FINAL REMEDIAL INVESTIGATION WORK PLAN
Jackson Street Former Manufactured Gas Plant (MGP) Site
Penn Yan, New York

NYSDEC Site #862008
Department Order on Consent #D0-0002-9309

Prepared for:

NYSEG

New York State Electric & Gas
18 Link Drive
Binghamton, NY 13904

Submitted by:

Geomatrix

Geomatrix Consultants. Inc.
90B John Muir Drive, Suite 104
Amherst, NY 14228

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1.0 INTRODUCTION

New York State Electric & Gas Corporation ("NYSEG") retained Geomatrix Consultants, Inc. to prepare this Remedial Investigation (RI) Work Plan for the Jackson Street Former Manufactured Gas Plant (MGP) Site, hereinafter referred to as the "Jackson St. Former MGP Site" or "Site". The Work Plan has been prepared in accordance with the requirements of Administrative Order on Consent Index Number D0-0002-9309 (the "Order") between NYSEG and the New York State Department of Environmental Conservation ("NYSDEC").

This RI Work Plan identifies the means for further characterizing the nature and extent of environmental impact from previous MGP operations at the Site and describes methods to assess the potential for human health and ecological risks under existing and reasonably anticipated future uses of the Site. The Work Plan summarizes site history and site investigation data collected by Atlantic Environmental Services, Inc. ("Atlantic") during site assessments conducted in 1991 and 1993 that pre-date the Order.

The following information is presented in this Work Plan:

- The remainder of Section 1 provides a description of the Site and its location, a summary of the site history, and a review of previous site investigations;
- Section 2 presents the RI scope of work and references the appended Field Sampling Plan and Quality Assurance Project Plan;
- Section 3 describes data compilation and the content of the RI Report; and
- Section 4 presents the schedule to complete the work.

1.1 SITE LOCATION AND DESCRIPTION

The Jackson Street Site is a former MGP located on Linden Street (formerly known as Jackson Street) in the Village of Penn Yan, New York (see Figure 1). The Site is owned by NYSEG

and encompasses approximately 0.7 acres. It is bordered by residential property to the north, the Yates County Correctional Facility to the south, Linden Street to the west, and Jacobs Brook to the east. The Site, which is zoned Residential R-2 and is located near the northern edge of the downtown business district of the Village of Penn Yan, is situated in an area of land use that transitions from residential to commercial. Properties north, east, and west of the Site are residential. Commercial properties exist to the south, in the direction of the Penn Yan business district.

The Site is currently a grass-covered, unoccupied residential lot with several large trees and two garages (wood-construction) situated on the property. The property is readily accessible to the general public from Linden Street. A split rail wood fence demarcates the northern property boundary with the adjacent landowner (111 Linden Street). The property slopes gently to the east in the direction of Jacobs Brook. A line of evergreen trees and remnants of a fence exist at the east end of the property. The line of trees segregates the grass-covered, comparatively flat portion of the Site, from the steep slope to the Brook. The slope of the bank is an approximate 50% grade. The change in elevation from the top of slope to the Brook is approximately 15 feet and is partially vegetated with grasses, brush, and small trees. The steep grade and vegetation general restricts public access to the Site from the east. Some debris and litter was observed on the slope. The Site boundary extends eastward to the centerline of the Brook. East of the Brook and opposite the Site, properties are residential and are topographically lower than the west side of the Brook. The nearest home east of the Brook is located approximately 250 feet from the centerline of the Brook at an elevation that is approximately 10 feet above the Brook's mean surface water elevation.

Jacobs Brook is accessible to the general public through private residential and commercial properties situated on the east side of the Brook. The recreational use of the Brook by the general public is expected to be limited based on access restrictions (requires traversing private property) and the heavily wooded nature of the area paralleling both sides of the Brook. It is possible that older children and adolescents could play, on occasion, in the area of the Brook. The Brook could also be used for fishing (non-game fish). The Brook does not appear to be deep enough to support boating/canoeing/tubing. Correspondence dated December 22, 2006 from the NYSDEC Region 8 Division of Environmental Permits reports the stream classification of Jacobs Brook is Class "C" and is considered non-navigable. Figure 2 shows existing and previous site features and site topography.

1.2 SITE HISTORY

The Site was utilized for manufactured gas production beginning in 1860 by the Penn Yan Gas Light Company. The MGP buildings and structures appear on Sanborn Fire Insurance Maps from 1882 through 1896 (see Appendix A). As shown on Figure 3, MGP operations included one gas holder, a retort building, coal shed and machine shop, and a gas purifying house. Other plant features included two "refuse wells", an underground tank for naphtha storage, and a cistern. According to research conducted by Atlantic, gas was manufactured either directly from naphtha by volatilization in retorts or through a hybrid process involving enrichment of coal gas by the addition of volatilized naphtha. Manufactured gas production ceased between 1897 and 1903. The 1903 Sanborn Map shows only the retort building and a structure labeled as a dwelling; all other structures present on earlier maps are not shown. By 1909, the retort house is not shown on the map and land use appears to be residential based on the presence of the dwelling being the only structure on the property.

Sometime between 1909 and the early 1990's the former MGP site encompassed three separate property parcels. The northern most parcel has been owned by NYSEG for over 60 years (acquiring ownership in 1936). The southern most parcel, formerly owned by Larry and Sherey Mickelson, was acquired by NYSEG in 1993. The third parcel, which contained the garage closest to Linden street was acquired by NYSEG from Steven Lizzi in 1994. Also in 1994, NYSEG razed the dwelling that occupied the property acquired from the Mickelson's. No visible remnants of former MGP structures or the dwelling remain.

Two garages (wood construction) are the only structures remaining on the property. NYSEG currently uses the property for storage of small service equipment and has no future plans for site divestiture or site development.

1.3 SUMMARY OF PREVIOUS INVESTIGATIONS

NYSEG retained Atlantic in the early 1990s to complete a Task I Screening Investigation (Task I Investigation) and a Task II Site Investigation (Task II Investigation). The investigations included the collection and analysis of soil (surface and subsurface), groundwater, surface water, sediment, soil gas, and ambient air samples. This work is summarized in two reports:

- *Jackson Street Manufactured Gas Plant Site Task I Screening Report, Penn Yan New York* dated May 1991; and

- *Jackson Street Manufactured Gas Plant Site Task II Site Investigation Report, Penn Yan New York* dated June 1993.

The Task I and Task II Investigation Reports are included in their entirety in Appendix A. The investigations are briefly summarized below.

Task I Screening Investigation Report

The Task I Investigation included a site reconnaissance, compilation of site history, collection and analysis of environmental samples, and establishment of a site topographic map prepared by a New York State licensed surveyor (S. Y. Kim Land Surveyor, P.C. of Latham, New York). A summary of report findings follows.

No odors or residues potentially associated with historic MGP processes were identified on the grass-covered, flat lying portion of the Site. Gas purifier residue was observed near the base of the steep slope adjacent to Jacobs Brook in the southeast corner of the Site. Tar was not observed at any location. The environmental samples collected during the Task I Investigation included:

- Five composite surface soil samples (discrete samples collected and combined as composite samples from areas covering over 100 square feet each, designated SS-1 through SS-5),

- One discrete surface soil sample (SS-6) collected from the area of gas purifier residual material observed near Jacobs Brook, and

- Three surface water (SW-1, SW-2, and SW-3) and stream sediment samples (SE-1, SE-2, and SE-3) were collected from Jacobs Brook.

