RECORD OF DECISION

Peter Cooper Markhams Superfund Site
Town of Dayton, Cattaraugus County, New York

United States Environmental Protection Agency
Region II
New York, New York
December 2006

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Peter Cooper Markhams Superfund Site
Town of Dayton, Cattaraugus County, New York

Superfund Site Identification Number: NYD980592547

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for the Peter Cooper Markhams Superfund Site (Site), which is chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §9601, *et seq.*, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the remedy for the Site. The attached index (see Appendix III) identifies the items that, together with this ROD, comprise the Administrative Record upon which the selection of the remedy is based.

The New York State Department of Environmental Conservation (NYSDEC) concurs with the Selected Remedy. A letter of concurrence from NYSDEC is attached to this document (Appendix IV).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

The response action described in this document represents the only planned remedy for the Site. The major components of the Selected Remedy include the following:

- Consolidating the waste/fill piles into 7 acres or less, then capping the consolidated wastes with a low permeability soil cover, consistent with the requirements of 6 NYCRR Part 360, including seeding with a mixture to foster natural habitat. Waste piles moved during consolidation will be removed to native soil. Removal to this depth will insure that any remaining contaminants will be within background concentrations.

- Imposing institutional controls in the form of an environmental easement/restrictive covenant filed in the property records of Cattaraugus County that will at a minimum require: (a) restricting activities on the Site that could compromise the integrity of the cap; and (b) restricting the use of groundwater as a source of potable or process water unless groundwater quality standards are met.

- Developing a site management plan that provides for the proper management of all Site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of groundwater to ensure that, following the soil consolidation and capping, the contamination is attenuating and groundwater quality continues to improve; (b) an inventory of any use restrictions on the Site; (c) necessary provisions for ensuring the easement/covenant remains in place and is effective; (d) provision for any operation and maintenance required of the components of the remedy; and (e) the owner/operator or entity responsible for maintenance of the Site to complete and submit periodic certifications concerning the status of the institutional and engineering controls for the Site.

- Evaluating Site conditions at least once every five years to ensure that the remedy continues to protect public health and the environment.

DECLARATION OF STATUTORY DETERMINATIONS

The Selected Remedy meets the requirements for remedial actions set forth in CERCLA §121. It is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The Selected Remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

While the Selected Remedy does not satisfy the statutory preference to reduce the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants through treatment, capping will prevent direct contact and reduce infiltration, thereby reducing the generation of leachate which mobilizes contaminants into the groundwater. EPA is not proposing an active groundwater remedy because of limited groundwater contamination underlying the waste piles at the Site. Instead, institutional controls will be used to prevent the use of groundwater at the Site.

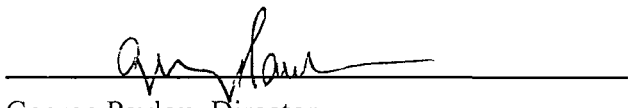
Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a review will be conducted no less often than once every five years after the start of construction of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this Site.

- Contaminants of concern and their respective concentrations in the "Summary of Site Characteristics" section (see ROD, pages 3-9);
- Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD in the "Current and Potential Future Site and Resource Uses" section (see ROD, page 9);
- Baseline human health and ecological risks posed by the contaminants of concern in the "Summary of Site Risks" section (see ROD, pages 9-15);
- Cleanup levels established for contaminants of concern and the basis for these levels in the "Remedial Action Objectives" section (see ROD, page 15);
- Key factors used in selecting the remedy (*i.e.*, how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) in the "Comparative Analysis of Alternatives" section (see ROD, pages 19-23);
- Manner of addressing source materials constituting principal threats in the "Principal Threat Waste" section (see ROD, page 23) and;
- Estimated capital, annual operation and maintenance, and present-worth costs, and the number of years over which the remedy cost estimates are projected in the "Selected Remedy" section (see ROD, page 25).

AUTHORIZING SIGNATURE



George Pavlou, Director
Emergency and Remedial Response Division

12/1/06
Date

RECORD OF DECISION FACT SHEET
EPA REGION II

Site

Site name:	Peter Cooper Markhams Site
Site location:	Town of Dayton, Cattaraugus County, New York
HRS score:	30
Listed on the NPL:	February 3, 2000.

