DRAFT 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	n Library	New York State Department of Environmental										
2010 South Pa	rk Avenue	Conservation										
Buffalo, New Y	York 14220	270 Michigan Avenue										
(716) 823-1854	4	Buffalo, New York 14203										
		(716) 851-7220										
Monday	10 a.m. – 6 p.m.	Attn: Bill Murray										
Tuesday	12 p.m. – 8 p.m.											
Wednesday	Closed	(Please call for an appointment)										
Thursday	12 p.m. – 8 p.m.											
Friday	10 a.m. – 6 p.m.											
Saturday	10 a.m. – 6 p.m.											
Sunday	Closed											

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: <u>Remedial History</u>

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: <u>Summary of the Remedial Investigation</u>

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: <u>Summary of Environmental Assessment</u>

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 nonchlorinated 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:	
Capital Cost:	
1	
Annual Costs:	

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:	
Capital Cost:	
1	
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 onsite 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 (ORCTM) 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.



COMPARISON OF RI TEST PIT AND SURFACE SOIL ANALYTICAL DATA TO COMMERCIAL AND INDUSTRIAL ${\tt SCOS}^1$

Remedial Investigation/Feasibility Study Report

Colgate Avenue Site

Ameron International Corporation

	Sample Location												
PARAMETER ¹	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)						1							
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	0.12.1	0.031.1	0.02.1	0.014.1	0.014.1	0.22.1	0.11.1	0.18.1	1000	500			
Phenanthrene	19.1	0.43	0.02.0	0.17.1	0.15.1	0.21.1	12	1.5	1000	500			
Anthracene	0.31 1	0.40	0.049 1	0.046.1	0.036.1	0.021.1	0.26.1	0.28.1	1000	500			
Carbazole	0.313	0.033	0.0433	0.0403	0.0303	0.0213	0.20 0	0.203					
	0.24 J	0.049.0	0.02 J	0.0133	0.012.0		0.103	0.24 J					
Eluoranthono	0.30 5	0.14 3	0.32 1	0.0313	0.13	0.37 1	2.5	1.8	1000	500			
Pyropo	2.4	0.05	0.32 J	0.413	0.27 3	0.37 3	2.5	1.0	1000	500			
Butyl bonzyl phthalato	0.22.1	0.55 ND		0.011	0.2 J	0.43 J	2.1		1000	500			
Butyl belizyl philialate	0.22 J			0.011.0	0.010 J	0.24 1	1.1	0.74					
	1.5 J	0.35 J	0.17 J	0.19 J	0.13 J	0.24 J	1.1	0.74	110	56			
Pic(2 othylboxyl) phtholoto	140	0.30 J		0.193		0.42 3	560	0.00	110	50			
Dis(2 - etryinexy) primate	ND			ND			500 ND						
DI - II - Octyl philialate			0.49.1	0.26 1	0.010 J		241	121		 F 6			
Benzo (k) fluoranthene	2.9 J	0.04 J	0.40 J	0.30 J	0.32 J	1.1 J	0.02 I	1.2 J	110	5.0			
Benzo (k) huorantinene	0.64 J	0.15 J	0.12 J	0.076 J	0.3 J	1 J 0 21 J	0.93 J	0.32 J	110				
	1.0 5	0.34 J	0.23 J	0.19 J	0.13 J	0.213	1.5	0.05	1.1	1			
Indono (1.2.2. od) pyropo	0.04.1	0.17.1	0.16	0.089.1	0.072.1	0.22.1	1.2	0.28.1	11	F 6			
Dihanza (a.h.) anthrasana	0.94 J	0.17 J	0.10 J	0.000 J	0.073 J	0.22 J	1.2	0.20 J	11	5.0			
Dibenzo (a,h) antinacene	0.23 J	0.052 J	0.055 J	0.026 J	0.023 J	0.065 J	0.26 J	0.062 J	1.1	0.50			
	0.793	0.16 J	0.16 J	0.07 T J	0.046 J	0.19 J	0.94	0.21 J	1000	500			
Aluminum	6500	0260	12600	10700	0020	8050	15100	10100					
Aluminum	0090	020U											
Anumony	2.9 DN J	2.9 DIN J							46				
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			
Banum	299	93.8	15.0	02.0 0.52.DC*	43.7 0.25 DE*	0.26 DE*	50.1 0.5 DE*	134 0.75.DE*	10000	400			
Beryllium	0.00 E J		1.5 E	0.53 BE	0.35 BE	0.30 BE	0.3 BE	0.75 BE	2700	590			
	3 EJ	0.59 BEJ	0.35 BE	0.84 BE	0.14 BE		0.23 BE	2.8 E	60	9.3			
	54200 E*J	38000 E^J	80300 E*	6350 E*	6690 E*	37400 E*	5150 E*	35800 E*	0000				
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	40.000				
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			



