DECISION DOCUMENT
AMERON SITE

State Superfund Project
City of Buffalo, Erie County, New York
Site No. 915133

May 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 Ameron Site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this proposed remedy. As more fully described in Sections 3 and 5 of this document, the operation of a coatings manufacturing facility has resulted in the release of hazardous substances, including inorganic compounds, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs) compounds. These wastes have contaminated the surface soil, subsurface soil and groundwater at the site, and have resulted in:

- a threat to human health associated with current and potential exposure to surface and subsurface soil, and groundwater.

- a threat to the environment associated with the current and potential impacts of contaminants to groundwater.

To eliminate or mitigate these threats, the Department proposes the excavation and off-site disposal of impacted soil, in-situ remediation of chlorinated VOCs utilizing hydrogen releasing compound (HRC) in groundwater in the vicinity of temporary monitoring well TWM-2, in-situ remediation of aromatic VOCs utilizing oxygen releasing compound (ORC) in groundwater in the vicinity of temporary monitoring well TWM-3, and implementation of a Site Management Plan including an Environmental Easement. The detailed description of the proposed remedy will be in Section 8.

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

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

The Department has issued this Decision Document as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. This

document is a summary of the information that can be found in greater detail in the May 2009 Remedial Investigation/Feasibility Study (RI/FS) Report, and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

Dudley Branch Library
2010 South Park Avenue
Buffalo, New York 14220
(716) 823-1854

Monday	10 a.m. – 6 p.m.
Tuesday	12 p.m. – 8 p.m.
Wednesday	Closed
Thursday	12 p.m. – 8 p.m.
Friday	10 a.m. – 6 p.m.
Saturday	10 a.m. – 6 p.m.
Sunday	Closed

New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203
(716) 851-7220
Attn: Bill Murray

(Please call for an appointment)

The Department seeks input from the community on all Decision Documents. A public comment period has been set from June 21 to July 20, 2010 to provide an opportunity for public participation in the remedy selection process.

Written comments may be sent to Mr. Murray at the above address through July 20, 2010.

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

SECTION 2: SITE LOCATION AND DESCRIPTION

The Colgate Avenue site encompasses approximately 3.2 acres in the southern portion of the City of Buffalo, New York. The site is generally bounded by Colgate Avenue to the north, residential properties along Colgate Avenue to the east, light industrial properties to the south (fronting on Okell Street), and commercial and industrial properties to the west (see Figure 1). Colgate Avenue terminates near the northwestern gated entrance to the site. Currently existing site structures consist of a former office and manufacturing building, a former warehouse, and a small production building. Surrounding property is comprised primarily of residential housing and light industrial business (see Figure 2). The site is zoned as vacant land surrounded by heavy industrial.

The site is generally flat lying with limited distinguishable features. The surface contains soil/fill with some patches of grass and brush and several building improvements. Precipitation (i.e., rain or melting snow) either infiltrates into the soil/fill or moves via overland flow to the storm drains present in the roadways. Surface and shallow groundwater flow are likely impacted by various cycles of development and filling, as well as utility lines and foundations.

Surface soils within the City are characterized as urban land with level to gently sloping land in which 80 percent or more of the soil surface is covered by asphalt, concrete, buildings, or other impervious structures typical of an urban environment. The presence of overburden fill material is widespread and common throughout the City of Buffalo. Site overburden soils have been described as soil/fill to approximately 0.5 to 2.0 feet below ground surface (fbgs) to as deep as 8 fbgs, overlying native silty clay with varying amounts of sand and brownish gray clay.

Hydrostratigraphic units are sequences of geologic materials that possess similar hydrogeologic properties including hydraulic conductivity and porosity. The hydrostratigraphy of the site, interpolated from other sites in the vicinity, consists of three hydrostratigraphic units: a shallow overburden zone; a deep overburden aquitard; and a till/bedrock zone. The shallow overburden zone consists of an unconfined, saturated soil/fill unit and an underlying layer of lacustrine silty sands with thin organic layers. The deep overburden aquitard, or confining unit, is comprised of low permeable lacustrine silty clay and a dense, low permeable glacial till. The till/bedrock zone consists of a hydraulically connected sandy reworked till and a directly underlying fractured shale and limestone. Groundwater within the shallow overburden zone varies in depth from 1.7 to 3.0 fbgs, as indicated by depth to water measurements recorded on May 3, 2006 from on-site monitoring wells (i.e., MW-1 through MW-6, and PZ-1). Shallow groundwater at the site generally flows west-northwest, toward Lake Erie.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

Beginning in approximately 1960 and continuing to 1982, Ameron (or its predecessors) operated a protective coatings manufacturing facility on the subject property. During 1983 and 1984, environmental investigations revealed the presence of certain chemicals in soil and shallow groundwater beneath the western most portion of the former manufacturing building.

3.2: Remedial History

In 1986, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required. In 1986, Ameron entered into an Order on Consent with the New York State Department of Environmental Conservation (NYSDEC), whereby Ameron installed, maintained, and operated a sub-floor soil vapor extraction (SVE) system for a 10-year period. The system was constructed and installed in 1988, approved by NYSDEC in 1989, and operated by Ameron through 1999. The site was subsequently reclassified to 4 to reflect the implementation of the OM&M Plan

In November 2001, Ameron retained AFI Environmental to conduct a limited subsurface site investigation to confirm that SVE successfully remediated contaminants of concern. The subsurface investigation consisted of six subsurface soil samples and one groundwater sample from existing monitoring well MW-2. Four soil samples exhibited petroleum-type volatile organic compound (VOC) contamination, primarily toluene, ethylbenzene and xylene, in excess of NYSDEC criteria. Elevated levels of semi-volatile organic compounds (SVOCs), potentially associated with diesel fuels, were also found in one soil sample. Benzene was found in the groundwater sample from monitoring well MW-2. The investigation results were reported

in AFI's report entitled *Subsurface Soil Investigation and Water Analysis for MW-2*, dated November 2001. This report included discussion of closed-in-place underground storage tanks (USTs).

In April 2002, the NYSDEC informed Ameron that it had no record of USTs for the site and required Ameron to submit a plan to decommission the USTs and mitigate any environmental impacts from the tanks.

In June 2004, Ameron retained AFI to conduct a supplemental site investigation for the purposes of providing information to allow the NYSDEC to consider delisting the property from the Registry of Inactive Hazardous Waste Sites. The investigation work plan, approved by the NYSDEC, required four subsurface soil samples and one groundwater sample as well as the completion of an Electromagnetic (EM-61) Survey to identify any potential USTs that remained on the site. No chemicals of concern were identified in any of the four borings. Two of the soil borings, however, exhibited elevated petroleum-type VOCs (i.e., xylenes). The EM-61 Survey identified 12 anomalies that were considered suspect USTs. The results of this investigation were reported in *AFI's Supplemental Site Investigation and Closure Report for Ameron Site (July 21, 2004)* that was filed with the NYSDEC.

In August 2004, AFI prepared and submitted to the NYSDEC a Remedial Action Work Plan (RAWP) for the investigation and removal of the USTs. Ameron entered into an Order on Consent (Index #B9-0680-04-011) with NYSDEC to complete a Supplemental Remedial Investigation/Feasibility Study (RI/FS). The RAWP, which was approved by the NYSDEC, was implemented from October to December 2004. Remedial work involved the removal, cleaning, and recycling of 11 USTs and off-site landfill disposal of 2,839 tons of impacted soils from the western portion of the site. The soil was disposed at a permitted landfill. Post-excavation confirmatory sampling verified that soil cleanup objectives were achieved. In April 2005, AFI issued a *Remedial Action Work Report* describing the UST and soil removal activities. In 2006, Ameron retained Benchmark Environmental Engineering & Science, PLLC (Benchmark) to prepare and implement an RI/FS Work Plan. The RI was substantially completed in 2006, with supplemental investigations performed in 2007, 2008 and 2009.

On November 3, 2009, a fire destroyed a portion of the buildings on-site referred to as Plant No. 1. On November 13, 2009, Ameron conducted an emergency demolition of all on-site structures with the exception of the 2-story office building, which is reportedly in sound condition and currently leased for storage.

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.

The PRPs for the site, documented to date, include: Ameron International Corporation.

The Department and Ameron International Corporation entered into a Consent Order on December 25, 2004. The Order obligates the responsible parties to implement a RI/FS remedial program. A Remedial Investigation/Feasibility Study (RI/FS) Report was submitted in May 2009 in response to this Order and is the basis for the remedy selection.

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted 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 RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between April 2006 and March 2009. The field activities and findings of the investigation are described in the RI report.

The Remedial Investigation included the following activities:

- a records search was performed;
- test pits and soil borings were installed;
- Groundwater wells were installed; and
- Environmental samples were collected from the following media: surface soil, subsurface soil, and groundwater;
- Environmental media were analyzed for VOCs, SVOCs (including Pesticides/PCBs), and inorganics.