Record of Decision

Date signed:	September 29, 2006.
Selected remedy:	Consolidation and containment of waste fill piles with a low permeability soil cover (*i.e.*, consistent with 6 New York Code Rules Regulations Part 360); establishment of environmental easements/restrictive covenants designed to prevent direct contact with the waste/fill material and prevent groundwater use on the Site for drinking water or potable purposes.
Capital cost:	$ 1,000,000
Operation and maintenance cost:	$ 15,000
Present-worth cost:	$ 1,300,000
Lead	Potential Responsible Parties (PRPs)
Primary contact:	Sherrel Henry, Remedial Project Manager, (212) 637-4273
Secondary contact:	Kevin Lynch, Chief, Western New York Remediation Section, (212) 637-4287
Main PRPs	Wilhelm Enterprises Corporation, Brown Shoe Company, Inc., GST Automotive Leather, Prime Tanning Company, Seton Leather, and Viad Corp.

Waste

Waste type:	Arsenic, chromium, zinc, and several organic compounds

Waste origin:	Waste from off-site manufacturing of animal glue and synthetic industrial adhesives at the Peter Cooper facility in Gowanda
Contaminated media:	Soil and groundwater

DECISION SUMMARY

Peter Cooper Markhams Superfund Site
Town of Dayton, Cattaraugus County, New York

United States Environmental Protection Agency
Region II
New York, New York
December 2006

TABLE OF CONTENTS

ATTACHMENTS

SITE NAME, LOCATION, AND DESCRIPTION

The Peter Cooper Markhams Superfund Site (the Site) is located off Bentley Road, approximately 6 miles south of the Village of Gowanda in the Town of Dayton, Cattaraugus County, New York. The Site is approximately 103 acres in size and is bordered to the northwest by Bentley Road, to the northeast by a wooded property and farm field, to the southeast by a railroad right-of-way, and to the southwest by hardwood forest. Site access is restricted by a locked cable gate at the Bentley Road entrance. A dirt access road extends to the fill area from Bentley Road and continues around a portion of the fill area perimeter. Surrounding property is rural, consisting of small farm fields, open meadow, and forests.

The majority of the Site is characterized by mature hardwood tree cover, as well as open fields. A portion of the Site contains several covered/vegetated waste fill piles arranged in an elliptical pattern. The fill piles vary in size and elevation, with base dimensions ranging from approximately 1,100 - 160,000 square feet and elevations of 5 to 15 feet above surrounding grade. The total area covered by fill piles (base area) is approximately 7 acres.

No structures are present on the property, with the exception of a natural gas wellhead located east of the access drive.

Figure 1 shows the Site location and Figure 2 shows a map of the Site.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Site was used for the disposal of wastes remaining after the manufacturing process from the Peter Cooper Corporations (PCC), a former animal glue and adhesives plant located in Gowanda, New York. Materials disposed at the Site were reported to consist of "cookhouse sludge," residue pile material and vacuum filter sludge. Cookhouse sludge was so named because of a cooking cycle that occurred just prior to extraction of the glue. It was derived primarily from chrome-tanned hides obtained from tanneries and leather finishers. Residue pile material is described as air-dried cookhouse sludge, which was stabilized to a fairly dry, granular form. Vacuum filter sludge is produced during dewatering of cookhouse sludge. The waste material has been shown to contain elevated levels of chromium, arsenic, zinc, and several organic compounds.

PCC purchased the Site in 1955 and sold the Site, among other assets including its corporate name, in 1976 to a foreign company, Rousselot Gelatin Corporation, and its parent, Rousselot, S.A. of Paris, France. Rousellot Gelatin, subsequently changed its name to the Peter Cooper Corporations. From approximately 1955 until September 1971, it was reported that approximately 9,600 tons of waste material from the Gowanda plant were placed at the Site over an approximately 15-acre area.

In addition, PCC transferred approximately 38,600 additional tons of waste materials from the Gowanda plant to the Site pursuant to a New York State Supreme Court Order (8th J.D. Cattaraugus County) dated June 1971. PCC arranged the material into several waste piles approximately 20 feet high and covering a total of approximately 7 acres, mostly in the original disposal area. In 1972, the waste piles were graded and covered with 6 inches of soil or stabilized residue, followed by seeding

to promote cover vegetation. No disposal occurred at the Site after 1971, and the disposal area has since revegetated.