COMPARISON OF RITEST PIT AND SURFACE SOIL ANALYTICAL DATA TO COMMERCIAL AND INDUSTRIAL SCO

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

					Sa	mple Locatio	on			
PARAMETER	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		37 83
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	1)				2				2
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	1	
Total Organic Carbon (mg/kg)	NA	NA	20000	NA	NA	7800	NA	NA	3 	
Pesticides (mg/kg)	· · · ·	· · · · · · · · · · · · · · · · · · ·		к — Л			<i>w</i> :	97. IN		97.
alpha - BH C	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	ŧ	***
4,4' - DDE	0.13 J	0.085 PJ	ND	ND	ND	ND	ND	ND	120	62
Endrin	0.03 J PN	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	1 1-11):
Total Pesticides (mg/kg)	0.174 JP	0.333 JP	0.0109 JP	0.022 JP	0	0	0	0		
PCB Aroclor (mg/kg)							10.4 · · · ·			
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 analysis 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 = Applytical segult exceeds posticized commercial SCO

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



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

						Sample L	ocation							
PARAMETER ¹	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)	SCO RESTRICTED- INDUSTRIAL (ppm) ²	SCO RESTRICTED- COMMERCIAL (ppm) ²
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	0.27 J	0.062	0.59	ND	25	1						
Aroclor 1260	0.23	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.

= Analytical result exceeds restricted-commercial SCO.