Figure 3 and 4 shows the locations of all the samples collected at the site.

5.1.1: Standards, Criteria, and Guidance (SCGs)

To determine whether the surface soil, subsurface soil, or groundwater contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

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

- Soil SCGs are based on 6 NYCRR Subpart 375-6, Remedial Program Soil Cleanup Objectives.

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

5.1.2: Nature and Extent of Contamination

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

As described in the RI report, many surface soil, subsurface soil, and groundwater samples were collected to characterize the nature and extent of contamination. The main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and inorganic compounds (metals). For comparison purposes, where applicable, SCGs are provided for each medium.

Chemical concentrations are reported in parts per billion (ppb) or microgram per liter (ug/L) for water, and parts per million (ppm) or milligrams per kilogram (mg/kg) for soil.

The following are the media which were investigated and a summary of the findings of the investigation.

Surface Soil

Two surface soil samples (SS-1 and SS-2) were collected from locations as shown on Figure 3. The samples were collected from the depth interval of 0 to 6 inches below ground surface and analyzed for TCL VOCs, TCL SVOCs, TCL pesticides, PCBs, TAL metals, and cyanide. All detected SVOC constituents were present below the corresponding SCOs for commercial soils with the exception of benzo(a)pyrene, which exceeded the SCO in sample SS-1 (see Table 1). All of the TAL metals were well within the corresponding commercial SCOs in the surface soil samples with the exception of lead in SS-2. The concentration of lead was detected at 2,660 ppm, (estimated value). The SCO for lead (commercial) is 1,000 ppm. PCB sample results for surface soil samples were slightly above the commercial SCO (see Table 1). The maximum concentration detected was 6.9 ppm. The SCO for PCBs (commercial) is 1 ppm.

Subsurface Soil

There were a total of 17 fill samples that were collected either as composites across the depth of the test pits (which typically extended 2-3 feet below grade to the clay layer) or from borings below the 0.5 foot interval. Impacted soil/fill was not observed in any of the soil samples. A slight glue-like odor was noted during excavation of test pit TP-5; however, PID headspace readings were 0.0 ppm in all compass directions at this location (see Figure 3). None of the headspace measurements exceeded 0.7 ppm (measured at the west wall of test pit TP-7), further supporting field observations. Sample results are described below according to contaminant class.

VOCs were generally reported as non-detectable or at trace (estimated) concentrations below the sample quantitation limit (see Table 1). VOC results were well below the corresponding commercial SCOs.

The majority of the analyzed SVOCs were reported as non-detectable or at trace (estimated) concentrations below the sample quantitation limit. All detected constituents were present well below the corresponding SCOs for commercial soils with the exception of benzo(a)pyrene, which slightly exceeded the SCO in sample TP-6 (see Table 1). Benzo(a)pyrene was detected at a concentration of 1.5 ppm at a depth of 0-2.5 fbgs. The commercial SCO for benzo(a)pyrene is 1 ppm.

Lead was detected at concentrations above the commercial use SCO in three soil samples. The three samples were collected from two locations, SB-3 and SB-5 (see Table 2). The maximum concentration detected was 50,300 ppm (estimated value). All of the other TAL metals were well within the corresponding commercial SCOs in the RI test pit soil samples with the exception of manganese in TP-5, which slightly exceeded the commercial SCO. The concentration of manganese detected was 12,400 ppm (estimated). The commercial SCO for manganese is 10,000 ppm.

None of the pesticides exceeded commercial SCOs.

PCB Aroclors were not detected or were present below the SCO for commercial soils.

The pH of the soil/fill samples was in the range of 6.6 – 8.4 SU (i.e., neutral).

Groundwater

Groundwater samples were collected from the two existing and four new/replacement monitoring wells during the spring 2006 RI investigation and at PZ-1 (VOCs only) during the January 2007 supplemental investigation (see Table 3). Groundwater samples were collected from four temporary monitoring wells and new shallow overburden well MW-7A during the October 2008-January 2009 supplemental investigation. A discussion of the results is presented below (see Table 4). See Figure 4 for ground water monitoring well locations.

The majority of the analyzed VOCs were reported as non-detectable or at trace concentrations below the practical quantitation limit. Piezometer PZ-1, located near the former underground storage tanks, exhibited low levels of ethylbenzene and xylene. A trace level of benzene was also detected in PZ-1 at an estimated concentration of 3 ppb. At downgradient well MW-2R, only one compound, cis-1,2-dichloroethene (reported at an estimated concentration of 6 ppb) slightly exceeded the corresponding groundwater quality standards/guidance values (GWQS/GV) of 5 ppb.

The sample from temporary monitoring well TMW-1 generally yielded non-detectable or low concentrations of VOCs below GWQS/GV, with only benzene present at a trace (estimated) concentration slightly above the GWQS/GV. At TMW-2, the data indicated the presence of several compounds, including chlorinated organics, at concentrations exceeding their respective Class GA GWQS/GV. Sample results for downgradient temporary well TMW-4 indicated a significant drop in VOC concentrations from TMW-2, with most parameters reported as non-detect or at trace levels below GWQS/GV; detected constituents were reported at concentrations an order of magnitude below the levels present in TMW-2. Sample results from temporary well TMW-3 exhibited no detectable chlorinated organics; compounds reported above GWQS/GV were limited to petroleum aromatics likely representing residual halo from the UST removal.

Sample results from new shallow overburden well MW-7A were comparable to those encountered at temporary well TMW-4, with concentrations of chlorinated VOCs dropping by approximately an order of magnitude from those detected at TMW-2.

Similar to VOCs, nearly all of the analyzed SVOCs were reported as non-detectable or at trace concentrations below the practical quantitation limit. Only one compound, phenol (reported at an estimated concentration of 2 ppb in MW-6) slightly exceeded the corresponding GWQS/GV of 1 ppb.

Metals detected at levels above GWQS/GV were limited to aluminum, iron, lead, magnesium, manganese, sodium, and zinc. With the exception of lead, all of these parameters were detected in the upgradient well (MW-1) location, with iron, magnesium and zinc present in MW-1 at concentrations in excess of the GWQS/GV. Although lead was reported as non-detect in MW-1, the concentration of lead in MW-3R (29 ppb) only slightly exceeded the GWQS/GV (25 ppb).

Only one pesticide compound, dieldrin (reported at an estimated concentration of 0.061 ppb in MW-5) slightly exceeded its GWQS/GV of 0.004 ppb.

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

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 6 of the RI report. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

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

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

The site is currently unoccupied and partly fenced. Under current and future use scenarios there could be the potential for exposure to contaminated soil via incidental ingestion or dermal contact should trespassing occur. There could also be potential for exposure by inhalation of disturbed soil particulates in air, incidental ingestion or dermal contact with contaminated soil and groundwater to workers during construction or utility operations. Exposure via soil vapor intrusion is also a potential should the site be redeveloped.

Exposure to contaminated groundwater via drinking water ingestion is not expected because public water serves the area.

5.3: Summary of Environmental Assessment

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

RI test pit, soil boring, and surface soil samples exhibited no visual or PID evidence of contamination. Analytical data show that all sampled constituents meet SCOs for commercial soils at all locations, with the exception of benzo(a)pyrene (two locations), manganese (one location), lead (three locations), and PCBs (two locations). Benzo(a)pyrene is a ubiquitous compound frequently detected in industrial areas at concentrations exceeding the levels detected at the site. Manganese is a naturally occurring metal with background concentrations on or about the same order of magnitude as the concentrations detected on the site. Elevated lead was identified at a sample location adjacent to a rail siding. Elevated concentrations of metals and PAHs on and around rail tracks is not uncommon, as track ballast is often comprised of slag and other mined materials containing metals, rail ties are typically preserved with creosote, and exhaust from diesel locomotives and rail brake systems is released to the tracks or in the track area.

Groundwater data for the monitoring wells sampled indicate that chlorinated VOC detections (i.e., cis-1,2

dichloroethene – 1,600 ppb, trichloroethene – 870 ppb) at temporary monitoring well TMW-2 are isolated and attenuate rapidly in the downgradient overburden groundwater. Sample results for downgradient temporary well TMW-4 indicated a significant drop in VOC concentrations from TMW-2, with most parameters reported as non-detected or at trace levels below GWQS/GV; detected constituents were reported at concentrations an order of magnitude below the levels present in TMW-2 (i.e., cis-1,2 dichloroethene 120 ppb, trichloroethene 46 ppb). Sample results from new downgradient shallow overburden well MW-7A were comparable to those encountered at temporary well TMW-4. Xylene and ethylbenzene, and other non-chlorinated VOCs were detected above GWQS/GV at piezometer PZ-1, and temporary groundwater monitoring wells TMW-1, TMW-2, TMW-3, and TMW-4. These detections are likely reflective of residual contamination from the former underground storage tank area, and would be expected to naturally attenuate as evidenced by their absence in downgradient wells MW-2R and MW-4. Otherwise, detected constituents were generally limited to naturally occurring metals, several of which were present in the upgradient groundwater sample at concentrations similar to those on-site.

