PROPOSED REMEDIAL ACTION PLAN
Edgewood Warehouse Site
Environmental Restoration Project
Dunkirk, Chautauqua County, New York
Site No. E907032

December 2009

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

A 1996 Clean Water/Clean Air Bond Act
Environmental Restoration Project

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the Edgewood Warehouse Site. The presence of hazardous substances has created threats to human health and/or the environment that are addressed by this proposed remedy.

The 1996 Clean Water/ Clean Air Bond Act provides funding to municipalities for the investigation and cleanup of brownfields. Brownfields are abandoned, idled or under-used properties where redevelopment is complicated by real or perceived environmental contamination. They typically are former industrial or commercial properties where operations may have resulted in environmental contamination. Brownfields often pose not only environmental, but legal and financial burdens on communities. Under the Environmental Restoration Program, the state provides grants to municipalities to reimburse up to 90 percent of eligible costs for site investigation and remediation activities. Once remediated, the property can then be reused.

As more fully described in Sections 3 and 5 of this document, the manufacturing of locomotives and process equipment at this facility have resulted in the disposal of hazardous substances, including:

- Typical degreasing solvents - volatile organic compounds (VOCs);
- Metals from pickling fluids; and
- Semi-volatile organic compounds (SVOCs) from the use of petroleum products and dielectric fluids.

These hazardous substances have contaminated the surface soils, subsurface soils and groundwater at the site, and have resulted in:

- a threat to human health associated with potential exposure to surface soil and soil vapor.

- an environmental threat associated with the current impacts of contaminants to groundwater resources impacted with VOCs.

To eliminate or mitigate these threats, the Department proposes excavation of soil in three areas containing elevated levels of hazardous substances; removal of contaminated wood flooring blocks; removal of contaminated sediments from pits and sumps; placement of clean cover outside the building footprint; in-situ groundwater treatment for VOCs; soil vapor mitigation; and an environmental easement with periodic certification.

The proposed remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference. The Department will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

The Department has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. This document is a summary of the information that can be found in greater detail in the May 2009, "Remedial Investigation (RI) Report", the September 2009, "Alternatives Analysis (AA) Report", and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

Dunkirk Free Library
536 Central Avenue
Dunkirk, NY 14048

Or

David P. Locey
NYSDEC Region 9 Office
270 Michigan Avenue
Buffalo, NY 14203
716-851-7220
Hours by appointment

The Department seeks input from the community on all PRAPs. A public comment period has been set from December 23, 2009 until February 5, 2010 to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for January 20, 2010 at the Dunkirk City Hall beginning at 7 PM.

At the meeting, the results of the RI/AAR will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP. Written comments may also be sent to Mr. David Locey at the above address through February 5, 2010.

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP, based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

SECTION 2: SITE LOCATION AND DESCRIPTION

The project site is located at 320 South Robert Road in the City of Dunkirk, Chautauqua County, as shown on Figure 1. The Edgewood Warehouse Site consists of three parcels that equal approximately 8.0 acres, see Figure 2 (SBL Nos 79.16-2-2, 79.12-4-31, 79.16-2-77 and 79.12-4-32). The Edgewood Warehouse Site is on the east side of South Roberts Road near the intersection of Talcott Street in an industrial/residential setting. This zoned industrial site was formerly part of the American Locomotive Company (ALCO), as were the adjacent NYSDEC sites: the Former Roblin Steel (B00173) and Alumax (V00589) shown on Figure 2. These three NYSDEC sites are currently planned to be redeveloped and would include a new road, the Millennium Parkway, and a new commercial/industrial complex.

Figure 3 shows the layout of the project site, including the on-site structures. The project site is occupied primarily by one remaining structure - a large warehouse building occupying approximately 167,400 square feet. Portions of the building are in poor condition and are expected to be demolished. The remaining portions of the property generally consist of aged asphalt, concrete and gravel parking area.

The project site is bounded to the north by an active CSX rail yard; to the south by an office building; to the east by the Former Roblin Steel Site and Alumax Site; and to the west by South Roberts Road, residential property and Cliffstar Corporation.

The subsurface geology can be divided into four significant units, which are described in descending order as follows:

- Soil/fill material
- Reworked native material
- Lacustrine native material
- Shale bedrock

The soil/fill material on the project site is present as the uppermost unit at the site and varies in thickness from 0 to 7 feet. The composition of this material reflects the various historical operations conducted on the project site. In general, the uppermost soil/fill material primarily consists of five types of material that includes topsoil; clay and sandy soils; brick; railroad materials (i.e. buried railroad ties); slag, construction and demolition debris; and a mixture of soil/fill materials.

A layer of reworked native material was sporadically encountered immediately below the soil/fill material. This was determined to be reworked based on chaotic layering and the presence of materials such as brick, slag, pipes, plastic and metal. This material ranges in thickness up to 8 feet and consists of the native clay soils that were encountered at greater depths throughout the site.

A layer of lacustrine deposits, consisting of clayey silts and silty clay was observed across the entire site during the subsurface investigation. This layer typically ranged in thickness from 1 to 14 feet. The thickest areas of native material were encountered north of the warehouse building. The silty clays were typically gray to tan in color and contained trace shale fragments.

Bedrock core samples at the adjacent Former Roblin Steel Site indicated that the upper most 3 to 5 feet of bedrock is slightly to severely weathered and consists mainly of a dark gray to gray shale.

Storm water drainage on the site primarily occurs by overland flow and infiltration to the subsurface. The on-site drainage and wastewater system are abandoned and not well understood. Limited site utility maps and historical information are available, and interviews with former employees provided little information on the drainage systems. A City of Dunkirk representative provided a historical facility map that depicted a cistern to the south of the eastern portion of the warehouse. This historical map is included as Figure 8. The cistern was not identified during test pit activities.

Groundwater was present in both the soil/fill and native material. Static water levels were measured on October 9, 2008. These measurements and resulting groundwater contours are shown of Figure 6. The depths of groundwater generally ranged from 3 to 12 feet below grade. The groundwater flow direction is generally to the west and northwest towards Lake Erie.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Edgewood Site, formerly part of a larger complex, was owned and operated by ALCO, which first developed the site in 1910. ALCO manufactured locomotives at this complex until 1930, at which time operations were converted to manufacturing process equipment, primarily consisting of heat exchangers, feed water heaters, tunnel shields, pressure vessels and steel pipe, fittings and conduits. During and after World War II, manufacturing operations at the plant were expanded to include military equipment. This equipment included gun carriages, fragmentation bombs, and thrust shafts for naval vessels, missile housings, nozzles, boosters and other components. Following the war, ALCO was contracted by the Atomic Energy Commission to manufacture nuclear reactor components and packaged reactor units. ALCO closed the Dunkirk plant in 1963 due to a combination of labor, union and management problems.

From 1963 until 1966 the site was owned by Progress Park, Inc. whose mission was to facilitate the re-occupation of the shuttered industrial complex. Next the site was occupied by the Plymouth Tube Company and operated there until 1982. The Plymouth Tube Company manufactured stainless steel feed water heater tubes for heat exchangers. During this time period, Canedella Wood Products also occupied the site and manufactured wooden pallets, crates and boxes.

The project site was owned by Edgewood Investments, Inc. which operated a warehouse within the existing main building from 1982 until recent years. The warehouse was used for packaging supplies and equipment from the Fieldbrook Farms Dairy facility. Since approximately 1997, the warehouse also accommodated a few small businesses: a limousine company, a spray-on truck bed liner and a home improvement company. The buildings are currently vacant and owned by Chautauqua County

In the past, the project site also contained another building that housed the facility power plant, a repair shop, a development area for experimental equipment and the plant hospital. That building was demolished in 1988. A second building, presently vacant, is located near the northeastern corner of the property, and appears to be a former scale house associated with the rail access to the industrial complex.

3.2: Remedial History

In 1997, a Phase I Environmental Site Assessment (ESA) Report was prepared to identify potential environmental conditions in connection with the property. In 1999, a Phase II ESA was performed on the project to identify PCB containing electrical equipment and investigate potential sediment, soil and groundwater contamination. The conclusions from this work were:

- Asbestos containing material (ACMs) was present in the warehouse building.
- Contaminated soil/fill and groundwater has been documented on the property.
- Electrical lighting ballast equipment containing polychlorinated biphenyls (PCBs) is likely to be present within the on-site buildings
- Since radiological sources were historically utilized on-site, there is the potential for the presence of radioactive materials
- Contaminated sediment and/or sludge were documented in on-site pits, drains and vaults
- The project site is hydrogeologically downgradient from the adjacent Roblin Steel and Alumax sites, where historic soil and groundwater contamination has been documented.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past owners and operators, waste generators, and haulers.

Since no viable PRPs have been identified, there are currently no ongoing enforcement actions. However, legal action may be initiated at a future date by the state to recover state response costs should PRPs be identified. The County of Chautauqua will assist the state in its efforts by providing all information to the state which identifies PRPs. The County of Chautauqua will also not enter into any agreement regarding response costs without the approval of the Department.

SECTION 5: SITE CONTAMINATION

The County of Chautauqua has recently completed a Remedial Investigation/Alternatives Analysis Report (RI/AAR) to determine the nature and extent of any contamination by hazardous substances at this environmental restoration site.

5.1: Summary of the Site Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between June 2008 and October 2008. The field activities and findings of the investigation are described in the RI report.

For this site the Site Investigation was titled Remedial Investigation (RI). The following tasks were completed during the field investigation:

- Boundary and topographic survey
- Geophysical survey to investigate for buried tanks and other buried structures
- Radiological survey
- Container inventory
- Collection of on-site surface soil/fill samples
- Completion of test pits, test borings and soil probes
- Installation, development and sampling of groundwater monitoring wells
- Evaluation of sumps vaults and pits that were not investigated during previous assessment

5.1.1: Standards, Criteria, and Guidance (SCGs)

Soil Vapor samples were not compared to SCGs because all the remedies includes soil vapor mitigation in any on-site structures and current soil vapor sampling would not be representative of future conditions. To determine whether the soil and groundwater contains contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on the Department's "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the Department's Cleanup Objectives contained in 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs), which can be found in Subpart 6.8,

- Wood block flooring analyzed by TCLP:40 CFR Part 261.24: Maximum Contaminant Levels for Toxicity Characteristic.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized in Section 5.1.2. More complete information can be found in the RI report.

5.1.2: Nature and Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

As described in the RI report, many soil, groundwater and sediment samples were collected to characterize the nature and extent of contamination. As seen in Figures 9 through 13 and summarized in Table 1, the main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and inorganics (metals). For comparison purposes, where applicable, SCGs are provided for each medium.

Chemical concentrations are reported in parts per billion (ppb) for water, waste, soil, and sediment. The exceptions are metals; concentrations detected in waste, soil and sediment are reported in parts per million.

Figures 9 through 13 and Table 1 summarize the degree of contamination for the contaminants of concern in surface and subsurface soil/fill, groundwater, sediments and wood block flooring and compare the data with the Unrestricted SCOs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Surface Soil, depth; 0 to 2 inches

Six soil/fill samples were collected during the Phase II ESA (PH II-SS-1 through PH II-SS-6) and fourteen surface soil/fill samples were collected during the RI (PH II-SS-7 through PH II-SS-20). Each of the surface soil/fill samples collected from the project site were analyzed for TCL SVOCs and PCBs and TAL metals. Additionally, the surface soil/fill samples collected during the Phase II ESA were analyzed for TCL VOCs. Figure 4 shows the sampling locations.

SVOCs, primarily polycyclic aromatic hydrocarbons (PAHs), were detected in each of the surface soil/fill samples, and one or more of the compounds exceeded the Unrestricted SCO in each surface soil/fill sample. For example, benzo(a)pyrene was found at concentrations as high as 180,000 ppb (Unrestricted SCO – 1,000) and exceeded the SCO in 19 of 20 samples. PCBs were detected in nine of the surface soil/fill samples with 8 of the 20 samples exceeding the Unrestricted SCO.

Metals exceeded the Unrestricted SCO in every sample for a minimum of two parameters. Arsenic ranging up to 165 ppm was detected at concentrations that exceeded the Unrestricted SCO in seven samples.

Surface soil contamination identified during the RI/AA will be addressed in the remedy selection process.

Subsurface Soil

Forty-four subsurface soil/fill samples were collected from test pits and soil probes from across the project site to characterize the subsurface soil/fill material. The subsurface soil/fill samples collected from the site were analyzed for one or more of the following: TCL VOCs, SVOCs, and PCBs, and TAL metals. Additionally, eight of these samples were also analyzed for asbestos. Asbestos was not detected in any of the eight samples. The locations of subsurface investigation points are depicted on Figure 5.

Staining and solvent odors were observed in TP-22, SP-6, SP-7, SP-8 and SP-15 and staining and petroleum odors were observed in TP-15, SP-1, SP-14, and SP-15.

Although VOCs were detected in many of the subsurface soil/fill samples, only acetone exceeded the Unrestricted SCO in 11 of the 43 samples (maximum concentration was 2,400 ppb compared to the Unrestricted SCO – 50).

SVOCs were detected in each of the subsurface soil/fill samples, although the concentrations of SVOCs in the subsurface soil/fill samples were typically much lower than in the surface soil/fill samples. For example, benzo(a)pyrene was above the Unrestricted SCO in only 7 of 41 samples with a maximum concentration found of 18,000 ppb (SCO-1,000).

All samples contained two or more metals that exceeded Unrestricted SCOs. It is noted that arsenic ranged up to 122 ppm (SCO – 13 ppm) and mercury ranged up to 7.1 ppm (SCO – 0.18 ppm).

Subsurface soil contamination identified during the RI/AA will be addressed in the remedy selection process.

Groundwater

Sixteen groundwater samples were collected during the Phase II ESA and the RI. The groundwater samples were analyzed for TCL VOCs and SVOCs and TAL metals, and a subset of samples was also analyzed for PCBs.

Prior to the initiation of groundwater sampling an electronic oil/water interface probe was lowered into each monitoring well to evaluate for the presence of light non-aqueous phase liquids (LNAPL) and dense non-aqueous phase liquids (DNAPL). LNAPL and DNAPL layers were not identified in any of the monitoring wells.

One or more VOCs were detected in eight of the sixteen groundwater samples. However, only five monitoring wells (PH II-MW-2, PH II-MW-4, MW-11, MW-12 and MW-13) contained VOC concentrations exceeding the SCGs. SVOCs were detected in five monitoring wells; however, none of the detected concentrations exceeded the SCGs.

One or more metals were detected in each of the sixteen groundwater samples at concentrations exceeding the SCGs. The highest concentrations of metals were detected in samples from PH II-MW-5 and PH II-MW-6, which were collected during the Phase II ESA. PH II-MW-5 was re-sampled during the RI and significantly lower concentrations were detected, indicating that the high metals concentrations detected during the Phase II ESA may have been related to the elevated turbidity levels. Iron, magnesium, manganese, and sodium were also detected in many of the groundwater samples at concentrations exceeding the SCGs. However, these parameters are commonly encountered in uncontaminated, natural environments and are associated more with groundwater aesthetics than toxicity. Thallium was also detected in four of the groundwater at concentrations exceeding SCGs.

Figure 13 shows analytes that exceed groundwater standards and an estimated area of groundwater with elevated concentrations of VOCs.

Groundwater contamination identified during the RI/AA will be addressed in the remedy selection process.

Sediments in Drainage Structures

Six sediment samples were collected during the Phase II ESA and nine sediment samples were collected during the RI from drains, trenches, sumps, pits and the brick incinerator. Each sediment sample was analyzed for TCL VOCs, SVOCs and PCBs as well as TAL metals. The locations of these samples are depicted on Figure 7.

With the exception of PH II-SED-6, at least one VOC was detected in each of the sediment locations. For example, toluene exceeded Unrestricted soil SCOs in two locations (maximum concentration of 480,000 ppb compared to the SCO of 700 ppb). Vinyl chloride also exceeded Unrestricted SCOs in two locations (maximum concentration of 400 ppb compared to the SCO of 20 ppb).

SVOCs were detected in each of the sediment samples. For example, benzo(a)pyrene ranged up to 1,000,000 ppb (SCO – 1,000 ppb) and exceeded the SCO in 12 of 15 sample locations.

PCBs were detected in eleven of the fifteen sediment samples. The maximum value of 40,000 ppb (SCO – 100 ppb) was found in sample PH II-SED-4.

Metals were found in nearly every sample taken with values exceeding the Unrestricted SCOs. Arsenic was found in 9 of 15 samples with a maximum value of 211 ppm (SCO – 13 ppm). Chromium was found in 14 of 15 samples and ranged up to 20,100 ppm (SCO – 30 ppm).

