PROPOSED REMEDIAL ACTION PLAN
312 Maple Street
Environmental Restoration Project
Village of Endicott, Broome County, New York
Site No. B00168

October 2010

Prepared by:
Division of Environmental Remediation
New York State Department of Environmental Conservation

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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 above referenced site. The disposal of hazardous waste at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Sections 5 of this document, have contaminated various environmental media. The proposed remedy, discussed in detail in Section 8, is intended to attain the remedial action objectives identified for this site in Section 6 for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy. The Department will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

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.

The Department has issued this PRAP in accordance with the requirements of 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 the site related reports and documents which are available for review at the document repositories. The public is encouraged to review the reports and documents, which are available at the following repositories:

George F. Johnson Memorial Library
1101 Park Street
Endicott, New York 13760
(607) 757-5350
Monday – Thursday 9:00am to 9:00pm
Friday – Saturday 9:00am to 5:00pm

Broome County Public Library
185 Court Street
Binghamton, New York 13901
(607) 778-6400
Monday – Thursday 9:00am to 8:00pm
Friday – Saturday 9:00am to 5:00pm

By appointment only:

Gary Priscott, Project Manager
NYSDEC Region 7 – Kirkwood Sub-office
1679 NY Route 11
Kirkwood, New York 13795-1602
(607) 775-2545

Diane Carlton, Citizen Participation Specialist
NYSDEC Region 7 Office
615 Erie Boulevard West
Syracuse, New York 13204-2400
(315) 426-7413

The Department seeks input from the community on all PRAPs. A public comment period has been set from November 15, 2010 to December 29, 2010 in order to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for November 30, 2010 at the Broome County Public Library beginning at 6:00 pm.

At the meeting, the findings of the remedial investigation (RI) and the alternative analysis (AA) 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. Priscott at the address provided above through December 29, 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 DESCRIPTION AND HISTORY

2.1: Location and Description

312 Maple Street (the site) is located on the southwest corner of Maple Street and North Duane Street in the Village of Endicott, Broome County (Figure 1). The site is approximately 0.93 acres in size and is comprised of two tax parcels with Tax Map ID Numbers 156.12-4-11 and 156.12-4-12. Three interconnected buildings and paved parking areas cover most of the site. A small vegetated area is located on the southwestern side of the site in an area formerly occupied by a rail spur. Currently, two of the three site buildings are used for wood cabinet manufacturing and leased office space. The third building is used primarily for storage. Adjacent parcels are currently used for a combination of residential and commercial purposes. Railroad tracks have been located adjacent to the site on the south since the early 1900s. The Former Canada Dry Bottling Facility inactive hazardous waste disposal site (Site No. 704050) is located approximately 275 feet to the east.

Overburden encountered at the site generally consists of fill material (e.g. sands and gravels intermixed with ash, coal, and slag components) ranging from about two to seven feet thick overlying assumed proglacial fluvial deposited granular sand and gravel soil with lesser amounts of silt. Investigations at the site were focused on overburden soils within 20 feet of the ground surface.

The average depth to groundwater measured in monitoring wells at the site is approximately 14 feet below ground surface (bgs). Seasonal fluctuations in observed groundwater levels have been as high as three feet. The groundwater flow direction at the site is generally to the northwest or west-northwest.

The site topography is generally flat and typical pavement grades have been constructed to shed precipitation away from the buildings and towards either North Duane Street or Maple Street where it drains into the nearest storm water catch basin. The nearest surface water bodies to the site are Nanticoke Creek and the Susquehanna River at approximately one-half mile to the north and south, respectively.

2.2: Operational/Disposal History

From 1922 to the 1960's, the site was used for shoe manufacturing; from 1965 to 1981, the site was used for electronics assembly; and from 1988 to 1993, the site was used for manufacturing circuit boards and computer recycling. Portions of the southern side of the site were historically occupied by several coal companies and used for coal storage. Trichloroethylene (TCE) was used in the electronics manufacturing process for cleaning parts. TCE apparently spilled outside the buildings in the southeast portion of the site and also may have been released through discharges to three drywells located beneath on-site buildings.

2.3: Remedial History

The site remedial program is being performed by Broome County through the Department's Environmental Restoration Program (ERP).

Investigation activities that were implemented by Broome County prior to conducting the Remedial Investigation and Alternatives Analysis (RI/AA) include the following:

- Environmental Site Assessments completed in 1996.
- Environmental Investigation completed in 1999.
- Supplemental Environmental Site Investigation completed in 1999.

SECTION 3: LAND USE

The Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings when assessing the nature and extent of contamination. For this site alternatives that may restrict the use of the site to restricted residential criteria as described in Part 375-1.8 (g) are being evaluated in addition to unrestricted use SCGs because data from the RI indicates that this restricted use level is achievable and would provide Broome County with additional options regarding land use planning. A comparison of the appropriate SCGs for the identified land use against the unrestricted use SCGs for the site contaminants is included in the tables for the media being evaluated in Section 5.1.2.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present 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. Broome County will assist the state in its efforts by providing all information to the state which identifies PRPs. The County will also not enter into any agreement regarding response costs without the approval of the Department.

SECTION 5: SITE CONTAMINATION

A remedial investigation has been conducted to determine the nature and extent of contamination and to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the Remedial Investigation (RI) was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between May 2006 and October 2009. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Soil borings and monitoring well installations,
- Sampling of surface and subsurface soils, groundwater and soil vapor,
- Ecological and Human Health Exposure Assessments.

5.1.1: Standards, Criteria and Guidance (SCGs)

The remedy must conform to 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.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and surface and subsurface soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in the following Sections list the applicable SCG in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html.

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 Remedial Investigation. As described in the RI Report, waste/source materials were identified at the site and are impacting groundwater, soil, and/or soil vapor.

Groundwater

Groundwater samples were collected from overburden monitoring wells. The samples were collected to assess groundwater conditions on- and off-site. The results indicate that contamination in the shallow groundwater at the site exceeds the SCGs for volatile organic compounds (VOCs) and heavy metal compounds (metals). Table 1 includes all contaminants that exceed the groundwater and drinking water SCGs.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Trichloroethene	2.3 – 1,600	5	12 of 15
Metals			
Hexavalent Chromium	48 - 1,200	50	3 of 5
Iron	44.5 - 590	300	1 of 5
Sodium	33,600 – 434,000	20,000	2 of 5
Thallium	1.7 – 2.0	0.5	2 of 5

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standards, Criteria and Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface Water and Groundwater Quality Standards and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

The primary groundwater contaminants of concern at the site are trichloroethene (TCE) associated with the previous use of the site for electronics manufacturing and hexavalent chromium associated with the previous use of the site for shoe manufacturing (i.e., leather tanning). The concentrations and distribution of the contaminants of concern are shown on Figure 2. The other metals listed in Table 1 are more isolated in extent. However, they are likely associated with previous site uses.

Groundwater contamination migrating off-site to the north and northwest combines with contamination associated with former Canada Dry Plant inactive hazardous waste disposal site. Contamination that exists beyond the limits shown on Figure 2 has been defined as part of the remedial investigation for the Former Canada Dry Bottling Facility site. The location of the Former Canada Dry site and the remedial investigation study area are shown on Figure 3.