Assessment of chemical fate and transport indicates that chemicals detected at the site are not likely to reach off-site receptors at significant exposure point concentrations.

No unacceptable ecological risks were indicated based on the cover type and site setting.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

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

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

- exposures of persons at or around the site to lead and PCBs in soil;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and
- exposures of persons at or around the site to contaminated ground water.

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

- ambient groundwater quality standards and
- Sub Part 375-6.8 Soil Clean up Guidance Values for Commercial Use.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Ameron site were identified, screened and evaluated in the FS 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 discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

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

Alternative 1: No Action

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

SOIL

Alternative 2 and Alternative 3 would achieve a restricted-commercial clean-up based on 6NYCRR Part 375-6 regulations.

Alternative 2 and Alternative 3 would also include institutional and engineering controls in the form of security fencing and appropriate signage to prevent the entry of trespassers onto the site; environmental easements to limit future site use (e.g., not for residential purposes), preclude the use of site groundwater for potable purposes, and a requirement sub-slab vapor mitigation in any new structures erected on the property; and a Soil/Fill Management Plan (SFMP) to provide guidance for workers involved in future handling of soil/fill from the site (e.g., personal protective equipment requirements during underground utilities construction, methods for disposing of soil/fill removed from excavations, etc.).

Alternative 2: Excavation and Off-Site Disposal

Present Worth: *$84,000-89,000*
Capital Cost: *$53,000-58,000*

Annual Costs: *$2,000*

This alternative would entail excavation of the PCB/lead-impacted soil/fill with transport of the excavated materials to and disposal at a permitted, off-site disposal facility. Depending on whether the soils exhibit hazardous waste characteristics for lead per toxicity characteristic leaching protocol (TCLP) determination, they may be subject to State and Federal Land Disposal Restrictions. If the soil is characteristically hazardous, it would need to be treated at an off-site Treatment, Storage and Disposal Facility (TSDF) to meet LDR criteria prior to disposal. The treatment step may involve stabilization to reduce lead leachability before disposal. Following removal and verification sampling of the excavation sidewalls and bottom, the areas would be backfilled with clean soil to within six inches of the surrounding grade, covered with six inches of topsoil, and seeded to promote vegetative growth. Based on the estimated 55 cubic yards of soil/fill, approximately 4 truckloads would need to leave the site with the same number returning with clean backfill. Based on the extensive site sampling data showing that the impacts in these areas are isolated and limited to the subject sample locations, confirmatory sampling would not be performed.

Alternative 3: Asphalt Cover System

Present Worth: *$103,000*
Capital Cost: *$60,000*

Annual Costs: *$2,800*

Containment with an asphalt cover system would include a filter fabric, a layer of stone, an asphalt binder course, and a final top course (see Figure 3). The investigation-derived waste (IDW) currently staged on-site would be placed beneath the asphalt cover. Grading/pitch would be adjusted to promote runoff and mitigate ponding. Because of the larger size of the covered area, 1 to 2 catch basins may be required with storm water conveyance to the BSA's combined sewer.

GROUNDWATER

In-Situ Ground Water Treatment At TMW-2 And TWM-3

Present Worth: *$52,000*
Capital Cost: *$52,000*

Annual Costs: *$0*

The most applicable remediation of the chlorinated/aromatic VOCs in groundwater in the vicinity of temporary monitoring wells TMW-2 and TMW-3 is in-situ treatment. For treatment of chlorinated VOCs, in-situ enhanced anaerobic biodegradation is generally regarded as a "presumptive remedy" for impacts of this nature. Toward that end, remediation will be accomplished through injection of Hydrogen Release Compound® (HRC®) or a similar biological reductive dechlorination method to stimulate anaerobic bioremediation of the chlorinated organic compounds. This alternative would involve directly injecting approximately 570 lbs of HRC® into the contaminated groundwater using small diameter rods and a high-capacity hydraulic injection pump. Approximately 16 delivery points spaced on 12.5-ft centers would be necessary to treat the area surrounding monitoring well TMW-2.

For treatment of aromatic VOCs, in-situ groundwater treatment is generally regarded as a "presumptive remedy" for impacts of this nature. Toward that end, enhanced aerobic microbial biodegradation will be accomplished through injection of Oxygen Release Compound (ORC™) or a similar product to accelerate aerobic bioremediation of the aromatic VOCs. This alternative would involve directly injecting approximately 500 lbs of ORC into the contaminated groundwater using small diameter drive rods and a high-capacity hydraulic injection pump. Approximately 16 delivery points spaced on 12.5-ft centers would be necessary to treat the area surrounding monitoring well TMW-3.

The treatment spacing was determined using design software for plume area/grid treatment and consultation with Regenesis, the developers of this software.

Cost-Effectiveness

The capital costs associated with Alternative 2 are estimated at $53,200 - $58,200, with the lower value assuming off-site disposal without treatment and the higher end assuming off-site treatment (stabilization) at a permitted treatment storage and disposal facility (TSDF) prior to disposal. Annual OM&M costs anticipated under this approach are estimated at $2,000, yielding a net present worth of $84,000 - $89,000. For Alternative 3, the 30-year present worth cost is estimated to be $102,500 with a projected $59,500 for capital expenditures and $2,800 for annual OM&M costs. See Table 5 for cost comparison between alternatives.

Description of the Remedy

Based on the results of the Alternatives Analysis and the criteria identified for evaluation of alternatives, the NYSDEC has selected a remedy for this site. The components of the remedy set forth in the May 2009 Remedial Investigation/Feasibility Study (RI/FS) Report are as follows:

The estimated present worth cost to implement the remedy is $136,000-141,000. The cost to construct the remedy is estimated to be $105,000-110,000 and the estimated average annual cost for 30 years is $2,000.

The elements of the proposed remedy are as follows:

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

2. Focused excavation (SS-2, SB-3, and SB-5 locations) of soil/fill exceeding the restricted-commercial SCOs with off-site disposal (see Figure 3). Based on the extensive site sampling data showing that the impacts in these areas are isolated and limited to the subject sample locations, confirmatory sampling will not be performed. Following excavation, the areas would be backfilled with clean soil (compliant with commercial SCOs and protection of groundwater quality concentrations per 6NYCRR Part 375-6) or structural fill from a permitted source to within six inches of grade, covered with topsoil, and seeded to promote vegetative growth.

3. Remediation of the chlorinated VOCs in groundwater in the vicinity of temporary monitoring well TMW-2 will be accomplished through injection of HRC®. Remediation of the aromatic VOCs in groundwater in the vicinity of temporary monitoring well TMW-3 will be accomplished through injection of ORC (see Figure 4).

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

5. Development of a site management plan which would include the following institutional and engineering controls: (a) Excavated soil would be tested, properly handled to protect the health and safety of workers and the nearby community, and would be properly managed in a manner acceptable to the Department; (b) evaluation of the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; (c) monitoring of ground water; (d) identification of any use restrictions on the site; and (e) provisions for the continued proper operation and maintenance of the components of the remedy.

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

Since the remedy may result in impacted soil and ground water remaining at the site, a long-term monitoring program would be instituted. The monitoring would include periodically collecting and analyzing ground water samples from select ground water monitoring wells. This program would allow the effectiveness of the in-situ ground water treatment of VOCs to be monitored and would be a component of the long-term management for the site.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1

COMPARISON OF RI TEST PIT AND SURFACE SOIL ANALYTICAL DATA TO COMMERCIAL AND INDUSTRIAL SCOs[1]

Remedial Investigation/Feasibility Study Report
Colgate Avenue Site
Ameron International Corporation

