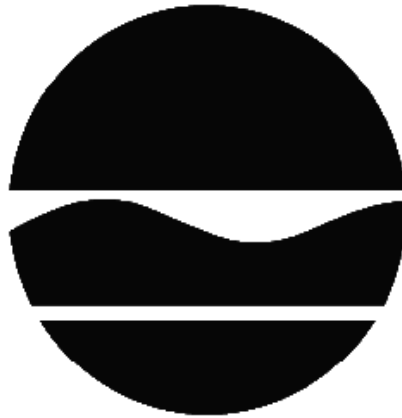


PROPOSED REMEDIAL ACTION PLAN

Dinaburg Distributing, Inc.
Operable Unit Number: 01
State Superfund Project
Rochester, Monroe County
Site No. 828103
February 2011



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 wastes 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 Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site 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 New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document 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 in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

Highland Branch Library
971 South Avenue
Rochester, NY 14620
Phone: (585) 428-8206

A public comment period has been set from:

3/1/2011 to 3/30/2011

A public meeting is scheduled for the following date:

3/15/2011 at 6:00 PM

Public meeting location:

Artisan Church, 1235 S. Clinton Ave, Rochester, NY 14620

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) 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 through 3/30/2011 to:

Matt Dunham
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
mddunham@gw.dec.state.ny.us

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 the proposed remedy identified herein. 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.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at <http://www.dec.ny.gov/chemical/61092.html>

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: This 0.25 acre Site includes the properties of identified as 1012 South Clinton Street

and 350 Benton Street in a mixed commercial/residential area on the southeast side of the City of Rochester, Monroe County.

Site Features: The buildings on both properties have been demolished and both properties are now vacant. Residential properties are located to the north, east and west of the Site with a commercial property located to the south of the Site.

Historical Use(s): The 1012 South Clinton Street property was used as a dry cleaning supply company that stored and distributed dry cleaning chemicals. The 350 Benton street property was formerly a private residence. Attempts to remediate the Site under the Voluntary Cleanup Program were unsuccessful and the voluntary cleanup agreement was terminated in 1999. Later that year, the Department installed two off-site soil vapor extraction (SVE) systems under an IRM. In 2006, under a separate IRM, the Department conducted a limited soil removal and installed a multi-phase extraction (MPE) system. Operation of the MPE system began in April, 2006 and is currently operating. Completed investigations include an Environmental Site Characterization Report (1995), a Voluntary Investigation Report (1998), a Remedial Investigation Report (2001) and a Remedial Investigation/Feasibility Study (2011).

Site Geology and Hydrogeology: The site is underlain by approximately 20 to 25 feet of overburden materials overlying bedrock. The overburden consists of miscellaneous fill and a low permeability glacial till. Groundwater in the overburden beneath the site is 10 feet below ground surface with flow to the west and southwest.

The site has been divided into two operable units for the purpose of remediation and they are:

Operable Unit 01 consists of the on-site soil.

Operable Unit 02 consists of groundwater and any contaminate migration associated with groundwater such as vapor intrusion.

Operable Unit (OU) Number 01 is the subject of this document.

A Record of Decision has yet to be issued for OU 02.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to residential use (which allows for restricted-residential use, commercial use and industrial use) as described in Part 375-1.8(g) is/are being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and

guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: 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.

The PRPs for the site, documented to date, include:

Estate of Saul Dinaburg

The PRPs for the site declined to implement a remedial program when requested by the Department. After the remedy is selected, the PRPs will again be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, the Department will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. 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,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

6.1.1: 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 soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: <http://www.dec.ny.gov/regulations/61794.html>

6.1.2: RI Information

The analytical data collected on this site includes data for:

- soil

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified for this Operable Unit at this site is/are:

tetrachloroethylene (pce)
trichloroethene (tce)

dichloroethylene
vinyl chloride

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable standards, criteria and guidance for:

- soil

6.2: 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.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

IRM #1: Soil Vapor Extraction (SVE)

In 1999 SVE systems were installed at two adjacent properties to address potential indoor air contamination of volatile organic compounds associated with soil vapor intrusion.

IRM #2: Soil removal, Multiphase Extraction (MPE) System, SSD system

An IRM was conducted in 2005 which included a limited soil removal of 370 cubic yards and the installation of a MPE system to treat the contaminated soil and groundwater remaining after

the removal. Mitigation measures were also taken at an adjacent residence to address potential indoor air contamination of volatile organic compounds associated with soil vapor intrusion.

6.3: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. They may come into contact with contaminated soil if they dig below the ground surface on the site. Volatile organic compounds in the subsurface soils and groundwater may move into the soil vapor (air spaces within soil), which in turn may move into future overlying buildings and affect indoor air quality. The process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Currently, there is no on-site building. However, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development. A sub-slab depressurization system (a system ventilates/removes the air beneath a building) was installed in an off-site building to prevent the indoor air quality from being affected by the contaminants in soil vapor beneath the building. Soil vapor extraction systems were installed adjacent to off-site buildings to address the potential for contaminated soil vapor to move to off-site structures. Air sampling at off-site buildings is ongoing.