Based on the findings of the RI, the disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are TCE and hexavalent chromium.

Soil

Surface and subsurface soil samples were collected at the site during the RI. Soil samples were collected both on- and off-site to assess direct human exposure and soil contamination impacts to groundwater. Soil samples were collected from ground surface to a depth of 16 feet. The results indicate that soils exceed the unrestricted use SCGs for VOCs and metals. Table 2 includes all contaminants that exceed the unrestricted use SCGs.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Residential SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
Trichloroethene	0.0034 – 110	0.47	12 of 40	21	6 of 40
Metals					
Cadmium	0.82 – 7.7	2.5	1 of 8	4.3	1 of 8
Copper	9.9 – 321	50	2 of 8	270	1 of 8

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil.
b - SCG: Part 375-6.8(a), Unrestricted Use Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Residential Soil Cleanup Objectives.

The trichloroethene (TCE) contamination in soil is associated with the former on-site electronics manufacturing and is typically present in the soil from near ground surface to a depth of approximately four feet. Remaining soil contamination appears isolated to an off-site area immediately adjacent to the where the on-site soil excavation Interim Remedial Measure (IRM) was performed. The IRM is described in Section 5.2. The concentrations and distribution of TCE soil contamination are shown on Figure 4.

The metals contamination in soil was isolated to an area beneath one of the drywells on-site and was addressed during the IRMs described in Section 5.2.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of soil. The site contaminant identified in soil which is considered to be the primary contaminant of concern to be addressed by the remedy selection process is TCE.

Soil Vapor Intrusion

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of sub-slab soil vapor under structures, and indoor air inside structures. At this site, due to the presence of buildings in the impacted area a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

Soil vapor intrusion samples (a combined sample set including sub-slab, indoor, and outside air) were collected from 21 residential, commercial and/or industrial buildings including those on-site. Sampling was performed in 2006, 2007 and 2008. Figure 5 shows the general locations of the buildings sampled. Based on the air sampling results, sub-slab depressurization (SSD) systems were installed at the three on-site buildings and at three off-site commercial buildings. Overall, the results of the air sampling effort indicated that no sampling of additional buildings was needed to assist with the completion of the RI.

The primary soil vapor contaminant is trichloroethene (TCE), which is associated with former on-site electronics manufacturing.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of soil vapor. The site contaminant that is considered to be the primary contaminant of concern which will drive the remediation of soil vapor to be addressed by the remedy selection process is TCE.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

Based on previously completed site investigations, it was determined that approximately 250 cubic yards of TCE-contaminated soil was present in the southeast portion of site. An IRM was conducted in 2006 which included excavation and off-site disposal of the TCE-contaminated soil. The approximate limits of the IRM excavation are shown on Figure 4. Additionally in 2006, sediment/soil at the bottom and beneath two drywells was removed and disposed off-site. The drywells were backfilled with concrete up to the existing floor grade.

Mitigation measures (i.e., installation of SSD systems) were also taken at the on-site buildings and three off-site buildings to address current and/or potential indoor air contamination of volatile organic compounds associated with soil vapor intrusion.

Excavation of TCE contaminated soil identified off-site on the Northfolk Southern Rail Road property will also be conducted as an IRM. All off-site soils located in the vadose zone (above the water table) which exceed unrestricted SCGs will be excavated and transported off-site for disposal. The approximate location and areal extent of excavation is shown on Figure 4. It is estimated that 50 cubic yards of soil will be removed. Clean fill will then be brought in to replace the excavated soil and establish the designed grades at the site.

5.3: Summary of Human Exposure Pathways:

This section describes the current or potential human exposures (the way people may come in contact with contamination) that may result from the site contamination. A more detailed discussion of the human exposure pathways can be found in the RI report available at the document repository. 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.

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.

Currently, there are no complete exposure pathways associated with the site. Exposure to site-related contaminants via soil vapor intrusion was previously identified as a completed exposure pathway for the on-site buildings and some buildings adjacent to the site. As a result, sub-slab depressurization systems were installed and continue to operate to ensure that site-related contaminants do not affect the indoor air of buildings on or near the site.

There is a potential for people to come into contact with contaminated surface or subsurface soil if they trespass or conduct ground-intrusive activities in the southeast area of the site or on the adjacent railroad property. People are not expected to come in contact with contaminated soil on the remainder of the site because buildings and pavement cover most of the site. People are not currently being exposed to the contaminated groundwater because groundwater in the vicinity of the site is not used as a source of drinking water and the contamination does not extend to the public water supply wells.

5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

The 312 Maple Street site is located in an urban area, with nearly the entire site covered by a building and paved parking lots. Significant portions of the land surrounding the site are also covered by the railroad, pavement and/or buildings. Based on the location of the site and the conditions summarized above and in Section 2.1, a Fish and Wildlife Impact Analysis was not included in the RI.

Surface water resources near the site include Nanticoke Creek and the Susquehanna River at approximately one-half mile to the north and south, respectively. No current or potential site-related surface water impacts have been identified.

Groundwater resources at the site include an overburden groundwater unit. The generalized hydrogeologic characteristics of the overburden groundwater unit are presented in Section 2.1. Site-related contamination is impacting a sole source, principal/primary aquifer that is used as a source of potable water. The remedy must address the impacts of the site to the groundwater aquifer.

SECTION 6: SUMMARY OF THE REMEDIATION OBJECTIVES

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial objectives for this site are:

Public Health Protection

Groundwater

- Prevent people from drinking groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with contaminated groundwater.
- Prevent inhalation of contaminants from groundwater.

Soil

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of contaminants volatilizing from the soil.

Soil Vapor

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into the indoor air of buildings at or near a site.

Environmental Protection

Groundwater

- Restore the groundwater aquifer to meet ambient groundwater quality criteria, to the extent feasible.

Soil

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Site were identified, screened and evaluated in the alternative analysis report which is available at the document repositories established for this site.

A summary of the remedial alternatives that were considered for this site is presented below. Cost information is presented in the form of present worth, which 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 alternatives were considered to address the contaminated media identified at the site as described in Section 5:

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 5.2. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Alternative 2: Monitored Natural Attenuation and Site Management

This alternative would include groundwater monitoring to assess the natural degradation of contaminants; operation, maintenance and monitoring of the existing SSD systems; and imposition of an environmental easement to restrict land use to restricted-residential use, prohibit groundwater use, and certify continued operation and maintenance of the SSD systems.

The groundwater monitoring would include periodic sampling of the existing monitoring wells (i.e., MW-1 through MW-8) plus one upgradient (i.e., background) monitoring well for analysis of VOCs and indicator parameters.

Present Worth: *$94,100*
Capital Cost: *$13,000*
Annual Costs (years 1 and 2): *$21,800*
Annual Costs (years 3-30): *$13,900*

Alternative 3: Enhanced Anaerobic Bioremediation and Site Management

Enhanced anaerobic bioremediation involves the addition of an electron donor to the subsurface for use by local microorganisms capable of degrading volatile organic compounds found in soil and/or groundwater. The electron donor is introduced into the subsurface via injection points. The microorganisms (i.e., dechlorinating bacteria) use the electron donor, ultimately replacing chlorine atoms with hydrogen atoms in a process known as reductive dechlorination. Reductive dechlorination results in the step-by-step biological degradation of chlorinated contaminants such as trichloroethene (TCE) and its breakdown products. Several reductive dechlorination reagents are commercially available. At this site, the electron donors would be applied through a network of injection points to target the primary contaminant of concern, TCE.