PARAMETER[1]	Sample Location									
	SS - 1	SS - 2	TP - 2 (0.0 - 3.0)	TP - 3 (0.0 - 3.0)	TP - 3 (0.0 - 3.0) Blind Duplicate	TP - 5 (0.0 - 3.0)	TP - 6 (0.0 - 2.5)	TP- 7 (0.0 - 2.5)	SCO RESTRICTED-INDUSTRIAL (ppm)[2]	SCO RESTRICTED-COMMERCIAL (ppm)[2]
TCL VOCs (mg/kg)										
Acetone	ND	ND	ND	ND	ND	0.084	0.005 J	ND	**1000**	**500**
Ethylbenzene	ND	ND	0.42 J	ND	ND	ND	ND	ND	**780**	**390**
TOTAL Xylenes	ND	ND	8.8	ND	ND	0.004 J	ND	ND	**1000**	**500**
Carbon Disufide	ND	ND	ND	ND	ND	0.003 J	ND	ND	**--**	**--**
Chlorofrom	ND	ND	ND	ND	ND	0.002 J	ND	ND	**700**	**350**
2 - Butanone	ND	ND	ND	ND	ND	0.009 J	ND	ND	**1000**	**500**
Methylcyclohexane	ND	ND	ND	ND	ND	0.005 J	0.004 J	ND	**--**	**--**
Isopropylbenzene	ND	ND	ND	ND	ND	0.004 J	0.003 J	ND	**--**	**--**
TCL SVOCs (mg/kg)										
2,4 - Dimethylphenol	ND	ND	0.045 J	ND	ND	ND	ND	ND	**--**	**--**
Naphthalene	0.062 J	0.03 J	0.018 J	ND	ND	1.1	0.067 J	0.083 J	**1000**	**500**
2 - Methylnaphthalene	ND	0.028 J	0.02 J	ND	ND	0.033 J	0.028 J	0.045 J	**--**	**--**
Dimethyl Phthalate	0.16 J	ND	ND	ND	ND	ND	ND	ND	**--**	**--**
Acenaphthylene	ND	0.015 J	0.054 J	ND	ND	ND	0.042 J	0.033 J	**1000**	**500**
Acenaphthene	0.16 J	0.032 J	0.013 J	ND	0.012 J	0.025 J	0.11 J	0.11 J	**1000**	**500**
Dibenzofuran	0.064 J	0.021 J	0.017 J	ND	ND	0.025 J	0.06 J	0.11 J	**--**	**350**
Fluorene	0.12 J	0.031 J	0.02 J	0.014 J	0.014 J	0.22 J	0.11 J	0.18 J	**1000**	**500**
Phenanthrene	1.9 J	0.43	0.17 J	0.17 J	0.15 J	0.21 J	1.2	1.5	**1000**	**500**
Anthracene	0.31 J	0.09 J	0.049 J	0.046 J	0.036 J	0.021 J	0.26 J	0.28 J	**1000**	**500**
Carbazole	0.24 J	0.049 J	0.02 J	0.015 J	0.012 J	0.13 J	0.16 J	0.24 J	**--**	**--**
Di - n - butyl phthalate	0.38 J	0.14 J	ND	0.031 J	0.1 J	ND	0.074 J	0.21 J	**--**	**--**
Fluoranthene	3.4	0.65	0.32 J	0.41 J	0.27 J	0.37 J	2.5	1.8	**1000**	**500**
Pyrene	2.9	0.55	0.27 J	0.3 J	0.2 J	0.43 J	2.1	1.1	**1000**	**500**
Butyl benzyl phthalate	0.22 J	ND	ND	0.011 J	0.016 J	ND	ND	ND	**--**	**--**
Benzo (a) anthracene	1.5 J	0.33 J	0.17 J	0.19 J	0.13 J	0.24 J	1.1	0.74	**11**	**5.6**
Chrysene	1.6 J	0.36 J	0.22 J	0.19 J	0.13 J	0.42 J	1.3	0.66	**110**	**56**
Bis(2 - ethylhexyl) phthalate	140	ND	ND	ND	ND	4	560	ND	**--**	**--**
Di - n - octyl phthalate	ND	ND	ND	ND	0.016 J	ND	ND	ND	**--**	**--**
Benzo (b) fluoranthene	2.9 J	0.64 J	0.48 J	0.36 J	0.32 J	1.1 J	3.4 J	1.2 J	**11**	**5.6**
Benzo (k) fluoranthene	0.64 J	0.15 J	0.12 J	0.076 J	0.3 J	1 J	0.93 J	0.32 J	**110**	**56**
Benzo (a) pyrene	**1.6 J**	0.34 J	0.23 J	0.19 J	0.13 J	0.21 J	**1.5**	**0.63**	**1.1**	**1**
TCL SVOCs (mg/kg)										
Indeno (1,2,3 - cd) pyrene	0.94 J	0.17 J	0.16 J	0.088 J	0.073 J	0.22 J	1.2	0.28 J	**11**	**5.6**
Dibenzo (a,h) anthracene	0.23 J	0.052 J	0.055 J	0.026 J	0.023 J	0.065 J	0.28 J	0.082 J	**1.1**	**0.56**
Benzo (g,h,i) perylene	0.79 J	0.16 J	0.18 J	0.071 J	0.048 J	0.19 J	0.94	0.21 J	**1000**	**500**
TAL Metals (mg/kg)										
Aluminum	6590	8260	13600	10700	8830	8050	15100	10100		**--**
Antimony	2.9 BN*J	2.9 BN*J	ND N*J	ND N*J	ND N*J	ND N*J	ND N*J	ND N*J		**--**
Arsenic	5.8 N*J	11 N*J	9.5 N*J	9.7 N*J	5.8 N*J	3.3 N*J	7.7 N*J	13 N*J	**16**	**16**
Barium	299	93.8	76.6	62.6	43.7	111	50.1	134	**10000**	**400**
Beryllium	0.88 E*J	0.7 E*J	1.5 E*	0.53 BE*	0.35 BE*	0.36 BE*	0.5 BE*	0.75 BE*	**2700**	**590**
Cadmium	3 EJ	0.59 BEJ	0.35 BE	0.84 BE	0.14 BE	ND	0.23 BE	2.8 E	**60**	**9.3**
Calcium	54200 E*J	38000 E*J	80300 E*	6350 E*	6690 E*	37400 E*	5150 E*	35800 E*		**--**
Chromium	41 NE*J	17.9 NE*J	24.1 NE*J	13.5 NE*J	9.2 NE*J	295 NE*J	12.8 NE*J	101 NE*J	**6800**	**1500**
Cobalt	4.4 BEJ	6.2 BEJ	6.9 BEJ	2.9 BEJ	3.4 BEJ	3.4 BEJ	4.9 BEJ	4.7 BEJ		**--**
Copper	55 N*J	31.5 N*J	38.3 N*J	13.3 N*J	12.4 N*J	33.4 N*J	10.1 N*J	44.9 N*J	**10,000**	**270**
Iron	17300 E*J	18400 E*J	29700 E*	23300 E*	15700 E*	90600 E*	21700 E*	43700 E*		**--**
Lead	505 E*J	**2660 E*J**	60 E*	74.1 E*	64.8 E*	108 E*	48.2 E*	224 E*	**3900**	**1000**
Magnesium	15000 *	4240 *	11800 *	1400 *	2440 *	8940 *	1630 *	4590 *		**--**
Manganese	1160 E*J	576 E*J	1430 E*J	296 E*J	157 E*J	**12400 E*J**	322 E*J	2570 E*J	**10000**	**10000**
Mercury	0.154 *	0.123 N*J	0.17 N*J	0.042 BN*J	0.151 N*J	0.036 BN*J	0.029 BN*J	0.021 BN*J	**5.7**	**2.8**
Nickel	18.2 EJ	16.4 EJ	23.2 E	8.3 E	9.6 E	10.4 E	10.4 E	19.1 E	**10000**	**310**

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1

COMPARISON OF RI TEST PIT AND SURFACE SOIL ANALYTICAL DATA TO COMMERCIAL AND INDUSTRIAL SCOs[1]

Remedial Investigation/Feasibility Study Report
Colgate Avenue Site
Ameron International Corporation

