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June 12, 2000

Christopher F. Conlon
Manager, Environmental Special Projects
KeySpan Energy Development New York
445 Broadhollow Road
Melville, NY 11747

Re: Newtown Station/Elmhurst Holder Tank Site
Final Investigation Work Plan
D&B No. 1620-M

Dear Mr. Conlon:

Enclosed for your files please find one copy of the following document:

"Investigation Work Plan
Newtown Station/Elmhurst Holder Tank Site"

By copy of this letter, one copy of the enclosed document has also been forwarded to each of those parties identified below.

In addition, as you are aware, we have submitted copies of the Work Plan under separate KeySpan cover to Thomas Lang, P.E. (NYSDEC) and G. Anders Carlson (NYSDOH).

If you have any comments or questions, please do not hesitate to contact Mr. Richard P. Russell, P.E., or me at (516) 364-9890.

Very truly yours,

Richard M. Walka

Richard M. Walka
Vice President

RMW/RPR/cmc
Enclosures
cc: L. Liebs (KeySpan)
T. Bell (KeySpan)
K. Rieke (KeySpan)
T. Campbell (KeySpan)
R. Wilson (KeySpan)
D. Harkawik (JFM)
K. Frantzen (VHB)
J. Bastedo (VHB)
S. Ostrow (Ostrow)
R. Russell (D&B)

♦1620\RMW00LTR-74.DOC(R02)

NEWTOWN STATION/ELMHURST HOLDER TANK SITE
INVESTIGATION WORK PLAN

Scope of Investigation
Project Management Plan
Quality Assurance/Quality Control Plan
Health and Safety Plan

Prepared for:

KEYSPAN ENERGY DELIVERY NEW YORK
ONE METROTECH CENTER
BROOKLYN, NEW YORK

Prepared by:

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
330 CROSSWAYS PARK DRIVE
WOODBURY, NEW YORK

In association with:

VANASSE HANGEN BRUSTLIN, INC.
54 TUTTLE PLACE
MIDDLETOWN, CONNECTICUT

JUNE 2000

♦1620\k0328001.doc(R01)

KEYSPAN
ENERGY

KeySpan Energy
445 Broadhollow Road
Melville, NY 11747

June 7, 2000

Thomas Lang, P.E.
New York State Department of
Environmental Conservation
Region 2 Office
47-40 21st Street
Long Island City, NY 11101

Re: Final Investigation Work Plan
Newtown Station/Elmhurst Holder Tank Site

Dear Mr. Lang:

In support of the Voluntary Cleanup Agreement (VCA) for the Newtown Station/Elmhurst Holder Tank Site, I have enclosed four final copies (one unbound) of the following document:

*"Investigation Work Plan
Newtown Station/Elmhurst Holder Tank Site"*

If you have any comments or questions, please do not hesitate to contact me at 1-631-391-6298.

Very truly yours,

Christopher F. Conlon

Christopher F. Conlon
Manager, Environmental Special Projects

CFC/kd
Enclosures
cc/encl.:
G. Anders Carlson, Ph.D. (NYSDOH) (2 copies)
cc: Dale A. Desnoyers, Esq. (NYSDEC)
Lawrence H. Liebs (KSE)
Kurt Rieke, Esq. (KSE)
Dennis P. Harkawik, Esq. (JFM)
Sam Ostrow (Ostrow)
Kurt A. Frantzen (VHB)

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KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE
INVESTIGATION WORK PLAN

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Section 1

1.0 INTRODUCTION

1.1 Project Purpose and Objectives

KeySpan Energy Delivery New York (KeySpan) has entered into a Voluntary Cleanup Agreement (VCA) with the New York State Department of Environmental Conservation (NYSDEC) to conduct an investigation at an approximate 6-acre former gas holder site located in Elmhurst, Queens County, New York. This document presents the Investigation Work Plan for the former gas storage facility, which is referred to as the Newtown Station/Elmhurst Holder Tank site. Dvirka and Bartilucci Consulting Engineers (D&B), in association with Vanasse Hangen Brustlin, Inc. (VHB), were retained by KeySpan to prepare this Investigation Work Plan in accordance with the requirements of the VCA.

The purpose of this Work Plan is to describe the methods and procedures to be implemented in performing the investigation that is required for the site according to the VCA. The Work Plan includes: a brief summary of historical information regarding the site; a sampling and analysis plan; a quality assurance/quality control (QA/QC) plan; and a health and safety plan (HASP) to protect personnel directly involved in the performance of the proposed investigation.

As will be discussed in greater detail in Sections 2 and 3 of this Work Plan, based on the findings of a site walkover, interviews with KeySpan representatives, and a review of previous investigations/studies and related site material, we believe that the principal area of environmental concern is related to the potential presence of residual lead contamination in surface soil on-site. The general objectives of this investigation are to:

- Sufficiently characterize the site to achieve an understanding of the nature and extent of any residual contamination in on-site surface and subsurface soil, as well as groundwater;
- Identify and evaluate the health and environmental risks associated with any contamination in an effort to determine the need for remedial action; and
- Obtain sufficient technical information to allow the identification, evaluation, selection, design and implementation of remediation alternatives, should remedial action be deemed necessary.

1.2 Project Approach

The Newtown Station/Elmhurst Holder Tank site operated from the early 1900s to 1993. In 1993, KeySpan (then named Brooklyn Union Gas Company) initiated the decommissioning of the facility. Since that time, KeySpan has dismantled and removed the steel superstructure of the two gas holders located on-site and collapsed the telescoping sections of the holders within each respective foundation. The decommissioning activities, as well as other related prior investigations undertaken at the site, are described in further detail in Section 2.4 of this document. This Work Plan was developed based on a review of the decommissioning activities and other prior investigations, as well as historical sources of information. The findings of this information review task, referred to as the "Initial Project Investigation," are discussed in Section 3.2 of this Work Plan. Based on the findings of this task, the Work Plan for the field investigation, presented in Section 3.3, includes provision to collect additional environmental data in order to identify and evaluate:

- Residual contaminant concentrations in surface soil, subsurface soil and groundwater at the facility; and
- The potential for contaminant pathways to exist whereby humans and/or environmental receptors might be exposed.

Section 2

2.0 SUMMARY OF EXISTING INFORMATION

2.1 Site Location and Ownership

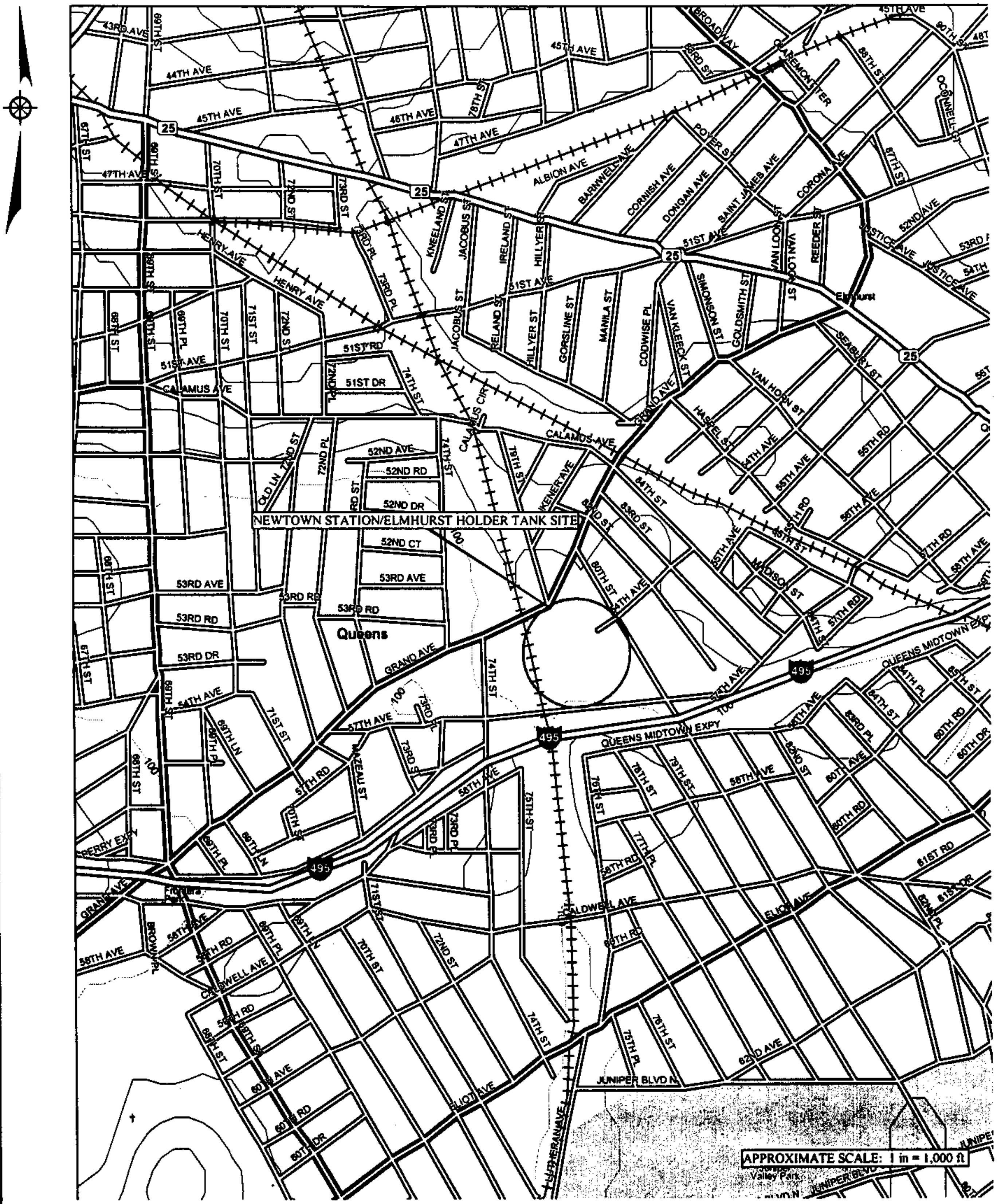
The Newtown Station/Elmhurst Holder Tank site is located in Elmhurst, Queens County, New York. The property is bounded on the south by 57th Avenue, on the west by the ConRail right-of-way, on the north by Grand Avenue and on the east by 80th Street (see Figure 2-1). The property includes the following parcels:

- Block 2805/Lot 31, which is zoned M3-1. This is the larger parcel of the overall site and includes the gas holders and compressor station ("Exhauster House") on the central and southern portion of the property.
- Block 2806/Lot 1, which is zoned residential. This is the smaller parcel of land adjacent to Grand Avenue, on the northern portion of the property.

The site is presently owned by KeySpan Energy Delivery New York (KeySpan). The site was utilized primarily for the temporary storage of manufactured gas during the early 1900's, followed by natural gas, for peak demand use in two "water seal" type holder tanks on-site. These two gas holder structures were decommissioned in 1993 and are currently being dismantled. Since the initiation of the decommissioning process, the Station has been out of service with the exception of the facility serving as a distribution operations satellite facility. A Site Plan is presented on Figure 2-2.

2.2 Site Description

The entire Newtown Station/Elmhurst Holder Tank site comprises approximately 6 acres. The two holder tanks, which collectively provided 20 million cubic feet of storage capacity for use during peak demand until 1993 when they were decommissioned, are located in the northern and central portion of the site and occupy approximately 3 acres. A compressor station referred to as the "Exhauster House" is located at the southeast corner of the site, and a one-story satellite station utilized for office space and parts storage exists in the southwest corner of the site. Two prefabricated hazardous waste storage sheds are also located on-site along the western property

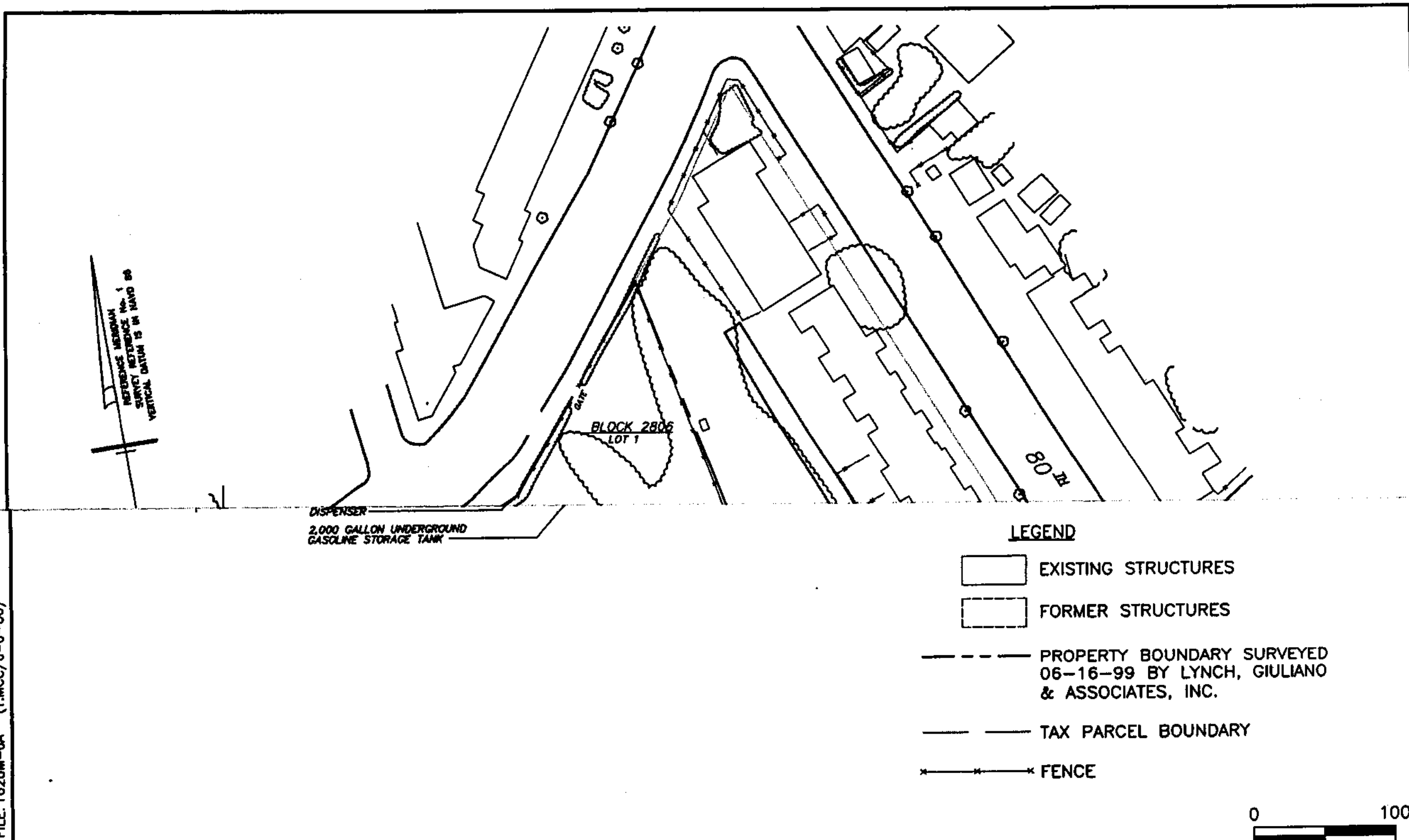


Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION / ELMHURST HOLDER TANK SITE
QUEENS COUNTY, NEW YORK

SITE LOCATION MAP

FIGURE 2-1



SOURCE: SURVEY BY LYNCH, GIULIANO & ASSOCIATES, INC.; 06-16-99 AND
SITE PLANS PROVIDED BY KEYSPAN: 1910, 1936, 1957, 1968, 1970, 1990, AND 1993

NEWTOWN STATION/ELMHURST HOLDER TANK SITE
SITE PLAN

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 2-2

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boundary. One of these sheds is utilized as a 90-day storage area and typically contains drummed personal protective equipment (PPE), oily rags, and other miscellaneous materials generated on-site. The other shed is utilized to store PPE and other spill-related control equipment and materials. Several other material/equipment storage buildings also exist in the southern portion of the site. A survey of the site is presented in Appendix A.

The surrounding area is primarily urban and land use is mostly residential with some industrial and commercial areas. Commercial development consisting of neighborhood stores exists to the immediate north side of Grand Avenue (north of the site) and the "backyard" areas of attached single-family residential units are located immediately east of the site along the northern portion of 80th Street. A Bell Atlantic service center is also located immediately east of the site along the southern portion of 80th Street. Immediately to the south of the southern property boundary is 57th Avenue, and the Long Island Expressway is further to the south.

2.3 Site Characteristics

The Newtown Station/Elmhurst Holder Tank site, located in western Queens County, New York, is surrounded by high density residential and commercial areas. The region is characterized as having numerous small variations in topographic relief. Regionally, drainage occurs primarily through sheet flow runoff, which is conveyed to sewers and eventually discharges into local tidal water bodies. The 6-acre site, however, is relatively flat with little relief, and is approximately 75 feet above mean sea level (msl).

Based on a regional 1989 United States Geological Survey (USGS) report, highly permeable, Pleistocene-aged glacial outwash deposits consisting of stratified medium to course sands and gravels comprise the unconfined Upper Glacial aquifer to approximately 100 feet below mean sea level (msl), or to a depth of approximately 175 feet below grade. A confining unit known as the Raritan Clay exists below the Upper Glacial aquifer, and is estimated to be between 50 and 75 feet thick. The site appears to be located beyond the reaches of the Magothy Aquifer. Bedrock is estimated to be between 150 and 175 feet below msl, or 225 to 250 feet below grade.

Based on regional studies, groundwater at the Newtown Station/Elmhurst Holder Tank site is believed to be approximately 50 feet below grade, with the direction of regional groundwater flow to the northeast.

2.4 Site Operating History

During its period of operation, the major function of the Newtown Station/Elmhurst Holder Tank site was for the temporary storage of gas for peak-demand use in the two "water seal" type holder tanks on-site. Although, the gas holders did, in fact, store manufactured gas during their initial years of operation, gas was not manufactured at the Elmhurst facility. Gas initially stored at this site was manufactured at nearby facilities and conveyed through the existing distribution system to the Elmhurst facility for temporary storage. Subsequently, the facility was utilized to store natural gas. Historically, the two gas holders have been referred to as the "Elmhurst Tanks." The base of Gas Holder No. 1 is approximately 35 feet below grade, has a diameter of 254 feet, and was constructed in approximately 1910. The base of Gas Holder No. 2 is approximately 12 feet below grade, has a diameter of 276 feet, and was constructed in approximately 1921. These two holders were both of "water seal" type construction, each with a capacity of approximately 10 million cubic feet. The holders were utilized until 1993, when KeySpan initiated the decommissioning of the facility. Additional information regarding the investigations and closure activities undertaken in support of the decommissioning program is presented in Section 2.5.

KeySpan currently uses the site as a distribution operations satellite facility. The one-story satellite station facility, currently used for office space and parts storage to support current operations, was constructed in 1968.

2.5 Previous Investigations and Decommissioning/Closure Activities

The following section provides a summary of prior investigations, analytical sampling programs and decommissioning/closure activities undertaken on-site.

2.5.1 Demolition of Holder Tank Structures

As previously mentioned, KeySpan initiated the decommissioning of the two holder tanks in 1993. The gas holders and associated piping were purged in November 1993. These activities are documented in Appendix B. In late 1990, an intermittent discharge to the adjacent property caused by high rainfall overflow of the holder cups was discovered through an environmental audit conducted by Brooklyn Union Gas. The discharge pipe was immediately removed and the overflow directed through an activated carbon filter system installed for the purpose to the municipal sewer system.

In December 1993, the New York City Department of Environmental Protection (NYCDEP) issued KeySpan an authorization to discharge up to 30 gpm of water from the holder tanks to the combined city sewer system, subsequent to treatment with the existing carbon system as installed following the 1990 audit. The initial NYCDEP discharge authorizations, as well as subsequent correspondence authorizing extensions to the original approval, are presented in Appendix C. KeySpan has recently completed this dewatering program. A total of approximately 34 million gallons of water (17 million gallons from each holder) were removed in association with this program.

To support the dewatering and decommissioning of the holder tanks, analytical sampling of the water in the holders, treated effluent, and bottom sludge/sediment has been undertaken. Appendix D presents documentation of analytical sampling undertaken in 1992, and Appendix E presents the results of a 1995 sampling program. In addition, KeySpan conducted monthly sampling of the treated effluent being discharged to the New York City sewerage system, as required by the NYCDEP discharge authorization. Copies of recent analytical results associated with these sampling activities are presented in Appendix F.

In July 1996, each of the three "pipe wells" and associated piping components for each of the two gas holders were drained of any residual water, visually inspected to confirm its structural integrity, and backfilled to grade with clean fill. These activities are documented in

Appendix B, and the laboratory analytical results obtained from samples collected prior to off-site transportation and disposal of the water removed from the "pipe wells' is presented in Appendix G.

In November 1996, KeySpan completed the dismantling and removal of the guide frame of each holder tank, and the telescoping walls of the holders were "collapsed" within their respective foundations. These activities are documented in Appendix H.

Subsequent to the completion of the dewatering activities, residual solids were removed from the bottom of the holders. As previously discussed, analytical sampling of the sludge/sediment was conducted in 1992 (see Appendix D) and 1995 (see Appendix E). Additional analytical sampling of the holder sludge/sediment was also undertaken in August 1999 (see Appendix I).

Preparation for the environmental cleaning of the two retired gas holders began in September of 1999. All material is being properly placarded and transported in accordance with 6 NYCRR Parts 364 and 372 to a hazardous waste landfill (Grows, Pennsylvania). Proper waste manifests are being used to document all shipments leaving the site.

The holder tank foundations and pipe wells are discussed further in Section 3.2.1 along with conclusions regarding the need for further investigation of these structures.

Historical maintenance of the exterior walls of the holder tank structures has typically involved sand blasting of the aboveground portion of each holder's water tank that resided partially above and below grade, and manual scraping of the holder shells, cups and structural steel guide frames followed by repainting activities. Due to the age of the structures, it is likely that lead based paint was utilized to support these maintenance programs. This is evidenced by the fact that elevated concentrations of lead have been detected in the holder sludge/sediment. Although lead based paint typically would only be utilized on the exterior of the structures, a pathway from the exterior walls to the interior of the tank exists due to the "cupped" design of the telescoping walls of the water seal type holders. In response to this concern, as well as a complaint from an adjacent residence to the New York City Department of Health that expressed concern over the potential presence of lead based paint chips associated with the historical maintenance of the holders, various activities have been undertaken by KeySpan to investigate and mitigate concerns over residual concentrations of lead based paint. These activities included, but are not limited to, analytical sampling for residual lead in air and soil samples in the vicinity of the site.

Based on an interview conducted by D&B with KeySpan on December 16, 1999, the following discussion presents a summary of the activities undertaken by KeySpan in response to concerns over lead based paint. KeySpan received an initial complaint on September 9, 1996 from Julian Monroe, who resided at 53-46 80th Street. KeySpan responded by conducting a sampling program at certain locations within the adjacent residential properties. In general, lead concentrations in soil were found to be within acceptable ranges, particularly given the highly urbanized location of the site. Although the lead levels at the Monroe residence were found to be acceptable, approximately 6 inches of topsoil was removed and replaced. Overall, approximately 12 paint chips were found in this yard, and 1 paint chip was found in the swimming pool of an adjacent yard. All remaining properties had no identifiable paint chips. These activities are documented in Appendix J.

After a review of the results of all sampling activities, laboratory analysis, and remedial activities, the New York City Department of Health indicated that it was satisfied with the program and closed the case.

2.5.2 Former Diesel Storage Tanks

Two 15,000-gallon aboveground diesel storage tanks (ASTs) were previously located on the southwestern portion of the Newtown Station site. These ASTs were utilized for fueling of fleet vehicles. The aboveground tanks and associated supporting structures, including the secondary containment system, were demolished and all related fuel was removed for disposal in 1974. This work is documented in Appendix B, and is discussed further in Section 3.2.2 along with conclusions regarding the need for further investigation of these former tanks.

2.5.3 Auto Repair Building

An Auto Repair Building was previously located in the southwestern section of the site. This facility was constructed in 1968 and was reportedly utilized for tire replacements and oil changes on fleet vehicles. Based on an interview conducted by D&B with KeySpan on November 16, 1999, this facility was demolished in the mid 1990's. This facility is discussed further in Section 3.2.3 along with conclusions regarding the need for further investigation of this former structure.

2.5.4 Former Underground Gasoline Storage Tank

Underground gasoline storage tanks (USTs) and a dispensing island are depicted on a 1970 construction plan of the east side of the former auto repair building. Handwritten notations on the plan indicate that while two 550-gallon USTs were proposed, only one 2,000-gallon UST was ultimately installed. This tank was utilized for fueling fleet vehicles. This UST was removed in November 1996. Documentation of the activities performed in support of this tank removal process is provided in Appendix K. These activities are discussed further in Section 3.2.4, along with conclusions regarding the need for further investigation of this former UST.

2.5.5 Underground "Fogging Oil" Storage Tank

A 1,500-gallon underground storage tank was previously utilized on-site to contain "fogging oil" to the west of the exhauster house. Based on an interview conducted by D&B with KeySpan on December 16, 1999, "fogging oil" was previously utilized to lubricate seals in gas lines on site. KeySpan indicated that "fogging oils" typically used included petroleum-based lubricants, propylene glycol, as well as water.

KeySpan stated that all "fogging" equipment on site was retired 15 to 20 years ago. Based on the December 16th interview, we now understand that while a formal underground storage tank "closure report" was not prepared, as the work was completed prior to the enactment of specific state or federal environmental regulatory requirements, the tank closure was undertaken in accordance with the requirements prescribed by the New York City Fire Department (NYCFD) at that time. The NYCFD typically required the removal of material from the tank and its ancillary equipment, the decontamination of the tank and associated piping and pumps, and the backfilling of the tank with a cement slurry. This work is discussed further in Section 3.2.5, along with conclusions regarding the need for further investigation of this former UST.

Section 3

3.0 SCOPE OF INVESTIGATION

The following section provides a detailed description of the proposed investigation of the Newtown Station/Elmhurst Holder Tank site.

3.1 Objectives and Approach

The focus of this investigation will be the characterization of on-site surface soil, subsurface soil and groundwater, identification of areas of concern, identification of potential pathways of contaminant migration and potential receptors, and evaluating the need for corrective measures.

The type of sampling techniques, and the number and depth of sampling locations, have been developed in consultation with Vanasse Hangen Brustlin, Inc. (VHB) based on a review of various environmental databases, a site inspection, interviews with representatives of KeySpan Energy Delivery New York (KeySpan), and a review of historic sources of information such as Sanborn Maps, as well as other historic site engineering drawings provided by KeySpan. The findings of these activities, referred to as the "Initial Project Investigation," are discussed in Section 3.2. Based on these findings, a sampling program has been proposed for the site, as discussed in Section 3.3.

3.2 Initial Project Investigation

As was mentioned previously in Section 1 of this Work Plan, the initial element of the investigation involved collecting and reviewing background information regarding the Newtown Station/Elmhurst Holder Tank site to support the preparation of this scope of work. This background information was used to focus the field investigation, particularly with respect to determining potential sources of contamination. The following is a list of the sources of information and investigation techniques that were utilized in order to better understand site history and prior on-site operations:

- Documentation of prior decommissioning/closure activities;
- Prior environmental studies/reports;
- Consultation with representatives of the NYCDEP;
- State and federal environmental databases;
- Interviews with representatives of KeySpan;
- Historic Brooklyn Union Gas information available from KeySpan files;
- Site plans and construction drawings; and
- Historic Sanborn (fire insurance) Maps.

Due to the period of operation of the facility (early 1900s to 1993), particular attention was given to the acquisition and review of historic Sanborn Maps and site plans/construction drawings. These sources of information were utilized to evaluate the location of former structures and operations which could represent potential source areas at the site. The following discussion presents a summary of the findings of this task, which in turn were utilized to develop the scope of the proposed field investigation.

A review of the sources of information identified above revealed a number of former as well as current structures that could potentially be considered areas of environmental concern. These potential areas of concern are discussed below, with references to various forms of documentation to support the conclusions regarding the need for any further investigation at each area.

3.2.1 Holder Tank Structures/Pipe Wells

As previously discussed, the two holder tanks on-site were taken out of service in 1993 and have been in the process of being demolished since that time. Both of these holders were of "water seal" type construction. The expression "water seal" refers to the use of water to form the leak tight interface between the gas and the atmosphere. No tars or oils were used to form this seal in any way. This interface occurred in the "cupped" ends of each of the five telescoping sections of each holder shell. The water used to seal each of the cups came from each holder's water tank that resided partially above and below grade. The average capacity of each water tank is approximately 17 million gallons.

As part of the decommissioning of the tanks, KeySpan has performed multiple visual inspections of the interior of the water tanks. The walls and bottoms were found to be completely intact. Close inspection of the steel floor and walls of each holder revealed a riveted fastening pattern, with all rivets still intact. The floor plates have not shifted and there was no observation of any water or soil infiltrating the bottom or sides of the tank. There were also no gaps in the corners of the walls and floor. Structural integrity is documented in writing and video.

A review of a design drawing presenting a cross sectional view of a holder indicates that the concrete holder foundations are up to 13 feet thick. Pipe conduits and galleries under the tanks are also shown as being completely enclosed within the concrete foundation and having up to 4 feet of concrete above and 2 feet of concrete below them.

As previously discussed in Section 2.5, documentation of the decommissioning and "dewatering" of the holders, including discharge authorizations from the NYCDEP and analytical sampling results, is presented in various appendices. Based on this information, the visual inspections identified above, and the design of the overall concrete foundation structure also described above, we believe sufficient documentation of prior, as well as ongoing, decommissioning/closure activities is available to eliminate concern over any potential prior releases from the holder foundations. Notwithstanding this, the sampling program includes provision for analytical sampling of a wide array of potential contaminants in the vicinity of the holders, including lead due to the concern over the potential presence of residual lead-based paint in surface and/or subsurface soil that could have resulted from the maintenance of the guide frame and telescoping steel walls of each holder tank over time. The sampling program is presented in Section 3.3.

The "pipe wells," "sumps," "pits" and utility conduits on-site that were interconnected to the holder tanks were utilized to support the gas and process cooling water piping network throughout the site. As mentioned above, these conduits were concrete structures that contained piping and associated valving controls to regulate and convey gas flow and water to and from the two holders. The piping networks throughout the site were purged by KeySpan in November 1993 utilizing carbon dioxide as an inerting medium and a thermal oxidizer to convert any residual gas to carbon dioxide and water vapor. Any residual water within the "pipe wells," also commonly referred to as "drip wells," "holder legs" and "drip legs," was either discharged to the New York City Sewerage System or pumped out into tanker trucks and transported off-site for proper disposal. Based on a December 16, 1999 interview conducted by D&B with KeySpan, a visual inspection of the pipe wells was conducted in 1996, and no apparent concrete spalling, major cracks or differential settling was found. As a result, these structures were deemed to be structurally sound, and were backfilled with clean fill. Based on the above discussion, and the supporting documentation of these activities presented in the appendices (as previously discussed in Section 2.5), further investigation of the "pipe wells" and interconnected sumps, pits and piping conduits does not appear to be warranted.

3.2.2 Underground "Fogging Oil" Storage Tank

As was discussed in Section 2.5.5, a 1,500-gallon underground storage tank (UST) was located to the west of the Exhauster House. This UST was utilized to store various lubricating materials, including water, which were periodically used to "fog" the on-site gas pipeline system for enhanced lubrication of seals. Based on an interview conducted by D&B with KeySpan on December 16, 1999, the tank was taken out of service, emptied of its contents, decontaminated and closed in accordance with New York City Fire Department requirements at that time. Notwithstanding the above, provision has been made in the sampling program presented in Section 3.3 for subsurface soil sampling in the vicinity of this former tank to confirm that there are no environmental concerns.

3.2.3 Former Diesel Storage Tanks

Two 15,000-gallon aboveground diesel storage tanks were previously located on the southwestern portion of the site. Based on a review of Sanborn Maps and a site plan drawing provided by KeySpan, it appears that the two aboveground storage tanks were located within a secondary containment structure. These tanks were taken out of service, excavated and removed from the site in 1974 by Petroleum Construction, Inc. All residual fuel was reportedly removed and all of the associated supporting structures were reportedly demolished. These activities are documented in Appendix B. Notwithstanding the above, provision has been made in the sampling program presented in Section 3.3 for subsurface soil sampling in the vicinity of these former tanks to confirm that there are no concerns in this area.

3.2.4 Auto Repair Building

An auto repair building previously existed in the southwestern portion of the site. Based on a review of a construction plan for this building, and interviews with a KeySpan representative, this structure contained one hydraulic lift, but did not contain any floor drains or pits, and was only used minimally for tire replacements and oil changes of fleet vehicles. Based on interviews with a KeySpan representative, all waste fluids were contained for off-site transportation and disposal, and the structure was demolished in the mid-1990's. However, provision has been made in the sampling program presented in Section 3.3 for subsurface soil sampling in the vicinity of this former structure to confirm that there are no concerns in this area.

3.2.5 Former Underground Gasoline Storage Tank

As previously discussed, a 2,000-gallon underground gasoline storage tank previously existed on the eastern side of the former auto repair building. This UST was removed in November 1996 with confirmatory end point sampling. Documentation of these activities, and a "no further action" letter from the NYSDEC, is presented in Appendix K. Based upon this information, further investigation of this former UST does not appear to be warranted.

3.2.6 On-Site Sanitary Disposal Systems

Based on a review of a limited number of engineering drawings of various buildings and structures at the Newtown Station/Elmhurst Holder Tank site, three cesspools were identified on-site. A sink and toilet facilities within the Exhauster House are depicted as discharging to a cesspool on a construction plan for this building. A second pool was identified along the western property boundary on a 1910 construction plan that was apparently utilized as an "outhouse" for sanitary waste. A third cesspool, with a handwritten notation of "dead," implying it was no longer utilized, was identified to the northwest of the Exhauster House. Based on a review of a "Sewer Map" provided by the Sewer Permit Control Office of the Queens Borough Hall, and an interview conducted by D&B with a representative of this agency on October 12, 1999, the facility was connected to the public sewer in approximately 1942. Prior to the facility being connected to the public sewer system, at least two of the three on-site cesspools were utilized for sanitary wastewater discharges. Further investigation of these former structures does not appear to be warranted.

3.2.7 Exhauster House Drain Sumps

Two drain sumps are located in the basement of the Exhauster House. Based on an interview conducted by D&B with KeySpan on December 2, 1999, these sumps are self-contained concrete structures utilized for the collection of facility wash water and boiler condensate, and are pumped out manually on an as-needed basis. KeySpan indicated that this wastewater was either discharged to the city sewer system or transported off-site for disposal. As a result, further investigation of these sumps does not appear to be warranted.

3.2.8 PCB-Containing Materials

PCB-containing materials are not expected at this site, and periodic sampling of liquids (primarily water) generated within the system has never shown any evidence of PCBs.

In natural gas pipelines and distribution systems, PCBs are associated with hydrocarbon condensates that are contained in the gaseous phase when the system is at high pressure and drop out into the liquid phase when the pressure is lowered. Pressures in interstate transmission systems are typically on the order of 300 pounds per square inch (psi). When the gas reaches local distribution systems such as those owned by KeySpan, pressure is dropped to approximately 60 psi. The majority of condensate and associated PCBs is scrubbed out of the system at this point and KeySpan's practice has always been to see that it is properly disposed of. In a series of intermediate steps, pressure is dropped even further (to as low as 0.25 psi).

The Newtown Holder operated by taking gas from the system at 0.25 psi and redistributing it at 15 psi to the surrounding system. Pressure was only increased and there was no pressure drop, therefore no hydrocarbon condensate would be formed and PCBs would not be generated. Nevertheless, in order to confirm this, the sampling program presented in Section 3.3 does make provision for a select number of surface and subsurface soil samples to be analyzed for PCBs.

3.3 Field Investigation

Based on the findings of the tasks identified above, the proposed scope of work and sampling program are provided on Table 3-1 and Table 3-2, respectively at the end of this section. A map showing the proposed sample locations is also provided on Figure 3-1, at the end of this section.

3.4 Risk Assessment

A site and reuse-specific baseline risk assessment will be prepared to support the Investigation Program. The assessment will include an evaluation of potential threats to human health and the environment posed by any observed chemical substances in tested media. If a significant threat is found to exist, then cleanup objectives and goals will be prepared. The assessment will be prepared in accordance with NYSDEC/NYSDOH guidance (TAGMs) and USEPA risk assessment guidance (RAGs). This task will be consistent with recent updates to both the human health and ecological risk assessment protocols, and the NYSDEC's *Fish and Wildlife Impact Analysis (FWIA) for Hazardous Waste Sites*. It is currently expected that the FWIA will require no more than Steps 1 (Background) and IIA (Pathway Analysis) of the protocol.

The baseline assessment will identify those detected chemical substances that are likely to be of potential concern, define likely routes or pathways of environmental migration, identify potential human and biotic receptors, and define routes of potential exposure. The human health portion of the baseline assessment will include exposure modeling of current (on-site worker, off-site resident-adult, and off-site resident-child) and future (on-site resident-adult, on-site resident-child, on-site construction worker and commercial worker) scenarios involving incidental ingestion, inhalation of fugitive dust, and direct dermal contact routes. Surface and subsurface soils, soil gas/ambient air (including indoor air), and fugitive dust will be the environmental media considered in the assessment. Although groundwater data will be available it is highly unlikely that direct contact or ingestion could occur now or in the future. Thus, this media and pathway will not be evaluated directly in the baseline assessment.

The ecological portion of the baseline assessment will define the site's biological and resource conditions and evaluate the potential for exposure (pathways analysis). Should additional steps be required, as indicated by the investigation findings, they will be implemented as required under the FWIA protocol.

The assessment will characterize the potential risks to human health and the environment in quantitative fashion and evaluate its significance based upon established agency guidelines. Because of the likelihood of finding lead in soil, the technical approach will include the evaluation of potential lead exposures using the following two models:

- USEPA's Integrated Exposure Uptake Biokinetic (IEUBK) model for residential (children in particular) lead exposure. (USEPA. 1994. *Technical Support Document: Parameters and Equations Used in the Integrated Exposure Uptake Biokinetic Model for Lead in Children* (v. 0.99d). Office of Emergency and Remedial Response, Washington, DC. EPA/540/R-94/040, PB94-963505. T. Fields. 1998. *Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective*

Action Facilities. USEPA Memorandum, OSWER Directive #9200.4-27P, EPA/540/F-98/030, PB98-963244. L.R. Goldman and T. Fields. 1998. *Proposed TSCA §403 Soil Lead Hazard and OSWER's Lead-in-Soils Policy.* USEPA Memorandum, OSWER Directive #9200.4-19, EPA/540/F-98/061, PB99-963211.

- The Bowers' revised version of the IEUBPK model to evaluate adult lead exposure. (T.S. Bowers, B.D. Beck, and H.S. Karam. 1994. Assessing the Relationship between Environmental Lead Concentrations and Adult Blood Lead Levels. *Risk Analysis* 14(2) 183-189. Technical Review Workgroup for Lead. 1996. *Recommendations... for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil,* USEPA, Washington, DC.)

As necessary, based on the assessment findings, a basis for determining chemical levels that can remain while providing adequate protection of human health and the environment will be provided and areas requiring remedial action will be identified.

3.5 Interim Remedial Measures

An IRM is defined in the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) No. 4042: Interim Remedial Measures, as a "discrete set of activities to address both emergency and non-emergency site conditions which can be undertaken without extensive investigation and evaluation, to prevent, mitigate, or remedy environmental damage or the consequences of environmental damage attributable to a site listed in the Registry." The purpose of an IRM is to provide an immediate remedial response action, prior to the completion of an investigation, to address contamination that is an immediate threat to human health or the environment.

Although intended to be a temporary or partial response, an IRM can be included as part of, as well as comprise the entire, final remedy for the site. Based on the results of the investigation, recommendations will be made that the option of implementing an IRM be considered, if warranted.

3.6 Focused Feasibility Study/Remediation Work Plan

Based upon the results of the investigation, a Remediation Work Plan will be prepared that will essentially be a Focused Feasibility Study (FFS), if necessary. The FFS, if required, would be prepared in order to identify, evaluate and select the most efficient remedial measures and provide a detailed discussion of the technical and financial rationale for the selection of the proposed remedial action.

The FFS, if required, would be prepared to include the development of alternatives, screening of the alternatives and detailed analysis of alternatives. Based on the identification of a limited number of presumptive remedies, appropriate remedial actions would be evaluated to ensure protection of human health and the environment, considering the site-specific circumstances. The development and screening of alternatives, as well as the detailed analysis of alternatives, would be presented in a draft and final FFS report. The preparation of the FFS would be consistent with NYSDEC and USEPA guidelines.

Table 3-1

<u>KEYSPAN ENERGY DELIVERY NEW YORK</u>
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

SCOPE OF WORK SUMMARY

PROGRAM ELEMENT	SCOPE OF WORK DESCRIPTION
• Surface Soil Sampling	Sixteen surface soil samples (each a composite of the 0-2 inch interval below ground surface) will be collected at locations across the site. Samples will be collected around the perimeter of Holders 1 and 2 and around the perimeter of the site. Figure 3-1, at the end of this section, depicts the general location of each of the proposed surface soil samples; however, exact locations of the samples will be determined in the field. Although volatile organic vapors are not anticipated to be a concern on-site, the samples will be screened utilizing a flame ionization detector (FID) or photoionization detector (PID). The samples will be analyzed for BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471). Also, 10% of the surface soil samples collected will be analyzed for full TAL/TCL (including PCBs). Additional samples may be selected for analysis of full TAL/TCL if they exhibit heavy staining.
• Subsurface Soil Sampling	Up to 8 soil probes will be advanced on-site utilizing the Geoprobe system in areas surrounding the two former Gas Holders and in the former location of the auto repair building, diesel storage tanks and "fogging oil" tank. Figure 3-1 depicts the general location of each of the proposed soil probes; however, the exact locations will be determined in the field. The samples will be screened utilizing a PID, visually inspected and logged by a geologist. Soil samples will be collected continuously to a depth of approximately 20 feet below the ground surface at three soil probes (in the former location of the auto repair building, diesel storage tanks and "fogging oil" tank). Provision has been made for laboratory analysis of up to two samples from each of these three probes for BTEX (USEPA Method 8021), PAHs (USEPA Method 8270) and RCRA metals (USEPA Methods 6010/7471).

Table 3-1 (continued)

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

SCOPE OF WORK SUMMARY

PROGRAM ELEMENT	SCOPE OF WORK DESCRIPTION
• Subsurface Soil Sampling (continued)	In addition, provision has been made to advance up to three soil probes around the perimeter of Former Holder Number 1 to approximately 51 feet below grade (16 feet below the base of the holder), with soil sampling at 5-foot intervals, and two soil probes around the perimeter of Former Holder Number 2 to approximately 28 feet below grade (16 feet below the base of the holder), with sampling at 5-foot intervals. For two of these five probe locations around the perimeters of the holders (one on the downgradient side of Former Holder Number 1 and one on the downgradient side of Former Holder Number 2), provision has been made for laboratory analysis of up to one sample from each 10-foot interval for VOCs (USEPA Method 8260), SVOCs (USEPA Method 8270) and RCRA metals (USEPA Methods 6010/7471). For the other three probe locations around the perimeters of the holders, provision has been made for laboratory analysis of up to one sample from each 10-foot interval for BTEX (USEPA Method 8021), PAHs (USEPA Method 8270) and RCRA metals (USEPA Methods 6010/7471). BTEX and PAH analysis on these samples may be replaced with VOC and SVOC analyses, respectively, if these samples exhibit heavy staining or NAPL. Also, 10% of the subsurface soil samples collected for analysis will be analyzed for full TAL/TCL (including PCBs). Additional samples may be selected for analysis of full TAL/TCL if they exhibit heavy staining or NAPL.

Table 3-1 (continued)

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

SCOPE OF WORK SUMMARY

PROGRAM ELEMENT	SCOPE OF WORK DESCRIPTION
• GW Monitoring Well Installation and Sampling	Provision has been made for the installation of up to five shallow monitoring wells on-site. Figure 3-1 depicts the general location of each of the proposed groundwater monitoring wells; however, the exact locations will be determined in the field. Monitoring wells will be constructed with 2-inch I.D., Schedule 40, 15-foot long, 0.020-inch slot screens (set 5 feet above and 10 feet below the groundwater interface) and threaded flush joint PVC casing, unless fine sand/silt is encountered. If fine sand/silt is encountered, 0.010-inch slot screens will be utilized. Anticipated depth to groundwater is approximately 50 feet below grade. As a result, the total depth of each well is anticipated to be approximately 60 feet below grade. In addition, if heavy sheens or NAPL are present, the wells will be equipped with 2-foot sumps. Provision has been made to analyze all five groundwater samples for BTEX (USEPA Method 8021), PAHs (USEPA Method 8270), and RCRA metals (USEPA Methods 6010/7471). Groundwater samples will also be analyzed for PCBs (Method 8082), if detected at elevated concentrations in soil probe samples. If a continuous confining unit is encountered on site, undisturbed soil/clay samples will also be collected using Shelby tubes or, if the clay is too stiff for the tube to penetrate, a Denison sampler will be used. A minimum of two undisturbed samples will be collected from each confining unit and analyzed for vertical permeability by ASTM Method D2434 and grain size by hydrometer utilizing ASTM Method D422. However, based on a review of available information, it has been assumed that a continuous confining unit will not be encountered on site. If a continuous unit is encountered on-site, appropriate steps will be taken, based on field conditions, to protect the integrity of the confining unit.

Table 3-1 (continued)

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

SCOPE OF WORK SUMMARY

PROGRAM ELEMENT	SCOPE OF WORK DESCRIPTION
• Air Monitoring	Air monitoring for VOCs and dust will be conducted at approximate 200-foot intervals around the perimeter of the site and at the upwind and downwind site perimeter when hollow-stem augering is being conducted on-site. Perimeter air monitoring for VOCs and dust will be conducted hourly with a PID and a digital dust meter (i.e., MiniRam), respectively. Continuous perimeter air monitoring for lead will also be conducted using air sampling pumps equipped with 0.8 um MCE filters during on-site hollow-stem augering activities. A temporary monitoring station will also be located at the work perimeter immediately downwind of hollow stem augering activities (to evaluate VOCs, lead and dust). The temporary station will continuously monitor for VOCs, lead and dust using a PID, air sampling pump equipped with a 0.8 um MCE filter, and digital dust meter, respectively. PIDs and digital dust meters utilized to continuously monitor for VOCs and dust at the temporary station immediately downwind of hollow stem augering activities will be equipped with alarms and data loggers.
• Surveying and Mapping	All monitoring well locations and casing elevations will be surveyed by a licensed surveyor and located on the base map.

Table 3-2

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

SAMPLING PROGRAM SUMMARY

PROGRAM ELEMENT	Environmental Media	Location/ Depth	Number of Samples Analyzed*	Equipment	Laboratory Analysis**
• Surface Soil Sampling	Soil	Sixteen samples (each a composite of the 0-2 inch interval below ground surface) around perimeter of Holders 1 and 2 and around the perimeter of the site.	16	Dedicated sterile polyethylene scoop, decontaminated hand auger or sampling probe with dedicated liners.	BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471). Also, full TAL/TCL (including PCBs) on 10% of the total number of surface soil samples collected for analysis. Additional samples may be selected for analysis of full TAL/TCL if they exhibit heavy staining.

*Does not include QA/QC samples. See Section 5 for summary of QA/QC samples.
**Assumes a normal 28-day turnaround of analytical results of samples will be provided by the laboratory.

Table 3-2 (continued)

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

SAMPLING PROGRAM SUMMARY

PROGRAM ELEMENT	Environmental Media	Location/ Depth	Number of Samples Analyzed*	Equipment	Laboratory Analysis**
• Subsurface Soil Sampling	Soil	Soil probe sampling at 5-foot intervals to approximately 51 feet below ground surface at one location on the north (downgradient) side of Holder 1 and to approximately 28 feet below ground surface at one location on the north (downgradient) side of Holder 2.	8	Decontaminated Geoprobe sampler.	VOCs (Method 8260), SVOCs (Method 8270) and RCRA metals (Methods 6010/7471). Also, full TAL/TCL (including PCBs) on 10% of the total number of unsaturated subsurface soil samples collected for analysis. Additional samples may be selected for analysis of full TAL/TCL if they exhibit heavy staining or NAPL.

*Does not include QA/QC samples. See Section 5 for summary of QA/QC samples.
**Assumes a normal 28-day turnaround of analytical results of samples will be provided by the laboratory.

Table 3-2 (continued)

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

SAMPLING PROGRAM SUMMARY

PROGRAM ELEMENT	Environmental Media	Location/ Depth	Number of Samples Analyzed*	Equipment	Laboratory Analysis**
• Subsurface Soil Sampling (continued)	Soil	Soil probe sampling at 5-foot intervals to approximately 51 feet below ground surface at 2 additional locations around Holder 1 and to approximately 28 feet below ground surface at one additional location around Holder 2.	13	Decontaminated Geoprobe sampler.	BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471). BTEX and PAH analyses may be replaced with VOC and SVOC analyses, respectively, if samples exhibit heavy staining or NAPL. Also, full TAL/TCL (including PCBs) on 10% of the total number of unsaturated subsurface soil samples collected for analysis. Additional samples may also be selected for analysis of full TAL/TCL if they exhibit heavy staining or NAPL.

*Does not include QA/QC samples. See Section 5 for summary of QA/QC samples.
**Assumes a normal 28-day turnaround of analytical results of samples will be provided by the laboratory.

Table 3-2 (continued)

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

SAMPLING PROGRAM SUMMARY

PROGRAM ELEMENT	Environmental Media	Location/ Depth	Number of Samples Analyzed*	Equipment	Laboratory Analysis**
• Subsurface Soil Sampling (continued)	Soil	Continuous soil probe sampling to approximately 20 feet below ground surface in three locations (the former location of the auto repair building, diesel storage tanks and "fogging oil" tank).	6	Decontaminated Geoprobe sampler.	BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471). Also, full TAL/TCL (including PCBs) on 10% of the total number of unsaturated subsurface soil samples collected for analysis. Additional samples may be selected for analysis of full TAL/TCL if they exhibit heavy staining or NAPL.
• Groundwater Monitoring Well Installation and Sampling	Groundwater	Collect groundwater samples from five new wells.	5	Disposable polyethylene bailer and/or dedicated tubing.	BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471). Also, PCBs (Method 8082) if detected at elevated concentrations in soil probe samples.

*Does not include QA/QC samples. See Section 5 for summary of QA/QC samples.
**Assumes a normal 28-day turnaround of analytical results of samples will be provided by the laboratory.

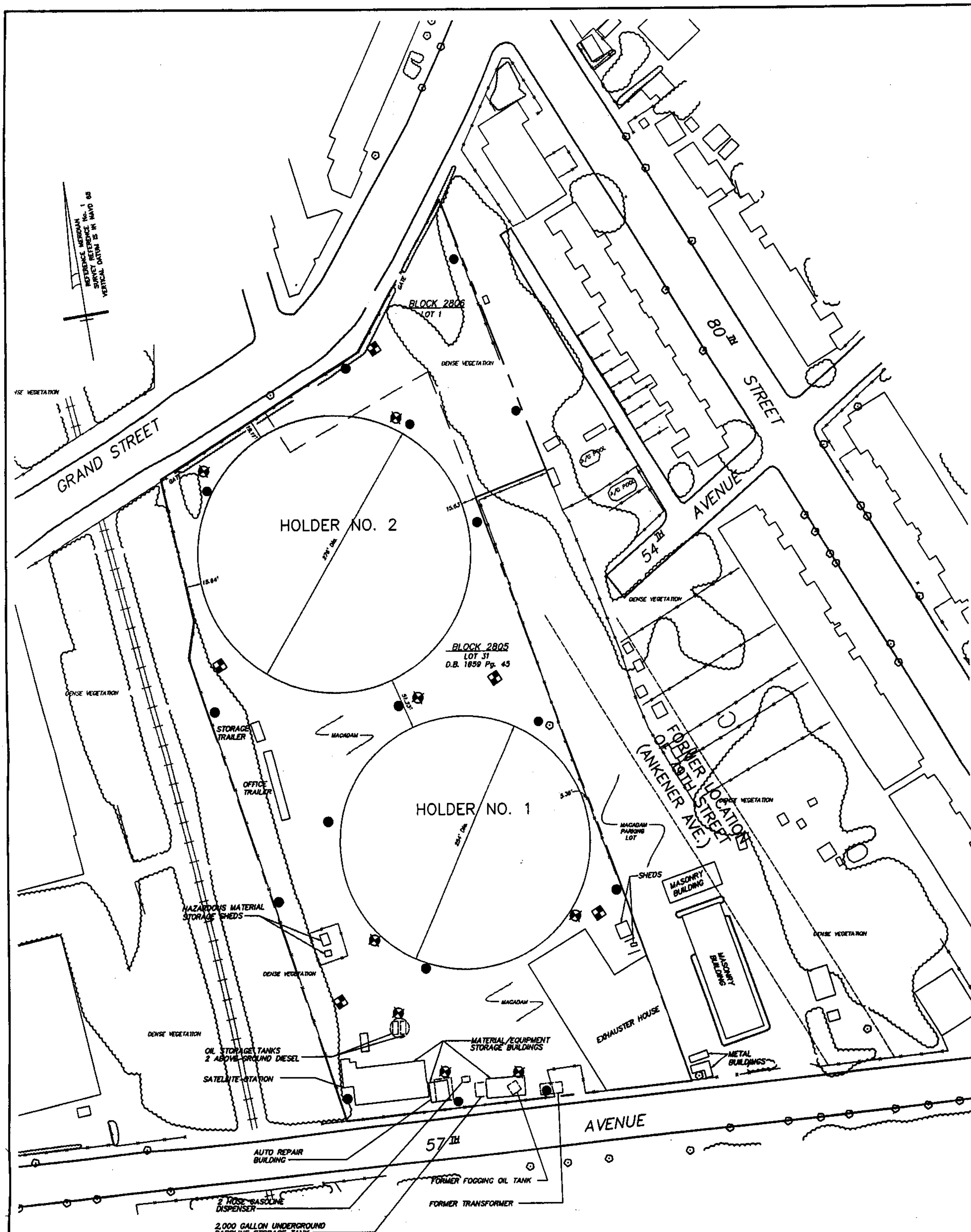
Table 3-2 (continued)

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

SAMPLING PROGRAM SUMMARY

PROGRAM ELEMENT	Environmental Media	Location/ Depth	Number of Samples Analyzed*	Equipment	Laboratory Analysis**
• Air Monitoring	Air	Conduct air monitoring hourly for VOCs and dust at approximate 200-foot intervals around site perimeter and at the upwind and downwind site perimeter during on-site hollow-stem augering activities. Conduct continuous perimeter lead monitoring during on-site hollow stem augering activities. Also, continuously monitor for VOCs, lead and dust at the work perimeter immediately down-wind of hollow stem augering activities.	Dependent on duration of hollow stem augering activities.	PID (for VOCs), air sampling pumps equipped with 0.8 um MCE filters (for lead), and a digital dust meter (for dust). PIDs and digital dust meters utilized at the work perimeter will be equipped with data loggers and alarms.	Lead (NIOSH 7300 or equivalent).