Previous Investigations

The NYSDEC completed preliminary Site Investigations in 1983 and 1985 and identified the presence of arsenic, chromium and zinc in soil samples. In 1986, pursuant to a Consent Order with NYSDEC, PCC commissioned the performance of a Remedial Investigation and Feasibility Study (RI/FS) at the Site. In conjunction with the RI, interim remedial measures were performed in 1989 to remove a number of buried containers that had been disposed within an isolated area of the Site. The containers held off-specification animal glue and oil. The containers and impacted soils were excavated and transported off-site for disposal.

The RI, which was completed in 1989, indicated the presence of total chromium, hexavalent chromium and arsenic above background levels in waste materials and some adjacent soils. Low levels of these contaminants were also detected in groundwater wells installed immediately adjacent to the fill piles. None of the samples tested exhibited hazardous waste (toxicity) characteristics and the RI concluded that the Site did not pose a risk to human health or the environment. The FS for the Site was completed in March 1991. The FS recommended a remedial alternative involving consolidation, compaction, and covering of the waste materials.

However, because the waste at the Site did not meet the statutory definition in effect at the time in New York State for an inactive hazardous waste disposal site, NYSDEC could not use State funds to implement a remedial program. Consequently, the NYSDEC removed the Site from its Registry of Inactive Hazardous Waste Disposal Sites.

In 1993, EPA conducted a Site Sampling Inspection, which included the collection and analysis of soil and surface water samples from the Site. Chromium and arsenic were detected in soils above background concentrations within the waste piles. In 1999, EPA determined the Hazard Ranking System score for the Site.

Based on the above information, the Site was added to the EPA's National Priorities List (NPL) on February 3, 2000. On September 29, 2000, EPA issued a Unilateral Administrative Order (UAO) to several potentially responsible parties (PRPs) to perform the RI/FS for the Site, subject to EPA oversight.

COMMUNITY PARTICIPATION

The Proposed Plan and supporting documents were made available to the public in both the Administrative Record maintained at the EPA Docket Room in the Region 2 offices at 290 Broadway in Manhattan, and at the information repository at the Town of Dayton, Town Building, located at 9100 Route 62 in South Dayton, New York. A public comment period was held from August 11, 2006 through September 9, 2006. In addition, a public meeting was held on August 22,

2006 at the Fireman's Activity Hall on Maple Street in South Dayton, New York. The purpose of the meeting was to inform local officials and interested citizens about the Superfund process, to discuss the Proposed Plan, to receive comments on the Proposed Plan, and to respond to questions from area residents and other interested parties. EPA issued a notice in the *Dunkirk Observer* on August 11, 2006 announcing the availability of the Proposed Plan and the Administrative Record, the commencement and duration of the public comment period, and the date of the public meeting, consistent with the requirements of NCP §300.430(f)(3)(i)(A). Responses to comments and questions received at the public meeting and in writing throughout the public comment period are included in the Responsiveness Summary (see Appendix IV), which is part of this Record of Decision.

SCOPE AND ROLE OF RESPONSE ACTION

This Record of Decision addresses the contaminated soil/waste materials at the Peter Cooper Markhams Site. The Selected Remedy includes containment of the contaminated materials and institutional controls to limit use of groundwater at the Site and to restrict activities such as digging and excavation that could damage the landfill cap. This ROD describes the Selected Remedy for the entire Site and is expected to be the only ROD issued for the Site. The primary objectives of the remedy are to reduce or eliminate any direct contact threat associated with the contaminated soils/fill and minimize or eliminate contaminant migration from contaminated soils to the groundwater.

SUMMARY OF SITE CHARACTERISTICS

Figure 2 shows a map of the Site, including the locations of wetlands and waste piles.

Geology and Hydrology

The Site is located on glacial sediments deposited in pre-glacial Conewango Lake. Two distinct types of fill material have been disposed of at the Site: a waste-fill material consisting of dewatered sludge, silt, sand, and gravel, and a non-waste fill, consisting of native soil mixed with occasional debris from building construction (*i.e.*. shingles, concrete, plastic, etc.). Fill materials are generally unsaturated and cover the glacially-derived soils. The thickness of the fill material ranges from approximately 2 to 15 feet. A dense mat of grassy vegetation, low-lying brush, and briar thickets cover the majority of the fill piles and immediate surrounding areas.