Prior to the full implementation of this technology, pre-design investigations and on-site pilot testing would be conducted to more clearly define design parameters. For full-scale implementation of this technology, it is estimated that approximately 18 injection points would be installed. It is estimated that the electon donors would be applied in one injection event. Monitoring would be conducted to assess the effectiveness of remediation. Figure 6 shows the conceptual layout for this alternative.

This alternative would also include operation, maintenance and monitoring of the existing SSD systems; and imposition of an environmental easement to restrict land use to restricted-residential use, prohibit groundwater use, and certify continued operation and maintenance of the SSD systems.

Present Worth:.....*$141,000*
Capital Cost:.....*$56,700*
Annual Costs (years 1 through 4):.....*$13,900*
Annual Costs (years 5 through 30):.....*$3,000*

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which sets forth the requirements for the remediation of inactive hazardous waste disposal sites in New York. A detailed discussion of the evaluation criteria and comparative analysis is included in the alternative analysis 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 six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. 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.

4. 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.

5. Short-term Impacts and 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.

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-Effectiveness. 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 the Remedial Alternatives Cost Table.

Table 3
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Further Action	0	0	0
Monitored Natural Attenuation and Site Management	13,000	21,800 (years 1-2) 13,900 (years 3-30)	94,100
Enhanced Anaerobic Bioremediation and Site Management	56,700	13,900 (years 1-4) 3,000 (years 5-30)	141,000

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The final criterion, Community Acceptance, 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.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, 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 3 (Enhanced Anaerobic Bioremediation and Site Management) as the remedy for this site. The elements of this remedy are described at the end of this section.

8.1 Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives.

Alternative 3 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the balancing criterion described in Section 7.2. It would achieve the remediation goals for the site by providing the greatest permanent reduction in the toxicity, mobility, or volume of contamination in groundwater and creating the conditions necessary to restore groundwater quality to pre-release conditions to the extent practicable. The reduction of contaminants in groundwater at the site is expected to have a correlative impact on soil vapor contamination.

Alternative 1 (No Further Action) with no institutional controls and no site management does not provide sufficient protection to public health and the environment. Groundwater sampling has not shown TCE breakdown products that are typically present when natural attenuation of TCE is occurring. Therefore, Alternative 2 may not provide overall protection to public health and the environment. Failing to meet the threshold criteria, Alternatives 1 and 2 will not be evaluated further.

Alternative 3 is protective of public health and the environment, complies with the SCGs, and addresses the remedial goals and objectives for the site. Alternative 3 is expected to achieve the remedial goals and objectives in 5 years or less.

The estimated present worth cost to implement the remedy is $141,000. The cost to construct the remedy is estimated to be $56,700 and the estimated average annual costs range from $13,900 for years 1 through 4 to $3,000 for years 5 through 30.

8.2 Elements of the Proposed Remedy

The elements of the proposed restricted use 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. Enhanced anaerobic bioremediation applied through a network of injection wells to target the primary contaminants of concern in groundwater.

3. Operation, maintenance and monitoring of existing sub-slab depressurization systems.

4. 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.

5. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

(a) requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);

(b) allows the use and development of the controlled property for restricted residential, commercial, and/or industrial use (land use is subject to local zoning laws);

(c) restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH;

(d) prohibits agriculture or vegetable gardens on the controlled property;

(e) requires compliance with the Department approved Site Management Plan.

6. Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required, which includes the following:

(a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Paragraph 5 above.

Engineering Controls: The sub-slab depressurization systems discussed in Paragraph 3 above.

This plan includes, but is not limited to:

(i) Excavation Management Plan which details the provisions for management of future excavations in areas of remaining contamination;
(ii) descriptions of the provisions of the environmental easement including any land use, groundwater water use restrictions;
(iii) provisions for the management and inspection of the identified engineering controls;
(iv) maintaining site access controls and Department notification; and
(v) the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

(b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but is not limited to:

(i) monitoring of groundwater to assess the performance and effectiveness of the remedy;
(ii) a schedule of monitoring and frequency of submittals to the Department;
(iii) provision to evaluate the potential for vapor intrusion for any buildings newly constructed on the site, including provision for mitigation of any impacts identified;
(iv) provision to evaluate the potential for soil vapor intrusion for existing buildings if building use changes significantly or if a vacant building become occupied.

(c) an Operation and Maintenance Plan to assure continued operation, maintenance, monitoring, inspection, and reporting of for any mechanical or physical components of the remedy. The plan includes, but is not limited to:

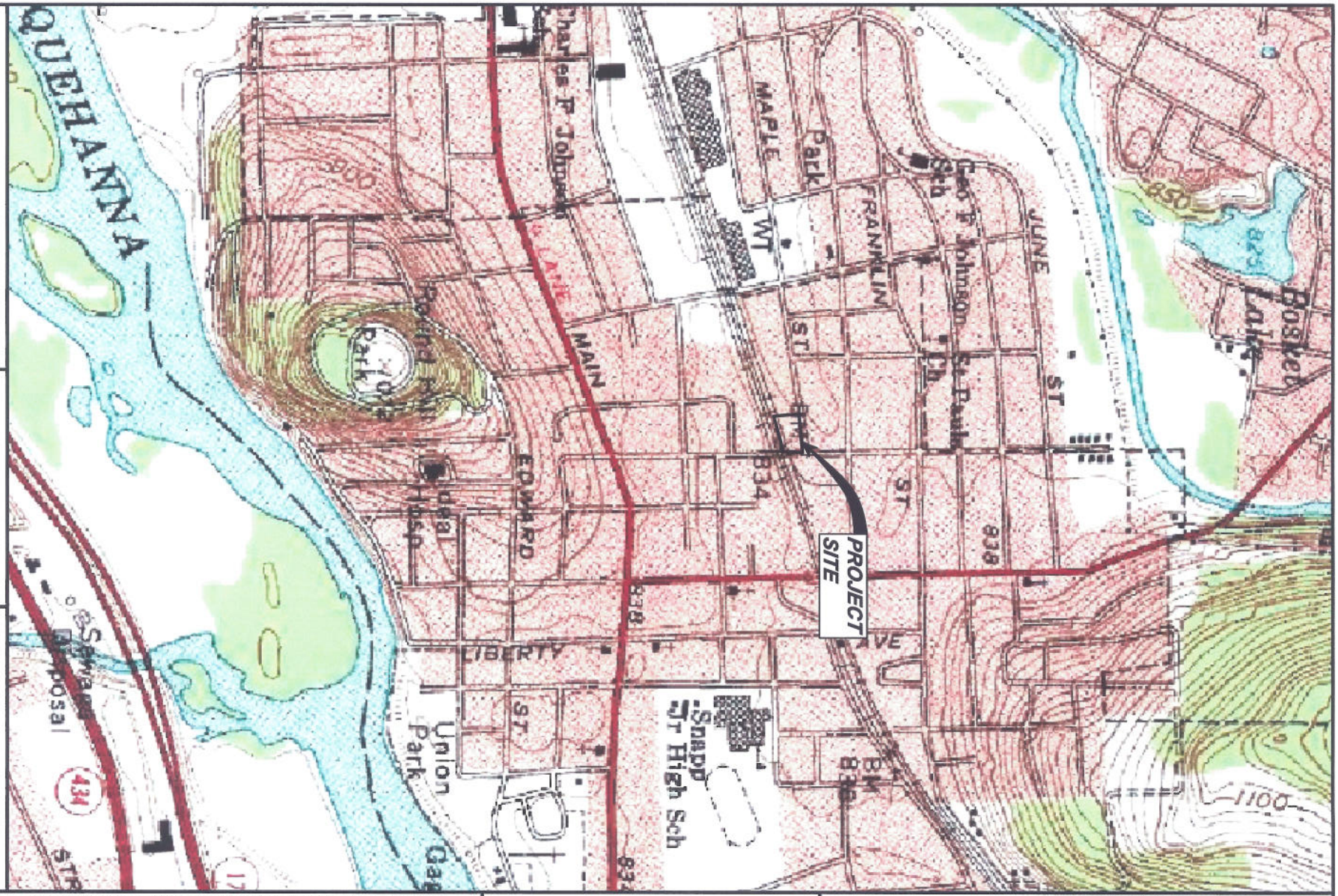
(i) compliance monitoring of treatment systems to assure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
(ii) maintaining site access controls and Department notification; and
(iii) providing the Department access to the site and O&M records.