*Does not include QA/QC samples. See Section 5 for summary of QA/QC samples.
**Assumes a normal 28-day turnaround of analytical results of samples will be provided by the laboratory.



LEGEND

- EXISTING STRUCTURES
- FORMER STRUCTURES
- PROPERTY BOUNDARY SURVEYED 06-16-99 BY LYNCH, GIULIANO & ASSOCIATES, INC.
- TAX PARCEL BOUNDARY
- FENCE
- PROPOSED SURFACE SOIL SAMPLING LOCATION
- PROPOSED SUB-SURFACE SOIL SAMPLING LOCATION
- PROPOSED GROUNDWATER MONITORING WELL LOCATION

0 100
SCALE IN FEET

SOURCE: SURVEY BY LYNCH, GIULIANO & ASSOCIATES, INC.; 06-16-99 AND SITE PLANS PROVIDED BY KEYSPAN: 1910, 1936, 1957, 1968, 1970, 1990, AND 1993

NEWTOWN STATION/ELMHURST HOLDER TANK SITE
SAMPLE LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 3-1

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Section 4

4.0 PROJECT MANAGEMENT PLAN

4.1 Scheduling

Key milestones for the investigation at the Newtown Station/Elmhurst Holder Tank site are identified below to monitor work progress. The following is the list of milestones proposed for this project:

Milestone	**Projected Completion Date**
1. Submittal of draft Work Plan to NYSDEC	January 12, 2000
2. Receipt of NYSDEC comments	March 14, 2000
3. Submittal of final Work Plan to NYSDEC	June 9, 2000
4. NYSDEC approval of final Work Plan (effective date of VCA)	June 14, 2000
5. Commence implementation of Work Plan	June 19, 2000
6. Submittal of draft Investigation Report to NYSDEC	October 23, 2000
7. Receipt of NYSDEC comments	November 17, 2000
8. Submittal of final Investigation Report to NYSDEC	December 18, 2000
9. NYSDEC approval of final Investigation Report	December 29, 2000

4.2 Project Management, Organization and Key Technical Personnel

Dvirka and Bartilucci Consulting Engineers will be the prime consultant responsible for the performance of the investigation. Subcontractors planned to be used for this project include:

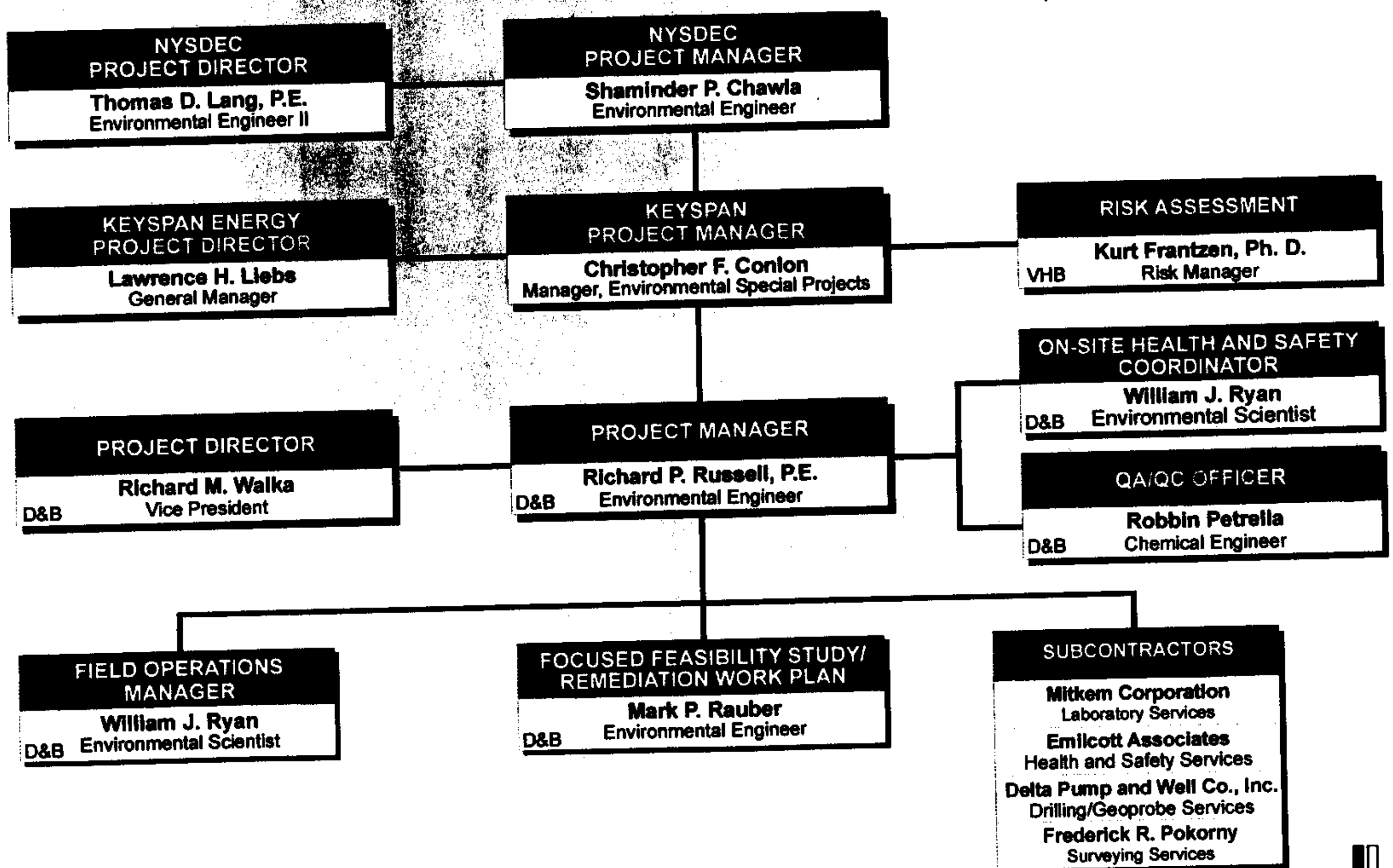
- Emilcott Associates, Inc. (Health & Safety Services)
- Delta Pump and Well, Inc. (Drilling/Geoprobing Services)
- Mitkem Corporation (Laboratory Services)
- Frederick R. Pokorny, Civil Engineer (Surveying Services)

KeySpan may also provide in-house surveying services for this project.

In addition to the subcontractors identified above, KeySpan has retained the services of Vanasse Hangen and Brustlin, Inc. (VHB) to undertake and complete any risk analysis associated with this project.

The project organization for this investigation, depicting both management and key technical staff associated with specific project responsibilities, is presented on Figure 4-1.

PROJECT TEAM ORGANIZATION CHART
NEWTOWN STATION/ELMHURST HOLDER TANK SITE
INVESTIGATION WORK PLAN



KEYSPAN

FIGURE 4-1

Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

RLA/KEYS1620(10/1/99)

Section 5

5.0 QUALITY ASSURANCE/QUALITY CONTROL PLAN

All sample analysis and data validation for the Investigation at the Newtown Station/Elmhurst Holder Tank Site will be conducted in accordance with the New York State Department of Environmental Conservation 1995 Analytical Services Protocol (ASP).

5.1 Sampling Program Design and Rationale

The proposed scope of work and QA/QC sampling components for the Newtown Station/Elmhurst Holder Tank Site is as follows:

Surface Soil Sampling

- Fourteen samples will be analyzed for BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471). In addition, the following QA/QC samples will be collected:
  - Two solid (soil) matrix spike samples will be collected for analysis of the above referenced parameters.
  - Two solid (soil) matrix spike duplicate samples will be collected for analysis of the above referenced parameters.
  - Two field blanks will be collected (unless sterile, disposable sampling equipment is used) for analysis of the above referenced parameters.

- Two samples will be analyzed for Full TAL/TCL.
  - One solid (soil) matrix spike sample will be collected for analysis of the above referenced parameters.
  - One solid (soil) matrix spike duplicate sample will be collected for analysis of the above referenced parameters.
  - One field blank will be collected (unless sterile, disposable sampling equipment is used) for analysis of the above referenced parameters.

Subsurface Soil Sampling

- Seventeen subsurface soil samples will be analyzed for BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471).
  - Two solid (soil) matrix spike samples will be collected for analysis of the above referenced parameters.
  - Two solid (soil) matrix spike duplicate samples will be collected for analysis of the above referenced parameters.
  - Two field blanks will be collected for analysis of the above referenced parameters.

- Seven subsurface soil samples will be analyzed for VOCs (Method 8260), SVOCs (Method 8270) and RCRA metals (Methods 6010/7471).
  - One solid (soil) matrix spike sample will be collected for analysis of the above referenced parameters.
  - One solid (soil) matrix spike duplicate sample will be collected for analysis of the above referenced parameters.
  - One field blank will be collected for analysis of the above referenced parameters.

- Three subsurface soil samples will be analyzed for Full TAL/TCL.
  - One solid (soil) matrix spike sample will be collected for analysis of the above referenced parameters.
  - One solid (soil) matrix spike duplicate sample will be collected for analysis of the above referenced parameters.
  - One field blank will be collected for analysis of the above referenced parameters.

Groundwater Sampling

- Five groundwater samples will be analyzed for BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471).
  - One liquid (groundwater) matrix spike sample will be collected for analysis of the above referenced parameters.

- One liquid (groundwater) matrix spike duplicate sample will be collected for analysis of the above referenced parameters.

- One field blank will be collected for analysis of the above referenced parameters.

- One trip blank will be collected for analysis of BTEX (Method 8021).

The QA/QC samples to be collected are also summarized in Table 5-1.

Table 5-1

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

QA/QC SAMPLE SUMMARY

PROGRAM ELEMENT	Environmental Media	Number of Environmental Samples	Number of QA/QC Samples	Equipment	Laboratory Analysis*
• Surface Soil Sampling	Soil	14	2 MS 2 MSD 2 FB**	Dedicated, sterile, polyethylene scoop, decontaminated hand auger or sampling probe with dedicated liners.	BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471).
	Soil	2	1 MS 1 MSD 1 FB**	Dedicated, sterile, polyethylene scoop, decontaminated hand auger or sampling probe with dedicated liners.	Full TAL/TCL.
• Subsurface Soil Sampling	Soil	17	2 MS 2 MSD 2 FB	Decontaminated Geoprobe sampler.	BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471).
	Soil	7	1 MS 1 MSD 1 FB	Decontaminated Geoprobe sampler.	VOCs (Method 8260), SVOCs (Method 8270) and RCRA metals (Methods 6010/7471).

Table 5-1 (continued)

KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION/ELMHURST HOLDER TANK SITE

QA/QC SAMPLE SUMMARY

PROGRAM ELEMENT	Environmental Media	Number of Environmental Samples	Number of QA/QC Samples	Equipment	Laboratory Analysis*
• Subsurface Soil Sampling (continued)	Soil	3	1 MS 1 MSD 1 FB	Decontaminated Geoprobe Sampler.	Full TAL/TCL.
• Groundwater Monitoring Well Installation and Sampling	Groundwater	5	1 MS 1 MSD 1 FB 1 TB	Disposable polyethylene bailer and/or dedicated tubing.	BTEX (Method 8021), PAHs (Method 8270) and RCRA metals (Methods 6010/7471). Also PCBs (Method 8082) if detected at elevated concentrations in soil probe samples. BTEX (Method 8021).

Notes:

*Assumes a normal 28-day turnaround of analytical results of samples will be provided by the laboratory.
**To be collected and analyzed only if sterile, disposable sampling equipment is not utilized.

MS: Matrix Spike
MSD: Matrix Spike Duplicate
FB: Field Blank
TB: Trip Blank

Section 6

6.0 HEALTH AND SAFETY PLAN

The following site-specific information is provided with respect to the Newtown Station/Elmhurst Holder Tank site.

6.1 Project Profile and Organization

SITE NAME:	Newtown Station/Elmhurst Holder Tank Site
SITE LOCATION	North of 57th Avenue and Long Island Expressway, south of Grand Avenue, east of Conrail Right-of-Way and west of 80th Street, Queens County, New York
ON-SITE TELEPHONE:	1-718-478-5865
ENTRY OBJECTIVES:	To characterize surface soil, subsurface soil and groundwater at the former site operations.

PROJECT ORGANIZATION:

Project Director:	Richard M. Walka	(516) 364-9890
Project Manager:	Richard P. Russell	(516) 364-9890
Field Operations Manager:	William J. Ryan	(516) 364-9890
On-site Health & Safety Coordinator:	William J. Ryan	(516) 364-9890
Health & Safety Manager:	Bruce Groves	(973) 765-0991
Subcontractors:	Emilcott Associates, Inc. (Health & Safety Services)	(973) 765-0991
	Delta Pump and Well Co., Inc. (Drilling/Geoprobe Services)	(631) 981-2255
	Mitkem Corporation (Laboratory Services)	(401) 732-3400
	Frederick R. Pokorny, Civil Engineer (Surveying Services)	(631) 266-1144

MEDICAL ASSISTANCE:

Physician:	Dr. Ronald Rosen
Address:	410 Lakeville Road New Hyde Park, NY 11040
Telephone:	(516) 437-9184

LOCAL HOSPITAL: St. John's Queens Hospital

Telephone:	(718) 558-1000
Address:	9002 Queens Blvd. Flushing, New York
Directions:	See directions below and Figure 6-1.

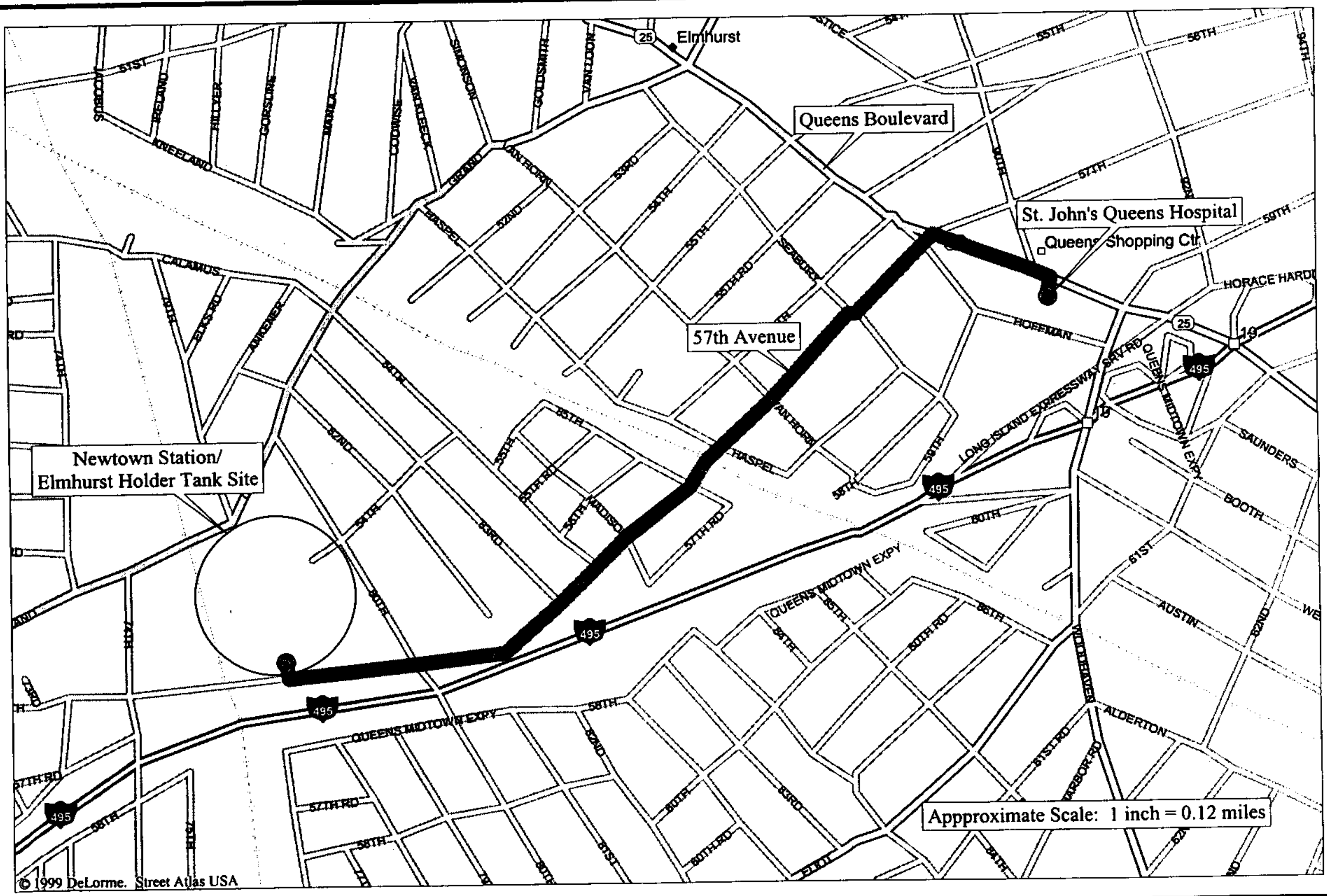
Directions to St. John's Queens Hospital

- Leave the southern border of the site turning left onto 57th Avenue.
- Take 57th Avenue approximately 0.6 miles to Queens Boulevard.
- Turn right onto Queens Boulevard.
- Take Queens Boulevard approximately 0.1 miles to St. John's Queens Hospital, which will be on the right.

6.2 Emergency Information

Agent/Facility	Telephone	Emergency Number
EMS – Ambulance	911	911
Police Department	(718) 476-9311	911
Fire Department	(718) 847-6600	911
Hospital	(718) 558-1000	--
Poison Control Center	(212) 764-7667	--
Gas Emergencies	(718) 643-4050* or 1-800-490-0045	911
Electric Emergencies	(516) 545-5310**	911

*Brooklyn Union Gas Emergency Hotline
**KeySpan Central Monitoring Station (CMS) in Hicksville



KEYSPAN ENERGY DELIVERY NEW YORK
NEWTOWN STATION / ELMHURST HOLDER TANK SITE
QUEENS COUNTY, NEW YORK

HOSPITAL ROUTE MAP

FIGURE 6-1

Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

6.3 Physical Hazard Analysis

Potential hazards that are most likely to be encountered at the Newtown Station/Elmhurst Holder Tank site during field operations include, but are not limited to:

- Weather conditions-lightning, rain, and high winds, etc.;
- Slips, trips, falls on-site and on uneven/overgrown surfaces;
- Heavy equipment traffic;
- Striking and struck-by (heavy equipment);
- Moving or rotating machinery;
- Flying debris from drilling;
- Electrocution from overhead power lines and underground utilities (water, gas, sewer and process systems) and distribution (substation) components (transformers); and
- Active rail traffic.

6.4 Biological Hazards

The location of the Newtown Station/Elmhurst Holder Tank site is such that a limited number of biological hazards may exist. These hazards may include, but are not limited to: ticks; microbiological agents (molds and fungi); improperly disposed medical waste, such as syringes, sharps or materials contaminated with human blood or bodily fluid; improperly disposed of household garbage; poison plants such as poison ivy, oak and sumac; animals and rodents that may inhabit the site.

6.5 Health Hazard Evaluation

The primary potential health hazards of concern for workers are anticipated to be from the inhalation of vapors and dust, as well as skin exposure to contaminated soil and groundwater.

Potential for these exposures exist during the activities associated with drilling, stockpiling, loading and handling soil and water for sampling or disposal. Nearby automobiles and railroad traffic may also cause an increase in airborne exposure concerns when conducting operations close to the surrounding roadways and railroad tracks. Precautions should be taken to continuously assess the workplace environment by observation and use of real time direct reading instruments during site operations where there exists a potential for contact with contaminants. Preventive measures must be taken to prevent an uncontrolled release or exposure to vapor, liquid or solid phase contaminants by workers and/or the general public. Assessment and prevention strategies are discussed in other sections of this HASP and must be practiced on a continuing basis by all on-site personnel throughout this project.

Table 6-1 summarizes the OSHA Permissible Exposure Limits (PELs) and primary health hazards for the main contaminant of concern at the site, which is lead. Although exposure to holder bottoms is not expected in association with the proposed field investigation, Table 6-1 also summarizes OSHA PELs for contaminants typically found in holder sludges (i.e., BTEX, PAHs and metals). There are several PAHs that have no PELs set by OSHA. These include non-carcinogenic PAHs, such as 2-methylnaphthaline, acenaphthylene, acenaphthene, fluorene, and fluoranthene, as well as potential carcinogenic PAHs such as benzo(a)anthracene, benzo(b,k)fluoranthene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i) perylene.

6.6 Activity Safety and Health Hazard Analysis

6.6.1 Scope of Work

The following activities encompass the anticipated scope of work for on-site activities:

- Surface soil, soil probes and split spoon sampling and well drilling for groundwater monitoring wells for the investigation of contamination;
- Groundwater handling activities including pumping, siphoning, bucketing, interim containers handling, temporary storage and transport and disposal to onsite or off site facilities;

Table 6-1

**PERMISSIBLE LIMITS
AND HEALTH HAZARDS
OF CONTAMINANTS OF CONCERN**

Chemical	OSHA Permissible Exposure Limits	Primary Health Hazard (Target Organs)
Benzene	1 ppm, ST* 5 ppm	Eyes, skin, respiratory system (RS), blood, central nervous system (CNS), bone marrow
Toluene	200 ppm C** 300 ppm	Eyes, skin, RS, CNS, liver, kidneys
Ethylbenzene	100 ppm	Eyes, skin, RS, CNS
Xylene	100 ppm	Eyes, skin, RS, CNS, gastrointestinal (GI) tract, blood, liver, kidneys
Naphthalene	100 ppm	Eyes, skin, blood, liver, kidneys, CNS
Fluoranthene	0.2 mg/m^3	No specific hazard listed
Coal Tar Pitch (phenanthrene, anthracene, pyrene, chrysene and benzo(a)pyrene)	0.2 mg/m^3	RS, skin, bladder, kidneys
Arsenic	0.010 mg/m^3	Liver, kidneys, skin, lungs, lymphatic system
Barium	0.5 mg/m^3	Eyes, nose, throat, lungs, heart and GI tract
Cadmium	0.005 mg/m^3	RS, kidneys, prostate, blood
Chromium	0.5 mg/m^3	Eyes, skin, RS
Lead	0.050 mg/m^3	Eyes, GI tract, CNS, kidneys, blood, gingival tissue
Mercury	C** 0.1 mg/m^3	Eyes, skin, RS, CNS, kidneys
Selenium	0.2 mg/m^3	Eyes, skin, RS, liver, kidneys, blood, spleen
Silver	0.01 mg/m^3	Nasal septum, skin, eyes
PCBs	0.5 mg/m^3 (skin)	Skin, eyes, liver, reproductive system

*ST - Short-Term Exposure Limit

**C - Ceiling Limit

- Air monitoring for VOCs/dust using direct reading instruments;
- Air monitoring for lead using air sampling pumps and 0.8 um MCE filters;
- Material handling, stockpiling and temporary storage of materials on-site.

6.6.2 Operations

The following list incorporates anticipated on-site operations that will be completed during the investigation:

- Soil probes/borings and well drilling;
- Staging, rigging and lifting;
- Liquid transfer activities;
- Material handling of potentially contaminated materials; and
- Decontamination of equipment and personnel.

6.6.3 Equipment

The following equipment is anticipated to be used on-site during this site investigation:

- Flatbed trucks and trailers;
- Tracked and rubber tire bulldozers, loaders, and backhoes;
- Pumps;
- Drill rigs;
- Rigging hoists and slings;
- Compressed gas cylinders;
- Liquid and solid soil sampling equipment; and
- Associated hand tools, equipment and materials.

6.6.4 Activity Hazard Analysis

Based upon the equipment in use and the tasks to be completed, the following is a list of hazards or activities that represent hazards that may be encountered during site activity:

- Contact with overhead electrical lines and transformers;
- Contact with underground utility services;
- Heavy equipment operation;
- Presence of contaminated and hazardous materials (soil and water);
- Groundwater infiltration;
- Adverse weather conditions;
- Airborne dust;
- Heat and/ or cold stress;
- Drilling and/ or geoprobing;
- Contact with unprotected fencing components;
- Noise associated with heavy equipment operations;
- Fire;
- Theft;
- Uneven and/or unstable work surfaces;
- Sharps (broken bottles, etc.); and
- Biologicals (snakes, ticks, stinging insects, etc.).

6.6.5 Activity Risks

Based on the above hazards, the following is a list of hazards that site personnel will be exposed to during the investigation:

- Electrocution;
- Accidents involving pedestrians or equipment;
- Encroachment of other tasks or activities;
- Physical contact with contaminated or hazardous materials;
- Airborne particulate;
- Fire or explosion;
- Crushing by heavy objects from lifting or movement by heavy equipment;
- Slip/trip/fall due to wet and unstable work surfaces or ground clutter;
- Spill and release of contaminated materials;
- Clothing or underground cable entanglement in drilling equipment causing direct and indirect bodily injury; and
- Dermal lacerations or evisceration from unprotected fencing.

6.6.6 Activity Controls

Based upon the above activity risks, the following activity controls will be used to manage risk:

- Identification and protective measures for work in and around live utilities, in accordance with the July 12, 1993 Long Island Lighting Company's (LILCO) Rules for Safety Operation Guidelines (see Exhibit 6A);
- Site security for limited access of personnel and equipment;
- Traffic control regarding site personnel and general pedestrian and vehicle traffic;
- The use of heavy equipment backup alarms and/or spotters, and the requirement that heavy equipment in use on-site is appropriately guarded and inspected;
- Enforce requirements of personnel to stay out of swing radius of heavy equipment and to stay out from under suspended loads;

- Implement appropriate rigging inspections, tagging procedures and storage;
- Securing of loose clothing;
- Protecting dismantled fencing;
- Pre-plan work area layout to minimize slip/trip/fall potential and stabilize heavy equipment;
- Use of hearing protection in and around heavy equipment;
- Coordinate with the Site/ local fire, emergency and/ or law enforcement agencies in the event of an emergency; and
- Ensure competent and qualified individuals perform work tasks.

6.7 Air Monitoring Program

Particular phases of work or tasks will require the utilization of specific air monitoring equipment to detect relative levels of VOCs and particulates and to assist in the selection of appropriate levels of personal protective equipment (PPE).

6.7.1 Air Monitoring Instrumentation

On-site air monitoring will be performed using some or all of the following instruments or equivalents:

- Photovac Microtip portable photoionization detector (PID) or equivalent with a 10.6 eV lamp for the detection of organic vapors.
- Colorimetric detector tubes for specific air contaminants; i.e., benzene, etc. Multigas colorimetric detector tubes can be used in conjunction with the PID to detect and quantify the concentration of selected contaminants in the air. The detector tubes to be employed must be sensitive in the concentration ranges in the action levels range for those contaminants. It should be realized that some "compound specific" detector tubes will also detect interference from other aromatic or aliphatic hydrocarbons; readings do not differentiate between which compounds are present. A hand pump and detector tubes for target compounds will be utilized as needed.

- If PID readings are elevated when compared to background (e.g., 1 ppm or more above background) or if separate phase product or odorous material is detected, then detector tubes for target compounds may be utilized.

- Portable combustible gas/oxygen/hydrogen sulfide detector(s) for determining lower explosive limits, oxygen and hydrogen sulfide levels in any identified confined spaces. Under no circumstances shall confined space be entered unless discussed with the D&B Project Director and authorized by the FOM. Only employees who have received confined space entry training and are prepared to deal with confined space hazards shall be authorized to enter a confined space.

- Respirable dust monitor(s) for the monitoring of particulate emissions. The Action Level for respirable dust identified in Section 6.7.3 is based on considerations for potential exposures to nuisance dust as well as contaminants that could be attached to particulate matter. NYSDEC technical guidance document for Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites is also referenced.

- Personal and perimeter sampling will be conducted where there is a potential for exposure to airborne lead. Potential worker exposure to lead will be evaluated using personal and area air sampling, direct reading dust monitoring and professional judgement to document exposures for various job class and/or work activities. Initially, personal sampling will be conducted on the worker(s) with the highest anticipated exposure potential. Personal sampling may end or be reduced if lead results and dust levels are significantly below worker action levels. At a minimum, perimeter sampling will include samples at the downwind property line. Samples will be collected on 0.8 um mixed cellulose ester (MCE) filters using air sampling pumps. Additional detail regarding lead monitoring protocol can be found in Section 3 of this Work Plan.

All monitoring and surveillance equipment will be operated, maintained and calibrated in accordance with the manufacturer's instructions and D&B's quality assurance procedures. They will be checked daily for proper operation. Organic vapor monitoring will be conducted by trained field staff prior to, during and following sampling, or disturbance of soils and/or sediments. Should contamination levels indicate a hazard, the FOM, IH or qualified designate will review monitoring procedures, results and required personal protective equipment to ensure personnel are adequately protected from the hazard.

Some monitoring and surveillance equipment is impacted by humidity (PID), cold weather (all electrical devices), communication transmissions and possibly high voltage electrical transmission wires and other interferences. Any unusual meter responses should be documented and a diagnosis of potential influencing factors made to determine and eliminate the cause.

6.7.2 Contaminants of Concern

- VOCs (BTEX, etc.);
- SVOCs (PAHs, CaPAHs, etc.);
- Toxic metals (lead, etc.); and
- Respirable dust (soil, silica).

6.7.3 Air Monitoring Locations and Action Level Criteria

The primary areas to be monitored during the project are the site perimeter and the downwind work perimeter. Specific air monitoring activities proposed for this project are identified in Section 3 of this Work Plan. A summary of the action levels to be used in association with these air monitoring activities, as well as other instrumentation which may be utilized at the discretion of the FOM, are presented in Table 6-2.

When the PID readings are 5 units or more above background level, monitoring requirements required by the NYSDEC Community Air Monitoring Plan (see Exhibit 6B) for vapor emission situations during ground intrusive activities shall be followed.

The recommendations provided in the NYSDEC Division of Environmental Remediation Guidance Document for Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites (see Exhibit 6C) shall be followed regarding dust suppression and air monitoring.

Table 6-2

SUMMARY OF AIR MONITORING PROGRAM AND ACTION LEVELS

Action Level	Level of Protection	Action to be Taken
INTRUSIVE ACTIVITIES		
Starting intrusive activities	Modified Level D	Intrusive work shall be started in Modified Level D. If air monitoring results indicate condition is above background level, actions to be taken are identified below.
PID		
Background (BKGD) to 5 units above BKGD	Modified Level D	Continue working with the current level of protection.
5 units above BKGD at breathing zone and below 100 units	Level C	Halt work, evacuate area and allow area to ventilate prior to resuming work. Should levels persist, D&B Project Manager or FOM will evaluate conditions prior to upgrading to Level C.
> 100 units above BKGD	Level B	Proceed with caution and monitor continuously. Should levels above 100 units persist, D&B Project Manager or FOM will evaluate conditions prior to upgrading to Level B. This action would require the work area protocol be amended for Level B protection as discussed in the HASP.
DETECTOR TUBES		
Benzene >1 ppm (Conduct test when PID/FID >1 unit above BKGD or if phase product or odorous material is detected)	Level C	Halt work, evaluate condition prior to upgrading to Level C protection.
Benzene >25 ppm (Conduct test when PID/FID >1 unit above BKGD or if phase product or odorous material is detected)	Level B	If levels persist, upgrade to Level B protection is required upon approval by FOM.
Other colorimetric detector tubes > PEL (used when necessary by FOM, IH or qualified designate when PID readings are > 1 unit or if phase product or odorous material is detected)	Level C	Halt work, evaluate condition prior to upgrading to Level C protection.

Table 6-2 (continued)

SUMMARY OF AIR MONITORING PROGRAM AND ACTION LEVELS

Action Level	Level of Protection	Action to be Taken
DIGITAL DUST INDICATOR		
Respirable dust >100 ug/m^3 above BKGD	Current Level in Use	Implement dust suppression techniques to reduce dust levels.
Respirable dust >150 ug/m^3	Current Level in Use	Monitoring upwind background levels and implement dust suppression techniques. If levels persist, halt work, Contact FOM. Work can only resumed if control measures can be implemented to remedy the situation.
COMBUSTIBLE GAS METER		
> 10% LEL scale		Halt work, evacuate area and allow to ventilate to below 10% LEL prior to resuming work. Contact FOM.
OXYGEN		
< 20.5%		Continuous monitoring. Consider engineering controls.
< 19.5%		Evacuate work area. Institute ventilation and engineering controls. Maintain > 19.5% oxygen condition for at least 10 min. before continuing. Notify FOM.
> 22%		Continuous monitoring. Identify combustion sources.
> 23.5%		Evacuate and institute engineering controls as necessary. Oxygen level must be below 22% for at least 10 minutes before continuing. Explosive condition may be present. Notify FOM.
HYDROGEN SULFIDE		
<10 ppm		Continue monitoring
>10 ppm		Halt work, evacuate area and allow area to ventilate below 10 ppm. Contact the FOM.
CARBON MONOXIDE		
< 25 ppm		Continue monitoring
> 25 ppm		Halt work, evacuate area and allow area to ventilate below 10 ppm. Contact the FOM.

Table 6-2 (continued)

SUMMARY OF AIR MONITORING PROGRAM AND ACTION LEVELS

Action Level	Level of Protection	Action to be Taken
LEAD (Personal Samples)		
0 - 10 ug/m^3	Modified Level D	Continue working.
>10 ug/m^3 and <30 ug/m^3	Level C	Implement dust suppression activities to reduce dust levels. Use respirators with N, R, or P-100 filters. Conduct daily perimeter sampling for lead. Conduct at least weekly personal sampling for each job class.
>30 ug/m^3	Level C	Stop work, modify work procedures and increase dust suppression activities. Conduct daily personal and perimeter sampling for lead until exposures are maintained below 30 ug/m^3.
LEAD (Perimeter Samples)		
<1 ug/m^3 (above background)	Current level in use	Continue working
>1 and <3 ug/m^3 (above background)	Current level in use	Implement dust suppression activities to reduce dust levels. Conduct daily perimeter sampling for lead.
>3 ug/m^3 (above background)	Current level in use	Stop work, modify work procedures and increase dust suppression activities. Conduct daily perimeter sampling for lead until perimeter can be maintained <1 ug/m^3.
OTHER		
Any worker experiences symptoms of chemical exposure		Stop work, evacuate the area, seek medical attention and notify FOM for proper incident reporting and follow-up.

6.7.4 Quality Assurance and Control

All monitoring instruments will be protected from surface contamination during use to allow easy decontamination. All instrumentation shall be field checked before and after use and operational checks conducted periodically in the field, over the duration of the day's field activities, to ensure proper operation. Calibration will be done according to manufacturer recommendations.

The following data shall be recorded by the FOM, IH or qualified designate:

- Date and time of monitoring;
- Air monitoring location;
- Instrument, model number, serial number;
- Calibration/background levels;
- Results of monitoring; and
- FOM, IH or qualified designate signature.

Interpretation of the data and any further recommendations shall be made by the FOM, IH or qualified designate.

When air monitoring is conducted by the IH or qualified designate during intrusive activities, air monitoring results shall be given verbally to D&B FOM following each site scan that indicates air contaminant concentrations in excess of the action levels. Excursions above the action levels will immediately be addressed by the D&B FOM. Results will then be documented in writing and provided to the D&B FOM by the end of that work day.

6.8 Personal Protective Equipment (PPE)

6.8.1 General

On-site personnel shall be issued appropriate PPE. All PPE is to be used properly and protective clothing is to be kept clean and well maintained. The FOM/HSO shall maintain communication with the D&B Project Manager when conducting air monitoring and consult the D&B Project Director with regard to "action levels" at which the specified minimum levels of protection are either upgraded or downgraded based upon air monitoring results and direct contact potential. The FOM/HSO has the authority to require the use of additional equipment, if necessary, for specific operations.

Intrusive work to be performed inside the Exclusion Zone will be started in Modified Level D. If air monitoring results indicate conditions above action levels, the protection level will be upgraded, as listed in Section 6.7. If at any time there is doubt about which level of PPE is acceptable per task, the next highest level of protection will be selected.

6.8.2 General Site Safety Equipment Requirements

The following is the basic work uniform and will primarily be worn outside the Exclusion Zone and the Contaminant Reduction Zone.

- Coveralls (Optional, may be disposable type);
- Boots/shoes (OSHA compliant construction footwear);
- Hard hat (with optional splash shield) - ANSI approved;
- Gloves (optional); and
- Safety glasses - ANSI approved.

6.8.3 Level D and Modified Level D Protection

Level D protection initially shall be worn in the Exclusion Zone and Contaminant Reduction Zone during non-intrusive sampling and investigative activities.

6.8.3.1 - Equipment for Level D

- One or two piece disposable suit, tyvek or equivalent;
- Gloves - Outer (nitrile or equivalent), Inner (latex);
- Boots - Outer (disposable outer boots or rubber overboots), if needed; Inner - (steel toe and shank) or equivalent combination (ANSI approved);
- Safety glasses or goggles (ANSI approved);
- Hard hat with splash shield, if needed (ANSI approved); and
- Hearing protection (if work is near heavy or noisy equipment).

6.8.3.2 - Equipment for Modified Level D

Modified Level D protection shall be worn in the Exclusion Zone and Contaminant Reduction Zone when performing intrusive work where respiratory protection is not required based on air monitoring results.

- One-piece chemical resistant suit, Tyvek or equivalent. If liquid may be encountered, polyethylene (PE) Tyvek will be required.
- Gloves - Outer (nitrile or equivalent), Inner (latex).
- Boots - Outer (disposable outer boots or rubber overboots), Inner - (steel toe and shank) or equivalent combination (ANSI approved).
- Safety glasses or goggles (ANSI approved).
- Hard hat (ANSI approved). If liquid may be encountered, the hard hat will be equipped with a splash shield.
- Hearing protection (if work is near heavy or noisy equipment).

6.8.4 Level C Protection

Level C protection shall be selected and worn when a modified level of respiratory protection is needed. Selection shall be made when air-monitoring results of the site or individual work areas exceed the action level criteria for using Level C protection.

6.8.4.1 - Equipment

- Full facepiece, air purifying respirator with combination organic vapor and high efficiency particulate air (HEPA rated) cartridges
- Hooded one-piece chemical resistant suit of Tyvek or equivalent. If liquid may be encountered, polyethylene (PE) Tyvek will be required (modification of protective suits may be made upon the approval of the HSO).
- Gloves - Outer (nitrile or equivalent), Inner (latex).
- Boots - Outer (disposable outer boots or rubber overboots), Inner (steel toe and shank) or equivalent combination (ANSI approved).
- Two way radio communications (for remote operations).
- Hard hat (ANSI approved).
- Hearing protection (if work is near heavy or noisy equipment)

6.8.5 Level B Protection

Level B protection may be required when air monitoring results indicate a higher level of respiratory protection is needed and/or when performing certain tasks in a confined space environment.

6.8.5.1 - Equipment

- Supplied air-respirator (MSHA/NIOSH approved). Respirator must be a positive pressure-demand self-contained breathing apparatus (SCBA) or a positive pressure-demand airline respirator (with escape bottle for IDLH or potential IDLH atmosphere).

- Hooded one-piece chemical resistant suit of Tyvek or equivalent. If liquid may be encountered, polyethylene (PE) Tyvek will be required (modification of protective suits may be made upon the approval of the HSO).

- Gloves - Outer (nitrile or equivalent), Inner (latex).

- Boots - Outer (disposable outer boots or rubber overboots), Inner (steel toe and shank) or equivalent combination (ANSI approved).

- Two way radio communications (for remote operations).

- Hard hat (ANSI approved).

- Hearing protection (if work is near heavy or noisy equipment).

6.8.6 Confined Spaces

Under no circumstances shall confined spaces be entered unless discussed with the D&B Project Director and authorized by the FOM/HSO . Only employees who have received Confined Space Entry Training and are prepared to deal with confined space hazards shall be authorized to enter a confined space. Confined space access is not anticipated to be required to support this investigation. However, should the need arise, Exhibit 6D presents the specific procedures to be followed.

6.8.7 Standing Orders

All prescription eyeglasses in use on the site shall be safety glasses. Prescription lens inserts shall be provided for use with full-face respirators, if necessary. All eye and face protection shall conform to OSHA 1910.133.

Programs for respiratory protection shall conform to OSHA 1910.134 and ANSI Z88.2-1989.

Personnel unable to pass a fit-test shall not enter or work in the Exclusion Zone or Contaminant Reduction Zone if respiratory protection is required.

Each respirator shall be individually assigned and not interchanged between workers without cleaning and sanitizing. Cartridges/canisters and filters shall be changed at least daily or upon breakthrough, whichever occurs first. If breakthrough occurs, a re-evaluation by the FOM/HSO of the protection level or cartridge/canister change frequency is warranted. A procedure for assuring periodic cleaning, maintenance and change of filters shall be followed by each respirator wearer. This procedure is described in Exhibit 6E - Respiratory Cleaning and Maintenance Procedure.

All personnel shall wear a hard hat. All head protection shall conform to the requirements in OSHA 1910.135.

All non-disposable Level B, C or D personal protective equipment worn on-site shall be decontaminated before being reissued. The FOM/HSO is responsible for ensuring all non-disposable personal protective equipment is decontaminated before being reissued. Disposable PPE shall be properly disposed of according to NYSDEC requirements and regulations.

All safety boots shall conform to OSHA 1910.136.

Power equipment may generate excessive noise levels (in excess of 85 decibels). Proper hearing protection shall be provided and used in accordance with OSHA 1926.52.

6.8.8 Use of Personal Protective Equipment

Personal protective equipment (PPE) will offer adequate protection only if used properly. Use of PPE will require:

- Training;
- Fit testing;

- Appropriate resistance to chemical permeation;
- Conformance to personal use factors (e.g., no facial hair, eyeglasses if using a full face respirator, gum or tobacco);
- Procedures for donning and removal of PPE;
- Monitoring use and effectiveness of PPE;
- Appropriate decontamination procedures;
- Maintenance;
- Inspection; and
- Proper storage.

Investigative work may be required near electrical energized electrical equipment. Specific PPE for electrical safety protection may be required depending on specific tasks and situations. No such work can be conducted without proper electrical safety training. PPE for electrical safety protection (if needed) can only be selected by a person knowledgeable in the electrical safety field. Training for using such PPE shall be provided. Refer to Exhibit 6A for LILCO requirements.

6.8.9 Physiological Factors

Employees must compensate for the increased heat stress caused by wearing protective clothing in hot weather in order to prevent the onset of heat induced illnesses. This is accomplished by increasing fluid intake, taking frequent work breaks and monitoring co-workers' physical and mental condition. The FOM/HSO will also monitor site workers conditions. Heat/cold stress guidelines are presented in Exhibit 6F.

EXHIBIT 6A

LILCO RULES FOR SAFETY OPERATION SECTIONS O, Q AND V

SECTION O

ELECTRICAL

1.00 **INTRODUCTION**

1.01 This Section covers the rules and regulations for the safe work practices associated with work on electrical transmission and distribution system.

2.00 **WORK ON ELECTRICAL EQUIPMENT**

2.01 The following **SHALL** be treated as energized equipment at the same voltage as the energized line to which they are connected or associated:

2.01.1 Ungrounded: Tanks of transformers, capacitors, bolsters, regulators oil switches, line reclosers, and ungrounded portion of switch rods, handles and mechanisms.

2.01.2 Ungrounded primary metering installations.

2.01.3 All wires that are down due to storm conditions or accidents, and not properly grounded.

2.01.4 All ungrounded wires in proximity of tree trimming operations and in trees.

2.01.5 Ungrounded equipment of street circuits.

2.02 Operating voltage of lines and equipment **SHALL** be determined before working on or near energized parts.

2.03 All lines and equipment **SHALL** be treated as energized and worked as such unless the lines or equipment are tested and grounded.

3.00 **GENERAL SAFETY PRECAUTIONS**

3.01 Personal protective equipment identified in this Section is in addition to the basic safety equipment (i.e., hard hat, safety glasses and traffic vest as required).

3.02 The use of shirts with long sleeves is required. Employees working on the ground may roll their shirt sleeves up in warm weather. Due care should be exercised however, when working with creosote poles or cross-arms or near poison ivy, shirt sleeves **SHALL** be rolled down to help prevent burn or infection. Workmen on poles and in aerial lifts **SHALL** keep their shirt sleeves rolled down unless rubber sleeves and gloves are being worn. Under no circumstances are employees to remove their shirts.

3.03 When working near energized lines or equipment, aerial lift trucks **SHALL** be grounded or barricaded and considered as energized equipment, or the aerial lift truck **SHALL** be insulated for the work being performed.

3.04 Contact with trucks, derricks, or other equipment which are not bonded to an effective ground and are being used to set, move or remove poles, or in other related work in or near energized lines **SHALL** be avoided by employees standing on the ground or in contact with grounded objects unless the employee is wearing electrical protective equipment and/or using other insulated devices.

3.05 When required to use rubber gloves this includes the use of protective leather keepers unless otherwise noted.

3.06 **JOB BRIEFING**

3.06.1 Before starting any job, the supervisor or person in charge of work **SHALL** hold a brief discussion explaining the safe method of accomplishing the job. The following points should be understood:

3.06.2 Status of the equipment to be worked on including limits of Clearance Permit if a Clearance Permit is involved, and including what parts are pressurized, energized, or otherwise present a hazard.

3.06.3 The proper placing of protective equipment including barriers, blocking, chains and locks, barricade tape or other safeguards insuring the safety of the employees and equipment.

3.06.4 His own particular job and also the work to be performed by others.

3.06.5 Any change or break in the work procedure as outlined by the supervisor or person in charge of work **SHALL** be preceded by additional briefing.

3.07 Whenever a discrepancy exists between these Rules For Safe Operation, OI-3001, OI-3005 and an approved work method, the requirements of the approved work method **SHALL** be followed.

4.00 **PROTECTIVE GROUNDING**

4.00.1 All conductors and electrical equipment connected to or attached to energized facilities **SHALL** be regarded as energized until they have been properly tested and grounded.

4.00.2 Location of protective grounds. When protective grounds are required , the minimum distance shown in Table R-4 **SHALL** be maintained from ungrounded conductors at the work location and the protective grounds **SHALL** be placed as follows:

4.00.2.1 At the work location, or;

4.00.2.2 Between the work location and all sources of energy and as close as practical to the work location, or;

4.00.3 Any conductor or equipment that is to be grounded **SHALL** be checked with an approved voltage detecting device before the initial grounding device is installed. Where an additional ground is to be installed on the same conductor and the initial ground and the continuity of conductor can be seen by the workmen applying the ground, this additional ground may be applied without the use of a voltage detecting device.

4.00.4 When attaching grounds to lines or equipment, the ground-end connection **SHALL** be attached first. The other end **SHALL** than be attached and removed by means of live-line tools or other suitable insulated devices.

4.00.5 Rubber gloves and sleeves **SHALL** be worn when using an approved voltage detecting device and when installing or removing devices. When applying the initial set of grounds, each phase of the circuit **SHALL** be tested and the grounds and shorts applied immediately thereafter. When the testing device is being used the hands **SHALL** be placed so as to maintain proper working clearance. The voltage detecting device **SHALL** be tested prior to use to insure its reliability. If all grounds are removed from a circuit, and grounds must again be installed on this circuit, the voltage detecting device **SHALL** be used before applying grounds.

4.00.6 Grounding and short circuiting devices **SHALL** be installed on and removed from conductors, operating at voltages of 2300 Volts and above by means of an approved tool.

4.00.7 When removing any grounds, the grounding device **SHALL** first be removed from the lines or equipment using live-line tools or other suitable insulated devices.

4.00.8 Removing grounds for test: Grounds may be temporarily removed only when necessary for test purposes and caution **SHALL** be exercised during the test procedures.

4.01 All ungrounded conductors and equipment connected to or attached to energized facilities **SHALL** be worked in the following manner:

4.01.1 Work on lines and equipment rated 100 to 6,500 volts **SHALL** be performed using rubber gloves and sleeves and portable insulating protective equipment, or:

4.01.1.1 The work **SHALL** be performed using approved Hot Stick methods and equipment. Rubber gloves and sleeves **SHALL** be worn when the work is performed using Hot Stick methods, however:

Work may be performed on the following circuits and equipment rated 100 to 600 volts using approved low voltage gloves or approved insulated tools and protective equipment:

- House wiring
- Relays; meters; control and instrument circuits or equipment

4.01.2 Work on lines and equipment rated 6,500 to 15,000 volts Phase to Phase **SHALL** be performed using high voltage rubber gloves and sleeves. Portable insulating protective equipment **SHALL** be used as required and all such work **SHALL** be performed from an insulated platform rated for the voltage involved, or: Work **SHALL** be performed using approved Hot Stick methods and equipment. High voltage rubber gloves and sleeves **SHALL** be worn when the work is performed using Hot Stick methods.

4.01.3 Work on lines and equipment rated 15,000 to 69,000 volts Phase to Phase **SHALL** be performed using approved Hot Stick methods and equipment. High voltage rubber gloves and sleeves **SHALL** be worn when work is performed using Hot Stick methods.

4.01.4 Work on lines and equipment rated 100,00 to 345,000 volts Phase to Phase **SHALL** be performed using approved Hot Stick methods and equipment. Rubber gloves and sleeves **SHALL NOT** be worn when Hot Stick work is performed on these voltages.

4.02 Where a distribution branch feed is to be temporarily disconnected by removing a live line tap from a distribution circuit and the branch feed grounded, it is permissible to use the disconnected live line tap as a grounding device, provided the following conditions are complied with:

4.02.1 The branch feed tap must be 2/0 or larger.

4.02.2 No load **SHALL** be interrupted when the tap is disconnected.

4.02.3 All sources of back feed **SHALL** be eliminated.

4.02.4 An approved tool **SHALL** be used to handle the tap.

4.03 Where grounding devices are removed from conductors or equipment for testing, the grounding devices **SHALL** be reapplied before any further work is performed on that conductor or equipment.

4.03.1 The requirements of OI-30005 for tagging of grounds and the steps required for taking and returning permission to work **SHALL** be followed.

4.04 Grounding Electrode: When grounding electrodes are utilized, such electrodes **SHALL** have a resistance to ground low enough to permit prompt operation of protective devices in case of accidental energizing of the grounded facility.

4.05 Grounding devices: Ground connections **SHALL** be made with an approved device capable of conducting the anticipated fault current for the length of time required for operation of protective devices.

4.06 Ground Lead: A ground lead **SHALL** be capable of conducting the anticipated fault current for the time required for protective devices to operate and **SHALL** have a minimum conductance of No. 2 AWG copper.

4.07 Permanent Grounding: Metal cases, bases, frames and other metal parts of electrical equipment, appliance, fixtures and fittings (except such minor items as portable floor, desk or table lamps and items such as wall clocks) **SHALL** be grounded. Where inherent grounding is not provided by the mounting arrangements, ground connections **SHALL** be provided to ground the frame, enclosure or support of permanently installed electrical equipment.

4.08 **TABLE R-4 ALTERNATING CURRENT-MINIMUM SAFE WORKING CONDITIONS**

Voltage range (phase-to-phase) kilovolts	Minimum working and clear hot-stick distance
1.0 to 15	2 ft. 0 in.
15.1 to 35	2 ft. 4 in.
35.1 to 46	2 ft. 6 in.
46.1 to 72.5	5 ft. 0 in.
138 to 145	6 ft. 0 in.
345 to 362	7 ft. 0 in.
500 to 552	11 ft. 0 in.
700 to 800	15 ft. 0 in.