Sediment contamination identified during the RI/AA will be addressed in the remedy selection process.

Soil Vapor

As noted earlier, VOCS were detected in the groundwater at concentrations exceeding SCGs. The groundwater can release these VOCs as a vapor into the overlying soils. This contaminated soil vapor has the potential to accumulate beneath buildings, in quantities which may pose a health risk to the occupants. No soil vapor data was gathered as part of the site investigation but the potential for soil vapors to infiltrate buildings will be evaluated as part of the remedial design and appropriate remedial measures taken if necessary.

Interior Wood Block Flooring

A sample was collected from the wood block flooring (see samples labeled as “FLOOR”) in the warehouse building to determine if the tar adhesive material and tar saturated wood flooring contained elevated SVOCs and/or PCBs. Although the wood block flooring is a building material and not technically a soil, the analytical results were compared to the Part 375 Commercial Soil Cleanup Objectives for evaluation purposes.

SVOCs were detected at concentrations exceeding the Commercial Use SCOs. Based on these analytical results, two additional wood flooring samples (FLOOR-2 and FLOOR-3) were collected and analyzed for

TCLP VOCs, SVOCs, PCBs and metals for disposal profiling purposes. The results from the FLOOR-3 sample indicated the wood block flooring was considered to be hazardous for lead. A second sample collected from the FLOOR-3 location (FLOOR-3RE), confirmed the hazardous characteristics concentration.

An additional eight samples (FLOOR-4 through FLOOR-11) were collected to determine the extent of lead contamination in the wood block flooring. Four of these additional samples exceeded the hazardous characteristic concentration for lead. The locations of these samples and the approximate extent of the contaminated wood block flooring areas are depicted on Figure 7.

Contaminated wood block flooring identified during the RI/AA will be addressed in the remedy selection process.

Asbestos

A pre-demolition asbestos inspection report conducted during the RI indentified substantial quantities of non-friable (approximately 32,045 square feet and 90 linear feet) and limited quantities of friable (approximately 820 linear feet) asbestos containing materials (ACMs) throughout the on-site structures. The friable ACMs that were identified in the warehouse building consisted of pipe and duct flue insulation. The majority of the non-friable ACMs consisted of exterior siding and roofing tar on the warehouse. The remainder of non-friable ACMs consisted of floor tile, piping, wire insulation and caulk.

Asbestos identified during the RI/AA will be addressed in the remedy selection process.

Container Inventory

An inventory identified 91 containers on site, a few were as small as 5 gallons most were 55 gallons in size. Most of the containers were empty or contained what appeared to be trash. Sixteen containers contained a suspect liquid that would require analytical testing prior to disposal. From the oily sheen observed and the labeling on the containers, the contents of the 16 containers are suspected to be petroleum products (e.g used oil, hydraulic fluid or tramission fluid) and food grade materials (e.g. chocolate syrup and apple concentrate).

These containers identified during the RI/AA will be addressed in the remedy selection process.

5.2: <u>Interim Remedial Measures</u>

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/AA. There were no IRMs performed at this site during the RI/AA.

5.3: <u>Summary of Human Exposure Pathways</u>:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 5.3 of the RI report. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

At this site, contamination exists in surface and subsurface soil and groundwater. For a complete exposure pathway to occur, persons would have to come into contact with the contaminated soil or groundwater, or inhale organic vapors, or contaminated dust. Exposure to these media could occur through trespassing, construction, or utility maintenance activities in and around the site. Currently, completed pathways of exposure are for site workers and utility workers entering on-site utilities and structures.

These pathways of exposure are:

- Dermal contact with contaminated surface and subsurface soils, and groundwater; and
- Inhalation of organic vapor and contaminated dust.

The site is located in a mixed residential and industrial area, and is not readily accessible to the public or workers at adjacent businesses. All occupied structures in the area are served by public water. Complete pathways could occur in the future to utility workers or site workers during subsurface construction activities and routine utility work. or to building occupants via soil vapor intrusion.

5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

Site contamination has impacted the groundwater resource in the overburden soils. The types of contaminants detected and concentrations found are reflective of the past usage of the site and adjacent parcels for heavy industrial purposes over a period of nearly 100 years.

Nearly the entire site is occupied by aged asphalt, concrete and gravel parking areas and the abandoned warehouse and smaller suspected scale house building. Due to the recent history of industrial use at the site and adjacent properties, the plant community is not well developed and does not provide an important habitat for terrestrial wildlife. There are no significant wildlife concerns at this site.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS AND PROPOSED USE OF THE SITE

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous substances disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- Exposures of persons at or around the site to SVOC and metals in surface soils;
- The release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and
- The release of contaminants from building sumps and drains into soil and groundwater through discharge of storm water.

Groundwater

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards;
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater; and
- Restore groundwater aquifer to pre-disposal/pre-release conditions.

Soil

- Prevent ingestion/direct contact with contaminated soil;
- Prevent inhalation of, or exposure to contaminated dust from site surface soils; and
- Prevent the release of VOCs from subsurface soil under buildings into indoor air through soil vapor.

Further, the remediation goals for the site include attaining to the extent practicable:

- ambient groundwater quality standards and
- meeting the requirements of 6 NYCRR Part 375 for commercial use.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements. Potential remedial alternatives for the Edgewood Warehouse Site were identified, screened and evaluated in the RA report which is available at the document repositories established for the site.

A summary of the remedial alternatives that were considered for this site is discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated soils and groundwater at the site.

Alternatives 2 through 6 below would require an Environmental Easement and the development and implementation of a Site Management Plan (SMP). Required elements of the SMP include:

- an Institutional Control/Engineering Control (IC/EC) Plan which would detail the requirements to assure that all of controls remain in place and effective;
- a Monitoring Plan describing the measures for monitoring and reportin on the performance and effectiveness of the remedy;
- an Operation and Maintenance (O&M) Plan to inspect, repair and maintain theremedy.

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2 – Exposure Pathway Removal

This alternative would include placing either a six-inch asphalt or concrete paving system or twelve-inch cover soil and the removal of the more significantly contaminated building components. The cover system would be placed over the exposed soil/fill across the property. The most contaminated sediments (SED-7 and SED-8) and the wood block flooring with hazardous levels of lead would be removed from the site. Asbestos-containing building materials and the containers would be removed and properly disposed.

This remedy would allow commercial or industrial redevelopment of the property. The site management plan (SMP) would address future invasive activities at the project site. Long-term monitoring of the cover system would be necessary. In addition to these requirements, the SMP would require the evaluation of the potential for soil vapor intrusion in the existing or any new structures, followed by the installation of a sub-slab depressurization system, if warranted. The environmental easement would include the prohibition on the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Chautauqua County Department of Health. Groundwater monitoring would be conducted at the site.

Present Worth: *$640,000*
Capital Cost: *$470,000*
Annual Costs: *$11,000*

Alternative 3 – Containment

This alternative includes placing either a six-inch asphalt or concrete paving system or twelve-inch soil cover over the entire site outside the building footprint. Additionally, this alternative includes the removal and off-site disposal of all sediments, wood block flooring, asbestos and containers; the in-place closure of all drainage features containing contaminated sediments; and the in-situ treatment of groundwater contamination.

This remedy would allow commercial or industrial redevelopment of the property. The site management plan (SMP) would address future invasive activities at the project site. Long-term monitoring of the cover system would be necessary. In addition to these requirements, the SMP would require the evaluation of the potential for soil vapor intrusion in the existing or any new structures, followed by the installation of a sub-slab depressurization system, if warranted. The environmental easement would include the prohibition on the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Chautauqua County Department of Health. Performance groundwater monitoring would be conducted at the site.

Present Worth: *$870,000*
Capital Cost: *$700,000*
Annual Costs: *$11,000*

Alternative 4 – Limited Excavation

Across the site, the primary contaminants of concern in the soil/fill are SVOCs and metals, However,the subsurface soil/fill sample from test pit TP-22 had the highest concentration of total SVOCs, and also demonstrated petroleum nuisance characteristics (i.e. odors) and elevated total organic vapors during the field screening. Arsenic was detected in test pit TP-4 at a concentration more than six times the arsenic concentration in the next highest sample and at a concentration more than seven times the Industrial Use SCO. Mercury was detected in the subsurface soil/fill and groundwater at slightly elevated concentrations in only a localized area around monitoring well PH-II-MW-6. This alternative includes limited subsurface soil/fill removal (approximately 4,900 cubic yards) from these three contaminated areas (surrounding TP-4, TP-6 and MW-6) that are potentially adversely affecting groundwater quality (see Figure 14). Asix-inch asphalt/ concrete paving system or twelve-inch soil cover over the entire site outside the building footprint would be put into place. Additionally, this alternative includes the removal and off-site disposal of all sediments, wood block flooring, asbestos and containers; the cleaning and in-place closure of all drainage features containing contaminated sediments; and the in-situ treatment of groundwater contamination. This remedy would allow commercial or industrial redevelopment of the property, although a site management plan would be required to address any future invasive activities at the project site. Long-term monitoring would focus on the cover system, and site-wide groundwater quality.,. In addition to these requirements, the SMP would require the evaluation of the potential for soil vapor intrusion in the existing or any new structures, followed by the installation of a sub-slab depressurization system if warranted. Also, the SMP would include the prohibition on the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Chautauqua County Department of Health. Performance groundwater monitoring would be conducted at the site.

Present Worth:..*$1,750,000*
Capital Cost:...*$1,600,000*
Annual Costs:..*$11,000*

Alternative 5 – Excavation

This alternative includes the removal of the surface soil/fill and subsurface soil/fill with concentrations above the Commercial Use SCOs. Additionally, this alternative includes the removal and off-site disposal of all sediments, wood block flooring, asbestos and containers; the cleaning and in-place closure of all drainage features containing contaminated sediments; and the in-situ treatment of groundwater contamination. Soil vapor mitigation controls consisting of a sub-slab depressurization system or vapor barrier would be installed within the existing building as well as any new buildings to eliminate to potential for volatile organic vapor intrusion.

This remedy would allow commercial or industrial redevelopment of the property, although a site management plan (SMP) would be required to address any future invasive activities at the project site. Long-term monitoring would focus on site-wide groundwater. Also, these restrictions would include the prohibition on the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Chautauqua County Department of Health. Performance groundwater monitoring would be conducted at the site. In addition to these requirements, the SMP would require the evaluation of the potential for soil vapor intrusion in the existing or any new structures, followed by the installation of a sub-slab depressurization system if warranted.

Present Worth:..*$4,800,000*
Capital Cost:...*$4,650,000*
Annual Costs:..*$8,700*

Alternative 6 – Pre-Disposal (Unrestricted Use) Cleanup

This alternative is the most comprehensive includes the removal of all soil/fill that exceeds the Unrestricted Use SCOs from the site and the in-situ treatment of groundwater contamination. Additionally, this alternative includes the removal and off-site disposal of all sediments, wood block flooring, asbestos and containers as well as the cleaning and in-place closure of all drainage features containing contaminated sediments. An evaluation would be made of the potential for soil vapor intrusion in the existing or any new structures, followed by the installation of a sub-slab depressurization system if warranted.

This remedy would allow any reuse of the property, although a site management plan would be required. Monitoring would focus on site-wide groundwater quality. Restrictions would include the prohibition on the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Chautauqua County Department of Health. Performance groundwater monitoring would be conducted at the site.
Present Worth: ……………………………………………………………………………$6,900,000
Capital Cost:..$6,800,000
Annual Costs:...$8,700

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of environmental restoration projects in New York A detailed discussion of the evaluation criteria and comparative analysis is included in the RA report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectivness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

This final criterion is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/AAR reports and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 4, Limited Excavation as the remedy for this site. The elements of this remedy are described at the end of this section.

The proposed remedy is based on the results of the RI and the evaluation of alternatives presented in the AAR. Alternative 4 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It would achieve the remediation goals for the site by removing the contaminated soils that pose an exposure pathway to the public and the environment, it would reduce the source of contamination to groundwater, and it would create the conditions needed to restore groundwater quality to the extent practicable. It also best serves the future use of the property by restricting it to commercial use while providing remediation to meet the needs for future development and use. The proposed remedy also outlines requirements for the maintenance of a cover system and annual certification to insure the remedy is protective. Alternatives 2 and 3 would also comply with the threshold selection criteria but to a lesser degree or with lower certainty. Alternatives 5 and 6 would provide greater protection for their intended use, by the complete removal of all contaminated soils on site, but may be more difficult to implement.

Because Alternatives 2, 3, 4, 5 and 6 satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Short Term

Alternative 2 (Exposure Pathway Removal), 3 (Containment), 4 (Limited Excavation), 5 (Excavation) and 6 (Unrestricted Use Cleanup) all have short-term impacts which can easily be controlled using standard engineering practices. The time needed to achieve remediation goals would be longest for Alternative 2 and 3 and somewhat similar for Alternative 4, 5 and 6

Long Term

Achieving long-term effectiveness would be best accomplished by excavation and removal of the contaminated overburden soils (Alternatives 4, 5 and 6). Alternatives 5 and 6 would be favorable because all the contaminated soil would be removed according to either commercial or residential future use. However, the need for property restrictions would still be necessary for all the Alternatives 4, 5 and 6 due to residual contamination in the groundwater and maintenance of a sub-slab depressurization system if one is warranted.

Reduction in Toxicity, Mobility and Volume

Alternatives 4, 5 and 6 have been identified as the most effective alternatives. Alternative 4 would reduce the concentration of contaminants in the groundwater and also within the building components as well remove potential source areas in the subsurface soil. Although Alternative 4 would not completely reduce the toxicity or volume of the contaminated soil, the placement of a cover across the site would limit the mobility of and exposure to the contaminants. Alternatives 5 and 6 would reduce the toxicity, mobility and volume of the contaminants through removal and proper off-site disposal of all the soil that exceeds commercial or unrestricted use SCOs, respectively. Alternatives 4, 5 and 6 would all reduce contaminants in the groundwater with on-site groundwater treatment by enhanced natural attenuation using material such as zero valent iron.

Implementability

While all alternatives are readily implementable, Alternative 5 (Excavation-Commercial) and Alternative 6 (Residential) require the excavation of all the contaminated soil on-site. This may prove difficult due to the extensive and substantial building and structure foundations throughout the property. Alternative 4 would have some implementability issues because of foundation and structures, but because the volume of excavated soil is less the difficulty level would decrease. Alternative 4 would require the removal of approximately 4,900 cubic yards of soil, while Alternative 5 would require the removal of 30,000 cubic yards of soil and Alternative 6 would require 41,500 cubic yards of soil. Alternative 2 and 3 do not require the removal of any soil. Restriction on the use of the property would be required for all the Alternatives; for Alternative 6 the only restriction would be on the use of groundwater.

Cost Effectiveness

The cost of the alternatives varies significantly. Although exposure pathway removal and containment (Alternatives 2 and 3) would be less expensive than excavation (Alternative 4, 5 and 6) they are not permanent remedies. Alternatives 5 and 6 would be favorable because they would be a permanent remedy that would eliminate most of a continuing source of groundwater contamination at the site, however they would be the most costly remedies and their implementability and effectiveness are uncertain. Alternative 4 is proposed for implementation based upon its high degree of overall protection of human health and the environment, as well as its cost effectiveness. This alternative would render the site suitable for the future intended use for commercial or industrial development.

The estimated present worth cost to implement the remedy is $1,750,000. The cost to construct the remedy is estimated to be $1,600,000 and the estimated average annual costs for 30 years is $11,000.

The elements of the proposed remedy are as follows:

1. A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.

2. Limited subsurface soil/fill removal (approximately 4,900 cubic yards) from three contaminated areas (surrounding test pits TP-4 and TP-6, and monitoring well MW-6) that are potentially adversely affecting groundwater quality. The concentrations of SVOCs, arsenic and mercury in these three areas were elevated relative to the concentrations generally found across the site. The limits of the excavations will be defined with post-excavation sampling, extending to the points at which sample concentrations approach typical site levels.

3. The removal and off-site disposal of all sediments in drainage structures, wood block flooring, asbestos and containers; the cleaning and in-place closure of all drainage features containing contaminated sediments; and the in-situ treatment of groundwater contamination.

4. The potential for soil vapor intrusion in the existing or any new structures would be evaluated, followed by the installation of a sub-slab depressurization system if warranted.

5. A soil cover would be constructed over all vegetated areas to prevent exposure to contaminated soils. The one -foot thick cover would consist of clean soil underlain by an indicator such as orange plastic snow fence to demarcate the cover soil from the subsurface soil. The top six inches of soil would be of sufficient quality to support vegetation. Clean soil would constitute soil that meets the Division of Environmental Remediation's criteria for backfill or local site background. Non-vegetated areas (buildings, roadways, parking lots, etc.) would be covered by a paving system or concrete at least 6 inches thick.