7. Green remediation and sustainability efforts are considered in the design and implementation of the remedy to the extent practicable, including:

- using renewable energy sources
- reducing green house gas emissions
- conserving natural resources

 GZA-T:\PROJECTS\56100s\56127 Broome Co SI-RAR\ERP Figures\FIGURE 1.dwg [Figure 1] October 20, 2009 - 9:46am daniel.wulf

NOTE:
BASE MAP ADAPTED FROM U.S.G.S. TOPOGRAPHIC MAPS DOWNLOADED FROM TERRASERVER.MICROSOFT.COM



BROOME COUNTY DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

312 MAPLE STREET
VILLAGE OF ENDICOTT, NEW YORK

ERP SITE No. B-00168-7

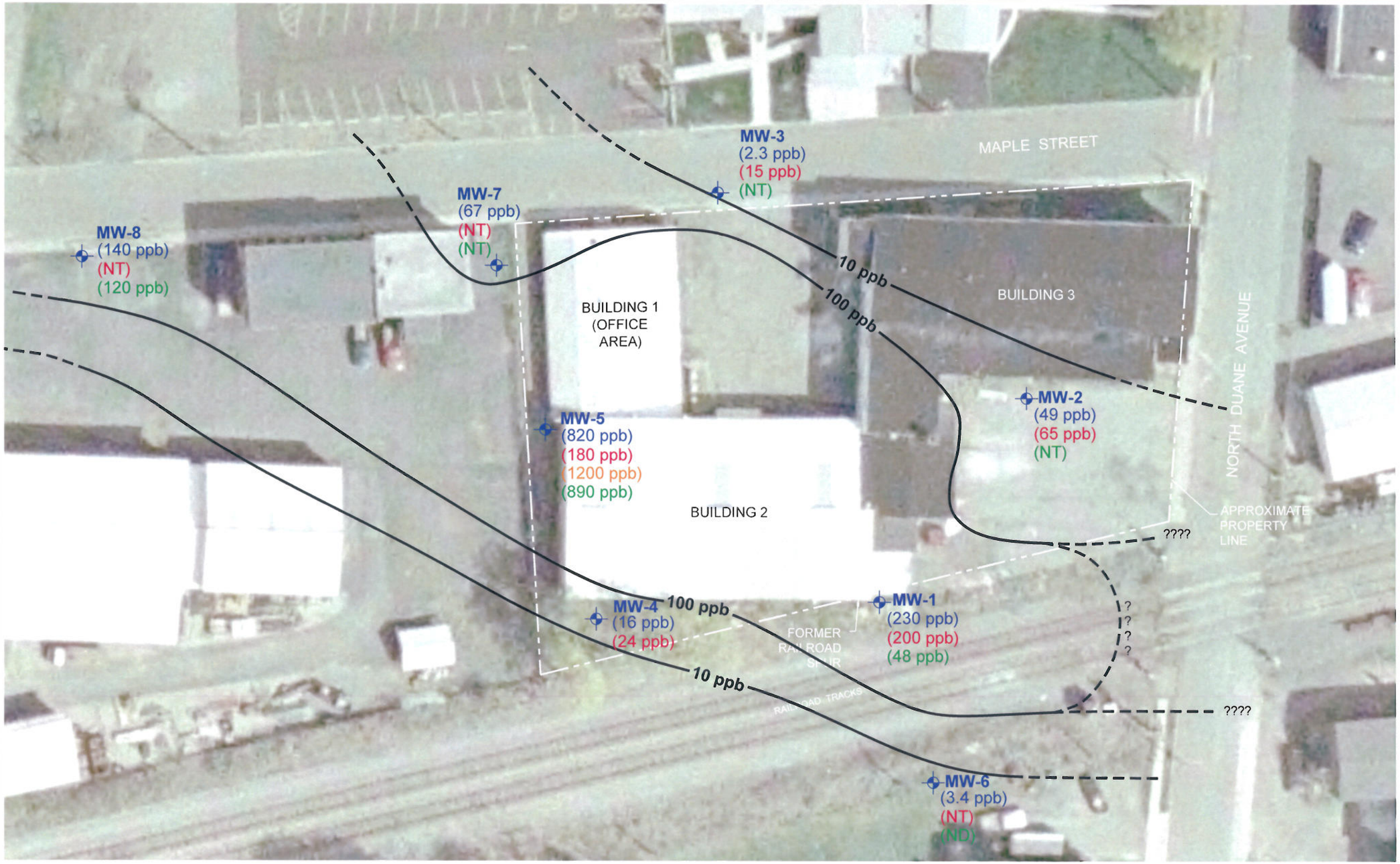
LOCUS PLAN

SCALE IN FEET
0 500 1000 2000

DRAWN BY: **DEW**
DATE: **OCTOBER 2009**

GZA GeoEnvironmental of New York

PROJECT No. **21.0056127.00**
FIGURE No. **1**



LEGEND:

MW-5
(820 ppb)
(180 ppb)
(1200 ppb)
(890 ppb)

APPROXIMATE LOCATION AND DESIGNATION OF MONITORING WELL. TCE CONCENTRATION IN PPB FROM SAMPLES COLLECTED FOR ANALYSIS IN PARENTHESIS.
2008 TCE VALUES IN BLUE
2006 TCE VALUES IN RED
SEPTEMBER 2008 Cr^{+6} VALUES IN GREEN
APRIL 2008 Cr^{+6} VALUES IN ORANGE
NT = NOT TESTED AS MONITORING WELL WAS NOT PRESENT AT THE SAMPLE TIME
ND = NOT DETECTED

10 ppb

TCE CONTOUR LINE REPRESENTS CONCENTRATIONS IN ppb AND IS BASED ON 2008 SAMPLE RESULTS

NOTES:

1. BASE MAP ADAPTED FROM A 2002 AERIAL PHOTOGRAPH DOWNLOADED FROM http://www.nysgis.state.ny.us/gateway/mg/interactive_main.html AND FIELD OBSERVATIONS.