PARAMETER[1]	Sample Location									
	SS - 1	SS - 2	TP - 2 (0.0 - 3.0)	TP - 3 (0.0 - 3.0)	TP - 3 (0.0 - 3.0) Blind Duplicate	TP - 5 (0.0 - 3.0)	TP - 6 (0.0 - 2.5)	TP- 7 (0.0 - 2.5)	SCO RESTRICTED-INDUSTRIAL (ppm)[2]	SCO RESTRICTED-COMMERCIAL (ppm)[2]
TAL Metals (mg/kg)										
Potassium	748	996	1040	414 B	576 B	508 B	486 B	483 B		--
Selenium	1.8 B	1.7 B	2.4 B	2.5 B	1.8 B	6.8	2.4 B	4.5 B	**6800**	**1500**
Silver	0.24 B	0.14 B	0.17 B	0.19 B	0.07 B	0.33 B	0.17 B	0.37 B	**6800**	**1500**
Sodium	286 B	129 B	264 B	141 B	81.8 B	227 B	147 B	165 B		--
Thallium	0.62 B	0.62 B	1.3 B	ND	ND	2.5	ND	1.5 B		--
Vanadium	15.5 NE*J	17.7 NE*J	25.4 NE*J	26.1 NE*J	19.5 NE*J	162 NE*J	29 NE*J	53.2 NE*J		--
Zinc	2280 NE*J	359 NE*J	217 NE*J	161 NE*J	136 NE*J	120 NE*J	108 NE*J	485 NE*J	**10000**	**10000**
Wet Chemistry Analysis (units as indicated)										
Leachable pH (S.U.)	7.6 J	7.7 J	7.8 J	7.7 J	7.7 J	8.4 J	6.6 J	7.7 J	--	
Total Organic Carbon (mg/kg)	NA	NA	20000	NA	NA	7800	NA	NA	--	
Pesticides (mg/kg)										
alpha - BHC	ND	0.01 J	ND	ND	ND	ND	ND	ND	**6.8**	**3.4**
Heptachlor	0.014 J	ND	ND	ND	ND	ND	ND	ND	**29**	**15**
Heptachlor epoxide	ND	ND	0.0055 JP	ND	ND	ND	ND	ND	--	--
4,4' - DDE	0.13 J	0.085 PJ	ND	ND	ND	ND	ND	ND	**120**	**62**
Endrin	0.03 JPN	0.018 JPN	ND	ND	ND	ND	ND	ND	**410**	**89**
Endosulfan Sulfate	ND	ND	0.0054 J	ND	ND	ND	ND	ND	**920**	**200**
4,4' - DDT	ND	0.22 P	ND	ND	ND	ND	ND	ND	**94**	**47**
Methoxychlor	ND	ND	ND	0.022 JP	ND	ND	ND	ND	--	--
Total Pesticides (mg/kg)	***0.174 JP***	***0.333 JP***	***0.0109 JP***	***0.022 JP***	***0***	***0***	***0***	***0***		
PCB Aroclor (mg/kg)										
Aroclor 1254	**3.1 P**	**1.4**	0.16 JP	0.61 P	ND	ND	ND	ND	**25**	**1**
Aroclor 1260	**3.8**	**1.4 P**	ND	ND	ND	ND	ND	ND	**25**	**1**

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Restricted Use Soil Cleanup Objectives for Protection of Human Health

Definitions:

ND = Parameter not detected above laboratory detection limit.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
b = Analyte was detected in the associated blank as well as in the sample. Value is above the action level for consideration as being external contamination.
B = Value is between the IDL and the CRDL.
* = Indicates analysis is not within quality control limits.
D = All compounds were identified in an analyisis at the secondary dilution factor.
N = Spike sample recovery is not within quality control limits.
E = Indicates value estimated or not reported due to the presence of interferences.
P = Detected concentrations between the two GC columns is greater than 25%; lower value is reported and flagged (for CLP methodology only).

BOLD	= Analytical result exceeds restricted-commercial SCO.
BOLD	= Analytical result exceeds both restricted-commercial and restricted-industrial SCOs.

TABLE 2

COMPARISON OF SUPPLEMENTAL SOIL BORING LEAD AND PCB DATA TO COMMERCIAL AND INDUSTRIAL SCOs

Remedial Investigation/Feasibility Study Report
Colgate Avenue Site
Ameron International Corporation

PARAMETER[1]	Sample Location												SCO RESTRICTED-INDUSTRIAL (ppm)[2]	SCO RESTRICTED-COMMERCIAL (ppm)[2]
	SB-1 (0.5-1.0)	SB-1 (1.0-1.5)	SB-2 (0.5-1.0)	SB-2 (1.0-1.5)	SB-3 (0.5-1.0)	SB-3 (1.0-1.5)	SB-4 (0.5-1.0)	SB-4 (1.0-1.5)	SB-5 (0.5-1.0)	SB-5 (1.0-1.5)	SB-6 (0.5-1.0)	SB-6 (1.0-1.5)		
Total Metals (mg/kg)														
Lead	65.2 E*J	16.1 E*J	844 E*J	476 E*J	**50300 E*J**	294 E*J	227 E*J	171 E*J	**3420 E*J**	**1430 E*J**	293 E*J	20.1 E*J	**3900**	**1000**
PCBs (mg/kg)														
Aroclor 1254	0.36	ND	ND	ND	ND	ND	ND	ND	0.27 J	0.062	0.59	ND	**25**	**1**
Aroclor 1260	0.23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**25**	**1**

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Restricted Use Soil Cleanup Objectives for Protection of Human Health

Definitions:

ND = Parameter not detected above laboratory detection limit.
* = Indicates analysis is not within quality control limits.
E = Indicates value estimated or not reported due to the presence of interferences.

BOLD	= Analytical result exceeds restricted-commercial SCO.
BOLD	= Analytical result exceeds restricted-commercial and restricted industrial SCOs.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

GROUNDWATER ANALYTICAL DATA SUMMARY

Remedial Investigation/Feasibility Study Report
Colgate Avenue Site
Ameron International Corporation

Parameter [1]	Sample Location								GWQS/GV [5]
	MW-1	MW-2R [2]	MW-3R [4]	MW-4	MW-5 [3]	Blind Dup, MW-5	MW-6	PZ-1	
TCL VOCs (ug/L)									
Acetone	ND	2 J	ND	2 J	6 J	7 J	8 J	ND	**50 ***
cis-1,2-Dichloroethylene	ND	**6 J**	ND	ND	ND	ND	ND		**5**
Benzene	ND	ND	ND	ND	ND	ND	ND	**3 J**	**1**
2-Butanone (MEK)	ND	ND	ND	1 J	ND	ND	ND	ND	**50 ***
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	**50**	**5**
Tetrachloroethene (PCE)	ND	ND	ND	ND	ND	ND	ND	2 J	**5**
Xylenes, total	ND	ND	ND	ND	ND	ND	ND	**120**	**5**
TCL SVOCs - acid extractables (ug/L)									
4-Methylphenol	ND	ND	ND	ND	ND	ND	1 J	--	**1***
Phenol	ND	ND	ND	ND	ND	ND	**2 J**	--	**1***
Pesticides (ug/L)									
beta-BHC	ND	0.034 JPNJ	ND	ND	0.098 PJ	0.1 PNJ	0.08 PJ	--	
Heptachlor	ND	0.013 JPNJ	ND	ND	0.033 JP	0.032 J	0.019 J	--	**0.04**
Aldrin	ND	ND	ND	ND	ND	ND	ND	--	**ND**
Heptachlor epoxide	ND	ND	ND	ND	0.13 P ND	0.12 P ND	ND	--	**0.03**
Endosulfan I	ND	ND	ND	ND	0.039 JP	0.04 J	ND	--	
Dieldrin	ND	ND	ND	ND	**0.061 JPNJ**	ND	ND	--	**0.004**
4,4'-DDE	ND	ND	ND	ND	0.1 JPNJ	0.11 PNJ	ND	--	**0.3**
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	--	
4,4'-DDT	ND	0.024 JPNJ	0.022 J	ND	ND	0.059 J	0.027 JP	--	**0.2**
Methoxychlor	ND	ND	ND	ND	0.11 J	0.13 J	0.05 J	--	**35**
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	--	**5**
alpha-Chlordane	ND	ND	ND	ND	ND	ND	0.019 J	--	**0.05**
gamma-Chlordane	ND	ND	ND	ND	0.02 JPNJ	0.023 JPNJ	ND	--	**0.05**
Total and Soluble Metals [4,6] (ug/L)									
Aluminum, Total	51.6 B*	**696 ***	**4100 ***	**127 B***	**101 B***	**113 B***	**213***	--	**100**
Aluminum, Soluble	--	--	16.2 B	--	--	--	--	--	**100**
Arsenic, Total	ND	ND	3.3 B	ND	ND	ND	ND	--	**25**
Barium, Total	32.2 B	40.1 B	68.8 B	74 B	52.6 B	52.1 B	27.8 B	--	**1000**
Barium, Soluble	--	--	43.9 B	--	--	--	--	--	**1000**
Beryllium, Total	0.43 B	0.62 B	0.77 B	0.59 B	0.38 B	0.46 B	0.36 B	--	**3**
Beryllium, Soluble	--	--	0.28 B	--	--	--	--	--	**3**
Cadmium, Total	ND	ND	ND	0.88 B	ND	ND	ND	--	**5**
Calcium, Total	120000	377000	185000	229000	142000	141000	91100	--	
Calcium, Soluble	--	--	171000	--	--	--	--	--	
Chromium, Total	0.55 B	0.65 B	6.5 B	ND	ND	ND	ND	--	**50**
Cobalt, Total	2.7 B	5.9 B	3.8 B	0.92 B	7.9 B	7.7 B	1.4 B	--	
Copper, Total	1.4 B	ND	9.3 B	5.9 B	4 B	3.5 B	ND	--	**200**
Copper, Soluble	--	--	1.2 B	--	--	--	--	--	**200**
Iron, Total	**4490**	**1630**	**12200**	**14700**	**1760**	**1560**	198	--	**300**
Iron, Soluble	--	**432**	**1270**	--	291	--	ND	--	**300**
Lead, Total	ND	ND	**29**	13.4	ND	ND	ND	--	**25**
Magnesium, Total	**45100**	**49200**	**38500**	**121000**	**54500**	**54100**	12200	--	**35000**
Magnesium, Soluble	--	--	33900	--	--	--	--	--	**35000**
Manganese, Total	133	**5090**	200	**726**	**10700**	**10700**	135	--	**300**
Manganese, Soluble	--	**5120**	84.8	--	**9750**	--	131	--	**300**