6. Imposition of an institutional control in the form of an environmental easement that would require (a) limiting the use and development of the property to commercial use, which would also permit industrial use; (b) compliance with the approved site management plan; (c) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the County health department; and (d) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls.

7. Development of a site management plan which would include the following institutional and engineering controls: (a) management of the final cover system to restrict excavation below the soil cover's demarcation layer, pavement, or buildings. Excavated soil would be tested, properly handled to protect the health and safety of workers and the nearby community, and would be properly managed in a manner acceptable to the Department; (b) continued evaluation of the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; (c) monitoring of groundwater; (d) identification of any use restrictions on the

site; and (e) provisions for the continued proper operation and maintenance of the components of the remedy.

8. The property owner would provide a periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal would: (a) contain certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that would impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

9. The operation of the components of the remedy would continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

Since the remedy results in untreated contaminated materials remaining at the site, a long-term monitoring program would be instituted. Monitoring of the cover system would be implemented. In addition, certification of the sub-slab depressurization system would be performed if an evaluation determined that such a system is warranted. This program would allow the effectiveness of the remedy to be monitored and would be a component of the long-term management for the site.

TABLE 1
Nature and Extent of Contamination
Range of sampling dates: March 1999 to October 2009

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b*] (ppb)[a]	Frequency of Exceeding SCG
Semi-volatile Organic Compounds (SVOCs)	Acenaphthene	110-330,000	20,000	2/20
	Acenaphthylene	270-21,000	100,000	0/20
	Anthracene	140-65,000	100,000	0/20
	Benzo(a)anthracene	1,500-210,000	1,000	19/20
	Benzo(a)pyrene	1,400-180,000	1,000	19/20
	Benzo(b)fluoranthene	2,100-190,000	1,000	19/20
	Benzo(g,h,i)perylene	540-350,000	100,000	1/20
	Benzo(k)fluoranthene	580-98,000	800	17/20
	Indeno(1,2,3-cd)pyrene	820-78,000	500	18/20
	Chrysene	1,500-72,000	1,000	19/20
	Dibenzo(a,h)anthracene	330-170,000	330	11/20
	Fluoranthene	2,500-2,600,000	100,000	4/20
	Fluorene	73-340,000	30,000	1/20
	Naphthalene	200-430,000	12,000	2/20
	Phenanthrene	920-2,100,000	100,000	2/20
	Phenol	550,000	330	1/20
	Pyrene	2,800-2,000,000	100,000	3/20

TABLE 1
Nature and Extent of Contamination (Continued)

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
PCB/Pesticides	Polychlorinated biphenyls	75-2,800	100	8/20
Metals (All values ppm)[a]	Arsenic	5-165	13	7/20
	Barium	59-690	350	2/20
	Berylium	0.35-5.76	7.2	0/20
	Cadmium	0.22-19.9	2.5	5/20
	Chromium	13.1-209	30	14/20
	Copper	17.8-193	50	9/20
	Lead	25.2-558	63	15/20
	Manganese	450-3,000	1,600	6/20
	Mercury	0.0098-0.38	0.18	5/20
	Nickel	11.3-120	30	14/20
	Selenium	0.8-8.1	3.9	3/20
	Silver	0.047-3.3	2	3/20
	Zinc	59.7-1,950	109	18/20

TABLE 1
Nature and Extent of Contamination (Continued)

SUBSURFACE SOIL/FILL	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b*] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Acetone	8.7-2,400	50	11/43
	2-Butanone (MEK)	3.7-110	120	0/43
	Benzene	5.7-7	60	0/43
	Carbon Tetrachloride	7	760	0/43
	Chloroform	8	370	0/43
	Methylene Chloride	9	50	0/43
	Tetrachloroethene	2.7-370	1,300	0/43
	Trichloroethene	3.5-280	470	0/43
	Xylene (Total)	5.2-190	260	0/43
	1,1,1-Trichloroethane	2.6-25	680	0/43
	1,1-Dichloroethane	5.4-22	270	0/43
	1,1-Dichloroethene	8-22	330	0/43
	Ethylbenzene	3.3-17	1,000	0/43
	Toluene	3.8-44	700	0/43
	Vinyl Chloride	2.9-8.5	20	0/43
	cis-1,2-Dichloroethene	3.2-80	250	0/43
Semi-Volatile Organic Compounds	Acenaphthene	51-6,800	20,000	0/41
	Acenaphthylene	45-3,600	100,000	0/41
	Anthracene	41-13,000	100,000	0/41
	Benzo(a)anthracene	45-21,000	1,000	7/41
	Benzo(a)pyrene	40-18,000	1,000	7/41
	Benzo(b)fluoranthene	45-29,000	1,000	9/41
	Benzo(g,h,i)perylene	64-4,500	100,000	0/41
	Benzo(k)fluoranthene	52-12,000	800	7/41

TABLE 1
Nature and Extent of Contamination (Continued)

SUBSURFACE SOIL/FILL	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b*] (ppb)[a]	Frequency of Exceeding SCG
	Indeno(1,2,3-cd)pyrene	42-9,100	500	6/41
	Chrysene	41-21,000	1,000	8/41
	Dibenzo(a,h)anthracene	45-3,000	330	3/41
	Fluoranthene	52-54,000	100,000	0/41
	Fluorene	43-7,000	30,000	0/41
	Naphthalene	44-5,300	12,000	0/41
	Phenanthrene	57-56,000	100,000	0/41
	Pyrene	41-50,000	100,000	0/41
	Phenol	1,000	330	0/41
PCBs	Polychlorinated biphenyls	94 - 1,000	100	3/41
Metals (all values ppm)[a]	Arsenic	2.9-122	13	15/41
	Barium	41-941	350	5/41
	Cadmium	0.096-1.6	2.5	0/41
	Chromium	11.2-626	30	7/41
	Copper	9.5-214	50	15/41
	Lead	13.6-796	63	15/41
	Manganese	122-7,640	1,600	2/41
	Mercury	0.011-7.1	.18	8/41
	Nickel	12.4-213	30	20/41
	Selenium	0.75-4.3	3.9	1/41
	Silver	0.035-12.9	2	1/41
	Zinc	19.5 - 903	109	19/41

TABLE 1
Nature and Extent of Contamination (Continued)

GROUND WATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Chloroethane	65	5	1/16
	Chloroform	21	7	1/16
	cis-1,2-Dichloroethene	7.5-200	5	3/16
	Cyclohexane	2.1-12	-	NA
	Methylcyclohexane	3.6-18	-	NA
	Tetrachloroethene	8.5	5	1/16
	Trichloroethene	5.2-15	5	4/16
	trans-1,2-Dichloroethene	2.5	5	0/16
	Vinyl Chloride	4.1-130	2	3/16
	Xylene (Total)	5.2	5**	1/16
	1,1,1-Trichloroethane	110-280	5	2/16
	1,1-Dichloroethane	53-96	5	4/16
	1,1-Dichloroethene	5-6.5	5	1/16
Semivolatile Organic Compounds (SVOCs)	Caprolactam	1.1-23	-	NA
	Bis(2-ethylhexyl)phthalate	1-4.2	5	0/16
Metals	Aluminum	19.4-99,100	2,000	4/16
	Antimony	5	3	1/16
	Arsenic	2-31	25	1/16
	Barium	25.6-1,260	1,000	1/16
	Berylium	0.042-9	3**	2/16
	Cadmium	3.5-10	5	4/16
	Calcium	29,900-198,000	-	NA
	Chromium	0.2-573	50	2/16
	Cobalt	0.19-304	110**	1/16
	Copper	1.2-323	200	1/16

TABLE 1
Nature and Extent of Contamination (Continued)

GROUND WATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
	Iron	25.1-238,000	300	13/16
	Lead	1-200	25	4/16
	Magnesium	10,400-99,900	35,000**	6/16
	Manganese	201-9,790	300	15/16
	Mercury	3	0.7	1/16
	Nickel	1.2-9,830	100	4/16
	Potassium	2,050-44,500	-	NA
	Selenium	3-7	10	0/16
	Silver	1.1	50	0/16
	Sodium	9,190-91,400	20,000	11/16
	Thallium	1-4	0.5**	4/16
	Vanadium	0.62-610	-	0/16
	Zinc	10.3-535	2,000**	0/16

SEDIMENT IN DRAINAGE STRUCTURES (DATA COMPARED TO SOILSCGs)	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Acetone	96-350	50	2/15
	2-Butanone (MEK)	95-110	120	0/15
	Benzene	34	60	0/15
	Carbon Tetrachloride	17	760	0/15
	Chlorobenzene	33	1,100	0/15
	Chloroform	13-36	370	0/15
	cis-1,2-Dichloroethene	23-1,900	250	2/15

SEDIMENT IN DRAINAGE STRUCTURES (DATA COMPARED TO SOILSCGs)	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
	Ethylbenzene	15-72	1,000	0/15
	Tetrachloroethene	8.6-2,200	1,300	1/15
	Trichloroethene	2.5-1,400	470	1/15
	Toluene	31-480,000	700	2/15
	Vinyl Chloride	400	20	2/15
	Xylene (Total)	16-360	260	1/15
	1,2-Dichlorobenzene	25	1,100	0/15
	1,3-Dichlorobenzene	6.6	2,400	0/15
Semivolatile Organic Compounds (SVOCs)	Acenaphthene	81-590,000	20,000	3/15
	Acenaphthylene	150-37,000	100,000	0/15
	Anthracene	150-910,000	100,000	2/15
	Benzo(a)anthracene	830-1,900,000	1,000	12/15
	Benzo(a)pyrene	990-1,000,000	1,000	12/15
	Benzo(b)fluoranthene	1,500-2,500,000	1,000	14/15
	Benzo(g,h,i)perylene	350-66,000	100,000	0/15
	Benzo(k)fluoranthene	580-780,000	800	11/15
	Indeno(1,2,3-cd)pyrene	420-780,000	500	12/15
	Chrysene	970-2,000,000	1,000	13/15
	Dibenzo(a,h)anthracene	140-290,000	330	8/15
	Fluoranthene	1,700-5,200,000	100,000	3/15
	Fluorene	75-540,000	30,000	2/15
	Naphthalene	120-860,000	12,000	3/15
	Phenanthrene	1,100-4,300,000	100,000	3/15

SEDIMENT IN DRAINAGE STRUCTURES (DATA COMPARED TO SOILSCGs)	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
	Phenol	320-14,000	330	4/15
	Pyrene	1,400-3,000,000	100,000	3/15
PCBS	Polychlorinated biphenyls	270-40,000	100	11/15
Metals (all values ppm)[a]	Arsenic	7.1-211	13	9/15
	Barium	26.7-13,000	350	6/15
	Cadmium	0.39-63.6	2.5	7/15
	Chromium	19.9-20,100	30	14/15
	Copper	23.8-117,000	50	14/15
	Lead	62-17,000	63	14/15
	Manganese	105-2,920	1,600	6/15
	Mercury	0.02-2.3	0.18	10/15
	Nickel	20.4-1,680	30	13/15
	Selenium	1.3-3.2	3.9	0/15
	Silver	0.2-212	2	3/15
	Zinc	144-11,300	109	15/15

INTERIOR WOOD BLOCK FLOORING	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Semivolatile Organic Compounds (VOCs)	Acenaphthene	32,000	NA	NA
	Acenaphthylene	4,400	NA	NA
	Anthracene	47,000	NA	NA
	Benzo(a)anthracene	11,0000	NA	NA
	Benzo(a)pyrene	93,000	NA	NA

INTERIOR WOOD BLOCK FLOORING	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
	Benzo(b)fluoranthene	120,000	NA	NA
	Benzo(g,h,i)perylene	25,000	NA	NA
	Benzo(k)fluoranthene	110,000	NA	NA
	Indeno(1,2,3-cd)pyrene	27,000	NA	NA
	Chrysene	110,000	NA	NA
	Dibenzo(a,h)anthracene	9,700	NA	NA
	Fluoranthene	340,000	NA	NA
	Fluorene	28,000	NA	NA
	Naphthalene	48,000	NA	NA
	Phenanthrene	310,000	NA	NA
	Phenol	810	NA	NA
	Pyrene	340,000	NA	NA
PCBs	Aroclor-1248	150	NA	NA

TCLP-VOCs	Carbon Tetrachloride	2.1	500	0/2
	1,2-Dichlorothane	3.4-3.9	500	0/2
	Benzene	1.2	500	0/2
TCLP-SVOCs	2-Methylphenol (o-Cresol)	8.7-16	200,000	0/2
	4-Methylphenol (p-Cresol)	26-32	200,000	0/2
TCLP-Metals	Barium	277-420	100,000	0/2
	Cadmium	43-241	1,000	0/2
	Chromium	19.4-47.8	5,000	0/2
	Lead	307-545,000	5,000	6/10
	Mercury	0.034-0.046	200	0/2

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water and micrograms per kilogram, ug/Kg, in soil;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
Chemical concentrations are reported in parts per billion (ppb) for water and organics detected in waste, soil, and sediment. Metals detected in the surface and subsurface soil/fill and sediment are reported in parts per million (ppm). Samples analyzed for the Toxicity Characteristic Leaching Procedure are reported in ppb.

[b] SCG = standards, criteria, and guidance values

- Groundwater SCGs are derived from NYS Ambient Water Quality Standards TOGS 1.1.1 (Source of Drinking Water, groundwater), June 1998.
- Soil and sediments SCGs are based on the NYSDEC's December 2006 6NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs) (Part 375 - Subpart 6.8).
- Wood block flooring analyzed by TCLP: 40 CFR Part 261.24: Maximum Contaminant Levels for Toxicity Characteristic.;

NA – not applicable

ND – analyte not detected

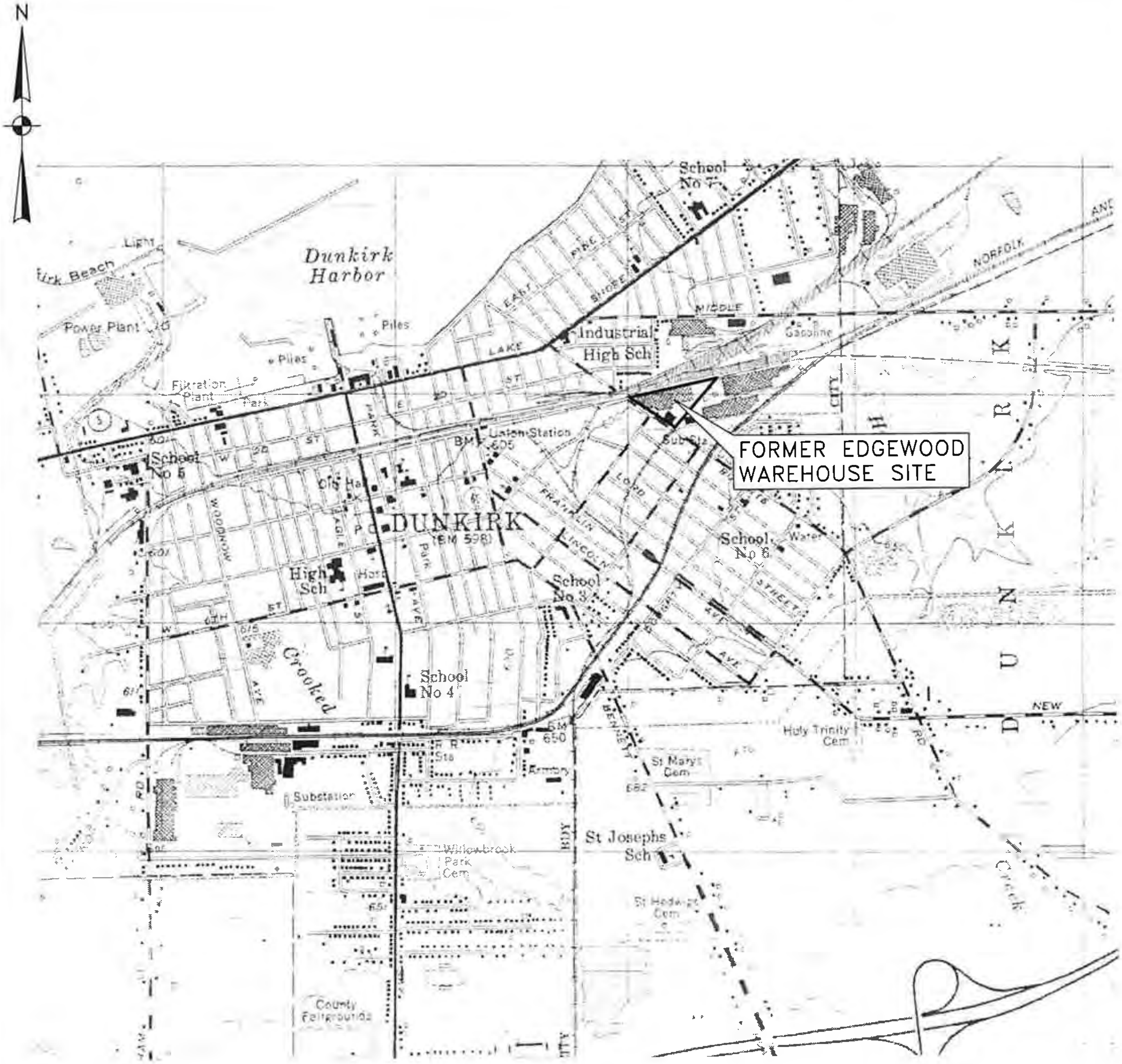
(*) = The cap for individual VOCs and SVOCs that do not have an SCO is 500,000 ug/kg for commercial use. The cap for individual metals that do not have an SCO is 10,000 mg/Kg.