See Appendix 1 of this Section for interpretation of Clearance.

4.09 For 345-362 kV, 500-552 kV and 700-800 kV. the minimum working distance and the minimum clear hot-stick distance may be reduced provided that such distances are not less than the shortest distance between the energized part and a grounded surface.

4.10 Mechanical equipment **SHALL** not be operated closer to any energized line or equipment than the clearance set forth in Table R-4, exclusive of 4.08, unless:

4.10.1 An insulated barrier is installed between the energized part and the mechanical equipment, or;

4.10.2 The mechanical equipment is insulated, or;

4.10.3 The mechanical equipment is considered as energized.

4.11 No employee **SHALL** be permitted to approach or use any conductive object without an insulated handle closer to exposed energized parts than shown in Table R-4, unless:

4.11.1 The employee is insulated or guarded from the energized part (gloves or gloves with sleeves rated for the voltage **SHALL** be considered insulation of the employee form the energized part), or

4.11.2 The energized part is insulated or guarded from the employee and any other conductive object at a different potential, or

4.11.3 The employee is isolated, insulated or guarded from any other conductive objects(s).

4.12 Work may be permitted on the de-energized part of a switch or disconnect but in no event **SHALL** the minimum working distance be reduced to less than the clear open distance of the switch or disconnect.

4.13 The minimum clear hot-stick distance means the distance between any exposed part of the employee and an energized part when the employee is using live-line tools.

4.14 Conductor support tools, such as link sticks, strain carriers, and insulator cradles, may be used, provided that the clear insulation is at least as long as the insulator string or the minimum distance specified in Table R-4 for the operating voltages.

5.00 GENERAL RULES FOR THE SAFE OPERATION OF THE ELECTRIC TRANSMISSION AND DISTRIBUTION SYSTEM

5.01 Responsibility for Operation of the Electric Transmission System

5.01.1 The Electric System Operations Department **SHALL** be responsible for the coordination of the operation of the electric transmission system in accordance with OI-30001. The transmission system **SHALL** include all transmission lines and equipment in generating stations and substations which affect the capacity to produce or transmit power.

5.01.2 No circuit breaker, switch, switching or control device, or control device, or valve which could affect the operation of transmission system equipment **SHALL** be operated until authorization has been obtained from the System Operator, except in an extreme emergency to protect personnel and property and where delay caused by first contacting the System Operator will increase this hazard.

5.01.3 Approval **SHALL** be obtained from the System Operator before any work is done on any relay, control device, wiring or other auxiliary device which in any way could affect, or through an accident or mistake could affect, the ability to generate or transmit power.

5.01.4 The System Operator **SHALL** have the right to delegate authority for control and operation of a part of the transmission system to other qualified personnel to meet local conditions or to expedite restoration of service during emergencies. The System Operator **SHALL NOT** delegate authority to issue "Clearances".

5.02 Responsibility for the Operation of the Distribution System

5.02.1 The S.S.O. of the Electric System Operations Department **SHALL** be responsible for the safe, reliable and efficient operation of the Distribution System in accordance with OI-30005.

5.02.2 DISTRIBUTION SYSTEM DEFINITION

The distribution system is generally,the primary and secondary circuits and associated devices whose primary function is the supply of service to individual customers.

For the purpose of these instructions, the distribution system begins at 1) the substation dead end, or load side of feeder exist cable riser pothead for overhead lines, and 2) at the first manhole outside the substation property for totally underground cable circuits.

5.02.3 Close liaison **SHALL** be maintained between the Electric Service Department and the Electric System Operations Department in order to obtain the highest possible degree of safety and service continuity.

5.02.4 The supervising Service Operator **SHALL** have the right to delegate authority for control and operation of a part of the Distribution System to other qualified personnel to meet local conditions or to expedite restoration of services during emergencies, as defined in OI-30005, Electric Distribution System Operation.

5.03 De-energizing lines or equipment for employee protection.

5.03.1 When de-energizing lines or equipment operated in excess of 300 volts, the provisions of IO-30005 and Sections 5.02.2-5.03.7 of these Rules **SHALL** be complied with.

5.03.2 When employees must depend on others for operating switches to de-energize lines or equipment on which they are to work or must secure special authorization themselves before operating such switches, the rules that follow **SHALL** be observed in the order given before work is begun.

5.03.3 The employee in charge of the work **SHALL** apply to the system operator or supervising service operator, in accordance with OI-30005, to have the particular section of line or equipment de-energized, identifying it by position, letter, color, number or other means.

5.03.4 The system operator or supervising service operator **SHALL** direct the opening of all switches, disconnectors, jumpers, taps or other means through which electric energy may be supplied to the particular lines and/or equipment to be de-energized, and **SHALL** direct that such switches, disconnectors, jumpers, taps or other means, be rendered inoperable, where practical, and appropriately tagged or flagged indicating that employees are at work.

5.03.5 All automatically and remotely controlled switches that could cause the opened switch, disconnector, etc., to close **SHALL** also be tagged at the point of control and **SHALL** be rendered inoperable where practical.

5.03.6 When tagging, a record **SHALL** be made giving the date and time of disconnection, the name of the employee making the disconnection, the name of the employee who requested the disconnection and the name of the system operator or supervising service operator. Whenever a system operator succeeds another, all record information pertinent to outstanding clearance, permission to test, ground and work and all other switching procedures **SHALL** be made available to the successor(s).

5.03.7 When all the switches, disconnectors, jumpers, taps and other means designated have been opened or rendered inoperable, where practical, and appropriately tagged. The system operator or supervising operator has given the employee permission to test, ground, work or clearance. The employee in charge of work **SHALL**:

5.03.7.1 Verify that all designated switches, disconnectors, jumpers, taps and other means have been opened, rendered inoperable, where practical, and tagged to the person in charge of the work.

5.03.7.2 Verify that adequate grounds have been applied on the disconnected lines or equipment, or in accordance with 2.03.

5.03.7.3 Install his own protective grounds in accordance with 4.00.

5.03.7.4 After the lines or equipment have been de-energized and the conditions of 5.03.7, 5.03.7.1, 5.03.7.2 and 5.03.7.3 observed, the employee in charge and those under his direction may proceed with work on the de-energized parts. Guards or barriers **SHALL** be erected as necessary to adjacent energized lines or equipment.

5.04 Other independent crews or employees desiring the same lines or equipment to be de-energized for their protection **SHALL** comply with these same procedures as stated in Section 5.03. Note: Both crews **SHALL NOT** work under the same clearance. A separate clearance is needed for each crew.

5.05 The employee in charge who received the permission to test, ground and work or clearance may not transfer his permission to test, ground and work or clearance to another crew or supervisor.

5.06 Upon completion of the work, and after the employee in charge assures himself that all employees under his direction are in the clear and that protective grounds installed by his crew have been removed, **SHALL** report to the system operator or supervising service operator that he is returning his permission to test, ground and work or clearance and that all tags protecting him may be removed.

5.07 Only after the system operator or supervising service operator has received the return of the permission to test, ground and work or clearance and is assured that all employees are in the clear and all protective grounds have been removed may he initiate action to re-energize the facilities.

5.08 Upon removal of any tag, there **SHALL** be added to the record (i.e. switching procedure, coversheet, etc.) containing the name of the system operator, or supervising service operator and the employee who requested the tag, the name of the employee authorizing removal, the time of removal and the name of the employee removing the tag. The name of the employee authorizing removal **SHALL** be the same as the employee requesting placement unless responsibility has been transferred.

5.09 **Fault Location and Associated Testing**

5.09.1 Unless the work is performed in accordance with the requirements of this Section, parts 4.11-4.14, switching and tagging procedures in compliance with Section O part 5.03 **SHALL** be followed before starting fault locating and testing on circuits or equipment previously energized. (Note: OI-30005 or approved work method **SHALL** be followed.) During the process of the work, the individual responsible for the work and for whom the tags were place may remove or direct removal of grounds and apply test voltage without removing the tags.

5.09.2 Only those employees involved in the fault locating and testing may work on circuits or equipment on which voltage is to be applied for the purpose of fault locating and testing.

5.09.3 Protective grounds which have been removed to permit application of test voltages **SHALL** be reinstalled in accordance with OI-30005 before work other than testing is resumed.

6.00 **WORK FROM INSULATED AERIAL LIFT**

6.01 Rubber gloves and sleeves, and body belt with lanyard **SHALL** be put on before the bucket is raised from the ground cradled position when work is to be performed on energized conductors or equipment, or where the minimum safe working distances cannot be maintained as specified in Table R-4 Section 4.09.

6.02 Employees on the ground **SHALL** wear rubber gloves and sleeves when operating the ground controls, where there is a possibility of lower boom contacting energized conductors. Gloves and sleeves **SHALL** be removed from the truck prior to the start of work.

6.03 Employees **SHALL NOT** approach or touch any conductive object without an approved insulating handle close to exposed energized parts than specified in Section 4.09 unless:

6.03.1 The employee is insulated or guarded from the energized part. (Gloves and sleeves rated for the voltage involved **SHALL** be considered as insulation of the employee from the energized part), or;

6.03.2 The energized part is insulated or guarded from the employee and any other object at a different potential, or;

6.03.3 The employee is isolated, insulated or guarded from any other conductive object(s).

6.04 The minimum working distance and clear hot stick distance specified in Table R-4 Section 4.09 **SHALL NOT** be violated.

6.05 Conductor support tools such as link sticks, strain clamps and insulator cradles, may be used provided that the clear insulation is at least as long as the insulator string, or the minimum distance as specified in Section 4.09 of this Section.

6.06 Employees **SHALL NOT** place any material in the bucket that has the potential of becoming a path to ground by inadvertent contact with energized equipment.

7.00 OVERHEAD LINES

7.01 When employees are required to work at night or in dark locations, sufficient illumination **SHALL** be used.

7.02 Prior to climbing pole, ladder, scaffolds, or other elevated structures, an inspection **SHALL** be made to determine that the structures are capable of sustaining the additional or unbalanced stresses to which they will be subjected.

7.03 Pole pikes unless attended **SHALL NOT** be considered adequate guying to support a pole while a workman is on the pole.

7.04 Workmen should avoid standing or stepping on metal attachments on poles, excepting pole steps.

7.05 A workman **SHALL NOT** grasp a cross-arm brace for support while climbing.

7.06 When any work is to be done on a pole or structure a hand line equipped with an approved pulley block **SHALL** be taken up and placed in the proper position for handling equipment and material. Such hand lines **SHALL NOT** be smaller than ½ inch and should be of hard long fiber twisted approved rope, and of sufficient length and strength to lower a person safely to the ground in case of injury. When an employee is working alone, a suitable ⅜ inch hand line may be used for raising and lowering small tools or instruments and no pulley is required.

7.07 The only tools that may be carried aloft in a body belt **SHALL** be pliers and skinning knife and where combination plier and screw driver pocket is provided, a screw driver. Exception: where an employee is working alone and then only a wrench and/or hammer when they are required to do the job. All other tools **SHALL** be in a tool bucket when raised from the ground and lowered, and tool bucket SHALL be used to deposit tools in during the work on the pole. All sharp tools SHALL be protected with suitable guards when not in use.

The intent of this rule is to prevent the carrying of tools on the belt that are not needed for the particular job to be done on the pole. Some workmen make a practice of always carrying all tools, regardless of the requirements of the job. This is a source of physical exhaustion and hazard. It is not the intent of this rule to prevent a workman from carrying the tools actually needed for a particular job; however, when a tool bucket is available, tools should be raised and lowered therein.

7.08 Safety straps **SHALL** always be placed around a structure in such a way that the straps cannot become disconnected. They **SHALL NOT** be placed around the top of a pole, the end of a crossarm, or pins or crossarm braces. Where safety cannot be accomplished in any other way an approved utility platform **SHALL** be used. Safety straps SHALL NOT be allowed to hang loose from one end, either in climbing or descending poles or other structures. Safety straps SHALL NOT be used while working on ladders unless the ladders are securely lashed, or are permanently fastened to a truck.

7.09 Whenever practicable, workmen who are working on overhead lines **SHALL** work from below rather than from above.

7.10 When more than one workman is working on a pole or structure he **SHALL NOT** change his working position without notifying other workmen of his intent.

7.11 All unnecessary conversation **SHALL** be avoided during work. Any distraction of attention of employees in a hazardous position or location may cause an accident. Employees **SHALL** warn each other of close proximity of grounds or live conductors or other hazards.

7.12 Workmen should not hold on to cross-arm braces, head guys or other attachments when working on the pole.

7.13 Employees **SHALL NOT** work at the base of a pole when any lineman is at work above. Employees serving linemen from the ground should do so from a point at least 10 feet from the base of the pole.

7.14 In ascending, or descending a pole or structure, each employee **SHALL** be permitted to reach the work level or the ground before another employee starts to climb.

7.15 When old poles are removed from service they should be lowered with rope or derrick.

7.16 The use of defective or unsafe climbers **SHALL NOT** be permitted. Climbers with gaffs shorter than 1¼ inches **SHALL NOT** be used. The gaffs **SHALL** be kept sharp in accordance with manufacturer's recommendations. Linemen **SHALL** remove their climbers while on the ground except when walking from pole to pole. Climbers should not be worn during work on ladders or other structures. Climbers **SHALL NOT** be worn while driving or riding in cars or trucks. When climbers are not in use they **SHALL** be fitted with gaff guards and properly stored.

7.17 Workmen **SHALL** use only climbers, climber guards, pliers, belts, safety straps, knives, screw drivers and wrenches issued by the Company and **SHALL NOT** be permitted to use other types or makes of these items except in emergency when Company tools are not available.

7.18 Safety lines (hand lines) are not intended to be subjected to shock loading and may be used for emergency rescue such as lowering a person to the ground. Such safety lines **SHALL** be a minimum of one-half inch diameter and three or four strand first-grade manila or its equivalent in strength (2,385 lbs) and durability.

7.19 Where poles or structures may be unsafe for climbing, they **SHALL NOT** be climbed until made safe by guying, bracing or other adequate means.

7.20 Before installing or removing wire or cable, strains to which poles and structures will be subjected **SHALL** be considered and necessary action taken to prevent failure of supporting structures.

7.21 When setting, moving or removing poles in or near lines energized in excess of 600 volts, precautions **SHALL** be taken to avoid direct contact of the pole with the energized conductors. Employees **SHALL** wear electrical protective equipment and/or use other insulated devices when handling poles. Employees performing such work **SHALL NOT** contact the pole with uninsulated parts of their body.

7.22 Pole holes **SHALL NOT** be left unattended or unprotected in areas where employees are currently working.

7.23 Conductive objects **SHALL NOT** be passed between employees working on poles, structures, or aerial devices in the vicinity of energized circuits or equipment unless the provisions of 4.07 are maintained.

7.24 Communication conductors on poles or structures **SHALL** be treated as energized lines when the hazard of induced voltage exists.

7.25 **Installing or Removing De-energized Conductors**

7.25.1 When installing or removing de-energized conductors, the applicable provisions of 7.25.2 through 5.25.16 of this paragraph **SHALL** be complied with.

7.25.2 Prior to beginning operations a briefing **SHALL** be held, setting forth the plan of operation and specifying the type of equipment and grounding devices to be used, procedures to be followed, cross-over methods to be employed, and the clearance authorization required.

7.25.3 Where there is a possibility of the conductor accidentally contacting an energized circuit or receiving a dangerous induced voltage buildup, the conductor being installed or removed **SHALL** be grounded or provisions made to insulate or isolate the employee.

7.25.4 When crossing over energized conductors in excess of 600 volts, guard structures **SHALL** be installed unless provision is made to isolate or insulate the workman or the energized conductor. Where practical the automatic-reclosing feature of the circuit-interrupting device **SHALL** be made inoperative.

7.25.4.1 When crossing an existing de-energized line, proper clearance authorization **SHALL** be obtained and the de-energized line grounded on both sides of the crossover or the line being installed or removed **SHALL** be considered and worked as energized.

7.25.5 Conductors being installed or removed **SHALL** be kept under control by the use of adequate tension devices, guard structures, tielines or other means to prevent accidental contact with energized circuits.

7.25.6 Guard structure members **SHALL** be sound and of adequate dimension and strength, and adequately supported.

7.25.7 Catchoff anchors, rigging and hoists **SHALL** be of ample capacity to prevent loss of the lines.

7.25.8 The manufacturer's load rating **SHALL NOT** be exceeded for stringing lines, pulling lines, shock connections, and all load-bearing hardware and accessories.

7.25.9 Pulling lines and accessories **SHALL** be inspected regularly and replaced or repaired when damaged.

7.25.10 Conductor grips **SHALL NOT** be used on wire rope unless designed for this application.

7.25.11 While the conductor or pulling line is being pulled (in motion) with a Power-driven device, employees **SHALL NOT** work directly under the moving conductor or pulling line nor **SHALL** any employee be permitted on the conductor support, i.e., cross-arm. An exception is made for only those situations when the employee is required to manually guide the stringing sock or board over or through the stringing sheave.

7.25.12 Except during emergency restoration procedures, work from structures **SHALL** be discontinued when adverse weather (such as high wind or ice on structures) makes the work hazardous.

7.25.13 Installing and clipping operations **SHALL** be discontinued during the progress of an electrical storm in the immediate vicinity.

7.25.14 Reel handling equipment, including pulling and tensioning devices, **SHALL** have ample capacity, be in proper operating condition and be leveled and aligned in accordance with the manufacturer's operating instructions.

7.25.15 Reliable communications between the reel tender and pulling rig operator **SHALL** be provided.

7.25.16 Each pull **SHALL** be snubbed or deadended at both ends before subsequent pulls.

7.26 Installing or removing deenergized conductor adjacent to energized lines: For purposes of this subpart, "stringing" means pulling in or out of overhead conductor for several spans or more with tensioners and power-driven pulling equipment.

7.26.1 When installing or removing deenergized conductor adjacent to an existing energized transmission line where there is a possibility that a dangerous induced voltage may exist, the employee **SHALL** comply with the provisions of paragraph 7.26.2 through 7.26.9 of this section, unless the line is worked as energized.

7.26.2 The tension stringing method, or other methods, which preclude unintentional contact between the lines being pulled and any employee, **SHALL** be used when stringing adjacent to energized lines.

7.26.3 All pulling and tensioning equipment **SHALL** be isolated, insulated or effectively grounded.

7.26.4 These grounds **SHALL** be left in place until conductor installation is completed between dead ends.

7.26.5 These grounds **SHALL** be removed as the last phase of aerial cleanup.

7.26.6 Bare conductors **SHALL** be grounded at all dead end or catch-off points.

7.26.7 Except for moving type grounds, the grounds **SHALL** be attached and removed by means of live-line tools or other suitable insulated devices.

7.26.8 A ground **SHALL** be located at each side of the work area where bare conductors are being spliced.

7.26.9 When working on conductors exposed to a dangerous induced voltage buildup, the clipping crews **SHALL** be protected by personal protective grounds installed at each of their work locations.

8.00 LIVE LINE TOOLS

8.01 Only live-line tools having a manufacturer's certification to withstand the following minimum test **SHALL** be used:

8.01.1 100,000 Volts AC per foot of length for 3 minutes when the tool is made of fiberglass; or

8.01.2 75,000 Volts AC per foot of length for 3 minutes when the tool is made of wood.

8.02 All live line tools **SHALL** be visually inspected before use each day. Tools to be used **SHALL** be wiped clean and if any hazardous defects are observed such tools **SHALL** be removed from service.

8.03 Rubber gloves and sleeves **SHALL** be worn when performing Hot Stick Operations, except as provided in Section F Paragraph 6.00.

9.00 PERSONAL PROTECTIVE EQUIPMENT

9.01 Body belts with safety straps or lanyards **SHALL** be worn to protect employees working at elevated locations on poles, towers, or other structures. The use of safety straps or lanyards is optional when the work involves climbing or changing location.

9.02 Only approved safety straps and body belts **SHALL** be used. Body belts **SHALL NOT** have any additional metal hooks or tool loops other than those required.

9.03 Body belts and safety straps **SHALL** be inspected before use each day to determine that they are in safe working condition.

10.00 **RULES FOR SAFE OPERATION OF CRANES, DERRICKS AND HOISTING EQUIPMENT PROXIMATE TO ENERGIZED POWER LINES AND EQUIPMENT**

10.01 Except where electrical distribution and transmission lines and/or equipment have been de-energized and visibly grounded at point of work or where insulating barriers, rated for the voltage not a part of or an attachment to the equipment or machinery; have been installed or erected to prevent physical contact with the lines or equipment; equipment or machines **SHALL** be operated proximate to energized lines and equipment in accordance with the following:

10.01.1 For equipment or lines rated 50 KV or below, minimum clearance between the lines or equipment and any part of the equipment or load **SHALL** be 10 feet.

10.01.2 For lines and equipment rated over 50 kv minimum clearances between the lines and equipment and any part of the crane or load **SHALL** be 10 feet plus 0.4 inch for each 1 KV above 50 KV or twice the length of the line insulator, but never less than 10 feet:

69 KV	10' 8"
138 KV	13' 0"
345 KV	20' 0"

0.01.3 Cranes, derricks and all hoisting equipment **SHALL** be adequately and securely grounded while they are in operation - proximate to energized lines and equipment.

10.01.4 When a crane or a derrick boom is raised and any part of the boom or load can possibly contact energized conductors or equipment, employees **SHALL** keep clear of the equipment and load. Employees on the ground who may operate the controls or be required to guide or handle the load **SHALL** wear rubber gloves and sleeves rated for the voltage involved or **SHALL** use other approved insulating devices.

0.01.5 A person **SHALL** be designated to observe clearances of equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.

.01.6 The crane operator **SHALL** be responsible for determining the need for an observer.

01.7 In a two person crane crew the driver-oiler may be utilized as the observer.

10.01.8 In a one person crane crew serving another crew, the crane operator may request a member of the crew being serviced as an observer.

10.01.9 Persons serving as an observer **SHALL** be trained in and SHALL use only those hand signals prescribed or approved by LILCO. (See Data Sheet.)

10.02 In transit, with no load and boom lowered the equipment clearance **SHALL** be a minimum of 4 feet for voltages less than 50 KV, 10 feet for voltages 50 to 345 KV, 16 feet for voltages 346 KV to 765 KV.

10.03 Exceptions to the "General Requirements When Company Personnel are Engaged in Construction, Operation and Maintenance of Electric Transmission and Distribution Lines and Equipment".

10.03.1 Where necessary to perform the required work, the clearance distance as specified in General Requirements, Paragraph 10.01.1 and 10.01.2 may be reduced to the "Safe Working Distances" as specified in "LILCO Rules for Safe Operation" Section O Paragraph 4.08 Table R-4 provided that:

10.03.1.1 Employees, on the ground, who operate the controls or may be required to guide or handle the load **SHALL** wear rubber gloves and sleeves rated for the voltage involved or use other approved insulating devices, and

10.03.1.2 The crane or derrick is considered as energized and is barricaded, or

10.03.1.3 The crane or derrick is effectively grounded and employees on the ground who may operate the controls or are required to guide or handle the load **SHALL** wear rubber gloves and sleeves rated for voltage or use other approved insulating devices.

10.04 **MECHANICAL EQUIPMENT:** Cranes and derricks **SHALL NOT** be operated closer than the minimum safe working distance set forth in LILCO Rules unless:

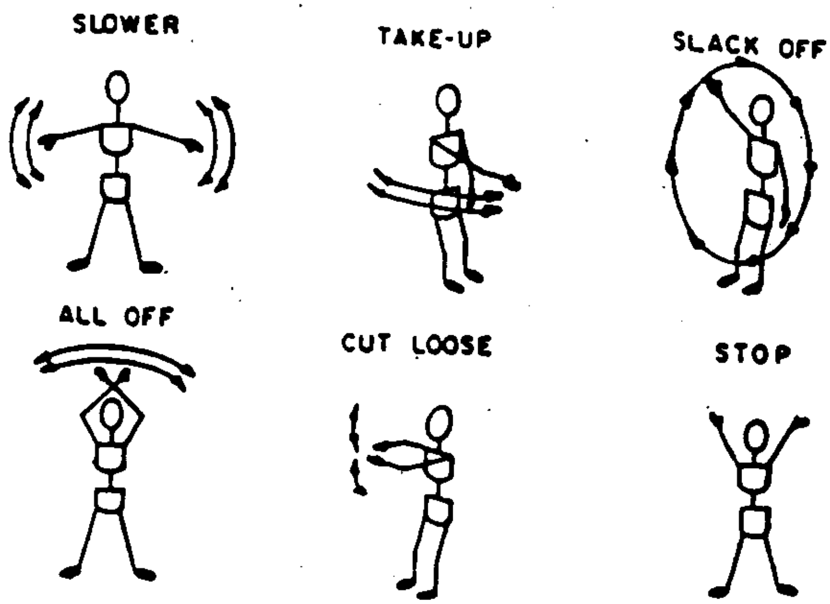
10.04.1 Employees, on the ground, who operate controls or may be required to guide or handle the load, **SHALL** wear rubber gloves and sleeves rated for the voltage; and,

10.04.2 An insulated barrier, rated for the voltage, is installed between the energized line or equipment and the mechanical equipment; and,

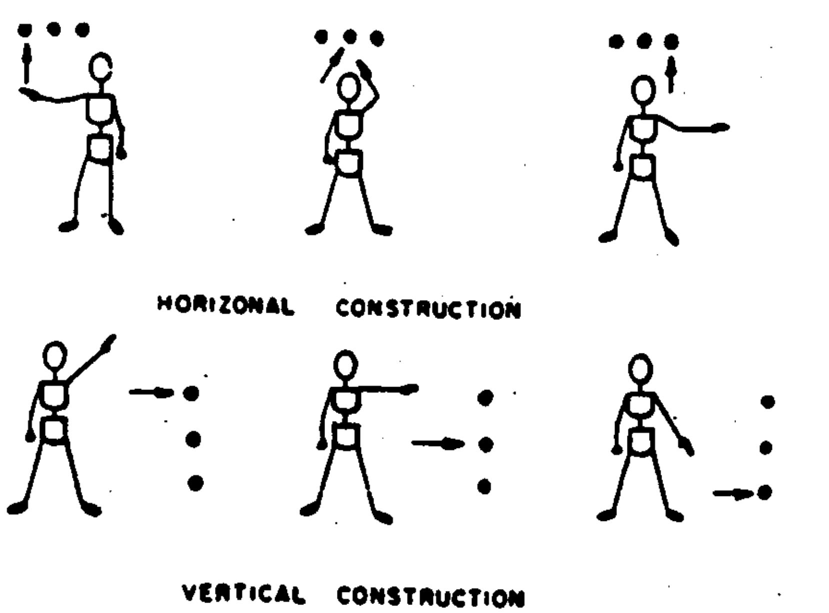
.3 The mechanical equipment is considered as energized and is barricaded or the equipment is effectively grounded.

ATTACHMENT 1

Standard Hand Signals for Sagging and Stringing Wire and Indicating Conductors



INDICATING CONDUCTORS



NOTE: Space radio is used extensively in our work. When using radio signals, standard operating procedure compatible with F.C.C. regulations must be followed. Be sure you understand all signals used in your organization.

Maximum Working Loads for Principle Hot Line Tools

The maximum load any hot line tool will support without danger of breaking depends upon the position of the tool on the structure and its relation to other tools used in conjunction with it.

The following tables and accompanying diagrams show the maximum loads that can be applied to wire tongs when used as pictured. In case of link sticks and miscellaneous tools, the load values given in the tables refer to the normal direct loads that can be applied. Loading for certain variations can be readily calculated; however, caution should be excercised when loading a tool near the limit given in the tables.

The maximum working load given in the wire tong table represents the actual breaking load as determined by tests, less 15 per cent for possible variations in the wood structure, and the result divided by a safety factor of two. When it becomes necessary to use wire tongs to handle larger wire sizes or larger spans than the ones mentioned in the table, double tongs should be employed. Where small diameter tongs are listed, a larger diameter tong should be selected. It should be remembered that loading increases considerably at hilltop structures, the extra weight depending upon the steepness of the line grade. It is possible that this force may exceed the weight of the conductor. Therefore, hilltop and other unusual problems require special analysis in the selection of wire tongs.

All live line tools must be inspected visually before each use. If any hazardous defects are indicated, the tool must be removed from service and not used until the defects are corrected.

Maximum Working Loads for Principle Hot Line Tools (continued)

LINK STICKS— WORKING LOADS		
Type	Pole Diameter (In Inches)	Max Work Load (In Pounds)
Strain	1-1/4	3500
Strain	1-1/2	5500
Strain	2	6500
Roller	1-1/4	1000
Suspension	2-1/2	2500

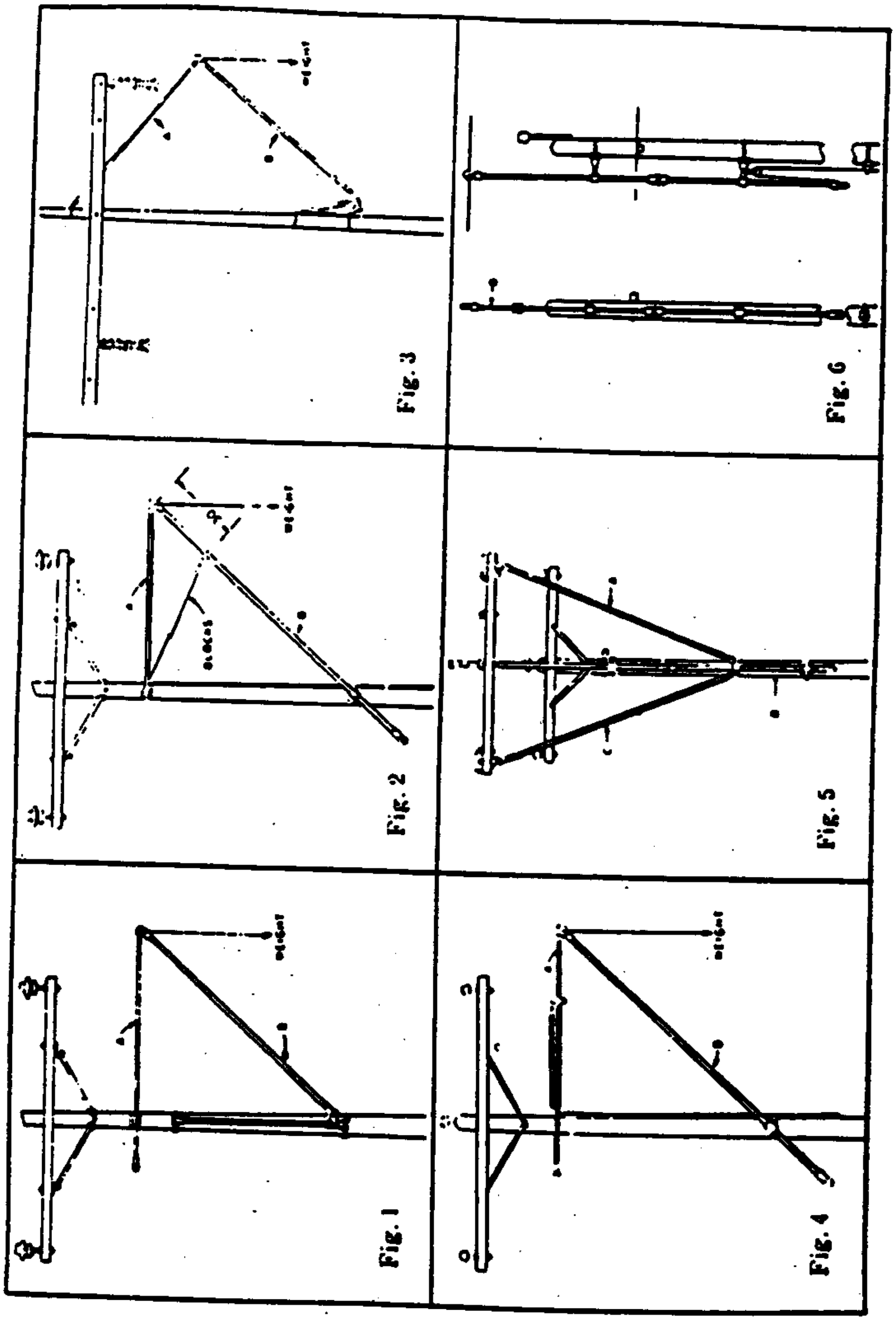
MISCELLANEOUS TOOLS— WORKING LOADS	
Tool	Max Working Load (In Pounds
Wire Tong Saddle	500
Wire Tong Saddle Ext.	500
Extension Chain	2500
Rope Snubbing Bracket	1000
Single Lever Lift	1500
Double Lever Lift	750 (each trunnion)
Rural Strain Carrier	2500
Two-Pole Strain Carrier	7000 (Spruce) 10000 (Hardwood)
Double-String Dead-End Tool	5000
Utility Platform	750
Universal Platform	600
Slide Support	500 (balanced weight)

Maximum Working Loads for Principle Hot Line Tools (continued)

WIRE TONGS—WORKING LOADS

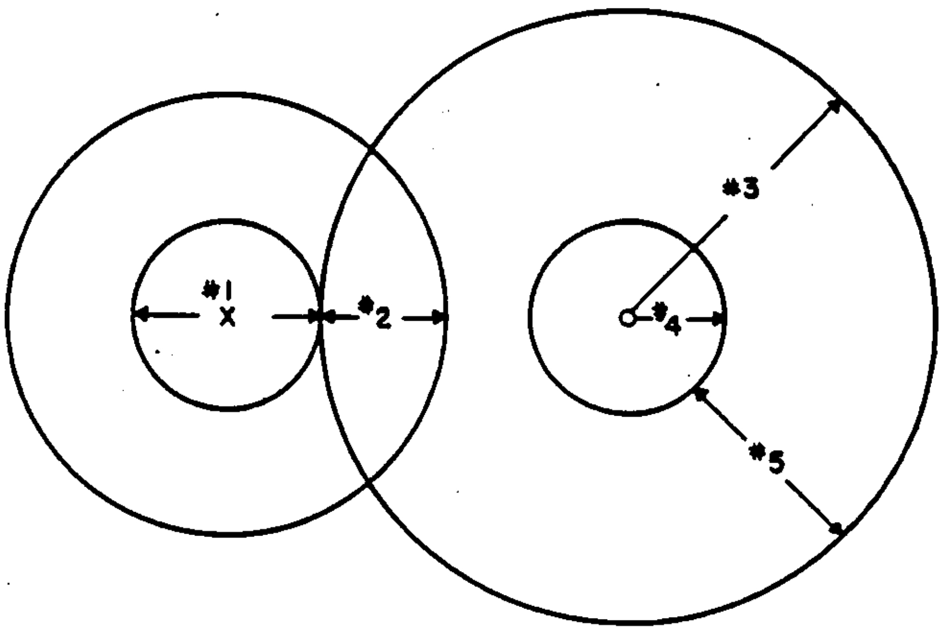
Fig. No.	Diameter (In Inches)			Type Support	Max. Working Load (Lbs. Per Conductor)	Max. Wire Size and Span (In Feet) (Level Ground)					
						ACBR		CPW-CPR		CPR	
	A	B	C			Size	Span	Size	Span	Size	Span
1	1-1/2	2		Saddle or Slide	180	1/0	750	4A	700	1/0	350
2	1-1/2	2-1/2		Saddle, Slide or Lever Lift	275	4/0	700	4D*	800	4/0	800
2	1-1/2	2		Saddle or Lever Lift	475	4&0	1200	4D*	1400	4/0	500
2	1-1/2	2-1/2		Saddle or Lever Lift	650	338.4 MCM	1000	1/)J*	1000	4/0	650
3	1-1/2	3		Lever Lift	915	397.5 MCM	1100	4/)E	700	250 MCM	800
4	1-1/2	2		Saddle	150						
4	1-1/2	2-1/2		Saddle	275						
4	1-1/2	3		Lever Lift	475						
5	1-1/2	2-1/2	2	Saddle	150						
5	2	3	2-1/2	Saddle	225						
6		2-1/2		Saddle	800						

Maximum Working Loads for Principle Hot Line Tools (continued)



Safe Work Distance and Clear Hot Stick Distance

FIGURE 1
69kV

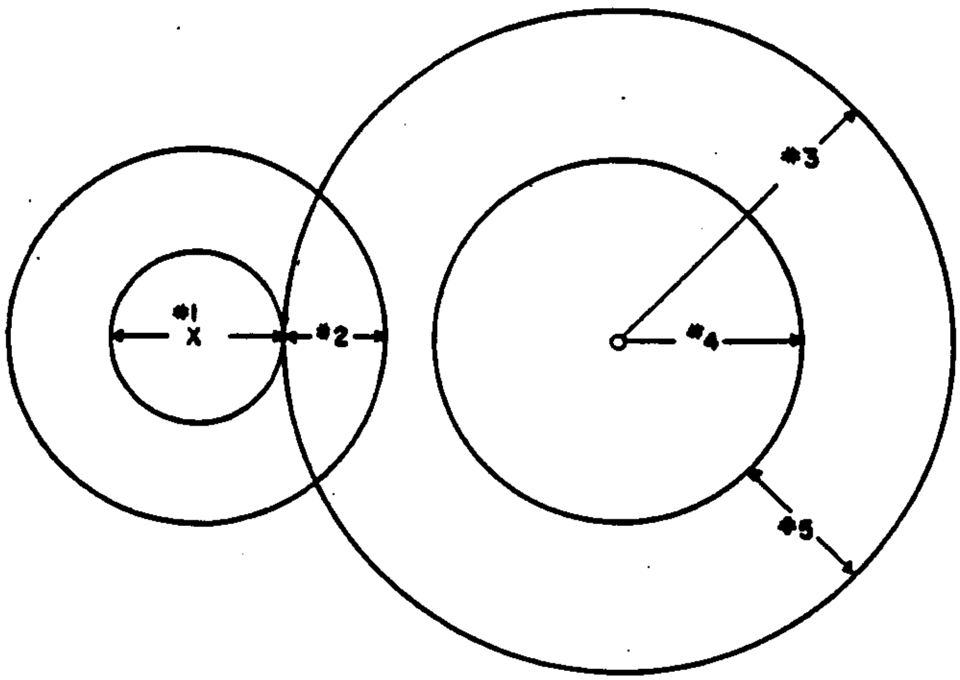


LEGEND

X = Center of Normal Work Position
O = Energized Part
#1 = 3′ = Normal Work Area
#2 = 2′ = Additional Space for Inadvertent Movement
#3 = 5′ = LILCO Safe Work Distance 69kV
#4 = 1′ 7″ = Flashover Portion of Safe Work Distance
#5 = 3′ 5″ Additional Distance for Inadvertent Movement

Safe Work Distance and Clear Hot Stick Distance (continued)

FIGURE 2
138kV

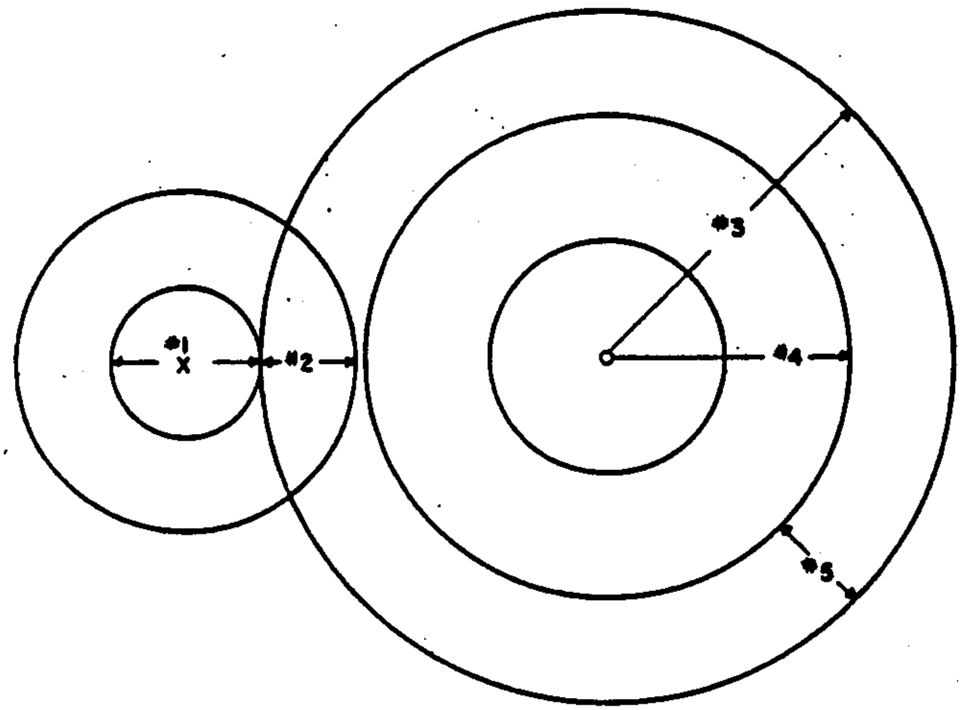


LEGEND

X = Center of Normal Work Position
O = Energized Part
#1 = 3′ = Normal Work Area
#2 = 2′ = Additional Space for Inadvertent Movement
#3 = 6′ = LILCO Safe Work Distance 138kV
#4 = 3′ 2″ = Flashover Portion of Safe Work Distance
#5 = 2′ 10″ Additional Distance for Inadvertent Movement

Safe Work Distance and Clear Hot Stick Distance

FIGURE 3
345kV



LEGEND

X = Center of Normal Work Position
O = Energized Part
#1 = 3' = Normal Work Area
#2 = 2' = Additional Space for Inadvertent Movement
#3 = 7' = OSHA/LILCO Safe Work Distance 345kV
#4 = 5' 2" = Flashover Portion of Safe Work Distance
#5 = 2" = Total Distance for Inadvertent Movement

SECTION Q

UNDERGROUND ELECTRICAL FACILITIES

1.00 **INTRODUCTION**

1.01 The rules in this section **SHALL** apply to all employees engaged in the construction, operation and maintenance of underground electric facilities, and to all other persons who may be required to enter underground installations.

1.02 **QUALIFIED EMPLOYEES**

1.02.1 Only workmen who are qualified by experience and training **SHALL** be assigned to work on energized conductors or equipment. Persons in training may be permitted to work on energized underground conductors or equipment provided such persons are under the direct supervision or instruction of a qualified person.

1.03 **WORKING AREA SAFEGUARDS**

1.03.1 Warning devices, barriers, barricades or guard rails **SHALL** be placed to protect adequately the public and employees before manhole or vault covers or gratings are removed or other work is started. All such signing and barricading **SHALL** be done in compliance with all laws and regulations.

1.03.2 Warning devices, barriers, etc. **SHALL NOT** be removed until the work is completed and manhole or vault covers or gratings are replaced.

1.03.3 Trucks, tool carts and other equipment **SHALL** be placed as to present the least impediment or hazard to traffic, consistent with safe working area for employees. If practicable, trucks or equipment **SHALL** be placed between the working area and on-coming traffic. Where trucks or other motor vehicles are used as barricades, care must be taken to shut off the engine, or otherwise protect men in manhole from exhaust fumes.

2.00 **OPERATING AND SWITCHING PROCEDURES**

2.01 Before any enclosure associated with a direct burial distribution system is opened, proper barriers will be placed or precautions taken to ensure that the public is kept at a safe distance from the working area.

2.02 All direct burial cables and equipment **SHALL** be considered alive at all times and **SHALL** be de-energized in accordance with IO-30005 and Section O, and grounded in accordance with IO-30005 and Section O Paragraph 1.03.

2.03 Live line tools, rubber protective equipment, and eye protection **SHALL** be used when switching an energized circuit.

2.04 Direct burial distribution circuits **SHALL** be energized and de-energized in accordance with applicable work methods, procedures, and by equipment designed for those purposes.

3.00 **PRELIMINARIES FOR VAULT AND MANHOLE WORK**

3.01 When opening a vault or manhole the following precautions **SHALL** be observed.

3.01.1 An open flame **SHALL NOT** be used to melt ice in and around a vault or manhole cover.

3.01.2 Manhole and vault cover hooks **SHALL** be used to remove and replace covers.

3.01.3 After removal, the manhole or vault cover **SHALL** be placed away from clear vehicular traffic lanes, and in a location so as not to present a tripping hazard to workmen and the public.

3.02 Entry into Manholes or Vaults - Refer to Section N - Work in Confined Spaces.

3.02.1 No entry **SHALL** be permitted unless forced ventilation is provided or the atmosphere found to be safe by testing for oxygen deficiency and the presence of explosive gases or fumes.

3.02.2 Where unsafe conditions are detected by testing or other means, the work area **SHALL** be ventilated and otherwise made safe before entry.

3.02.3 Provisions **SHALL** be made for an adequate continuous supply of air.

3.02.4 While work is being performed in manholes, an employee **SHALL** be available in the immediate vicinity to render emergency assistance as may be required. This **SHALL NOT** preclude the employee in the immediate vicinity from occasionally entering a manhole to provide assistance, other than emergency. This requirement does not preclude a qualified employee, working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of inspection, housekeeping, taking readings, or similar work if such work can be performed safely.

3.02.5 When open flames must be used extra precautions **SHALL** be taken to provide adequate ventilation.

3.02.6 Before using open flames in a manhole or excavation in an area where combustible gases or liquids may be present, such as near a gasoline service station, the atmosphere of the manhole or excavation **SHALL** be tested and found safe or cleared of the combustible gases or liquids.

4.00 ENERGIZED CABLES

4.01 When live work is to be done on cables, wires or other equipment, identification **SHALL** be made first at each working point by tags, route directions, vault or manhole number, position on the pole, cable size and type and position of conduit as indicated on maps, records or layouts.

4.02 Rubber protective equipment **SHALL** be worn when work is done on energized cables and equipment below 5,000 volts and all grounded equipment with which contact can be made while working on the energized cables **SHALL** be covered with rubber blankets or approved insulating devices.

4.03 Before a section of metallic sheathing is removed from cables, both sides **SHALL** be bonded together with a metallic jumper.

4.04 Energized cables that are to be moved **SHALL** be carefully inspected and **SHALL** be moved only under the direction of a qualified employee.

5.00 DE-ENERGIZED CABLES

5.01 When work is to be performed on de-energized cables, wires or equipment, proper identification **SHALL** be made at each work location.

5.02 De-energizing lines and equipment and the application of protective grounds **SHALL** be in accordance with the provisions of OI-30005, and Section O Paragraph 2.03 of these rules.

5.03 When working on unenergized cables in manholes containing other energized cables, care **SHALL** be exercised not to disturb the energized cables. Cables **SHALL NOT** be unnecessarily moved nor **SHALL** they be stepped upon.

5.04 Arc proofing **SHALL NOT** be unnecessarily disturbed on adjacent cables in the manhole.

6.00 **PULLING CABLE**

Duct rods **SHALL** be installed in the direction presenting the least hazard to employees. An employee **SHALL** be stationed at the far end of the duct line being rodded.

6.02 When pulling cables, workmen **SHALL NOT** remain in the vaults or manholes during heavy pulling strains on the cables.

6.03 When removing cables care **SHALL** be exercised to prevent persons from tripping on cables when the cables are pulled into the street.

6.04 Suitable precautions **SHALL** be taken when reeling removed cables to minimize hazards to employees and other persons in the vicinity of the reeling operation.

6.05 Shieve wheels, pulling blocks and lines **SHALL** be properly secured to prevent contact with adjacent live cables in manholes while pulling operations are in progress.

6.06 Cable reels **SHALL NOT** be left unattended, but if necessary to do so, they **SHALL** be lagged and blocked on both sides.

7.00 **SPLICING CABLES**

7.01 Solder and joint heating compound heating equipment using open flames **SHALL NOT** be permitted in manholes.

7.02 Employees SHALL use equipment provided for lowering materials and small tools into manholes and vaults. Safety pot hooks SHALL be used when lowering solder pots and compound kettle. Solder ladles SHALL be lowered separately. In lowering bulky material, the hand line should be properly secured to prevent slipping.

7.03 Before hot solder or hot compound is lowered into a manhole or vaults, those working in the hole SHALL be warned to stand clear. The man on the surface SHALL NOT proceed to lower material until he is instructed to do so from below.

7.04 Gloves SHALL be worn by workmen when handling or heating insulating compound or solder

8.00 WORKING ON CABLES 13 KV AND ABOVE

8.01 No work SHALL be performed on any underground cable which would require contact with any part of the cable other than armor, pipe or outer jacket when the cable is energized. This provision SHALL NOT preclude the taking of oil samples through appropriate valves.

9.00 PROTECTIVE GROUNDING

9.01 When an underground cable is to be worked on, the cable SHALL be removed from service and protective grounds SHALL be applied as provided in OI-30005 and Section O Paragraph 2.3 of these rules.

10.00 TRENCHING AND EXCAVATION

10.01 Trenching and excavation for the installation of underground facilities SHALL be in accordance with Section L of these rules.

11.00 HIGH PRESSURE PIPE-TYPE CABLES

11.01 When applying hot applied corrosion protection to pipes, care SHALL be exercised to prevent spillage of hot emulsions, by the person applying the compound, on his person or on anyone else.

11.02 Holiday testing of pipe coatings SHALL be done in such a manner as to prevent employees or workmen from contacting the pipe or energized part of the probe when the equipment is energized.

11.03 Pressure testing of pipes **SHALL** be in accordance with all appropriate laws and ordinances. Only qualified persons shall be permitted in the manholes to operate valves, make hose or line connections, and perform other operations associated with pressure testing.

11.04 On pipes which are underhung from bridges over roadways or rail lines or pipes which are fully exposed, hydrostatic testing may be performed to minimize the hazard of pipe rupture.

11.05 Air, water or dry nitrogen may be used for pressure testing. When using dry nitrogen care **SHALL** be exercised to insure that the atmosphere in manholes does not contain an unsafe level of nitrogen. If the level of nitrogen is found to exceed safe levels the manhole **SHALL** be thoroughly ventilated and the source of the nitrogen detected and corrected before work may resume.

11.06 When cleaning and clearing pipes of debris and installing steel lines utilizing a mandrel powered by gas pressure, no employee **SHALL** be permitted in the receiving end hole until the mandrel has passed completely through the pipe.

11.07 **PIPE END PREPARATION**

11.07.1 When cutting pipe ends to install reducers, the pipe cutting apparatus **SHALL** be installed on the pipe between the wall and the end to be cut off. Support for the cut end **SHALL** be provided so that the cut pipe does not fall free after the cut has been made.

11.08 **PULLING CABLE**

11.08.1 When pulling cables, workmen **SHALL NOT** remain in manholes when the pulling lines are under heavy strains.

11.08.2 Shieve wheels **SHALL** be securely fastened to rigid anchors within the manhole and **SHALL** be designed for the maximum tensions encountered.

12.00 **SPLICING CABLE**

12.01 Only hot oil type baths with electric heaters **SHALL** be permitted in manholes. Tape baths **SHALL** rest securely on the floor of the manhole and **SHALL NOT** readily tip when accidently contacted.

12.02 When the manhole is provided with double access, both manhole covers **SHALL** be removed and suitable protection provided during the splicing operation.

12.03 If the cable connectors must be welded using inert gas welding apparatus, only the welder **SHALL** be in the manhole during the welding operation.

12.04 When crimp or compressor type connectors are used care **SHALL** be exercised to prevent a workman from injury to his hands. Heavy connector presses **SHALL** be supported so that they do not fall causing injuries to workmen.

12.05 If portable power operated tools are used in the splicing operations, the manufacturer's instructions for safe handling **SHALL** be observed.

12.06 When installing joint casings, suitable supports **SHALL** be provided to permit placement of the sleeves in the proper location and to hold the sleeve while welding.

12.07 When welding joint casing sleeves only the welder **SHALL** be in the manhole. If a helper is required he **SHALL** wear suitable eye and face protection along with suitable respiratory protection as required for the welding operation.

13.00 LOW PRESSURE OIL FILLED CABLES AND SOLID DIELECTRIC CABLES

13.01 When work is to be performed on either low pressure oil filled cables or solid dielectric cables, the procedures to be followed **SHALL** be the same as set forth in OI-30005 and Section O Paragraph 2.03.2.08 for work on de-energized lines.

14.00 HEATING EQUIPMENT - HEATED MATERIALS

14.01 Suitable guards **SHALL** be placed around lighted or hot furnaces to prevent accidental contact with the flame or furnace.

14.02 Furnaces and tanks containing liquified petroleum gas **SHALL NOT** be placed in a manhole or vault.

15.00 DISCONNECT SWITCHES

15.02 Air break switches with exposed blades located in underground installations **SHALL NOT** be used to drop load.

16.00 UNDERGROUND DIRECT BURIED SYSTEMS

16.01 GENERAL

16.01.1 These rules apply to the construction, operation and maintenance of direct burial primary and secondary distribution systems.

16.02 INSTALLATION

16.02.1 TRENCHING AND EXCAVATION

See: General Rules Section L, Excavations, Trenching and Shoring.

16.02.2 CABLES

Exposed cables **SHALL** be secured in a safe manner which will protect employees and public against accidental tripping or injury.

16.02.3 PRECAST VAULTS, HANDHOLES AND PADS

a. Applicable safety procedures **SHALL** be followed when lifting, transporting and installing precast vaults, precast handholes and precast pads.

b. Precast vaults, handholes and pads **SHALL NOT** be left open or unprotected when not attended.