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

GROUNDWATER ANALYTICAL DATA SUMMARY

Remedial Investigation/Feasibility Study Report
Colgate Avenue Site
Ameron International Corporation

Parameter [1]	Sample Location								GWQS/GV [5]
	MW-1	MW-2R [2]	MW-3R [4]	MW-4	MW-5 [3]	Blind Dup, MW-5	MW-6	PZ-1	
Total and Soluble Metals [4,6] (ug/L)									
Nickel, Total	9.9 B	9.3 B	9 B	2.6 B	5.7 B	6.5 B	2.8 B	--	**100**
Nickle, Soluble	--	--	3.5 B	--	--	--	--	--	**100**
Potassium, Total	740 B	1840 B	1960 B	1620 B	4420 B	4470 B	2360 B	--	
Potassium, Soluble	--	--	756 BE	--	--	--	--	--	
Selenium, Total	ND	ND	ND	ND	7.7 B	ND	ND	--	**10**
Sodium, Total	12800	**66300**	17100	**48000**	**45500**	**45100**	5460	--	**20000**
Sodium, Soluble	--	--	17000 E	--	--	--	--	--	**20000**
Vanadium, Total	ND	1.3 B	6.9 B	ND	ND	0.63 B	ND	--	
Zinc, Total	**3390**	63.7	834	**14500**	12.1 B	10.5 B	7.1 B	--	**2000**
Zinc, Soluble	--	--	11.1 B	--	--	--	--	--	**2000**
Wet Chemistry [7] (units as indicated)									
Chemical Oxygen Demand (mg/L)	--	ND	21.3	--	80.8	--	18.2	--	
Sulfate (mg/L)	--	998	163	--	174	--	66.4	--	
Field Measurements [8] (units as indicated)									
pH (S.U.)	6.89	6.91	6.75	6.65	6.93	6.85	6.92	6.95	6.79	6.98	6.79	6.98	6.74	6.86	6.74	6.89	**6.5 - 8.5**
Temperature (°C)	11.2	18.6	11.8	12.7	9.3	14.5	9.2	12.3	10.0	18.4	10.0	18.4	11.1	14.6	7.3	6.2	
Specific Conductance (uS)	819.1	909.1	1824	1902	991.5	987.8	1759	1732	1020	985.3	1020	985.3	414.2	706.9	705.9	704.7	
Turbidity (NTU)	18.8	17.3	38.7	38.5	**120**	**387**	40.9	23.9	32.4	13.5	32.4	13.5	8.91	**501**	**330**	**>1000**	**50****
ORP (mV)	-103	-108	127	90	-55	-55	-89	-114	36	80	36	80	68	-97	-112	-111	

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. MS/MSD collected at monitoring well MW-2R.
3. Blind Duplicate collected at monitoring well MW-5.
4. Due to turbidity greater than 50 NTU, a filtered sample was submitted for soluble metal analysis at MW-3R.
5. NYSDEC Class "GA" Groundwater Quality Standards/Guidance Values (GWQS/GV), 6 NYCRR Part 703.
6. Groundwater collected from well MW-2R, MW-5, and MW-6 were analyzed for soluble iron and manganese, in addition to TAL Metals.
7. Samples were also collected from MW-2R, MW-3R, MW-5, and MW-6 for BOD_5 and nitrate; however, results were reported as ND. Similarly, samples were collected from MW-3R, MW-5 and MW-6 for TPH; results were reported as ND.
8. Field measurements collected at time of groundwater sampling. Field measurements stabilized during well purging, as presented on Well Purge & Sample Collection Logs.

Definitions:

J = Estimated value; result is less than the sample quantitation limit but greater than zero.
B = Analyte was detected in the associated blank as well as in the sample.
P = Detected concentrations between the two GC columns is greater than 25%; lower value is reported and flagged (for CLP methodology only).
ND = parameter not detected above laboratory detection limit.
NJ = parameter has been 'tentatively identified' with its approximate concentration.
" -- " = not analyzed for this parameter
" * " = Groundwater Quality Guidance Value
" ** " = field threshold value; when exceeded, field filtered metals sample is collected (i.e., dissolved metals).

BOLD = Analytical result exceeds individual GWQS/GV.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4

GROUNDWATER ANALYTICAL DATA SUMMARY

Remedial Investigation/Feasibility Study Report
Colgate Avenue Site
Ameron International Corporation

Parameter [1]	Sample Location								GWQS/GV [5]
	MW-1	MW-2R [2]	MW-3R [4]	MW-4	MW-5 [3]	Blind Dup, MW-5	MW-6	PZ-1	
TCL VOCs (ug/L)									
Acetone	ND	2 J	ND	2 J	6 J	7 J	8 J	ND	**50 ***
cis-1,2-Dichloroethylene	ND	**6 J**	ND	ND	ND	ND	ND		**5**
Benzene	ND	ND	ND	ND	ND	ND	ND	**3 J**	**1**
2-Butanone (MEK)	ND	ND	ND	1 J	ND	ND	ND	ND	**50 ***
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	**50**	**5**
Tetrachloroethene (PCE)	ND	ND	ND	ND	ND	ND	ND	2 J	**5**
Xylenes, total	ND	ND	ND	ND	ND	ND	ND	**120**	**5**
TCL SVOCs - acid extractables (ug/L)									
4-Methylphenol	ND	ND	ND	ND	ND	ND	1 J	--	**1***
Phenol	ND	ND	ND	ND	ND	ND	**2 J**	--	**1***
Pesticides (ug/L)									
beta-BHC	ND	0.034 JPNJ	ND	ND	0.098 PJ	0.1 PNJ	0.08 PJ	--	
Heptachlor	ND	0.013 JPNJ	ND	ND	0.033 JP	0.032 J	0.019 J	--	**0.04**
Aldrin	ND	ND	ND	ND	ND	ND	ND	--	**ND**
Heptachlor epoxide	ND	ND	ND	ND	0.13 P ND	0.12 P ND	ND	--	**0.03**
Endosulfan I	ND	ND	ND	ND	0.039 JP	0.04 J	ND	--	
Dieldrin	ND	ND	ND	ND	**0.061 JPNJ**	ND	ND	--	**0.004**
4,4'-DDE	ND	ND	ND	ND	0.1 JPNJ	0.11 PNJ	ND	--	**0.3**
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	--	
4,4'-DDT	ND	0.024 JPNJ	0.022 J	ND	ND	0.059 J	0.027 JP	--	**0.2**
Methoxychlor	ND	ND	ND	ND	0.11 J	0.13 J	0.05 J	--	**35**
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	--	**5**
alpha-Chlordane	ND	ND	ND	ND	ND	ND	0.019 J	--	**0.05**
gamma-Chlordane	ND	ND	ND	ND	0.02 JPNJ	0.023 JPNJ	ND	--	**0.05**
Total and Soluble Metals [4,6] (ug/L)									
Aluminum, Total	51.6 B*	**696 ***	**4100 ***	**127 B***	**101 B***	**113 B***	**213***	--	**100**
Aluminum, Soluble	--	--	16.2 B	--	--	--	--	--	**100**
Arsenic, Total	ND	ND	3.3 B	ND	ND	ND	ND	--	**25**
Barium, Total	32.2 B	40.1 B	68.8 B	74 B	52.6 B	52.1 B	27.8 B	--	**1000**
Barium, Soluble	--	--	43.9 B	--	--	--	--	--	**1000**
Beryllium, Total	0.43 B	0.62 B	0.77 B	0.59 B	0.38 B	0.46 B	0.36 B	--	**3**
Beryllium, Soluble	--	--	0.28 B	--	--	--	--	--	**3**
Cadmium, Total	ND	ND	ND	0.88 B	ND	ND	ND	--	**5**
Calcium, Total	120000	377000	185000	229000	142000	141000	91100	--	
Calcium, Soluble	--	--	171000	--	--	--	--	--	
Chromium, Total	0.55 B	0.65 B	6.5 B	ND	ND	ND	ND	--	**50**
Cobalt, Total	2.7 B	5.9 B	3.8 B	0.92 B	7.9 B	7.7 B	1.4 B	--	
Copper, Total	1.4 B	ND	9.3 B	5.9 B	4 B	3.5 B	ND	--	**200**
Copper, Soluble	--	--	1.2 B	--	--	--	--	--	**200**
Iron, Total	**4490**	**1630**	**12200**	**14700**	**1760**	**1560**	198	--	**300**
Iron, Soluble	--	**432**	**1270**	--	291	--	ND	--	**300**
Lead, Total	ND	ND	**29**	13.4	ND	ND	ND	--	**25**
Magnesium, Total	**45100**	**49200**	**38500**	**121000**	**54500**	**54100**	12200	--	**35000**
Magnesium, Soluble	--	--	33900	--	--	--	--	--	**35000**
Manganese, Total	133	**5090**	200	**726**	**10700**	**10700**	135	--	**300**
Manganese, Soluble	--	**5120**	84.8	--	**9750**	--	131	--	**300**