Samples were analyzed for a full suite of Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs), metals, and total cyanide using US EPA analytical methods.

VOCs were not detected in the surface soil samples. SVOCs, primarily polycyclic aromatic hydrocarbons (PAHs) were detected in surface soils. Atlantic summarized the detections as follows:

Compound	*SS-1 (mg/kg)*	*SS-2 (mg/kg)*	*SS-3 (mg/kg)*	*SS-4 (mg/kg)*	*SS-5 (mg/kg)*	*SS-6 (mg/kg)*	*SS-7 (mg/kg) **
Total Non-Carcinogenic PAHs	11.60	13.30	17.00	41.00	19.91	1.5	1.5
Total Suspected Carcinogenic PAHs	17.76	16.40	23.72	36.54	11.39	9.28	1.4

Note: * SS-7 was collected off-Site on the adjacent northern property during the Task II Investigation. Atlantic referred to this sample as "background". Soil sample locations are shown in Appendix A.

Inorganic constituents considered by Atlantic to be elevated were: arsenic (9.5 to 15 mg/kg), mercury (<0.133 to 1.5 mg/kg), nickel (not detected to 20 mg/kg) and total cyanide (0.76 to 2,600 mg/kg). The comparatively high concentration of cyanide was detected in sample SS-6 which was collected from the ground surface near the creek bank in the extreme southeast corner of the Site where gas purifier residue was visible on surface soil.

Atlantic collected samples from Jacobs Brook to characterize surface water and sediment quality upstream of the Site (SW-1 and SE-1), downstream of the Site (SW-3 and SE-3) and adjacent to the Site (SW-2 and SE-2). The Atlantic Task I report mentions, "isolated sheens of unknown origin" on surface water in Jacobs Brook near sample locations SW-1 and SW-3. No further details were provided in the report. Analysis of surface water samples collected from the brook did not detect typical MGP indicator parameters (i.e., BTEX, PAHs, and total cyanide). Low concentrations of PAHs were detected in stream bottom sediment samples collected from Jacobs Brook. However, the detections do not appear to be Site related based on the following: 1) MGP indicator parameters BTEX, naphthalene, and cyanide were not detected in any of the sediment samples, and 2) the total PAH concentration detected in the upstream sediment sample (SE-1 - 6.73 mg/kg) was higher than those detected in the samples collected adjacent to the Site (SE-2 – 2.28 mg/kg) and downstream from the Site (SE-3 – 1.56 mg/kg). These results suggest an anthropogenic source upstream from the Site.

Task II Investigation

The Task II Investigation included a more comprehensive assessment of Site media. The Task II Investigation included the following:

- Geophysical surveys (EM-31, GPR, and magnetometer).

- A semi-quantitative soil gas survey using a Photovac portable GC.
- The collection of an off-site surface soil sample ("background") to supplement Task I investigation sampling.
- Test pit excavation and soil observations at five locations near former MGP structures.
- Ambient air quality sampling and analysis during test pit excavations (five samples analyzed for TCL VOCs by Research Triangle Laboratory).
- Completion of 11 soil borings and subsurface soil sample collection and laboratory analysis.
- Monitoring well installation and groundwater sample analysis (six borings finished as stainless steel wells, two finished as PVC piezometers).
- A limited remedial action involving the removal of gas purifier residual material observed on the ground surface in the southeast corner of the Site near Jacobs Brook (soil sample SS-6 contained a total cyanide concentration of 2,600 mg/kg). During the removal, approximately 2 cubic feet of soil were removed by hand shoveling material into a 55-gallon drum from the Jacob Brook creek bank. Post-excavation soil sample results were not collected.

Overall, the site investigations did not identify widespread presence of MGP by-products. Notations of coal tar residuals described in test pits and soil boring logs were limited to a few locations and PID readings were generally not substantially elevated. Blue staining (typically associated with gas purifier by-products) was identified at discrete areas in the subsurface and at one surface location near Jacobs Brook.

Information provided by the geophysical surveys was limited and generally indicated areas containing buried fill. Soil gas analyses did not detect elevated levels of VOCs in soil gas. Quantitative air sampling performed during test pit excavations did not detect chemical constituents in ambient air samples at concentrations above those considered representative of background.

VOCs and PAH concentrations in soil and groundwater were detected above NYSDEC TAGM #4046 Recommended Soil Cleanup Guidance Values ("TAGM values") and New York State Ambient Water Quality Standards and Guidance Values in TOGS 1.1.1 ("Water Quality Criteria") at a limited number of on-Site locations. Eight subsurface soil samples were collected from depths ranging from 8.3 to 26 feet below grade. Samples submitted for laboratory analysis were selected from soils suspected to have chemical impact. Samples were analyzed for a full suite of VOCs, SVOCs, Metals, and total cyanide.

Excluding the samples collected from borings located near the former coal storage and retort buildings (borings BH-1 and BH-2, respectively), total VOC and/or total PAH concentrations were less than 10 mg/kg in soil. Analytical results for two subsurface soil samples collected from off-Site borings MW-3 and MW-5 (collected north and south of the Site, respectively) did not detect elevated concentrations of MGP indicator parameters. The highest concentrations of BTEX and PAHs were detected in native soil immediately below the fill in a soil sample collected from BH-2 near the former retort. Total VOC and PAH concentrations in the sample from BH-2 were 207.66 mg/kg and 1,025.73 mg/kg, respectively. These concentrations were an order of magnitude higher than concentrations detected in soil at BH-1, located east of the retort building. Suspected MGP impacts (tarry sheens and a mild naphthalene odor) were reported in a ten foot interval of native soil below the fill at BH-4; however insufficient soil recovery from the interval precluded laboratory analysis with the exception of TCLP extraction and analyses for benzene and metals. Benzene was not detected and metals concentrations were not detected above regulatory levels. MW-4, BH-1, and BH-2 are located within the vicinity of the former gas purifier house, retort and coal storage area. BH-4 is located south of the gas holder.

Groundwater samples were collected on four separate occasions from two on-Site (MW-1 and MW-4) and three off-Site (MW-2, MW-3A, and MW-5) monitoring wells. Atlantic considered the water levels measured in monitoring well MW-3 to be anomalous, did not collect groundwater samples from that location, and installed well MW-3A as an alternate well location on the adjacent northern property. VOCs, naphthalene, and cyanide (i.e., MGP indicator parameters) were detected above Water Quality Criteria in wells MW-1, MW-3A, and MW-4. MGP indicator parameters were not detected above water quality criteria in wells MW-2 and MW-5 located on the adjacent southern property. The highest concentration of Site-related chemicals were detected in MW-4 where maximum total VOC concentrations were 10.14 mg/L during one of four sampling events (less than 1.0 mg/L during the other three sampling events) and maximum total PAH concentrations were 4.115 mg/L (less than 0.5 mg/L during the other three sampling events).