16.02.4 CABLE CONNECTORS

a. All cable terminations **SHALL** be properly connected or insulated, protected or grounded to minimize the contact hazard if the circuit is accidentally energized.

b. Cable terminations made at ground level may be made without rubber protective equipment only if one of the following conditions prevails:

- Opposite end of cable is grounded
- No source of potential available

16.02.5 TRANSFORMERS AND EQUIPMENT

All ground connections **SHALL** be made prior to connecting primary or secondary to transformers or equipment.

16.03 PROTECTIVE EQUIPMENT

16.03.1 Rubber Protective Equipment **SHALL** be worn:

a. When opening padmounted transformers, switches, and any other gear containing equipment rated 2300 volts and higher. Rubber gloves and sleeves **SHALL** be put on as soon as the gear is unlocked and before the door is opened;

b. While working on energized secondary or service conductors and associated equipment;

c. When working on a neutral or an energized circuit.

16.05 WORK ON ENERGIZED SYSTEMS

16.05.1 When working on energized submersible transformer, padmounted transformers and other equipment with the gratings, covers or doors opened, precautionary measures **SHALL** be taken to minimize tripping, falling and contact injuries. At all other times, energized equipment **SHALL** be closed and/or secured.

16.05.2 Other than testing, only one exposed energized secondary or service conductor **SHALL** be worked on at any one time at a given location. Protective devices **SHALL** be used to insulate or isolate it from all others.

16.05.3 All primary cables **SHALL** be de-energized, tested for potential and grounded at both terminals before performing any splicing work.

16.05.4 When it is necessary to work on any direct buried system, and the equipment must be de-energized, precautions **SHALL** be taken to insure that these portions of the system have been effectively separated from all known sources of potential, tested and grounded. The use of circuit maps and marking schemes is recommended to determine that the equipment being worked is properly identified. Precautions **SHALL** be taken to minimize the possibility of backfeed from any possible source.

16.05.5 Protective equipment **SHALL** be used when moving energized cables.

16.05.6 The concentric neutral of an energized circuit may be opened only after adequate jumpers have been installed, or other provisions made to insure the continuity of the system neutral.

SECTION V

WORK AREA PROTECTION

1.00 WORK AREA PROTECTION

1.01 INTRODUCTION

1.01.1 This section provides guidelines for protection of the public and the worker when working on a road or near a roadway/sidewalk.

2.00 GENERAL GUIDELINES

2.01 Work area protection **SHALL** be designed and installed for the protection of the public when hazards exist in a work area that cannot be eliminated under all conditions of weather, day or night.

2.02 These hazards may be from gas flash fires, explosions, electrical contact, motor vehicles, mobile power equipment, machinery, openings in walking surfaces, defective structures or substructures, falling objects and tripping hazards.

2.03 Barricades, tapes, signs, flags, high intensity flashing lights and tags are devices that **SHALL** be considered as parts of a work area protection system designed to protect against a known hazard.

2.04 When operations are such that signs, signals and barricades do not provide the necessary protection on or adjacent to a highway or street, a flagperson or other appropriate traffic controls **SHALL** be provided.

2.05 Reference for standards of signs, signaling and barricades **SHALL** be New York State Department of Transportation Manual of Uniform Traffic Control Devices. (LILCO Work Area Protection Manual).

2.06 Hand signaling by a flagperson **SHALL** be by use of red flags at least 18 inches square or sign paddles, and in periods of darkness, red lights.

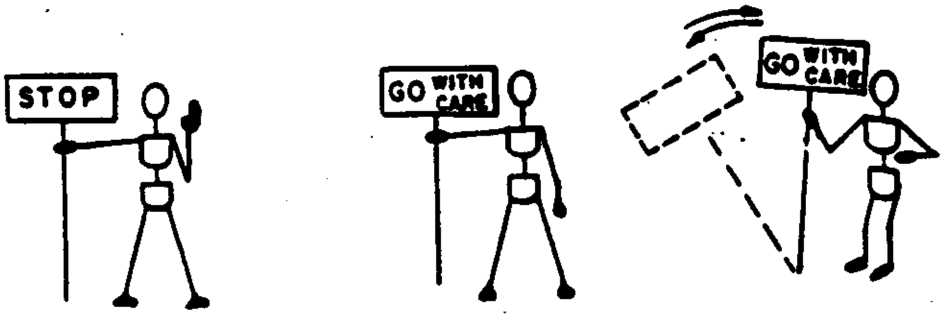
2.07 Flaggers and employees exposed to vehicular traffic **SHALL** wear traffic safety vests or other suitable high visibility garments marked with or made of reflecting material. Vests **SHALL** be flame retardant.

2.08 Work involving one or more employees that are exposed to vehicular traffic for only a brief period (10 minutes or less) is considered "mobile work" regarding operating power distributer switches, most bar holing, etc. Employees involved in mobile work **SHALL** comply with Section 2.07 and **SHALL** utilize the vehicle and its installed rotating, flashing, etc., warning system for protection when available.

2.09 All work occupying a work area for more then a brief period **SHALL** be considered "short duration stationary work" (i.e., overhead lines repair, underground work, etc.). At least one advanced warning sign **SHALL** face each direction of traffic approaching the work area. Channelizing devices **SHALL** be used if the work area occupies a portion of the roadway.

Hand Signals For Traffic Control

STOP GO WITH CARE TO GET ATTENTION



All signs used for traffic control should meet all federal, state, and local regulations.

Flagman stations should be located for enough from the work site so that vehicles will have sufficient distance to slow down before entering the project, but not so far that vehicles will tend to speed up again before entering the work site.

Flagman stations shall be illuminated at night. Conspicuous clothing is required to accentuate the visibility of flagmen.

Red lanterns or lights should be used to flag traffic at night. To stop traffic the light should be waved back and forth across the path of the approaching vehicle. The signal to proceed should be made verbally or by a hand motion.

Each flagman should be equipped to give an audible signal which may be used to attract the attention of motorists and to warn the workmen when a motorist refuses to obey the flagman.

EXHIBIT 6B

NYSDEC COMMUNITY AIR MONITORING PLAN

Community Air Monitoring Plan
(Ground Intrusive Activities)

Real-time air monitoring, for volatile compounds and particulate levels at the perimeter of the work area is necessary. The plan must include the following:

Volatile organic compounds must be monitored at the downwind perimeter of the work area on a continuous basis. If total organic vapor levels exceed 5 ppm above background, work activities must be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings must be recorded and be available for State (DEC & DOH) personnel to review.

Particulates should be continuously monitored upwind, downwind and within the work area at temporary particulate monitoring stations. If the downwind particulate level is 150 $\mu g/m^3$ greater than the upwind particulate level, then dust suppression techniques must be employed. All readings must be recorded and be available for State (DEC & DOH) personnel to review.

<u>Vapor Emission Response Plan</u>

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- the organic vapor level 200 ft. downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. When work shutdown occurs, downwind air monitoring as directed by the Safety Officer will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

Major Vapor Emission

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If efforts to abate the emission source are unsuccessful and if the following levels persist for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect;

- if organic vapor levels are approaching 5 ppm above background.

However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background.

Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in the Health and Safety Plan of the Work Plan will go into effect.
2. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation.
3. Frequent air monitoring will be conducted at 30 minutes intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

EXHIBIT 6C

NYSDEC DIVISION OF ENVIRONMENTAL REMEDIATION GUIDANCE DOCUMENT FOR FUGITIVE DUST SUPPRESSION AND PARTICULAR MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

New York State Department of Environmental Conservation

TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM #4031

FUGITIVE DUST SUPPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

TO: Regional Hazardous Waste Remediation Engrs., Bur. Directors & Section Chiefs

FROM: Michael J. O'Toole, Jr., Director, Division of Hazardous Waste Remediation

SUBJECT: DIVISION TECHNICAL AND ADMINISTRATIVE GUIDANCE MEMORANDUM -- FUGITIVE DUST SUPRESSION AND PARTICULATE MONITORING PROGRAM AT INACTIVE HAZARDOUS WASTE SITES

DATE: Oct 27, 1989

Michael J. O'Toole, Jr. (signed)

1. Introduction

Fugitive dust suppression, particulate monitoring, and subsequent action levels for such must be used and applied consistently during remedial activities at hazardous waste sites. This guidance provides a basis for developing and implementing a fugitive dust suppression and particulate monitoring program as an element of a hazardous waste site's health and safety program.

2. Background

Fugitive dust is particulate matter--a generic term for a broad class of chemically and physically diverse substances that exist as discrete particles, liquid droplets or solids, over a wide range of sizes--which becomes airborne and contributes to air quality as a nuisance and threat to human health and the environment.

On July 1, 1987, the United States Environmental Protection Agency (USEPA) revised the ambient air quality standard for particulates so as to reflect direct impact on human health by setting the standard for particulate matter less than ten microns in diameter (PM_{10}); this involves fugitive dust whether contaminated or not. Based upon an examination of air quality composition, respiratory tract deposition, and health effects, PM_{10} is considered conservative for the primary standard--that requisite to protect public health with an adequate margin of safety. The primary standards are 150 ug/m^3 over a 24-hour averaging time and 50 ug/m^3 over an annual averaging time. Both of these standards are to be averaged arithmetically.

There exists real-time monitoring equipment available to measure PM_{10} and capable of integrating over a period of six seconds to ten hours. Combined with an adequate fugitive dust suppression program, such equipment will aid in preventing the off-site migration of contaminated soil. It will also protect both on-site personnel from exposure to high levels of dust and the public around the site from any exposure to any dust. While specifically intended for the protection of on-site personnel as well as the public, this program is not meant to replace long-term monitoring which may be required given the contaminants inherent to the site and its air quality.

3. Guidance

A program for suppressing fugitive dust and monitoring particulate matter at hazardous waste sites can be developed without placing an undue burden on remedial activities while still being protective of health and environment. Since the responsibility for implementing this program ultimately will fall on the party performing the work, these procedures must be incorporated into appropriate work plans. The following fugitive dust suppression and particulate monitoring program will be employed at hazardous waste sites during construction and other activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Such activities shall also include the excavation, grading, or placement of clean fill, and control measures therefore should be considered.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM_{10}) with the following minimum performance standards:

   Object to be measured: Dust, Mists, Aerosols
   Size range: <0.1 to 10 microns
   Sensitivity: 0.001 mg/m^3
   Range: 0.001 to 10 mg/m^3
   Overall Accuracy: ±10% as compared to gravimetric analysis of stearic acid or reference dust

   Operating Conditions:
   Temperature: 0 to 40°C
   Humidity: 10 to 99% Relative Humidity

   Power: Battery operated with a minimum capacity of eight hours continuous operation

   Automatic alarms are suggested.

   Particulate levels will be monitored immediately downwind <u>at</u> the working site and integrated over a period not to exceed 15 minutes. Consequently, instrumentation

shall require necessary averaging hardware to accomplish this task; the P-5 Digital Dust Indicator as manufactured by MDA Scientific, Inc. or similar is appropriate.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the entity operating the equipment to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m^3 over the integrated period not to exceed 15 minutes. While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m^3, the upwind background level must be measured immediately using the same portable monitor. If the working site particulate measurement is greater than 100 ug/m^3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see Paragraph 7). Should the action level of 150 ug/m^3 be exceeded, the Division of Air Resources must be notified in writing within five working days; the notification shall include a description of the control measures implemented to prevent further exceedences.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM_{10} at or above the action level. Since this situation has the potential to migrate contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

    1. Applying water on haul roads.
    2. Wetting equipment and excavation faces.
    3. Spraying water on buckets during excavation and dumping.
    4. Hauling materials in properly tarped or watertight containers.
    5. Restricting vehicle speeds to 10 mph.
    6. Covering excavated areas and material after excavation activity ceases.
    7. Reducing the excavation size and/or number of excavations.

Experience has shown that utilizing the above-mentioned dust suppression techniques, within reason as not to create excess water which would result in

unacceptable wet conditions, the chance of exceeding the 150 ug/m^3 action level at hazardous waste site remediations is remote. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. If the dust suppression techniques being utilized at the site do not lower particulates to an acceptable level (that is, below 150 ug/m^3 and no visible dust), work must be suspended until appropriate corrective measures are approved to remedy the situation. Also, the evaluation of weather conditions will be necessary for proper fugitive dust control--when extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended.

There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require appropriate toxics monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

EXHIBIT 6D

D&B CONFINED SPACE ENTRY PROCEDURES

Dvirka and Bartilucci Consulting Engineers

Confined Space Entry Program

Prepared By

Field Safety Corporation

March 1999

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ACKNOWLEDGEMENT

I have read the Confined Space Entry Program concerning the health and safety procedures for Confined Space Entry. I have discussed any questions which I have regarding these materials with my supervisor or the health and safety officer, and I understand the requirements.

Signed:______________________________________ Date:_______________________

I POLICY STATEMENT

Dvirka and Bartilucci Consulting Engineers (D&B) is committed to carrying out an effective on-going Confined Space (CS) Entry Program, and will do so by adhering to the procedures in this document. Recognized occupational health and safety practices, standards, regulations, and other corporate Health and Safety Policies and Procedures will be followed in achieving this goal.

Under no circumstances will personnel who have not been trained in CS entry procedures, and who do not have the necessary equipment and an authorized permit, be allowed to access any CS.

II PURPOSE

To protect and safeguard employees from the hazards of confined space entry by establishing responsibilities and procedures for the safe performance of confined space operations.

III SCOPE

This program applies to all employees assigned to confined space entry related duties and operations. This document presents general practices to be followed for confined space entries. The specific conditions, dangers and site layout of a specific project must be evaluated prior to all confined space entries.

IV DEFINITIONS

A. Confined Space

A space large enough and so configured that an employee can bodily enter and perform assigned work; and has limited or restricted means for entry or exit; and is not designated for continuous employee occupancy. Examples include: manholes, sewers, boilers, silos, vessels, vats, pipelines, tunnels, storage tanks, vaults, open pits, degreaser tanks, trenches, dry/wet wells.

B. Permit-Required Confined Space (PRCS)

A permit-required confined space, or permit space, has one or more of the following characteristics:

- Contains or has the potential to a contain hazardous atmosphere;
- Contains a material that has the potential for engulfing an entrant;
- Has an internal configuration that could trap or asphyxiate an entrant by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section;
- Contains any other recognized serious safety or health hazard.

C. Non-Permit Confined Space

A confined space that does not contain, or with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

V. RESPONSIBILITIES

A. Management

Management is responsible for overseeing the program and for ensuring that all procedures are carried out. Management shall ensure that employees are familiar with confined space entry hazards and qualified to perform safe entry, and that the proper training and equipment is provided and used. Appendix A of this plan lists personnel qualified to perform various confined space tasks.

B. Field Operations Manager & Project Manager

When necessary, the Field Operations Manager (FOM) will visit during entry into a confined space to ensure enforcement of general procedures and activities. Any decisions requiring use or selection of personal protective equipment of monitoring devices will be approved by the FOM. The Project Manager will ensure that all elements of a site specific plan are implemented (Where applicable) and that all on-site staff have had required confined space training, and are equipped for a CS entry and are working in a safe manner. The Field Operations Manger will also be responsible for implementing safety procedures in the field during all work activities.

C. Entry Supervisors

Supervisors shall ensure compliance with the procedures, and shall be responsible for assigning and designating competent and trained personnel to the various confined space entry duties.

Supervisors will issue permits for entry into permit-required spaces. A Supervisor will be available on-site all times when confined space entry is performed. He will verify that all pre-entry tests have been conducted and that all procedures and equipment are in place before signing and issuing a permit.

D. Entrants and Attendants

Employees who are trained and authorized to perform work activities inside or outside a confined space are responsible for complying with the entry and attendant procedures and practices contained in this document. They must be knowledgeable of the hazards and use the equipment properly.

1. Entrant

The entrant must remain in communication with the attendant as necessary. He must alert the attendant and evacuate whenever hazards or dangers arise, or evacuate the space when an order is given from an attendant or supervisor, or when an alarm sounds.

2. Attendant

Attendants must observe and be aware of behavioral changes which may result from overexposure to chemicals or oxygen deficiency. He must remain in continuous contact with entrants, and maintain an accurate account of entrants in the space. Attendants are responsible for remaining at the entrance until relieved by another attendant.

VI CONFINED SPACE IDENTIFICATION, CLASSIFICATION AND EVALUATION CRITERIA

All confined spaces will be evaluated by a qualified person for the following hazards and conditions:

A. General Hazardous Characterization

The primary health concern is potential hazards due to the generation and possible presence of flammable and other toxic gases, and an oxygen deficient environment. In addition to the chemical hazards associated with the location, various biological and physical hazards may also be present for on-site workers. Due to access requirements at several work locations, entry into confined spaces may be required as a part of work activities. Evaluations to determine if these locations can be accessed outside of the confined space shall be made first. Entry into a confined space will only be performed if no other alternative for sample collection can be identified. The confined space entry site will be evaluated for the type and degree of hazards expected for a given job. Decisions concerning how to proceed will be based upon the evaluation of potential hazards.

It may be possible that Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits or the American Conference of Government Industrial Hygienists

(ACGIH) Threshold Limit Values are exceeded for volatile organic chemicals or other toxic chemicals which may be present as a result of decomposition of organic matter or other conditions. These compounds are capable of accumulating in confined spaces and specific protection will be required for entry into spaces.

B. Hazardous Atmosphere – Immediately Dangerous to Life & Health (IDLH)

A hazardous atmosphere, or IDLH atmosphere, is one which may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness. The following criteria define IDLH conditions and acceptable levels for entry:

1. Oxygen Deficiency and Oxygen Enrichment

   Oxygen concentration below 19.5% is oxygen deficient and the minimum permissible level for entry into a space.

   Oxygen concentrations above 23.5% create a potentially explosive or flammable atmosphere.

   Acceptable oxygen range for entry: 19.5% to 23.5%. Entry shall be prohibited when levels of oxygen are not within the acceptable range.

2. Flammable Vapors and Gases

   Airborne concentrations of flammable gases or vapors in excess of 10% of the Lower Flammable Limit (LFL) or Lower Explosive Limit (LEL) is considered IDLH.

   Entry shall be prohibited when LEL readings equal or exceed 10%.

3. Toxic Vapors

   Entry shall be prohibited when levels exceed the predetermined action levels specific to the nature of the work.

4. Changing Conditions

   Activities performed in the space can change atmospheric conditions by introducing air contaminants;

a. cleaning materials
b. welding, brazing, cutting
c. operating internal combustion engine-powered equipment
d. chemical removal of wall coatings and paints, sanding, scraping

C. Mechanical Hazards

All mechanical apparatus, such as pumps, which if activated could injure the worker shall be identified and locked out prior to entry.

D. Electrical Hazards

Any electrical which can cause shock or electrocution shall be identified, deenergized and locked out prior to entry.

E. Engulfment

Any liquid or solid material which can enter the space and surround and capture a person shall be identified and controlled by isolation of the space by blanking, blinding, or line breaking.

F. Heat Stress

Heat stress may occur even in moderate temperatures when work is strenuous. Heat stress symptoms and illnesses include heat rash, heat cramps, heat exhaustion, and heat stroke. Work activities will be monitored and schedules adjusted to allow for intake of fluids as well as resting and "cooling off" periods.

G. Other Hazards

Spaces shall be evaluated for any additional hazards, including: high pressure lines; steam lines; slip, trip and fall hazards; and space configurations which could cause entrapment or crushing. Entry into sewer systems, wet wells, etc. presents special hazards, such as biological hazards from waste materials, extremely slippery conditions, and drowning hazard.

VII ENTRY PERMIT

A. Requirements

Before entering a permit-required confined space, the entrant must be issued a permit signed by the supervisor. The permit must be completed in its entirety, assuring that all of the actions have been taken and conditions met which are in Section VIII, Entry Preparation.

A copy of the permit is located in Appendix B.

B. Permit Information

The following information must be included in the permit:

- Identification of space;
- Purpose of entry;
- Date and duration of permit;
- Names of authorized entrants;
- Name of entry supervisor;
- Names of authorized attendants;
- Identification of hazards;
- Actions taken to isolate space, and eliminate/control hazards;
- Acceptable entry conditions;
- Test results;
- Rescue and emergency means;

- Communication procedures; and
- Required equipment.

A confined space entry checklist is available in Appendix C. It should be used together with the permit.

VIII ENTRY PREPARATION

A. Identification and Classification of Spaces

- Inspect the exterior of the space and determine if the cover can be safely removed by testing the air around the over, and if possible, insert the probe by slightly prying open the cover.
- Inspect the interior of the space <u>from outside</u> and perform atmospheric testing around and at the opening to the space.
- Guard the opening with a railing or barrier to prevent an accidental fall.
- Determine means of escape and estimated time needed to escape.
- Determine hazards present or potential for hazards to develop (for conditions to change) based on hazards described in Section VI of this plan.

B. Atmospheric Testing

- **The internal atmosphere must be tested before anyone enters the space.** The space will be tested for:
  - % oxygen;
  - % lower explosive limit (LEL); and
  - toxic vapors.
- Tests will be performed with a Bacharach Sentinel 4 (or equivalent) – a four (4) gas atmosphere testing device for oxygen, combustible gas, carbon monoxide, and hydrogen sulfide.

- Tests will be performed with low detection level atmospheric testing equipment (calorimetric tubes or organic vapor analyzers) should toxic concentrations be suspected or known to be present.

- Test the atmosphere at a distance of every <u>4 feet</u> in the direction of travel and to each side. Test progression must be slow to allow for instrument response time.

- Order of testing:

  - Test for oxygen first. If the atmosphere is oxygen deficient, combustible gas reading will not be reliable.
  - Test for combustible gas second.
  - Test for toxic vapors last.

- **Do not enter confined space if oxygen is less than 19.5%.**

- **Do not enter a confined space if the LEL is greater than or equal to 10%.**

- **Exit a confined space if the meter indicates an alarm condition.**

- **If other toxic materials are suspected, contact your supervisor.**

- Toxic air symptoms – if you are exposed to toxic gas and have symptoms such as nausea, dizziness, blurred vision, irregular heartbeat, or breathing difficulty, signal for help. Attendant call for medical attention immediately if you observe signs of distress.

C. Ventilation

- In a confined space where the natural ventilation is poor, areas will be ventilated with an explosion proof fan and ducts.

- The O_2 meter will remain running with the probe inside the confined space the entire duration that personnel are inside, and will be monitored by the attendant.

- In confined areas where it is extremely hot, the explosion proof fan will be used to lower the temperature.

- The ventilation shall be maintained and fresh air shall continue to be introduced during occupancy of the space.

- Several air exchanges shall be used to purge the space. (A ventilation worksheet can be found in Appendix D).

D. Attendants

No work shall be performed in any confined space without an attendant. The attendant shall remain outside the space and observe and/or communicate with the entrant until the operation is complete and the entrant has exited the space. This person shall be properly instructed in emergency and rescue procedures. The supervisor and the attendant must assure the following:

- That a precise record be maintained of all personnel entering the confined space.
- That all emergency services and necessary equipment are available, and personnel in the vicinity advised of the hazard.
- The equipment which allows proper mechanical advantages for removing immobile personnel is in place so that attendants can perform non-entry rescue.
- The attendant shall not leave the opening until relieved by another attendant.
- The attendant will have an on-site means of summoning help, such as an air horn, or a portable telephone, in the event of an emergency.

E. Isolation of Confined Spaces

- The confined space must be isolated from all other systems.
- Electrical equipment must be locked out and tagged by the person(s) entering the confined space.
- Line disconnect switches supplying power to all mechanical equipment such as pumps, must be locked and tagged in the off position by the person(s) entering the confined space.
- All mechanical equipment must be blocked, chocked, and disengaged.
- Piping containing pressure must be bled and the line left separated exterior to the confined space so that no vapors can enter the confined space. If it is not possible to leave the line separated, a blank, which stops any possible flow, must be installed in the line to the confined space.
- Blanking flanges (skillet blanks) – Such flanges, pre-cut and designed for specific locations, are used in addition to lock-out of valves to block material flow through the piping system. Blanking flanges must be sufficiently strong to withstand anticipated line pressures. Gaskets should be provided on the incoming side of the blanks.

- All movable equipment within the confined area must be made immobile to prevent accidental movement.

F. Lock-out/Tag-out (LO/TO)

The purpose of locking and tagging is to prevent inadvertent actuation of electrical circuits, mechanical apparatus, or where there are any other operations or processes associated with the space whose operation may expose employees working within to hazardous energy conditions.

The conditions include but are not limited to those created by the following equipment or systems:

- Vapor, liquid, or gas lines used to fill the vessel or space with fuel;
- Mechanical pumps, electrical circuits, and auxiliary systems (including climate control, lighting, and power transmission apparatus);
- Mechanical cleaning or discharging systems used to empty the vessel or space of processed materials.

The following types of LO/TO devices may be used by personnel depending on the specific needs of the site, equipment, or operation:

- Lock – standard, key-opened padlocks are the only type which shall be used.
- Lock-out boxes – For multiple lock-out, a lockable container for holding a number of keys shall be used. The supervisor must retain a master key to open the lock-out box.
- Multiple lock hasps – a locking device enabling padlocks to be installed for simultaneous use when several employees are required to lock-out the same device.
- Chains – chains can be used to lock cut-off points of piping systems where valves are not provided with other equally effective types of locking devices. These chains must be pre-cut for specific valve lock-outs and must be provided with padlocks.
- Tags – any lock-out system must be accompanied by an informational tag indicating that the system has been deactivated and that use is prohibited.

Proper employee protection can be insured only if all power sources and potential exposures from any hazardous materials or systems are positively eliminated.

All systems or equipment which could create a hazardous condition must be identified and positively eliminated through locking and isolation. All electrical apparatus must be shut off and locked in the off position. Mechanical power transmission apparatus must be mechanically disabled or locked to prevent operation. Valves must be locked in the closed position. Additionally, the piping should be disconnected from the vessel and further disabled by installation of blanking or skillet blanks, especially in cases where misalignment is impractical.

Th use of signs or tags confirming the deactivation of the device or system and warning against further use shall be used only when a checklist and supervisory approval system (with a signed verification form) can be constructed from an inventory of all tagged points as insurance that all systems have been locked-out and isolated.

Before any employees enter a space or vessel, the start buttons, valves, and other actuating devices shall be tried to insure that they are disabled and the proper systems have been disabled.

Prior to removing any locks, tags, and isolation devices, employees and supervision must verify that the equipment or system locked-out is safe to operate. The Supervisor shall utilize a checklist to assure the following conditions are met:

- All personnel are clear of hazardous equipment and spaces:
- All guards are installed;
- All previously exposed electrical wiring and equipment are properly covered;
- All piping systems and open pipes are closed and properly connected;
- All mechanical devices are free of loose, unsecured objects.

G. Hot Work Permit

Any work to be done in the space which includes riveting, welding, cutting, burning and heating that is capable of providing an ignition source, requires a hot work permit.

Hot work permits must be obtained from the appropriate authority having jurisdiction or the corporate entry supervisor.

- When performing Hot Work in confined spaces employees shall:

  - identify any chemical involved;
  - check appropriate required personal protective equipment and ensure that a dry chemical fire extinguisher is on hand for all Hot Work;
  - check appropriate safety requirements.

- When Hot Work ceases employees shall:

  - leave all gas cylinders and welding machines outside of the confined space;

  - positively isolate the gas supply outside the confined space when torches are not in use for substantial periods of time (such as during lunch break), and where practical, remove troches and hoses from the confined space;

  - de-energize electrode holders by electrically disconnecting the power supply when welding is to be suspended for an appreciable amount of time or the welder has occasion to lave work;

  - ensure that mechanical ventilation in the confined space is continuous and is arranged to pull fumes away from employees who may be performing Hot Work;

  - properly file documentation of entry activities.

H. Entry Equipment

All equipment introduced into confined space or used in the immediate vicinity of confined spaces shall meet the specific performance requirements for the hazardous atmospheres, i.e., intrinsic safety and explosion proof conditions as specified in the National Electrical codes. (See Appendix E).

The following tools and equipment should be available for entry and set up during pre-entry preparation:

- Escape respirators or emergency breathing systems;
- Lighting equipment (flashlights, lanterns, or AC or DC electric powered lighting) approved for Class I, Division I, Group C or D atmospheres (explosion proof);
- Hand tools constructed of non-sparking metal alloys;
- Ladders;
- Lifeline and harnesses;
- Tripod with lifting device;
- Explosion proof fan and ductwork;
- Venturi horn;
- Oxygen/combustible gas meter with alarm set at 19.5% 0_2 and 10% LEL;
- Two-way radio;
- Emergency equipment – first aid kit.

I. Personal Protective Equipment

Workers are provided and required to use protective equipment as follows:

- For worker entering permit-required confined space:
  - gloves;
  - safety glasses or goggles;
  - boots and safety shoes;
  - impermeable coveralls;
  - safety harness with attached lifeline;
  - respiratory protection as deemed necessary by results of atmospheric testing.

- For attendant:

  - safety glasses or goggles;
  - gloves;
  - boots and safety shoes;
  - impermeable coveralls;
  - immediate access to safety harness and lifeline;
  - two-way radio for summoning assistance and emergency communication;
  - respiratory protection as deemed necessary by results of atmospheric testing.

J. Traffic Precautions

Traffic control may be necessary while confined space entry is taking place.

1. When approaching the job site.

   a. Activate 4-way flashers upon approach to the confined area to be entered.

   b. Park the vehicle in such a way that traffic will flow in the most unobstructed manner and, where possible, the vehicle should provide protection for the entry crew.

   c. Park the vehicle in such a manner that exhaust fumes are not drawn down into the manhole.

2. Cone Placement

Prior to opening the cover, place traffic safety cones around the space and the vehicle. These cones are to be visible to traffic in all directions. Cones are to be used to protect the crew and channel traffic. Place the cones at sufficient distances and intervals to adequately warn oncoming traffic.

3. Flagman

   a. If only one lane of traffic is open in a congested area, use a flagman to direct traffic flow.

   b. Use of safety vests and flags is required.

c. When a flagman is necessary, he cannot act as an attendant. An employee must be present as an attendant to the entrant.

K. Fall Arrest and Removal System Precautions

1. General Warnings

a. Do not install fall arrest and removal equipment where there exists the possibility of coming into contact with power liens, live cables, etc.

b. Do not leave equipment for long periods in environments where corrosion of the main components could take place as a result of vapors rising into the atmosphere from organic materials. Sewage and fertilizer plants, for example, should be avoided for they have high concentrations of ammonia present.

c. Always erect equipment directly overhead of intended working area. Do not work at more than a 10° angle from vertical below tripod or davit arm suspension point. Working outside of this range could cause the tripod to tip or create a "swing fall" situation (swing fall occurs when a worker swings and strikes an immovable object).

2. Winch and Tripod

- Lay the tripod on the working surface and attach the winch if not already in position.
- Adjust legs to required working length.
- Tilt tripod into an upright position.
- Spread legs out. Make sure legs are against bearing surface on head (legs fully spread).
- Position tripod over opening so which cable is located approximately in the center of the opening. Make sure footing is solid under each leg and capable of supporting intended lading (a suitable safety factor must be applied). Level the tripod by adjusting the leg height.
- Adjust the leg chain by removing excessive slack. WARNING: Tripod must <u>never</u> be used without leg chains in place.
- The winch may be adjusted up or down along the main leg of the tripod. Loosen the clamp plate and slide the winch to the desired level and retighten. Do not over-tighten the clamp plate.
- For personnel use, attach the fall protection system to the fall arrest anchorage.

- Inspect system before use (see Section VIII. K. 4 below).

3. Inspection

A visual inspection of the operating condition of the system is required before each use. Detailed inspections shall be conducted at a minimum of two (2) times per year. Detailed inspections must be recorded on the inspection log provided in Appendix F.

L. List of Confined Space Entry Equipment

A list of confined space entry equipment (instruments, personal protective equipment, and fall arrest equipment, etc.) can be found in Appendix G.

IX ENTRY PROCEDURES

A. Entrant and Attendant Duties

All confined space entries will be performed by a team of no less than two (2) persons with specific duties as follows:

1. Entrant

   Secure a lifeline to winch or stationary object and enter into confined space to perform necessary operation(s). Maintain communication with the attendant.

2. Attendant

   Remain outside the confined space and observe and/or communicate with entrant until the operation is complete and entrant has exited the confined space. During the entire period in which the confined space operation is being performed, the attendant will tend to the entrant's lifeline.

B. Communications

Entrants and attendants shall communicate with each other during the entire operation if visual contact cannot be maintained. Radio communication may be used if designed for atmospheric conditions (i.e, hazardous atmospheres requiring intrinsically safe devices). Lifeline may also be used. The following code shall be used when utilizing the lifeline:

Attendant to Entrant	Entrant to Attendant
1 pull – Are you okay?	1 pull – I am okay
2 pulls – Advance	2 pulls – I'm going ahead
3 pulls – Back out	3 pulls – Keep slack out of line
4 pulls – Come out	4 pulls – Send help immediately

If Entrant does not respond to the pull code, assume that there is trouble and begin effecting emergency procedures.

C. Continuous Testing

- The atmosphere within the space must be tested continuously to ensure that the forced air ventilation is preventing the accumulation of a hazardous atmosphere.
- If a hazardous atmosphere develops:
  - the entrant must leave the space immediately;
  - the space will be evaluated from the **outside** to determine how the conditions changed, if possible;
  - the hazardous atmosphere will be eliminated before subsequent entry takes place.

X. EMERGENCY PLAN

A. Self Rescue

Self Rescue implies that the entrant(s) will be removed by themselves. This may be done with or without the aid of an approved escape respirator or emergency breathing system.

B. Non-entry Rescue

If it becomes necessary to effect rescue efforts to remove a worker from a confined space, the following procedures will be followed:

- Attendant will communicate via two-way radio or air horn to request assistance. The following information will be given:
  - location of worker;
  - description of problem;
  - call for emergency medial assistance.

If the entrant's lifeline is secured to a winch, begin hauling entrant out of the confined space. This procedure must be performed at a speed that will not injure the entrant.

C. Entry Rescue

If the lifeline is not secured to a winch, the attendant will secure a lifeline and enter the confined space only under the following conditions:

- There is no hazardous atmosphere as determined by air testing instruments;
- There are no other physical hazards that would injure the rescuer;
- Another attendant has arrived on the scene;
- Outside emergency assistance has been summoned.

ALWAYS SUMMON ASSISTANCE BEFORE BEGINNING A RESCUE ATTEMPT!

The Attendant will:

- Sound the alarm and begin to down any appropriate equipment:
- **WAIT FOR SOMEONE TO RESPOND** to the scene of the entry before he/she enters the confined space (responder becomes Attendant);
- Enter the confined space;
- Locate the downed person;
- Secure the rescue line to the disabled persons harness or belt;
- Signal the Attendant to pull the person out of the space.

D. Outside Emergency Services and Notifications

- The **local fire department** will be summoned for rescue assistance when rescue cannot be performed by corporate personnel:

  Telephone No. **911**

- Rescue operations shall cease if removal would cause:
  - further injury to the victim;

- injury to the rescuer

NO RESCUE WILL BE ATTEMPTED BY EMPLOYEES WHEN A HAZARDOUS ATMOSPHERE OR ANY OTHR HAZARDOUS CONDITION EXISTS IN THE SPACE!

The emergency procedures will include notifying emergency and other affected personnel, and keeping the locations of the nearest emergency telephone numbers in a convenient and readily accessible area at the project site. In addition, a map showing the route from the project site to the medical facility will be shown on a map attached to the permit. Emergency services include:

Ambulance, Emergency and Rescue Service
Call Emergency 911

Fire Department
Call Emergency 911

Police Department
Call 911 for emergencies

Poison Control Center

1-516-542-2323 (Nassau and Suffolk Counties, NY)

1-212-340-4494 (Five Boroughs, New York City, NY)

Designated on-call Physician

Dr. Ronald Rosen
410 Lakeville Road
New Hyde Park, NY 11042
(516) 437-9184

All emergency services must be contacted prior to initiation of field work to explain the effort involved, site location and work schedule.

XI REPORTING

Upon completion of the confined space entry operation, the permit will be completed indicating the amount of time the entrants were inside the space. The permit will be submitted to the supervisor/foreman:

XII TRAINING

A. Frequency

Training shall be provided to employees:

- Before the employee is first assigned confined space entry duties;
- Before there is a change is assigned duties;
- Whenever there is a change in confined space operations that presents a new hazard;
- Whenever there are inadequacies in the employee's knowledge or use of these procedures.

B. Purpose

- The training shall establish employee proficiency in confined space entry duties, and shall introduce new or revised procedures, as necessary.
- The corporation shall certify that the training has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. There certification shall be available for inspection by employees and their authorized representatives.

APPENDIX A

LIST OF QUALIFIED CONFINED SPACE PERSONNEL

APPENDIX A

LIST OF QUALIFIED CONFINED SPACE PERSONNEL

Entry Supervisor:

Entrants:

Attendants:

Rescuer:

APPENDIX B

CONFINED SPACE ENTRY PERMIT

BACHARACH 625 ALPHA DRIVE • PITTSBURGH, PA 15238 • (800)736-4666 • FAX [illegible]

☐ CONFINED SPACE ENTRY PERMIT ☐ HAZARDOUS AREA ENTRY PERMIT ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

1	LOCATION AND DESCRIPTION OF CONFINED SPACE	DATE
	PURPOSE OF ENTRY	TIME _.m.
	DEPARTMENT	EXPIRATION _.m.
	PERSON IN CHARGE OF WORK	

	CREW SUPERVISOR(S)	TYPE OF CREW	[illegible]
2			

	SPECIAL REQUIREMENTS	YES	NO		YES	NO
3	Lock Out – De-Energize			Escape Harness		
	Lines Broken – Capped or Blanked			Tripod Emergency Escape Unit		
	Purge – Flush and Vent			Lifelines		
	Ventilation			Fire Extinguishers		
	Secure Area			Lighting		
	Breathing Apparatus			Protective Clothing		
	Resuscitator – Inhalator			Respirator		

	TEST(S) TO BE TAKEN (Valid for one 8 hour shift)	P.E.L.*	YES	NO	DATE _.m	DATE _.m	DATE _.m	DATE _.m	DATE _.m	DATE _.m	DATE _.m	DATE _.m
4	% of Oxygen	-19.5% +21%										
	% of L.E.L.**	Any % over 10										
	Carbon Monoxide	35 ppm										
	Hydrogen Sulfide	10 ppm										

GAS TESTER NAME ______

Note: Continuous/periodic tests shall be established before beginning job. Any questions pertaining to test requirements, contact certified division gas tester.

Plant Gas Coordinator (name) ______ or the Industrial Hygienist (name) ______

	INSTRUMENTS USED NAME	TYPE	[illegible]
5			

SAFETY STANDBY PERSON(S)	NAME	CHECK
YES ☐		
NO ☐		

AMBULANCE ______ ORIGINAL TO DEPARTMENT

FIRE ______ COPY TO SAFETY

SUPERVISOR AUTHORIZING ALL ABOVE CONDITIONS SATISFIED ______

* P.E.L. Permissible Entry Level ** L.E.L. Lower Explosion Level

APPENDIX C

CONFINED SPACE ENTRY CHECK LIST

CONFINED SPACE IDENTIFICATION

Confined Space Location: ______________________

Purpose of Entry: ______________________

Previous materials in space: ______________________

Potential Hazards of the Confined Space

Atmospheric Hazards:

Yes NA Flammable gas vapor or mist < 10% LFL): ______________

Yes NA Airborne combustible dust > LFL: ______________

Yes NA Atmospheric oxygen < 19.5% or > 23.5% ______________

Yes NA Atmospheric condition over PEL: ______________

Yes NA Other condition IDLH

Yes NA Poor ventilation

Yes NA Migrating vapors/gases

Chemical Hazards:

Yes NA Unknown contents

Yes NA Corrosive materials: ______________

Yes NA Chemical reactivity: ______________

Yes NA Sludge/residue

Yes NA Chemical contact

Engulfment Hazards:

Yes NA Materials that fill or plug respiratory tract: ______________

Yes NA Materials that exert pressure to strangle, constrict or crush: ______________

Configuration Hazards:

Yes NA Inadequate light

Yes NA Difficult to exit

Yes NA Heat/cold

Yes NA Falling objects: ______________

Yes NA Poor communications

Yes NA Equipment startup: ______________

Yes NA Electrical shock: ______________

Yes NA Poor visibility

Yes NA Hot/cold contact

Yes NA Pressure/vacuum

Yes NA Sharp objects

Yes NA Sloping surfaces

Yes NA Taper to smaller cross section

External Hazards:

Yes NA Weather

Yes NA Slip/trip surfaces

Yes NA ______________

Yes NA ______________

Hazards Being Introduced to Space:

Yes NA Toxic chemical: ______________

Yes NA Atmospheric contaminant: ______________

Yes NA Radiation hazard: ______________

Yes NA Electrical hazard: ______________

Yes NA Mechanical hazard: ______________

Yes NA ______________

CONTROL OF THE POTENTIAL HAZARDS

Required Before Entry:

Yes NA Isolate chemical, utility and outlet lines

Yes NA Purge the space with:
- ☐ water/steam
- ☐ air
- ☐ inert

Yes NA Lockout, tagout and tryout:
- ☐ physical/mechanical
- ☐ electrical
- ☐ radiation

Yes NA Minimize slipping hazards

Yes NA Conduct atmospheric tests:
- ☐ O_2
- ☐ LEL
- ☐ toxic
- ☐ continuous monitoring required
- ☐ periodic monitoring required

Yes NA Guard sharp edges and moving parts

Yes NA Ventilation:
- ☐ mechanical
- ☐ natural ventilation only

Yes NA Review the MSDS for

____

Yes NA Non-sparking tools

Yes NA Explosion proof lighting

Yes NA Gloves for hazards

Yes NA Boots for hazards

Yes NA Additional PPE:

____

Yes NA Emergency eye wash

Yes NA First aid kit

Yes NA Safety harness:
- ☐ chest
- ☐ full body

Yes NA Wristlets

Yes NA Lifeline

Required During Entry:

Protective Equipment -

Yes NA Hearing protection

Yes NA Special clothing:

____

Yes NA Splash goggles

Yes NA Splash shield

Yes NA Respirator:
- ☐ SCBA
- ☐ Air-line with egress bottle
- ☐ PAPR/air purifying: cartridge

____

Yes NA Head protection

Yes NA Fire extinguisher

Communications -

Yes NA Portable radio

Yes NA Mobil phone

Yes NA Unaided voice

Ventilation -

Yes NA Conduct atmospheric tests: ☐ O_2 ☐ LEL ☐ toxic
- ☐ continuous monitoring required
- ☐ periodic monitoring required

Required for Rescue/First Aid:

Yes NA Vertical retrieval device/winch

Yes NA Respiratory protection: ☐ SCBA ☐ Air-line with egress bottle

Yes NA Battery Lighting

Yes NA Alarm/powered communication device

Yes NA Antidote for ____________________

Yes NA ____________________

Yes NA ____________________

SPECIAL ENTRY INSTRUCTIONS

____

____

____

Anticipated Signs and Symptoms

Yes	NA	Irritation of eyes, nose and throat
Yes	NA	Tearing
Yes	NA	Changes in complexion or skin color
Yes	NA	Breathing difficulties
Yes	NA	Coughing
Yes	NA	Coordination difficulties
Yes	NA	Confusion
Yes	NA	Incoherent speech
Yes	NA	Dizziness, nausea, light-headed
Yes	NA	Clammy skin
Yes	NA	Weak or strong rapid pulse
Yes	NA	Heat rash
Yes	NA	Fatigue and/or weakness
Yes	NA	Sneezing
Yes	NA	Tightness in the chest
Yes	NA	Drooling
Yes	NA	Diarrhea
Yes	NA	Slurred speech
Yes	NA	Irritability
Yes	NA	Headaches
Yes	NA	Profuse sweating
Yes	NA	Fainting
Yes	NA	Convulsions
Yes	NA	Unconsciousness, coma

Rescue Information

Important Numbers:

Rescue: ____________________

Plant: ____________________

Other: ____________________

Special Rescue Instructions

____

____

____

Based upon the above evaluation, it is <u>anticipated</u> that this space will be classified as:

☐ Multiple hazards permit-required space: requires full compliance with Permit Space Program including the completion of a permit and the presence of an attendant.

☐ Atmospheric hazard permit-required space that can be controlled by ventilation alone: no permit or attendant required. Note: This classification allows alternate entry procedures.

☐ Non-permit required space: no potential or actual atmospheric hazards or all hazards within the space have been eliminated - no permit or attendant required. Note: this classification requires special certification.

Evaluation performed by: ____________________
(Print name)

____
(Print title)

____
(Sign name)

APPENDIX D

VENTILATION WORKSHEET

...e this Work Sheet to calculate the approximate volume of the Confined Space and the number of minutes needed to change the ... in the confined space. IF Ventilation is used to modify the atmosphere of the confined space then a MINIMUM of two (2) air ...nges MUST occur before retesting PRIOR to any entry into the confined space. Entry is made ONLY after it is authorized ... PERMIT is signed and issued.

Ventilation Requirements

A. Height of Confined Space (H) = ______________ feet

B. Length of Confined Space (L) = ______________ feet

C. Width of Confined Space (W) = ______________ feet

D. Diameter of Confined Space (D) = ______________ feet

ESTIMATE IF DIMENSIONS ARE UNKNOWN

Volume of the Confined Space

For Rectangular or Cubic spaces:

E. Volume (V) = L x W x H = ______________ cubic feet

For Circular or Columnar spaces:

F. Volume (V) = π x (D/2)^2 x H = ______________ cubic feet

NOTE: π = 3.14

Ventilation Times

Minimum Ventilation Time = 2 x [CS Volume (V)/Ventilation Rate (VR)]

Blower Model No. ______________

G. Ventilation Rate of the Blower (VR) = ______________ cubic feet per minute

Found on Blower or in Manual. Call Manufacturer if YOU unsure of Blower output.

Time of ventilation required prior to retesting prior to Authorized Entry:

H. Time (in minutes) = 2 x (V/VR) = ______________ minutes

NOTE: Ventilation MUST continue for the entire duration of the CS Entry.

APPENDIX E

INSTRUMENT INHERENT SAFETY

Instrument Inherent Safety

The portable instrumentation used to evaluate hazardous material spills or waste sites must be demonstrated as being safe to use in those hostile environments. Electrical devices, such as the monitoring instruments, must be constructed in such a fashion as to eliminate the possibility of igniting a combustible atmosphere. The sources of his igniting could be: an arc generated by the power source itself or the associated electronics, and/or a flame or heat source inherent in the instrument and necessary for its proper functioning.

Several engineering, insurance, and safety industries have standardized test methods, established inclusive definitions: and developed codes for testing electrical devices used in hazardous locations. The National Fire Protection Association (NFPA), a forerunner in this endeavor, created minimum standards in its National Electrical Code (NEC), published every 3 years. This code spells out among other things:

- Types of controls acceptable for use in hazardous atmospheres.

- Types of areas in which hazardous atmospheres can be generated and the types of materials that generate these atmospheres.

I. Hazardous Atmospheres

Depending upon the response worker's background, the term *hazardous atmosphere* conjures up situations ranging from toxic air contaminants to flammable atmospheres. For our purposes, an atmosphere is hazardous if it meets the following criteria:

- It is a mixture of any flammable material in air (see *Class* and *Group* below) whose composition is within this material's flammable range (LEL-UFL).

- A critical volume of the mixture is sufficiently heated by an outside ignition source.

- The resulting exothermic reaction propagates the flame beyond where it started.

Hazardous atmospheres can be produced by one of three general types of materials:

- Flammable gases/vapors

- Combustible dusts

- Ignitable fibers

Whereas the flammable material may define the hazard associated with a given product, the occurrence of release (how often the material generates a hazardous atmosphere), dictates the risk. Two types of releases are associated with hazardous atmospheres:

- CONTINUOUS: Those existing continuously in an open unconfined area during normal operating conditions.

- CONFINED: Those existing in closed containers, systems or piping, where only ruptures, leaks, or other failures result in a hazardous atmosphere outside the closed system.

There are six possible environments in which a hazardous atmosphere can be generated. However, not every type of control will prevent an ignition in every environment. To adequately describe the characteristics of those environments and what controls can be used, the National Electrical Code defines each characteristic:

- *Class* is a category describing the type of flammable material that produces the hazardous atmosphere:

  - *Class I* is flammable vapors and gases, such as gasoline, hydrogen. Class I is further divided into groups A, B, C, and D on the basis of similar flammability characteristics (*Table 1-1*).

  - *Class II* consists of combustible dusts like coal or grain and is divided into groups E, F, and G.

- *Class III* is ignitable fibers such as produced by cotton milling.

- *Division* is the term describing the "location" of generation and release of the flammable material.

  - *Division 1* is a location where the generation and release are continuous, intermittent, or periodic into an open, unconfined area under normal conditions.

  - *Division 2* is a location where the generation and release are in closed systems or containers and only form ruptures, leaks or other failures.

Using this system, a hazardous atmosphere can be routinely an adequately defined. As an example, a spray-painting operation using acetone carrier would be classified as a Class I, Division 1, Group D environment. Additionally, an abandoned waste site containing intact closed drums of methyl ethyl ketone, toluene, and xylene would be considered a Class I, Division 2, Group D environment. Once the containers begin to leak and produce a hazardous atmosphere, the environment changes to Class I, Division 1, Group D.

2. <u>Controls</u>

Three methods exist to prevent a potential ignition source from igniting a flammable atmosphere:

- EXPLOSION-PROOF: Encase the ignition source in a rigidly built container. "Explosion-proof" instruments allow the flammable atmosphere to enter. If and when an arc is generated, the ensuing explosion is contained within the specially designed and built enclosure. Within it, any flames or hot gases are cooled prior to exiting into the ambient flammable atmosphere so that the explosion does not spread into the environment.

- INTRINSICALLY SAFE: Reduce the potential for arcing among components by encasing them in a solid insulating material. Also, reducing the instrument's operational current and voltage below the energy level necessary for ignition of the flammable atmosphere provides equal protection. An "intrinsically safe" device, as defined by the National Electrical Code, is incapable "of releasing sufficient electrical or thermal energy under normal or abnormal conditions to cause ignition of a specific hazardous atmospheric mixture in its most easily ignited concentration. Abnormal conditions shall include accidental damage to any...wiring, failure of electrical components,

TABLE 1-1

CLASS I CHEMICALS BY GROUPS

GROUP A ATMOSPHERES

Acetylene

GROUP B ATMOSPHERES

Butadiene
Ethylene Oxide
Hydrogen
Manufactured gases containing more than 30% hydrogen (by volume)
Propylene Oxide

GROUP C ATMOSPHERES

Acetaldehyde
Crotonaldehyde
Cyclopropane
Diethyl Ether
Ethylene
Unsymmetrical Dimethyl Hydrazine (UDMH, 1-, 1-Dimethyl Hydrazine)

GROUP D ATMOSPHERES

Acetone
Acrylonitrile
Ammonia
Benzene
Butane
1-Butanol (Butyl Alcohol)
2-Butanol (Secondary Butyl Alcohol)
2-Butyl Acetate
n-Butyl Acetate
Isobutyl Acetate
Ethane
Ethanol (Ethyl Alcohol)
Ethyl Acetate
Ethylene Dichloride
Gasoline
Heptanes
Hexanes
Isoprene
Methane (Natural Gas)
Methanol (Methyl Alcohol)
3-Methyl-1-Butanol (Isoamyl Alcohol)
Methyl Ethyl Ketone
Methyl Isobutyl Ketone
2-Methyl-1-Propanol (Isobutyl Alcohol)
2-Methyl-1-Propanol (Tertiary Butyl Alcohol)
Octanes
Petroleum Naphtha[1]
Pentanes
1-Pentanol (Amyl Alcohol)
Propane
1-Propanol (Propyl Alcohol)
2-Propanol (Isopropyl Alcohol)
Propylene
Styrene
Toluene
Vinyl Acetate
Vinyl Chloride
Xylenes

Source: *National Electrical Code*
National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210 (1977).

[1] A saturated hydrocarbon mixture boiling in the range 20°- 135°C (68°-275°F). Also known by the synonyms benzine, ligroin, petroleum ether, or naphtha.

application of over-voltage, adjustment and maintenance operations and other similar conditions."

- PURGED: Buffer the arcing or flame-producing device from the flammable atmosphere with an inert gas. In a pressurized or "purged" system, a steady stream of, for example, nitrogen or helium is passed by the potential arcing device, keeping the flammable atmosphere from the ignition source. This type of control, however, does not satisfactorily control analytical devices that use a flame or heat for analysis such as a combustible has indicator (CGI) or has chromatograph (GC).

National groups, such as Underwriters Laboratories (UL), Factory Mutual (FM), and the American National Standards Institute (ANSI), together with NFPA, developed test protocols for certifying explosion-proof, intrinsically safe, or purged devices to meet minimum standards of acceptance.

An electrical device certified under one of these test methods carries a permanently affixed plate showing the logo of the laboratory granting certification and the Class(es), Division(s), and Group(s) it was tested against. See *Figure 1-1*.

Certification means that if a device is certified as explosion-proof, intrinsically safe, or purged for a given Class, Division, and Group, and is used, maintained, and serviced according to the manufacturer's instructions, it will not contribute to ignition. The device is not, however, certified for use in atmospheres other than those indicated.

Any manufacturer wishing to have an electronic device certified by FM or UL must submit a prototype for testing. If the unit passes, it is certified as submitted. However the manufacturer agrees to allow the testing laboratory to randomly check the manufacturing plant at any time, as well as any marketed units. Furthermore, any change in the unit requires the manufacturer to notify the test laboratory, which can continue the certification or withdraw it until the modified unit can be retested.