BOLD = Analytic BOLD = Analytic

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



GROUNDWATER ANALYTICAL DATA SUMMARY

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

Parameter in Parameter in NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2NW-2 <th></th> <th></th> <th>-</th> <th></th> <th>Sample</th> <th>Location</th> <th></th> <th></th> <th>-</th> <th></th>			-		Sample	Location			-	
Tot. Voces (apr.) Vice 1-20 ND 2 J ND 2 J S J ND ND ND Cis-1-20(chtorobylene ND	Parameter ¹	MW-1	MW-2R ²	MW-3R ⁴	MW-4	MW-5 ³	Blind Dup, MW-5	MW-6	PZ-1	GWQS/GV ⁵
Acetone ND 2 J 6 J 7 J 8 J ND 60 Coin-12-Dictinctonyino ND ND ND ND ND ND S Berzene ND ND ND ND ND ND ND ND SJ 1 2-Butrone (NEK) ND ND ND ND ND ND ND ND SJ 5 Tetrachlorosthere (PCE) ND ND ND ND ND ND ND ND 120 5 Veloces -acid extractables (ag/L) ND ND ND ND ND 130 - 14 Petroide ND ND ND ND ND 0.033 JPN ND ND 0.032 J 0.032 J 0.032 J - 0.04 Dels-BHC ND ND ND ND ND ND ND - 0.04 Dels-BHC ND ND <	TCL VOCs (ug/L)									_
dis-1.2.Dicklocostrylene ND N	Acetone	ND	2 J	ND	2 J	6 J	7 J	8 J	ND	50 *
Berzane ND ND ND ND ND ND ND ND SD SD <t< td=""><td>cis-1,2-Dichloroethylene</td><td>ND</td><td>6 J</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td></td><td>5</td></t<>	cis-1,2-Dichloroethylene	ND	6 J	ND	ND	ND	ND	ND		5
2-Butanore (MEK) ND	Benzene	ND	ND	ND	ND	ND	ND	ND	3 J	1
Eltryburcane ND	2-Butanone (MEK)	ND	ND	ND	1 J	ND	ND	ND	ND	50 *
Tetrachroothene (PCB) ND ND </td <td>Ethylbenzene</td> <td>ND</td> <td>ND</td> <td>ND</td> <td>ND</td> <td>ND</td> <td>ND</td> <td>ND</td> <td>50</td> <td>5</td>	Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	50	5
Xydnes, total ND ND ND ND ND ND ND 120 5 TCL SVOGs - soid extractables (ug/L)	Tetrachloroethene (PCE)	ND	ND	ND	ND	ND	ND	ND	2 J	5
ToL. SVOCs - solid extractables (ug/L) ND ND ND ND ND ND ND ND ND L 11 Phenol ND ND ND ND ND ND ND ND 0.08 PJ 14 Pesticides (ug/L) 0.013 JPNJ ND 0.008 JP 0.019 J 0.04 Heptachor ND 0.031 JPNJ ND ND 0.008 JP 0.019 J 0.04 Adrin ND ND ND ND ND ND ND 0.03 Ieddsuffan I ND ND ND ND ND ND 0.03 Ieddsuffan I ND ND ND ND ND ND ND 0.2 Heftoxychor ND ND ND ND ND ND 0.2 Heftoxychor ND ND ND ND <tdn< td=""><td>Xylenes, total</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>120</td><td>5</td></tdn<>	Xylenes, total	ND	ND	ND	ND	ND	ND	ND	120	5
Image Image ND ND ND ND ND ND ND Image <	TCL SVOCs - acid extractables (u	g/L)								
Phenol ND ND ND ND ND ND 2,j 1* Pesticides (ugl.) ND 0.034 JPNJ ND ND 0.098 PJ 0.1PNJ 0.082 J 0.019 J 0.04 Aldrin ND ND ND ND ND ND ND ND 0.02 J 0.019 J 0.04 Aldrin ND ND ND ND ND 0.039 PP 0.04 J ND 0.004 Endosulfan I ND ND ND ND ND 0.021 PNJ ND 0.031 Endosulfan II ND ND ND ND ND 0.021 PNJ ND ND 0.031 4.4*:DDT ND ND ND ND ND ND ND ND 0.021 JPJJ 0.027 PP 0.22 Methoxychior ND ND ND ND ND ND <	4-Methylphenol	ND	ND	ND	ND	ND	ND	1 J		1*
Pesticides (ug/L) ND 0.034 JPNJ ND ND 0.098 PJ 0.1 PNJ 0.032 J 0.013 JPNJ ND	Phenol	ND	ND	ND	ND	ND	ND	2 J		1*
beta-BHC ND 0.034 JPNJ ND ND 0.038 PJ 0.1 PNJ 0.08 PJ Heptachlor ND 0.013 JPNJ ND 0.03 Endosuffan I ND ND ND ND ND ND ND 0.03 Endosuffan I ND ND ND ND ND ND ND 0.03 Endosuffan II ND ND ND ND ND ND ND ND 0.03 Endosuffan II ND ND ND ND ND ND ND ND ND 0.02 4.4-DDT ND ND ND ND ND ND ND ND ND 0.23 ND </td <td>Pesticides (ug/L)</td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Pesticides (ug/L)	•	•	•	•					