Sampling locations and tabulated analytical results from these investigations are included in the complete Atlantic Task I and Task II investigation reports included in Appendix A.

1.4 SITE GEOLOGY/HYDROGEOLOGY

The Task II Investigation completed a sufficient number of borings and monitoring wells/piezometers for characterization of site geology and hydrogeology. The deepest boring

(MW-3A) was advanced to a depth of 42 feet below ground surface and did not encounter bedrock. Based on the descriptions of subsurface materials described during the Atlantic investigation, the two uppermost geologic units present at the Site are fill and glacial drift. The fill is present at ground surface across the Site beneath the sod layer and is composed of brick fragments, clinker, ash, coal, and lime in a matrix of silt, sand, and gravel. The thickness of the fill ranges from 1.6 to 12 feet in borings completed at the Site and generally increases in thickness toward the eastern portion of the Site (above the stream bank). It appears that fill material was historically used to level the grade of the properties between Linden Street and Jacobs Brook.

Native soil below the fill is glacial drift and includes materials having different grain sizes and density. Laterally discontinuous layers of "silt and fine sand" and "clay and sand" exist in the western portion of the Site. Dense till was encountered beneath the fill in the eastern portion of the site. An area of medium to coarse sand and gravel was identified in boring MW-3A at depths below the finer grained soils.

Depth to groundwater was measured at depths ranging from eight to 13 feet below ground surface indicating much of the fill is unsaturated. Groundwater flows in an eastward direction toward Jacobs Brook with a horizontal hydraulic gradient of approximately 0.03. Hydraulic conductivity of the saturated zone based on slug testing in monitoring wells is generally low to moderate ranging from 1.0×10^{-6} cm/s (MW-5) to 5.4×10^{-3} cm/s (MW-2) – the lower value is reflective of till and the upper value reflects the silt and sand layer. Groundwater at the Site discharges to Jacobs Brook. Jacobs Brook flows to the south for approximately 1/2 mile before its confluence with the Keuka Lake Outlet.

1.5 WORK PLAN APPROACH

The investigation activities described in this work plan are supplemental to the previous investigations and will generate a combined data set sufficient to:

- Assess the extent of MGP-related by-products identified at the Site;
- Define the nature and extent of chemical constituents in Site media;
- Determine if potential human health and ecological risks are posed by chemical constituent presence at the Site;
- Evaluate the need for additional quantitative Risk Assessment and Feasibility Study for further evaluation and mitigation of potential risks.

The Site investigation team will collect environmental samples in accordance with the rationale and protocols described in Section 2 and the Field Sampling Plan (FSP) presented in Appendix B. USEPA and NYSDEC-approved sample collection and handling techniques will be used throughout the investigation fieldwork and laboratory analyses will be conducted in accordance with the Quality Assurance Project Plan (QAPP) presented in Appendix C.

2.0 REMEDIAL INVESTIGATION FIELD WORK

This section of the RI Work Plan describes the field investigation activities and rationale for implementation. The planned field activities include:

- Completion of a high-resolution electromagnetic (EM) geophysical survey to locate buried MGP structures containing metals that could be associated with MGP byproducts and potentially corroborate former MGP structure locations;
- Completion of test pit excavations to investigate EM anomalies and supplement the previous test pit investigation;
- Collection and analysis of surface soil samples near the Site perimeter to support qualitative risk assessment;
- Collection and analysis of surface and subsurface soil samples near the southeast corner of the Site adjacent to Jacobs Brook to assess the effectiveness of a previous remedial action where gas purifier residual materials were removed;
- Completion of soil borings and collection and analyses of subsurface soil samples to supplement the previous site characterization data;
- Assessment of existing monitoring well integrity for use during the RI;
- Installation of monitoring wells and collection of groundwater samples from new and existing wells to supplement previous groundwater characterization data;
- Characterization and sampling of stream bed sediment in Jacobs Brook;
- Collection and analysis of surface water samples to supplement previous analytical data for Jacobs Brook; and
- Assessment of the potential soil vapor intrusion pathway at the residence located on the adjacent property.

Prior to conducting intrusive field activities, DigSafely New York will be contacted to mark nearby underground utilities. Subsequent to the completion of field activities, a surveyor will field survey sample locations and any other pertinent locations. Ground surface elevations and any required reference elevations will be obtained.

During field activities, work will be completed in accordance with a Site-Specific Health and Safety Plan (HASP) prepared pursuant to 40 CFR 300.150 of the NCP and 29 CFR 1910.120. The HASP will address worker safety and will include monitoring of air in the worker breathing zone using a photoionization detector (PID) and Real-Time Mini-Ram Aerosol

Monitor. Additional perimeter air monitoring during the investigation is described in the Community Air Monitoring Plan (CAMP) presented in Appendix D.

Excess soil and groundwater derived from intrusive field activities (investigation derived waste) will be containerized in DOT-approved 55-gallon steel drums. The drums will be appropriately labeled with the contents, location, and date and staged on-Site at a location selected by NYSEG for off-site transportation and disposal (to be coordinated by NYSEG).

2.1 GEOPHYSICAL SURVEY

The location of former MGP structures will be the target of test pit excavations. Geophysical techniques were employed by Atlantic during the Task II Investigation to locate these structures, but the usefulness of the data to identify previous MGP structure locations was limited. Ground penetrating radar (GPR) results reported signal penetration depths of only 2 to 3 feet due to signal attenuation (likely caused by fine grain soil) and the EM-31 terrain conductivity survey produced low resolution results.

High-resolution electromagnetic (EM) surveys have demonstrated success in the identification of pre-existing MGP structure locations and potential MGP byproduct source areas since many of these features are associated with metallic objects (rebar, metal wall ties for brick, pipes, etc.). Test pit excavation observations reported by Atlantic described metal piping filled with solidified tar in TP-2 and TP-4. This suggests that anomalies identified by a high-resolution electromagnetic survey could be locations of MGP related debris and/or structures. EM anomalies suggesting the location of former foundations or buried piping would, therefore be the target of test pit excavations.

An electromagnetic survey of accessible areas of the Site will be conducted using a GEONICS EM-61 time domain metals detection system. A reference grid will be established across the entire Site prior to data acquisition that will aid in subsequently field locating EM-61 anomalies. A description of the EM-61 survey methods and data presentation techniques are included in the FSP presented in Appendix B.

2.2 TEST PIT EXCAVATIONS

Test pit excavations will be completed near potential former MGP structures as indicated by EM-61 anomalies to supplement five test pits excavated during the Atlantic Task II Investigation. It is planned that at least eight additional test pits (TP6 through TP13) will be excavated during this RI. In the absence of geophysical anomalies, the proposed locations are

as shown on Figure 4. The locations are subject to relocation (to target anomalies) based on interpretation of the electromagnetic geophysical survey. The rationale for relocating test pit locations shown on Figure 4 and the nature of any anomalies targeted will be documented.

If electromagnetic anomalies are identified in areas distant from anticipated former MGP structure locations, additional test pits may be excavated.