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

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Ameron International Corporation

Parameter [1]	Sample Location															GWQS/GV [5]
	MW-1		MW-2R [2]		MW-3R [4]		MW-4		MW-5 [3]		Blind Dup, MW-5		MW-6		PZ-1	
Total and Soluble Metals [4,6] (ug/L)																
Nickel, Total	9.9 B		9.3 B		9 B		2.6 B		5.7 B		6.5 B		2.8 B		--	**100**
Nickle, Soluble	--		--		3.5 B		--		--		--		--		--	**100**
Potassium, Total	740 B		1840 B		1960 B		1620 B		4420 B		4470 B		2360 B		--	
Potassium, Soluble	--		--		756 BE		--		--		--		--		--	
Selenium, Total	ND		ND		ND		ND		7.7 B		ND		ND		--	**10**
Sodium, Total	12800		**66300**		17100		**48000**		**45500**		**45100**		5460		--	**20000**
Sodium, Soluble	--		--		17000 E		--		--		--		--		--	**20000**
Vanadium, Total	ND		1.3 B		6.9 B		ND		ND		0.63 B		ND		--	
Zinc, Total	**3390**		63.7		834		**14500**		12.1 B		10.5 B		7.1 B		--	**2000**
Zinc, Soluble	--		--		11.1 B		--		--		--		--		--	**2000**
Wet Chemistry [7] (units as indicated)																
Chemical Oxygen Demand (mg/L)	--		ND		21.3		--		80.8		--		18.2		--	
Sulfate (mg/L)	--		998		163		--		174		--		66.4		--	
Field Measurements [8] (units as indicated)																
pH (S.U.)	6.89	6.91	6.75	6.65	6.93	6.85	6.92	6.95	6.79	6.98	6.79	6.98	6.74	6.86	6.74	6.89	**6.5 - 8.5**
Temperature (°C)	11.2	18.6	11.8	12.7	9.3	14.5	9.2	12.3	10.0	18.4	10.0	18.4	11.1	14.6	7.3	6.2	
Specific Conductance (uS)	819.1	909.1	1824	1902	991.5	987.8	1759	1732	1020	985.3	1020	985.3	414.2	706.9	705.9	704.7	
Turbidity (NTU)	18.8	17.3	38.7	38.5	**120**	**387**	40.9	23.9	32.4	13.5	32.4	13.5	8.91	**501**	**330**	**>1000**	**50****
ORP (mV)	-103	-108	127	90	-55	-55	-89	-114	36	80	36	80	68	-97	-112	-111	

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. MS/MSD collected at monitoring well MW-2R.
3. Blind Duplicate collected at monitoring well MW-5.
4. Due to turbidity greater than 50 NTU, a filtered sample was submitted for soluble metal analysis at MW-3R.
5. NYSDEC Class "GA" Groundwater Quality Standards/Guidance Values (GWQS/GV), 6 NYCRR Part 703.
6. Groundwater collected from well MW-2R, MW-5, and MW-6 were analyzed for soluble iron and manganese, in addition to TAL Metals.
7. Samples were also collected from MW-2R, MW-3R, MW-5, and MW-6 for BOD_5 and nitrate; however, results were reported as ND. Similarly, samples were collected from MW-3R, MW-5 and MW-6 for TPH; results were reported as ND.
8. Field measurements collected at time of groundwater sampling. Field measurements stabilized during well purging, as presented on Well Purge & Sample Collection Logs.

Definitions:

J = Estimated value; result is less than the sample quantitation limit but greater than zero.
B = Analyte was detected in the associated blank as well as in the sample.
P = Detected concentrations between the two GC columns is greater than 25%; lower value is reported and flagged (for CLP methodology only).
ND = parameter not detected above laboratory detection limit.
NJ = parameter has been 'tentatively identified' with its approximate concentration.
" -- " = not analyzed for this parameter
" * " = Groundwater Quality Guidance Value
" ** " = field threshold value; when exceeded, field filtered metals sample is collected (i.e., dissolved metals).

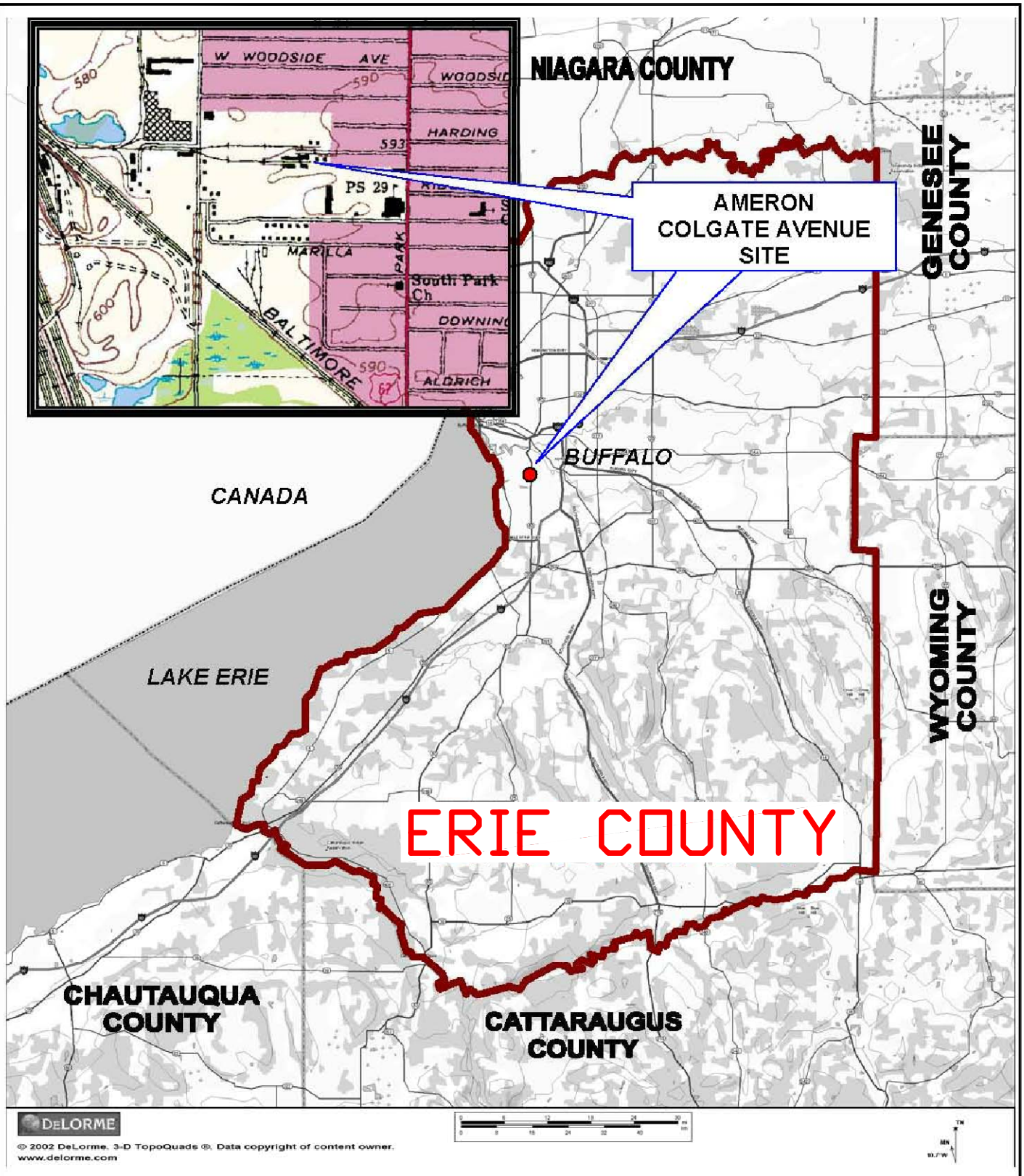
BOLD = Analytical result exceeds individual GWQS/GV.