6.4: 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.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU(s) 01.

Contamination at the Site is related to historical releases to the soil and groundwater from the former use of this site. Based on samples collected at the Site during the RI VOCs exceed the Department SCGs for soil and groundwater standards. The site is located in a residential/commercial area in the City of Rochester. There are no fish or wildlife receptors present.

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. The remedy must also attain the remedial action objectives identified for the site, which are presented in

Exhibit B. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit C. 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. A summary of the Remedial Alternatives Costs is included as Exhibit D.

7.1: Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS 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.

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.

7.2: Elements of the Proposed Remedy

The basis for the Department's proposed remedy is set forth at Exhibit E.

The estimated present worth cost to implement the remedy is \$2,020,000. The cost to construct the remedy is estimated to be \$1,900,000 and the estimated average annual cost is \$74,000.

The elements of the proposed remedy are as follows:

The elements of the proposed remedy, shown on Figure 5, 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. Green remediation principals and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;

Reducing direct and indirect greenhouse gas and other emissions;

Increasing energy efficiency and minimizing use of non-renewable energy;

Conserving and efficiently managing resources and materials;

Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;

Maximizing habitat value and creating habitat when possible;

Fostering green and healthy communities and working landscapes which balance ecological, economic goals; and

Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Installation of an in-situ electrical resistance heating system in the area of the former Dinaburg building and the 350 Benton Street property to address on-site VOC soil contamination. Implementation of this alternative will include electrical resistance heating of on-site soil and groundwater to volatilize VOC contamination and vapor recovery extraction wells for vapor recovery.

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

4. 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) will allow the use and development of the controlled property for residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws; and

(c) requires compliance with the Department approved Site Management Plan;

5. A Site Management Plan is required, which will include 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:

To prevent exposure to contamination in groundwater until SCGs are met, institutional controls will include the implementation of land-use restrictions as set forth above.

This plan includes, but may not be limited to:

- (i) a description of the provisions of the environmental easement including any land use restrictions;
- (ii) 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;
- (iii) a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- (iv) maintenance of site access controls and Department notification; and
- (v) the steps necessary for the periodic reviews and certification of the institutional controls; and

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

- (i) monitoring of groundwater to assess the performance and effectiveness of the remedy; monitoring will consist of the sampling and analysis of on-site groundwater monitoring wells for VOCs until remediation goals are achieved;
- (ii) provision to evaluate the potential for vapor intrusion for off-site buildings, including provision for implementing actions recommended to address exposures; and
- (iii) a schedule of monitoring and frequency of submittals to the Department;

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

- (i) compliance monitoring of treatment systems to ensure 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.

Exhibit A

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 and soil.

Waste/Source Areas

As a result of the historic use of the Site, dry cleaning chemicals were either spilled to the ground surface or to floor drains, where they flowed/leaked into the soils at the Site. The historic source area was located beneath the former on-site building and at the rear of the building at 1006 South Clinton Avenue. In 2005, as part of an IRM, part of the source area (above the water table) was removed. Due to the proximity of the building at 1006 South Clinton Avenue limited soil removal was conducted, around the building, in order to maintain the integrity of the adjacent building. After the limited source removal was completed a MPE system was installed to address the remaining contamination on-site.

A portion of the waste/source areas identified at the site were addressed by the IRM(s) described in Section 6.2. The remaining waste/source area(s) identified during the RI (2010) will be addressed in the remedy selection process.

Soil

Soil samples were collected at the site in 2010 during the RI, from on-site and off -site locations to further delineate the historic source area and to evaluate the progress of the IRMs. Soil samples were collected in the vicinity of the historic source area, beneath the former on-site building, north to an adjacent property and on the eastern portion of the site at the location of the former home for analytical analysis primarily for VOCs.

The RI soil sampling results were compared to the applicable Soil Cleanup Objectives (SCOs) for unrestricted use and restricted use/protection of groundwater, as discussed in Section 3, and indicate that the primary contaminants of concern on-site are VOCs. Based on the comparison of the soil sampling results to the restricted use SCOs, the protection of groundwater SCOs were selected for the evaluation of the data.

The soil VOC results reveal that a VOC contaminant source still exists on the site. The VOC contamination exceeding the unrestricted and protection of groundwater SCOs was determined to extend from the historic source area north on to an adjacent property, to the eastern boundary of the site, beneath the concrete slab of the former Dinaburg building and up to an adjacent off-site building on the west as shown in Figure 4. The estimated area of soil VOC contamination is approximately 6300 square feet and extends from approximately 3 to 15 feet bgs, for a total volume of approximately 2700 cubic yards.

Unrestricted use SCOs were also exceeded for 1,1-DCA at two locations and 1,1,1-TCA at one location.