Soils and materials encountered during test pit excavations will be examined and logged in accordance with the FSP included in Appendix B. Soil samples will be collected from approximately half of the test pit locations and submitted for laboratory analyses for MGP indicator parameters (see Section 2.7). Soil sample selection will be based on the presence and magnitude of suspected chemical impact from historic MGP operations. Test pits at TP6 and TP13 will be excavated to the bottom of the visible structural remnants of the gas holder.

2.3 SURFACE SOIL SAMPLING

Analyses of five composite surface soil samples (SS-1 through SS-5) and one discrete surface soil sample (SS-6) collected from the Site during the Atlantic Task I Investigation detected PAHs at concentrations above TAGM values and above concentrations detected in sample SS-7. While the existing surface soil data provide an overall assessment of surface soil quality, the usefulness of the data for risk assessment is limited due to sample compositing. An additional nine discrete surface soil samples (DSS1 through DSS9) will be collected from locations situated along the Site perimeter and two discrete samples will be collected from the interior of the Site near the footprint of the former gas holder (DSS10 and DSS11). Four additional discrete surface soil samples (DSS12 through DSS15) will be collected from the western edge of the creek bank in the area where gas purifier residual materials were removed from the Site during the remedial action described in the 1993 Task II Investigation (Appendix A). Samples will be collected from the upper 2-inches of soil below the sod layer from discrete locations shown on Figure 4 in accordance with the FSP presented in Appendix B.

Surface soil samples will be collected and analyzed to characterize potential exposure to chemicals from historic MGP operations on the ground surface. Sample analyses are discussed in Section 2.7.

2.4 SOIL BORINGS

The Atlantic Task II Investigation completed seven borings on the property, two borings on the adjacent property to the south, and two borings on the adjacent property to the north. The

highest concentrations of MGP-related constituents were detected in on-Site subsurface soils in the area of the coal storage area, retort building, and purifier house (borings BH-1 and BH-2 where Total BTEX concentrations are above10 mg/kg and Total PAH concentrations are above 500 mg/kg). MGP residual by-products were described in the native soil below the fill at MW-4 and at BH-4.

An additional nine soil borings will be completed using a truck-mounted drill rig equipped with a pneumatic auto-hammer capable of driving split spoon samplers and/or macrocore samplers. The borings will be drilled and continuously sampled to characterize subsurface soils in accordance with the FSP presented in Appendix B. Borings will be drilled and sampled near the northern site boundary and in the vicinity of former MGP structures to a minimum depth of 40 feet below grade. The locations of seven soil borings (BH6 through BH12) are shown defintively on Figure 5 and two additional borings (not shown on Figure 5) will be established in the field with concurrence from the NYSDEC field representative after EM anomalies are investigated by test pit excavation. Soil borings BH9, BH11, and BH12 will be finished as groundwater monitoring wells (MW2D, MW4D, and MW6) as described in Section 2.5 to assess deeper groundwater quality.

Four additional definitive boring locations are shown on Figure 5. Soil borings (BH13 through BH16) will be advanced and sampled in the vicinity of gas purifier residual material removed by hand shoveling during the Atlantic Task II Investigation. Sampling will assess the vertical extent of any remaining impact in the area. Due to the inability to access that location with a drill rig, the borings will be completed with a hand auger or shovel to a depth of approximately four feet or the maximum feasible depth using hand tools to assess the vertical extent of gas purifier residual material. If gas purifier residual material is observed in a boring, additional borings will be completed to assess the visual lateral and vertical extent of residual material.

Soil samples collected from split spoon samplers, macrocore samplers, and hand augers will be examined and logged in accordance with the FSP presented in Appendix B. Soil boring depths will be determined in the field and will extend through the fill material into the native soil. Soil boring sampling will continue in the native soil until no evidence of suspected MGP residual impact (i.e., visual, odor, or elevated PID readings) is identified in the lower five to six feet of the boring.

One to two soil samples will be collected and analyzed from each soil boring. Where MGP impacts are visible or suspected, one soil sample will be collected from the impacted soil and a

second sample will be collected from a horizon below the potentially impacted zone. The objective of this sampling strategy is to characterize the vertical extent of potential chemical impacts. One or two soil samples (based on field considerations such as strata changes) will be collected from borings without suspected MGP residual impact. The analytical parameter list is summarized in Section 2.7 and detailed in the QAPP presented in Appendix C.

2.5 EXISTING WELL ASSESSMENT AND GROUNDWATER MONITORING WELL INSTALLATION/SAMPLING

Each of the existing monitoring wells installed during the Task II investigation will be located and evaluated for usability during the assessment of groundwater quality. The well integrity will be evaluated by inspecting the surface seal and sounding the bottom depth of the well to compare the measured depth with well installation records. Any accumulated sediment on the bottom of the well will be removed using well development methods described in the FSP presented in Appendix B. The viability of the well will be evaluated by purging the well and monitoring groundwater recovery. Monitoring wells found not to be usable will be decommissioned by overdrilling and tremie-grouting the borehole and will be replaced with a new well having similar screen depth intervals.

New monitoring wells (MW2D, MW4D, and MW-6) will be installed at boring locations described in Section 2.4. These wells will assess deeper groundwater quality at the site and allow the triangulation of the deeper groundwater flow direction (supported by MW3A). A NYSEG survey crew will establish the reference elevation for each existing and new well (using Mean Sea Level as a datum) and tie in the locations to the New York State Plane Coordinate System. The monitoring wells will be installed and developed in accordance with the FSP presented in Appendix B.

One round of groundwater samples will be collected from eight monitoring wells (five existing and three new wells) to supplement the four previous rounds of groundwater analytical data. DNAPL checks will be made and water levels will be recorded during the groundwater sampling event. A second round of water level gauging and DNAPL checks will be conducted within two months after completing the first sampling round to verify water level data and check for potential DNAPL accumulation in wells after groundwater had been pumped from the wells during sampling.

Sample collection procedures are described in the FSP presented in Appendix B. The analytical parameter list is summarized in Section 2.7 and detailed in the QAPP presented in Appendix C.

2.6 SURFACE WATER AND SEDIMENT PROBING AND SAMPLE COLLECTION

Dissolved phase VOCs and cyanide potentially derived from MGP residuals were detected in shallow groundwater (highest concentrations detected at MW-4) and MGP byproducts were identified adjacent to the creek bank. Jacobs Brook is a receptor of groundwater discharge from the Site and will be evaluated for chemical impact in both surface water and sediment.

Several days prior to sampling in the Brook, the sediments in the Brook will be probed with a steel rod along the transect locations shown on Figure 5. Probing will aid in characterizing the density of the sediments and may identify the presence of MGP related byproducts by producing a sheen on the surface water or coating the rod with tar. Areas exhibiting evidence of MGP related byproducts would be target locations for sediment sample collection.

A total of 12 sediment and four surface water samples will be collected from Jacobs Brook at locations bordering the Site as well as locations both upstream and downstream. RI sampling locations are shown on Figure 6. As shown on Figure 6, eight sediment samples will be collected from the Brook at areas upstream of the Site to establish background concentrations of organic (PAHs) and inorganic (metals) constituents in sediment. Five of these samples will be collected distant from outfall pipes observed along the creek bank (appearing to discharge stormwater from residential or commercial properties) on the east and west side of the Brook and three samples will be collected from sediment in close proximity to the outfall pipes. The background samples will be used to determine if the concentration of organic and/or inorganic constituents in sediment across or downstream from the Site have increased significantly due to overland transport or groundwater discharge from the Site.