2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

NORTH

DRAWN BY: DEW
DATE: OCTOBER 2009

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APPROXIMATE SCALE IN FEET
0 20 40 80

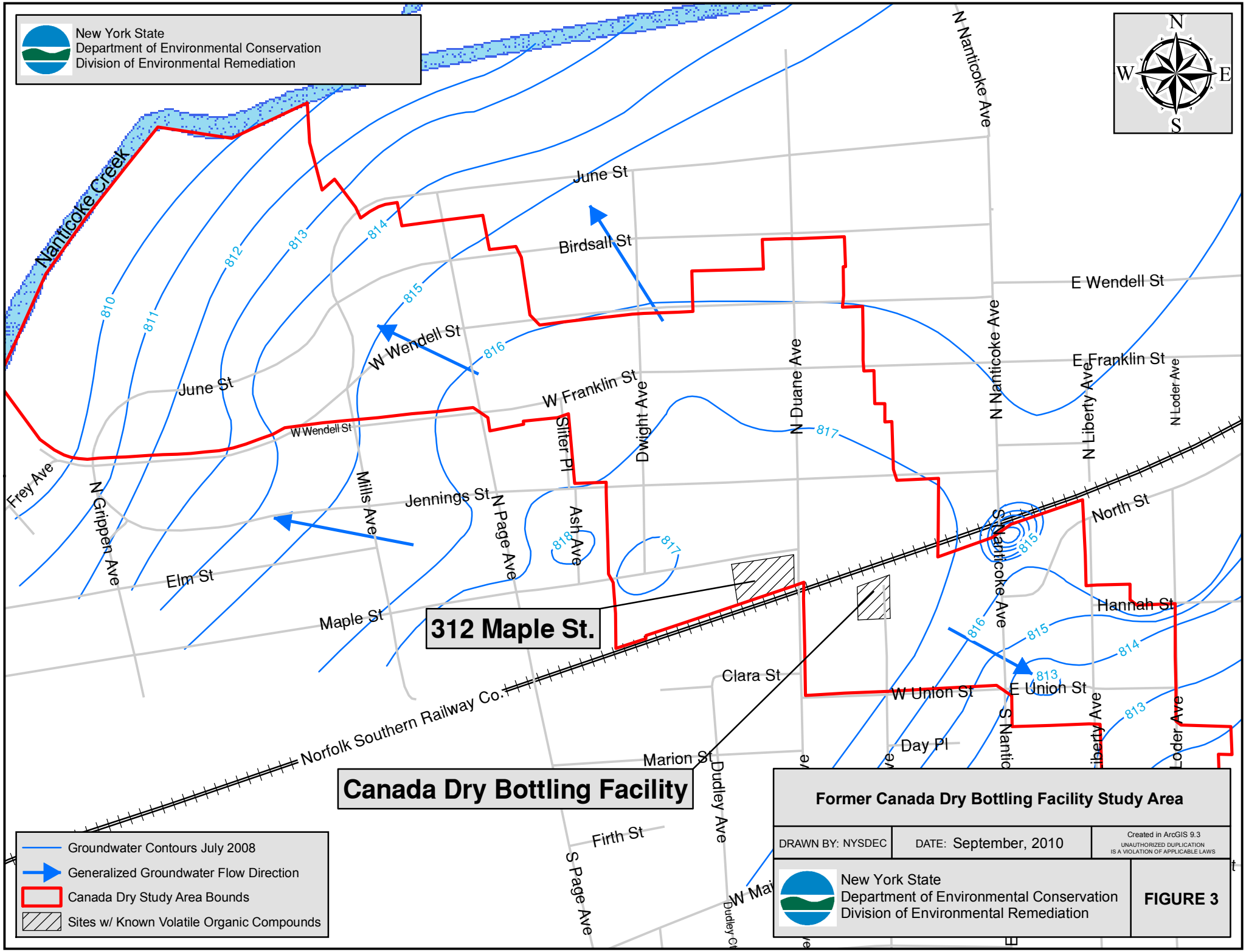
BROOME COUNTY DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT
312 MAPLE STREET
VILLAGE OF ENDICOTT, NEW YORK
ERP SITE No. B-00168-7

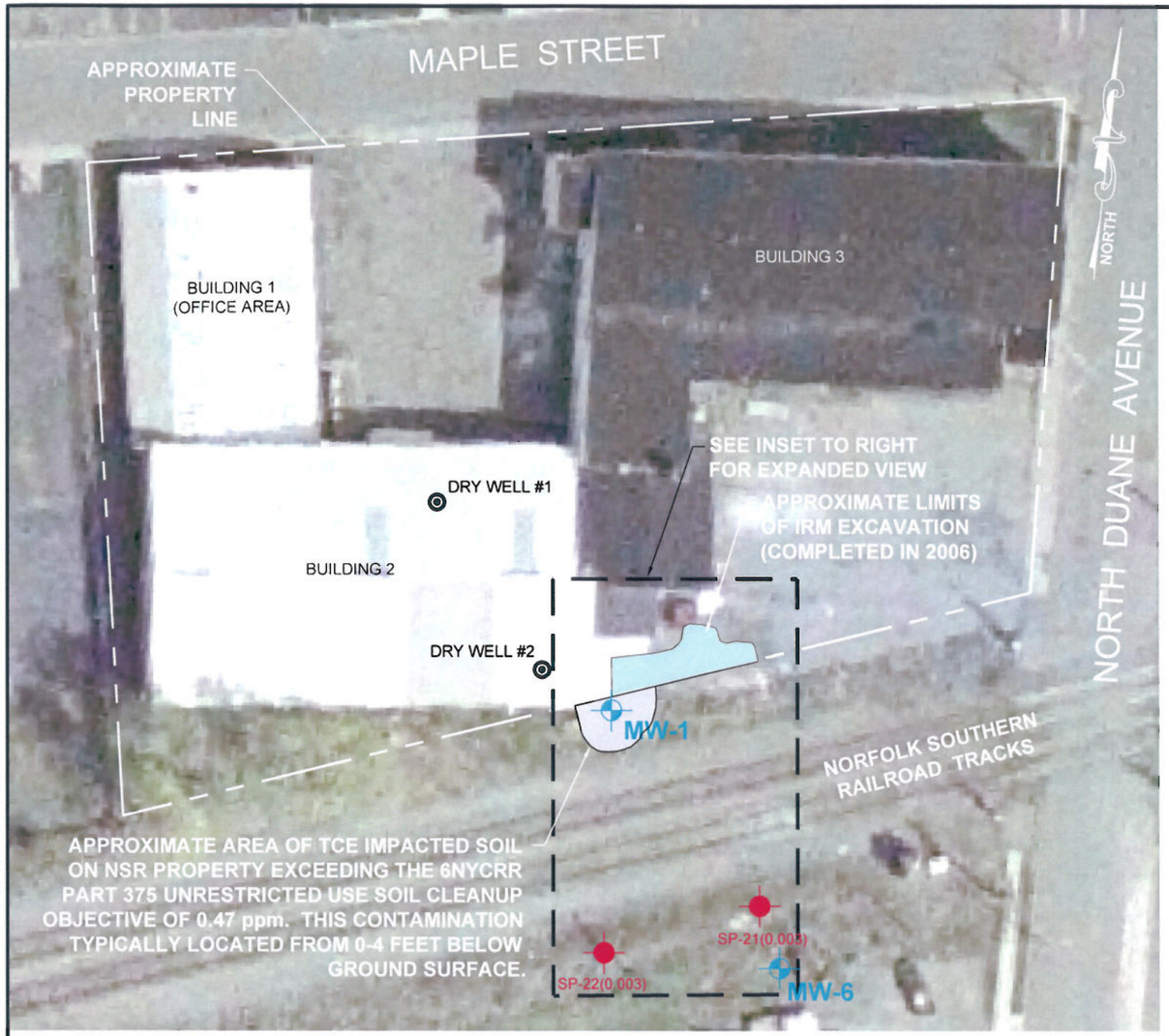
MONITORING WELL LOCATIONS AND TCE CONCENTRATION CONTOURS FROM 2006 AND 2008 GROUNDWATER SAMPLES