The overburden thickness at the Site is reported to be approximately 440 feet based on the well log for the gas well located near the entrance road to the Site. Native glacially derived materials consist of a glacial outwash unit, and a lacustrine (lake deposited) unit. The outwash deposits are continuous across the Site, and consist of poorly sorted fine to coarse sand and fine gravel. The outwash unit varies in thickness from 8 feet near the center of the Site to a maximum of 18 feet at the southwest corner of the Site. Lacustrine silt and fine sand are located below the outwash sand. The lacustrine deposits are locally stratified, and exhibit discontinuous, alternating layers of silt and clay, suggesting periods of a deep water depositional environment.

Groundwater is present from approximately 1.5 feet below ground surface to over 14 feet deep and seasonally fluctuates within a five-foot range. Groundwater levels measured in the deep monitoring wells near the fill piles were generally lower than the shallow wells, indicating a slight downward vertical hydraulic gradient. However, water levels measured in deep monitoring wells farther downgradient of the fill piles were generally higher than the shallow wells, indicating an upward vertical hydraulic gradient in the southwestern portion of the Site.

Groundwater flows generally in a southwesterly direction at the Site toward the locally significant groundwater discharge area, Wetland F. During periods of higher groundwater elevations, localized groundwater discharge also occurs to Wetland D. The upward vertical hydraulic gradients that exist below and downgradient of the fill piles indicates groundwater at the Site is strongly influenced by Wetland F and groundwater will ultimately flow toward Wetland F located southwest of the fill piles.

Sensitive Environments

Six, noncontiguous, distinct wetland areas were identified during the RI. The wetland areas are generally characterized by slightly lower topography with a thin layer (< 2 feet) of vegetative matter, detrital matter and peat. Each of these larger wetland areas was assigned an alphabetic designation (Wetland A through F). Standing water is present seasonally (generally December through April) in all of the wetland areas. Wetland B, located north of the fill piles, retains standing surface water longer than the other wetland areas on the Site. Wetland F, the largest wetland area on-site, contains both wetland vegetation and large trees with high water demand (cottonwoods and poplars).

Chemical Characteristics

The Remedial Investigation characterized the physical properties of the soil fill piles, soils around the perimeter of the fill piles (perimeter surface soils), native subsurface soils, wetland sediments, groundwater, and soil gas as described below.

Chemical and physical data were collected to determine the nature and extent of contamination associated with the Site. Media sampled during the RI included: groundwater, wetland surface water; wetland sediments; surface and subsurface soil; waste fill; and soil vapor. The constituent concentrations detected during this RI are generally consistent with the data from the 1989 RI. The preliminary list of constituents detected in Site media considered to pose a potential concern (COPCs) at the Site included: arsenic, total chromium and hexavalent chromium (metal COPCs). The results of the RI are summarized below.

Groundwater

Groundwater samples collected from nine shallow and nine deep overburden monitoring wells, during two rounds of sampling, were compared to groundwater regulatory levels including New York State Division of Water Technical and Operational Guidance Series (TOGS) Ambient Water

Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998. Data were also collected to evaluate the movement of groundwater in these areas and the extent of contamination. Groundwater data and sampling locations can be found in Tables 1a and 1b, and Figures 2 and 3, respectively.

Arsenic and total chromium, were detected above the groundwater criteria during the first round of sampling. Arsenic was detected at a maximum concentration of 133 micrograms per liter (µg/L), which is above the groundwater criterion of 25 µg/L. Total chromium was detected at a maximum concentration of 981 µg/L, which is above the groundwater criterion of 50 µg/L. Hexavalent chromium was not detected in any of the groundwater samples. Inorganic constituents such as ammonia, nitrate, and sulfate are elevated at various locations in groundwater downgradient of the fill piles. Volatile organic compounds (VOCs) detected above the groundwater criteria in downgradient monitoring wells were benzene and trichloroethene. The semivolatile organic compounds (SVOCs) detected above groundwater criteria were benzo(b)fluoranthene and bis(2-ethylhexyl)phthalate.