Sediment probing and sample collection procedures are described in the FSP presented in Appendix B. The analytical parameter list is summarized in Section 2.7 and detailed in the QAPP presented in Appendix C.

2.7 SOIL VAPOR INTRUSION PATHWAY ASSESSMENT

A soil vapor intrusion (SVI) investigation will be conducted at the adjacent residence (111 Linden Street) in accordance with Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH, October 2006). The purpose of the investigation will be to assess

current and potential exposure to volatile organic compounds that could be derived from the Site. Atlantic conducted a semi-quantitative analysis of on-site soil vapor during the Task II Site Investigation and concluded that volatile organic compounds were not a significant concern in on-site soil vapor. Since that time, the approach and methods developed to assess the soil vapor intrusion pathway have evolved which greatly improve the characterization of risk for this potential human exposure pathway. The SVI investigation will involve conducting a pre-sampling building inspection to identify the type of foundation present beneath the structure and potential routes of vapor entry. Following the pre-sampling building inspection, a SVI Investigation Plan will be provided to the NYSDEC that will present the site-specific sampling methodology. Further details are provided in the FSP in Appendix B.

2.8 ENVIRONMENTAL SAMPLE ANALYSES

Environmental samples collected during the RI will be submitted to a New York State Department of Health (NYSDOH) accredited laboratory. At this time, Severn-Trent Laboratories (STL) located in Amherst, New York is expected to perform laboratory analyses. Analytical methods, sample handling, chain of custody procedures, and laboratory protocols are described in QAPP presented in Appendix C. Sample analyses will be conducted in accordance with NYSDEC Analytical Services Protocol (ASP). Field and laboratory QC samples are described in the QAPP. Analytical results generated by the laboratory will be reported using NYSDEC ASP Category B data deliverables. The laboratory-generated data will be validated by Geomatrix and evaluated to assess achievement of data quality objectives described in the QAPP. A Data Usability Summary Report (DUSR) will be prepared to summarize these findings.

The table below presents a summary of environmental sampling program for the RI.

Sampling Activity	*Laboratory Analyses*	*Sample IDs Shown on Figures 4, 5, & 6*	*Number of Samples*
Discrete Surface Soil Sampling from Site Perimeter	TCL SVOCs, TAL Metals, Total Cyanide	DSS1 through DSS11	11
Creek Bank Surface Soil Sampling (Remedial Action Confirmation Sampling)	TCL SVOCs, Total Cyanide	DSS12 through DSS15	4
Creek Bank Shallow Soil Boring Sampling (Remedial Action Confirmation Sampling)	TCL SVOCs, Total Cyanide	BH13 through BH16	4
Test Pit Soil Sampling	MGP indicators	To be determined	Maximum of 4
Soil Boring Subsurface Soil Sampling	MGP indicators	To be determined	Minimum of 9
Groundwater Sampling	TCL VOCs, TCL SVOCs, TAL Metals, Cyanide, MNA parameters	MW1 through MW6 and MW2D and MW4D	8
Surface Water Sampling	TCL VOCs, TCL SVOCs, TAL Metals, Cyanide	Sample IDs not specified	4
Sediment Sampling	TCL VOCs, TCL SVOCs, TAL Metals, Cyanide/ PAHs and TAL Metals (background list)	Sample IDs not specified	4/7 northernmost samples for background list
Soil Vapor Intrusion Sampling	To be determined	To be determined	To be determined
Investigation-Derived Waste Soil	Waste Characterization Sampling as required by the receiving facility	To be determined	1

Note: MGP indicators - BTEX, Naphthalene and other PAHs, and cyanide.
MNA parameters – Dissolved oxygen, Redox, pH, (field measured); Nitrate, Dissolved Ferrous Iron, Sulfate

3.0 DATA EVALUATION AND RI REPORT

Site characterization data from the RI and previous investigations will be compiled and interpreted to: 1) assess the nature and extent of chemical constituents detected in Site media, 2) identify potential chemical constituent migration pathways, and 3) qualitatively assess exposure pathways for human and environmental receptors. A conceptual site model will be developed integrating Site hydrogeologic conditions, chemical constituent presence in Site media, and potential migration pathways.

The exposure pathways analysis will address potential risk to human and environmental receptors utilizing the NYSEG property and surrounding properties. The analysis will include characterizing the exposure setting (including the physical environment and potentially exposed populations) and identifying the means by which an individual may be exposed to constituents originating from a site.

A RI Report will be prepared after evaluation of all site characterization data. The report will include the following information and documentation:

- A description of the Site in its current state;
- Field procedures and methods used to characterize the Site during the RI;
- A discussion of the nature and rationale for any significant variances from the scope of work described in this Work Plan;
- A Data Usability Summary Report;
- Maps showing previous and RI sample locations and tabulated data summaries;
- Soil boring logs, test pit excavation logs, monitoring well construction diagrams, laboratory analytical reports, sampling information and other supportive Site characterization data;
- Discussion of and conclusions regarding the extent and character of environmental impact in the various media being investigated;
- A conceptual site model describing environmental fate and transport of chemical constituents of potential concern at the Site;
- Completion of an exposure pathways assessment to qualitative assess Human Health Risks and a Fish & Wildlife Impact Analysis through Step IIB; and

- Recommendations regarding the performance of Quantitative Risk Assessment and Feasibility Study.

4.0 SCHEDULE AND CITIZEN PARTICIPATION

Following agency approval of the Work Plan, the activities described in the preceding sections will be implemented. NYSEG has prepared a Citizen Participation Plan (submitted to the NYSDEC under separate cover) which describes opportunities for public involvement and an anticipated schedule for public notification of major project elements.

The Department will be provided with two weeks notice before initiating the first on-Site work activity and will be provided with periodic updates regarding field activity scheduling during the course of the investigation. A project schedule is provided below.

RI Activity	***Duration***
Work Plan Approval	Written Notice from Agency
Implementation of Field Activities	8 weeks (1)
Laboratory Sample Analysis	6 weeks
Data Validation	4 weeks
Field/Lab Data Compilation-Interpretation	4 weeks
Preparation of RI Report	8 weeks

Notes:
(1) A second round of water level gauging and DNAPL checks will be conducted outside the duration of "Implementation of Field Activities" but prior to submittal of the RI Report.