Heptachlor ND 0.013 JPNJ ND ND ND 0.033 JP 0.032 J 0.019 J 0.04 Aldrin ND ND ND ND ND ND ND ND ND ND Heptachlor epoxide ND ND ND ND ND ND ND ND ND Endosulfan I ND ND ND ND ND ND 0.04 ND 0.04 44:DDE ND ND ND ND ND ND 0.3 Endosulfan II ND ND ND ND ND ND ND ND 0.3 Endosulfan II ND ND ND ND ND ND ND 0.3 Endosulfan II ND ND ND ND ND ND 0.05 335 Endrin didehyde ND ND	beta-BHC	ND	0.034 JPNJ	ND	ND	0.098 PJ	0.1 PNJ	0.08 PJ		
Aldrin ND ND <th< td=""><td>Heptachlor</td><td>ND</td><td>0.013 JPNJ</td><td>ND</td><td>ND</td><td>0.033 JP</td><td>0.032 J</td><td>0.019 J</td><td></td><td>0.04</td></th<>	Heptachlor	ND	0.013 JPNJ	ND	ND	0.033 JP	0.032 J	0.019 J		0.04
Heptachlor epoxide ND ND ND ND ND 0.13 P ND 0.12 P ND ND - 0.03 Endosulfan 1 ND ND ND ND 0.03 JPN 0.04 J ND - - Dieldrin ND ND ND ND 0.061 JPNJ ND ND - 0.004 A4*DDE ND ND ND ND ND ND ND - 0.33 Endosulfan II ND ND ND ND ND ND ND ND - 0.2 Mathoxychlor ND ND ND ND ND ND ND ND - 0.5 garma-Chiordane ND ND ND ND ND ND ND 0.02 JPNJ 0.02 JPNJ ND - 0.05 fotal and Soluble fordias** (agt) ND ND ND ND ND ND ND - 100 Ala	Aldrin	ND	ND	ND	ND	ND	ND	ND		ND
Endosulfan I ND ND ND ND ND ND O.039 JP O.04 J ND O.0044 Liddrin ND	Heptachlor epoxide	ND	ND	ND	ND	0.13 P ND	0.12 P ND	ND		0.03
Dieldrin ND <	Endosulfan I	ND	ND	ND	ND	0.039 JP	0.04 J	ND		
4.4-DDE ND ND <t< td=""><td>Dieldrin</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>0.061 JPNJ</td><td>ND</td><td>ND</td><td></td><td>0.004</td></t<>	Dieldrin	ND	ND	ND	ND	0.061 JPNJ	ND	ND		0.004
Endosulfan II ND Inc 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 ND 0.11 J 0.13 J 0.05 J 35 Endrin aldehyde ND ND ND ND ND ND ND ND 0.05 J 35 garma-Chlordane ND ND ND ND ND ND 0.02 JPNJ 0.023 JPNJ ND 0.05 garma-Chlordane ND ND ND ND ND 0.02 JPNJ 0.023 JPNJ ND 0.05 duminum, Total 51.6 B* 696 * 4100 * 127 B* 101 B* 113 B* 213 * 100 Arsenic, Total ND ND ND 33.8 ND ND	4,4'-DDE	ND	ND	ND	ND	0.1 JPNJ	0.11 PNJ	ND		0.3
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 ND 0.11 J 0.13 J 0.05 J 35 Endrin aldehyde ND ND ND ND ND ND ND ND 5 alpha-Chlordane ND ND ND ND ND 0.02 JPNJ 0.023 JPNJ ND 0.05 Jarma-Chlordane ND ND ND ND 0.02 JPNJ 0.023 JPNJ ND 0.05 Total and Soluble 100 Aluminum, Soluble 16.2 B 100 Assenic, Total 32.2 B 40.1 B 68.8 B 74 B 52.6 B 52.1 B 27.8 B 1000 Barium, Total 0.43 B 0.62 B 0.77 B 0.59 B<	Endosulfan II	ND	ND	ND	ND	ND	ND	ND		
Methoxychlor ND	4,4'-DDT	ND	0.024 JPNJ	0.022 J	ND	ND	0.059 J	0.027 JP		0.2
Endrin aldehyde ND	Methoxychlor	ND	ND	ND	ND	0.11 J	0.13 J	0.05 J		35
alpha-Chlordane ND 0.019 J 0.05 Total and Soluble Metals ** (ug/L) U U ND ND ND ND 0.02 JPNJ 0.023 JPNJ ND 0.05 Total Soluble 100 Aluminum, Soluble 100 Arsenic, Total 32.2 B 40.1 B 68.8 B 74 B 52.6 B 52.1 B 27.8 B 1000 Barium, Soluble 1000 Beryllium, Soluble 3 Cadaium, Total 0.55 B 0.62 B 6.7 B ND ND <td>Endrin aldehyde</td> <td>ND</td> <td>ND</td> <td>ND</td> <td>ND</td> <td>ND</td> <td>ND</td> <td>ND</td> <td></td> <td>5</td>	Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND		5