Table #2 - Soil

| Detected Constituents | Concentration Range Detected (ppm) ^a | Unrestricted SCG ^b (ppm) | Frequency Exceeding Unrestricted SCG | Residential SCG ^c (ppm) | Frequency Exceeding Residential SCG | Protection of Groundwater SCG ^d (ppm) | Frequency Exceeding Protection of Groundwater SCG |
|-------------------------|---|-------------------------------------|--------------------------------------|------------------------------------|-------------------------------------|--|---|
| VOCs | | | | | | | |
| 1,1,1-Trichloroethane | 0.6 – 0.86 | 0.68 | 1/30 | 100 | 0/30 | 0.68 | 1/30 |
| 1,1-Dichloroethane | 0.2 – 0.94 | 0.27 | 2/30 | 19 | 0/30 | 0.27 | 2/30 |
| cis-1,2-Dichloroethene | 0.2 – 5.2 | 0.25 | 4/30 | 59 | 0/30 | 0.25 | 4/30 |
| Tetrachloroethene (PCE) | 0.63 - 1700 | 1.3 | 24/30 | 5.5 | 23/30 | 1.3 | 24/30 |
| Trichloroethene | 0.44 - 1400 | 0.47 | 28/30 | 10 | 17/30 | 0.47 | 28/30 |

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Residential Use, unless otherwise noted.

d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, PCE and its daughter products.

Exhibit B

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:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Exhibit B) to address the contaminated media identified at the site as described in Exhibit A:

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative would include discontinuing the operation of the current treatment system. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative 2: No Further Action with Site Management

The No Further Action with Site Management Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2 and Site Management and Engineering Controls and Institutional Control is necessary to confirm the effectiveness of the IRM. This alternative maintains engineering controls which were part of the IRM and includes institutional controls, in the form of an environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site after the IRMs.

Present Worth: \$1,596,000
Capital Cost: \$37,000
Annual Costs (30 years): \$259,000

Alternative 3: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative would include: the excavation and off-site disposal of all on-site soil, the demolition of the building located at 1006 South Clinton Avenue, the excavation of off-site soil with VOC concentrations greater than or equal to the NYCRR Part 375 unrestricted SCOs, implementation of in-situ enhanced biodegradation during the backfilling of the excavation to address the residual soil and groundwater contamination. The remedy will not rely on engineering or institutional controls to prevent future exposure. There is no Site Management, no restrictions and no periodic review. This remedy will have no annual cost, only the capital cost.

Capital Cost: \$4,125,000

Alternative #4: Enhanced Multi-phase Extraction

This alternative would include, installation of up to 20 additional multi-phase extraction wells to target subsurface contamination currently untreated by the current extraction point layout. The expanded network of MPE wells will increase recovery rates and accelerate the treatment of remaining soil contamination. By reducing or eliminating the operation of the existing MPE points which achieve the least contaminant recovery, it is assumed that the existing IRM groundwater and vapor treatment plant capacity will not have to be expanded. This analytical data will provide the basis to evaluate the effectiveness of the enhanced MPE system. This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment.

Present Worth: \$1,412,000
Capital Cost: \$177,000
Annual Costs (30 years): \$316,000

Alternative #5: Chemical Oxidation with Soil Mixing

This alternative would include, mechanical mixing of the on-site source area soils with chemical reagents and/or amendments designed to aid in destruction of the VOC contamination. The targeted source area would be limited to the area within the 10 mg/kg PCE isoconcentration lines as shown in Figure 3. Prior to the full implementation of this alternative, laboratory and on-site pilot scale studies would be conducted to more clearly define design parameters. This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment.

Present Worth: \$1,373,000
Capital Cost: \$1,122,000
Annual Costs (30 years): \$79,000

Alternative #6: Excavation and Off-Site Disposal with Enhanced Biodegradation

This alternative would include the excavation and off-site disposal of the on-site soil source area. Under this alternative, on-site source area soils located both above and below the water table would be excavated and transported off-site for treatment and/or disposal. The source area targeted for excavation would be limited to the areas within the 100 mg/kg PCE isoconcentration lines as shown in Figure 3. On-site soil uncontaminated by site-specific COC, would be stockpiled separately for potential reuse as excavation backfill. Approximately 822 cubic yards of contaminated soil would be removed. Clean fill would then be brought in to replace the excavated soil transported off-site for treatment/disposal and to establish the designed finish grades.

Once the source removal is completed the enhanced biodegradation reagent would be introduced into the remaining remedial area to treat any contamination outside the source area and to promote natural attenuation. Prior to the full implementation of this alternative, laboratory and on-site pilot scale studies would be conducted

to more clearly define design parameters. Monitoring would begin following the injection of the enhanced biodegradation reagent and would occur on a periodic basis. The need for additional injections of a biodegradation reagent would be evaluated during periodic reviews of the Site. This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment.