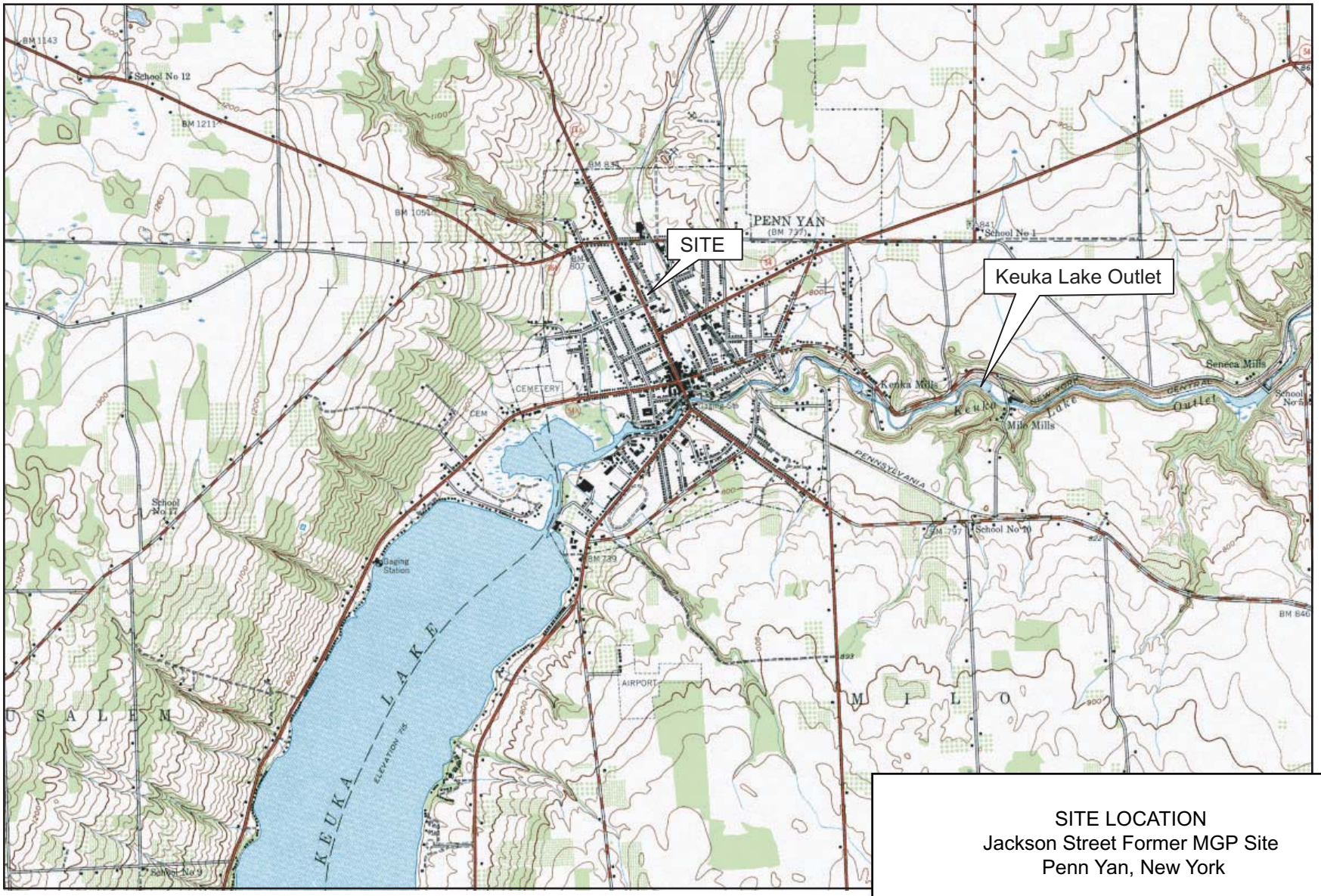
5.0 REFERENCES

1. Atlantic Environmental Services, Inc., "Jackson Street Manufactured Gas Plant Site Task I Screening Report, Penn Yan New York" dated May 1991

2. Atlantic Environmental Services, Inc., "Jackson Street Manufactured Gas Plant Site Task II Site Investigation Report, Pen Yan New York" dated June 1993

3. Order on Consent Index #D0-0002-9309 In the Matter of the Development and Implementation of a Former Manufactured Gas Plant (MGP) Sites Investigation and Remediation Program by NYSEG dated March 30, 1994.

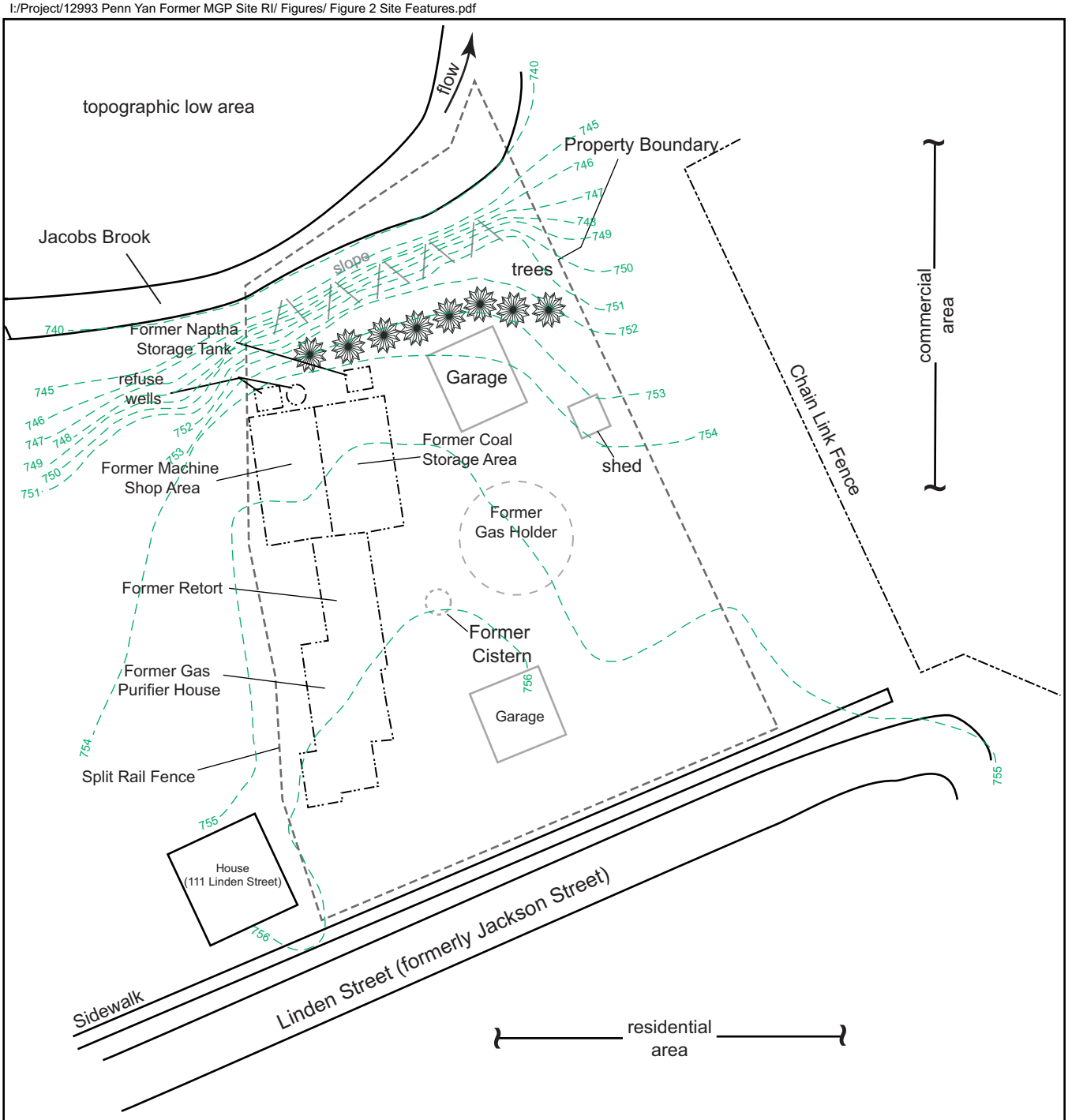
I:/Project/12993 Penn Yan Former MGP Site RI/ Figures/ Figure 1 Site Location Map.pdf