(**) = New York state guidance value was used where no groundwater standard was available

(-) = No regulatory value is associated with this parameter

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1 - No Action			
2 – Exposure Pathway Removal	$470,000	$11,000	$640,000
3 - Containment	$700,000	$11,000	$870,000
4 - Limited Excavation	$1,600,000	$11,000	$1,750,000
5 – Excavation	$4,700,000	$8,700	$4,800,000
6 – Residential Use Cleanup	$6,800,000	$8,700	$6,900,000



SITE LOCATION MAP

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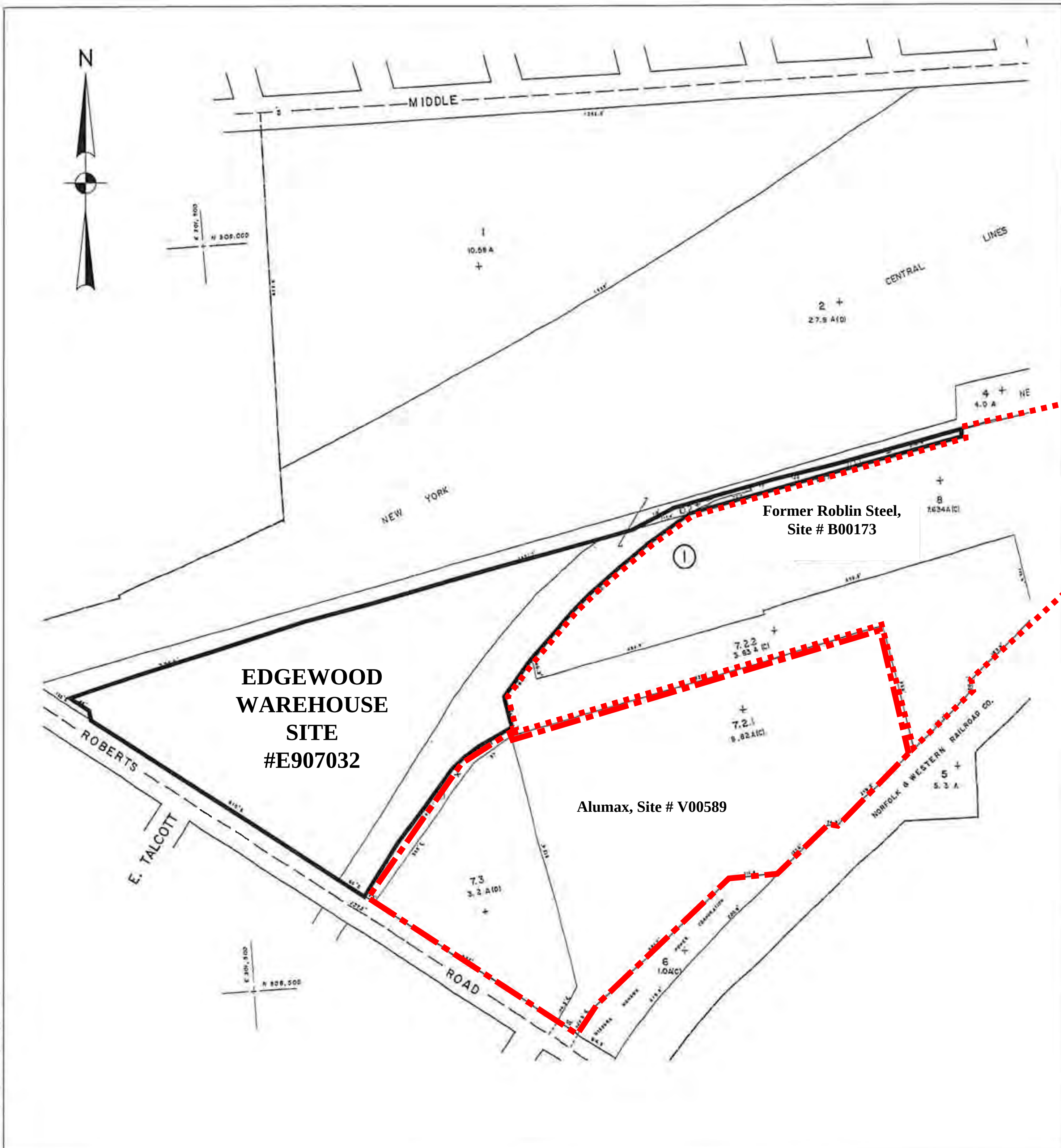
PROJ. NO. 2008.0011.00	SCALE: 1: 24000	DATE: 01/3/2009	FIGURE NO. 1

N:\2008.0011.00-Edgewood Warehouse RI-AA\Engineering\CADD\CADD\Location Map.dwg, 1/2/2009 9:57:50 AM



TAX MAP

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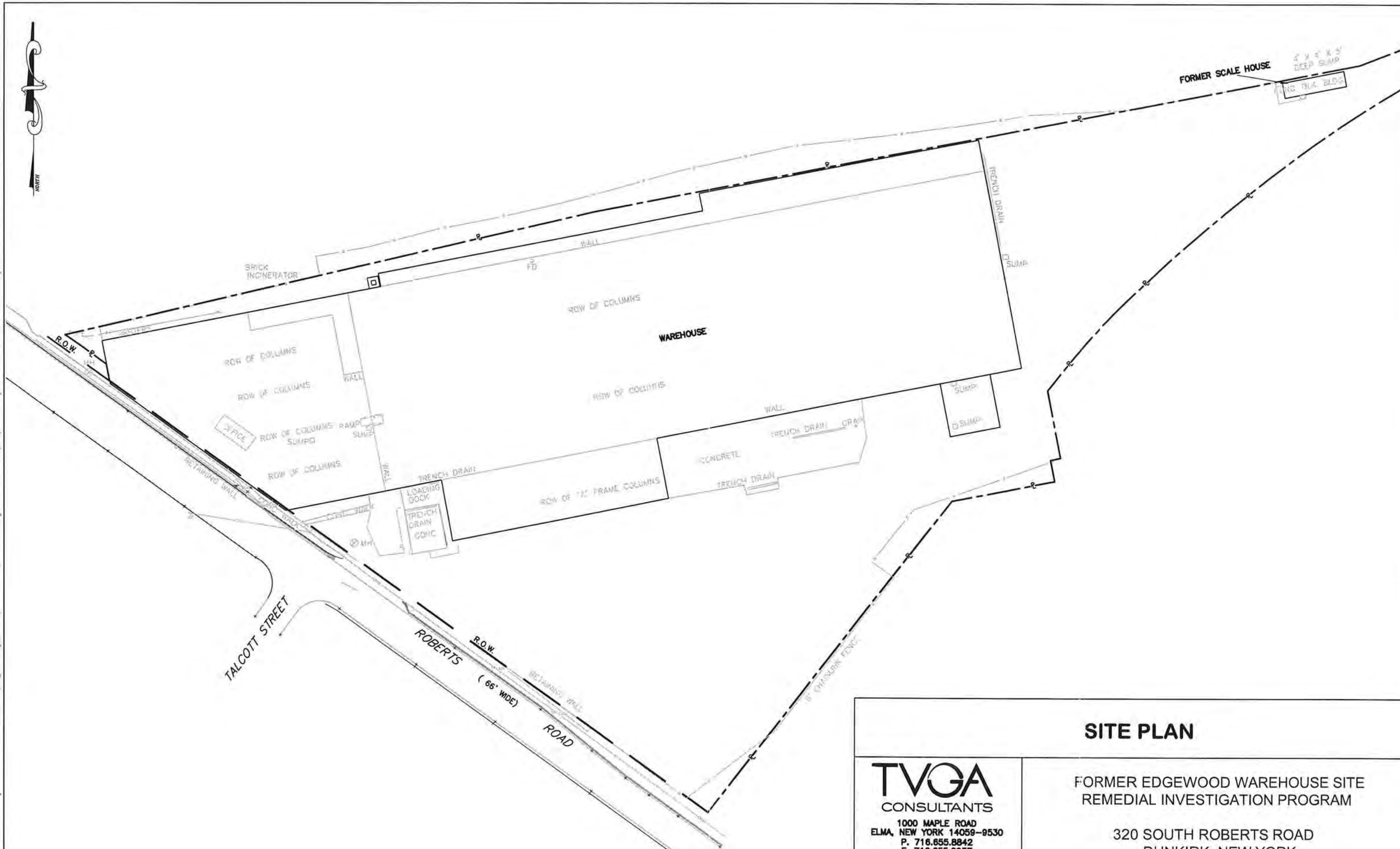
PROJECT NO. 2008.0011.00	SCALE: 1" = 300'	DATE: 1/3/2009	FIGURE 2

N:\2008.0011.00-Edgewood Warehouse RI-AA\Engineering\CADD\CADD\PLAN.dwg, 1/2/2009 9:55:47 AM

Adapted from Figure 2 of ***Final Remedial Investigation (RI) Report (TVGA, May 2009***



SITE PLAN

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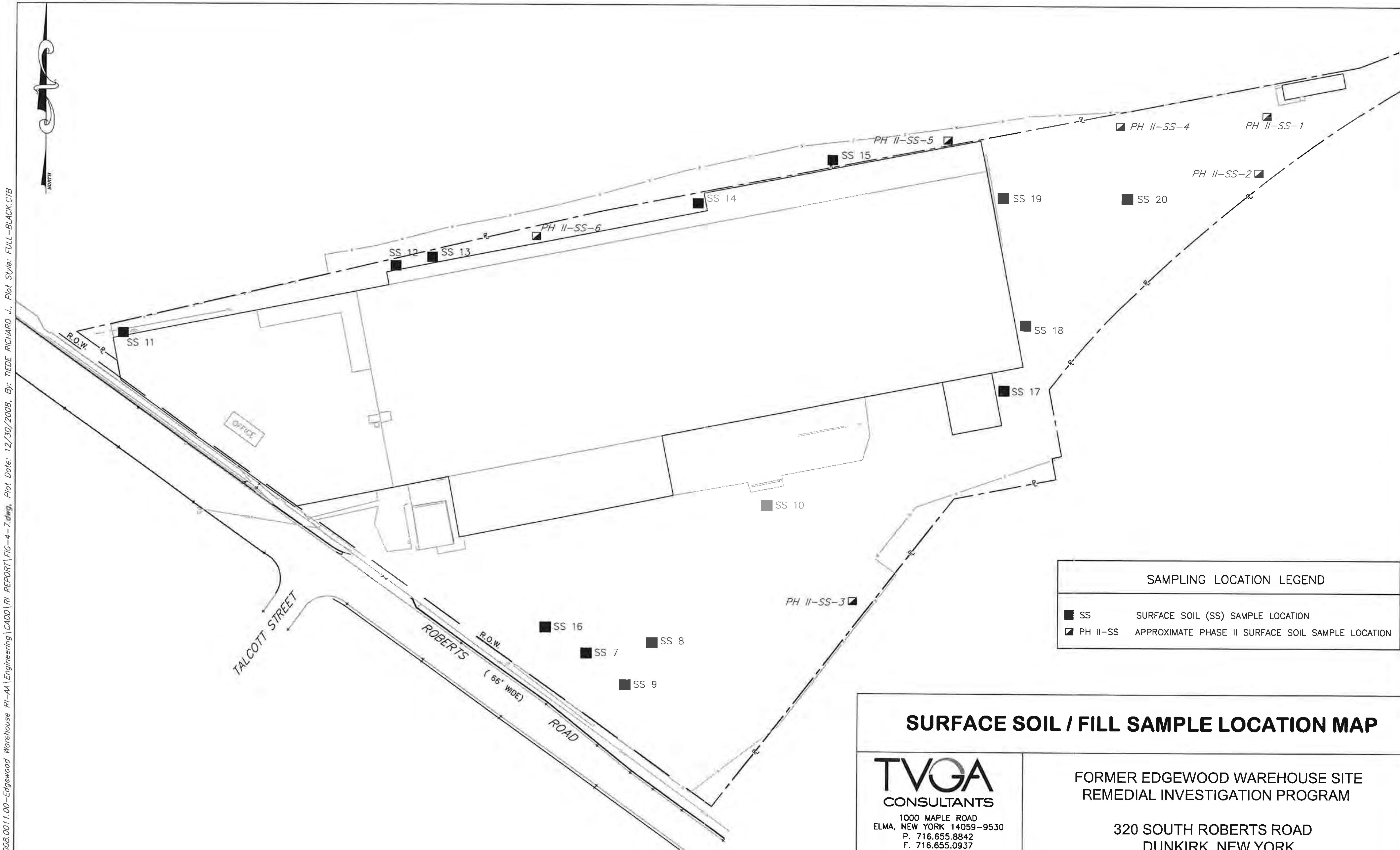
PROJ. NO. 2008.0011.00	NOT TO SCALE	DATE: 12/30/08	FIGURE NO. 3

N:\2008.0011.00-Edgewood Warehouse RI-AA\Engineering\CADD\RI REPORT\FIG-4-7.dwg, 12/31/2008 5:00:29 PM



SURFACE SOIL / FILL SAMPLE LOCATION MAP

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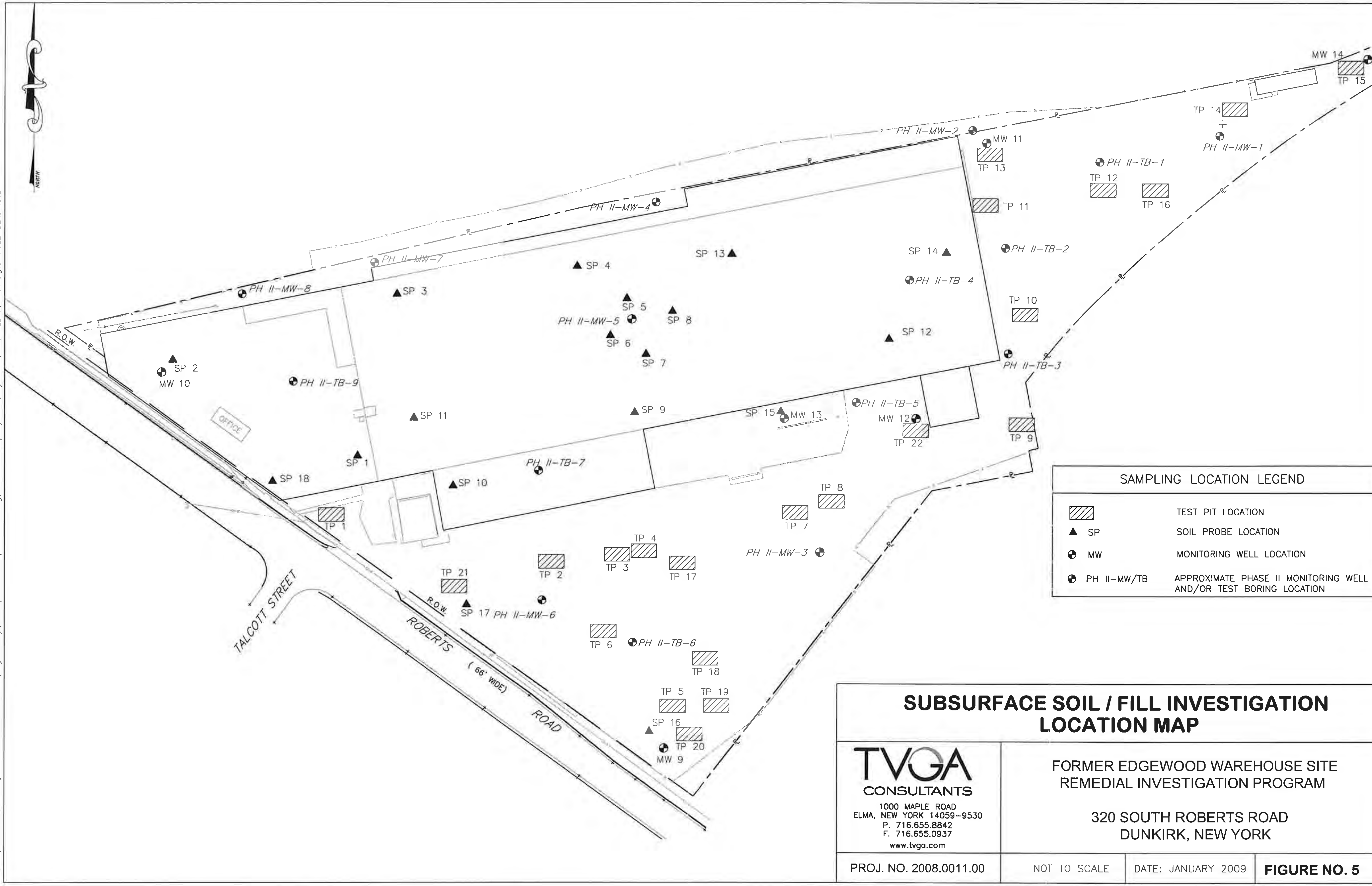
PROJ. NO. 2008.0011.00	NOT TO SCALE	DATE: 12/30/08	**FIGURE NO. 4**