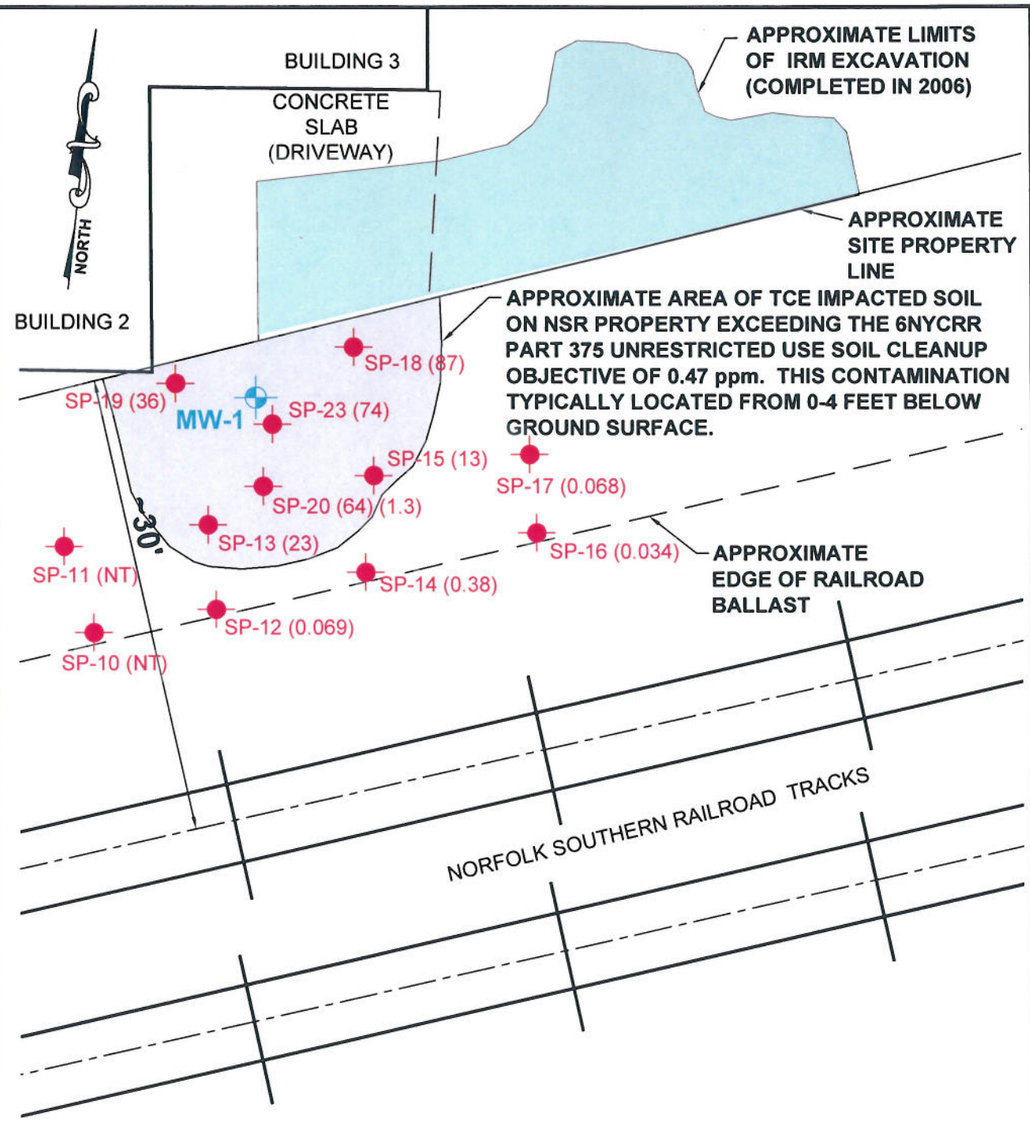
PROJECT No.
21.0056127.00

FIGURE No.
2

GZA-T:\PROJECTS\56100s\56127 Broome Co SI-RAR\ERP Figures\FIGURE 5.dwg [Figure 5] May 17, 2010 - 8:56am daniel.wulf


New York State
Department of Environmental Conservation
Division of Environmental Remediation
N
W
E
S
Nanticoke Creek
N Nanticoke Ave
June St
Birdsall St
E Wendell St
W Wendell St
E Franklin St
W Franklin St
N Duane Ave
Dwight Ave
N Liberty Ave
N Loder Ave
Frey Ave
N Grippen Ave
Mills Ave
Jennings St
Sliter Pl
N Page Ave
Ash Ave
S Nanticoke Ave
North St
Elm St
Maple St
312 Maple St.
Hannah St
Clara St
W Union St
E Union St
Day Pl
Marion St
Dudley Ave
Firth St
S Page Ave
Norfolk Southern Railway Co.
Canada Dry Bottling Facility
810
811
812
813
814
815
816
817
818
Groundwater Contours July 2008
Generalized Groundwater Flow Direction
Canada Dry Study Area Bounds
Sites w/ Known Volatile Organic Compounds
Former Canada Dry Bottling Facility Study Area
DRAWN BY: NYSDEC
DATE: September, 2010
Created in ArcGIS 9.3
UNAUTHORIZED DUPLICATION IS A VIOLATION OF APPLICABLE LAWS
New York State
Department of Environmental Conservation
Division of Environmental Remediation
FIGURE 3





LEGEND:

- **SP-11 (13)** — APPROXIMATE LOCATION OF SOIL PROBE AND TCE CONCENTRATION IN ppm FROM SAMPLES COLLECTED FOR ANALYSIS (NT = NOT TESTED)
- **MW-1** — APPROXIMATE LOCATION AND DESIGNATION OF EXISTING MONITORING WELL
- **DRY WELL #1** — APPROXIMATE LOCATION AND DESIGNATION OF DRYWELL CLOSURE

SITE PLAN

0 20 40 80

APPROXIMATE SCALE IN FEET

NOTES:

1. BASE MAP ADAPTED FROM A 2002 AERIAL PHOTOGRAPH DOWNLOADED FROM http://www.nysgis.state.ny.us/gateway/mg/interactive_main.html, A SURVEY PLAN PROVIDED BY THE CLIENT, AND FIELD OBSERVATIONS.