SITE LOCATION
Jackson Street Former MGP Site
Penn Yan, New York

By: MAC	Date: 12/2006	Project No. 12993
Geomatrix		Figure 1

I:/Project/12993 Penn Yan Former MGP Site RI/ Figures/ Figure 2 Site Features.pdf



0 100

SCALE in feet (approximate)

*Note: This basemap is based on Figure 4 appearing in the document entitled "Manufactured Gas Plant Screening Report, Jackson Street Site; Penn Yan, New York, prepared by Atlantic Enviromental Services, Inc, (July 1991) and based on a surveyed Site Plan developed by S.Y. Kim Land Surveyors, Dated 01-16-91. Sampling locations are from the Task II Site Invesitgation Screening Report (Atlantic, 1993).

SITE FEATURES AND TOPOGRAPHY
Jackson Street Former MGP Site
Penn Yan, New York

By: MAC	Date: 12/2006	Project No. 12993.00
Geomatrix		Figure 2

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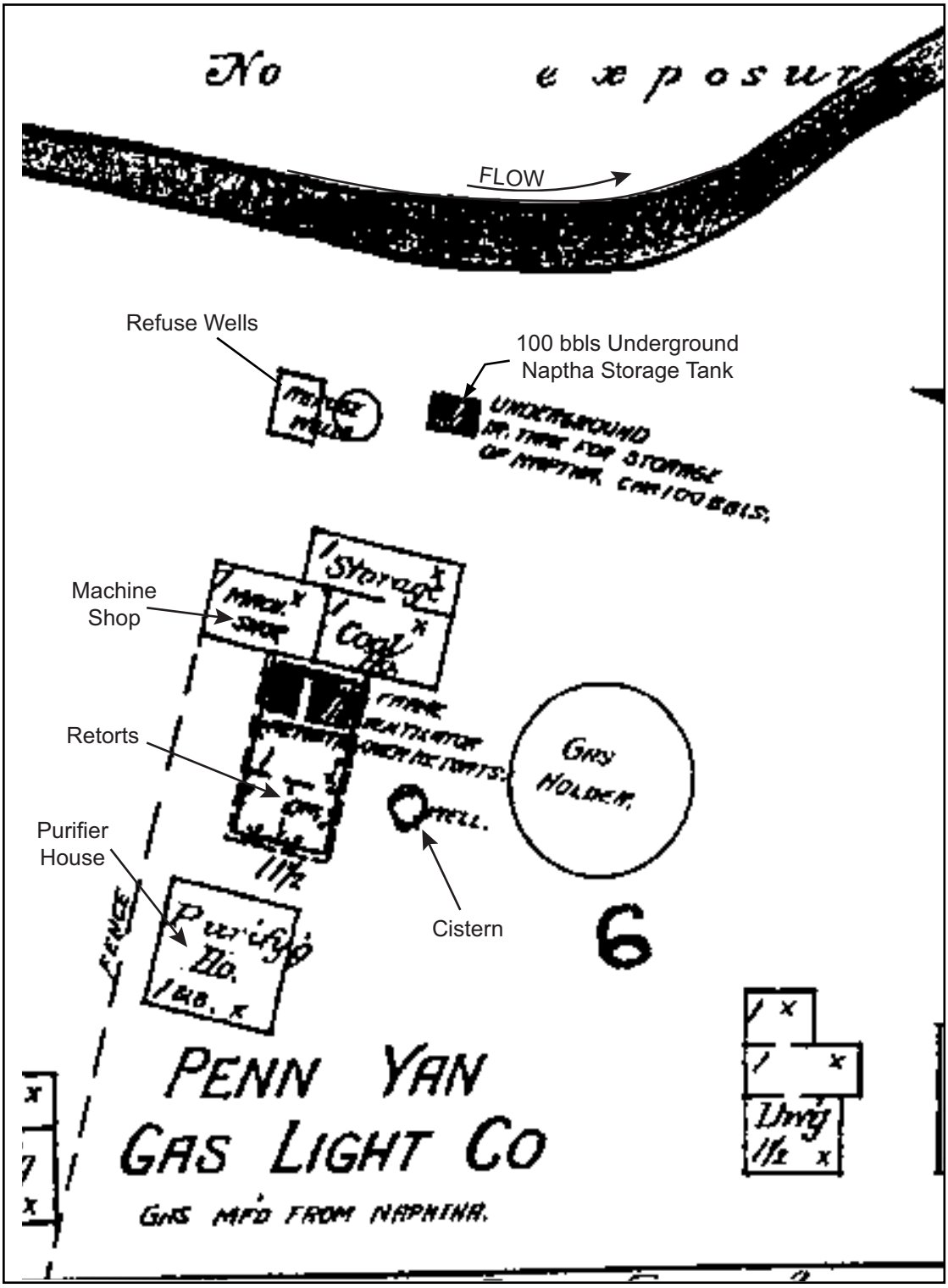


1892 SANBORN FIRE INSURANCE MAP
Jackson Street MGP Site
Penn Yan, New York

By: MAC	Date: 12/2006	Project No. 12993.
Geomatrix		Figure 3

I:/Project/12993 Penn Yan Former MGP Site RI/ Figures/ Figure 4 Proposed TP Locations.pdf

topographic low area

flow

Jacobs Brook

SE-1 SW-1

SE-2 SW-2

SE-3 SW-3

slope

trees

DSS13

DSS12

DSS14

DSS15

Property Boundary

DSS1

DSS9

MW5

Former Naptha Storage Tank

MW4

TP7

refuse wells

TP8

Garage

Asphalt Parking Lot

Chain Link Fence

commercial area

shed

DSS2

DSS8

TP5

TP4

Former Coal Storage Area

BH4

TP6

Former Machine Shop Area

BH1

DSS10

Former Gas Holder

MW3A

MW3

TP10

TP9

TP1

BH3

TP13

Former Retort

TP12

DSS11

BH5

DSS7

BH2

Former Cistern

TP2

Former Gas Purifier House

DSS3

MW2

Garage

TP3

TP11

DSS4

Split Rail Fence

DSS6

MW1

House (111 Linden Street)

DSS5

Sidewalk

Linden Street (formerly Jackson Street)

residential area

EXPLANATION

- MW1 — Task II Monitoring Well Location
- BH2 — Task II Soil Boring Location
- TP2 — Task II Test Pit Location
- Task II Surface Water Sampling Location
- Task II Stream Sediment Sampling Location
- TP9 — Proposed Test Pit Location
- DSS5 — Proposed Discrete Surface Soil Sampling Location

0 100

SCALE in feet (approximate)

* This basemap is based on Figure 4 appearing in the document entitled "Manufactured Gas Plant Screening Report, Jackson Street Site; Penn Yan, New York, prepared by Atlantic Enviromental Services, Inc, (July 1991) and based on a surveyed Site Plan developed by S.Y. Kim Land Surveyors, Dated 01-16-91. Sampling locations are from the Task II Site Invesitgation Screening Report (Atlantic, 1993).