gamma-Chlordane ND ND ND ND ND 0.02 JPNJ 0.023 JPNJ ND 0.05 Total and Soluble Metals ** (ug/L) Aluminum, Total 51.6 B* 696* 4100* 127 B* 101 B* 113 B* 213* 100 Aluminum, Soluble 100 Arsenic, Total ND ND ND 33.8 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 Beryllium, Total 0.43 B 0.62 B 0.77 B 0.59 B 0.38 B 0.46 B 0.36 B 3 Cadrium, Total ND ND ND 0.88 B ND ND ND 5 Calcium, Soluble 170000 142000 141000 91100 <	alpha-Chlordane	ND	ND	ND	ND	ND	ND	0.019 J		0.05
Total and Soluble Metals ⁴⁶ (ug/L) Total and Soluble Metals ⁴⁶ (ug/L) Total and Soluble 51.6 B* 696 * 4100 * 127 B* 101 B* 113 B* 213* 100 Aluminum, Total 51.6 B* 696 * 4100 * 127 B* 101 B* 113 B* 213* 100 Arsenic, Total ND ND 3.3 B ND ND ND ND 100 Arsenic, Total 32.2 B 40.1 B 68.8 B 74 B 52.6 B 52.1 B 27.8 B 1000 Barium, Total 0.43 B 0.62 B 0.77 B 0.59 B 0.38 B 0.46 B 0.36 B 3 Cadmium, Total 0.43 B 0.62 B 0.77 B 0.59 B 0.38 B 0.46 B 0.36 B 3 Cadmium, Total ND ND ND 0.88 B ND ND ND	gamma-Chlordane	ND	ND	ND	ND	0.02 JPNJ	0.023 JPNJ	ND		0.05
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 100 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 Cadmium, Total ND ND ND 0.88 B ND ND ND 5 Calcium, Total 120000 377000 185000 229000 142000 141000 91100 Calcium, Total 0.55 B	Total and Soluble Metals ^{4,6} (ug/L)									
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, Soluble 171000 Chromium, Total 0.55 B 0.65 B ND ND ND 50 </td <td>Aluminum, Total</td> <td>51.6 B*</td> <td>696 *</td> <td>4100 *</td> <td>127 B*</td> <td>101 B*</td> <td>113 B*</td> <td>213*</td> <td></td> <td>100</td>	Aluminum, Total	51.6 B*	696 *	4100 *	127 B*	101 B*	113 B*	213*		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 50 Cobalt, Total 0.55 B 0.65 B 6.5 B ND </td <td>Aluminum. Soluble</td> <td></td> <td></td> <td>16.2 B</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>100</td>	Aluminum. Soluble			16.2 B						100
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 50 Cobat, Total 0.55 B 0.65 B 6.5 B ND ND ND 200 Copper, Total 1.4 B ND 9.3 B 5.9 B <td< td=""><td>Arsenic. Total</td><td>ND</td><td>ND</td><td>3.3 B</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td></td><td>25</td></td<>	Arsenic. Total	ND	ND	3.3 B	ND	ND	ND	ND		25
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 12000 377000 185000 229000 142000 141000 91100 Calcium, Soluble 171000 50 Cobalt, Total 0.55 B 0.65 B 6.5 B ND ND ND 50 Copper, Total 1.4 B ND 9.3 B 5.9 B 4.8 B 3.5 B ND 200 Iron, Total 4490 1630 12200 14700 1760 1560 198 <td>Barium, Total</td> <td>32.2 B</td> <td>40.1 B</td> <td>68.8 B</td> <td>74 B</td> <td>52.6 B</td> <td>52.1 B</td> <td>27.8 B</td> <td></td> <td>1000</td>	Barium, Total	32.2 B	40.1 B	68.8 B	74 B	52.6 B	52.1 B	27.8 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 ND 0.88 B ND ND ND 5 Calcium, Total 120000 377000 185000 229000 141000 91100 5 Calcium, Total 120000 377000 185000 229000 142000 141000 91100 5 Calcium, Soluble 171000 50 Cobalt, Total 0.55 B 0.65 B 6.5 B ND ND ND ND 50 Copper, Total 1.4 B ND 9.3 B 5.9 B 4 B 3.5 B ND 200 Iron, Total 4490 1630 12200<	Barium, Soluble			43.9 B						1000
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 5 Calcium, Total 120000 377000 185000 229000 142000 141000 91100 5 Calcium, Soluble 171000 50 Cobalt, 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 200 Copper, Soluble 1.2 B 200 Iron, Total	Beryllium Total	0.43 B	0.62 B	0.77 B	0.59 B	0.38 B	0.46 B	0.36 B		3