2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

SP-21 (0.003)

SP-22 (0.003)

INSET

0 5 10 20

APPROXIMATE SCALE IN FEET

DRAWN BY: DEW

DATE: OCTOBER 2009

GZA GeoEnvironmental of New York

APPROXIMATE SCALE IN FEET

AS SHOWN

BROOME COUNTY DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

312 MAPLE STREET

VILLAGE OF ENDICOTT, NEW YORK

ERP SITE No. B-00168-7

RAILROAD PROPERTY SOIL DELINEATION AND IRM LOCATIONS

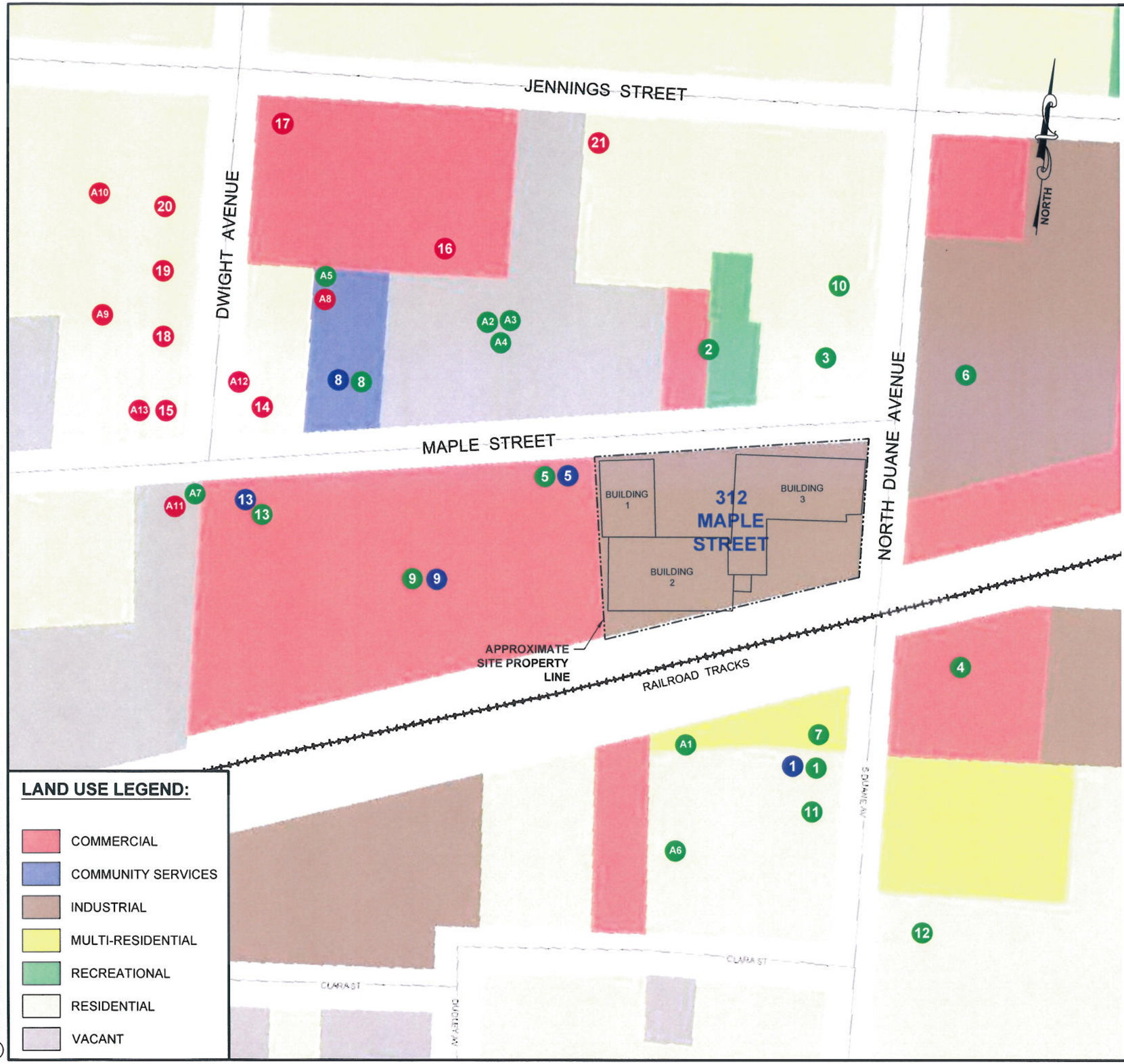
PROJECT No.

21.0056127.00

FIGURE No.

4

GZA-T:\PROJECTS\56100s\56127 Broome Co SI-RAR\ERP Figures\FIGURE 4.dwg [Figure 4] September 08, 2010 - 11:52am daniel.wulf



LAND USE LEGEND:

- COMMERCIAL
- COMMUNITY SERVICES
- INDUSTRIAL
- MULTI-RESIDENTIAL
- RECREATIONAL
- RESIDENTIAL
- VACANT

EVENTS 1 AND 2 SAMPLING LEGEND (2006):

- 5 STRUCTURE 5 (COMMERCIAL)
- 2 STRUCTURE 2 (COMMERCIAL)
- 3 STRUCTURE 3 (RESIDENCE)
- 6 STRUCTURE 6 (COMMERCIAL)
- 7 STRUCTURE 7 (MULTI-FAMILY RESIDENCE)
- 1 STRUCTURE 1 (MULTI-FAMILY RESIDENCE)
- 4 STRUCTURE 4 (COMMERCIAL)
- 10 STRUCTURE 10 (MULTI-FAMILY RESIDENCE)
- 11 STRUCTURE 11 (SINGLE-FAMILY RESIDENCE)
- 12 STRUCTURE 12 (MULTI-FAMILY RESIDENCE)
- 9 STRUCTURE 9 (COMMERCIAL)
- 8 STRUCTURE 8 (COMMERCIAL)
- 13 STRUCTURE 13 (SINGLE-FAMILY RESIDENCE)

EVENT 3 SAMPLING LEGEND (2007-2008):

RESAMPLED STRUCTURES :

- 9 STRUCTURE 9 (COMMERCIAL)
- 5 STRUCTURE 5 (COMMERCIAL)
- 13 STRUCTURE 13 (SINGLE FAMILY RESIDENCE)
- 1 STRUCTURE 1 (MULTI-FAMILY RESIDENCE)
- 8 STRUCTURE 8 (COMMERCIAL)

STRUCTURES SAMPLED 1st TIME:

- 21 STRUCTURE 21 (SINGLE FAMILY RESIDENCE) (SEE NOTE 3)
- 17 STRUCTURE 17 (MIXED COMMERCIAL/RESIDENTIAL)
- 14 STRUCTURE 14 (MULTI-FAMILY RESIDENCE)
- 15 STRUCTURE 15 (SINGLE FAMILY RESIDENCE)
- 16 STRUCTURE 16 (COMMERCIAL)
- 20 STRUCTURE 20 (MULTI-FAMILY RESIDENCE)
- 19 STRUCTURE 19 (MULTI-FAMILY RESIDENCE)
- 18 STRUCTURE 18 (MULTI-FAMILY RESIDENCE)

LEGEND:

- A1 APPROXIMATE LOCATION AND DESIGNATION OF AMBIENT/OUTDOOR AIR SAMPLE (EVENTS 1-2, 2006)
- A8 APPROXIMATE LOCATION AND DESIGNATION OF AMBIENT/OUTDOOR AIR SAMPLE (EVENT 3, 2007-08)

NOTES:

1. BASE MAP ADAPTED FROM A LAND USE MAP DOWNLOADED FROM http://broomegis.co.broome.ny.us/website/gisweb/portal.htm AND FIELD OBSERVATIONS.