PROPOSED TEST PIT EXCAVATION and SURFACE SOIL SAMPLE LOCATIONS
Jackson Street Former MGP Site
Penn Yan, New York

By: MAC	Date: 8/2007	Project No. 12993.
Geomatrix		Figure 4

I:/Project/12993 Penn Yan Former MGP Site RI/ Figures/ Figure 5 Proposed RI Sampling Locations.pdf

topographic low area

flow

SE-3 SW-3

SE-2 SW-2

SE-1 SW-1

Jacobs Brook

slope

trees

BH13

Property Boundary

BH14

BH16

BH15

MW5

BH12/
MW6

Former Naptha
Storage Tank

MW4

refuse
wells

BH11/
MW4D

Garage

shed

BH7

BH4

TP5

TP4

Former Coal
Storage Area

Former Machine
Shop Area

BH1

BH8

Former
Gas Holder

BH6

MW3A

MW3

TP1

BH3

Former Retort

BH5

Former
Cistern

BH2

TP2

Former Gas
Purifier House

BH10

TP3

Garage

BH9/
MW2D

MW2

Split Rail Fence

MW1

House
(111 Linden Street)

Asphalt Parking Lot

Chain Link Fence

commercial
area

Sidewalk

Linden Street (formerly Jackson Street)

residential
area

EXPLANATION

- MW1 — Task II Monitoring Well Location
- BH2 — Task II Soil Boring Location
- TP2 — Task II Test Pit Location
- Task I Surface Water Sampling Location
- Task I Stream Sediment Sampling Location
- Proposed Soil Boring Location
- Proposed Monitoring Well Location
- Stream Bed Sediment Probing Transect

0 100

SCALE in feet (approximate)

Notes:

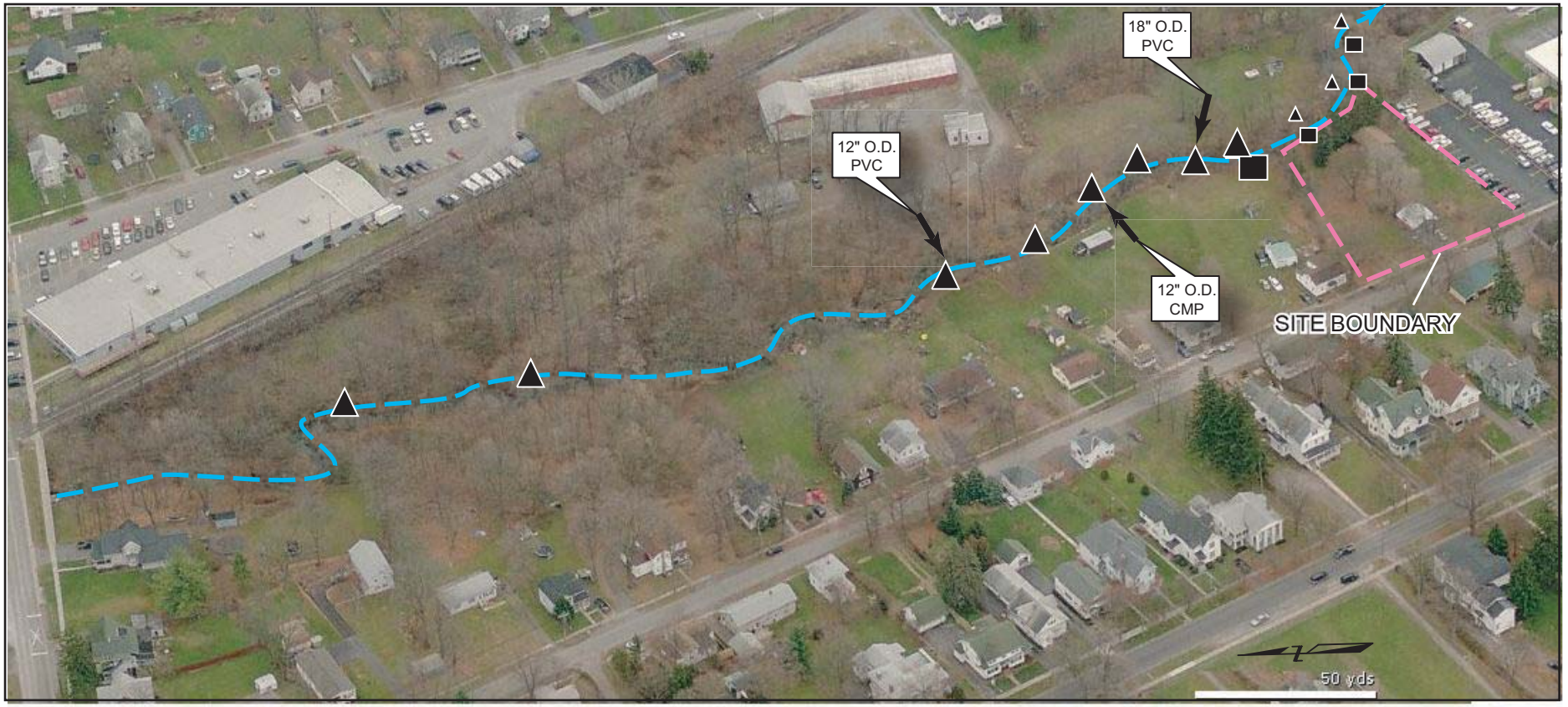
1.) A minimum of five exploratory soil borings will be added to characterize Site conditions. Locations will be agreed upon following test pit excavation.

*This basemap is based on Figure 4 appearing in the document entitled "Manufactured Gas Plant Screening Report, Jackson Street Site; Penn Yan, New York, prepared by Atlantic Enviromental Services, Inc, (July 1991) and based on a surveyed Site Plan developed by S.Y. Kim Land Surveryors, Dated 01-16-91. Sampling locations are from the Task II Site Invesitgation Screening Report (Atlantic, 1993).

PROPOSED SOIL BORING and
MONITORING WELL LOCATIONS
Jackson Street Former MGP Site
Penn Yan, New York

By: MAC	Date: 8/2007	Project No. 12993.
Geomatrix		Figure 5

I:/Project/12993/ Penn Yan Former MGP Site/ Work Plan/ Figures/ Figure 6 Outfall Locations.pdf



EXPLANATION

Known Outfall with Direction of Flow

Approximate Centerline of Jacob's Brook

▲ Proposed Sediment Sampling Location

■ Proposed Surface Water Sampling Location

} Larger symbol size denotes background sample location.

PROPOSED SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS
Jackson Street Former MGP Site
Penn Yan, New York

By: MAC	Date: 7/2007	Project No. 12993
Geomatrix		Figure 6