Present Worth: \$2,360,000
Capital Cost: \$2,100,000
Annual Costs (30 years): \$79,000

Alternative #7: Electrical Resistance Heating

This alternative would include, the implementation of in-situ electrical resistance heating to address on-site VOC contamination. Electrical resistance heating uses an electrical current to heat less permeable soils such as clays and fine-grained sediments so that water and contaminants trapped in these relatively conductive regions are vaporized and readied for vacuum extraction. Electrodes are placed directly into the less permeable soil matrix and activated so that electrical current passes through the soil, creating an electrical resistance which then heats the soil. Implementation of this alternative would include electrical resistance heating of on-site soil and groundwater to volatize VOC contamination, and vapor recovery extraction wells for vapor recovery. Monitoring will be conducted during remediation to insure that vapors are being recovered at the site. Sampling will be preformed to verify the effectiveness of the electrical resistance heating. This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment.

Present Worth: \$2,020,000
Capital Cost: 1,900,000
Annual Costs (10 years): \$74,000

Exhibit D**Remedial Alternative Costs**

| Remedial Alternative | Capital Cost (\$) | Annual Costs (\$) | Total Present Worth (\$) |
|---|--------------------------|--------------------------|---------------------------------|
| 1. No Action | 0 | 0 | 0 |
| 2. No Further Action w/Site Management | 37,000 | 259,000 | 1,596,000 |
| 3. Restoration to Pre-Disposal or Unrestricted Conditions | 4,125,000 | 0 | 4,125,000 |
| 4. Enhanced Multi-phase Extraction | 177,000 | 316,000 | 1,412,000 |
| 5. Chemical Oxidation with Soil Mixing | 1,122,000 | 79,000 | 1,373,000 |
| 6. Excavation and Off-Site Disposal w/Enhanced Biodegradation | 2,100,000 | 79,000 | 2,360,000 |
| 7. Electrical Resistance Heating | 1,900,000 | 74,000 | 2,020,000 |

Exhibit E

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative #7, Electrical Resistance Heating as the remedy for this site. The elements of this remedy are described in Section 7.2. The proposed remedy is depicted in Figure 5.

Basis for Selection

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

Alternative 7 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the balancing criterion described in Exhibit C. It will achieve the remediation goals for the site by permanently removing the soil contamination through electrical resistance heating of the source area soils. Alternative 7 addresses the source of the groundwater contamination, which is the most significant threat to public health and the environment, and it creates the conditions necessary to restore groundwater quality to the extent practicable. The intent of this alternative is achieve pre-disposal conditions, at a considerably lower cost, but will require additional sampling to confirm.

Alternative 1 (No Action) does not provide any protection to public health and the environment and will not be evaluated further. Alternative 3, (Restoration to Pre-Disposal or Unrestricted Conditions) by removing all soil contaminated above the “unrestricted” soil cleanup objective, meets the threshold criteria. Alternative 2 (No Further Action w/Site Management), Alternative 4 (Enhanced Multi-phase Extraction), Alternative 5 (Chemical Oxidation with Soil Mixing), Alternative 6 (Excavation and Off-Site Disposal w/Enhanced Biodegradation) and Alternative 7 (Electrical Resistance Heating) also comply with this criteria but to a lesser degree or with lower certainty. Because Alternatives 2 through 7 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

Alternatives 2 through 5 all have short-term impacts which could easily be controlled; however, Alternative 2 would have the least impact. The time needed to achieve the remediation goals is the shortest for Alternatives 3 and 7. Alternatives 4, 5 and 6 will take longer to achieve the remediation goals.

Long-term effectiveness is best accomplished by those alternatives involving excavation of the contaminated overburden soils (Alternatives 3 and 6). A VOC contaminant source still exists on-site beneath the former on-site building, the adjacent off-site building and the former residential property, Alternatives 3 and 7 results in the treatment of all of the chemical contamination at the site and may eliminate the need for property use restrictions and long-term monitoring. Alternative 4 would result in the removal of almost all of the contaminated soil above and below the water table, but it also requires an environmental easement and long-term monitoring. For Alternative 2, site management remains effective, but it will not be as desirable in the long term due to the continued presence of the source area. The unknown results of the future bench scale testing for Alternative 5 and 6 makes Alternative 5 and 6 less desirable.

Alternatives 3 and 6 will result in the reduction of mobility and volume of soil and groundwater contamination at and in the vicinity of the Site through excavation and off-site treatment. Alternatives 4, 5 and 7 will permanently reduce the toxicity, mobility and volume of contaminants by use of in-situ remediation of the soil source area. Alternative 7 includes the implementation of a more effective and reliable remedial technology for

reducing toxicity, mobility and volume of the site contamination than Alternatives 4 and 5 due to the tightness of the soil.