Cadmium, Total ND ND ND 0.88 B ND ND ND ND S Cadcium, Total 120000 377000 185000 229000 142000 141000 91100 5 Calcium, Total 120000 377000 185000 229000 142000 141000 91100 5 Calcium, Soluble 171000 50 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 200 Copper, Total 1.4 B ND 9.3 B 5.9 B 4 B 3.5 B ND 200 Iron, Total 4490 1630 12200 14700 1760 1560 198 300 Iron, Soluble	Beryllium Soluble			0.28 B						3
Calcium, Total 12000 377000 185000 229000 142000 141000 91100 Calcium, Soluble 171000 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50 50	Cadmium Total	ND	ND	ND	0.88 B	ND	ND	ND		5
Calcium, Soluble 171000 50 Cobalt, Total 2.7 B 5.9 B 3.8 B 0.92 B 7.9 B 7.7 B 1.4 B 200 Copper, Total 1.4 B ND 9.3 B 5.9 B 4 B 3.5 B ND 200 Iron, Total 14490 1630 12200 14700 1760 1560 198 300 Iron, Soluble 432 1270	Calcium Total	120000	377000	185000	229000	142000	141000	91100		•
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 200 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 25 Magnesium, Total ND ND 29 13.4 ND ND 12200 35000 Magnesium, Soluble 33900 35000 Magnesee, Total 133 5090 200 726	Calcium, Soluble			171000						
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, 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 25 Magnesium, Total ND ND 29 13.4 ND ND 12200 35000 Magnesium, Soluble 33900 35000 Magnese, Total 133 5090 200 726 10700 10700 135	Chromium Total	0.55 B	0.65 B	6.5 B	ND	ND	ND	ND		50
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, 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 25 Magnesium, Total 45100 49200 38500 121000 54500 54100 12200 35000 Magnesium, Soluble 35000 Magnese, Total 133 5090 200 726 10700 10700 135	Cobalt Total	27B	59B	38B	0.92 B	7.9 B	77B	14B		
Copper, Soluble 1.2 B 200 Iron, Total 4490 1630 12200 14700 1760 1560 198 200 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 35000 Magnese, Total 133 5090 200 726 10700 10700 135 300 Manganese, Soluble 5120 84.8 9750	Copper Total	14B		9.3 B	59B	4 B	35B	ND		200
Oopper, outside 4490 1630 12200 14700 1760 1560 198 300 Iron, Total 432 1270 291 ND 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 Magnese, Total 133 5090 200 726 10700 10700 135 300 Manganese, Soluble 5120 84.8 9750 131 300	Copper, Soluble			12B						200
Indit, fold Hote	Iron Total	4490	1630	12200	14700	1760	1560	198		300
Indit, Soluble ND ND 29 13.4 ND ND ND 25 Magnesium, Total 45100 49200 38500 121000 54500 54100 12200 35000 Magnesium, Soluble 33900 35000 Magnese, Total 133 5090 200 726 10700 10700 135 300 Magnese, Soluble 5120 84.8 9750 131 300	Iron Soluble		432	12200		291				300
Local, rotal HD		ND	ND	20	13.4	ND	ND	ND		25
Magnesium, rotar 40100 40100 40100 12100 34100 12200 35000 Magnesium, Soluble 33900 35000 Magnesium, Soluble 33900 35000 Magnese, Total 133 5090 200 726 10700 10700 135 300 Manganese, Soluble 5120 84.8 9750 131 300	Magnesium Total	45100	49200	38500	121000	54500	54100	12200		25
Magnesium, online 00000 35000 Manganese, Total 133 5090 200 726 10700 10700 135 300 Manganese, Soluble 5120 84.8 9750 131 300	Magnesium, Solublo		+3200	33000	121000		5-100	12200		35000
Manganese Soluble 5120 84.8 9750 131 300	Manganese Total	122	5090	200	726	10700	10700	135		3000
	Manganese, rotal Manganese Soluble		5120	84.8		9750		131		300