In the RI report, the PRPs' consultants described difficulties they experienced in obtaining representative samples from one well (MW-2S), possibly related to its age and construction materials. They concluded that the groundwater analytical results collected from well MW-2S during the first and second sampling events might not be representative of Site groundwater. EPA acknowledges the information presented by the PRPs' consultant. However, EPA believes that until further monitoring is conducted, a definitive conclusion that water samples from MW-2S are not representative of groundwater quality in the surrounding formation cannot be supported. Nonetheless, even if the data from monitoring well MW-2S were to be discounted, other groundwater data from the Site demonstrate that there is an unacceptable noncancer health hazard for the future industrial worker. However, based on data from the other wells at the Site, it appears that the area of groundwater contamination may be limited to a relatively small area, under the waste piles.

To address the limitations of the sampling from monitoring well MW-2S, any groundwater monitoring program at the Site would include replacing MW-2S and conducting analytical sampling for metals.

Wetland Surface Water

Surface water samples were collected from wetland areas and analyzed for metals. Surface water sample locations are shown on Figure 3. Sample results were compared to the appropriate TOGS value.

Arsenic and total chromium were not detected in the surface water samples. Hexavalent chromium was detected at 13.0 µg/L, above the surface water criterion of 11 µg/L, during the first sampling round. However, the result was flagged as estimated by the laboratory and the detected presence of

this contaminant was not confirmed during the second sampling round, nor was total chromium detected in the sample above the reporting limit of 10 µg/L.

Sulfate was detected at a maximum concentration of 337 milligrams per liter (mg/L), above the surface water criterion of 250 mg/L in a surface water sample collected from Wetland F. However, sulfate was detected below the surface water criterion during the second sampling event. Surface water in Wetland F receives groundwater discharge with elevated sulfate concentrations. Sulfate was detected in Wetlands B and D at maximum concentrations of 34.5 mg/L and 27.8 mg/L, respectively. Sulfide was not detected in any of the surface water samples.

Ammonia was detected during the second sampling event at a concentration of 110 µg/L, above the surface water criterion of 2.5 µg/L, but was not detected at that location during the first sampling event or at other surface water sample locations.

Wetland Sediments

Sediment samples were collected from wetlands adjacent to the Site. Sediment sample locations are shown on Figure 4. Sediment sampling data were compared to the Low Effect Level (LEL) and Severe Effect Level (SEL) sediment quality guideline values presented in NYSDEC Division of Fish, Wildlife, and Marine Resources Technical Guidance for Screening Contaminated Sediments for arsenic and chromium.

Background wetland sediment samples were collected at nine sample locations during the first sampling event and analyzed for arsenic and chromium. Arsenic concentrations ranged from 1.4 to 10.3 milligrams per kilograms (mg/kg) and total chromium concentration ranged from 7.8 to 23.1 mg/kg.

Arsenic concentrations were detected in five of the nine background sediment samples above the LEL of 6.0 mg/kg, but below the SEL of 33 mg/kg, at a maximum concentration of 10.3 mg/kg. All of the total chromium background samples were below both the LEL of 26 mg/kg and the SEL of 110 mg/kg.

Fourteen sediment samples were collected from wetland areas near and downgradient from the waste fill piles during the initial sampling event and analyzed for metal COPCs. The metal COPCs detected included arsenic, which ranged from 2.3 to 11.4 mg/kg; total chromium, which ranged from 9.2 to 215 mg/kg; and hexavalent chromium, which ranged from 1.3 to 18.3 mg/kg.

Total chromium concentrations in 8 of the 14 wetland sediment samples were detected above the LEL of 26 mg/kg at a maximum concentration of 215 mg/kg. Total chromium concentration in 2 of the 14 sediment samples were detected above the SEL of 110 mg/kg. Arsenic concentrations in 8 of the 14 wetland sediment samples were detected above the LEL of 6 mg/kg at a maximum concentration of 11.4 mg/kg. None of the arsenic concentrations were detected above the SEL of

33 mg/kg. Hexavalent chromium was detected in two of the sediment samples. A sediment quality criterion is not available for hexavalent chromium.

Wetland F is the receptor of groundwater discharge from the Site. Metal COPCs detected in samples collected from this wetland were not elevated compared to Site background.