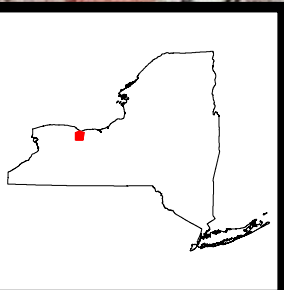
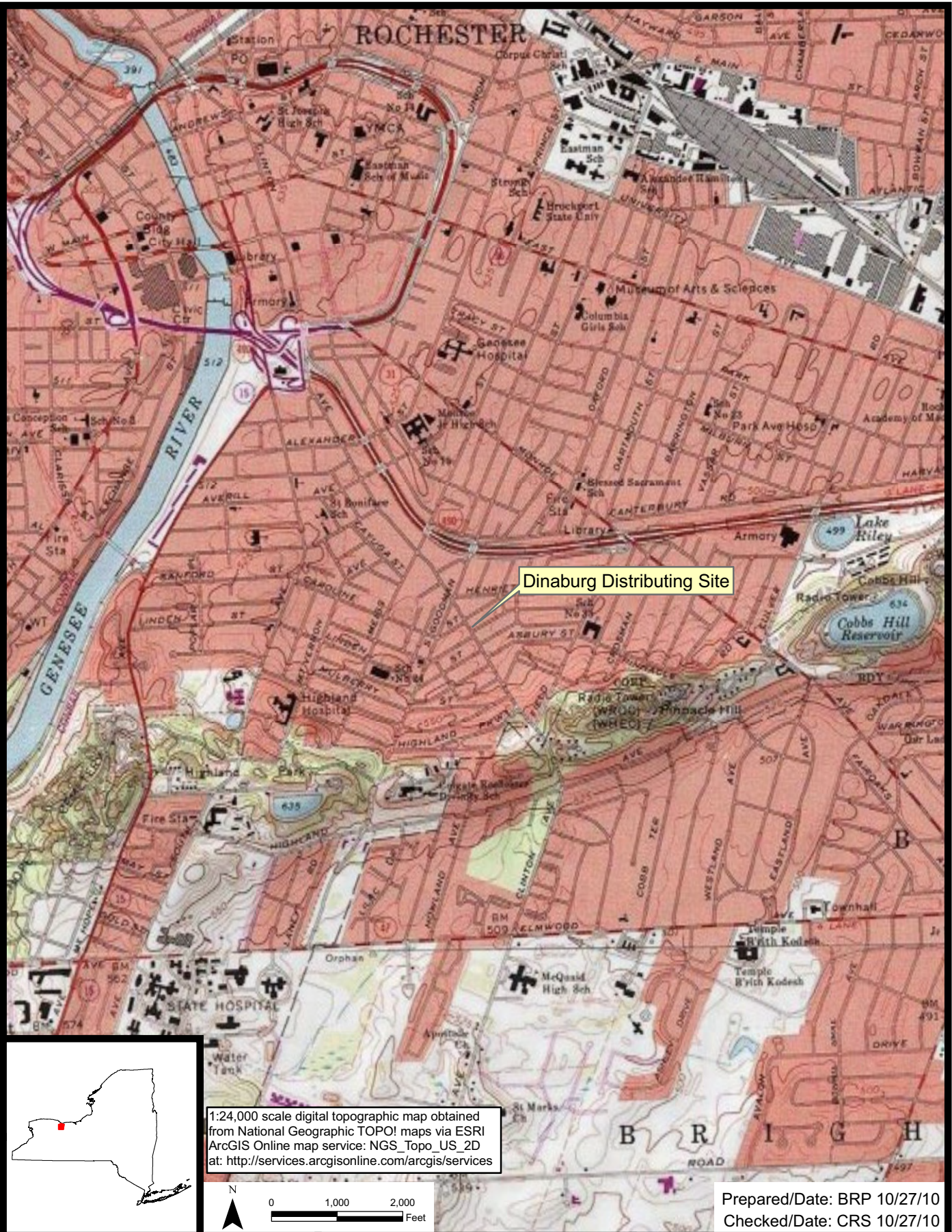
Alternative 2 includes the continued operation of the current treatment system and the implementation of institutional controls and will not result in short term adverse impacts and risks to the community, site workers, or the environment. During the implementation of the remedial action, Alternatives 3 through 6 will result in potential short-term adverse impacts and risks to the community, site workers, and the environment. Potential short-term adverse impacts and risks associated with the implementation of Alternatives 3 through 6 could be controlled with the use of appropriate engineering controls and the preparation of and adherence to a comprehensive construction work plan and health and safety plan. Alternative 3 and 6 includes both excavation and transportation off-site of contaminated soils from the Site and off-site implementation of groundwater extraction and treatment, presenting the greatest potential short-term risks to the community. Alternatives 4, 5 and 7, which consist primarily of in-situ treatment, will provide the least disturbance of contaminated soils, and therefore present the least potential short-term adverse impacts and risks to the community, site workers, and the environment.