2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

3. GZA ATTEMPTED TO COLLECT SAMPLES FROM THE STRUCTURE 21, HOWEVER THE OCCUPANT/OWNER DECLINED ACCESS/SAMPLING ON SEVERAL OCCASIONS. GZA CONTACTED THE OCCUPANT/OWNER BOTH IN PERSON AND VIA MAIL REQUEST.

DRAWN BY: DEW

DATE: OCTOBER 2009

GZA GeoEnvironmental of New York

APPROXIMATE SCALE IN FEET

0 50 100 200

BROOME COUNTY DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

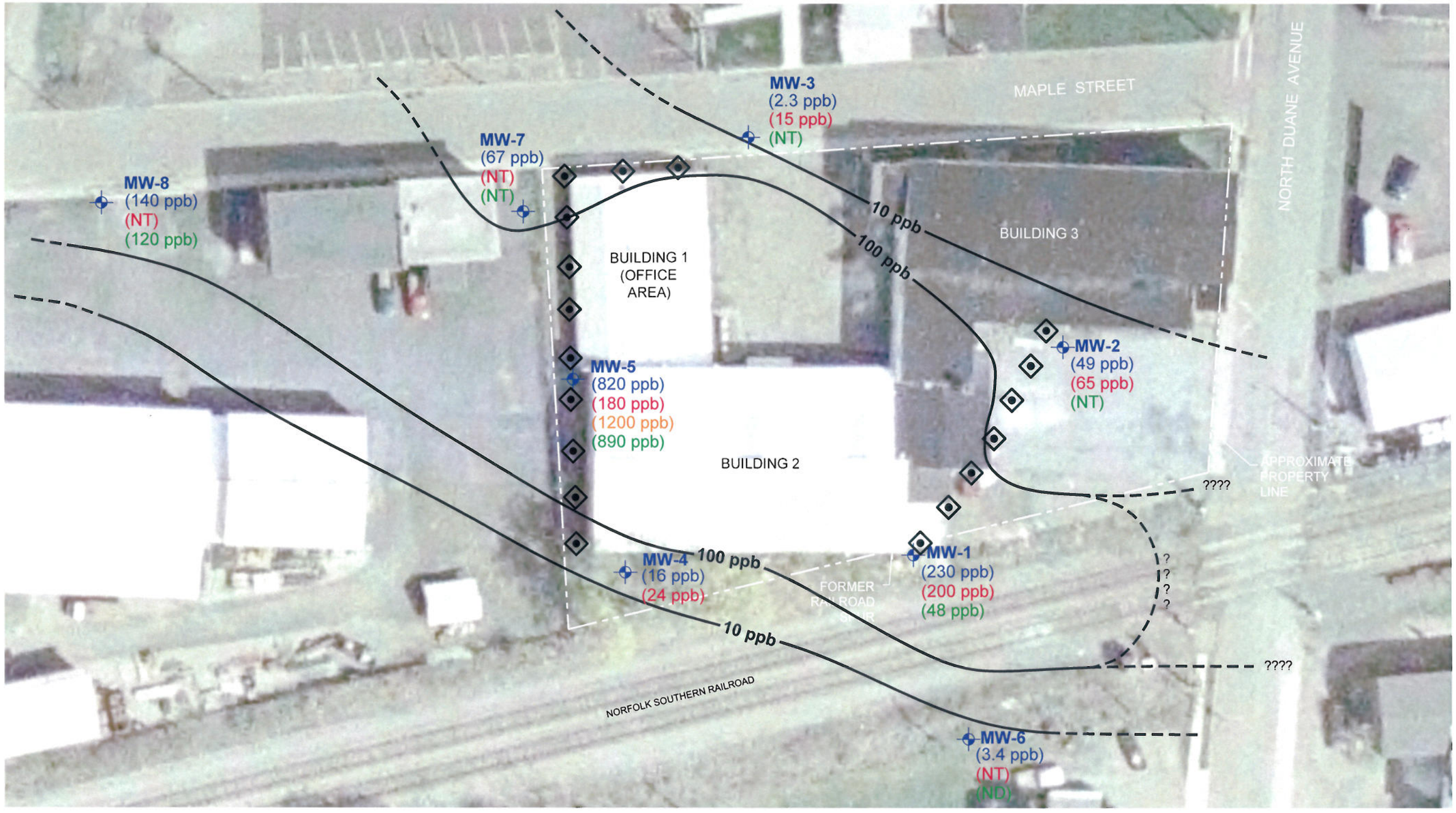
312 MAPLE STREET
VILLAGE OF ENDICOTT, NEW YORK

ERP SITE No. B-00168-7

ON-SITE AND OFF-SITE SOIL VAPOR SAMPLING PLAN

PROJECT No.
21.0056127.00

FIGURE No.
5



NORTH

DRAWN BY: MDK

DATE: OCTOBER 2009

GZA GeoEnvironmental of New York

APPROXIMATE SCALE IN FEET

0 20 40 80

LEGEND:

MW-5
(820 ppb)
(180 ppb)
(1200 ppb)
(890 ppb)

APPROXIMATE LOCATION AND DESIGNATION OF MONITORING WELL. TCE CONCENTRATION IN PPB FROM SAMPLES COLLECTED FOR ANALYSIS IN PARENTHESIS.
2008 TCE VALUES IN BLUE
2006 TCE VALUES IN RED
SEPTEMBER 2008 Cr^{+6} VALUES IN GREEN
APRIL 2008 Cr^{+6} VALUES IN ORANGE
NT = NOT TESTED AS MONITORING WELL WAS NOT PRESENT AT THE SAMPLE TIME
ND = NOT DETECTED

APPROXIMATE LOCATION OF PROPOSED INJECTION POINTS

10 ppb — TCE CONTOUR LINE REPRESENTS CONCENTRATIONS IN ppb AND IS BASED ON 2008 SAMPLE RESULTS

NOTES:

1. BASE MAP ADAPTED FROM A 2002 AERIAL PHOTOGRAPH DOWNLOADED FROM http://www.nysgis.state.ny.us/gateway/mg/interactive_main.html AND FIELD OBSERVATIONS.

2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

BROOME COUNTY DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT
312 MAPLE STREET
VILLAGE OF ENDICOTT, NEW YORK
ERP SITE No. B-00168-7
Conceptual Layout For The Proposed Remedial Action

PROJECT No.
21.0056127.00

FIGURE No.
6