A unit may be certified either by Ul, FM or both. Both laboratories follow test protocols established by NFPA and ANSI. Therefore once certification is no better or worse than the other. The important consideration is that the device is approved for the Class(es), Division(s), and Group(s) it will be used in.

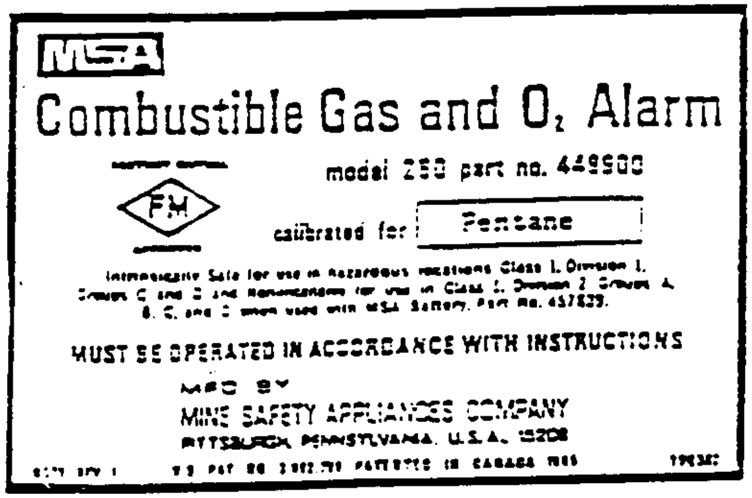

FIGURE 1-1

The mention of FM or UL in the manufacturer's equipment literature **does** not guarantee certification. All certified devices that are used in **hazardous** (flammable) locations must be marked to show Class, Division, and **Group,** per NEC Table 500-2(b).

Other organizations such as the Mine Safety and Health Administration (MSHA), Canadian Standards Association (CSA), National Electrical Manufacturers Association (NEMA), and the U.S. Coast Guard (USCG) have developed their own testing and certification schemes for electrical devices in hazardous locations common to their jurisdiction.

MSHA tests and certifies electrical equipment to be used in hazardous atmospheres associated with underground mining. These atmospheres usually contain methane gas and coal dust; hence the tests and certification are specific to those two contaminants.

Often the same monitoring equipment is used in mines as well as above ground and therefore carry more than one certification, such as FM and MSHA.

To ensure personnel safety, it is recommended that only approved (FM or UL) instruments be used on-site and only in atmospheres for which they have been certified. When investigating incidents involving unknown hazards, the monitoring instruments should be rated for use in the most hazardous locations. The following points will assist in selection of equipment that will not contribute to ignition of a hazardous atmosphere:

- In an area designated Division 1, there is a greater probability of generating a hazardous atmosphere than in Division 2. Therefore, the test protocols for Division 1 certification are more stringent than those for Division 2. Thus a device approved for Division 1 is also permitted for use in Division 2, but not vice versa. For most response work this means that devices approved for Class I (vapors, gases), Division 1 (areas of ignitable concentrations), Groups A, B, C, D should be chosen whenever possible. At a minimum, an instrument should be approved for use in Division 2 locations.

- An additional consideration is that all instruments used in a methane environment should be approved by the Mine Safety and Health Administration (MSHA) as being safe in such atmospheres.

- There are so many Groups, Classes, and Divisions that it is impossible to certify an all-inclusive instrument. Therefore, select a certified device based on the chemicals and conditions most likely to be encountered. For example, a device certified for a Class II, Division 1, Group E (combustible metal dust) would offer little protection around a flammable vapor or gas.

APPENDIX F

INSPECTION AND MAINTENANCE LOG

INSPECTION AND MAINTENANCE LOG

SERIAL NUMBER ________________

MODEL NUMBER ________________

DATE ________________

INSPECTION ITEMS NOTED	CORRECTIVE ACTION TAKEN	MAINTENANCE PERFORMED

APPROVED: ________________________

APPENDIX G

LIST OF CONFINED SPACE ENTRY EQUIPMENT

[TO BE PROVIDED ON A SITE-SPECIFIC BASIS]

EXHIBIT 6E

CARE AND CLEANING OF RESPIRATORS

EXHIBIT I

CARE AND CLEANING OF RESPIRATORS

General Requirements

Any organization using respirators on a routine basis should have a program for their care and cleaning. The purpose of a program is to assure that all respirators are maintained at their original effectiveness. If they are modified in any way, their Protection Factors may be voided. Usually one person in an organization is trained to inspect, clean, repair, and store respirators.

The program should be based on The number and types of respirators, working conditions, and hazards involved. In general, The program should include:

- Inspection (including a leak check)
- Cleaning and Disinfection
- Repair
- Storage

Inspection

Inspect respirators after each use. Inspect a respirator that is kept ready for emergency use monthly to assure it will perform satisfactorily.

On air-purifying respirators, thoroughly check all connections for gaskets and "O" rings and for proper tightness. Check The condition of The facepiece and all its parts, connecting air tubes, and headbands. Inspect rubber or elastomer parts for pliability and signs of deterioration.

Maintain a record for each respirator inspection, including date, inspector, and any unusual conditions for findings.

Cleaning and Disinfection

Collect respirators at a central location. Brief employees required to wear respirators on The respirator program and assure them that they will always receive a clean and sanitized respirator. Such assurances will boost morale. Clean and disinfect respirators as follows:

- Remove all cartridges, canisters, and filters, plus gaskets or seals not affixed to their seats.
- Remove elastic headbands.
- Remove exhalation cover.
- Remove speaking diaphragm.
- Remove inhalation valves.
- Wash facepiece and breathing tube in cleaner/sanitizer powder mixed with warm water, preferably at 120% to 140% F.

EXHIBIT 6F

HEAT STRESS/COLD STRESS

EXHIBIT G

HEAT/COLD STRESS

1.0 HEAT STRESS

1.1 Personal Protective Clothing

All of the protective ensemble does not lend itself to the release of body heat generated during work. With this in mind, the following will be taken into consideration during the work schedule so as to minimize the heat stress to all personnel:

A. All personnel will be advised to wear lightweight undergarments with short sleeves, under the chemical protective coverall.

B. Personnel will be advised that extra clothing be on-site for use as the workday progresses due to the clothing becoming wet from perspiration.

C. Dressing-out will be done in a designated area and be scheduled so as not to extend time in the protective ensembles.

D. The dress-out area will have a table with fresh water and/or other water replenishing liquids along with disposable cups. All personnel will be expected to drink liquids before each work cycle. The FOM will supervise the dressing and water intake.

E. As the job progresses and more information becomes available as to the materials that the workers are coming in contact with, consideration as to modifications to the protective ensemble will be examined. Such things as allowing personnel to keep the protective garment's hood down allowing for the release of heat. All decisions regarding the protective ensemble will be the FOM decision based on available information.

F. After completion of each work cycle, personnel will pass through personnel decontamination and remove their protective ensembles in the designated area. All personnel will then be medically monitored, if deemed necessary by the FOM. Liquid replenishment will be mandatory after each work cycle.

G. Eating facilities will allow for meal periods to be taken in the designated lunch area. On days of extreme temperatures, the use of air conditioning will be limited so as not to have personnel exposed to temperature extremes.

patient will experience dizziness, nausea, or fainting. This condition is an indicator of overwork in the environmental conditions. Treatment includes all for heat cramps with an extended rest period before re-entry. Depending on the worker's physical condition, rest periods may be from 30-60 minutes. After experiencing heat exhaustion, the worker should be closely monitored for symptoms reoccurring.

D. **HEAT STROKE** can occur if heat exhaustion is not cared for. This occurs when the body loses its ability to regulate its temperature. Sweating stops and, if not treated, can lead to death. Signs and symptoms include dry red skin with no perspiration along with nausea, dizziness and confusion. A strong, rapid pulse should be carefully monitored as this condition can lead to coma. Proper treatment begins by understanding that this is a true medical emergency and requires activating the emergency medical system as covered in other sections. When notifying the Emergency Medical Response organization, emphasis should be placed on the words HEAT STROKE and the need for rapid transportation to the medical facility. Emergency medical treatment in the field includes immediate cooling of the body with total body immersion preferable. Water temperature should be cool enough to absorb the high body heat but not cold. Ice packs can be applied to the person's head area and under the arms. Due to the personnel needed to treat the patient while awaiting emergency medical care, all work will stop and all attention will be devoted to the person in stress.

The First Aid Technician will evaluate all personnel after the patient is transported to determine if they also are showing signs of heat stroke.

To facilitate treatment of all of the above, air conditioning, fresh water supply, and shower, will be used if necessary. In all cases requiring treatment, emergency decontamination procedures based on the individual's degree of contamination will be done before entry into the treatment area. Remember: *You* are your own best indicator of signs of heat stress.

2.0 COLD STRESS

The purpose of this section is to make all workers on-site aware of The problems associated with cold weather operations. As with heat related emergencies, cold weather injuries are progressive. That means that if The worker is aware of The problems beforehand he may prevent further damage and remain working.

Cold related injuries may be divided into two types:

LOCAL COOLING affects The particular part of The body coming in direct contact with The cold air. This is commonly known as FROSTBITE.

SIGNS TO LOOK FOR:

FROSTNIP, The first stage of frostbite occurs when a body part comes in direct contact to a cold object or cold air. This condition is not serious and can be remedied by warming of the region. The real problem is that a numbing effect can occur and keep The worker from realizing that he is going into the next stage SUPERFICIAL FROSTBITE.

The skin and under layers become effected. If not treated this can become a FREEZING condition in which the deeper structures of the body become effected.

CONDITION	SKIN SURFACE	TISSUE UNDER SKIN	SKIN COLOR
frostnip	soft	soft	red-white
frostbite	hard	soft	white/waxy
freezing	hard	hard	white/gray

HYPOTHERMIA occurs when The body is unable to maintain its proper temperature of 98.6 degrees. It is important for The worker to realize that this can occur in temperatures of 50 degrees and below. Submersion of a body part in cold water will also cause hypothermia very quickly. Some early signs are:

1. Shivering
2. Numbness in extremities
3. Drowsiness
4. Slow breathing and pulse rates
5. Failing eyesight
6. Loss of coordination, inability to do easy tasks
7. Freezing of body parts

Proper treatment begins by activation of emergency medical service procedure. Hypothermia required prompt qualified medical treatment. Initial site action would revolve around getting the affected worker out of the weather and begin the warming process. The most important thing to realize is that Hypothermia is a MEDICAL EMERGENCY.

Workers exposed to cool temperatures for extended period of time can experience lesions in the form of red swollen areas that seem hot and itchy. These chronic lingering lesions are known as CHILBLAINS. Although not an emergency, The Chilblains indicate that the worker in not adequately protecting the affected area.

Appendix A

APPENDIX A

TOPOGRAPHIC SURVEY AND DEED PLOTTING OF PROPERTY

Appendix B

APPENDIX B

NEWTOWN STATION RETIREMENT - EXECUTIVE SUMMARY

Brooklyn Union

287 Maspeth Avenue
Brooklyn, New York 11211
718 963-5420
718 963-3026 Fax

Robert D. Wilson, CHMM
Director
Laboratory & Environmental
Field Operations

Newtown Station Retirement

Executive Summary

The following documents work performed and personnel (Contractor and In-house) involved in the retirement of the Holders, associated piping, compressor station, drips and storage tanks at Newtown Station. The Station has been out of service since 1993 and the site is currently being used as a Distribution Operations satellite.

Newtown Station Retirement

Newtown Holder along with all associated piping was purged in November 1993. The purge used carbon dioxide as the inerting medium and a thermal oxidizer to convert the residual Holder gas to carbon dioxide and water vapor. This environmentally correct purge scheme avoided the release of more than 1.25 MMCF of natural gas to the atmosphere. Compressor station and yard piping were also purged with CO_2 . Purge routes were developed to sweep the natural gas into the Holders and as a result eliminated the need to vent to atmosphere. Purge points were used to monitor purge progress. On November 4, 1994 all purge points readings taken by the chemist read 0 LEL.

In 1996, Holder drip wells (3 on each Holder) were drained of any residual condensate and backfilled with clean fill. Miller Environmental carried out condensate disposal and backfilling operations. This work was performed in July 1996 prior to the removal of the Holder guideframes.

A visual inspection of piping components was performed to confirm the integrity of the system prior to backfilling. Material removed from each drip was sampled and analyzed and was confirmed to be non-hazardous wastewater.

The following summarizes the retirement of the yard gas piping, Gas Holders, Drip Wells and the associated compressor station:

Equipment	Date Retired	Contractor/In-House
Gas piping	11/93	NAO, Inc (Thermal Oxidizer) ACI, Inc (CO_2 Supplier) In-House personnel: Ray Hippeli, Sr. Consulting Engineer Victor Morales, General Foreperson Michael Russo, Senior Foreperson
Gas Holders	11/93	NAO, Inc (Thermal Oxidizer) ACI, Inc (CO_2 Supplier) In-House personnel: Ray Hippeli, Sr. Consulting Engineer Victor Morales, General Foreperson Michael Russo, Senior Foreperson
Compressor Station	11/93	In-House personnel: Ray Hippeli, Sr. Consulting Engineer Victor Morales, General Foreperson Michael Russo, Senior Foreperson
Drip Wells	7/96	In House personnel: Michael Ruiz, Field Engineer Anthony Schwab, General Foreperson Contractor: Miller Environmental

Diesel Storage Tank Retirement

In 1974, Petroleum Construction, Inc retired and removed two 15,000 gallon (each) above ground diesel gas tanks used as fuel storage for Company fleet vehicles. The retirement included the proper removal and disposal of all fuel, the demolition of the tank and its supporting structure (concrete).

Diesel Oil Storage Tanks	9/74	Contractor: Petroleum Construction

2 tanks: 10ft dia. X 27.5ft long
15,000 gal (each) capacity

CERTIFIED HAZARDOUS MATERIALS MANAGER
ROBERT D. WILSON
2508
CHMM

Robert D. Wilson, CHMM

Appendix C

APPENDIX C

NYCDEP DISCHARGE AUTHORIZATIONS

DEP

New York City
Department of
Environmental
Protection

Bureau of
Clean Water

96-05 Horace Harding
Expressway
Corona, New York
11368
718) 595-5066

[ALB]ERT F. APPLETON
Commissioner

[E]DWARD O. WAGNER, P.E.
Deputy Commissioner

November 10, 1993

Ms. Tracy Bell
The Brooklyn Union Gas Co.
One Metro Tech Center
Brooklyn, N.Y. 11201-3851

Re: **Newtown Holder Dewatering**
File # C-1826

Dear Ms. Bell:

This is in response to your November 4, 1993 letter, requesting permission to discharge approximately 30 gallons per minute (gpm) of treated groundwater, continuously for a 29-month period, through carbon filters, to the sanitary sewer at 38-01 57th Avenue in Queens.

Based upon the information submitted, you are hereby conditionally authorized to discharge up to 30 gpm, or 40,000 gallons per day, of treated groundwater through carbon filters as specified in your submission, over a period of 12 months to the sanitary sewer at the above mentioned location. An additional 12-month period for discharge may be granted for you upon a written request to this Department at the end of the first year.

This conditional approval, however, is subject to the following:

1. Analytical data must be submitted to this Department for review and final approval within 15 days of the date of this letter; and

2. Because you plan to discharge over 10,000 gallons per day, you must obtain a groundwater discharge permit from the Division of Sewer Regulation and Control prior to commencement of discharge.

If you have any questions concerning this matter, please telephone Mr. Peter Garofalis, Project Coordinator, at 718-595-4943.

Sincerely,

Vincent Spz

VINCENT SAPIENZA, P.E., Chief,
Program Development Section

PG/mrk

Senior Environment
al Engineer

cc: Magdi Farag, P.E.

DEP

New York City
Department of
Environmental
Protection

59-17 Junction Blvd.
Corona, New York
11368
718 · 595 · 6576

ALBERT F. APPLETON
Commissioner

NICHOLAS S. ILIJIC, P.E.
First Deputy Commissioner

December 2, 1993

Mr. Lawrence H. Liebs
The Brooklyn Union Gas Co.
One Metro Tech Center
Brooklyn, NY 11201-3851

Re: Newtown Holders Stored Water Discharge, 57th Avenue, Queens

Dear Mr. Liebs:

This is in reply to your November 24, 1993 letter, requesting permission to discharge approximately 30 gallons per minute (gpm) of treated water continuously for 29-month period, through carbon filters, to the 15" combined sewer at 38-01 57th Avenue in Queens.

Based upon the information submitted, permission is granted to discharge up to 30 gpm, or 40,000 gallons per day of treated water to the combined sewer at the above mentioned location through the existing sanitary house connection. Total amount of water to be discharged is 34,000,000 gallons over a 29 month period.

Program Development Section approval for this treated water discharge has been granted by letter dated November 10, 1993, copy attached.

The discharger shall indemnify and hold the City harmless for any damage or liability incurred by the City due to the discharge operation in the event that the discharge results in overloading the capacity of the city sewer.

If you have any further questions concerning this matter, please telephone Mr. Irving Ganz, P.E., (718) 595-5192.

Very truly yours,

Magdi Farag

MAGDI FARAG, P.E., CHIEF
Division of Sewer Regulation and Control

September 26, 1996

Mr. Vincent Sapienza, P.E.
Chief, Program Development Section
Bureau of Wastewater Treatment
New York City Department of Environmental Protection
96-05 Horace Harding Expressway
Corona, NY 11368

Re: Newtown Holders Stored Water Discharge, 57th Avenue, Queens
File # C-1826

Dear Mr. Sapienza:

Brooklyn Union is requesting an extension of your letter of approval for our disch arge of approximately 30 gallons per minute of water through a carbon filter, con tinuously, to the "15" combined sewer at 38-01 57th Avenue in Queens.

As you will recall, the purpose of the discharge is to drain our Newtown Holders i n preparation for demolition. Our initial estimate of the duration of the discha rge was 29 months, however, rain and snow infiltration, filter conditions, and oth er factors have extended the discharge period. We currently estimate that another 24 months will be necessary to complete the discharge process.

As predicted by our initial testing results, the discharge is relatively uncontami nated. Analysis indicates that even the untreated discharge is below all availabl e industrial wastewater discharge standards, however, the discharge is always trea ted through the carbon filters as previously described.

We have been in contact with Mr. Magdi Farag, Chief of DEP's Sewer Regulation and Control Division and, after discussion, he has indicated that he will issue an ex tension of his letter of approval upon our application without requiring further r eview. This decision was based on the fact that there are no changing conditions or problems with the discharge, only a longer time frame is needed to complete the process.

I have attached the following documents for your information:

1. Copy of BU's initial application for this approval.
2. Copies of approval letters from your office and from Sewer Regulation.

3. Copy of BU's extension request to Sewer Regulation (sent simultaneously).
4. Copy of signed and sealed blueprint of Sewer Tank, and Roof Drain Pipin gs for Newtown Station.

We'd appreciate your assistance in this matter. If you need additional informatio n on the tanks or the discharge, please feel free to call me at (718) 403-3053.

Very truly yours,

Tracey L. Bell

TABLE 1

COMPARISON OF NEWTOWN HOLDER WATER WITH

TCLP AND SEWER REGULATIONS

	Sewer Regs. (ppm)	TCLP REGS. (ppm)	Untreated Water (ppm)	Treated Water (ppm)
	Section 2.38			
BOD	300	-	-	(1)
Chlorine Demand	25	-	-	(2)
Suspended Solids	350	-	-	15
Oil and Grease	50	-	-	17.2
Ether Soluble Mat'l	50	-	-	(3) 34.4
pH	5.0 - 9.5	-	-	6.0
	Section 5.1			
Arsenic	NL (4)	5.0	NA (5)	(6) ND
Barium	NL	100.0	<0.20	NA
Cadmium	2	1.0	<0.005	<0.01
Chromium	5	5.0	<0.01	ND
Copper	5	NL	<0.02	NA
Cyanide	0.2	NL	NA	NA
Iron	NL	NL	16.6	13.24
Lead	2	1.0	0.012	0.13
Mercury	0.05	0.2	NA	NA
Nickel	3	NL	<0.04	NA
Selenium	NL	1.0	NA	NA
Silver	NL	5.0	<0.01	NA
Zinc	5	NL	NA	NA

NOTES:

1. Laboratory conducted 2 hour COD (total chemical oxygen demand) analysis instead of 5 day BOD (total biochemical oxygen demand) analysis. COD was less than instrument detection level. In general, COD results are comparable to BOD results.

2. Test to determine quantity of chlorine converted to less active forms by substance in water. Test not run by Lab; no chlorine-reactable materials apparent in effluent.

3. Ether soluble material is the sum of Total Petroleum Hydrocarbons and Oil & Grease.

4. NL = not listed in regulations

5. NA = no analysis

6. ND = not detected

Technical Services
Laboratory Operations

RWPORT DATE: 1-10-92
LAB.NO. 920013,14,15,16

NEWTOWN STATION
HOLDER WATER OVERFLOW STUDY
PONDED WATER RESULTS SUMMARY

PARAMETER (S)	W-1	W-2	W-3	W-4
% MOISTURE				
SILVER	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l
BARIUM	<0.20 mg/l	0.35 mg/l	<0.20 mg/l	<0.20 mg/l
CALCIUM	2.3 mg/l	4.9 mg/l	3.1 mg/l	3.1 mg/l
CADMIUM	<5.0 ug/l	13.0 ug/l	<5.0 ug/l	<5.0 ug/l
CHROMIUM	<0.01 mg/l	0.07 mg/l	0.10 mg/l	<0.01 mg/l
COPPER	<0.02 mg/l	0.06 mg/l	<5.0 mg/l	<0.02 mg/l
IRON	16.6 mg/l	219 mg/l	31.7 mg/l	22.5 mg/l
POTASSIUM	0.99 mg/l	1.7 mg/l	1.2 mg/l	1.2 mg/l
MAGNESIUM	0.45 mg/l	1.2 mg/l	0.66 mg/l	0.61 mg/l
MANGANESE	0.16 mg/l	0.60 mg/l	0.21 mg/l	0.22 mg/l
SODIUM	7.2 mg/l	10.2 mg/l	9.1 mg/l	9.3 mg/l
NICKEL	<0.04 mg/l	<0.04 mg/l	<0.04 mg/l	<0.04 mg/l
OIL & GREASE (IR)	<5.0 mg/l	<5.0 mg/l	<5.0 mg/l	21.8 mg/l
LEAD	11.7 ug/l	1800 ug/l	1394 ug/l	94.0 ug/l
PETROLEUM HYDROCARBON (IR)	<5.0 mg/l	<5.0 mg/l	<5.0 mg/l	17.9 mg/l
pH				
TOTAL SOLIDS				
CHLOROMETHANE	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l
BROMOMETHANE	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l
VINYL CHLORIDE	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l
CHLOROETHANE	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l
METHYLENE CHLORIDE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
TRICHLOROFLUOROMETHANE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
1,1-DICHLOROETHENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
1,1-DICHLOROETHANE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
C/T-1/2-DICHLOROETHENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
CHLOROFORM	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
1,2-DICHLOROETHANE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
1,1,1-TRICHLOROETHANE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
CARBON TETRACHLORIDE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
BROMODICHLOROMETHANE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
1,2-DICHLOROPROPANE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
TRANS-1,3-DICHLOROPROPENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
TRICHLOROETHENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
DIBROMOCHLOROMETHANE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
1,1,2-TRICHLOROETHANE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
CIS-1,3-DICHLOROPROPENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
BENZENE	530 ug/l	410 ug/l	305 ug/l	200 ug/l
2-CHLOROETHYLVINYL ETHER	<10 ug/l	<10 ug/l	<10 ug/l	<10 ug/l
BROMOFORM	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
1,1,2,2-TETRACHLOROETHANE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
TETRACHLOROETHENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
TOLUENE	21 ug/l	20 ug/l	14 ug/l	12 ug/l
CHLOROBENZENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
ETHYLBENZENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
XYLENES (TOTAL)	110 ug/l	89 ug/l	66 ug/l	51 ug/l
1,2-DICHLOROBENZENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
1,4-DICHLOROBENZENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
1,3-DICHLOROBENZENE	< 5 ug/l	< 5 ug/l	< 5 ug/l	< 5 ug/l
AROCLOR 1016	<0.5 ug/l	<0.5 ug/l	<0.5 ug/l	<0.5 ug/l
AROCLOR 1221	<0.5 ug/l	<0.5 ug/l	<0.5 ug/l	<0.5 ug/l
AROCLOR 1232	<0.5 ug/l	<0.5 ug/l	<0.5 ug/l	<0.5 ug/l
AROCLOR 1242	<0.5 ug/l	<0.5 ug/l	<0.5 ug/l	<0.5 ug/l
AROCLOR 1248	<0.5 ug/l	<0.5 ug/l	<0.5 ug/l	<0.5 ug/l
AROCLOR 1254	<1.0 ug/l	<1.0 ug/l	<1.0 ug/l	<1.0 ug/l
AROCLOR 1260	<1.0 ug/l	<1.0 ug/l	<1.0 ug/l	<1.0 ug/l

Notes: (<) Indicates Value Less Than The Method Practical Quantitation Limit. (PQL)

Technical Services
Laboratory Operations

Lab # 920239

NEWTOWN FILTER (OUTLET)

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 02/27/92
Date Completed: 03/03/92

PARAMETERS:	SAMPLE(S): ID # 001	ID # 002	ID # 003
TOT.DISSOLVED SOLIDS	0.66 %		
COD	< DL		
SUSPENDED SOLIDS	15 ppm		
TOT.PET.HYDROCARBONS	17.2 ppm		
OIL & GREASE	17.2 ppm		
pH	6.0		
CADMIUM	<0.01 ppm		
CHROMIUM	ND		

Remarks: LEAD = 0.13 ppm
IRON = 13.24 ppm
ARSENIC = N.D.

CHIEF CHEMIST

Technical Services
Laboratory Operations

CONFIDENTIAL

MEMORANDUM

SUBJECT: Newtown Station Holder Water Dissolved Methane Determination

DATE: 5/11/92

TO: R. F. Hippeli, Engineering

FROM: R. D. Wilson, Chief Chemist

OBJECTIVE

Results are presented of a study conducted on 5/5/92 aimed at determining the dissolved methane content of the Newtown Station holder water filtration system effluent. The scope of this report includes a description of the analysis method, sampling techniques and a results summary.

DISCUSSION

A holder water treatment system was installed at Newtown Station to remove trace organic components and suspended solid material. The treatment system consists of cartridge type particle filters followed by activated carbon to remove trace organic material typically associated with natural gas liquids.

In addition to trace organics and suspended matter, the holder water contains dissolved gases with the major constitute being methane. An equilibrium according to Henry's law is established between the gases in solution and the partial pressure of gas components above the solution. Agitation of the water results in a release of the dissolved gases with may cause an explosive atmosphere. Two filter trains are in place (System "A" & System "B"). System "A" has been on-line for approximately 2 months. During routine sampling for BETX, the Chemist noted a distinct odor emanating from the water effluent. As a result, a study was initiated to determine the extent of dissolved gases in the holder water treatment unit effluent.

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DISCUSSION

A. ANALYSIS METHOD

Standard test method 502 A. "Determination of Methane - Combustible Gas Indicator Method" from the Standard Methods For The Examination Of Water And Wastewater (17th addition) was utilized in conjunction with Method 511 (GC Determination). In summary, water is collected in a 4 liter pre-cleaned glass container, agitated for 15 seconds and allowed to stand for 1 minute. A portable gas detector (CGI) is utilized to determine the % lower explosive limit (LEL) in the headspace above the water.

The gas indicator method is primarily utilized for field determinations of combustible gases. Qualitative analysis of headspace components contributing to the % LEL reading obtained in the field is performed via gas chromatography. In this method, a 4 liter bottle is filled with sample and capped in the field to avoid any headspace. The sample is transported under chain-of-custody to the laboratory. Water is removed from the bottle until the volume of sample to be analyzed is achieved. The sample is then agitated for 15 seconds and allowed to stand for 1 minute. The head space above the water is displaced into the gas chromatograph for detailed analysis of components.

B. ANALYSIS RESULTS

Highlighted below are details of the analysis results.

1. "A" Filter Analysis

The filter system was activated and allowed to operated for approximately 30 minutes prior to sampling. Samples were obtained from the "A" Filter Train effluent point downstream of the activated carbon filter. Approximately 2 liters of sample was collected in a 4 liter container. Headspace analysis with the CGI resulted in a 70% LEL reading. Confirming GC analysis revealed that major components of natural gas were present. A 1 liter sample was collected and analyzed. Approximately 32% LEL was found in the headspace above the water.

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B. ANALYSIS RESULTS (Cont'd.)

2. "B" Filter Analysis

The filter system was activated and allowed to operated for approximately 30 minutes prior to sampling. Samples were obtained from the "B" Filter Train effluent point downstream of the activated carbon filter. Approximately 2 liters of sample was collected in a 4 liter container. Headspace analysis with the CGI resulted in a 35% LEL reading. Confirming GC analysis revealed that major components of natural gas were present. A 1 liter sample was collected and analyzed. Approximately 14% LEL was found in the headspace above the water.

3. Calculation Of Methane Content (mg CH4/L)

The weight of methane (w), in mg/L assuming standard temperature and pressure is given by:

$$mg\ CH4/L = Rf(6.7 \frac{Vo - V1}{V1} + 0.24)$$

where:

R = scale reading,
Vo = total volume of sample bottle,
V1 = volume of water sampled, ml
f = instrument factor (0.05).

The accuracy of the determination is limited to the accuracy of the instrument used and engineering controls employed during sampling. Errors of approximately 10% may be expected. In addition, low-boiling hydrocarbons (other than ethane) and vapors from combustible oils may interfere.

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3. Calculation Of Methane Content (Cont'd.)

METHANE CONTENT RESULTS SUMMARY

Lab# 920463
Test Date 5/5/92

TEST	FILTER "A"	FILTER "B"
Meter Reading 1 Liter Sample (% LEL)	32	14
Meter Reading 2 Liter Sample (% LEL)	70	35
GC Analysis 2 Liter Sample		
Methane %	2	1.4
Ethane %	.06	.002
Mercaptan (Y/N)	Y	N
Methane Content 1 Liter Sample (mg/L)	32.54	14.24
Methane Content 2 Liter Sample (mg/L)	24.29	12.15

NOTE: A distinct odor was noticed from the "A" filter effluent.

C. <u>CONCLUSION</u>

Water contained in the water tank of water seal gas holders is in intimate contact with the gas stored in the holder. As a result, an equilibrium concentration of methane in water is expected related to the solubility of methane in water. Test results confirmed that the water effluent from the holder water treatment system does indeed contain methane.

Further investigation revealed that the dissolved gases match the "fingerprint" typically associated with natural gas including trace amounts of all major components.

Results obtained agree within the accepted margin of error for the experimental method. However, data from Filter "A" is suspect and the effluent may contain contaminants which would result in elevated %LEL readings on the gas indicator (low boiling hydrocarbons).

CC:HJR,FILE

Robert D. Wilson

Technical Services
Laboratory Operations

MEMORANDUM

SUBJECT: Newtown Holder Water Treating Unit Effluent Analysis   DATE: 6/15/92

TO: R. F. Hippeli, Sr. Engineering Consultant

FROM: R. D. Wilson, Chief Chemist

OBJECTIVE

Results are presented of a report aimed at documenting analysis of the Newtown Station holder water treating unit effluent. Analysis of the water effluent was required to document compliance with NYC Department Of Environmental Protection Sewer Regulations as well as EPA TCLP metals analysis limitations.

BACKGROUND

A holder water treatment system was installed at Newtown Station to remove trace organic components and suspended solids. The treatment system consists of cartridge type particle filters followed by activated carbon to adsorb trace amounts of organic material typically associated with natural gas liquids. Water effluent from the treatment system discharges into a sanitary sewer connection on 57th avenue.

Compliance with sewer discharge limitations for receivable industrial waste includes the following analytes:

* BOD
* Chlorine Demand
* Suspended Solids
* Oil & Grease
* Ether Soluble Material
* pH

In addition, eight metals are also listed including:

* Cadmium
* Chromium
* Copper
* Cyanide
* Lead
* Mercury
* Nickel
* Zinc

BACKGROUND (Cont'd.)

Organic materials listed in TCLP regulations contained in the effluent are well below listed restrictions. Most of the restricted metals identified in the Sewer Regulations and TCLP were tested and found to be in compliance, however some of the restricted metal analytes have not been tested. As a result, samples of the treatment system effluent were obtained to establish complete compliance with applicable City, State and Federal regulations.

DISCUSSION

Samples were obtained from the systems on Tuesday, June 2, 1992. The "B" filter was on-line at the time of sampling. Samples were obtained from the "B" filter effluent sample point downstream of the activated carbon filter. In addition, filter inlet samples were obtained from the inlet sample point upstream of the particle filters.

Samples were obtained under strict EPA & ELAP protocol in I-CHEM Series 300 glass containers preserved as per BUG Standard Laboratory Procedures. Field blanks and sample duplicates were obtained. The samples were stored in coolers at the sample site and later transferred into the Mobile Laboratory for transport under Chain-Of-Custody to H2M Laboratories, Melville, Long Island. All samples were obtained using a conventional "grab" technique.

CONCLUSION

Sample analysis by H2M Laboratories (ELAP & CLP Approved Laboratory) confirmed that all of the analytes of interest were found well below regulatory limits (see attached table). This report should serve as "base-line" data for continued operation of the treatment system. Additional in-house compliance monitoring is recommended on a monthly basis to ensure compliance over the long term. If monthly profile analysis results are found consistent with the attached data, less frequent monitoring could be explored at that time.

CC:HJR

Robert D. Wilson

NEWTOWN WATER TREATMENT

PERFORMANCE ANALYSIS

	UNTREATED WATER (ppm)	TREATED WATER (ppm)	SEWER REGS. (ppm)	TCLP REGS. (ppm)
BOD	6.0	6.0	300	-
CHLORINE DEMAND	NA	NA	25	-
SUSPENDED SOLIDS	<5.0	<5.0	350	-
OIL AND GREASE	<5.0	<5.0	50	-
ETHER SOLUBLE MAT'L	<5.0	<5.0	50	-
pH	6.4	6.5	5.0 - 9.5	-
ARSENIC	<0.01	<0.01	NL	5.0
BARIUM	<0.20	0.20	NL	100.0
CADMIUM	<0.005	<0.005	2	1.0
CHROMIUM	<0.01	<0.01	5	5.0
COPPER	<0.02	<0.02	5	NL
CYANIDE	0.020	<0.01	0.2	NL
IRON	0.45	1.10	NL	NL
LEAD	<0.005	0.01	2	5.0
MERCURY	<0.0002	<0.0002	0.05	0.2
NICKEL	0.05	0.05	3	NL
SELENIUM	<0.005	<0.005	NL	1.0
SILVER	<0.01	<0.01	NL	5.0
ZINC	0.27	0.16	5	NL

NOTES: SAMPLES TAKEN BY VINCENT MORALES ON 6-1-92
ANALYSIS COMPLETED BY H2M LABORATORIES ON 6-10-92

NL = NOT LISTED IN REGULATIONS
NA = NOT ANALYZED
ND = NOT DETECTED

LABORATORY NUMBERS : 920538 , 920539 , 920540 , 920541

Technical Services
Laboratory Operations

LAB # 920538

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name:R.HIPPELI
Area: System Eng.
Location: METROTECH 18FL
Phone No.: (718)-403-3006
ELAP NUMBER:

LABORATORY ACCEPTANCE:
Approved By: F. Ferretti
Date Received:06/01/92
Date Assigned:06/01/92
Date Completed:06/12/92
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: 140 W.O. No.: 0900139400

ANALYSIS REQUEST

Matrix Identification: liquid

Number of Samples: 1

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWTOWN FILTER INLET	Special Request

Comments: SAMPLE SENT TO H2M

QUALITY ASSURANCE

Chemist: R. Basri

QA Method(s): SL 6.02

Laboratory Notebook: 92-02

Reference Page:

Technical Services
Laboratory Operations

Lab # 920538

NEWTOWN FILTER INLET

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 06/01/92
Date Completed: 06/12/92

SAMPLES:	TEST PARAMETER(S): 001
SILVER	<0.01 mg/l
ARSENIC	<10.0 ug/l
BARIUM	<0.20 mg/l
BOD5	6 mg/l
CALCIUM	3.4 mg/l
CADMIUM	<5.0 ug/l
COD	<15 mg/l
CHROMIUM	<0.01 mg/l
COPPER	<0.02 mg/l
IRON	0.45 mg/l
MERCURY	<0.20 ug/l
POTASSIUM	0.82 mg/l

CHIEF CHEMIST

Technical Services
Laboratory Operations

Lab # 920538

NEWTOWN FILTER INLET

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 06/01/92
Date Completed: 06/12/92

SAMPLES:	TEST PARAMETER(S): 001
MAGNESIUM	0.50 mg/l
MANGANESE	0.22 mg/l
SODIUM	7.80 mg/l
NICKEL	0.05 mg/l
OIL & GREASE (IR)	<5.0 mg/l
LEAD	<5.0 ug/l
PET.HYDROCARBON (IR)	<5 mg/l
pH	6.4 units
SELENIUM	<5.0 ug/l
SUSPENDED SOLIDS	<5.0 mg/l
ZINC	0.27 mg/l

CHIEF CHEMIST

Technical Services
Laboratory Operations

LAB # 920539

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name: R.HIPPELI
Area: System Eng.
Location: METROTECH 18FL
Phone No.: (718)-403-3006
ELAP NUMBER:

LABORATORY ACCEPTANCE:
Approved By: F. Ferretti
Date Received: 06/01/92
Date Assigned: 06/01/92
Date Completed: 06/12/92
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: 140 W.O. No.: 0900139400

ANALYSIS REQUEST

Matrix Identification: liquid Number of Samples: 2

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWTOWN FILTER INLET SAMPLE	Purgeable Aromatics Special Request
002	FIELD BLANK	Purgeable Aromatics

Comments: SAMPLES SENT TO H2M

QUALITY ASSURANCE

Chemist: R. Basri

Laboratory Notebook: 92-02

QA Method(s): SL 6.02

Reference Page:

Technical Services
Laboratory Operations

Lab # 920539

PURGEABLE ORGANICS

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 06/01/92
Date Completed: 06/12/92

SAMPLES:	TEST PARAMETER(S): ID:001	ID:002
CHLOROMETHANE	13.0 ug/l	81.0 ug/l
BROMOMETHANE	< 10 ug/l	< 10 ug/l
VINYL CHLORIDE	< 10 ug/l	< 10 ug/l
CHLOROETHANE	< 10 ug/l	< 10 ug/l
METHYLENE CHLORIDE	< 5 ug/l	< 5 ug/l
TRICHLOROFLUOROMETH.	< 5 ug/l	< 5 ug/l
1,1-DICHLOROETHENE	< 5 ug/l	< 5 ug/l
1,1-DICHLOROETHANE	< 5 ug/l	< 5 ug/l
C/T-1/2-DICHLETHENE	< 5 ug/l	< 5 ug/l
CHLOROFORM	< 5 ug/l	25 ug/l
1,2-DICHLOROETHANE	< 5 ug/l	< 5 ug/l

CHIEF CHEMIST

Technical Services
Laboratory Operations

Lab # 920539

PURGEABLE ORGANICS

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 06/01/92
Date Completed: 06/12/92

SAMPLES:	TEST PARAMETER(S): ID:001	ID:002
1,1,1TRICHLOROETHANE	< 5 ug/l	< 5 ug/l
CARBON TETRACHLORIDE	< 5 ug/l	< 5 ug/l
BROMODICHLOROMETHANE	< 5 ug/l	< 5 ug/l
1,2-DICHLOROPROPANE	< 5 ug/l	< 5 ug/l
TRAN1,3DICHLOPROPENE	< 5 ug/l	< 5 ug/l
TRICHLOROETHENE	< 5 ug/l	< 5 ug/l
DIBROMOCHLOROMETHANE	< 5 ug/l	< 5 ug/l
1,1,2TRICHLOROETHANE	< 5 ug/l	< 5 ug/l
CIS1,3DICHLOROPROPEN	< 5 ug/l	< 5 ug/l
BENZENE	7 ug/l	< 5 ug/l
2CHLOROETHYLVINETHER	<10 ug/l	<10 ug/l

CHIEF CHEMIST

Technical Services
Laboratory Operations

Lab # 920539

PURGEABLE ORGANICS

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 06/01/92
Date Completed: 06/12/92

SAMPLES:	TEST PARAMETER(S): ID:001	ID:002
BROMOFORM	< 5 ug/l	< 5 ug/l
1,1,2,2TETRACHLETHAN	< 5 ug/l	< 5 ug/l
TETRACHLOROETHENE	< 5 ug/l	< 5 ug/l
TOLUENE	< 5 ug/l	< 5 ug/l
CHLOROBENZENE	< 5 ug/l	< 5 ug/l
ETHYLBENZENE	< 5 ug/l	< 5 ug/l
XYLENES (TOTAL)	5 ug/l	< 5 ug/l
1,2DICHLOROBENZENE	< 5 ug/l	< 5 ug/l
1,4DICHLOROBENZENE	< 5 ug/l	< 5 ug/l
1,3DICHLOROBENZENE	7 ug/l	< 5 ug/l
CYANIDE	19.8 ug/l	

CHIEF CHEMIST

Technical Services
Laboratory Operations

LAB # 920540

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name: R.HIPPELI
Area: System Eng.
Location: METROTECH 18FL
Phone No.: (718)-403-3006
ELAP NUMBER:

LABORATORY ACCEPTANCE:
Approved By: F. Ferretti
Date Received: 06/01/92
Date Assigned: 06/01/92
Date Completed: 06/12/92
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: 140 W.O. No.: 0900139400

ANALYSIS REQUEST

Matrix Identification: liquid Number of Samples: 1

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWT.FILTER OUTLET	Special Request

Comments: SAMPLES SENT TO H2M

QUALITY ASSURANCE

Chemist: R. Basri Laboratory Notebook: 92-02

QA Method(s): SL 6.02 Reference Page:

Technical Services
Laboratory Operations

Lab # 920540

NEWTOWN FILTER OUTLET

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 06/01/92
Date Completed: 06/12/92

SAMPLES:	TEST PARAMETER(S): ID: 001
SILVER	<0.01 mg/l
ARSENIC	<10.0 ug/l
BARIUM	0.20 mg/l
BOD5	6 mg/l
CALCIUM	3.2 mg/l
CADMIUM	< 5.0 ug/l
COD	<15.0 mg/l
CHROMIUM	<0.01 mg/l
COPPER	<0.02 mg/l
IRON	1.10 mg/l
MERCURY	<0.20 ug/l
POTASSIUM	0.94 mg/l

CHIEF CHEMIST

Technical Services
Laboratory Operations

Lab # 920540

NEWTOWN FILTER OUTLET

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 06/01/92
Date Completed: 06/12/92

SAMPLES:	TEST PARAMETER(S): ID: 001
MAGNESIUM	0.60 mg/l
MANGANESE	0.26 mg/l
SODIUM	9.0 mg/l
NICKEL	0.05 mg/l
OIL & GREASE (IR)	< 5.0 mg/l
LEAD	9.9 ug/l
PET.HYDROCARBON (IR)	< 5.0 mg/l
pH	6.5
SELENIUM	< 5.0 ug/l
SUSPENDED SOLIDS	< 5.0 mg/l
ZINC	0.16 mg/l

Technical Services
Laboratory Operations

LAB # 920541

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name: R.HIPPELI
Area: System Eng.
Location: METROTECH 18FL
Phone No.: (718)-403-3006
ELAP NUMBER:

LABORATORY ACCEPTANCE:
Approved By: F. Ferretti
Date Received: 06/01/92
Date Assigned: 06/01/92
Date Completed: 06/12/92
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: 140 W.O. No.: 0900139400

ANALYSIS REQUEST

Matrix Identification: liquid Number of Samples: 2

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWT.FILTER OUTLET SAMPLE	Purgeable Aromatics Special Request
002	FIELD BLANK	Purgeable Aromatics Special Request

Comments: SAMPLES SENT TO H2M

QUALITY ASSURANCE

Chemist: R. Basri Laboratory Notebook: 92-02

QA Method(s): SL 6.02 Reference Page:

Technical Services
Laboratory Operations

Lab # 920541

PURGEABLE ORGANICS

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 06/01/92
Date Completed: 06/12/92

SAMPLES:	TEST PARAMETER(S): ID:001	ID:002
CHLOROMETHANE	14.0 ug/l	< 10 ug/l
BROMOMETHANE	< 10 ug/l	< 10 ug/l
VINYL CHLORIDE	< 10 ug/l	< 10 ug/l
CHLOROETHANE	< 10 ug/l	< 10 ug/l
METHYLENE CHLORIDE	< 5 ug/l	< 5 ug/l
TRICHLOROFLUOROMETH.	< 5 ug/l	< 5 ug/l
1,1-DICHLOROETHENE	< 5 ug/l	< 5 ug/l
1,1-DICHLOROETHANE	< 5 ug/l	< 5 ug/l
C/T-1/2-DICHLETHENE	< 5 ug/l	< 5 ug/l
CHLOROFORM	< 5 ug/l	22 ug/l
1,2-DICHLOROETHANE	< 5 ug/l	< 5 ug/l

CHIEF CHEMIST

Technical Services
Laboratory Operations

Lab # 920541

PURGEABLE ORGANICS

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 06/01/92
Date Completed: 06/12/92

SAMPLES:	TEST PARAMETER(S): ID:001		ID:002	
1,1,1TRICHLOROETHANE	< 5	ug/l	< 5	ug/l
CARBON TETRACHLORIDE	< 5	ug/l	< 5	ug/l
BROMODICHLOROMETHANE	< 5	ug/l	< 5	ug/l
1,2-DICHLOROPROPANE	< 5	ug/l	< 5	ug/l
TRAN1,3DICHLOPROPENE	< 5	ug/l	< 5	ug/l
TRICHLOROETHENE	< 5	ug/l	< 5	ug/l
DIBROMOCHLOROMETHANE	< 5	ug/l	< 5	ug/l
1,1,2TRICHLOROETHANE	< 5	ug/l	< 5	ug/l
CIS1,3DICHLOROPROPEN	< 5	ug/l	< 5	ug/l
BENZENE	< 5	ug/l	< 5	ug/l
2CHLOROETHYLVINETHER	<10	ug/l	<10	ug/l

CHIEF CHEMIST

Technical Services
Laboratory Operations

Lab # 920541

PURGEABLE ORGANICS

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.HIPPELI
Area: System Eng.
Matrix: liquid

Chemist: R. Basri
Date Assigned: 06/01/92
Date Completed: 06/12/92

SAMPLES:	TEST PARAMETER(S): ID:001	ID:002
BROMOFORM	< 5 ug/l	< 5 ug/l
1,1,2,2TETRACHLETHAN	< 5 ug/l	< 5 ug/l
TETRACHLOROETHENE	< 5 ug/l	< 5 ug/l
TOLUENE	< 5 ug/l	< 5 ug/l
CHLOROBENZENE	< 5 ug/l	< 5 ug/l
ETHYLBENZENE	< 5 ug/l	< 5 ug/l
XYLENES (TOTAL)	5 ug/l	< 5 ug/l
1,2DICHLOROBENZENE	< 5 ug/l	< 5 ug/l
1,4DICHLOROBENZENE	< 5 ug/l	< 5 ug/l
1,3DICHLOROBENZENE	< 5 ug/l	< 5 ug/l
CYANIDE	<10.0 ug/l	

CHIEF CHEMIST

Appendix E

APPENDIX E

1995 SAMPLING HOLDER CONTENTS

Brooklyn Union

Laboratory Operations

SUBJECT: Newtown Station Holder Water Tank BTEX Profile & Sludge Characterization for Holder Retirement

DATE: 10/09/95

TO: R. D. Wilson, Laboratory Director

FROM: D. H. White, Sr. Field Engineer

OBJECTIVE:

This report is a continuation of the 1992 study and is aimed at re-assessing the water contamination profile initially conducted on the water and sludge/sediment present in the water seal gas holders at Newtown Station. The scope of this report includes site sampling plan and analysis results summary of recent testing.

BACKGROUND:

The water seal gas holders at Newtown Station have been retired from service and subsequently tank water effluents are being treated prior to discharged into sanitary sewers. Previous analysis of holder water indicated the presence of elevated amounts light hydrocarbon materials typically associated with gas condensate (i.e. benzene, toluene, ethylbenzene and xylenes (BTEX)). In addition the prior analysis of the holders' bottom sludge/sediment was found to contain concentrations of metals and oil/grease in excess of NYC regulatory limits.

In an effort to re-assess the prior tank water profiles and sludge/sediment characterizations in each tank, a core sample analysis was performed. Samples were collected from three of several locations at 10' intervals down to the bottom of each tank and a profile was developed. In addition the bottom sludge and sediment was sampled and analyzed.

DISCUSSION:

A. Site Sampling Plan Description

The site sampling plan included six sample locations (three locations in each holder). Samples were taken eccentrically at 10' intervals from the surface to bottom of the aqueous layers of each tank using a Bacon Bomb sampling device. The Bacon Bomb consist of a cylindrical chamber with an orifice at the bottom, and a cast top, with a locking device for suspending the complete apparatus.

Laboratory Operations

DISCUSSION: (cont'd)

A. Site Sampling Plan Description (cont'd)

The device is lowered into position, opened allowed to fill, closed and retracted from sample medium. The bomb is then emptied into the appropriate sample bottles, washed and rinsed with laboratory pure water and lowered into position for additional sampling. In addition to aqueous samples the following sludge/sediment samples were taken:

Newtown Tank #1 top sediment

Newtown Tank #1 middle sediment

Newtown Tank #1 cup sediment

NOTE: Aqueous samples were collected first followed by sediment samples. The sampling device was cleaned with laboratory water between each sample point.

Samples were obtained using strict EPA recommended protocol in I-Chem Series glass containers and persevered as per Standard Laboratory Procedures. Field blanks, sample duplicates and equipment blanks were obtained. Previous testing included BTEX on the aqueous samples, Total Metals analysis and Total Petroleum Hydrocarbon (TPH) on the sludge & sediment samples. Analysis of the present set of aqueous samples included BTEX, Toxicity Characteristic Leaching Procedures (TCLP) for eight priority metals and TPH on the sludge/sediment samples. Once the samples were collected they were stored in coolers at the sample site and later transported to the mobile lab for transport back to the GSO Laboratory under the required chain-of-custody.

Environmental conditions during sampling were sunny, with an average temperature of 70 F. Both holders were down in the first section.

B. ANALYSIS RESULTS:

1. HOLDER #1 AQUEOUS SAMPLES

Aqueous samples and duplicates were collected. Results were inconsistent with BTEX concentrations found during the previous 1992 study. The benzene concentration ranged from approximately 76 parts per billion (ppb) at the top surface sampling site to 4 ppb 30' below the middle surface sample site.

Laboratory Operations

B. ANALYSIS RESULTS: (cont'd)

2. HOLDER #1 SEDIMENT SAMPLES

Approximately 50-100 grams of bottom sediment was obtained. The sediment core was approximately 3-4" and had slight hydrocarbon odor. Concentrations of oil/grease/TPH were all less then 2 parts per million (ppm). Toxicity Characteristic Leaching Procedure (TCLP) metals analysis was performed on the sediment sample and all analyte concentrations were less then the practical quantitation limits (PQL).

1. HOLDER #2 AQUEOUS SAMPLES

Aqueous samples and duplicates were collected. Results were inconsistent with BETEX concentrations found during the previous 1992 study. The benzene concentrations ranged from approximately 358 parts per billion (ppb) 30' below the middle surface sample site to 67 ppb at the top surface sampling site.

2. HOLDER #2 SEDIMENT SAMPLES

Approximately 50-100 grams of bottom sediment was obtained. The sediment core was approximately 3-4" and had slight hydrocarbon odor. Concentrations of oil/grease/TPH were all less then 50 parts per million (ppm). Toxicity Characteristic Leaching Procedure (TCLP) metal analysis was performed on the sediment sample and all analyte concentrations were less then 1 ppm.

NOTE: A results summary is included in attachment #1.

CONCLUSION:

Core sample profiles revealed the presence of light hydrocarbon components. The results of BTEX analysis performed on tank water removed form holders No. 1 & No. 2, indicated low levels of BTEX compounds as compared to previous analysis (1992). It should be noted that the holders have been down in the first section for an extended period of time. The relatively low levels of volatile organics found in holders #1 and #2 may be attributed to continuous migration of hydrocarbons from sludge/sediment and subsequent volatilization of low vapor pressure organic compounds. In addition the continuous treatment and removal of large volumes of tank water has significantly decreased sludge/sediment to surface water distance.

Brooklyn Union

Laboratory Operations

CONCLUSION: (cont'd)

This decrease in sludge/sediment to surface water distance combined with treatment/removal of tank water may attribute to the increased migration of volatile organics to the water surface, which then undergo vaporization. This would explain the consistent overall decreases in BTEX levels observed in recent analysis results.

The bottom sediment and sludge samples taken from both holders contained petroleum hydrocarbons and metals concentrations well below all regulatory limits. These results are inconsistent with prior analysis. One reason for the low metals concentrations was that the previous analysis was based on the total metals content of the sludge/sediment. Where as the TCLP procedure recently performed involves analysis of a sediment leachate instead of the direct analysis of sample sediment.