File: N:\2008.0011.00-Edgewood Warehouse RI-AA\Engineering\CADD\RI REPORT\FIG-4-7.dwg, Plot Date: 12/30/2008, By: TIEDE RICHARD J. Plot Style: FULL-BLACK.CTB



SAMPLING LOCATION LEGEND	
(hatched box)	TEST PIT LOCATION
▲ SP	SOIL PROBE LOCATION
MW	MONITORING WELL LOCATION
PH II-MW/TB	APPROXIMATE PHASE II MONITORING WELL AND/OR TEST BORING LOCATION

SUBSURFACE SOIL / FILL INVESTIGATION LOCATION MAP

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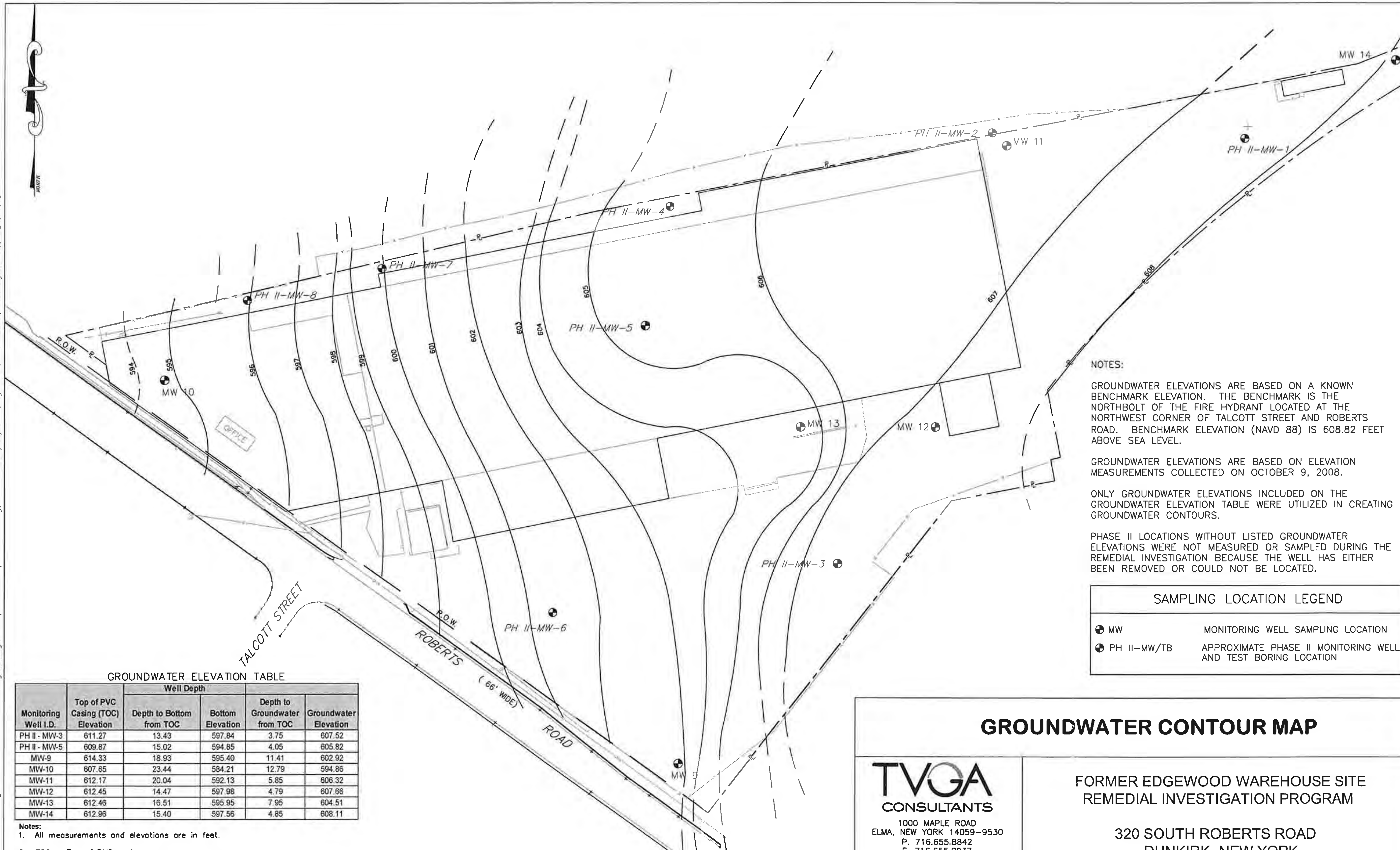
PROJ. NO. 2008.0011.00	NOT TO SCALE	DATE: JANUARY 2009	FIGURE NO. 5



NOTES:

GROUNDWATER ELEVATIONS ARE BASED ON A KNOWN BENCHMARK ELEVATION. THE BENCHMARK IS THE NORTHBOLT OF THE FIRE HYDRANT LOCATED AT THE NORTHWEST CORNER OF TALCOTT STREET AND ROBERTS ROAD. BENCHMARK ELEVATION (NAVD 88) IS 608.82 FEET ABOVE SEA LEVEL.

GROUNDWATER ELEVATIONS ARE BASED ON ELEVATION MEASUREMENTS COLLECTED ON OCTOBER 9, 2008.

ONLY GROUNDWATER ELEVATIONS INCLUDED ON THE GROUNDWATER ELEVATION TABLE WERE UTILIZED IN CREATING GROUNDWATER CONTOURS.

PHASE II LOCATIONS WITHOUT LISTED GROUNDWATER ELEVATIONS WERE NOT MEASURED OR SAMPLED DURING THE REMEDIAL INVESTIGATION BECAUSE THE WELL HAS EITHER BEEN REMOVED OR COULD NOT BE LOCATED.

SAMPLING LOCATION LEGEND	
MW	MONITORING WELL SAMPLING LOCATION
PH II-MW/TB	APPROXIMATE PHASE II MONITORING WELL AND TEST BORING LOCATION

GROUNDWATER ELEVATION TABLE

Monitoring Well I.D.	Top of PVC Casing (TOC) Elevation	Well Depth: Depth to Bottom from TOC	Well Depth: Bottom Elevation	Depth to Groundwater from TOC	Groundwater Elevation
PH II - MW-3	611.27	13.43	597.84	3.75	607.52
PH II - MW-5	609.87	15.02	594.85	4.05	605.82
MW-9	614.33	18.93	595.40	11.41	602.92
MW-10	607.65	23.44	584.21	12.79	594.86
MW-11	612.17	20.04	592.13	5.85	606.32
MW-12	612.45	14.47	597.98	4.79	607.66
MW-13	612.46	16.51	595.95	7.95	604.51
MW-14	612.96	15.40	597.56	4.85	608.11

Notes:

1. All measurements and elevations are in feet.
2. TOC = Top of PVC casing
3. Elevations were measured using the north bolt of a fire hydrant located at the northwest corner of Talcott Street and South Roberts Road.
4. Groundwater measurements recorded on October 8, 2008

GROUNDWATER CONTOUR MAP

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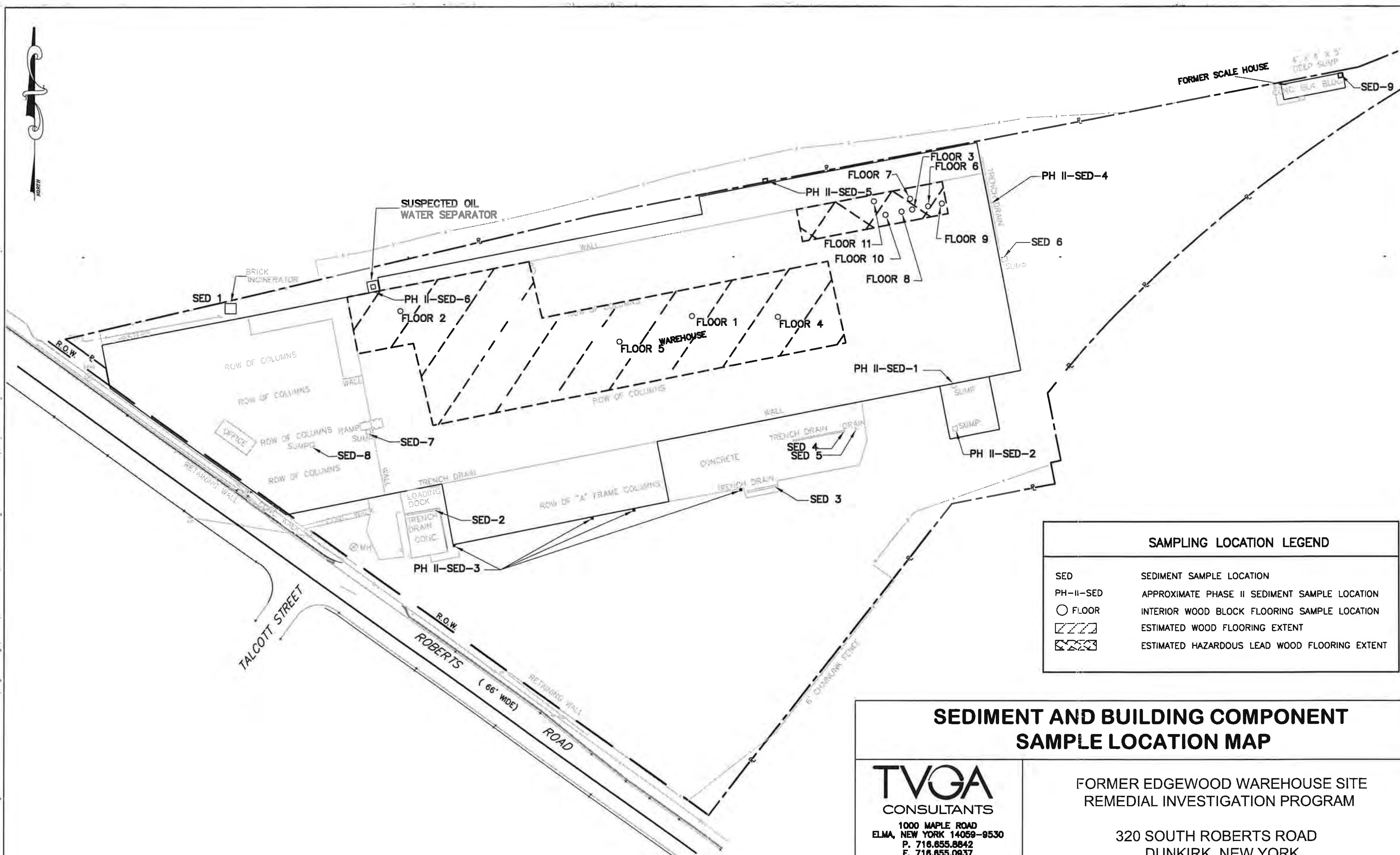
PROJ. NO. 2008.0011.00	1" = 80'	DATE: JANUARY 2009	**FIGURE NO. 6**



SAMPLING LOCATION LEGEND

SED	SEDIMENT SAMPLE LOCATION
PH-II-SED	APPROXIMATE PHASE II SEDIMENT SAMPLE LOCATION
○ FLOOR	INTERIOR WOOD BLOCK FLOORING SAMPLE LOCATION
(hatched)	ESTIMATED WOOD FLOORING EXTENT
(cross-hatched)	ESTIMATED HAZARDOUS LEAD WOOD FLOORING EXTENT

SEDIMENT AND BUILDING COMPONENT SAMPLE LOCATION MAP

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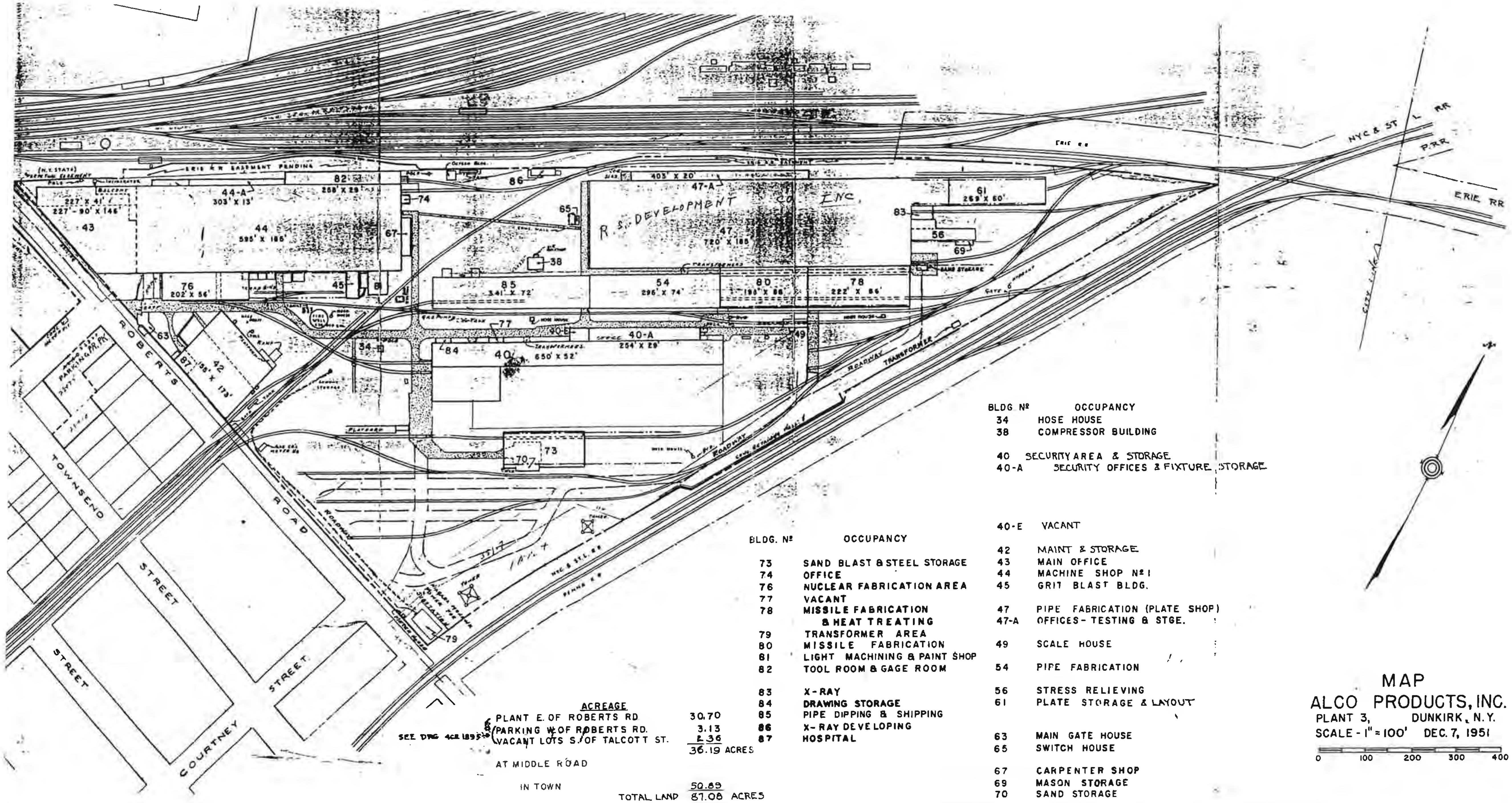
PROJ. NO. 2008.0011.00 | NOT TO SCALE | DATE: JANUARY 2009 | **FIGURE NO. 7**