Table 5
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alternative 1: No Action			
Soil Component			
Alternative 2: Excavation and Off-Site Disposal	$53,000-58,000 $105,000-110,000*	$2,000	$84,000-89,000 $136,000-141,000*
Alternative 3: Asphalt Cover System	$60,000 $112,000*	$2,800	$103,000 $155,000*
Ground Water Component			
In-Situ Ground Water Treatment At TMW-2 And 3	$52,000	$0	$52,000

*Including Ground Water Component

FIGURE 1



BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
LACKAWANNA, NY 14218
(716) 856-0599

PROJECT NO.: 0100-001-200

DATE: MAY 2009

DRAFTED BY: AJZ

SITE LOCATION AND VICINITY MAP

REMEDIAL ACTION WORK PLAN

COLGATE AVENUE SITE
BUFFALO, NEW YORK

PREPARED FOR
AMERON INTERNATIONAL

F:\CAD\Benchmark\Ameron International\Colgate Avenue\RA WORK PLAN\Figure 1; Site Location and Vicinity Map.dwg, 6/1/2009 1:44:07 PM

F:\CAD\Benchmark\Ameron International\Colgate Avenue\RA WORK PLAN\Figure 1; site location and vicinity map.dwg

F:\CAD\Benchmark\Ameron International\Colgate Avenue\RA WORK PLAN\Figure 2; Site Plan.dwg, 6/1/2009 2:46:49 PM

DATE: MAY 2007
DRAFTED BY: BCH

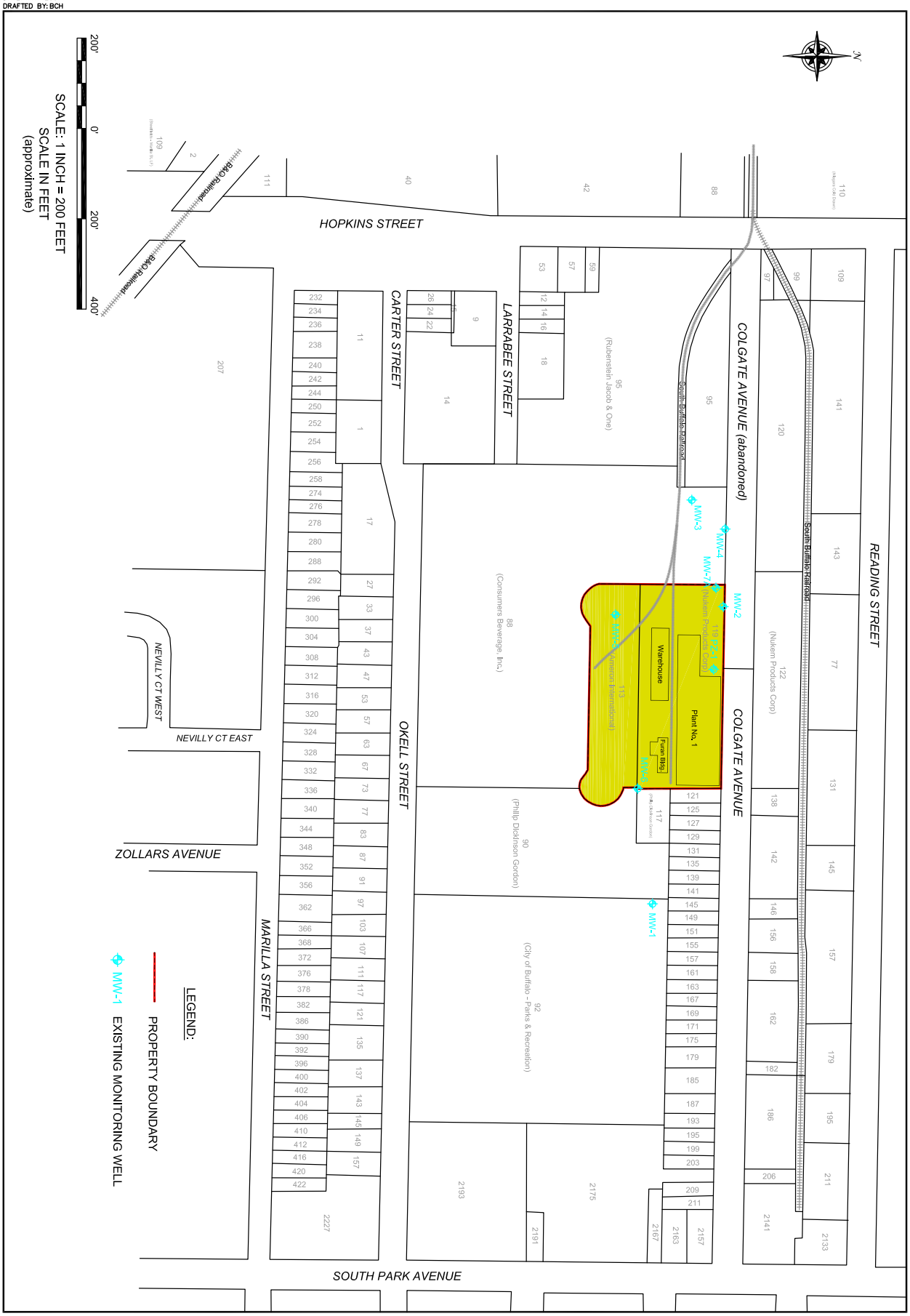


FIGURE 2

SITE PLAN

REMEDIAL ACTION WORK PLAN

COLGATE AVENUE SITE
BUFFALO, NEW YORK

PREPARED FOR
AMERON INTERNATIONAL

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
LACKAWANNA, NY 14218
(716) 856-0599

JOB NO.: 0100-001-200

LEGEND:

- PROPERTY BOUNDARY
- MW-4 MONITORING WELL
- MW-2R REPLACEMENT MONITORING WELL
- SB-1 PLANNED SUPPLEMENTAL BORING
- TP-1 RI TEST PIT LOCATION (7)
- SS-1 RI SURFACE SOIL SAMPLE (2)
- PZ-1 RI PIEZOMETER (1)
- STRUCTURES TO BE DEMOLISHED
- 15' X 15' EXCAVATION AREA

COLGATE AVENUE (abandoned)

COLGATE AVENUE

MW-2R

MW-7A

PZ-1

Plant No. 1

2-STORY OFFICE TO REMAIN

121

125

SB-6

SB-5

SB-4

SB-3

SS-1

SS-2

Furan Bldg.

Warehouse

SB-1

SB-2

South Buffalo Railroad (abandoned)

TP-4

TP-5

TP-6

TP-7

MW-6

MW-5

TP-1

TP-2

TP-3

Former AST Cradle

88

(Consumers Beverage, Inc.)

N

50' 0' 50' 100'

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

DATE: FEBRUARY 2010
DRAFTED BY: AJZ

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BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

JOB NO.: 0100-001-200

FOCUSED SOIL/FILL EXCAVATION PLAN

REMEDIAL ACTION WORK PLAN

COLGATE AVENUE SITE
BUFFALO, NEW YORK

PREPARED FOR
AMERON INTERNATIONAL

FIGURE 3

LEGEND:

- PROPERTY BOUNDARY
- MW-4 EXISTING MONITORING WELL
- MW-2R REPLACEMENT MONITORING WELL
- MW-5 RI MONITORING WELL
- PZ-1 RI PIEZOMETER
- B-3 BORING
- TMW-2 TEMPORARY WELL
- MW-7A SUPPLEMENTAL MONITORING WELL
- 499 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- HRC DIRECT-PUSH INJECTION POINT
- ORC DIRECT-PUSH INJECTION POINT

South Buffalo Railroad (abandoned)

122
(Nukem Products Corp)

138

142

146

COLGATE AVENUE (abandoned)

COLGATE AVENUE

MW-2R (496.8)

MW-4 (496.3)

MW-7A
B-4
TMW-4

B-1
TMW-1

PZ-1 (498.3)

B-9

B-2
TMW-2

B-6

B-3
TMW-3

B-7

B-5

Plant No. 1

MW-3R (495.9)

South Buffalo Railroad (abandoned)

Warehouse

Furan Bldg.

Former AST Cradle

MW-6 (498.6)

MW-5 (498.7)

117
(Philip Dickinson Gordon)

MW-1 499.3

121

125

127

129

131

135

139

141

145

496

497

498

499

88
(Consumers Beverage, Inc.)

90
(Philip Dickinson Gordon)

N

70' 0' 70' 140'

SCALE: 1 INCH = 70 FEET
SCALE IN FEET
(approximate)

DATE: FEBRUARY 2009
DRAFTED BY: THF/JCT/NTM

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BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

JOB NO.: 0100-001-200

HRC® AND ORC® INJECTION PLAN

REMEDIAL ACTION WORK PLAN

COLGATE AVENUE SITE

BUFFALO, NEW YORK

PREPARED FOR

AMERON INTERNATIONAL

FIGURE 4