Alternative 2 includes the continued operation of the current treatment system and the implementation of institutional controls, and therefore is favorable in that it is readily implementable. Alternatives 3 and 6 are also implementable, but would involve increased truck traffic on local streets for several weeks to months, with alternative 3 taking the longest time to complete the building demolition and excavation of soil. There will be technical issues with implementing Alternatives 4 through 6, associated primarily with addressing contamination present beneath the adjacent off-site building. These alternatives may not be capable of providing remediation of this contamination. Alternatives 5 and 6 will primarily rely upon natural attenuation of this contamination, while Alternative 4 will rely upon long-term remediation of this contamination using in-situ treatment amendments. Relative to the other alternatives evaluated, Alternative 7 is the only remedial alternative with the potential to provide reduction of VOC contamination beneath the adjacent off-site building through the anticipated zone of influence of the in-situ electrical resistance heating system.

The costs of the alternatives vary significantly. With the large volume of soil to be handled, Alternatives 3 and 6 will have the highest present worth costs. Alternative 7 will be less expensive than Alternatives 3 and 6, yet it will provide equal protection of the groundwater resource. The past remedial efforts at this site (Alternative 2) proved to be ineffective due to the poor communication of the on-site subsurface geology within the vicinity of the soil source area. The effectiveness of Alternatives 4, 5 and 6 could also prove to be difficult based on the subsurface geology within the vicinity of the soil source area, whereas Alternative 7 benefits from dense soil as the conductivity of the electrical current increases within glacial till.

Alternatives 2, 4, 5 and 6 would be less desirable because contaminated soil would remain on the property whereas Alternative 3 and 7 would remove or treat the contaminated soil permanently. With Alternative 3, all of the overburden soil to bedrock would be removed and restrictions on the site use would not be necessary. The intent of Alternative 7 is to achieve pre-disposal conditions, at a considerably lower cost, but this will require additional sampling during implementation to confirm.

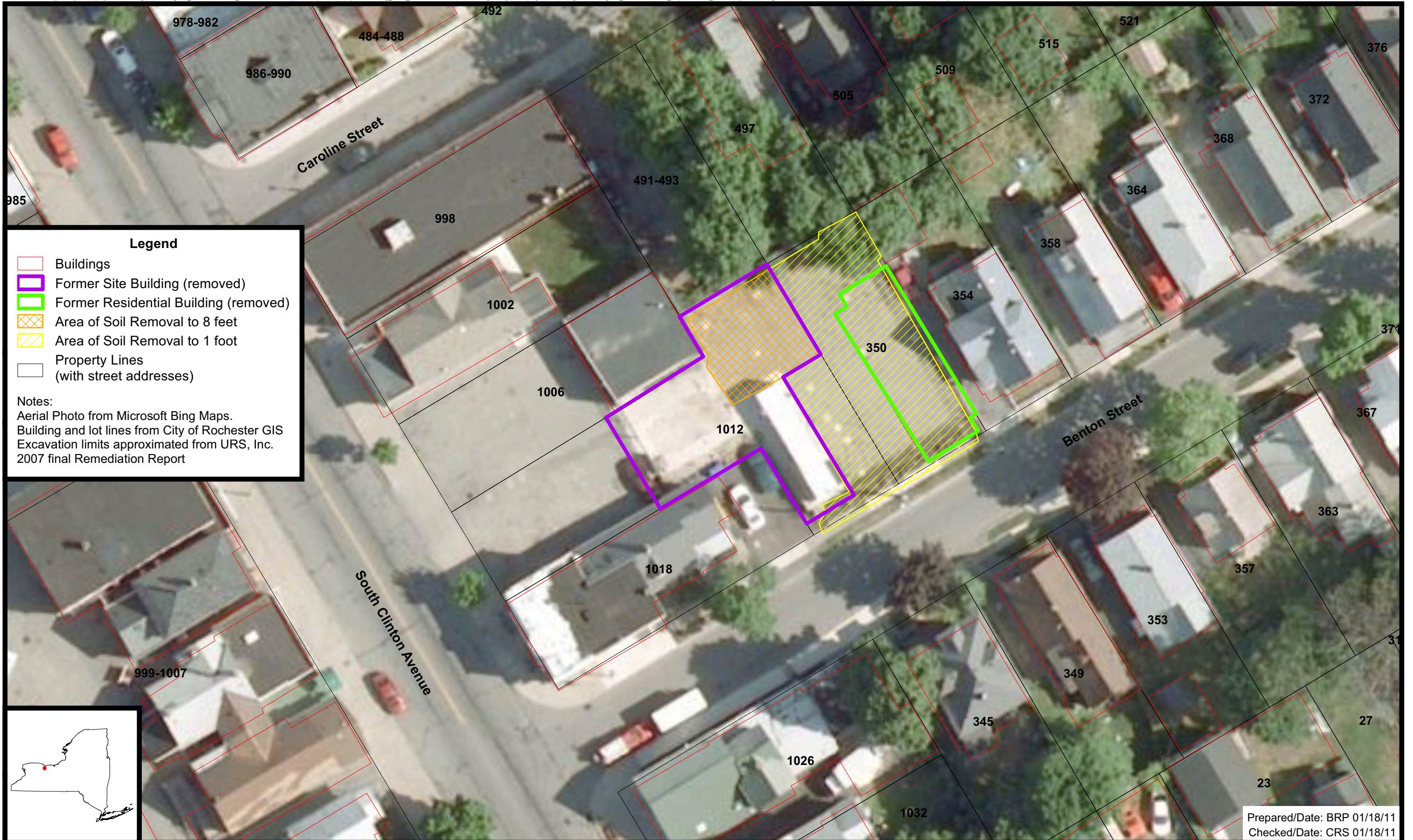
Alternative 7 is a permanent remedy and can be implemented in a short period of time. It is less intrusive than Alternatives 3, 5 and 6 and is more reliable than Alternatives 5 and 6 that rely on chemical contact with the waste. The soil consistency is more amenable to electrical treatment versus mixing.