Soils

Surface and subsurface soil samples were collected at the Site. Surface soil samples were collected from the following three distinct locations: upgradient of the fill piles, surface of the fill piles, and areas adjacent to the fill piles. Subsurface soil samples were collected from the perimeter of the fill piles and from monitoring well and soil boring locations. Soil results and sampling locations can be found in Tables 2 through 6, and Figures 5 and 6, respectively. There are currently no federal or state promulgated standards for contaminant levels in soils. As a result, soil sampling data were compared to the New York State cleanup objectives defined in the Technical and Administrative Guidance Memorandum (TAGM)[1].

Site background (SB) surface soil samples were collected at six locations, approximately 500 to 600 feet upgradient of the fill piles, and analyzed for arsenic and chromium. Background concentrations ranged from nondetectable to 8.1 mg/kg for arsenic and 7.8 to 31.8 mg/kg for total chromium. TAGM soil cleanup objectives for arsenic and total chromium are 7.5 mg/kg or SB and 10 mg/kg or SB, respectively.

To characterize the soil covering the fill piles and evaluate the extent of surface soil impacts, nine surface soil samples were collected from 0 to 6 inches below the fill piles. The samples were analyzed for metal COPCs. Arsenic concentrations were detected in seven of the nine soil samples above the soil cleanup objective at a maximum concentration of 95.5 mg/kg. Total chromium was detected at all nine locations above the soil cleanup objective at a maximum concentration of 65,300 mg/kg.

To characterize soils that may have been impacted by the adjacent fill piles, a total of 48 discrete surface soil samples were collected from 0 to 6 inches below ground surface (bgs) and analyzed for metal COPCs. Arsenic concentrations were detected in 19 of the 48 soil samples above the soil cleanup objective at a maximum concentration of 55.1 mg/kg. Total chromium concentrations were detected in 42 of the 48 soil samples above the soil cleanup objective at a maximum concentration of 11,800 mg/kg.

Ten of the samples were also analyzed for VOCs and SVOCs. No VOCs or SVOCs were detected above the soil cleanup objectives.

---

[1] *Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, Division of Hazardous Waste Remediation, January 24, 1994.*

Subsurface soils near the fill piles were sampled to assess potential vertical migration of metal COPCs with percolating surface water. Perimeter subsurface soil samples were collected at 29 sample locations from depths of 6 to 12 inches bgs and analyzed for metal COPCs. Arsenic concentrations were detected in 24 of the 29 samples above the soil cleanup objective with a maximum concentration of 28.9 mg/kg. Total chromium was detected at all 29 locations above the soil cleanup objective at a maximum concentration of 19,700 mg/kg.

Subsurface soil samples were also collected from monitoring wells and soil boring locations. Native soil samples (nonwaste fill) were collected below the waste fill from four soil borings (B-1A, B-4, B-5, and B-6) at three depth discrete intervals: immediately below the waste fill/native soil interface, the subsequent one-foot incremental depth, and soil immediately above the water table. A subsurface soil sample was also collected from the unsaturated zone (one foot above the water table) at monitoring well location MW-8S. Each of the discrete native soil samples was analyzed for metal COPCs (arsenic, chromium, and hexavalent chromium).

Arsenic concentration ranged from 4.7 to 13.4 mg/kg and was detected at 11 of the 13 locations sampled, slightly above the soil cleanup objective.

Total chromium concentrations were detected well above the soil cleanup objective at three boring locations: B-1A (10 - 11 feet bgs, depth interval of 1 to 2 feet below the waste fill), B-4 (16 - 17 feet bgs, depth interval of 1 to 2 feet below the waste fill), and B-6 (7.5 - 8.5 feet bgs, depth interval of 1 to 2 feet below the waste fill). The total chromium concentrations at these locations were 65.1 mg/kg, 1,150 mg/kg and 5,860 mg/kg, respectively. Total chromium concentrations below these sample depths were within SB levels. Hexavalent chromium was not detected in any of the samples analyzed. These data indicate that metal COPCs have not migrated substantially in native soil below the bottom of the waste fill piles.