REFERENCE:
"MAP ALCO PRODUCTS, INC.
PLANT 3, DUNKIRK, NY"
(12/7/51)

HISTORICAL FACILITY PLAN

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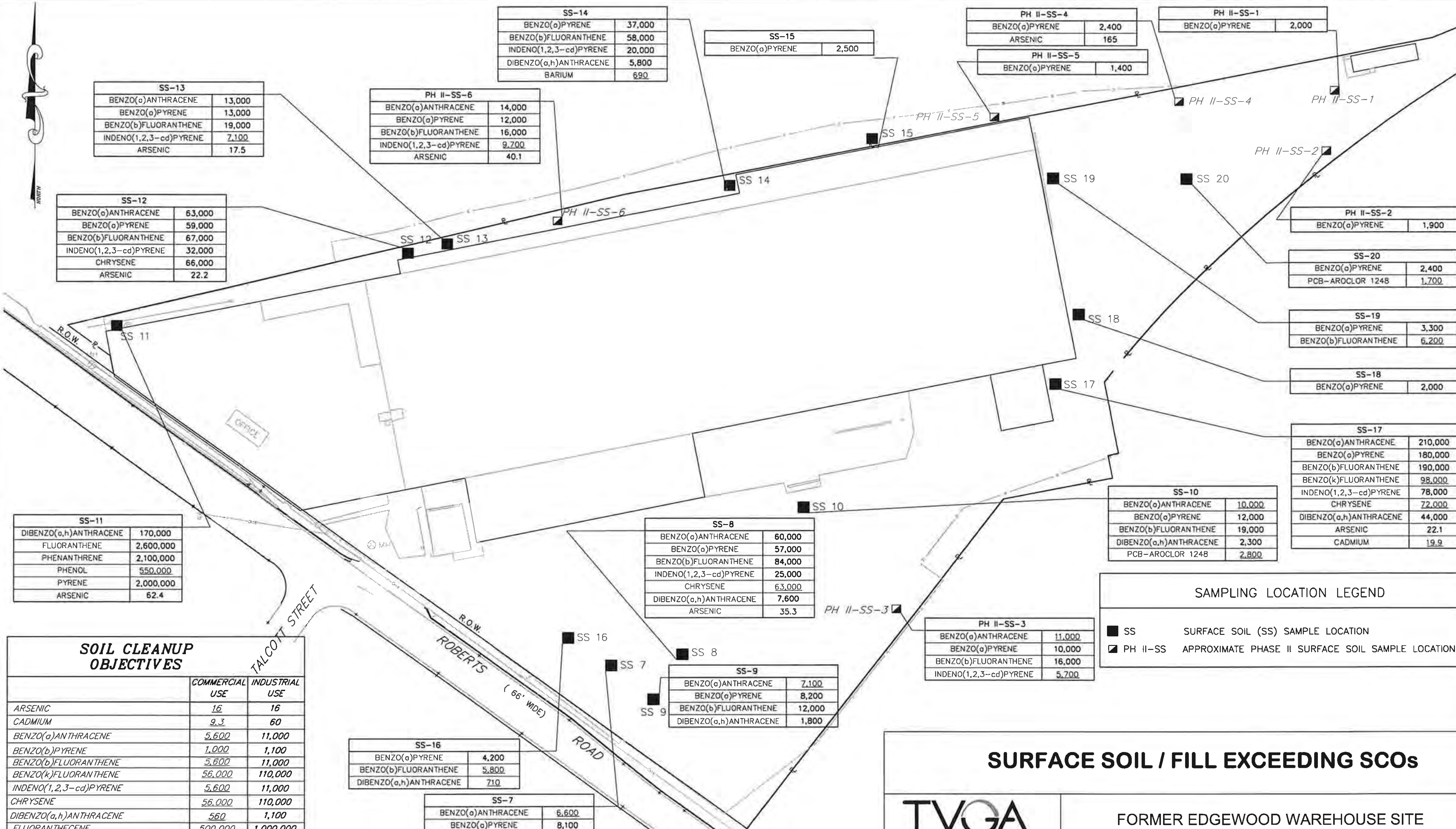
PROJ. NO. 2008.0011.00	NOT TO SCALE	DATE: 12/30/08	FIGURE NO. 8



SS-14	
BENZO(a)PYRENE	37,000
BENZO(b)FLUORANTHENE	58,000
INDENO(1,2,3-cd)PYRENE	20,000
DIBENZO(a,h)ANTHRACENE	5,800
BARIUM	690

SS-15	
BENZO(a)PYRENE	2,500

PH II-SS-4	
BENZO(a)PYRENE	2,400
ARSENIC	165

PH II-SS-5	
BENZO(a)PYRENE	1,400

PH II-SS-1	
BENZO(a)PYRENE	2,000

SS-13	
BENZO(a)ANTHRACENE	13,000
BENZO(a)PYRENE	13,000
BENZO(b)FLUORANTHENE	19,000
INDENO(1,2,3-cd)PYRENE	7,100
ARSENIC	17.5

PH II-SS-6	
BENZO(a)ANTHRACENE	14,000
BENZO(a)PYRENE	12,000
BENZO(b)FLUORANTHENE	16,000
INDENO(1,2,3-cd)PYRENE	9,700
ARSENIC	40.1

SS-12	
BENZO(a)ANTHRACENE	63,000
BENZO(a)PYRENE	59,000
BENZO(b)FLUORANTHENE	67,000
INDENO(1,2,3-cd)PYRENE	32,000
CHRYSENE	66,000
ARSENIC	22.2

PH II-SS-2	
BENZO(a)PYRENE	1,900

SS-20	
BENZO(a)PYRENE	2,400
PCB-AROCLOR 1248	1,700

SS-19	
BENZO(a)PYRENE	3,300
BENZO(b)FLUORANTHENE	6,200

SS-18	
BENZO(a)PYRENE	2,000

SS-17	
BENZO(a)ANTHRACENE	210,000
BENZO(a)PYRENE	180,000
BENZO(b)FLUORANTHENE	190,000
BENZO(k)FLUORANTHENE	98,000
INDENO(1,2,3-cd)PYRENE	78,000
CHRYSENE	72,000
DIBENZO(a,h)ANTHRACENE	44,000
ARSENIC	22.1
CADMIUM	19.9

SS-10	
BENZO(a)ANTHRACENE	10,000
BENZO(a)PYRENE	12,000
BENZO(b)FLUORANTHENE	19,000
DIBENZO(a,h)ANTHRACENE	2,300
PCB-AROCLOR 1248	2,800

SS-11	
DIBENZO(a,h)ANTHRACENE	170,000
FLUORANTHENE	2,600,000
PHENANTHRENE	2,100,000
PHENOL	550,000
PYRENE	2,000,000
ARSENIC	62.4

SS-8	
BENZO(a)ANTHRACENE	60,000
BENZO(a)PYRENE	57,000
BENZO(b)FLUORANTHENE	84,000
INDENO(1,2,3-cd)PYRENE	25,000
CHRYSENE	63,000
DIBENZO(a,h)ANTHRACENE	7,600
ARSENIC	35.3

PH II-SS-3	
BENZO(a)ANTHRACENE	11,000
BENZO(a)PYRENE	10,000
BENZO(b)FLUORANTHENE	16,000
INDENO(1,2,3-cd)PYRENE	5,700

SS-9	
BENZO(a)ANTHRACENE	7,100
BENZO(a)PYRENE	8,200
BENZO(b)FLUORANTHENE	12,000
DIBENZO(a,h)ANTHRACENE	1,800

SS-16	
BENZO(a)PYRENE	4,200
BENZO(b)FLUORANTHENE	5,800
DIBENZO(a,h)ANTHRACENE	710

SS-7	
BENZO(a)ANTHRACENE	6,600
BENZO(a)PYRENE	8,100
BENZO(b)FLUORANTHENE	11,000
DIBENZO(a,h)ANTHRACENE	1,300
PCB-AROCLOR 1248	2,100

SAMPLING LOCATION LEGEND

SS	SURFACE SOIL (SS) SAMPLE LOCATION
PH II-SS	APPROXIMATE PHASE II SURFACE SOIL SAMPLE LOCATION

SOIL CLEANUP OBJECTIVES

	COMMERCIAL USE	INDUSTRIAL USE
ARSENIC	16	16
CADMIUM	9.3	60
BENZO(a)ANTHRACENE	5,600	11,000
BENZO(b)PYRENE	1,000	1,100
BENZO(b)FLUORANTHENE	5,600	11,000
BENZO(k)FLUORANTHENE	56,000	110,000
INDENO(1,2,3-cd)PYRENE	5,600	11,000
CHRYSENE	56,000	110,000
DIBENZO(a,h)ANTHRACENE	560	1,100
FLUORANTHECENE	500,000	1,000,000
MANGANESE	500,000	1,000,000
PYRENE	500,000	1,000,000
PCB-AROCLOR 1248	1,000	25,000
INDENO(1,2,3-cd)FLUORANTHRANCENE	1,000	25,000
BARIUM	400	10,000
PHENANTHRENE	500,000	1,000,000

NOTES:
METALS ARE LISTED IN mg/Kg AND ORGANIC ANALYTES ARE LISTED IN ug/Kg.
ANALYTES THAT WERE DETECTED AT CONCENTRATIONS EXCEEDING 6NYCRR PART 375-6.8(b) COMMERCIAL USE SOIL CLEANUP OBJECTIVES ARE UNDERLINED WHILE CONCENTRATIONS EXCEEDING THE INDUSTRIAL USE SOIL CLEANUP OBJECTIVES ARE IN BOLD TEXT.

SURFACE SOIL / FILL EXCEEDING SCOs

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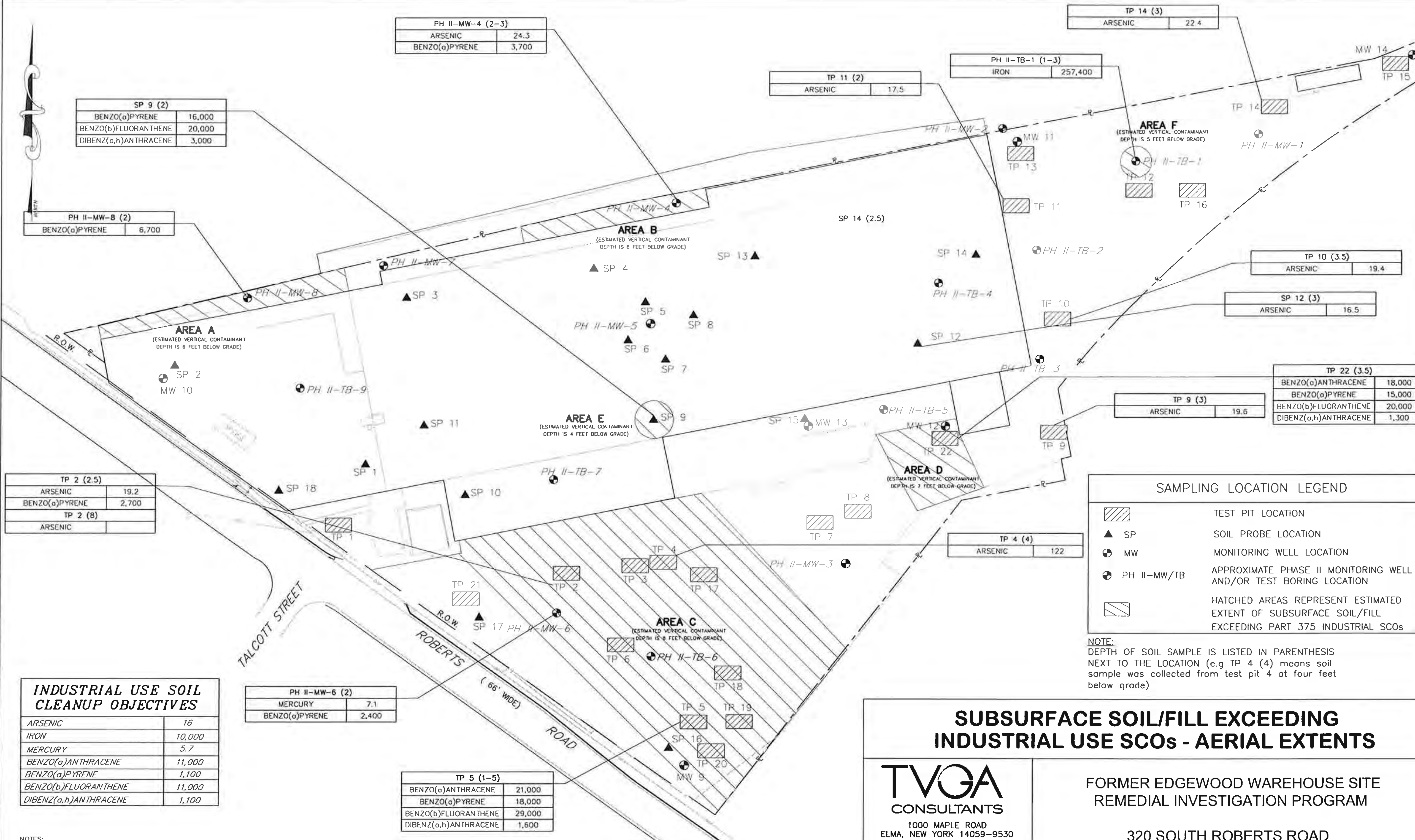
PROJ. NO. 2008.0011.00	1" = 80'	DATE: MARCH 2009	FIGURE NO. 9

N:\2008.0011.00-Edgewood Warehouse RI-AA\Engineering\CADD\RI REPORT\FIG-9-13.dwg, 5/12/2009 3:41:50 PM
File: N:\2008.0011.00-Edgewood Warehouse RI-AA\Engineering\CADD\RI REPORT\FIG-9-13.dwg, Plot Date: 5/12/2009, By: KEPPEL ANGELA M, Plot Style: FULL-BLACK.CTB



PH II-MW-4 (2-3)	
ARSENIC	24.3
BENZO(a)PYRENE	3,700

SP 9 (2)	
BENZO(a)PYRENE	16,000
BENZO(b)FLUORANTHENE	20,000
DIBENZ(a,h)ANTHRACENE	3,000

PH II-MW-8 (2)	
BENZO(a)PYRENE	6,700

TP 14 (3)	
ARSENIC	22.4

PH II-TB-1 (1-3)	
IRON	257,400

TP 11 (2)	
ARSENIC	17.5

TP 10 (3.5)	
ARSENIC	19.4

SP 12 (3)	
ARSENIC	16.5

TP 22 (3.5)	
BENZO(a)ANTHRACENE	18,000
BENZO(a)PYRENE	15,000
BENZO(b)FLUORANTHENE	20,000
DIBENZ(a,h)ANTHRACENE	1,300

TP 9 (3)	
ARSENIC	19.6

TP 2 (2.5)	
ARSENIC	19.2
BENZO(a)PYRENE	2,700
TP 2 (8)	
ARSENIC	

TP 4 (4)	
ARSENIC	122

PH II-MW-6 (2)	
MERCURY	7.1
BENZO(a)PYRENE	2,400

TP 5 (1-5)	
BENZO(a)ANTHRACENE	21,000
BENZO(a)PYRENE	18,000
BENZO(b)FLUORANTHENE	29,000
DIBENZ(a,h)ANTHRACENE	1,600

SAMPLING LOCATION LEGEND

(hatched box)	TEST PIT LOCATION
▲ SP	SOIL PROBE LOCATION
MW	MONITORING WELL LOCATION
PH II-MW/TB	APPROXIMATE PHASE II MONITORING WELL AND/OR TEST BORING LOCATION
(hatched area)	HATCHED AREAS REPRESENT ESTIMATED EXTENT OF SUBSURFACE SOIL/FILL EXCEEDING PART 375 INDUSTRIAL SCOs

NOTE:
DEPTH OF SOIL SAMPLE IS LISTED IN PARENTHESIS NEXT TO THE LOCATION (e.g TP 4 (4) means soil sample was collected from test pit 4 at four feet below grade)

INDUSTRIAL USE SOIL CLEANUP OBJECTIVES	
ARSENIC	*16*
IRON	*10,000*
MERCURY	*5.7*
BENZO(a)ANTHRACENE	*11,000*
BENZO(a)PYRENE	*1,100*
BENZO(b)FLUORANTHENE	*11,000*
DIBENZ(a,h)ANTHRACENE	*1,100*

NOTES:
METALS ARE LISTED IN mg/Kg AND ORGANIC ANALYTES ARE LISTED IN ug/Kg.
INDUSTRIAL USE SOIL CLEANUP OBJECTIVES WERE OBTAINED FROM 6NYCRR PART 375-6.8(b).