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SITE LOCATION
Project 3612-08-2107
Figure 1



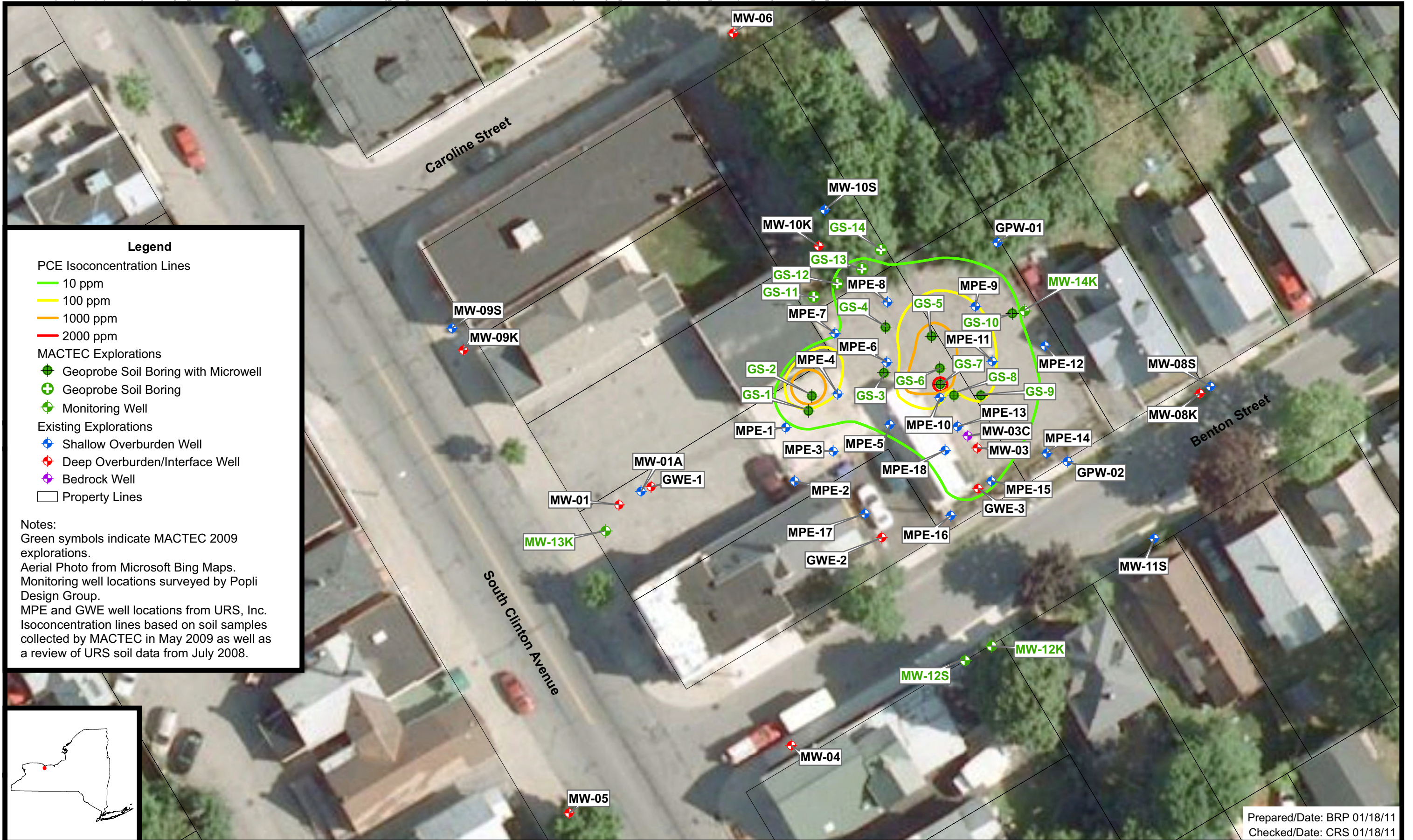
Prepared/Date: BRP 01/18/11
Checked/Date: CRS 01/18/11