GROUNDWATER ANALYTICAL DATA SUMMARY

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

							S	ample	Locatio	on							
Parameter ¹	MV	V-1	MW	-2R ²	MW	-3R ⁴	MV	N-4	MW	/-5 ³	Blind MV	l Dup, V-5	MV	V-6	Pž	Z-1	GWQS/GV 5
Total and Soluble Metals 4,6 (ug/L)																	
Nickel, Total	9.9	ЭB	9.3	3 B	9	В	2.0	3 B	5.3	7 B	6.	5 B	2.8	3 B			100
Nickle, Soluble	3	<u>an</u>		1014	3.5	5 B	8	223	3	<u>an</u>		102.6		82.57 2	2	<u>111</u>	100
Potassium, Total	74	0 B	184	40 B	196	60 B	162	20 B	442	20 B	447	70 B	236	60 B	5	107	
Potassium, Soluble	4. (8				756	BE	4		20 (8								
Selenium, Total	N	ID	N	ID	N	ID	N	ID	7.3	7 B	N	ID	N	D			10
Sodium, Total	12	800	66	300	17	100	48	000	45	500	45	100	54	60		<u></u>	20000
Sodium, Soluble		60		1270	170	00 E		 ,		60		1210	ales (20000
Vanadium, Total	N	ID	1.3	3 B	6.9	9 B	N	ID	N	ID	0.6	3 B	N	D		-	
Zinc, Total	33	90	63	3.7	8	34	14	500	12.	1 B	10.	5 B	7.1	1 B			2000
Zinc, Soluble	a.	<u>an</u>		100.0	11.	1 B	8	229	a a	<u>an</u>		100.0				<u></u>	2000
Wet Chemistry ⁷ (units as indicate	ed)																
Chemical Oxygen Demand (mg/L)	-int 		N	ID	21	1.3	2	-	80).8	33	.	18	3.2			
Sulfate (mg/L)	-	-	99	98	1	63	-	œ.	1	74		•	66	6.4		-	
Field Measurements ⁸ (units as inc	dicated	<i>I</i>)					1. 1. iv		tai a							10 12 12	
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 BOD₅ 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.