Due to the degree of inconsistency with both the TPH and TCLP metals concentration it is recommended that this part of the sampling plan be repeated on both holders. The analysis of metals concentration shall include direct analysis of the sludge/sediment removed from bottom of each holder. This analysis will provide a more realistic basis for comparison of the 1992 analysis results of bottom sediment with the results shown in this report.

David White

David H. White

cc: RDW

Brooklyn Union

Laboratory Operations

ATTACHMENTS

Attachment #1 - Holders No. 1 & No. 2 BTEX Profile

Attachment #2 - Holders No. 1 & No. 2 Bottom Sludge/Sediment Results Summary

NEWTOWN STATION HOLDER #1
TANK WATER BTEX PROFILE

Top Sample Position	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	M&P-Xylene (ppb)	O-Xylene (ppb)
Surface	76.1	29.1	<1	12.9	15.7
10' down	8.2	4.2	<1	3.9	3.0
20' down	9.3	4.0	<1	3.9	3.3
30' down	7.0	2.9	<1	1.8	2.2
Middle Sample Position	**Benzene (ppb)**	**Toluene (ppb)**	**Ethylbenzene (ppb)**	**M&P-Xylene (ppb)**	**O-Xylene (ppb)**
Surface	59.7	17.8	3.8	9.0	9.6
10' down	25.3	9.6	2.5	6.2	6.5
20' down	8.3	3.8	1.1	3.2	2.7
30' down	4.2	2.2	<1	1.6	1.3
Cup Sample Position	**Benzene (ppb)**	**Toluene (ppb)**	**Ethylbenzene (ppb)**	**M&P-Xylene (ppb)**	**O-Xylene (ppb)**
Surface	<1	<1	<1	<1	<1
10' down	<1	<1	<1	<1	<1
20' down	<1	<1	<1	<1	<1
30' down	<1	<1	<1	<1	<1

NEWTOWN STATION HOLDER #2
TANK WATER BTEX PROFILE

Top Sample Position	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	M&P-Xylene (ppb)	O-Xylene (ppb)
Surface	67.6	22.2	<1	7.8	4.6
10' down	243.4	73.5	2.3	22.9	13.7
20' down	266.2	80.5	2.7	26.9	16
30' down	N/A	N/A	N/A	N/A	N/A
Middle Sample Position	**Benzene (ppb)**	**Toluene (ppb)**	**Ethylbenzene (ppb)**	**M&P-Xylene (ppb)**	**O-Xylene (ppb)**
Surface	148.7	47.6	1.7	16.5	10.1
10' down	260.1	79.5	2.8	27.9	16.2
20' down	357.8	123	<1	46.9	27.7
30' down	N/A	N/A	N/A	N/A	N/A
Cup Sample Position	**Benzene (ppb)**	**Toluene (ppb)**	**Ethylbenzene (ppb)**	**M&P-Xylene (ppb)**	**O-Xylene (ppb)**
Surface	246.5	65.9	<1	46.5	27.1
10' down	264.1	76.6	<1	49.8	28.6
20' down	256.2	86.7	<1	15.2	28.5
30' down	N/A	N/A	N/A	N/A	N/A

NEWTOWN STATION
TANK BOTTOM SEDIMENT & SLUDGE
ANALYSIS SUMMARY

ANALYTE SAMPLE POSITION	HOLDER #1 TOP	HOLDER #1 MIDDLE	HOLDER #1 CUP
OIL & GREASE/TPH	3.6 ppm	1.6 ppm	1.6 ppm
ARESENIC	<0.005 ppm	<0.005 ppm	<0.005 ppm
BARIUM	<0.10 ppm	<0.10 ppm	0.20 ppm
CADMIUM	0.003 ppm	<0.002 ppm	<0.002 ppm
CHROMIUM	<0.04 ppm	<0.04 ppm	<0.04 ppm
LEAD	<0.05 ppm	<0.05 ppm	<0.05 ppm
MERCURY	<0.001 ppm	<0.001 ppm	<0.001 ppm
SELENIUM	<0.01 ppm	<0.01 ppm	<0.01 ppm
SILVER	<0.02 ppm	<0.02 ppm	<0.02 ppm

NEWTOWN STATION
TANK BOTTOM SEDIMENT & SLUDGE
ANALYSIS SUMMARY

ANALYTE SAMPLE POSITION	HOLDER #2 TOP	HOLDER #2 MIDDLE	HOLDER #2 CUP
OIL & GREASE/TPH	17 ppm	20 ppm	26 ppm
ARESENIC	<0.005 ppm	<0.005 ppm	<0.005 ppm
BARIUM	<0.10 ppm	<0.10 ppm	0.16 ppm
CADMIUM	<0.002 ppm	<0.002 ppm	<0.002 ppm
CHROMIUM	<0.04 ppm	<0.04 ppm	<0.04 ppm
LEAD	<0.05 ppm	<0.05 ppm	<0.05 ppm
MERCURY	<0.001 ppm	0.0013 ppm	<0.001 ppm
SELENIUM	<0.01 ppm	<0.01 ppm	<0.01 ppm
SILVER	<0.02 ppm	<0.02 ppm	<0.02 ppm

Technical Services
Laboratory Operations

MEMORANDUM

SUBJECT: Newtown Station Surface Soil Lead Survey

DATE: 11/6/92

TO: L. Liebs, System Engineering ETRA

FROM: R. Wilson, ETS Laboratory

OBJECTIVE

Results are presented of a report aimed at documenting a preliminary surface soil lead survey conducted at Newtown Station in September 1992. The scope of this report includes a site sampling plan, analysis description and a results summary.

BACKGROUND

The water seal gas holders at Newtown Station have been in operation for over 70 years. Routine maintenance practices include occasional external painting of the holder shell, the water tank and cup internals. Painting provided an external coating that served as primary protection against accelerated rates of corrosion. Surface preparation techniques prior to coating application included sandblasting and power tool scraping of loose and blistering paint.

Until recently, prior to environmental concerns regarding metals content in paint, most alkyd primers and finish materials contained various quantities of lead and other metals. Previous surface preparation techniques may have resulted in deposition of paint chips containing lead on the ground surrounding each Holder. As a result, ETRA requested that the ETS Laboratory conduct a preliminary survey of surface soil for lead content. Samples were obtained on Thursday, September 10, 1992 for subsequent analysis of leachable lead.

DISCUSSION

A. Site Sampling Plan

The site sampling plan included eight sample points at two locations (4 points around each holder, see sketch in attachment #1). Samples were obtained at 90 degree intervals around the circumference of each holder. Highlighted below is a summary of samples obtained at each Holder (site location photographs are presented in attachment #2).

Holder #1	Site Description
S1-A	Holder #1, 2′ off column #2
S1-B	Holder #1, 2′ off column #10
S1-C	Holder #1, 2′ off column #16
S1-D	Holder #1, 2′ off column #23

Holder #2	Site Description
S2-A	Holder #2, 2′ off column #27
S2-B	Holder #2, 2′ off column #7
S2-C	Holder #2, 2′ off column #13
S2-D	Holder #2, 2′ off column #22

Surface bluestone, leaves, grass and other obvious debris which would skew sample weight determinations were removed prior to extracting surface soils. The samples were obtained utilizing a pre-cleaned stainless steel spoon and deposited into appropriate sample containers. The spoon was decontaminated prior to each use.

Samples were obtained under strict EPA recommended protocol in I-Chem Series 300 low density polyethylene containers. The samples were stored in a controlled environment (sample cooler) at the site and later transferred into the mobile laboratory for transport back to the Greenpoint Laboratory under chain-of-custody. Samples were logged into the Laboratory Information Management System (LIMS) and stored in an appropriate sample refrigerator pending analysis.

B. Analysis Method Summary

The EP Extraction Procedure, EPA Method 1310A, was utilized to prepare the soil samples for analysis. This extraction method is used to simulate leaching in a sanitary landfill. Method 1310 is applicable to liquid, solid and multiphase samples. If a representative sample contains > 0.5% solids, the solid phase is ground to pass a 9.5 mm sieve and extracted with deionized water which is maintained at a pH of 5 +/- 0.2, with acetic acid. The extraction process occurs over a 24 hour period. The extract is than filtered and analyzed using flame atomic absorption methods.

C. ANALYSIS RESULTS

1. Holder #1 Surface Soil

Approximately 1,000 grams of surface soil was collected at each of four sample points. Each sample was thoroughly mixed in the laboratory, split into two equal portions and extracted (sample & duplicate). Surface soil lead concentrations ranged from less than the practical quantitation limit at point "A" to .45 ppm at point "D". A results summary is included in attachment 3.

2. Holder #2 Surface Soil

Approximately 1,000 grams of surface soil was collected at each of four sample points. Each sample was thoroughly mixed in the laboratory, split into two equal portions and extracted (sample & duplicate). Surface soil lead concentrations ranged from 1.2 ppm at point "D" to 71 ppm at point "C". It should be noted that point "C" contained material assumed to be paint chips (orange particles). The remaining samples did not appear to have paint chips contained in the sample matrix. A results summary is included in attachment 3.

CONCLUSION

Surface soil sample analysis around the base of each holder confirmed the presence of extractable lead in concentrations ranging from less than the practical quantitation limit to over 70 parts per million. Additional detailed site sampling and analysis is required to adequately quantify surface soil contamination.

Robert D. Wilson

CC:HJR/FILE

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Technical Services
Laboratory Operations

ATTACHMENTS

1. Site Map

2. Site Photographs

3. Analysis Results Summary

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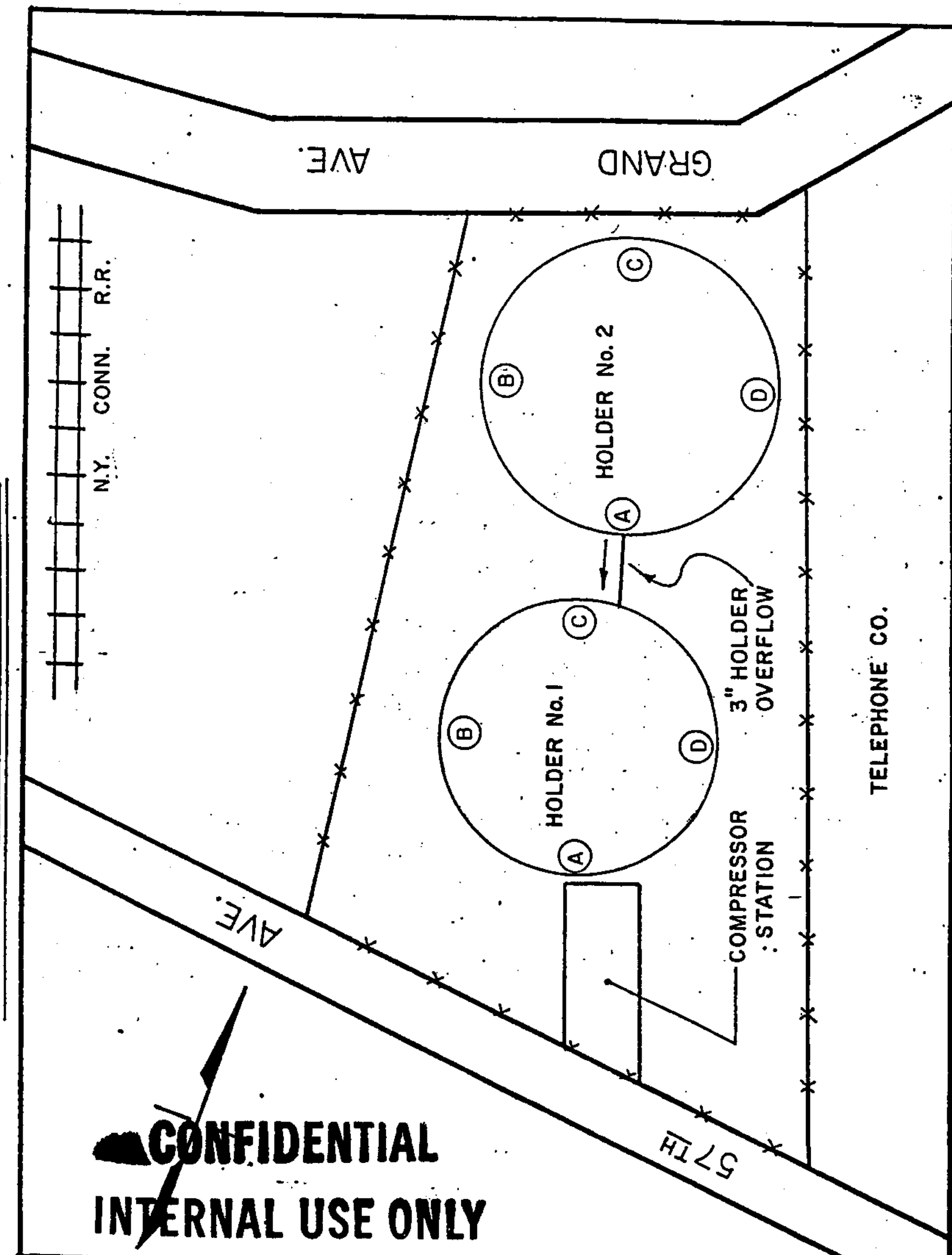
INTERNAL USE ONLY

NEWTOWN STATION SITE MAP (NOT TO SCALE)



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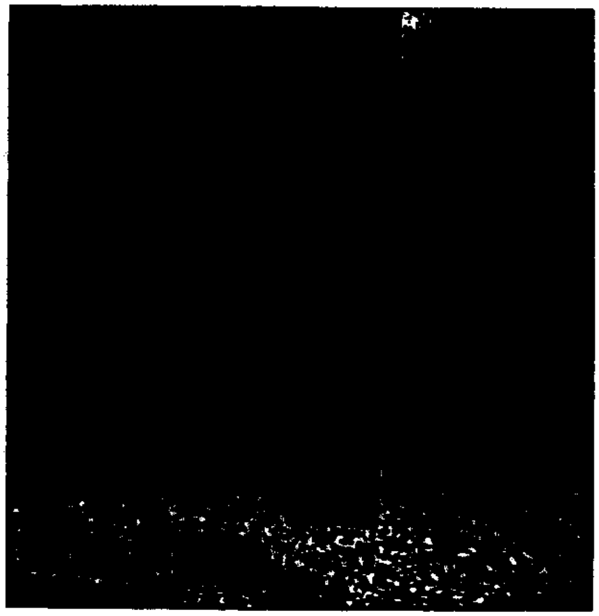
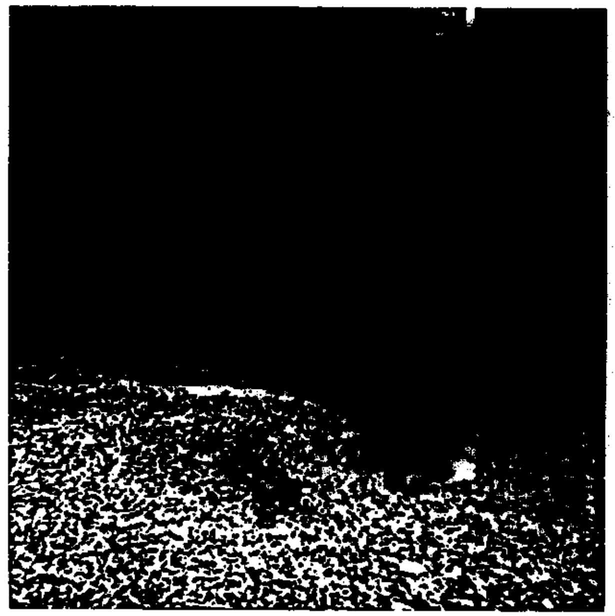
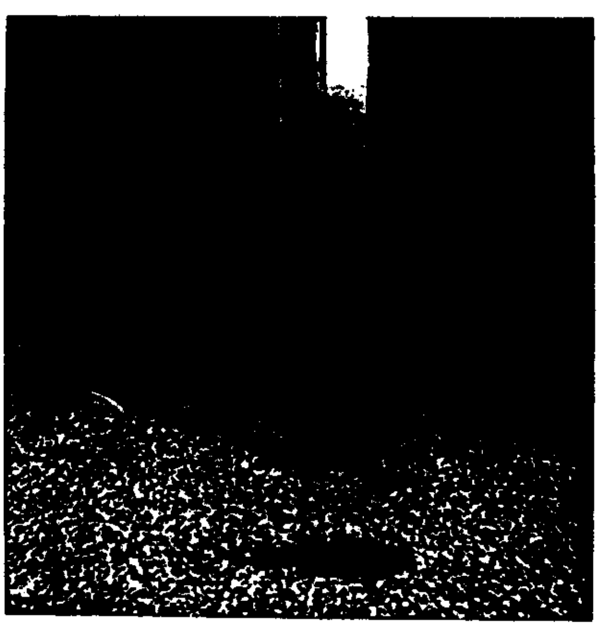
DS I-92



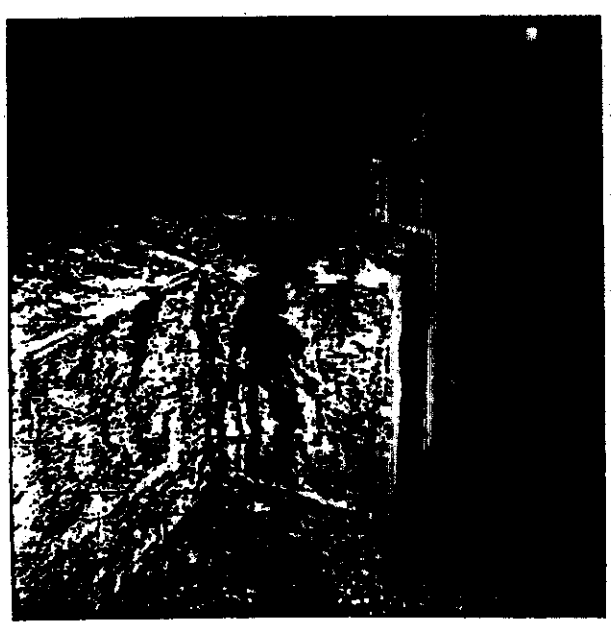
S1-A COL. #2



S1-B COL. #10



S1-C COL. #16



S1-D COL. #23

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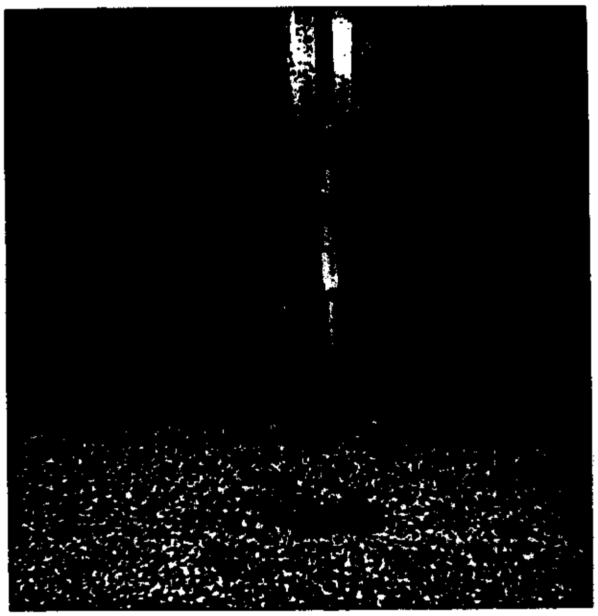
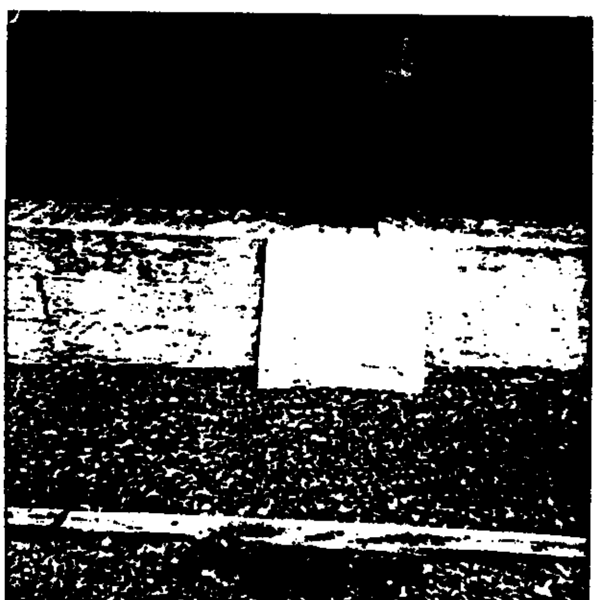
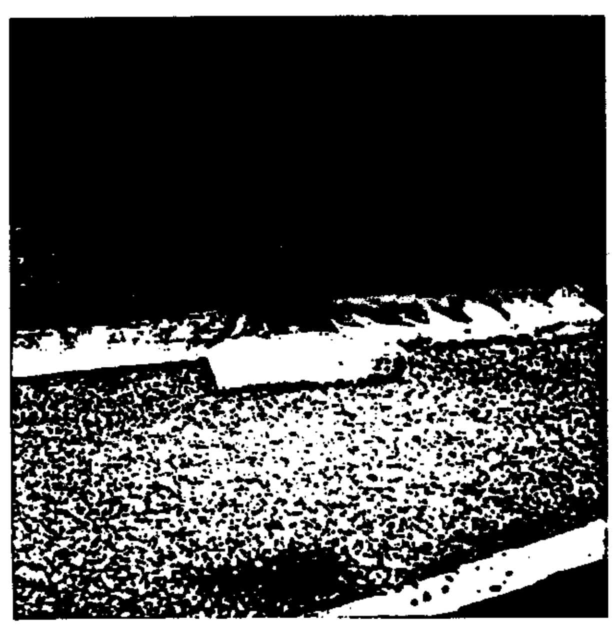


S2-A COL. #27

S2-B COL. #7



S2-C COL. #13



S2-D COL. #22

Technical Services
Laboratory Operations

CONFIDENTIAL

INTERNAL USE ONLY

NEWTOWN STATION
SOIL SURVEY
ANALYSIS RESULTS SUMMARY

HOLDER #1	LEAD (ppm)
A	<PQL
A–DUPLICATE	<PQL
B	0.22
B–DUPLICATE	0.38
C	0.29
C–DUPLICATE	0.19
D	0.32
D–DUPLICATE	0.45

HOLDER #2	LEAD (ppm)
A	52.83
A–DUPLICATE	50.64
B	8.03
B–DUPLICATE	7.69
C	72.5
C–DUPLICATE	71.25
D	1.20
D–DUPLICATE	1.11

NOTE: PQL–PRACTICAL QUANTITATION LIMIT

Appendix F

APPENDIX F

1999 SAMPLING OF HOLDER EFFLUENT

KEYSPAN ENERGY

287 Maspeth Avenue, Brooklyn, NY 11211
Phone: (718) 963-5421, Fax: (718) 963-3026

Lab Report #: 99100039
ELAP Number: 11173

System Laboratory Analysis Report

Customer Information

Company Name: MetroTech
Customer Contact: Anthony Taddeo PCE
Address: One MetroTech Center
Brooklyn NY 11201
Phone Number: Fax Number:
Customer PO:

Laboratory Acceptance

Collect Date: 10/13/1999
Collector: Leo Tyrrell
Receive Date: 10/13/1999 6:30:00 AM
Approved By: 0414
Approved Date: 10/22/1999 11:59:00 AM
Report Date: 10/29/1999 1:30:37 PM

Matrix: Aqueous
Location: Newtown
Sample ID: 99100039-01
Customer Sample #: Filter Outlet
Project ID: Newtown - Waste Water

Test	Parameters	Result	Comments
Purgeable Aromatics	Benzene	<10 µg/kg	
	Chlorobenzene	<10 µg/kg	
	1,2-Dichlorobenzene	<10 µg/kg	
	1,3-Dichlorobenzene	<10 µg/kg	
	1,4-Dichlorobenzene	<10 µg/kg	
	Ethylbenzene	<10 µg/kg	
	Toluene	<10 µg/kg	
	m,p-Xylene	<10 µg/kg	
	o-Xylene	<10 µg/kg	
Waste Water	pH (electrometric)	5.571 pH Units	
	Cyanide, Amenable	<0.01 mg/L	
	Oil/Grease	<5.0 mg/L	
	Cadmium (Cd)	<0.0025 mg/L	
	Chromium (Cr)	0.035 mg/L	
	Copper (Cu)	0.051 mg/L	
	Lead (Pb)	0.018 mg/L	
	Molybdenum (Mo)	0.001 mg/L	
	Nickel (Ni)	0.025 mg/L	
	Silver (Ag)	0.121 mg/L	
	Zinc (Zn)	0.259 mg/L	
	Chromium (VI), Hexavalent (Cr)	0.064 mg/L	
	Mercury (Hg)	0.24 mg/L	

Sample Comment:

SPAN
.{GY

287 Maspeth Avenue, Brooklyn, NY 11211
Phone: (718) 963-5421, Fax: (718) 963-3026

Lab Report #: 99100039

ELAP Number: 11173

System Laboratory Analysis Report

Customer Information

Company Name: MetroTech
Customer Contact: Anthony Taddeo PCE
Address: One MetroTech Center
Brooklyn NY 11201
Phone Number:
Fax Number:
Customer PO:

Laboratory Acceptance

Collect Date: 10/13/1999
Collector: Leo Tyrrell
Receive Date: 10/13/1999 8:21:40 AM
Approved By: 0414
Approved Date: 10/22/1999 11:59:00 AM
Report Date: 10/29/1999 1:30:37 PM

Matrix: Aqueous
Location: Newtown
Sample ID: 99100039-02
Customer Sample #: Filter Inlet
Project ID: Newtown - Waste Water

Test	Parameters	Result	Comments
Purgeable Aromatics	Benzene	<10 µg/kg	
	Chlorobenzene	<10 µg/kg	
	1,2-Dichlorobenzene	<10 µg/kg	
	1,3-Dichlorobenzene	<10 µg/kg	
	1,4-Dichlorobenzene	<10 µg/kg	
	Ethylbenzene	<10 µg/kg	
	Toluene	<10 µg/kg	
	m,p-Xylene	<10 µg/kg	
	o-Xylene	<10 µg/kg	

Sample Comment:

Matrix: Aqueous
Location: Newtown
Sample ID: 99100039-03
Customer Sample #: Field Blank
Project ID: Newtown - Waste Water

Test	Parameters	Result	Comments
Purgeable Aromatics	Benzene	<10 µg/kg	
	Chlorobenzene	<10 µg/kg	
	1,2-Dichlorobenzene	<10 µg/kg	
	1,3-Dichlorobenzene	<10 µg/kg	
	1,4-Dichlorobenzene	<10 µg/kg	
	Ethylbenzene	<10 µg/kg	
	Toluene	<10 µg/kg	
	m,p-Xylene	<10 µg/kg	
	o-Xylene	<10 µg/kg	

Sample Comment:
Comments:

CERTIFIED HAZARDOUS MATERIALS MANAGER
ROBERT D. WILSON
2508
CHMM

Laboratory Director

NOTE: The liability of KeySpan Energy shall in no event exceed the amount of the invoice with respect to the services charged for therein.

KEYSPAN ENERGY

287 Maspeth Avenue, Brooklyn, NY 11211
Phone: (718) 963-5421, Fax: (718) 963-3026

Lab Report #: 99090042

ELAP Number: 11173

System Laboratory Analysis Report

Customer Information

Company Name: MetroTech
Customer Contact: Anthony Taddeo PCE
Address: One MetroTech Center
Brooklyn NY 11201
Phone Number:
Fax Number:
Customer PO:

Laboratory Acceptance

Collect Date: 9/9/1999
Collector: Leo Tyrrell
Receive Date: 9/9/1999 3:33:52 PM
Approved By: 0414
Approved Date: 10/1/1999 8:48:00 AM
Report Date: 10/1/1999 3:08:13 PM

Matrix: Aqueous
Location: Newtown
Sample ID: 99090042-01
Customer Sample #: Inlet
Project ID: Newtown - Waste Water

Test	Parameters	Result	Comments
Oil & Grease	Oil/Grease	5.80 mg/L	
Purgeable Aromatics	Benzene	<10 µg/L	
	Chlorobenzene	<10 µg/L	
	1,2-Dichlorobenzene	<10 µg/L	
	1,3-Dichlorobenzene	<10 µg/L	
	1,4-Dichlorobenzene	<10 µg/L	
	Ethylbenzene	<10 µg/L	
	Toluene	<10 µg/L	
	m,p-Xylene	<10 µg/L	
	o-Xylene	<10 µg/L	
Waste Water	pH (electrometric)	5.980 ph Units	
	Cyanide, Amenable	<0.01 mg/L	
	Cadmium (Cd)	<0.0025 mg/L	
	Chromium (Cr)	<0.0024 mg/L	
	Copper (Cu)	<0.004 mg/L	
	Lead (Pb)	0.005 mg/L	
	Molybdenum (Mo)	<0.100 mg/L	
	Nickel (Ni)	0.004 mg/L	
	Silver (Ag)	<0.0033 mg/L	
	Zinc (Zn)	0.139 mg/L	
	Chromium (VI), Hexavalent (Cr)	<0.25 mg/L	
	Mercury (Hg)	<0.0005 mg/L	

Sample Comment:

NOTE: The liability of BROOKLYN UNION shall in no event exceed the amount of the invoice with respect to the services charged for therein.

SPAN
.GY
287 Maspeth Avenue, Brooklyn, NY 11211
Phone: (718) 963-5421, Fax: (718) 963-3026

Lab Report #: 99090042
ELAP Number: 11173

System Laboratory Analysis Report

Customer Information

Company Name: MetroTech
Customer Contact: Anthony Taddeo PCE
Address: One MetroTech Center
Brooklyn NY 11201
Phone Number: Fax Number:

Customer PO:

Laboratory Acceptance

Collect Date: 9/9/1999
Collector: Leo Tyrrell
Receive Date: 9/9/1999 3:33:52 PM
Approved By: 0414
Approved Date: 10/1/1999 1:02:00 PM
Report Date: 10/1/1999 3:08:13 PM

Matrix: Aqueous Sample ID: 99090042-02 Customer Sample #: Outlet
Location: Newtown Project ID: Newtown - Waste Water

Test	Parameters	Result	Comments
BETX	Benzene	<10 µg/L	
	Ethylbenzene	<10 µg/L	
	Toluene	<10 µg/L	
	Total Xylene	<10 µg/L	

Sample Comment:
Comments: BETX Subcontracted with KeySpan East.

HAZARDOUS MATERIALS MANAGER ROBERT D. WILSON 2508 CH...

Laboratory Director

NOTE: The liability of BROOKLYN UNION shall in no event exceed the amount of the invoice with respect to the services charged for therein.

Brooklyn Union
A KeySpan Energy Company

287 Maspeth Avenue, Brooklyn, NY 11211
Phone: (718) 963-5421, Fax: (718) 963-3026

Lab Report #: 99080056

ELAP Number: 11173

Laboratory Operations Analysis Report

Customer Information

Company Name: MetroTech
Customer Contact: Anthony Taddeo PCE
Address: One MetroTech Center
Brooklyn NY 11201
Phone Number:
Fax Number:
Customer PO:

Laboratory Acceptance

Collect Date: 8/11/1999
Collector: Leo Tyrrell
Receive Date: 8/11/1999 1:46:05 PM
Approved By: 0414
Approved Date: 8/23/1999 12:04:00 PM
Report Date: 8/26/1999 8:11:57 AM

Matrix: Aqueous | Sample ID: 99080056-01 | Customer Sample #: Newtown Waste Water
Location: Newtown | Project ID: Newtown - Waste Water

Test	Parameters	Result	Comments
Waste Water	Cadmium (Cd)	<0.003mg/L	
	Chromium (Cr)	0.020mg/L	
	Chromium (VI), Hexavalent (Cr)	<0.25mg/L	
	Copper (Cu)	0.042mg/L	
	Cyanide, Amenable	<0.0100mg/L	
	Lead (Pb)	0.022mg/L	
	Mercury (Hg)	<0.26mg/L	
	Molybdenum (Mo)	<1.0mg/L	
	Nickel (Ni)	0.018mg/L	
	pH (electrometric)	6.92ph Units	
	Silver (Ag)	<0.0033mg/L	
	TPH	<5.0mg/L	
	Zinc (Zn)	0.208mg/L	

Sample Comment:

Matrix: Aqueous | Sample ID: 99080056-02 | Customer Sample #: Newtown Inlet
Location: Newtown | Project ID: Newtown - Waste Water

Test	Parameters	Result	Comments
BETX	Benzene	1.2µg/L	
	Ethylbenzene	3.7µg/L	
	Toluene	4.7µg/L	
	Total Xylene	14.7µg/L	

Sample Comment:

NOTE: The liability of BROOKLYN UNION shall in no event exceed the amount of the invoice with respect to the services charged for therein.

Brooklyn Union
A KeySpan Energy Company

287 Maspeth Avenue, Brooklyn, NY 11211
Phone: (718) 963-5421, Fax: (718) 963-3026

Lab Report #: 99080056

ELAP Number: 11173

Laboratory Operations Analysis Report

Customer Information

Company Name: MetroTech
Customer Contact: Anthony Taddeo PCE
Address: One MetroTech Center
Brooklyn NY 11201
Phone Number:
Fax Number:
Customer PO:

Laboratory Acceptance

Collect Date: 8/11/1999
Collector: Leo Tyrrell
Receive Date: 8/11/1999 1:46:05 PM
Approved By: 0414
Approved Date: 8/23/1999 12:04:00 PM
Report Date: 8/26/1999 8:11:57 AM

Matrix: Aqueous
Location: Newtown
Sample ID: 99080056-03
Customer Sample #: Newtown Outlet
Project ID: Newtown - Waste Water

Test	Parameters	Result	Comments
BETX	Benzene	<0.2µg/L	
	Ethylbenzene	<0.2µg/L	
	Toluene	<0.2µg/L	
	Total Xylene	<0.6µg/L	

Sample Comment:
Comments: Cyanide Subcontrated to ETL ([I4290] NYS Lab ID # 10969) BETX Subcontracted to KeySpan - East

CERTIFIED HAZARDOUS MATERIALS MANAGER
ROBERT D. WILSON
2308
CHMM

Laboratory Director

NOTE: The liability of BROOKLYN UNION shall in no event exceed the amount of the invoice with respect to the services charged for therein.

Appendix G

Brooklyn Union

Laboratory Operations Analysis Report

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name:T.SCHWAB
Area: Gas System Ops.
Location: GRNPT
Phone No.: (718)-963-5456
ELAP NUMBER: 11173

LABORATORY ACCEPTANCE:
Approved By: R. Kalberer
Date Received:06/28/96
Date Assigned:06/28/96
Date Completed:07/12/96
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: W.O. No.: 5102940103

ANALYSIS REQUEST

Matrix Identification: liquid Number of Samples: 3

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWTOWN HOLDER# 2 DRIP BAY #16,#17 OIL/GREASE	Waste Water
002	METALS	Waste Water
003	GENERAL CHEM.	Waste Water

Comments:

QUALITY ASSURANCE

Chemist: A. Gharib

Laboratory Notebook: 96-04

QA Method(s): SL. 6.02

Reference Page: 0054

Brooklyn Union

Laboratory Operations Analysis Report

SEWER WATER ANALYSIS REPORT

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: T.SCHWAB
Area: Gas System Ops.
Matrix: liquid

Chemist: A. Gharib
Date Assigned: 06/28/96
Date Completed: 07/12/96

PARAMETERS:	SAMPLE(S): ID # 001	ID #	REGULATORY LIMIT
pH	6.99		>5.0 and <11.0
Oil & Grease/TPH	267.33 mg/l		50 mg/l MAX.
Nickel	<0.05 mg/l		3 mg/l MAX.
Zinc	0.033 mg/l		5 mg/l MAX.
Cadmium	<0.03 mg/l		2 mg/l MAX.
Chromium (Hexavalent)	0.013 mg/l		5 mg/l MAX.
Copper	<0.04 mg/l		5 mg/l MAX.
Cyanide (Amendable)	NA		0.2 mg/l MAX.
Lead	<0.2 mg/l		2 mg/l MAX.
Mercury	0.0006 mg/l		0.05 mg/l MAX.

Remarks: COMPOSITE PCB = < 2 mg/Kg

LABORATORY DIRECTOR

Brooklyn Union

Laboratory Operations Analysis Report

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name:T.SCHWAB
Area: Gas System Ops.
Location: GRNPT
Phone No.: (718)-963-5456
ELAP NUMBER: 11173

LABORATORY ACCEPTANCE:
Approved By: R. Kalberer
Date Received:06/28/96
Date Assigned:06/28/96
Date Completed:07/12/96
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: W.O. No.: 5102940103

ANALYSIS REQUEST

Matrix Identification: liquid

Number of Samples: 3

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWTOWN HOLDER# 2 DRIP BAY #23,#24 OIL/GREASE	Waste Water
002	METALS	Waste Water
003	GENERAL CHEM.	Waste Water

Comments:

QUALITY ASSURANCE

Chemist: A. Gharib

QA Method(s): SL. 6.02

Laboratory Notebook: 95-04

Reference Page: 0054

Brooklyn Union

Laboratory Operations Analysis Report

SEWER WATER ANALYSIS REPORT

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: T.SCHWAB
Area: Gas System Ops.
Matrix: liquid

Chemist: A. Gharib
Date Assigned: 06/28/96
Date Completed: 07/12/96

PARAMETERS:	ID # 001	SAMPLE(S): ID #	REGULATORY LIMIT
pH	6.93		>5.0 and <11.0
Oil & Grease/TPH	404.11 mg/l		50 mg/l MAX.
Nickel	0.057 mg/l		3 mg/l MAX.
Zinc	0.188 mg/l		5 mg/l MAX.
Cadmium	<0.03 mg/l		2 mg/l MAX.
Chromium (Hexavalent)	0.014 mg/l		5 mg/l MAX.
Copper	0.061 mg/l		5 mg/l MAX.
Cyanide (Amendable)	NA		0.2 mg/l MAX.
Lead	<0.02 mg/l		2 mg/l MAX.
Mercury	0.0008 mg/l		0.05 mg/l MAX.

Remarks: PCB ON COMPOSITE = <2 mg/Kg

LABORATORY DIRECTOR

Appendix H

APPENDIX H

HOLDER GUIDE FRAME REMOVAL

CLOSE OUT REPORT

REMOVE/DISPOSE GUIDE FRAMES
NEWTOWN HOLDERS 1 & 2

GSO PROJECT NO. 10294

JANUARY 27, 1997

CLOSE OUT REPORT

REMOVE/DISPOSE GUIDE FRAMES
NEWTOWN HOLDERS 1 & 2

GSO PROJECT NO. 10294

TABLE OF CONTENTS

January 27, 1997

To: W.J. Mahon, Director, Gas System Engineering ENG

From: R.P. Brigando, Senior Engineer ENG

Subject: Close Out Report
Remove/Dispose Guide Frame Newtown Holders 1 & 2
Demolish Newtown Holder Station
GSO Project No. 10294

I. Introduction

The plan to demolish retired Newtown Holders 1 & 2 calls for removal in two phases to allow costs to be spread over a number of years. Phase one involved guide frame removal. Phase two will involve the removal of the tanks, holder shells and crowns.

During Fiscal Year 1996 and the first quarter of Fiscal Year 1997, Gas System Engineering investigated and coordinated the removal and disposal of the guide frames (Attachment A). Removal eliminates the liabilities associated with maintaining these superstructures.

Execution of this project satisfies Corporate Values and Initiatives of Customer Satisfaction, Excellence and Teamwork, as well as our business area's initiative of performing our jobs in an ethical, environmentally responsible and proficient manner.

Close Out Report
Remove/Dispose Guide Frames Newtown Holders 1 & 2
Demolish Newtown Holder Station GSO Project No. 10294

II. Project Estimate

All Retirement $'s

Labor	$ 94,500
Materials	5,000
Purchased Services	1,000,000
Other	500
Total Estimate	$1,100,000

III. Project Chronology

June 1996

ENG prepares/issues specification for guide frames demolition.
MMP issues bid package to demolition contractors.

July 1996

Contractor hired.
FAA informed.
GSO mechanics prepare station for guide frame removal.

August 1996

Contractor starts Holder 1 guide frame removal.

September 1996

Contractor completes Holder 1 guide frame removal and starts Holder 2.

October 1996

Contractor completes Holder 2 guide frame removal and starts station restoration.

November 1996

Contractor completes station restoration.
Guide frame removal (phase one) completed.

Microsoft Project 4.0 for Windows was utilized to prepare the project schedule (Attachment B).

IV. Project Execution

Execution was carried out as follows:

ENG managed the project, i.e. schedules, removal specification, contractor bid requests, pre-bid site visits, pre-commencement meeting, quality assurance, budget reconciliation and close-out report.

GSO operations prepared the station for demolition and provided inspector and firewatch.

GSO Laboratory Services and ETRA provided support on environmental issues.

Outside laboratory, under blanket contract, provided air monitoring and analysis.

RMS provided support on safety issues.

PRA handled the media.

SCR provided station security during off hours.

MMP hired the demolition contractor, Big Apple Wrecking Corporation.
Big Apple's performance was excellent.

Close Out Report
Remove/Dispose Guide Frames Newtown Holders 1 & 2
Demolish Newtown Holder Station GSO Project No. 10294

V. Cost Analysis

Estimated:

	Labor	Materials	Purchased Services	Other	Total	
	$94,500	$5,000	$1,000,000	$500	$1,100,000	$1,100,000

Cost:

Capital	0	0	4,990	412	5,402	
Retirement	58,500	4,000	586,610	1,088	650,198	
Total Cost	58,500	4,000	591,600	1,500	655,600	$655,600
				Variance		($444,400)

Variance was caused by extremly competitive bidding costs for demolition.

Capital $'s were required for installation of privacy slats on the property line chain link fence.

VI. Problems Encountered and Lessons Learned

Problems Encountered (all job related):

Delay at Startup "Stop Work Order" issued by the NYC Building Department, Cranes & Derricks inspector pending resolution of man basket and site certification issues delayed startup three days.

Inclement Weather Rainy/windy weather presented hazardous working conditions for the ironworkers causing work to be suspended a total of four days.

Equipment Breakdown Jib failure. Crane was taken out of service and work was stopped for three days. Repairs and inspection by NYC Cranes & Derricks were made immediately.

Difficult Working Conditions These superstructures, for the most part, were located close to the station's property line. Careful attention was given to ensure safe conditions while working near the neighboring homes, businesses and heavily traveled Grand Avenue, and while positioning the crane at some very confining locations (Attachment "C").

Customer Complaint During holder 2 demolition a customer expressed concern about possible lead contamination on his property. GSO laboratory services arranged for air monitoring at the property line by the customer's house and by the Long Island Expressway to establish background levels. The customer was informed that results indicated lead levels by the customer's property to be less than background levels and EPA recommended levels. The customer decided to arrange for his own testing.

The contractor was requested to work cautiously to eliminate paint chip flaking during removal. Steel was removed at a slower pace when working in the vicinity of the concerned customer. Dismantled steel was moved to a location away from the property line where it was cut up and loaded onto hauling trucks.

After a time complaints ceased.

VI. Problems Encountered and Lessons Learned (cont'd)

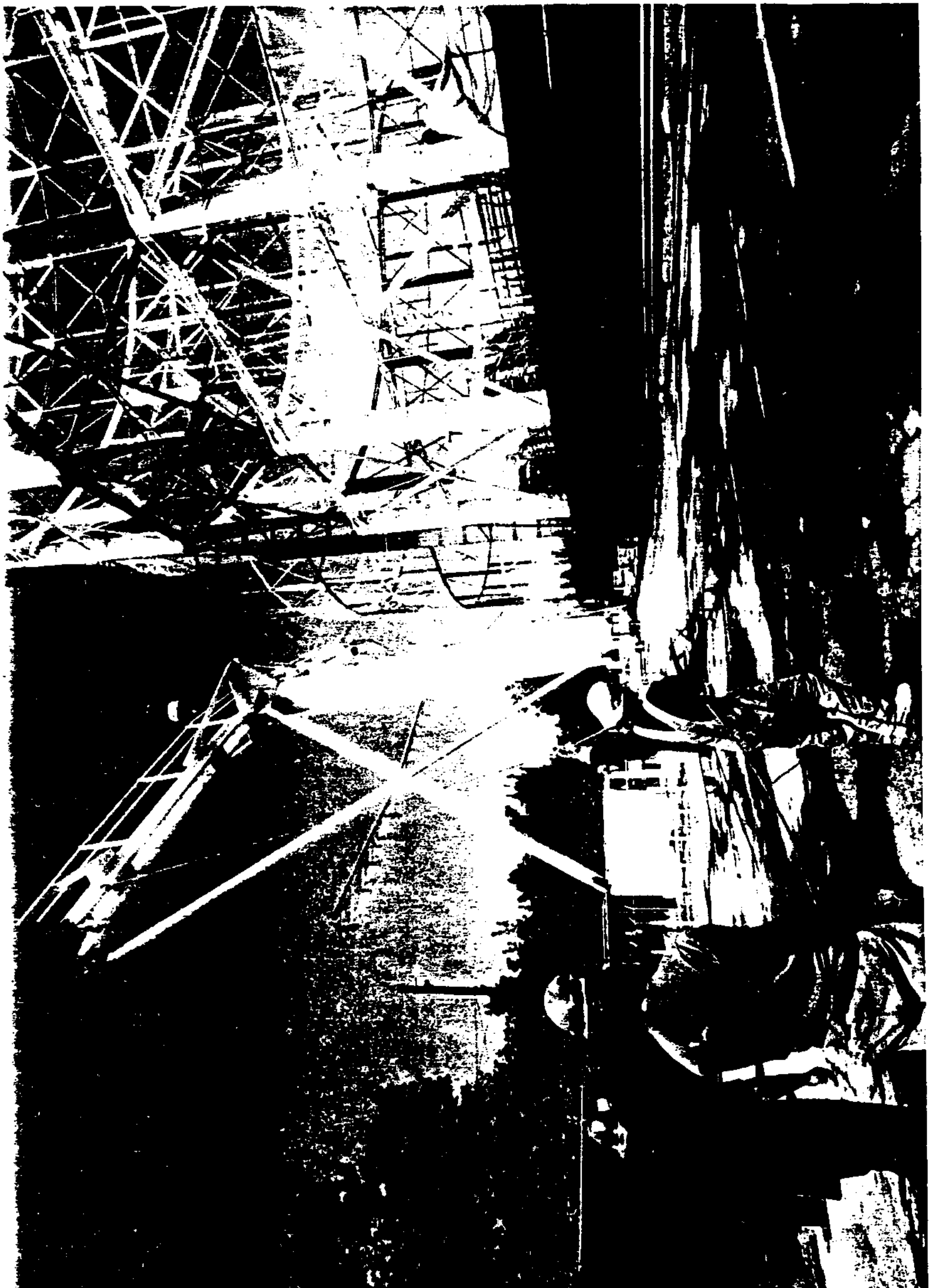
Lessons Learned:

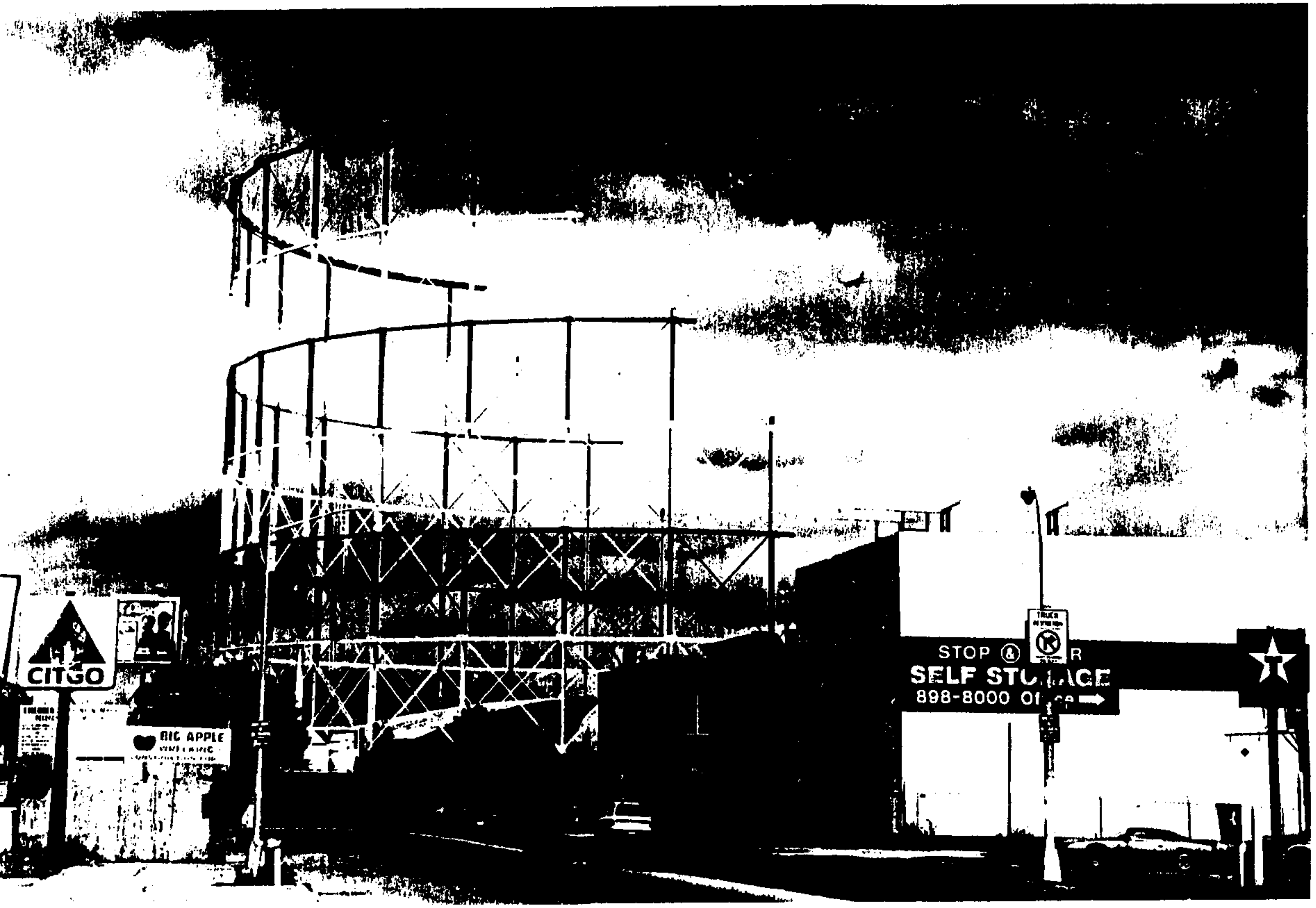
Address all current and potential problems immediately.

Maintain an open dialogue with the contractor and with the business areas involved in the project.

Hire contractors experienced with New York City working conditions for fast track projects that require dealing with agencies such as the NYC Department of Buildings, FDNY, OSHA and the FAA. Big Apple's resourcefulness allowed them to quickly work through the bureaucratic process and overcome all obstacles with minimum delay.