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HISTORIC SITE FEATURES
AND SOIL REMOVAL AREA
Project 3612-08-2107 Figure 2



Legend

PCE Isoconcentration Lines

- 10 ppm
- 100 ppm
- 1000 ppm
- 2000 ppm

MACTEC Explorations

- Geoprobe Soil Boring with Microwell
- Geoprobe Soil Boring
- Monitoring Well

Existing Explorations

- Shallow Overburden Well
- Deep Overburden/Interface Well
- Bedrock Well
- Property Lines

Notes:

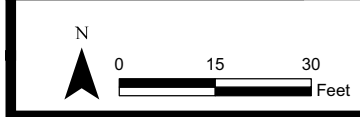
Green symbols indicate MACTEC 2009 explorations.

Aerial Photo from Microsoft Bing Maps.

Monitoring well locations surveyed by Popli Design Group.

MPE and GWE well locations from URS, Inc.

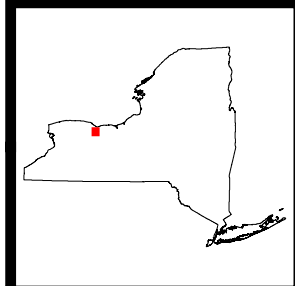
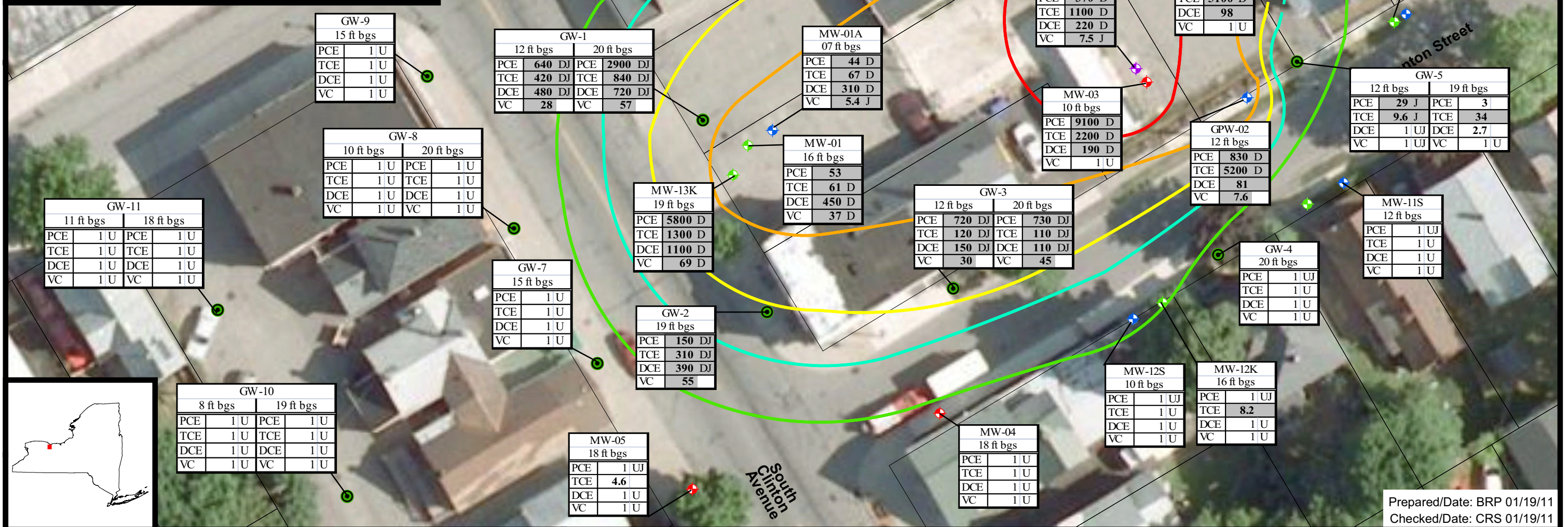
Isoconcentration lines based on soil samples collected by MACTEC in May 2009 as well as a review of URS soil data from July 2008.



Legend

- Geoprobe Water Sample
 - Bedrock Well
 - Interface Well
 - Overburden Well
 - Overburden/Interface Well
- Interpreted Total Chlorinated Solvent Isoconcentration Lines
- 5 ppb
 - 100 ppb
 - 1,000 ppb
 - 5,000 ppb
 - 10,000 ppb
 - Property Lines

Notes:
 Groundwater samples collected by MACTEC in May and Dec. 2009
 ft bgs = sample depth in feet below ground surface (pump intake)
 PCE = tetrachloroethene; TCE = trichloroethene;
 DCE = cis-1,2-dichloroethene; VC = vinyl chloride
 Concentrations in µg/L.
 Aerial Photo from Microsoft Bing Maps.
 Well locations surveyed by Popli Design Group.



Prepared/Date: BRP 01/19/11
 Checked/Date: CRS 01/19/11