GROUNDWATER ANALYTICAL DATA SUMMARY

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

				Sample	Location				
Parameter ¹	MW-1	MW-2R ²	MW-3R ⁴	MW-4	MW-5 ³	Blind Dup, MW-5	MW-6	PZ-1	GWQS/GV ⁵
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 (u	ıg/L)	1							
4-Methylphenol	ND	ND	ND	ND	ND	ND	1 J		1*
Phenol	ND	ND	ND	ND	ND	ND	2 J		1*
Pesticides (ug/L)								1	
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	0.11.1	0.13.1	0.05.1		35
Endrin aldebyde	ND	ND	ND	ND	ND	ND			5
alpha-Chlordane	ND	ND	ND	ND	ND	ND	0.019.1		0.05
damma-Chlordane	ND	ND	ND	ND	0.02 IPN I	0.023 JPN I			0.05
Total and Soluble Metals 4,6 (ug/l)			110	0.02 01 110	0.020 01 110	110		0.00
Aluminum Total	, 516B*	696 *	4100 *	127 B*	101 B*	113 B*	213*		100
Aluminum, Soluble			16.2 B						100
	ND	ND	33B	ND	ND	ND	ND		25
Barium Total	32.2 B	10.1 B	68.8 B	74 B	52.6 B	52.1 B	27.8 B		1000
Barium Soluble			/3.9 B				27.0 D		1000
Benyllium Total	0.43 B	0.62 B	43.3 D	0 59 B	0 38 B	0.46 B	0.36 B		3
Bonyllium Solublo	0.40 B	0.02 B	0.28 B	0.00 B	0.00 D	0.40 D	0.00 B		3
Cadmium Total	ND	ND	ND	0.88 B	ND	ND	ND		5
	120000	377000	185000	229000	1/2000	1/1000	91100		5
	120000	577000	171000	223000	142000	141000	31100		
	0.55 B	0.65 B	65B	ND		ND			50
	0.00 D	5.05 D	3.8 B	0.92 B	7 9 B	77B	148		50
	2.7 D		0.0 D	5.0 B	7.5 D	7.7 D			200
Copper, Total	1.4 D		3.3 D	J.9 D	40	5.5 D			200
	4400	1620	12200	14700	1760	1560	109		200
	4430	422	12200	14700	201	1300	130		300
		432 ND	20		291				300
	45400	40200	29	13.4	NU 54500	54400	12200		20
Magnesium, Lotal	45100	49200	30000	121000	54500	54100	12200		35000
iviagnesium, Soluble			33900						35000
	133	5090	200	726	10/00	10/00	135		300
Manganese, Soluble		5120	84.8		9750		131		300



GROUNDWATER ANALYTICAL DATA SUMMARY

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

							S	ample	Locati	on							
Parameter ¹	MV	N-1	MW	-2R ²	MW	-3R ⁴	MV	N-4	мм	/-5 ³	Blind M\	l Dup, N-5	ми	V-6	P	Z-1	GWQS/GV ⁵
Total and Soluble Metals 4,6 (ug/L))																
Nickel, Total	9.9	9 B	9.3	3 B	9	В	2.0	6 B	5.	7 B	6.	5 B	2.8	3 B			100
Nickle, Soluble					3.5	5 B											100
Potassium, Total	74	0 B	184	10 B	196	60 B	162	20 B	442	20 B	447	70 B	236	60 B			
Potassium, Soluble					756	BE											
Selenium, Total	N	ID	N	ID	N	D	N	ID	7.	7 B	N	ID	N	D			10
Sodium, Total	12	800	66	300	17	100	48	000	45	500	45	100	54	60			20000
Sodium, Soluble					170	00 E											20000
Vanadium, Total	N	ID	1.:	3 B	6.9	9 B	N	ID	N	ID	0.6	0.63 B ND					
Zinc, Total	33	90	63	3.7	8	34	14	500	12.	1 B	10.	.5 B	7.′	1 B			2000
Zinc, Soluble					11.	1 B											2000
Wet Chemistry ⁷ (units as indicat	ed)																
Chemical Oxygen Demand (mg/L)	-		N	ID	21	.3	-		80).8		-	18	3.2			
Sulfate (mg/L)	-		9	98	10	63	-		1	74			66	õ.4			
Field Measurements ⁸ (units as in	dicated	d)															
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	
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ORP (mV)	-103	-108	127	90	-55	-55	-89	-114	36	80	36	80	68	-97	-112	-111	

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Samples were also collected from MW-2R, MW-3R, MW-5, and MW-6 for BOD₅ 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.

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

Table 5Remedial Alternative Costs

*Including Ground Water Component

FIGURE 1





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date: February 201 **d**rafted by: AJZ



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