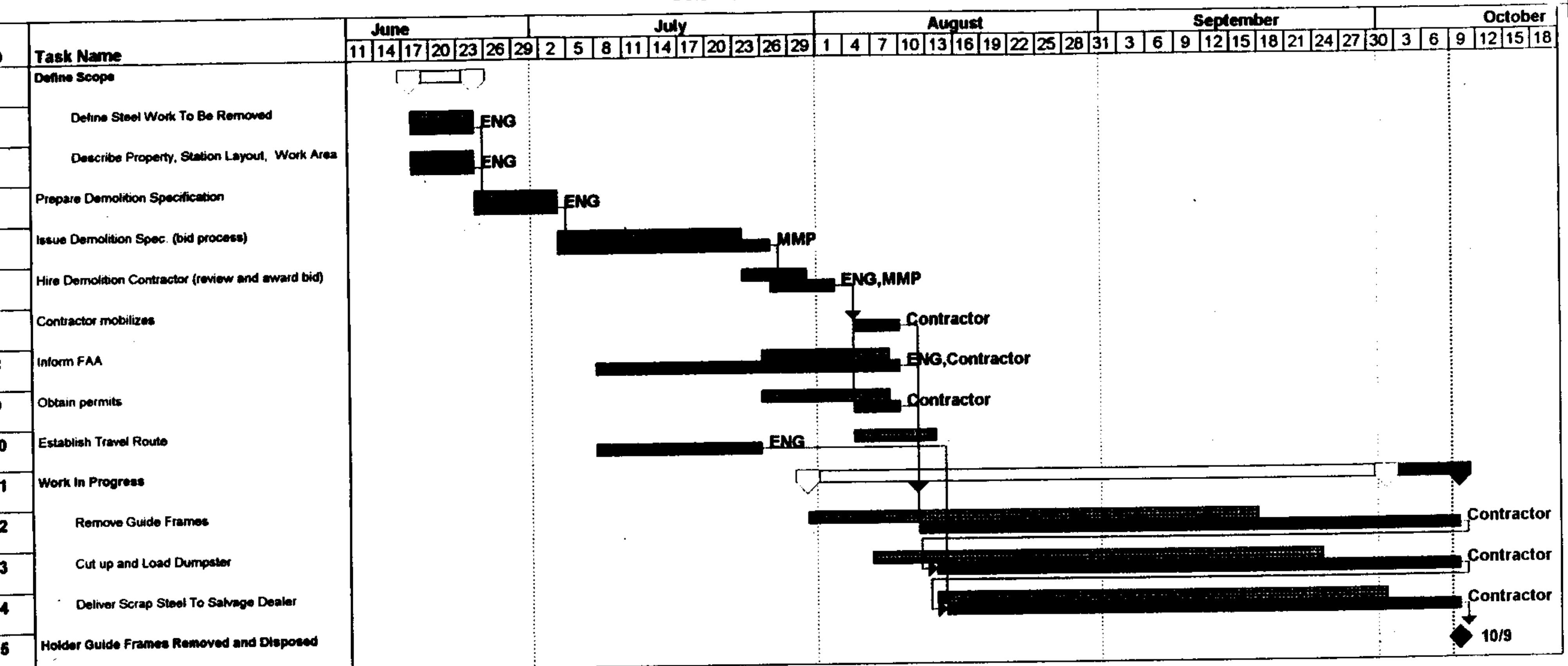

Link-Belt




CITGO
BIG APPLE
SELF STO
898-8000

ATTACHMENT B

NEWTOWN HOLDER DEMOLITION
GUIDEFRAME REMOVAL



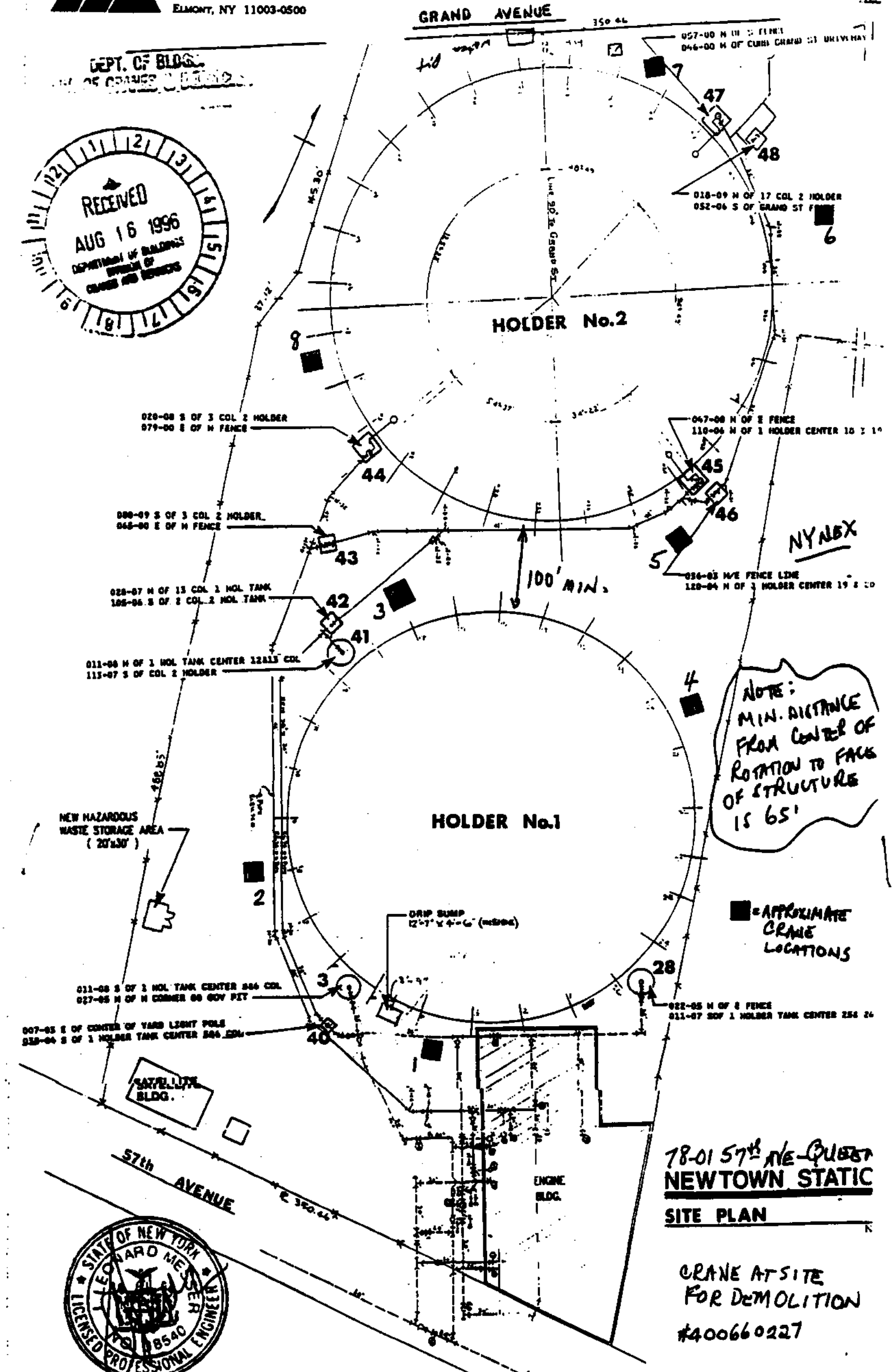
Task		Baseline Milestone		Baseline Summary	
Progress		Summary		Rolled Up Baseline	
Baseline		Rolled Up Task		Rolled Up Baseline Milestone	
Milestone		Rolled Up Milestone		Rolled Up Progress	

oject: Remove/Dispose Guide Frames
te: 10/9/96

ATTACHMENT

(N175 96

MESSER-GAVENDER CONSULTANTS
PROFESSIONAL ENGINEERS
P.O. Box 030500
ELMONT, NY 11003-0500



Close Out Report
Remove/Dispose Guide Frames Newtown Holders 1 & 2
Demolish Newtown Holder Station GSO Project No. 10294

ATTACHMENT D

Project File Index

Volume 1	1. Planning 2. Schedule 3. Specification 4. Purchase Order 5. Department of Transportation 6. Environment 7. FAA
Volume 2	8. Demolition 9. Safety 10. Publicity 11. Security 12. Fire Department 13. PSC 14. Permits
Volume 3	15. Daily Log 16. Station Restoration

Appendix I

APPENDIX I

1999 SAMPLING OF HOLDER SLUDGE/SEDIMENT

Brooklyn Union
A KeySpan Energy Company

287 Maspeth Avenue, Brooklyn, NY 11211
Phone: (718) 963-5421, Fax: (718) 963-3026

Lab Report #: 99080096

ELAP Number: 11173

Laboratory Operations Analysis Report

Customer Information

Company Name: Greenpoint - Gas System Operations
Customer Contact: Jim Lindner
Address: 287 Maspeth Avenue
Brooklyn NY 11211
Phone Number: (718) 963-5456 Fax Number: (718) 599-0705
Customer PO: 8045102940111

Laboratory Acceptance

Collect Date: 8/19/1999
Collector: Jeff Brathwaite
Receive Date: 8/19/1999 1:43:30 PM
Approved By: 0414
Approved Date: 9/3/1999 7:40:00 AM
Report Date: 9/7/1999 12:08:12 PM

Matrix: Solid Sample ID: 99080096-01 Customer Sample #: Holder # 1
Location: Newtown Project ID: Newton Holders

Test	Parameters	Result	Qualifier	Comments
Corrosivity	Corrosivity	5.71 ph Units		
Ignitability	Ignitability	>140 °F		
PCBs	Aroclor 1016 (PCB-1016)	<2.0 mg/Kg		
	Aroclor 1221 (PCB-1221)	<2.0 mg/Kg		
	Aroclor 1232 (PCB-1232)	<2.0 mg/Kg		
	Aroclor 1242 (PCB-1242)	<2.0 mg/Kg		
	Aroclor 1248 (PCB-1248)	<2.0 mg/Kg		
	Aroclor 1254 (PCB-1254)	<2.0 mg/Kg		
	Aroclor 1260 (PCB-1260)	<2.0 mg/Kg		
Reactivity	Cyanide	<2.5 mg/Kg		
	Sulfide	64.1 mg/Kg		
TCLP - Analysis	o-Cresol (2-Methylphenol)	<10 µg/L	U	
	p-Cresol (4-Methylphenol)	<10 µg/L	U	
	1,4-Dichlorobenzene	<10 µg/L	U	
	2,4-Dinitrotoluene	<10 µg/L	U	
	Hexachlorobenzene	<10 µg/L	U	
	Hexachloroethane	<10 µg/L	U	
	Nitrobenzene	<10 µg/L	U	
	Pentachlorophenol	<50 µg/L	U	
	Pyridine	<10 µg/L	U	
	2,4,5-Trichlorophenol	<50 µg/L	U	
	2,4,6-Trichlorophenol	<10 µg/L	U	
	Benzene	2 µg/L	J	
	Carbon tetrachloride	<10 µg/L	U	
	Chlorobenzene	<10 µg/L	U	
	Chloroform	<10 µg/L	U	
	1,2-Dichloroethane	<10 µg/L	U	
	1,1-Dichloroethene	<10 µg/L	U	
	MEK (2-Butanone)	<10 µg/L	U	
	Tetrachloroethylene	<10 µg/L	U	
	Trichloroethylene	<10 µg/L	U	
	Vinyl chloride	<10 µg/L	U	
	Arsenic (As)	<0.036 mg/L		
	Barium (Ba)	1.67 mg/L		

Brooklyn Union
A KeySpan Energy Company

287 Maspeth Avenue, Brooklyn, NY 11211
Phone: (718) 963-5421, Fax: (718) 963-3026

Lab Report #: 99080096

ELAP Number: 11173

Laboratory Operations Analysis Report

Customer Information

Company Name: Greenpoint - Gas System Operations
Customer Contact: Jim Lindner
Address: 287 Maspeth Avenue
Brooklyn NY 11211
Phone Number: (718) 963-5456 Fax Number: (718) 599-0705

Customer PO: 8045102940111

Laboratory Acceptance

Collect Date: 8/19/1999
Collector: Jeff Brathwaite
Receive Date: 8/19/1999 1:43:30 PM
Approved By: 0414
Approved Date: 9/3/1999 7:40:00 AM

Report Date: 9/7/1999 12:08:12 PM

Matrix: Soil Sample ID: 99080096-01 Customer Sample #: Holder # 1
Location: Newtown Project ID: Newton Holders

Test	Parameters	Result	Qualifier	Comments
TCLP - Analysis	Cadmium (Cd)	0.031 mg/L		
	Chromium (Cr)	0.165 mg/L		
	Lead (Pb)	119.98 mg/L		
	Mercury (Hg)	<0.0001 mg/L		
	Selenium (Se)	<0.085 mg/L		
	Silver (Ag)	<0.005 mg/L		

Sample Comment:

Brooklyn Union
A KeySpan Energy Company

287 Maspeth Avenue, Brooklyn, NY 11211
Phone: (718) 963-5421, Fax: (718) 963-3026

Lab Report #: 99080096
ELAP Number: 11173

Laboratory Operations Analysis Report

Customer Information

Company Name: Greenpoint - Gas System Operations
Customer Contact: Jim Lindner
Address: 287 Maspeth Avenue
Brooklyn NY 11211
Phone Number: (718) 963-5456 Fax Number: (718) 599-0705
Customer PO: 8045102940111

Laboratory Acceptance

Collect Date: 8/19/1999
Collector: Jeff Brathwaite
Receive Date: 8/19/1999 1:43:30 PM
Approved By: 0414
Approved Date: 9/3/1999 7:40:00 AM
Report Date: 9/7/1999 12:08:13 PM

Matrix: Solid
Location: Newtown
Sample ID: 99080096-02
Customer Sample #: Holder # 2
Project ID: Newton Holders

Test	Parameters	Result	Qualifier	Comments
Corrosivity	Corrosivity	4.95 ph Units		
Ignitability	Ignitability	>140 °F		
PCBs	Aroclor 1016 (PCB-1016)	<2.0 mg/Kg		
	Aroclor 1221 (PCB-1221)	<2.0 mg/Kg		
	Aroclor 1232 (PCB-1232)	<2.0 mg/Kg		
	Aroclor 1242 (PCB-1242)	<2.0 mg/Kg		
	Aroclor 1248 (PCB-1248)	<2.0 mg/Kg		
	Aroclor 1254 (PCB-1254)	<2.0 mg/Kg		
	Aroclor 1260 (PCB-1260)	<2.0 mg/Kg		
Reactivity	Cyanide	<2.5 mg/Kg		
	Sulfide	56.1 mg/Kg		
TCLP - Analysis	o-Cresol (2-Methylphenol)	<10 µg/L	U	
	p-Cresol (4-Methylphenol)	<10 µg/L	U	
	1,4-Dichlorobenzene	<10 µg/L	U	
	2,4-Dinitrotoluene	<10 µg/L	U	
	Hexachlorobenzene	<10 µg/L	U	
	Hexachloroethane	<10 µg/L	U	
	Nitrobenzene	<10 µg/L	U	
	Pentachlorophenol	<50 µg/L	U	
	Pyridine	<10 µg/L	U	
	2,4,5-Trichlorophenol	<50 µg/L	U	
	2,4,6-Trichlorophenol	<10 µg/L	U	
	Benzene	<10 µg/L	U	
	Carbon tetrachloride	<10 µg/L	U	
	Chlorobenzene	<10 µg/L	U	
	Chloroform	<10 µg/L	U	
	1,2-Dichloroethane	<10 µg/L	U	
	1,1-Dichloroethene	<10 µg/L	U	
	MEK (2-Butanone)	<10 µg/L	U	
	Tetrachloroethylene	<10 µg/L	U	
	Trichloroethylene	<10 µg/L	U	
	Vinyl chloride	<10 µg/L	U	
	Arsenic (As)	<0.036 mg/L		
	Barium (Ba)	0.313 mg/L		

Brooklyn Union
A KeySpan Energy Company

287 Maspeth Avenue, Brooklyn, NY 11211
Phone: (718) 963-5421, Fax: (718) 963-3026

Lab Report #: 99080096
ELAP Number: 11173

Laboratory Operations Analysis Report

Customer Information

Company Name: Greenpoint - Gas System Operations
Customer Contact: Jim Lindner
Address: 287 Maspeth Avenue
Brooklyn NY 11211
Phone Number: (718) 963-5456 Fax Number: (718) 599-0705
Customer PO: 8045102940111

Laboratory Acceptance

Collect Date: 8/19/1999
Collector: Jeff Brathwaite
Receive Date: 8/19/1999 1:43:30 PM
Approved By: 0414
Approved Date: 9/3/1999 7:40:00 AM
Report Date: 9/7/1999 12:08:13 PM

Matrix: Soil
Location: Newtown
Sample ID: 99080096-02
Customer Sample #: Holder # 2
Project ID: Newton Holders

Test	Parameters	Result	Qualifier	Comments
TCLP - Analysis	Cadmium (Cd)	0.036 mg/L		
	Chromium (Cr)	0.237 mg/L		
	Lead (Pb)	21.88 mg/L		
	Mercury (Hg)	<0.0001 mg/L		
	Selenium (Se)	<0.085 mg/L		
	Silver (Ag)	<0.005 mg/L		

Sample Comment:

U - Indicates compound was analyzed for but not detected.
D - Diluted
B - Indicates that compound was found in associated blank as well as in the sample.
UD - Indicates diluted compound was analyzed for but not detected.
J - Indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero (0).
E - Exceeds calibration range, dilution to flow.

Comments: TCLP Analysis subcontracted to Enviro Probe

CERTIFIED HAZARDOUS MATERIALS MANAGER
ROBERT D. WILSON
12808
CHMM

Laboratory Director

NOTE: The liability of BROOKLYN UNION shall in no event exceed the amount of the invoice with respect to the services charged for therein.

Appendix J

APPENDIX J

LEAD SAMPLING RESULTS

GCI ENVIRONMENTAL ADVISORY, INC.
165 Darling Street, Wilkes-Barre, PA 18701 (717) 823-9069 (800) 843-3380 Fax: (717) 823 9240

August 21, 1996

Mr. Ben Versaci
Big Apple Wrecking & Construction Corp.
748 Brush Avenue
Bronx, NY 10465

RE: 7801 57th Avenue, Elmhurst, NY

Dear Mr. Versaci,

GCI Environmental Advisory, Inc. has conducted personnel air sampling for lead exposure on the above referenced project. Laboratory analysis indicated the following range of concentrations for each period monitored:

August 15, 1996	62.69 μ/m^3 - 197.10 μ/m^3
August 19, 1996	174.68 μ/m^3 - 306.91 μ/m^3

Based upon the OSHA Construction Standard (1926.62 Lead), the appropriate respiratory protection for this project would be one-half (1/2) mask air purifying respirator with high efficiency filters-five hundred micrograms per cubic meter (500 μ/m^3). It is recommended that periodic sampling be conducted during the project to document continued compliance.

If you have any questions or need additional information please contact me at (212) 986-9460.

Sincerely,

James Grond, CIH
President
GCI Environmental Advisory, Inc.

JFG/gj

air monitoring
FAX from
Ron

Author: Robert Wilson at GRNPT01
Date: 9/24/96 4:30 PM
Priority: Normal
TO: Joseph Littmann at BUGLANG1
TO: Henry Friediger at BUGLANE1
TO: Ronald Brigando at BUGLANE1
TO: Arthur Dart at BUGLANG1
TO: Francis Katulak
Subject: Holder Demolition - Customer Complaint

---------------------------------- Message Contents ----------------------------------

As per your request, highlighted below is a chronological sequence of events regarding a complaint made by Mr. Julian Monroy. Mr. Monroy is concerned about possible lead contamination of his property from demolition of the Newtown Holders.

9/9/96

* 8:30 PM Customer made a complaint about possible lead contamination on his property resulting from demolition of Newtown Holders. Customer was informed that BU would investigate.

  Customer Address: Mr. Julian Monroy
  53-46 80th Street
  Elmhurst NY

9/10/96

* 8:15AM Arrived at customers house, customer expressed concerns about lead contamination in the form of white dust on his car and the potential of lead in the air and exposure to his children and wife.

* We explained to Mr. Monroy that although the steel may have been painted with lead paint in the past, abrasive cleaning and conventional paint removal techniques that result in dust generation were not being used for this project and we were simply removing the steel by cutting and that his family and property was not in any danger.

* Mr. Monroy demanded a letter stating that the air around his home was free from lead. I explained to Mr. Monroy that due to the location of his home to the expressway and other factors that small levels of background lead may very well exist. Mr. Monroy agreed. I offered to perform testing of the "dust" on his vehicle and air sampling along the property line to demonstrate his family was not in danger. Mr. Monroy agreed and seemed satisfied. Visual inspection did not reveal any dust.

* Perform wipe test of car, results negative.

* Performed air monitoring of property line and background samples along the expressway at 74th street and 57th Avenue. Results all less than background levels and EPA recommended ambient air levels.

9/11/96

* Performed additional air monitoring samples, results negative.

* Notified Mrs. Monroy of results and she seemed very pleased. I informed Mrs. Monroy that a letter will follow.

9/17/96

* Hand delivered letter to Mrs. Monroy, she seemed pleased.

9/23/96

* 8:30 AM - Mr. Monroy called and informed me that he was not satisfied with the testing and that he was calling in a lab to perform soil sampling, air sampling and wipe samples from his roof. Mr. Monroy was very upset and went on to say that he was proceeding with blood tests for his children and wife and that BU is going to pay for these tests.

* I tried to calm Mr. Monroy and told him that I would immediately go out to his house to look around his yard. F. Katulak accompanied me for the inspection.

* We arrived at the Monroy house and spoke with Mrs. Monroy. She expressed concerns about lead in the air and exposure to her children. We informed Mrs. Monroy that all previous testing was negative and that we would not put her family in any danger. We offered to perform additional air monitoring and to police the yard and pickup any paint chips that may have migrated over. She was satisfied with this.

9/24/96

* Made arrangements with an independent third party laboratory to perform air monitoring in the Monroy backyard. Confirmed with Mrs. Monroy for 9:00 AM on 9/25.

Enviro-Probe, Inc.

Customer Service: 800-888-3585

[illegible] Edison, New Jersey 08820
(908) 494-4600
FAX (908) 494-4611

2917 Bruckner Blvd.
Bronx, New York 10461
(718) 863-0045
FAX: (718) 518-7454

Please Reply To:

ANALYTICAL DATA REPORT FOR LEAD IN AIR SAMPLES

Client's Name: BROOKLYN UNION GAS CO.
Client's Project : N.A.
Analyte: Lead
Matrix: Air
Test Method: NIOSH 7082

Date Received: 09/09/96
Date Analyzed: 09/09/96
Analyzed By: SP
EPI Project #: 6211
EPI Case # : 0441

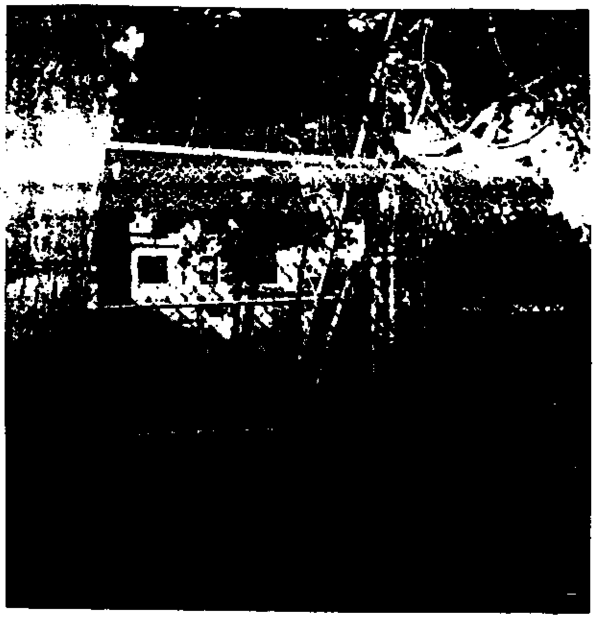
Client/Field ID	Lab Sample ID #	Total volume(Liter)	Concenteration mg/m3
960910 - 1	9606299	504	0.002
960910 - 2	9606300	420	0.002
BLANK	9606301	-	BDL

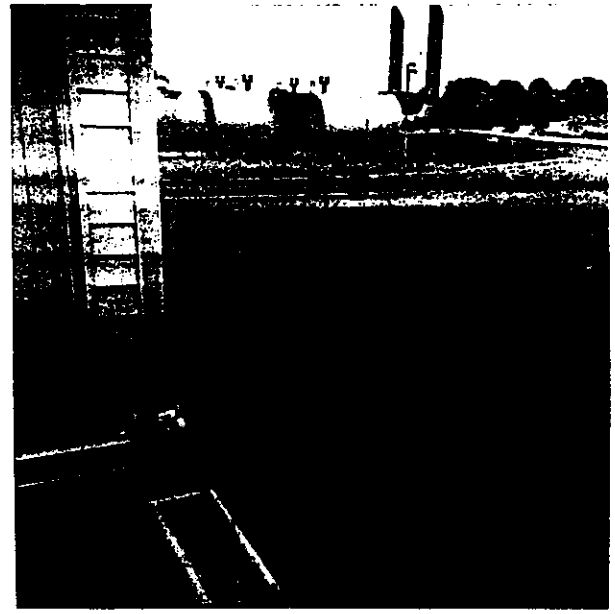
W

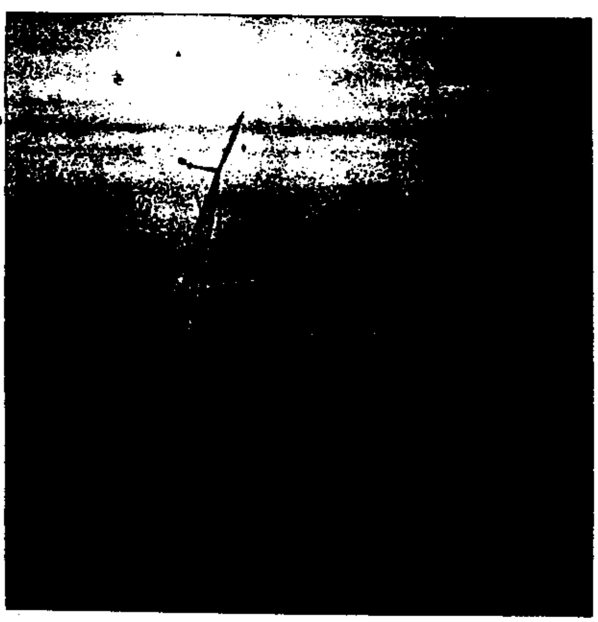
9/10/96 JULIAN MONROE
53-46 80TH ST
WIPE SAMPLE

9/10/96 JULIAN MONROE
53-46 80TH ST
WIPE SAMPLE

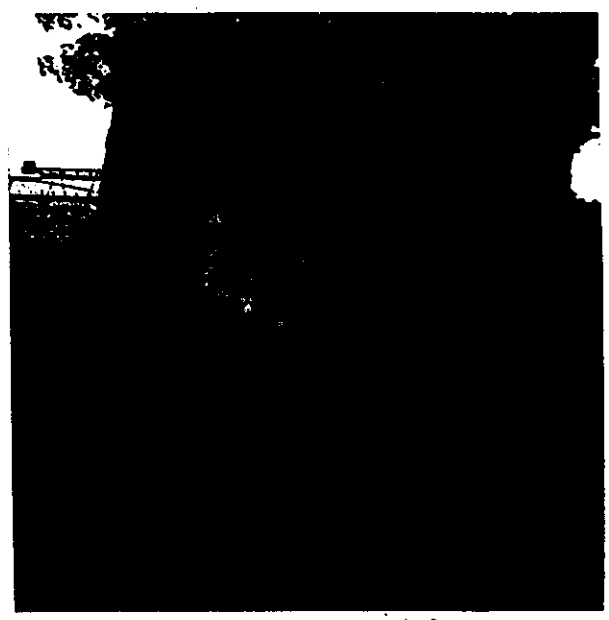
9/10/96 JULIAN MONROE
53-46 80TH ST
WIPE SAMPLE

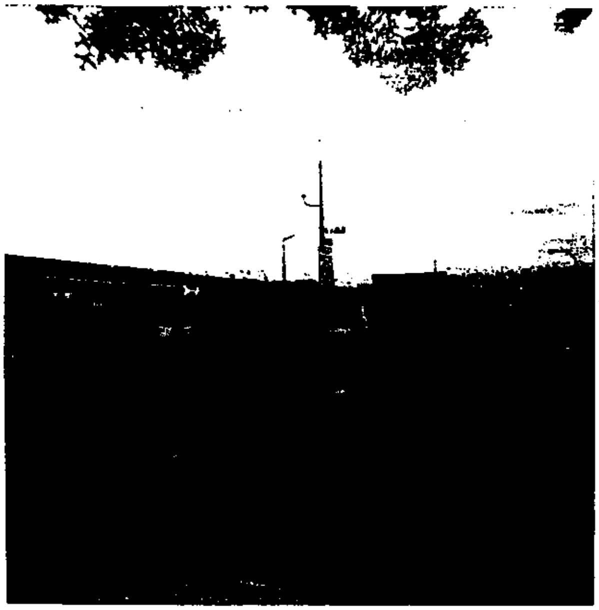




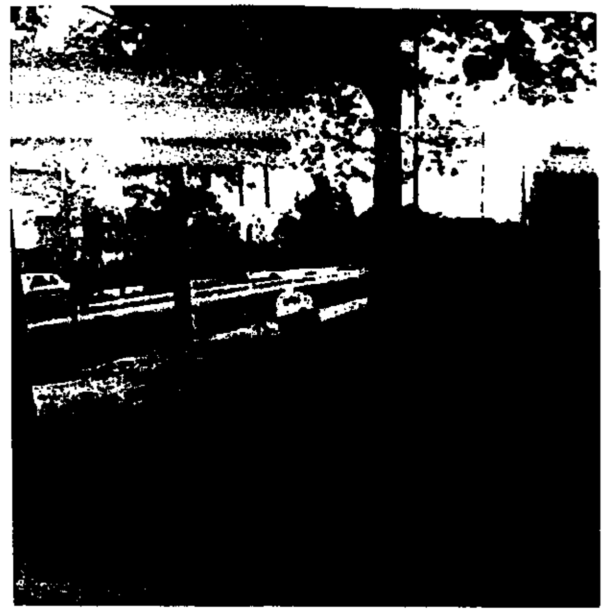


HOLDER DEMO 9/11/96





9/11/96 AIR MONITORING SAMPLES



9/11/96 AIR MONITORING SAMPLES BACKGROUND CHECK 57TH AV 74TH ST

Brooklyn Union

LAB # 961034

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name:T.SCHWAB
Area: Gas System Ops.
Location: GREENPOINT
Phone No.: (718)-963-3022
ELAP NUMBER: 11173

LABORATORY ACCEPTANCE:
Approved By: R. Kalberer
Date Received:09/10/96
Date Assigned:09/10/96
Date Completed:09/10/96
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: W.O. No.: 5102940103

ANALYSIS REQUEST

Matrix Identification: gas Number of Samples: 3

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWTOWN AIR MONITORING LEAD 960910-1	Special Request
002	960910-2	Special Request
003	960910-3	Special Request

Comments: SENT OUT TO ENVIRO-PROBE LAB FOR ANALYSIS

QUALITY ASSURANCE

Chemist:

Laboratory Notebook:

QA Method(s): SL. 6.02

Reference Page:

Enviro-Probe, Inc.

Customer Service: 800-833-3585

3830 Park Avenue
Edison, New Jersey 08820
(908) 494-4600
FAX (908) 494-4611

2917 Bruckner Blvd.
Bronx, New York 10461
(718) 863-0045
FAX: (718) 518-7454

Please Reply To:

ANALYTICAL DATA REPORT FOR LEAD IN AIR SAMPLES

Client's Name: BROOKLYN UNION GAS CO.
Client's Project : N.A.
Analyte: Lead
Matrix: Air
Test Method: NIOSH 7082

Date Received: 09/09/96
Date Analyzed: 09/09/96
Analyzed By: SP
EPI Project #: 6211
EPI Case # : 0441

Client/Field ID	Lab Sample ID #	Total volume(Liter)	Concenteration mg/m3
960910 - 1	9606299	504	0.002
960910 - 2	9606300	420	0.002
BLANK	9606301	-	BDL

LAB # [illegible]

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name: T.SCHWAB
Area: Gas System Ops.
Location: GREENPOINT
Phone No.: (718)-963-3022
ELAP NUMBER: 11173

LABORATORY ACCEPTANCE:
Approved By: R. Kalberer
Date Received: 09/10/96
Date Assigned: 09/10/96
Date Completed: 09/10/96
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: W.O. No.: 5102940103

ANALYSIS REQUEST

Matrix Identification: gas

Number of Samples: 3

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWTOWN AIR MONITORING LEAD 960910-1	Special Request
002	960910-2	Special Request
003	960910-3	Special Request

Comments: SENT OUT TO ENVIRO-PROBE LAB FOR ANALYSIS

QUALITY ASSURANCE

Chemist:

Laboratory Notebook:

QA Method(s): SL. 6.02

Reference Page:

Brooklyn Union

Laboratory Operations Analysis Report

LAB # 961031

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name: R.WILSON
Area: Gas System Ops.
Location: GREENPOINT
Phone No.: (718)-963-5420
ELAP NUMBER: 11173

LABORATORY ACCEPTANCE:
Approved By: R. Kalberer
Date Received: 09/10/96
Date Assigned: 09/10/96
Date Completed: 09/10/96
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: W.O. No.: 5102940103

ANALYSIS REQUEST

Matrix Identification: solid

Number of Samples: 3

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWTOWN WIPE SAMPLE FOR LEAD WINDSHIELD	Special Request
002	HOOD OF CAR	Special Request
003	FIELD BLANK	Special Request

Comments:

QUALITY ASSURANCE

Chemist: V. Morales

Laboratory Notebook: 96-08

QA Method(s): SL. 6.02

Reference Page: 0019

Operations
Report

NEWTOWN WIPE SAMPLES FOR LEAD

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.WILSON
Area: Gas System Ops.
Matrix: solid

Chemist: V. Morales
Date Assigned: 09/10/96
Date Completed: 09/10/96

PARAMETERS:	SAMPLE(S): ID # 001	ID # 002	ID # 003
LEAD	ND	ND	ND

REMARKS: ND = NOT DETECTED

LABORATORY DIRECTOR

Operations
Report

LAB # 961044

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name: R.WILSON
Area: Gas System Ops.
Location: GRNPT
Phone No.: (718)-963-5420
ELAP NUMBER: 11173

LABORATORY ACCEPTANCE:
Approved By: R. Kalberer
Date Received: 09/11/96
Date Assigned: 09/11/96
Date Completed: 09/12/96
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: W.O. No.: 5102940103

ANALYSIS REQUEST

Matrix Identification: gas Number of Samples: 4

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWTOWN AIR MONITORING FOR LEAD 960911-1	Special Request
002	960911-2	Special Request
003	960911-3	Special Request
004	960911-4	Special Request

Comments: SENT OUT TO ENVIRO-PROBE EDISON, N.J.

QUALITY ASSURANCE

Chemist: Laboratory Notebook:

QA Method(s): SL. 6.02 Reference Page:

Probe, Inc.

2917 Bruckner Blvd.
Bronx, New York 10461
(718) 863-0045
FAX: (718) 518-7454

Please Reply To:

ANALYTICAL DATA REPORT FOR LEAD IN AIR SAMPLES

Client`s Name: BROOKLYN UNION GAS CO.
Client's Project : N.A.
Analyte: Lead
Matrix: Air
Test Method: NIOSH 7082

Date Received: 09/11/96
Date Analyzed: 09/11/96
Analyzed By: SP
EPI Project #: 6215
EPI Case # : 0447

Client/Field ID	Lab Sample ID #	Total volume(Liter)	Concenteration (ug/m3)
960911 - 1	9606337	460	0.87
960911 - 2	9606338	460	0.87
960911 - 3	9606339	460	1.74
960911 - FB	9606340	-	BDL

INDUSTRIAL HYGIENE FIELD DATA FORM

Brooklyn Union
Risk Management Services
Safety Section

Date: 9/11/96 Sampled by: RCraw

Description of Operations: Ambient air monitoring at Newtown during guide-frame demolition. ① Roof of holder station, corner ② corner of NYNEX/Mr. Monroe's fence ③ Park bench at 74th + 57th.

Sample Number	Pump	Type	Media	Description (Name, Emp#, Task)	Time On	Time Off	(Minutes) Time	LPM PreCal	LPM PostCal	Litre Volume	Lead µg/m³ Results
960911-1	564 673	~~TWE~~ AREA	MCEF	Holder roof	0805	1125	200	2.3	2.3	460	
960911-2	695	Area	MCEF	Fenceline - NYNEX/ Monroe	0748	1108	200	2.3	2.3	460	
960911-3	693	Area	MCEF	Neighborhood park bench	0810	1130	200	2.3	2.3	460	
960911-FB	—	—	MCEF	Field blank	—	—	—	—	—	0	

Rec'd. from filters [illegible] 9/11/96.

CHAIN OF CUSTODY FORM FOR AREA AIR SAMPLES

ENVIRO-PROBE,INC.,3830 Park Ave. Edison,N.J. 08820 Phone: (908) 494-4600 Fax :(908) 494-4611
ENVIRO-PROBE,INC.,2917 Bruckner Boulevard,Bronx, N.Y. 10461 Phone:(718)863-0045 Fax:(718) 518-7454

Client's Project: -
Site:
Client's Name: BROOKLYN UNION GAS CO.
City: Brooklyn State: NY Zip:
Contact: M. R. BISRI
Address:
Turnaround time: RUSH
Phone: Fax :
Filter used: Charcoal tube / other :
Sampling address/location:
Method :
Activity: Preparation ( ) Abatement ( ) Clean-Up ( ) Ambient ( )

#	Sample Lab ID	Field ID	Location	Time ON	Time OFF	Total minutes	Flow rate(avg)l/min	Total volume(l)	Analysis R.
1	9606337	960911-1	Holder Roof	0805	1125	200		460	Lead
2	6338	-2	Fenceline - NYNEX MONROE	0748	1108	200		460	
3	6339	-3	NEIGHBOURHOOD PARK BENCH	0810	1130	200		460	
4	6340	-4	FIELD BLANK	-	-	-		-	
5									
6									
7									
8									
9									
10									
11									
12									

Person(s) responsible for sampling:Print Sign: Date: Time:

Relinquished by Print	Relinquished by Sign	Received by Print	Received by Sign	Company To relinquish	Company To receive	Date	Time
CLIENT		S. PUNT	[illegible]			09/11/96	@ 2PM
							@
							@

EPI Project : 6215 EPI Case # : 0447 N.Y. file #:

Page 1 of 1

Comments:

Brooklyn Union

Laboratory Operations
Analysis Report

LAB #

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name: R.WILSON
Area: Gas System Ops.
Location: GRNPT
Phone No.: (718)-963-5420
ELAP NUMBER: 11173

LABORATORY ACCEPTANCE:
Approved By: R. Kalberer
Date Received: 09/11/96
Date Assigned: 09/11/96
Date Completed: 09/12/96
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: W.O. No.: 5102940103

ANALYSIS REQUEST

Matrix Identification: gas Number of Samples: 4

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWTOWN AIR MONITORING FOR LEAD 960911-1	Special Request
002	960911-2	Special Request
003	960911-3	Special Request
004	960911-4	Special Request

Comments: SENT OUT TO ENVIRO-PROBE EDISON, N.J.

QUALITY ASSURANCE

Chemist:

Laboratory Notebook:

QA Method(s): SL. 6.02

Reference Page:

800-813-8585

FAX (908) 49

2917 Bruckner Blvd.
Bronx, New York 10461
(718) 863-0045
FAX: (718) 518-7454

Please Reply To:

ANALYTICAL DATA REPORT FOR LEAD IN AIR SAMPLES

Client's Name: BROOKLYN UNION GAS CO.
Client's Project : N.A.
Analyte: Lead
Matrix: Air
Test Method: NIOSH 7082

Date Received: 09/11/96
Date Analyzed: 09/11/96
Analyzed By: SP
EPI Project #: 6215
EPI Case # : 0447

Client/Field ID	Lab Sempie ID #	Total volume(Liter)	Concenteration (ug/m3)
960911 - 1	9606337	460	0.87
960911 - 2	9606338	460	0.87
960911 - 3	9606339	460	1.74
960911 - FB	9606340	-	BDL

Brooklyn Union

287 Maspeth Avenue
Brooklyn, New York 11211
718 963-5420
718 963-3026 Fax

Robert D. Wilson
Director
Laboratory Operations
Technical Services-Laboratory Operations

September 16, 1996

Mr. Julian Monroe
53-46 80th Street
Elmhurst, NY 11373

Dear Mr. Monroe:

As per your request on September 10, 1996, Brooklyn Union performed wipe sampling of your vehicle and air monitoring along your property line for the presence of lead. Results of the abovementioned testing did not exceed normal background levels for the area.

If you have any further questions or would like to discuss the results, please call me at (718) 963-5420.

Sincerely,

CERTIFIED HAZARDOUS MATERIALS MANAGER
ROBERT D. WILSON
2503
CHMM

Robert D. Wilson, CHMM
Laboratory Director
RDW:gw

Brooklyn Union

Laboratory Operations Analysis Report

LAB # 96103?

CHAIN OF CUSTODY RECORD

SAMPLE ORIGINATION:
Client Name: R.WILSON
Area: Gas System Ops.
Location: GREENPOINT
Phone No.: (718)-963-5420
ELAP NUMBER: 11173

LABORATORY ACCEPTANCE:
Approved By: R. Kalberer
Date Received: 09/10/96
Date Assigned: 09/10/96
Date Completed: 09/10/96
Phone No.: (718)963-5420

INVOICE

Area: 926 Function: Prime: W.O. No.: 5102940103

ANALYSIS REQUEST

Matrix Identification: solid

Number of Samples: 3

SAMPLE ID:	DESCRIPTION/LOCATION:	TYPE OF SERVICES:
001	NEWTOWN WIPE SAMPLE FOR LEAD WINDSHIELD	Special Request
002	HOOD OF CAR	Special Request
003	FIELD BLANK	Special Request

Comments:

QUALITY ASSURANCE

Chemist: V. Morales

Laboratory Notebook: 96-08

QA Method(s): SL. 6.02

Reference Page: 0019

961031

NEWTOWN WIPE SAMPLES FOR LEAD

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.WILSON
Area: Gas System Ops.
Matrix: solid

Chemist: V. Morales
Date Assigned: 09/10/96
Date Completed: 09/10/96

PARAMETERS:	SAMPLE(S): ID # 001	ID # 002	ID # 003
LEAD	ND	ND	ND

Remarks: ND = NOT DETECTED

LABORATORY DIRECTOR

CHAIN OF CUSTODY FORM FOR AREA AIR SAMPLES

ENVIRO-PROBE,INC.,3830 Park Ave. Edison,N.J. 08820 Phone: (908) 494-4600 Fax :(908) 494-4611
ENVIRO-PROBE,INC.,2917 Bruckner Boulevard,Bronx, N.Y. 10461 Phone:(718)863-0035 Fax:(718) 518-7454

Client's Name: Brooklyn UNION Gas Co   Client's Project: –   Site:
Address: City: Brooklyn   State: NY   Zip: Contact:
Phone: Fax: Turnaround time: RUSH
Sampling address/location: Filter used: Charcoal tube / other :
Activity: Preparation ( ) Abatement ( ) Clean-Up ( ) Ambient ( )   Method :-

#	Sample Lab ID	Field ID	Location	Time ON	Time OFF	Total minutes	Flow rate(avg)l/min	Total volume(l)	Analysis Request
1	96C6Y37	18280-101	[illegible] ROOF PARAPET	8:55	11-25	150	10	1500	Lead
2	[illegible]	[illegible]	[illegible] SIDE of PLAY-YARD	9:35	12-20	165	10	1650	
3	[illegible]	[illegible]	IN PLAYYARD NEAR TOOL SHED	9:40	12-25	165	10	1650	
4	[illegible]	18280-[illegible]	FIELD BLANK						
5									
6									
7									
8									
9									
10									
11									
12									

Person(s) responsible for sampling:Print   Sign: Date: Time:

Relinquished by Print	Relinquished by Sign	Received by Print	Received by Sign	Company To relinquish	Company To receive	Date	Time
		ZK				09/25/96	@ 7:30p.m.
							@
							@

EPI Project : 6229   EPI Case # : 0467   N.Y. file #: 18280

Comments:

Page ___ of ___

Brooklyn Union

287 Maspeth Avenue
Brooklyn, NY 11211-1788
718-963-

FAX# 718-963-3026

FAX TRANSMITTAL

DATE:

TIME:

TO: ARTIE DART

COMPANY/BUS. AREA:

FROM: BOB WILSON

COMPANY/BUS. AREA:

NUMBER OF PAGES INCLUDING COVER SHEET: 3

MESSAGE: ARTIE -

THIS WAS FAXED OVER WED. NITE.

RESULTS ARE SUSPECT, PLEASE CALL ME WITH

YOUR THOUGHTS.

THANKYOU

BOB

Enviro-Probe, Inc.

Customer Service: 800-833-3585

3830 Park Avenue
Edison, New Jersey 08820
(908) 494-4600
FAX (908) 494-4611

2917 Bruckner Blvd.
Bronx, New York 10461
(718) 863-0045
FAX: (718) 518-7454

Please Reply To:

ANALYTICAL DATA REPORT FOR LEAD IN AIR SAMPLES

Client's Name: BROOKLYN UNION GAS CO.
Client's Project : Elmhurst Gas Tanks
Analyte: Lead
Matrix: Air
Test Method: NIOSH 7082

Date Received: 09/26/96
Date Analyzed: 09/26/96
Analyzed By: LK
EPI Project #: 6229
EPI Case # : 0467

Client/Field ID	Lab Sample ID #	Total volume(Liter)	Concenteration (mg/m3)
18280 - 01	9606437	1500	*BDL
18280 - 02	9606438	1650	*BDL
18280 - 03	9606439	1650	*BDL
18280 - 04	9606440	[illegible]	*BDL

NOTE: *BDL - Below Detection Limit = 0.06mg/m3

ENVIRO[illegible]OBE, INC.
2917 BRUCKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: MR. BRUCE WILSON
BROOKLYN UNION GAS
7801 57TH AVE
ELMHURST, N.Y.

FILE #: 18280

PROJECT LOCATION: ELMHURST GAS TANKS

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 9-25-96

TURN AROUND 24 HOURS

SAMPLING FOR LEAD:

SAMPLING LOCATIONS:

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID#	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME	RESULT LEAD (mg/m³)
[illegible]	18280 - 01	8.55AM	11.25AM	10		1500	BDL
RIGHT SIDE OF PLAY YARD	18280 — 02	9.35Am	12.20PM	10		1650	BDL
IN PLAY YARD NEAR TOOL SHED	18280 - 03	9.40AM	12.25PM	10		1650	BDL
FIELD BLANK	18280 — 04	—	—	—		—	BDL

FAX RESULTS
963 3026

Ved P. Kukreja, Ph.D
Laboratory Director

Enviro-Probe, Inc.

Customer Service: 800-833-3585

3830 Park Avenue
Edison, New Jersey 08820
(908) 494-4600
FAX (908) 494-4611

2917 Bruckner Blvd.
Bronx, New York 10461
(718) 863-0045
Fax: (718) 518-7454

Please Reply To:

Mr. Robert Wilson
Brooklyn Union Gas Company
287 Maspeth Avenue
Brooklyn, NY 11211

September 26, 1996

Dear Mr. Wilson:

As per your request, Enviro-Probe will provide B.U.G. with a technician to conduct air monitoring for lead at 7801 57th Avenue, Queens. All air samples will be sent to our Edison New Jersey laboratory for analysis within 24 hours. The monitoring work will begin on Friday, September 27 and continue for approximately 3 weeks. Based upon our contract terms, the estimated cost for the monitoring and analytical services will be $6,750.00. This is based upon a $250.00/shift technician fee and $25.00/sample analysis fee.

Please contact our office if you require additional information.

Sincerely,
Enviro-Probe, Inc.

Christopher Zanoni
Senior Project Manager

ENVIRO-PROBE, INC

3830 Park Ave.
Edison N.J. 08820
Phone number : 1 908 494 4500
Fax number : 1 908 494 4611

FAX COVER SHEET

TO : [illegible]

FROM : A KIM [illegible]

DATE : 9-26-96

FAX NUMBER : 718-463-3026

NUMBER OF PAGES INCLUDING FAX COVER SHEET :

Comments :

Elmhurst Gas Tanks Lead Results. All samples are Below detection limit

Enviro-Probe, inc.

Customer Service: 800-833-3585

3830 Park Avenue
Edison, New Jersey 08820
(908) 494-4600
FAX (908) 494-4611

2917 Bruckner Blvd.
Bronx, New York 10461
(718) 863-0045
FAX: (718) 518-7454

Please Reply To:

ANALYTICAL DATA REPORT FOR LEAD IN AIR SAMPLES

Client's Name: BROOKLYN UNION GAS CO.
Client's Project : Elmhurst Gas Tanks
Analyte: Lead
Matrix: Air
Test Method: NIOSH 7082

Date Received: 09/26/96
Date Analyzed: 09/26/96
Analyzed By: LK
EPI Project #: 6229
EPI Case # : 0467

Client/Field ID	Lab Sample ID #	Total volume(Liter)	Concenteration (mg/m3)
18280 - 01	9606437	1500	BDL
18280 - 02	9606438	1650	BDL
18280 - 03	9606439	1650	BDL
18280 - 04	9606440	-	BDL

ENVIRO-PROBE, INC.
2917 BRUCKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: Brooklyn Union Gas Co.
287 Maspeth Ave. Brooklyn.

FILE #: 18280

PROJECT LOCATION: Roof of
S&S Building

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 9.27.96

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID# FIELD ID #	LAB ID #	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
on the roof of building second location (back). #4		9606469	8:20 Am	11:20 Am	10		1800	BDL
on the back roof 10 feet of the door 2 location #8		6470	11:26 Am	2:26 Pm	10		1800	BDL
on the back roof 10 of the door second location #12		6471	2:15 Pm	5:15 Pm	10		1800	BDL

Ved P. Kukreja, Ph.D

ENVIRO-PROBE, INC.
2917 BRUCKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: Brooklyn Union Gas Co.
7801 57 Ave Maspeth Queens
718-963-5421 (Ph)

[illegible] 12300

PROJECT LOCATION: Back yard

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 9-27-96

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID# FIELD ID #	LAB ID #	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
on the wall back yard front to big tank #1	113-1	9606460	8:00 Am	11:00 Am	10		1800	0.0002
in the middle back yard front big tank #2	29-2	6461	8:02 Am	11:02 Am	10		1800	0.0002
20' of the entrance to the back yard [illegible] big tank #3	52-3	6462	8:04 Am	11:10 Am	10		1960	BDL
on the wall back yard front big tank #5	113-5	6463	11:03 Am	2:03 Pm	10		1800	0.0005
on the wall in the middle back yard [illegible] #6	29-6	6464	11:05 Am	2:05 Pm	10		1800	0.0002
20' of the [illegible] #7	52-7	6465	11:07 Am	2:26 Pm	10		1990	0.0004
on the wall back yard front [illegible] #9	113-7	6466	2:05 Pm	5:05 Pm	10		1800	BDL
on the wall middle back yard [illegible] #10	29-10	6467	2:06 Pm	5:06 Pm	10		1800	BDL
20' of the entrance to back yard front big tank #11	52-11	6468	2:15 Pm	6:15 Pm	10		1800	BDL

BDL = Below Detection Limit (0.00006 mg/L)

Sampled by: Fabio Rispoli

Ved P. Kukreja, Ph.D

ENVIR[illegible]ROBE, INC.
2917 BRUCKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: BROOKLYN UNION GAS CO.
7801 57 Ave [illegible]
718-963-5421 (Ph)

FILE #: 18280

PROJECT LOCATION: Buck Yard

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 9.27.96

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID# FIELD ID #	LAB ID #	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
[illegible] to big tank #1	113-1	96-6460	8:00 Am	11:00 Am	10		1800	0.0002
[illegible] back yard [illegible] big tank #2	29-2	6461	8:02 Am	11:02 Am	10		1800	0.0002
20 [illegible] to the back yard [illegible] big tank #3	52-3	6462	8:04 Am	11:20 Am	10		1960	BDL
[illegible] back yard [illegible] big tank #5	113-5	6463	11:03 Am	2:07 Pm	10		1800	0.0005
[illegible] in the middle back yard [illegible] big tank #6	29-6	6464	11:05 Am	2:05 Pm	10		1800	0.0002
20 of the entr[illegible] to the back yard [illegible] big tank #7	52-7	6465	11:07 Am	2:26 Pm	10		1990	0.0004
[illegible] back yard [illegible] to big tank #9	113-9	6466	2:05 Pm	5:05 Pm	10		1800	BDL
[illegible] middle back yard [illegible] big tank #10	29-10	6467	2:06 Pm	5:06 Pm	10		1800	BDL
20 of the enter to back yard [illegible] big tank #11	52-11	6468	2:16 Pm	5:15 Pm	10		1800	BDL

BDL = Below Detection limit (0.00006 mg/L)

Sampled by: Fabio Ripald

Ved P. Kukreja, Ph.D
Laboratory Director

CHAIN OF CUSTODY FORM FOR AREA AIR SAMPLES

ENVIRO-PROBE INC. 3830 Park Ave. Edison,N.J. 08820 Phone: (908) 494-4800 Fax :(908) 494-4811
ENVIRO-PROBE INC. 2817 Bruckner Boulevard,Bronx, N.Y. 10461 Phone:(718)863-0046 Fax:(718) 518-7454

Client's Name: BROO[illegible] CORP
Address: 257 MASPETH AVE City: BROOKLYN State: NY Zip : ______
Phone: 718-963-5421 Fax: 718-963-3026
Client's Project: ______ Site: ______ Contact: BOB
Turnaround time: ______
Sampling address/location: ______
Filter used: Charcoal tube / other : ______
Method : ______
Activity: Preparation ( ) Abatement ( ) Clean-Up ( ) Ambient ( )

#	Sample Lab ID	Field ID	Location	Time ON	Time OFF	Total minutes	Flow rate(l/min)	Total volume(l)	Analysis Request
1	9606460	113-1	on the wall back yard front big tank #1	8:00AM	11:00AM	180	10	1800	[illegible]
2	6461	29-2	on the middle wall back yard front big tank #2	8:02AM	11:02AM	180	10	1800	
3	6462	52-3	20 ft the entrance to back yard front big tank #3	8:04AM	11:20AM	196	10	1960	
4	6463	113-5	on the wall back yard front big tank #5	11:03AM	2:03PM	180	10	1800	
5	6464	29-6	on the wall on the middle back yard front big tank #6	11:05AM	2:05PM	180	10	1800	
6	6465	52-7	20 ft the entrance to the back yard front big tank #7	11:07AM	2:26PM	199	10	1990	
7	6466	113-9	on the wall backyard front big tank #9	2:05PM	5:05PM	180	10	1800	
8	6467	29-10	on the wall in middle backyard front big tank #10	2:10PM	5:10PM	180	10	1800	
9	6468	52-11	20 ft the entrance to back yard front big tank #11	2:15PM	5:15PM	180	10	1800	
10	6469	-	on the roof of building second location (back) #4	8:20AM	11:20AM	180	10	1800	
11	6470	-	on the back roof to [illegible] 2 location #8	11:26AM	2:26PM	180	10	1800	
12	6471	-	on the back roof to [illegible] second location #12	2:15PM	5:15PM	180	10	1800	

Person(s) responsible for sampling:Print ______ Sign ______ Date ______ Time ______

Relinquished by: Print	Sign	Received by: Print	Sign	Company: To relinquish	To receive	Date	Time
[illegible]		S. PUNJ	[illegible]			10/1/96	@ 9AM
							@
							@

EPI Project : 6235 EPI Case # : 0473 N.Y. file #: 18280

Page 1

ENVIRO[illegible]ROBE, INC.
2917 BRUCK[illegible]ER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

[illegible]IENT: BROOKLYN UNION GAS Co.
287 MASPETH Ave. Brooklyn.