SUBSURFACE SOIL/FILL EXCEEDING INDUSTRIAL USE SCOs - AERIAL EXTENTS

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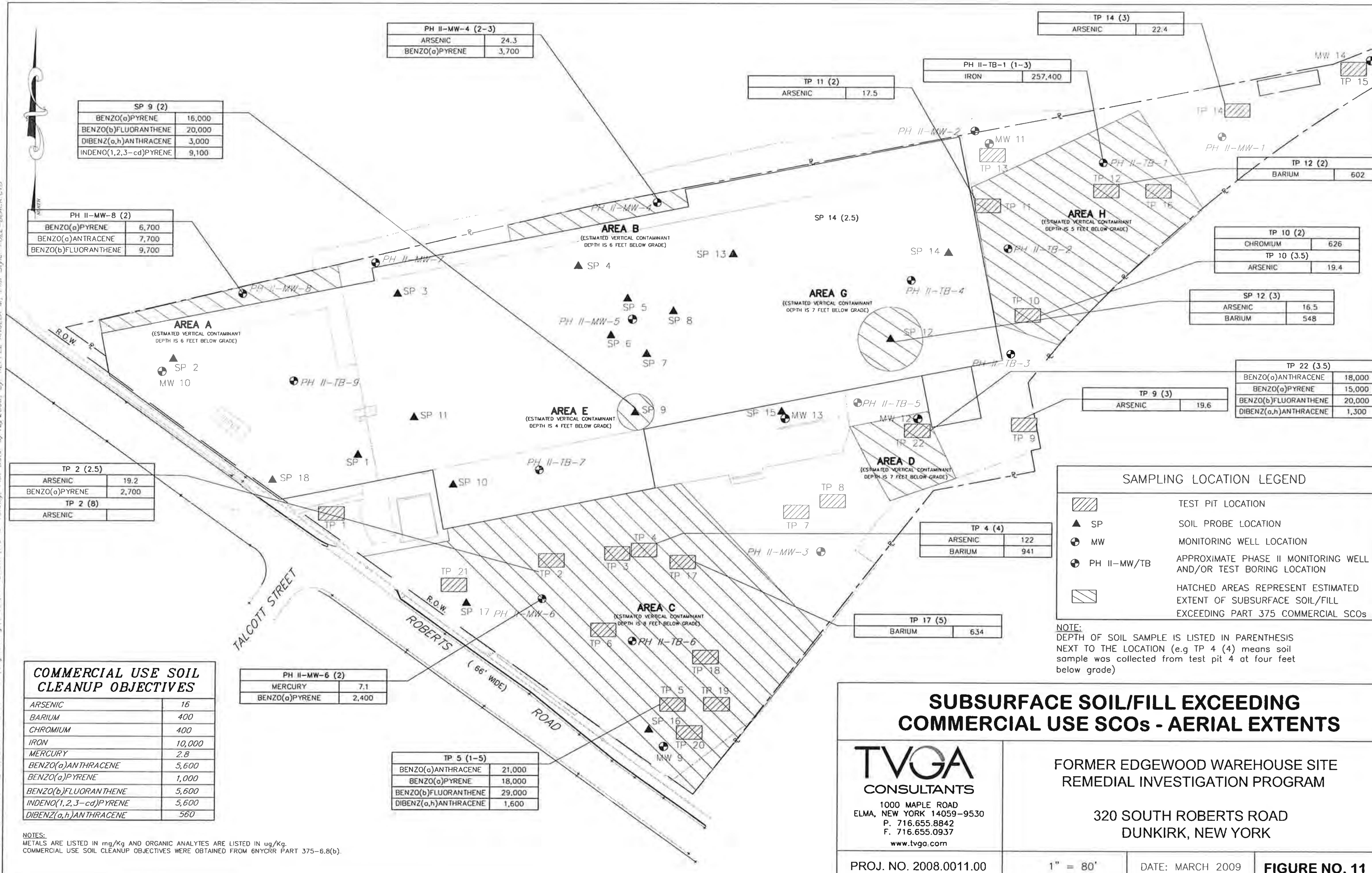
PROJ. NO. 2008.0011.00	1" = 80'	DATE: MARCH 2009	FIGURE NO.10



PH II-MW-4 (2-3)	
ARSENIC	24.3
BENZO(a)PYRENE	3,700

SP 9 (2)	
BENZO(a)PYRENE	16,000
BENZO(b)FLUORANTHENE	20,000
DIBENZ(a,h)ANTHRACENE	3,000
INDENO(1,2,3-cd)PYRENE	9,100

PH II-MW-8 (2)	
BENZO(a)PYRENE	6,700
BENZO(a)ANTRACENE	7,700
BENZO(b)FLUORANTHENE	9,700

TP 11 (2)	
ARSENIC	17.5

PH II-TB-1 (1-3)	
IRON	257,400

TP 14 (3)	
ARSENIC	22.4

TP 12 (2)	
BARIUM	602

TP 10 (2)	
CHROMIUM	626
TP 10 (3.5)	
ARSENIC	19.4

SP 12 (3)	
ARSENIC	16.5
BARIUM	548

TP 22 (3.5)	
BENZO(a)ANTHRACENE	18,000
BENZO(a)PYRENE	15,000
BENZO(b)FLUORANTHENE	20,000
DIBENZ(a,h)ANTHRACENE	1,300

TP 9 (3)	
ARSENIC	19.6

TP 2 (2.5)	
ARSENIC	19.2
BENZO(a)PYRENE	2,700
TP 2 (8)	
ARSENIC	

TP 4 (4)	
ARSENIC	122
BARIUM	941

TP 17 (5)	
BARIUM	634

PH II-MW-6 (2)	
MERCURY	7.1
BENZO(a)PYRENE	2,400

TP 5 (1-5)	
BENZO(a)ANTHRACENE	21,000
BENZO(a)PYRENE	18,000
BENZO(b)FLUORANTHENE	29,000
DIBENZ(a,h)ANTHRACENE	1,600

COMMERCIAL USE SOIL CLEANUP OBJECTIVES

ARSENIC	*16*
BARIUM	*400*
CHROMIUM	*400*
IRON	*10,000*
MERCURY	*2.8*
BENZO(a)ANTHRACENE	*5,600*
BENZO(a)PYRENE	*1,000*
BENZO(b)FLUORANTHENE	*5,600*
INDENO(1,2,3-cd)PYRENE	*5,600*
DIBENZ(a,h)ANTHRACENE	*560*

NOTES:
METALS ARE LISTED IN mg/Kg AND ORGANIC ANALYTES ARE LISTED IN ug/Kg.
COMMERCIAL USE SOIL CLEANUP OBJECTIVES WERE OBTAINED FROM 6NYCRR PART 375-6.8(b).

SAMPLING LOCATION LEGEND

[hatched box]	TEST PIT LOCATION
▲ SP	SOIL PROBE LOCATION
MW	MONITORING WELL LOCATION
PH II-MW/TB	APPROXIMATE PHASE II MONITORING WELL AND/OR TEST BORING LOCATION
[hatched area]	HATCHED AREAS REPRESENT ESTIMATED EXTENT OF SUBSURFACE SOIL/FILL EXCEEDING PART 375 COMMERCIAL SCOs

NOTE:
DEPTH OF SOIL SAMPLE IS LISTED IN PARENTHESIS NEXT TO THE LOCATION (e.g TP 4 (4) means soil sample was collected from test pit 4 at four feet below grade)

SUBSURFACE SOIL/FILL EXCEEDING COMMERCIAL USE SCOs - AERIAL EXTENTS

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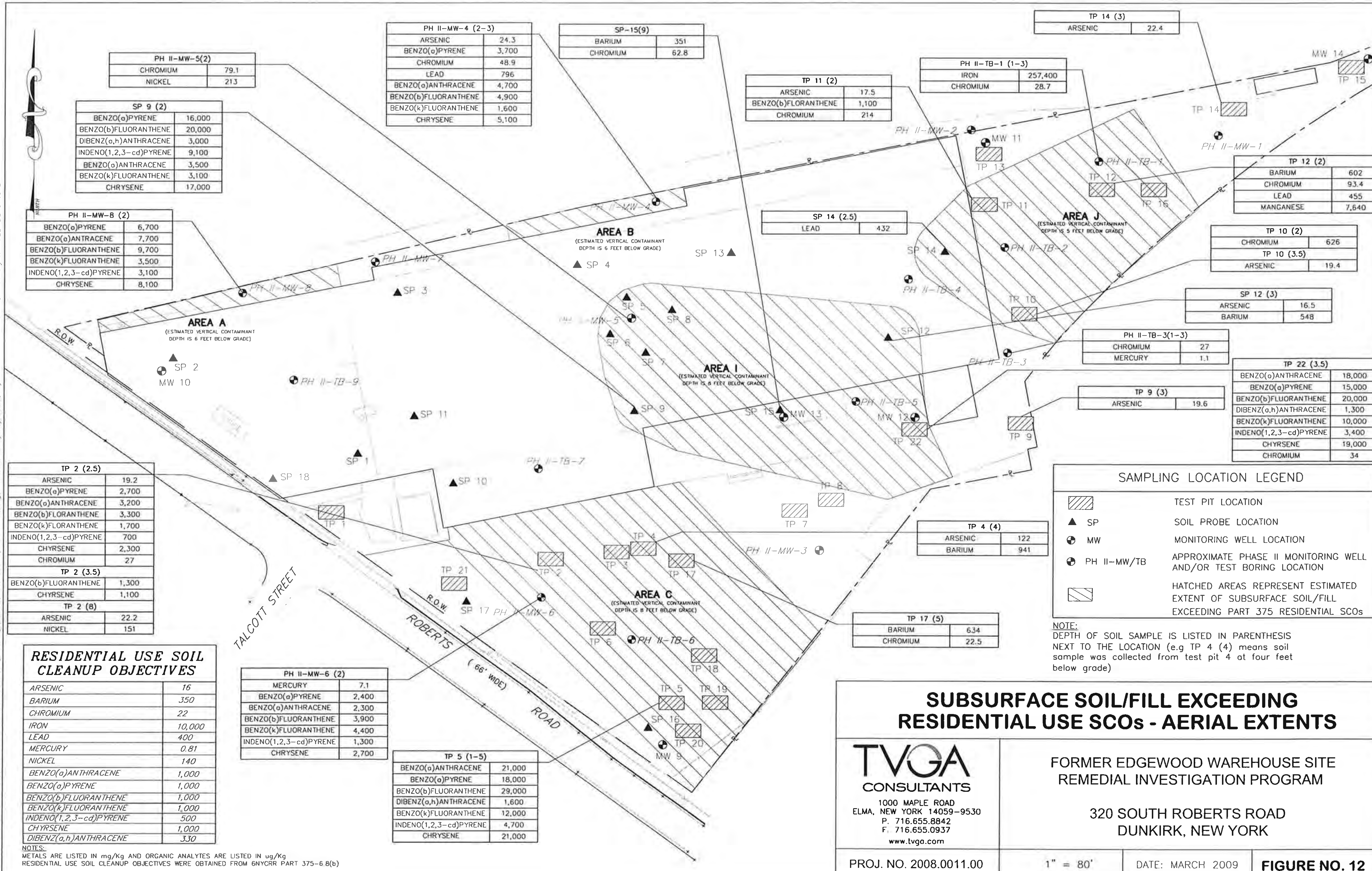
FORMER EDGEWOOD WAREHOUSE SITE
REMEDIAL INVESTIGATION PROGRAM

320 SOUTH ROBERTS ROAD
DUNKIRK, NEW YORK

PROJ. NO. 2008.0011.00 | 1" = 80' | DATE: MARCH 2009 | **FIGURE NO. 11**



PH II-MW-5(2)	
CHROMIUM	79.1
NICKEL	213

SP 9 (2)	
BENZO(a)PYRENE	16,000
BENZO(b)FLUORANTHENE	20,000
DIBENZ(a,h)ANTHRACENE	3,000
INDENO(1,2,3-cd)PYRENE	9,100
BENZO(a)ANTHRACENE	3,500
BENZO(k)FLUORANTHENE	3,100
CHRYSENE	17,000

PH II-MW-8 (2)	
BENZO(a)PYRENE	6,700
BENZO(a)ANTRACENE	7,700
BENZO(b)FLUORANTHENE	9,700
BENZO(k)FLUORANTHENE	3,500
INDENO(1,2,3-cd)PYRENE	3,100
CHRYSENE	8,100

PH II-MW-4 (2-3)	
ARSENIC	24.3
BENZO(a)PYRENE	3,700
CHROMIUM	48.9
LEAD	796
BENZO(a)ANTHRACENE	4,700
BENZO(b)FLUORANTHENE	4,900
BENZO(k)FLUORANTHENE	1,600
CHRYSENE	5,100

SP-15(9)	
BARIUM	351
CHROMIUM	62.8

TP 11 (2)	
ARSENIC	17.5
BENZO(b)FLORANTHENE	1,100
CHROMIUM	214

PH II-TB-1 (1-3)	
IRON	257,400
CHROMIUM	28.7

TP 14 (3)	
ARSENIC	22.4

TP 12 (2)	
BARIUM	602
CHROMIUM	93.4
LEAD	455
MANGANESE	7,640

SP 14 (2.5)	
LEAD	432

TP 10 (2)	
CHROMIUM	626
TP 10 (3.5)	
ARSENIC	19.4

SP 12 (3)	
ARSENIC	16.5
BARIUM	548

PH II-TB-3(1-3)	
CHROMIUM	27
MERCURY	1.1

TP 22 (3.5)	
BENZO(a)ANTHRACENE	18,000
BENZO(a)PYRENE	15,000
BENZO(b)FLUORANTHENE	20,000
DIBENZ(a,h)ANTHRACENE	1,300
BENZO(k)FLUORANTHENE	10,000
INDENO(1,2,3-cd)PYRENE	3,400
CHYRSENE	19,000
CHROMIUM	34

TP 9 (3)	
ARSENIC	19.6

TP 2 (2.5)	
ARSENIC	19.2
BENZO(a)PYRENE	2,700
BENZO(a)ANTHRACENE	3,200
BENZO(b)FLORANTHENE	3,300
BENZO(k)FLORANTHENE	1,700
INDENO(1,2,3-cd)PYRENE	700
CHYRSENE	2,300
CHROMIUM	27
TP 2 (3.5)	
BENZO(b)FLUORANTHENE	1,300
CHYRSENE	1,100
TP 2 (8)	
ARSENIC	22.2
NICKEL	151

TP 4 (4)	
ARSENIC	122
BARIUM	941

TP 17 (5)	
BARIUM	634
CHROMIUM	22.5

PH II-MW-6 (2)	
MERCURY	7.1
BENZO(a)PYRENE	2,400
BENZO(a)ANTHRACENE	2,300
BENZO(b)FLUORANTHENE	3,900
BENZO(k)FLUORANTHENE	4,400
INDENO(1,2,3-cd)PYRENE	1,300
CHRYSENE	2,700

TP 5 (1-5)	
BENZO(a)ANTHRACENE	21,000
BENZO(a)PYRENE	18,000
BENZO(b)FLUORANTHENE	29,000
DIBENZ(a,h)ANTHRACENE	1,600
BENZO(k)FLUORANTHENE	12,000
INDENO(1,2,3-cd)PYRENE	4,700
CHRYSENE	21,000

RESIDENTIAL USE SOIL CLEANUP OBJECTIVES

ARSENIC	16
BARIUM	350
CHROMIUM	22
IRON	10,000
LEAD	400
MERCURY	0.81
NICKEL	140
BENZO(a)ANTHRACENE	1,000
BENZO(a)PYRENE	1,000
BENZO(b)FLUORANTHENE	1,000
BENZO(k)FLUORANTHENE	1,000
INDENO(1,2,3-cd)PYRENE	500
CHYRSENE	1,000
DIBENZ(a,h)ANTHRACENE	330

NOTES:
METALS ARE LISTED IN mg/Kg AND ORGANIC ANALYTES ARE LISTED IN ug/Kg
RESIDENTIAL USE SOIL CLEANUP OBJECTIVES WERE OBTAINED FROM 6NYCRR PART 375-6.8(b)