FILE #: 18280

[illegible]ROJECT LOCATION: Roof.
S&S building

CONTAMINANT INVESTIGATED: Lead Air Monitoring

[illegible]ATE MONITORED: 9.27.16

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID# FIELD ID#, LAB ID #	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
on the roof of building [illegible] location (front). #4	960469	8:20 Am	11:20 Am	10		1800	BDL
on the back [illegible] of the [illegible] 2 [illegible]. #8	6470	11:26 Am	2:26 Pm	10		1800	BDL
[illegible] of the [illegible] second location. #12	6471	2:15 Pm	5:15 Pm	10		1800	BDL

Ved P. Kukreja, Ph.D
Laboratory Director

EN[illegible]RO-PROBE, INC.
2917 BRUCKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: Brooklyn Union Gas Co.
7801 57 Ave Maspeth Queens

FILE #: 13280

PROJECT LOCATION: Back Yard.

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 9.30.96

SAMPLING LOCATIONS		FIELD #/ LABORATORY ID# FIELD ID #	LAB ID #	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
at the back yard front [illegible]	1	29-1	9606472	7:30 Am	10:30 Am	10		1800	BDL
in the middle backyard [illegible]	2	57-2	6473	7:32 Am	10:32 Am	10		1800	0.0002
[illegible]	3	5-3	6474	7:34 Am	10:34 Am	10		1800	BDL
[illegible]	5	29-5	6475	10:32 Am	1:32 Pm	10		1800	BDL
in the middle [illegible]	6	57-6	6476	10:34 Am	1:34 Pm	10		1800	BDL
[illegible]	7	5-7	6477	10:36 Am	1:36 Pm	10		1800	BDL
in the corner [illegible]	9	29-9	6478	1:33 Pm	4:33 Pm	10		1800	0.0002
in the middle [illegible]	10	57-10	6479	1:35 Pm	4:35 Pm	10		1800	BDL
[illegible] of the [illegible] yard [illegible]	11	5-11	6480	1:37 Pm.	4:37 Pm	10		1800	0.0002

BDL = Below Detection Limit (0.00066 mg/L)

Ved P. Kukreja, Ph.D
Laboratory Director

E[illegible] O-PROBE, INC.
2917 BRUCKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

n GAS Co.
MASPETH QUEENS

FILE #: 19280

.. Yard.

CONTAMINANT INVESTIGATED: Laad Air Monitoring

..96

LOCATIONS		FIELD #/ LABORATORY ID# FIELD ID #	LAB ID#	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
.. big tank	1	29-1	96 6472	7:30 Am	10:30 Am	10		1800	BDL
.. big tank	2	57-2	6473	7:32 Am	10:32 Am	10		1800	0.0002
.. yard front big tank	3	5-3	6474	7:34 Am	10:34 Am	10		1800	BDL
big tank	5	29 5	6475	10:32 Am	1:32 Pm	10		1800	BDL
.. big tank	6	57-6	6476	10:34 Am	1:34 Pm	10		1800	BDL
.. big tank	7	5-7	6477	10:36 Am	1:36 Pm	10		1800	BDL
front big tank	9	29-9	6478	1:33 Pm	4:33 Pm	10		1800	0.0002
front big tank	10	57-10	6479	1:35 Pm	4:35 Pm	10		1800	BDL
front big tank	11	5-11	6480	1:37 Pm.	4:37 Pm	10		1800	0.0002

.w Detection Limit (0.00066 mg/L)

$.06 \frac{mg}{l} = .0006 \frac{ug}{l}$

Ved P. Kukreja, Ph.D
Laboratory Director

Brooklyn Union

287 Maspeth Avenue
Brooklyn, New York 11211
718 963-5420
718 963-3026 Fax

Robert D. Wilson
Director
Laboratory Operations
Technical Services-Laboratory Operations

September 30, 1996

Mr. Julian Monroy
53-46 80th Street
Elmhurst, NY 11373

Dear Mr. Monroy:

Brooklyn Union has performed air monitoring for the presence of lead along our property line adjacent to your home. Results of the abovementioned testing were below detection limits (see attached reports). In addition, per your request, I have included results of previous testing conducted on September 10-11, 1996.

If you have any additional questions or would like to discuss the results, please call me at (718) 963-5420.

Sincerely,

RDW

Robert D. Wilson, CHMM
Laboratory Director
RDW:gw
Attachment

ENVIRO[illegible]OBE, INC.
2917 BRUCKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: Brooklyn Union Gas Co.
7801 57 Ave Maspeth Queens

FILE #: 18280

PROJECT LOCATION: Back Yard.

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 9.30.96

SAMPLING LOCATIONS		FIELD #/ LABORATORY ID# FIELD ID #	LAB ID #	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
at the back yard front big tank	41	29-1	9606472	7:30 A.	10:30 Am	10		1800	BDL
in the middle back yard front big tank	2	57-2	6473	7:32 Am	10:32 Am	10		1800	0.0002
20' of the east of the back yard front big tank	3	5-3	6474	7:34 A.	10:34 A.	10		1800	BDL
on the corner back yard front big tank	5	~~29~~ 6	6475	10:32 Am	1:32 Pm	10		1800	BDL
in the middle back yard front big tank	6	57-6	6476	10:34 Am	1:34 Pm	10		1800	BDL
20' of the east back yard front big tank	7	5-7	6477	10:36 Am	1:36 Pm	10		1800	BDL
in the corner back yard front big tank	9	29-9	6478	1:33 Pm	4:33 Pm	10		1800	0.0002
in the middle back yard front big tank	10	57-10	6479	1:35 Pm	4:35 Pm	10		1800	BDL
20' of the [illegible] back yard front big tank	11	5-11	6480	1:37 Pm.	4:37 Pm	10		1800	0.0002

BDL = Below Detection Limit (0.00006 mg/L)

Ved P. Kukreja, Ph.D
Laboratory Director

ENVIRO ROBE, INC.
2917 BRUCKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: Brooklyn Union Gas [illegible]
287 Maspeth Ave Brooklyn.

FILE #: 18280

PROJECT LOCATION: Roof
S & S Building.

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 9.30.96

SAMPLING LOCATIONS		FIELD #/ LABORATORY ID# FIELD ID #	LAB ID	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME	RESULT LEAD (mg/m³)
Out of the roof, 10 of the door [illegible]	#4	52-8	9606481	7:45 Am	10:45 Am	10		1800	BDL
On the [illegible] roof [illegible] side of S & S Bldg	#8	52-8	6482	10:49 Am	1:47 Pm	10		1800	BDL
On the [illegible] roof [illegible] side of S & S building	#12	52-12	6483	1:50 Pm	4:50 Pm	10		1800	BDL

Ved P. Kukreja, Ph.D
Laboratory Director

ENVIRO-[illegible] BE, INC.
2917 BRUCKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: BROOKLYN UNION GAS
7301 57th Ave MASPETH QUEENS

FILE #: 18280

PROJECT LOCATION: BACK YARD

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 10.1.96

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID#	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
corner back yard front big tank	29 - 1	730 Am	1030 Am	10		1800	BDL
middle back yard front big tank	52 - 2	732 Am	1032 Am	10		1800	BDL
20' of enter to back yard front big tank	57 - 3	734 Am	1034 Am	10		1800	BDL
corner back yard front big tank	29 - 5	[illegible]	[illegible]	10		1800	0.0005
middle back yard front big tank	52 - 6	1033 Am	118 Pm	10		1800	BDL
20' of gate back yard front big tank	57 - 7	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
corner back yard front big tank	29 - 9	133 Pm	433 Pm	10		1800	0.0005
middle back yard front big tank	52 - 10	135 Pm	435 Pm	10		1800	0.0007
20' of gate back yard front big tank	57 - 11	137 Pm	437 Pm	10		1800	0.001

NOTE : B.D.L. - BELOW DETECTION LIMIT = 0.06 mg/L

Ved P. Kukreja, Ph.D
Laboratory Director

ENVIRO-PROBE, INC.
2917 BRUCKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: Brooklyn Union Gas
287 Hispetyha Brooklyn.

FILE #: 18280

PROJECT LOCATION: Roof
S & S Building

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 10.1.96

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID#	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
20' back door on the roof.	265 - 4	744 Am	1044 Am	10		1800	BDL
20' back door on the roof.	265 - 8	1045 Am	145 Pm	10		1800	BDL
20' front door on the roof	265 - 10	150 Pm	450 Pm	10		1800	BDL

NOTE: BDL - BELOW DETECTION LIMIT = 0.06 mg/L

Ved P. Kukreja, Ph.D
Laboratory Director

CHAIN OF CUSTODY FORM FOR AREA AIR SAMPLES

ENVIRO-PROBE,INC.,3930 Park Ave. Edison,N.J. 08820 Phone: (908) 4[illegible] Fax:(908) 494-4811
ENVIRO-PROBE,INC.,2917 Bruckner Boulevard,Bronx, N.Y. 10461 Phone:(718)863-0046 Fax:(718) 518-7454

Client's Name: BROOKLYN UNION GAS CORP. Client's Project: ______ Site: ______
Address: 287, MASPETH AVE. City: BROOKLYN State: NY Zip: ______ Contact: BOB
Phone: 718-963-5421 Fax: 718-963-3026 Turnaround time: ______
Sampling address/location: ______ Filter used: Charcoal tube / other: ______
Activity: Preparation ( ) Abatement ( ) Clean-Up (✓) Ambient ( ) Method: ______

#	Sample Lab ID	Field ID	Sample location	Time ON	Time OFF	Total minutes	Flow rate(avg)l/min	Total volume(l)	Analysis Request
1	9606460	113-1	on the [illegible] backyard front [illegible] Tank #1	8:00AM	11:00AM	180	10	1800	Lead
2	6461	29-2	on the middle wall back yard front big Tank #2	8:02AM	11:02AM	180	10	1800	
3	6462	52-3	20 of the entrance to the backyard front big Tank #3	8:04AM	11:20AM	196	10	1960	
4	6463	113-5	on the wall backyard front big [illegible] #5	11:03AM	2:03PM	180	10	1800	
5	6464	29-6	on the wall in the middle backyard front big Tank #6	11:05AM	2:05PM	180	10	1800	
6	6465	52-7	20 of the entrance to the backyard front big Tank #7	11:07AM	2:26PM	199	10	1990	
7	6466	113-9	on the wall backyard front & big Tank #9	2:05PM	5:05PM	180	10	1800	
8	6467	29-10	on the wall in middle backyard front big Tank #10	2:06PM	5:06PM	180	10	1800	
9	6468	52-11	20 of the entrance to backyard front big Tank #11	2:15PM	5:15PM	180	10	1800	
10	6469	-	on the roof of building second [illegible] (back) #4	8:20AM	11:20AM	180	10	1800	
11	6470	-	on the back roof 10 of [illegible] #8 2 [illegible]	11:26AM	2:26AM	180	10	1800	
12	6471	-	on the back roof [illegible] second [illegible] #12	2:15PM	5:15PM	180	10	1800	

Person(s) responsible for sampling: Print ______ Sign ______ Date ______ Time ______

Relinquished by Print	Relinquished by Sign	Received by Print	Received by Sign	Company To relinquish	Company To receive	Date	Time
[illegible] Box		S. PUNT	[illegible]			10/0/96	9AM

N172

182 80.

CHAIN OF CUSTODY FORM FOR AREA AIR SAMPLES

ENVIRO-PROBE, INC., [illegible] Fax (908) 494-1811
ENVIRO-PROBE, INC., 2917 Bruckner Boulevard, Bronx, N.Y. [illegible] Fax (718) [illegible]

Client's Name: BROOKLYN UNION GAS CORP.
Address: 287 Maspeth Ave City: Brooklyn State: NY
Phone: 718-963-5421 Fax: 718-963-3026
Sampling address/location:
Activity: Preparation ( ) Abatement ( ) Clean-Up ( ) Ambient ( )

Client's Project: N.H. Site:
Zip: Contact: BOB
Turnaround time:
Filter used: Charcoal tube / other :
Method :

#	Sample Lab ID	Field ID	Location	Time ON	Time OFF	Total minutes	Flow rate(l/min)	Total volume(l)	Analysis Request
1	9606484	29-1	Corner Backyard front Big Tank	720AM	1030AM	180	10	1800	Lead
2	6485	52-2	Middle Backyard front Big Tank	732AM	1032AM	180	10	1800	
3	6486	57-3	20' of entr. to backyard front Big Tank	734AM	1034AM	180	10	1800	
4	6487	29-5	Corner Backyard front Big Tank	1031AM	131PM	180	10	1800	
5	6488	52-6	Middle back yard front Big Tank	1033AM	133PM	180	10	1800	
6	6489	57-7	20' of Gate back yard front Big Tank	1035AM	135PM	180	10	1800	
7	6490	29-9	Corner Backyard front Big Tank	133PM	433PM	180	10	1800	
8	6491	52-10	Middle Back yard front Big Tank	135PM	435PM	180	10	1800	
9	6492	57-11	20' of Gate Back yard front Big Tank	137PM	437PM	180	10	1800	
10	6493	265-4	20' back door on the roof	744AM	1044AM	180	10	1800	
11	6494	265-8	20' back door on the roof	1045AM	145PM	180	10	1800	
12	6495	265-10	20' back door on the roof	150PM	450PM	180	10	1800	

Person(s) responsible for sampling: Print Sign: Date: Time:

Relinquished by Print	Relinquished by Sign	Received by Print	Received by Sign	Company To relinquish	Company To receive	Date	Time
Ted Ex		S. PUNT	[illegible]			10/02/96	@ 10:30 am
							@
							@

6235 EPI Case #: 0475 N.Y. file #:

CHAIN OF CUSTODY FORM FOR AREA AIR SAMPLES

ENVIRO-PROBE, INC. 3830 Park Ave. Edison, N.J. 08820 Phone (908) 494-4800 Fax (908) 494-8311

ENVIRO-PROBE, INC. 2917 Bruckner Boulevard, Bronx, N.Y. 10461 Ph (718) 518-0045 Fax (718) 518-7454

Client's Name: BROOKLYN UNION GAS CORP

Address: 287 MASPETH AVE City: BROOKLYN State: NY

Phone: Fax:

Client's Project: NA

Zip:

Site:

Contact:

Turnaround time:

Filter used: Charcoal tube / other:

Method:

Sampling address/location:

Activity: Preparation ( ) Abatement ( ) Clean-Up ( ) Ambient ( )

#	Sample Lab ID	Field ID	Location	Time On	Time OFF	Total minutes	Flow rate(l/min)	Total volume(l)	Analysis Request
1	9606472	29-1	On the back yard front big Tank #1	7:30AM	10:30AM	180	10	1800	None
2	6473	57-2	In the middle back yard front Big Tank #2	7:32AM	10:32AM	180	10	1800	
3	6474	5-3	20' of the exit of the backyard front Big Building #3	7:34AM	10:34AM	180	10	1800	
4	6475	29-5	On the corner backyard front Big Tank 5	10:32AM	1:32PM	180	10	1800	
5	6476	57-6	In the middle back yard front Big Tank 6	10:34AM	1:34PM	180	10	1800	
6	6477	5-7	To exit backyard front Big Tank 7	10:36AM	1:36PM	180	10	1800	
7	6478	29-9	In the corner back yard front Back yard 9	1:33PM	4:33PM	180	10	1800	
8	6479	57-10	In the middle back yard front Big Tank 10	1:35PM	4:35PM	180	10	1800	
9	6480	5-11	3' of the exit of back yard front Big Tank 11	1:37PM	4:37PM	180	10	1800	
10	6481	52-8	out of the roof to of the door #4 (back roof)	7:45AM	10:45AM	180	10	1800	
11	6482	52-8	on the back roof outside of the building #8	10:43AM	1:47PM	181	10	1800	
12	6483	52-12	On the back roof outside of the building #12	1:50PM	4:50PM	180	10	1800	

Person(s) responsible for sampling: Print Sign: Date: Time:

Relinquished by Print	Relinquished by Sign	Received by Print	Received by Sign	Company To relinquish	Company To receive	Date	Time
Drop Box		S. RINJ	[signature]			10/01/96	@ 9AM
							@
							@

0474

N.Y. file #: 18280

ENVIRO-PROBE, INC

[illegible]
Edison [illegible]
Phone number: 1 908 494 4500
Fax number: 1 908 494 4611

FAX COVER SHEET

TO: Brooklyn Union Gas Corp Attn. BOB

FROM: A.K.

DATE: 10/07/96

FAX NUMBER: 10/2[illegible]-960-5026

NUMBER OF PAGES INCLUDING FAX COVER SHEET: 03

Comments: Results of Air Samples for Lead Analysis
Case # 0575

2917 UCKNER BOULEVARD
B NX, N.Y. 10461
(212) 863-0045

CLIENT: BROOKLYN UNION GAS
7801 57th Ave MASPETH QUEENS.

FILE #: 13280

PROJECT LOCATION: BACK YARD

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 10-1-96

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME	RESULT LEAD (mg/m
corner back yard paint big tank	29 - 1	730 Am	1036 Am	10		[illegible]	BDL
middle back yard paint big tank	52 - 2	732 Am	1032 Am	10		[illegible]	BDL
20' of center to back yard paint big tank	57 - 3	734 Am	1034 Am	10		[illegible]	BDL
corner back yard paint big tank	29 - 5	1031 Am	131 Pm	10		[illegible]	[illegible]
middle back yard paint big tank	52 - 6	1033 Am	133 Pm	10		[illegible]	[illegible]
20' of gate back yard paint big tank	57 - 7	1035 Am	135 Pm	10		[illegible]	[illegible]
corner back yard paint big tank	29 - 9	131 Pm	433 Pm	10		[illegible]	[illegible]
middle back yard paint big tank	52 - 10	135 Pm	435 Pm	10		[illegible]	[illegible]
20' of gate back yard paint big tank	57 - 11	137 Pm	437 Pm	10		[illegible]	[illegible]

NOTE: B.D.L. - BELOW DETECTION LIMIT = 0.06 mg/L

Ved P. Kukreja, Ph.
Laboratory Director

2917 [illegible]UCKNER BOULEVARD
B[illegible]NX, N.Y. 10461
(212) 863-0045

FILE #: 18250

CLIENT: BROOKLYN UNION GAS
287 MASPETH Ave BROOKLYN.

PROJECT LOCATION: Roof
S & S Building

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 10.1.96

SAMPLING LOCATIONS	FIELD #/ LABORATORY [illegible]	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME	RESULT LEAD (mg/[illegible])
20' from door on the roof.	265 - 4	7:44 A.	10:44 Am	10		[illegible]	BDL
20' from door on the roof.	265 - 8	10:45 Am	1:45 Pm	10		[illegible]	BDL
20' from door on the ramp.	265 - 10	1:50 P.	4:50 [illegible]	10		[illegible]	BDL

NOTE: BDL - BELOW DETECTION LIMIT = 0.06 mg/L

Ved P. Kukreja, PhD
Laboratory Director

ENVIRO-PROBE, INC.
2917 BR[illegible]KNER BOULEVARD
BRO[illegible], N.Y. 10461
(212) 863-0045

CLIENT: Brooklyn Union Gas.
7801 57 Ave Elmhurst Queens.

FILE #: 18280

PROJECT LOCATION: Back yard
by Grand Ave.

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 10.3.96

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID#	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
in the corner of back yard [illegible]	29 - 1	730 Am	1030 Am	10		1800	BDL
on middle fence [illegible]	52 - 2	732 Am	1032 Am	10		1800	BDL
20 of entrance [illegible] yard [illegible]	57 - 3	734 Am	1034 Am	10		1800	BDL
in the corner of back yard [illegible]	29 - 5	1031 Am	131 Pm	10		1800	BDL
on middle fence [illegible]	52 - 6	1033 Am	132 Pm	10		1800	BDL
20 of [illegible]	57 - 7	1035 Am	135 Pm	10		1800	BDL
in the [illegible]	29 - 9	132 Pm	432 Pm	10		1800	0.003
on middle [illegible]	52 - 10	134 Pm	434 Pm	10		1800	BDL
[illegible]	57 - 11	136 Pm	436 Pm	10		1800	BDL

NOTE: BDL = BELOW DETECTION LIMIT = 0.06 mg/L

Ved P. Kukreja, Ph.D
Laboratory Director

EN[illegible]O-PROBE, INC.
2917 BR[illegible]CKNER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: Brooklyn [illegible]
287 Maspeth [illegible] Brooklyn.

FILE #: 18280

PROJECT LOCATION: Roof
S&S. Building.

CONTAMINANT INVESTIGATED: Lead Air Monitor

DATE MONITORED: 10.3.96

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID#	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
20' of the roof door out side	265 - 4	1045 Am	1045 Pm	1.0		1800	BDL
20' of the roof door out side	265 - 8	1045 Am	145 Pm	1.0		1800	BDL
20' of the roof door out side	265 - 12	150 Pm	450 Pm	1.0		1800	BDL

NOTE: BDL = BELOW DETECTION LIMIT = 0.06 mg/L

Ved P. Kukreja, Ph.D
Laboratory Director

Author: Joseph Littmann at BUGLANG1
Date: 10/4/96 1:44 PM
Priority: Normal
TO: Frances Resheske
TO: Jeanne Bezko
TO: Robert Keller
TO: Robert Loftus
TO: Henry Friediger at BUGLANE1
TO: Robert Wilson at GRNPT01
Subject: Elmhurst Holder Issue- customer complaint
------------------------------------ Message Contents ------------------------------------

I spoke with Gail Brewer @ Mark Green's Office (Public Advocate for NYC) re; customer Monroy. I reviewed all we've done. They don't seem to be taking this too seriously, but I indicated if it escalates on their radar screen, they should call me first before doing anything. She agreed...I'll keep you posted.

ENVIRO-PROBE, INC

3830 Park Ave.
Edison N.J. 08820
Phone number : 1 908 494 4600
Fax number : 1 908 494 4611

FAX COVER SHEET

TO : Bob Wilson

FROM : AKM Mahbubullah

DATE : 9-26-96

FAX NUMBER : 718-943-3026

NUMBER OF PAGES INCLUDING FAX COVER SHEET :

Comments :

Elmhurst Gas Tanks Lead Results - All samples are Below detection limit.

Report date : 10/4/96

ENVIRO-PROBE, INC.
2917 BRU[illegible]ER BOULEVARD
BRONX, N.Y. 10461
(212) 863-0045

CLIENT: MR. BRUCE WILSON
BROOKLYN UNION GAS
7801 57TH AVE
ELMHURST, N.Y.

FILE #: 18280

PROJECT LOCATION: ELMHURST GAS TANKS

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 9.25.96

[illegible] [illegible]

SAMPLING FOR LEAD: [illegible]

SAMPLING LOCATIONS:

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID#	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME	RESULT LEAD (mg/m³)
[illegible]	18280 - 01	[illegible]	[illegible]	10		1500	BDL
RIGHT SIDE OF PLAY YARD	18280 — 02	9.35 AM	[illegible]	10		1650	BDL
IN PLAY YARD NEAR [illegible] SHED	18280 - 03	9.40 AM	[illegible]	10		1650	BDL
FIELD BLANK	18280 — 04	—	—	—		—	BDL

BDL = Below Detection limit = 0.06 mg/m³

[illegible]

[illegible] 3026

Ved P. Kukreja, Ph.D
Laboratory Director

OCT-07-96 MON 14:04

ENVIRO-PROBE, INC

33 ... ...
E... ... CO...
Phone number: (908) 494-4600
Fax number: (908) 494-4611

FAX COVER SHEET

TO: Bob

FROM: A.K.

DATE: 10-7-96

FAX NUMBER: 718-963-3626

NUMBER OF PAGES INCLUDING FAX COVER SHEET: 4

Comments:

Lew... Re...

BRON .Y. 461
(2 3-0045

CLIENT: Brooklyn Union Gas.
7801 57 Ave Elmhurst Queens.

FILE #: 1828

PROJECT LOCATION: Boca yard front
Gas Tanks

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 10.5.96

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID#	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
	29 - 1 / 9606526	720 Am	1026 Am	10		1800	BDL
	52 - 2 / 6527	722 Am	1022 Am	10		1800	BDL
	57 - 3 / 6528	724 Am	1024 Am	10		1800	BDL
	29 - 5 / 6529	1021 Am	121 Pm	10		1800	BDL
	52 - 6 / 6530	1023 Am	123 Pm	10		1800	BDL
	57 - 7 / 6531	1025 Am	125 Pm	10		1800	BDL
	29 - 9 / 6532	112 Pm	412 Pm	10		[illegible]	BDL
	52 - 10 / 6533	114 Pm	[illegible]	10		1800	BDL
	57 - 11 / 6534	116 Pm	426 Pm	10		1800	BDL

NOTE: BDL - BELOW DETECTION LIMIT = 0.06 mg/L

Ved P. Kukreja, Ph.D
Laboratory Director

BRONX, [illegible] Y. [illegible]61
(212) [illegible]-0045

FILE #: 18280

CLIENT: Brooklyn Union Gas
287 Maspeth Av Brooklyn

PROJECT LOCATION: roof
S & S Building

CONTAMINANT INVESTIGATED: Lead Air Monitoring

DATE MONITORED: 10.5.96

SAMPLING LOCATIONS	FIELD #/ LABORATORY ID#	TIME ON	TIME OFF	FLOW RATE	TOTAL LEAD (mg)	TOTAL VOLUME (L)	RESULT LEAD (mg/m³)
20' of the door back roof.	265 - 4/9606535	748 Am	1048 Am	10		1800	BDL
20' of the door back roof.	265 - 8/6536	1048 Am	148 Pm	10		1800	BDL
20' of the door back roof.	265 - 12/6537	148 Pm	448 Pm	10		1800	BDL

NOTE: BDL - BELOW DETECTION LIMIT = 0.06 mg/L

Ved P. Kukreja, Ph.D
Laboratory Director

Brooklyn Union

Laboratory Operations Analysis Report

LEAD IN SOIL

Characteristics and Amounts
BUG Quality Assurance No. 6.02

Client Name: R.WILSON
Area: Gas System Ops.
Matrix: solid

Chemist: A. Gharib
Date Assigned: 04/08/97
Date Completed: 04/15/97

SAMPLES:	TEST PARAMETER(S): LEAD IN SOIL
FLUSHING & STEWART	446 PPM
58-64 78 AVE	396 PPM
85-09 57 AVE	95 PPM
84-03 57 AVE	135 PPM
82-03 57 AVE	369 PPM
79-09 57 AVE	195 PPM

CERTIFIED HAZARDOUS MATERIALS MANAGER
ROBERT D. WILSON
2503
CHMM

LABORATORY DIRECTOR

Appendix K

APPENDIX K

2,000-GALLON GASOLINE UST CLOSURE REPORT

New York State Department of Environmental Conservation
Bureau of Spill Prevention and Response Field Office
222-34 96TH Avenue, Queens Village NY 11429
(718) 776-6080 FAX: (718) 740-6537

John P Cahill
Commissioner

October 27, 1997

Brooklyn Union Gas
287 Maspeth Avenue
Brooklyn, NY 11211-1788

RE: Newtown Service Facility
76-15 57th Avenue
Queens, New York

Ms. Mary E. Casey,

Upon review of the tank closure report, submitted by your consultant "Fanning, Phillips and Molnar," for the above referenced site, it is the feeling of this Department that the results of the investigations show no significant petroleum contamination of the ground or waters of the State of New York. Any remaining contamination does not pose a threat and should biodegrade naturally. The work performed by your contractors was done in a satisfactory manner and meets all Departmental requirements. This Department requires no further action to be taken at this site.

Please be advised that this letter is to serve only as an approval of the nature and extent of the work performed. It **does not exempt the owner** of this property from unforeseen, or future, environmental problems at this site, directly or indirectly related to the contamination source which initiated this work.

I would like to take this opportunity to thank you for your cooperation. If there are any question or problems, please contact me at 718-776-6080.

Sincerely,

Mark C. Tibbe
Env. Eng. Tech. III
Region 2 NYS DEC

cc: Fanning, Phillips and Molnar
File

FANNING, PHILLIPS & MOLNAR
Engineers and Geohydrologists
909 MARCONI AVENUE
RONKONKOMA, NEW YORK 11779

RICHARD FANNING, P. E. (1931-1984)
KEVIN J. PHILLIPS, P. E., Ph.D.
GARY A. MOLNAR, P. E.

516/737-6200
718/767-3337
TELECOPIER 516/737-2410

March 11, 1997

Mr. Tom Heim
Brooklyn Union
One Metro Tech Center
20th Floor
Brooklyn, NY 11201-3850

Re: **Newtown Service Facility**
FP&M Project No. 291-96-10

Dear Mr. Heim:

Enclosed please find one draft copy of the Closure Report for the above-referenced site for your review.

Should you have any questions, please do not hesitate to call.

Very truly yours,

Thomas P. Doriski

Thomas P. Doriski, C.P.G.
Senior Hydrogeologist

TPD:tac
Enclosure

cc: Mary Casey (w/encl)

gm bug newtown Heim

UST CLOSURE REPORT
FOR THE
NEWTOWN SERVICE FACILITY
76-15 57th AVENUE
QUEENS, NEW YORK

PREPARED FOR

BROOKLYN UNION

PREPARED BY

FPM

FANNING, PHILLIPS AND MOLNAR
909 MARCONI AVENUE
RONKONKOMA, NEW YORK 11779

MARCH, 1997

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

SECTION 1.0
INTRODUCTION

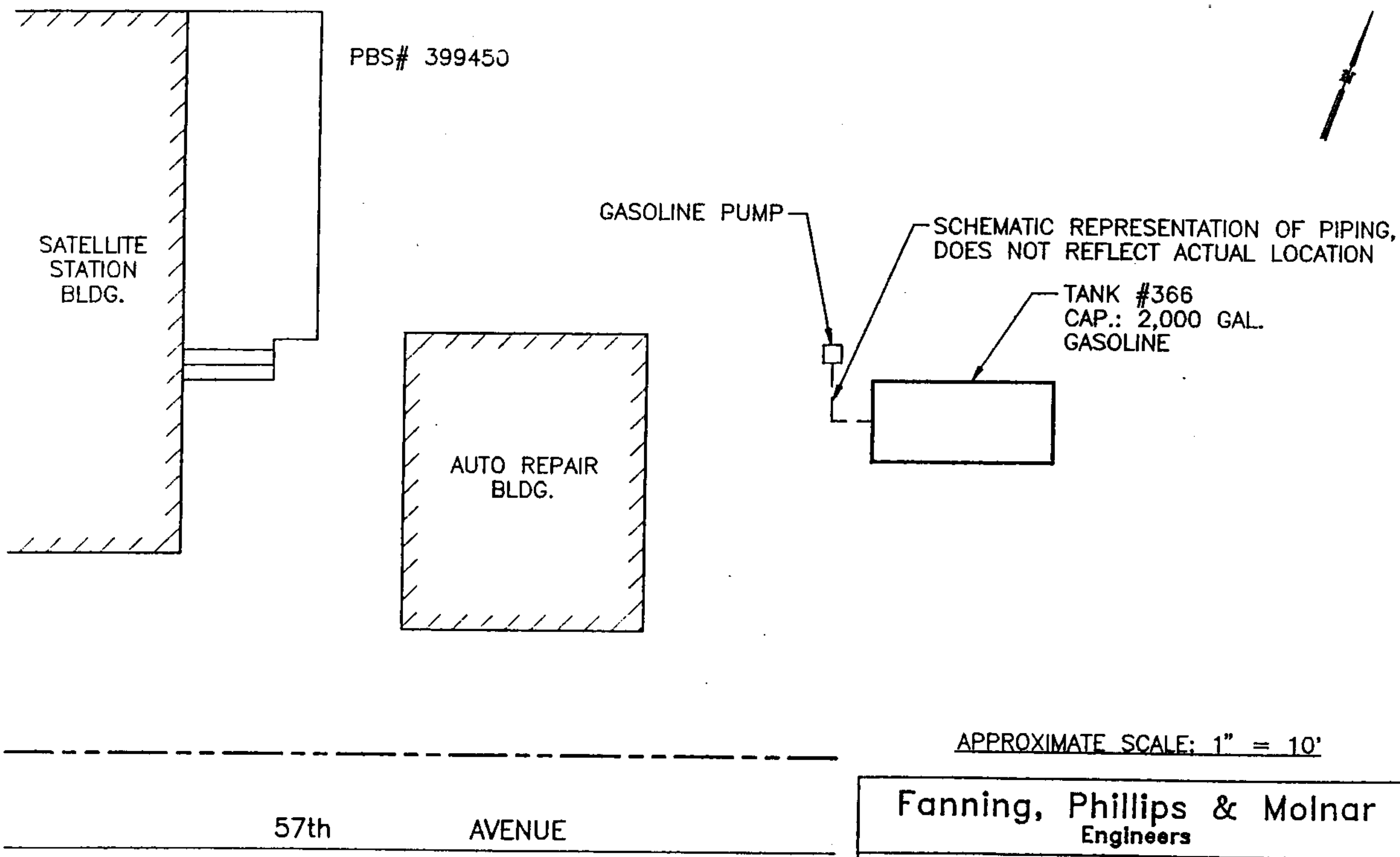
The Newtown Service Facility (see Figure 1.1 for site location) was operated by Brooklyn Union as a maintenance and fueling facility for a portion of the Queens service fleet. The fueling facility was closed in November, 1996 as a part of Brooklyn Union's conversion to compressed natural gas (CNG) and the underground storage tank (UST) was removed as described in this report.

The UST, as shown on Figure 1.2, was a 2,000-gallon gasoline UST (active, empty as of November 25, 1996). FP&M was retained to provide environmental services relating to oversight of the UST removal contract, sampling of soil, and preparation of a final report documenting the UST removal.

The UST closure activities occurred on November 25, 1996. The removal of the UST was performed by Tyree Organization, Ltd. (Tyree) of Farmingdale, New York under contract with Brooklyn Union and included disposal of tank bottom residual liquids. All field activities are documented in the FP&M field report (see Appendix A).

SCALE: 1" = 2,000'

Fanning, Phillips & Molnar Engineers		
FIGURE 1.1 SITE LOCATION MAP BROOKLYN UNION NEWTOWN SERVICE FACILITY		
Drawn By: JDS	Checked By: TD	Date: 2-21-97



APPROXIMATE SCALE: 1" = 10'

Fanning, Phillips & Molnar
Engineers

FIGURE 1.2

UST LOCATION

Drawn By:JDS | Checked By:TD | Date: 2/25/97

SECTION 2.0
PERSONNEL DOCUMENTATION

The following personnel were on site during excavation and removal of the USTs:

Brooklyn Union:	Mr. Tom Heim
Tyree:	Mr. Rick Wright Mr. Rod Rodriquez Mr. Marty Shields
Brown and Davis: (Subcontractor to Tyree)	Mr. Ted Davis Mr. Joseph Dinapoli
Fanning, Phillips & Molnar:	Mr. Thomas Doriski

SECTION 3.0
UST CLOSURE ACTIVITIES

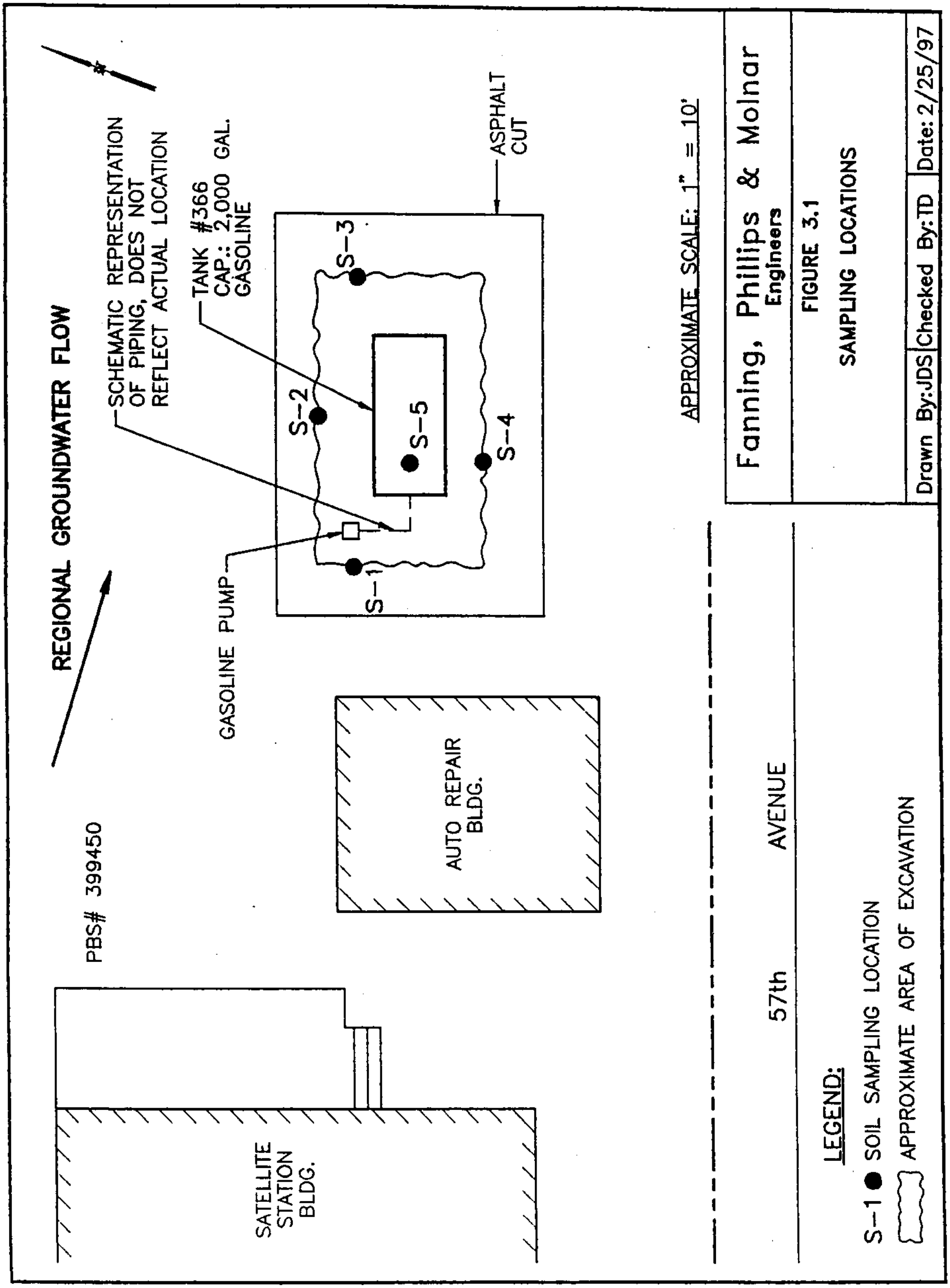
The following subsections describe the UST closure activities. The field report which provides the details of the daily activities is provided in Appendix A. Permits and certificates relating to the UST closure activities are provided in Appendix B. Definitions for the laboratory qualifiers used on the analytical data are included as Appendix C. The analytical data for the end point soil samples is provided in Appendix D. The sampling locations are shown on Figure 3.1, which also provides the approximate dimensions of the excavation.

3.1 Background Information

There was one UST present at the Newtown facility which was located approximately 50 feet east of the east end of the facility building (Figures 1.2 and 3.1). The 2,000-gallon UST (UST number 366) was used for gasoline and was installed in 1977. Prior to its installation, there were no USTs at this location. The UST had a vapor recovery system and corrosion protection and was encased in concrete. This UST was in service until November, 1996. A decision was made to excavate the UST without pre-excavation sampling since there was no indication that the UST had impacted the subsurface environment and there was room at the facility to stockpile soil, if necessary.

3.2 UST/Soil Removal and Endpoint/Groundwater Sampling

UST removal activities commenced on November 25, 1996 and were completed the same day. The field report in Appendix A provides the details of the removal activities. The UST was in excellent condition upon removal from the excavation and the concrete encasement and the soil surrounding the concrete encasement did not appear to be impacted based on visual and PID screening.



REGIONAL GROUNDWATER FLOW
PBS# 399450
SCHEMATIC REPRESENTATION OF PIPING, DOES NOT REFLECT ACTUAL LOCATION
TANK #366 CAP.: 2,000 GAL. GASOLINE
ASPHALT CUT
GASOLINE PUMP
S-1
S-2
S-3
S-4
S-5
AUTO REPAIR BLDG.
SATELLITE STATION BLDG.
57th AVENUE
APPROXIMATE SCALE: 1" = 10'
LEGEND:
S-1 SOIL SAMPLING LOCATION
APPROXIMATE AREA OF EXCAVATION
Fanning, Phillips & Molnar
Engineers
FIGURE 3.1
SAMPLING LOCATIONS
Drawn By:JDS
Checked By:TD
Date: 2/25/97

Endpoint soil samples were taken at the locations shown on Figure 3.1, with S-1 through S-4 serving as sidewall samples near the bottom of the excavation and S-5 as a bottom endpoint sample beneath the concrete encasement. The concrete encasement was broken up to allow drainage.

3.3 Materials Disposal

The materials disposal documentation is provided in Appendix B. The UST and piping, transported by Tyree, was disposed at Charles J. King, Inc. The residual liquid from the UST (20 gallons) was transported by Tyree to their facility for recycling. The UST bottom sludges (one 55-gallon drum) were transported by Chemical Pollution Control, Inc. to their facility for disposal. The concrete removed from the excavation was transported by Broman Trucking to be recycled at their facility. No soil was removed from the site based on the lack of petroleum contamination documented by visual and PID screening.

3.4 Endpoint Soil Sampling Results

The endpoint soil sampling results are summarized in Table 3.4.1. The samples were analyzed for STARS Table 1 compounds since only gasoline was stored at this location. There were no detections of the compounds in the S-1 through S-4 samples. The S-5 sample had one minor detection of methyl tertiary butyl ether (MTBE) at a level of 18 micrograms per kilogram (ug/kg). The STARS TCLP Alternative Guidance Value for MTBE in soil is 1,000 ug/kg. None of the other petroleum analytes on STARS Table 1 were detected at the S-5 location indicating that the minor detection of MTBE is not indicative of a significant impact to the subsurface environment due to petroleum storage activities at the site.

TABLE 3.4.1
ENDPOINT SOIL SAMPLE ANALYTICAL DATA
NEWTOWN FACILITY UST AREA
BROOKLYN UNION
QUEENS, NY

Parameter	S-1	S-2	S-3	S-4	S-5	STARS Alternative Guidance Value
VOCs	ug/kg	ug/kg	ugkg	ug/kg	ug/kg	ug/kg
Benzene	U	U	U	U	U	14
Toluene	U	U	U	U	U	100
Ethylbenzene	U	U	U	U	U	100
M&P Xylenes(Total)	U	U	U	U	U	100
O-Xylene	U	U	U	U	U	100
Isopropylbenzene	U	U	U	U	U	100
P-Isopropyltoluene	U	U	U	U	U	100
Naphthalene	U	U	U	U	U	200
N-Propylbenzene	U	U	U	U	U	100
1,2,4 Trimethylbenzene	U	U	U	U	U	100
1,3,5 Trimethylbenzene	U	U	U	U	U	100
Tert-butylbenzene	U	U	U	U	U	100
Sec-butylbenzene	U	U	U	U	U	100
N-butylbenzene	U	U	U	U	U	100
Xylenes(Total)	U	U	U	U	U	100
Methyl Tertiary Butyl Ether	U	U	U	U	18	1,000

Laboratory qualifers defined in Appendix C
U - Undetected
ug/kg - micrograms per kilogram

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The endpoint samples indicate that there is no impact to the subsurface environment (no concentration above the STARS TCLP Alternative Guidance Values) from the petroleum storage and dispensing that occurred at the site. It does not appear that any further action is warranted.

SECTION 4.0
SUMMARY AND CONCLUSIONS

The UST was removed on November 25, 1996. It was in excellent condition and the concrete encasement and the surrounding soil showed no indication that petroleum operations at this site had impacted the subsurface environment. The analytical results confirmed the negligible impact with the only detectable compound being MTBE at location S-5 (18 ug/kg) which is well below the STARS TCLP Alternative Guidance Value of 1,000 ug/kg for MTBE. No spill number was opened on this UST since there was no petroleum contaminated soil disposal. Based on the above information, no further action is required and the UST project has reached closure in accordance with NYSDEC Petroleum Bulk Storage (PBS) program guidance.

SECTION 5.0
REFERENCES

NYSDEC, 1992. STARS Memo #1. Petroleum Contaminated Soil Guidance Policy. NYSDEC, Division of Construction Management, Bureau of Spill Prevention and Response - August, 1992.

NYSDEC, 1991. SPOTS #14. Site Assessments at Bulk Storage Facilities. NYSDEC, Division of Construction Management - May, 1991.

New York State Government, 1991. 6NYCRR, Article 2, Parts 700-705 and NYSDEC, Division of Water, Technical and Operational Guidance Series (1.1.1) - Ambient Water Quality Standards and Guidance Values.

NYSDEC, 1986. Technical Information Memorandum on Methyl Tertiary Butyl Ether. NYSDEC, Spill Prevention Section - December, 1986.

SECTION 6.0
DISCLAIMER

Conclusions from this data are limited to those areas focused on in the study and represent our best judgment using analytical techniques and our past experience. Even though our investigation has been scientific and thorough, it is possible that certain areas of this site may pose environmental concerns that as yet are undiscovered. In addition, environmental regulations may change in the future and could have an effect on our conclusions.

APPENDIX A

FP&M FIELD REPORT

FIELD REPORT
BROOKLYN UNION
NEWTOWN SERVICE FACILITY
76-15 57th AVENUE

DATE: November 25, 1996

PRESENT:

Tom Heim	Brooklyn Union
Thomas Doriski	Fanning,Phillips & Molnar
Rick Wright	Tyree Environmental
Rod Rodriquez	Tyree Environmental
Marty Shields	Tyree Environmental
Ted Davis	Brown & Davis Excavation
Joe Dinapoli	Brown & Davis Excavation

WEATHER: Cool, (45-55°F), partly cloudy, calm.

OBJECTIVE: To remove the one 2,000-gallon UST at the site and perform environmental sampling and oversight and health and safety oversight.

DETAILS:

Arrived onsite at 0625. Brown and Davis excavator at entrance on low boy trailer. Tyree personnel yet to arrive. The electric gate is open. Walked into site and inspected the UST site with the low boy operator. Joe Dinapoli arrives and the two Brown and Davis employees move the excavator onto the site (0645 to 0700). Tom Heim of Brooklyn Union arrives at approximately 0700. Most of the Tyree personnel arrive at 0725. Tyree was reminded to vac out the dispenser lines prior to any removal work at the tank and line areas. The disassembly of the pumps commenced at 0730. The markout of all utilities was confirmed by Brooklyn Union. Tyree asked if the break up of the concrete pad could proceed prior to the inerting of the tanks. Brooklyn Union and FP&M conferred and gave Tyree approval to proceed. The 2,000-gallon UST and line was vacced out from 0735 to 0755.

FP&M checked the yard for explosive vapors from 0735 until the tank was removed from the ground. All areas were at 0.0 % of the lower explosive limit (LEL) as measured on the CGI throughout this time period. While the pumps were being removed from the product line, absorbent pads were placed at the connection to prevent any liquids from impacting the ground. The pumps were removed from the pump island and loaded onto a Tyree truck by 0800. The vac truck left the site with approximately 20 gallons that had been removed from the tank.

Brown and Davis commenced removal of the concrete pad 0755. Upon removal of the pad and island, Brown and Davis worked on one end of the excavation and Tyree utilized a backhoe at the other end of the excavation to remove the sand overlying the tank encasement. At 0830, FP&M performed a vapor survey of the soil piles excavated by each unit. One soil pile registered from 1.8

to 2.0 ppm on the PID with a background of 1.0 to 1.4 ppm. The other pile registered 1.0 to 1.4 ppm with a background of 1.0 to 1.2 ppm. The soil was visually inspected and showed no evidence of petroleum contamination. There were no odors noted.

After removal of the sand which exposed the top of the encasement and the tank access (vent and product line ports), Tyree commenced adding dry ice to the UST (0930) while Brown and Davis proceeded to change to the hammer to remove the concrete encasement. At 1000, the tank atmosphere still had an unacceptable level of oxygen and gasoline vapors present, so the venturi was placed on the UST and was started to accelerate the process. At 1010, a check was performed of vapors in the yard by CGI around the excavator and downwind of the UST and the venturi. The CGI registered 0.0 % of the LEL. At 1010, Tyree measured the vapor level in the tank as 3 % of the LEL. Brown and Davis proceeded to remove the concrete encasement from around the tank and remove the tank from the excavation. The tank was noted to be in excellent condition with most of the red primer paint still intact on the tank. The tank was placed on the ground and the venturi reinstalled to prevent the regeneration of a hazardous atmosphere in the tank prior to removal of a portion of the tank end to access the interior for cleaning. At 1045 the interior of the tank registered 0.0 % LEL and 19 % oxygen. The venturi was removed and Tyree personnel commenced using air operated tools (drill with hole saw and nibbler) to make an access hole on one end of the tank. When the access hole was completed, Tyree personnel donned confined space level B equipment and cleaned out the tank. At the completion of cleaning, the tank was loaded for disposal at a metal recycling yard.

After removal of the tank, Brown and Davis proceeded to break up the loose concrete into manageable pieces and break holes into the bottom concrete slab that was remaining in place to allow for a bottom endpoint sample. Upon completion, Brown and Davis changed to the bucket while Tyree moved the loose concrete around in the hole to dig out soil under the direction of FP&M at four locations around the excavation perimeter (sidewalls) and bottom for endpoint samples. The following samples were retained at the times indicated:

S-1	1125	West side of the excavation
S-2	1135	North side of the excavation
S-3	1145	East side of the excavation
S-4	1140	South side of the excavation
S-5	1130	Bottom of the excavation (below concrete)

Upon completion of the endpoint sampling, Brown and Davis removed loose concrete from the hole.

After lunch, a Broman truck delivered one load of sand and was loaded with one load of concrete to remove from the site. Brown and Davis and Tyree proceeded to backfill the excavation using the delivered sand and the minimal amount of sand that had been excavated (clean based on visual inspection and PID screening). Broman delivered a load of recyled concrete (blend) for the top of the excavation and left the site empty (all concrete fit on first load). The backfill was compacted by the excavator as each lift was completed. Upon completion of the majority of the backfilling, Brown and Davis departed the site and Tyree completed preparation of the excavation for asphalting by cutting the asphalt and adding the blend to the top. The site was cleaned under the direction of FP&M and upon completion, Tyree departed the site and FP&M put the electric gate back in service as instructed by Tom Heim of Brooklyn Union. FP&M departed the site at approximately 1630 to deliver the samples to Federal Express.

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APPENDIX B

TANK REMOVAL APPLICATION AND PERMIT,
TANK DISPOSAL CERTIFICATES,
AND
RESIDUAL LIQUIDS DISPOSAL CERTIFICATES

Brooklyn Union

One MetroTech Center
Brooklyn, New York 11201-3850

October 9, 1996

Mr. Koon Tang
New York State Department of Environmental Conservation
Petroleum Bulk Storage Unit
Spill Prevention and Response Programs - Region 2
47-40 21st Street
Long Island City, New York 11101

Subject: **Tank Removal Notification - PBS No. 399450**
Brooklyn Union
Newtown Service Station
76-15 57th Avenue, Elmhurst, NY

Dear Mr. Tang:

Please be informed that Brooklyn Union will be retiring one (1) 2,000 gallon gasoline UST (Tank 366), as indicated on the attached notification form. The work is scheduled for the third week of November, 1996 at the above referenced site.

Enclosed is the Petroleum Bulk Storage (PBS) application required for a "substantial tank modification." Brooklyn Union is the owner of the Newtown facility and will perform the tank closure procedure in accordance with 40 CRF Part 280: Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks, as well as other state laws and local ordinances, as applicable.

If you have any questions, please do not hesitate to call me at (718) 403-3088.

Sincerely,

Mary E. Casey

Mary E. Casey
Environmental Engineer

Enclosure
cc: T. Heim, BU
M. Tibbe, NYSDEC

IEA Connecticut
Internal Chain-of-Custody

Client: Fanning

Custody Seal: present / absent
intact / not intact

Field C-O-C: present / absent

IEA Job #: 7096-26298A

Airbill #: FE

Sample #s: 01-05

Locations: 34, 13-5

Laboratory Sample #	Relinquished by	Accepted by	Date	Time	Reason	Relinquished by	Accepted by	Date	Time
1-5	P	Mike Crowe	12/3/96	2245	T/S VOA	Mike Crowe		12/3/96	2310
1-5	C	Bzomyjewski	12/4/96	8:30	VOA	Mike Crowe		12/4/96	2230

IEA Inc. Form# SMF00500.CT

909 MARCONI AVENUE, RONKONKOMA, NEW YORK 11779

(516) 737-6200 (718) 767-3337