SAMPLING LOCATION LEGEND

(hatched box)	TEST PIT LOCATION
▲ SP	SOIL PROBE LOCATION
MW	MONITORING WELL LOCATION
PH II-MW/TB	APPROXIMATE PHASE II MONITORING WELL AND/OR TEST BORING LOCATION
(hatched area)	HATCHED AREAS REPRESENT ESTIMATED EXTENT OF SUBSURFACE SOIL/FILL EXCEEDING PART 375 RESIDENTIAL SCOs

NOTE:
DEPTH OF SOIL SAMPLE IS LISTED IN PARENTHESIS NEXT TO THE LOCATION (e.g TP 4 (4) means soil sample was collected from test pit 4 at four feet below grade)

SUBSURFACE SOIL/FILL EXCEEDING RESIDENTIAL USE SCOs - AERIAL EXTENTS

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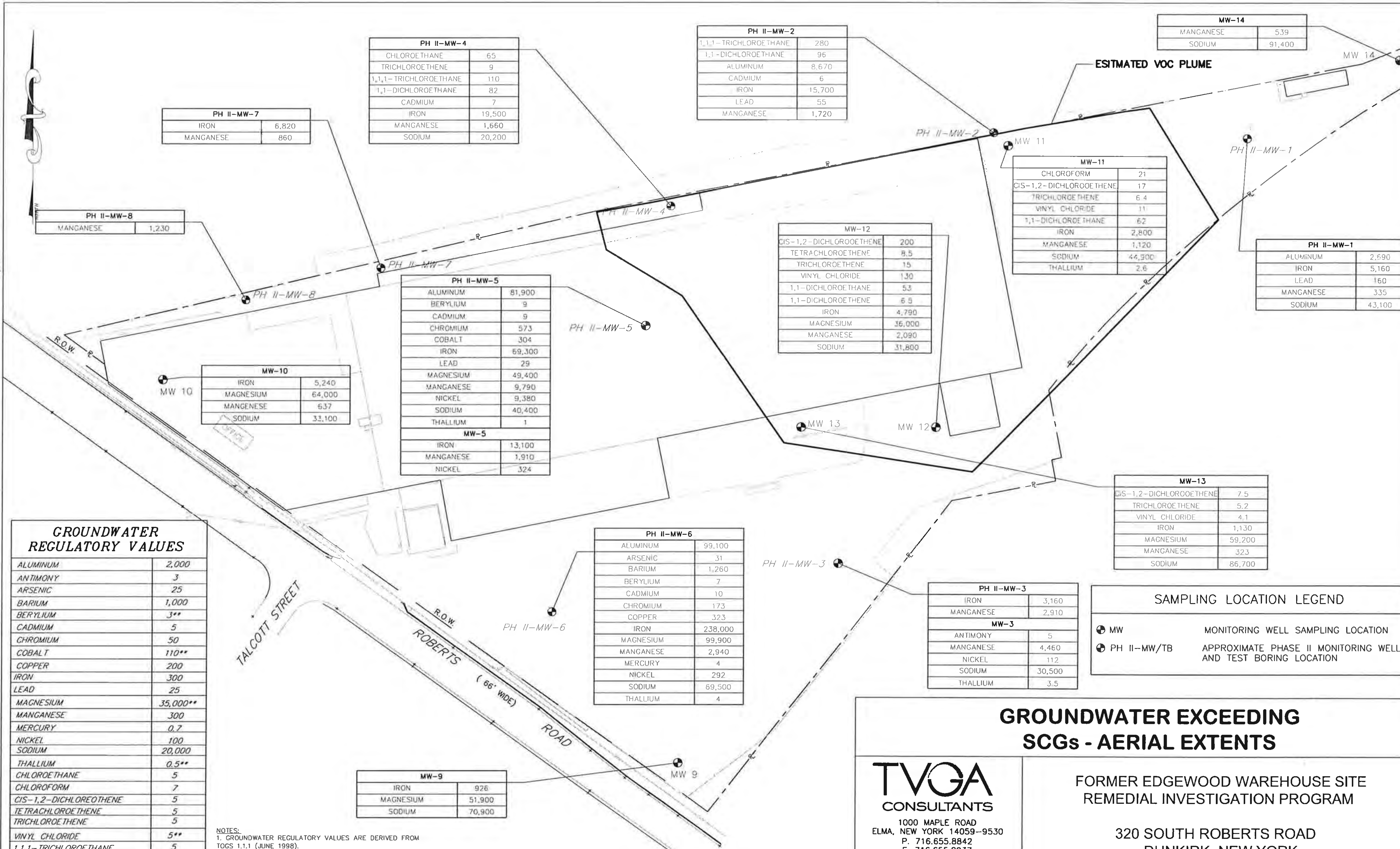
PROJ. NO. 2008.0011.00 | 1" = 80' | DATE: MARCH 2009 | **FIGURE NO. 12**

N:\2008.0011.00-Edgewood Warehouse RI-AA\Engineering\CADD\RI REPORT\FIG-9-13.dwg, 5/15/2009 10:53:05 AM, By: KEPPEL ANGELA M., Plot Style: FULL-BLACK.CTB
File: N:\2008.0011.00-Edgewood Warehouse RI-AA\Engineering\CADD\RI REPORT\FIG-9-13.dwg, Plot Date: 5/15/2009



PH II-MW-7	
IRON	6,820
MANGANESE	860

PH II-MW-4	
CHLOROETHANE	65
TRICHLOROETHENE	9
1,1,1-TRICHLOROETHANE	110
1,1-DICHLOROETHANE	82
CADMIUM	7
IRON	19,500
MANGANESE	1,660
SODIUM	20,200

PH II-MW-2	
1,1,1-TRICHLOROETHANE	280
1,1-DICHLOROETHANE	96
ALUMINUM	8,670
CADMIUM	6
IRON	15,700
LEAD	55
MANGANESE	1,720

MW-14	
MANGANESE	539
SODIUM	91,400

PH II-MW-8	
MANGANESE	1,230

MW-11	
CHLOROFORM	21
CIS-1,2-DICHLOROOETHENE	17
TRICHLOROETHENE	6.4
VINYL CHLORIDE	11
1,1-DICHLOROETHANE	62
IRON	2,800
MANGANESE	1,120
SODIUM	44,900
THALLIUM	2.6

MW-12	
CIS-1,2-DICHLOROOETHENE	200
TETRACHLOROETHENE	8.5
TRICHLOROETHENE	15
VINYL CHLORIDE	130
1,1-DICHLOROETHANE	53
1,1-DICHLOROETHENE	6.5
IRON	4,790
MAGNESIUM	36,000
MANGANESE	2,090
SODIUM	31,800

PH II-MW-1	
ALUMINUM	2,690
IRON	5,160
LEAD	160
MANGANESE	335
SODIUM	43,100

PH II-MW-5	
ALUMINUM	81,900
BERYLIUM	9
CADMIUM	9
CHROMIUM	573
COBALT	304
IRON	69,300
LEAD	29
MAGNESIUM	49,400
MANGANESE	9,790
NICKEL	9,380
SODIUM	40,400
THALLIUM	1
MW-5	
IRON	13,100
MANGANESE	1,910
NICKEL	324

MW-10	
IRON	5,240
MAGNESIUM	64,000
MANGENESE	637
SODIUM	33,100

MW-13	
CIS-1,2-DICHLOROOETHENE	7.5
TRICHLOROETHENE	5.2
VINYL CHLORIDE	4.1
IRON	1,130
MAGNESIUM	59,200
MANGANESE	323
SODIUM	86,700

PH II-MW-6	
ALUMINUM	99,100
ARSENIC	31
BARIUM	1,260
BERYLIUM	7
CADMIUM	10
CHROMIUM	173
COPPER	323
IRON	238,000
MAGNESIUM	99,900
MANGANESE	2,940
MERCURY	4
NICKEL	292
SODIUM	69,500
THALLIUM	4

PH II-MW-3	
IRON	3,160
MANGANESE	2,910
MW-3	
ANTIMONY	5
MANGANESE	4,460
NICKEL	112
SODIUM	30,500
THALLIUM	3.5

MW-9	
IRON	926
MAGNESIUM	51,900
SODIUM	70,900

GROUNDWATER REGULATORY VALUES

ALUMINUM	2,000
ANTIMONY	3
ARSENIC	25
BARIUM	1,000
BERYLIUM	3**
CADMIUM	5
CHROMIUM	50
COBALT	110**
COPPER	200
IRON	300
LEAD	25
MAGNESIUM	35,000**
MANGANESE	300
MERCURY	0.7
NICKEL	100
SODIUM	20,000
THALLIUM	0.5**
CHLOROETHANE	5
CHLOROFORM	7
CIS-1,2-DICHLOREOTHENE	5
TETRACHLOROETHENE	5
TRICHLOROETHENE	5
VINYL CHLORIDE	5**
1,1,1-TRICHLOROETHANE	5
1,1-DICHLOROETHANE	5
1,1-DICHLOROETHENE	5

NOTES:
1. GROUNDWATER REGULATORY VALUES ARE DERIVED FROM TOGS 1.1.1 (JUNE 1998).
2. ALL ANALYSIS ARE LISTED IN ug/L = MICROGRAMS PER LITER (EQUIVALENT TO PARTS PER BILLION OR ppb)
3. (**) = NEW YORK STATE GUIDANCE VALUE WAS USED WHERE NO GROUNDWATER STANDARD WAS AVAILABLE.

SAMPLING LOCATION LEGEND

MW	MONITORING WELL SAMPLING LOCATION
PH II-MW/TB	APPROXIMATE PHASE II MONITORING WELL AND TEST BORING LOCATION

GROUNDWATER EXCEEDING SCGs - AERIAL EXTENTS

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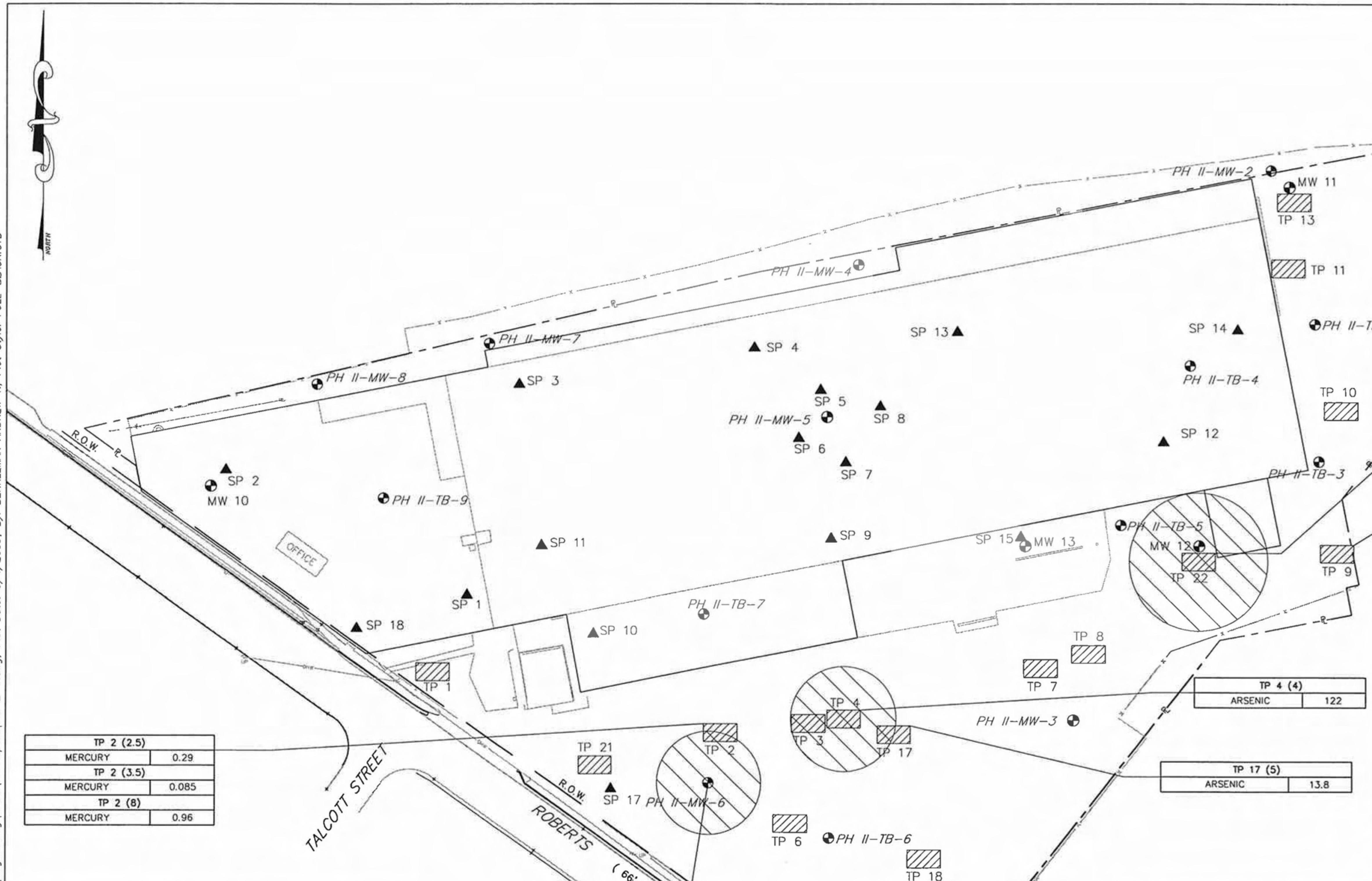
PROJ. NO. 2008.0011.00 | 1" = 80' | DATE: MARCH 2009 | **FIGURE NO. 13**



TP 22 (3.5)	
BENZO(a)ANTHRACENE	18,000
BENZO(a)PYRENE	15,000
BENZO(b)FLUORANTHENE	20,000
DIBENZ(a,h)ANTHRACENE	1,300
BENZO(k)FLUORANTHENE	10,000
INDENO(1,2,3-cd)PYRENE	3,400
CHYRSENE	19,000

TP 9 (3)	
BENZO(a)ANTHRACENE	640
BENZO(a)PYRENE	650
BENZO(b)FLUORANTHENE	880
DIBENZ(a,h)ANTHRACENE	86
BENZO(k)FLUORANTHENE	680
INDENO(1,2,3-cd)PYRENE	270
CHYRSENE	650

TP 4 (4)	
ARSENIC	122

TP 17 (5)	
ARSENIC	13.8

TP 2 (2.5)	
MERCURY	0.29
TP 2 (3.5)	
MERCURY	0.085
TP 2 (8)	
MERCURY	0.96

PH II-MW-6 (2)	
MERCURY	7.1

SAMPLING LOCATION LEGEND

(test pit symbol)	TEST PIT LOCATION
▲ SP	SOIL PROBE LOCATION
MW	MONITORING WELL LOCATION
PH II-MW/TB	APPROXIMATE PHASE II MONITORING WELL AND/OR TEST BORING LOCATION
(hatched symbol)	HATCHED AREAS REPRESENT ESTIMATED EXTENT OF SUBSURFACE SOIL/FILL REQUIRING EXCAVATION UNDER ALTERNATIVE D. ESTIMATED VERTICAL DEPTH IS 8 FEET BELOW GRADE.

NOTE:
DEPTH OF SOIL SAMPLE IS LISTED IN PARENTHESIS NEXT TO THE LOCATION (e.g TP 4 (4) means soil sample was collected from test pit 4 at four feet below grade)

SOIL CLEANUP OBJECTIVES

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
ARSENIC	16	16	16
MERCURY	0.81	2.8	5.7
BENZO(a)ANTHRACENE	1,000	5,600	11,000
BENZO(a)PYRENE	1,000	1,000	1,000
BENZO(b)FLUORANTHENE	1,000	5,600	11,000
BENZO(k)FLUORANTHENE	1,000	56,000	110,000
INDENO(1,2,3-cd)PYRENE	500	5,600	11,000
CHYRSENE	1,000	56,000	110,000
DIBENZ(a,h)ANTHRACENE	330	560	1.100

NOTES:
METALS ARE LISTED IN mg/Kg AND ORGANIC ANALYTES ARE LISTED IN ug/Kg.
SOIL CLEANUP OBJECTIVES WERE OBTAINED FROM 6NYCRR PART 375-6.8(b)

LIMITED SUBSURFACE SOIL/FILL EXCAVATION AREAS UNDER ALTERNATIVE 4

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PROJ. NO. 2008.0011.00 | 1" = 80' | DATE: SEPTEMBER 2009 | Figure 14

File: N:\2008.0011.00-Edgewood Warehouse RI-AA\Engineering\CADD\AA Report\FIG-2-7.dwg, Plot Date: 9/4/2009, By: BENKLEMAN ANDREW T., Plot Style: FULL-BLACK.CTB