Waste Fill

No seeps or significant erosional features were observed on the fill piles. Waste fill samples were collected from three borings. The three samples were analyzed for total metal constituents of potential concern, identified as arsenic, total chromium, and hexavalent chromium. The COPCs were also analyzed utilizing the EPA Synthetic Precipitation Leaching Procedure (SPLP) to assess the leachability of the waste fill contaminants to the groundwater. The metal COPCs detected at maximum concentration in the waste fill borings were arsenic (65.6 mg/kg), chromium (31,200 mg/kg), and hexavalent chromium (4.7 mg/kg).

The concentrations of pollutants in SPLP leachate can be measured and compared to groundwater quality criteria to determine if groundwater contamination is likely. The analysis of leachable metal COPCs detected the following maximum concentrations: arsenic (14.2 µg/L), chromium (1,010 µg/L), and hexavalent chromium (22.0 µg/L). The groundwater criterion for arsenic and total chromium are 25 µg/L and 50 µg/L, respectively. The data suggests the potential for impact to groundwater.

Soil Vapor

Two field-measured soil vapor samples were analyzed using a calibrated multi-gas meter at a gas probe; one during the initial monitoring event and the other during the second monitoring event. The soil vapor monitoring data are summarized as follows:

The lower explosive limit (percent of methane in air) exceeded the range of the instrument (0 to 5% methane) in both samples, indicating high methane levels. Hydrogen sulfide was detected at low levels (1 to 4 ppm) during the first monitoring event, and ranged from 195 to 305 ppm during the second monitoring event. Hydrogen sulfide has a "rotten egg" odor with a very low concentration threshold. Oxygen content was detected near 0% (0.4 to 0.9 %) during the first monitoring event, indicating an anoxic or anaerobic subsurface condition, and ranged from 6.1 to 9.8 % during the second monitoring event. Carbon monoxide was detected at low levels (3 to 6 ppm) during the first monitoring event and ranged from 103 to 185 ppm during the second monitoring event. No vapors were detected in ambient air on or near the waste fill piles, indicating the elevated hydrogen sulfide and methane detected in the gas probe are not being emitted in significant quantities and/or they are being dispersed in ambient air.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The Site is zoned industrial and future use of the Site is expected to remain unchanged. Surrounding demographics are rural and sparsely populated as indicated by both direct observations during Site reconnaissance activities and information provided by the Town of Dayton. The Hamlet of Markhams is generally characterized by large fields, pasture land, and forested property. Agricultural fields (primarily livestock feed) surround the Site. Land use near the Site is consistent with the agricultural/forestry zoning designation for surrounding lands.

Although groundwater in the State of New York is classified as "GA," potential potable water supply, groundwater at the Site is not presently used as a potable water supply and is not likely to be used as such in the future.

SUMMARY OF SITE RISKS

A baseline human health risk assessment (HHRA) was conducted for the Peter Cooper Markhams Site. The HHRA is available in the July 2006 report *Baseline Risk Assessment* prepared by Geometric Consultants, Inc. and Benchmark Environmental Engineering and Science, PLC.

The HHRA evaluated the Site for current and future industrial use consistent with the land use zoning. The Site carries an industrial zoning designation, which, in accordance with the Town Zoning Law, precludes other non-industrial uses such as residential. At the current time, the property is vacant. A Screening Level Ecological Risk Assessment (SLERA) was also prepared to evaluate the potential risks to ecological receptors detected at and adjacent to the Site.

Human Health

A Superfund HHRA is an analysis of the potential adverse health effects caused by hazardous substance releases from the Site in the absence of any actions to control or mitigate these conditions under current and future land uses. The HHRA was developed consistent with appropriate Agency guidelines, guidance, and policies, including program-specific Superfund guidance. The HHRA considering both current and future land use, was conducted for chemicals of potential concern at the Site. Table 7 summarizes the pathways that exceeded the upper bounds of EPA's risk range for cancer of 10^{-4} (one in ten thousand) and a Hazard Index (HI) for non-cancer health effects of 1 (HI = 1).

A four-step process is utilized for assessing quantitative human health risks for reasonable maximum exposure scenarios. The methodology is presented below:

Data Collection and Analysis: In this step, COPCs at the site in groundwater, soil, air, etc. are identified based on factors such as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the COPCs identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a "reasonable maximum exposure" (RME) scenario, which portrays the highest level of human exposure that could reasonable be expected to occur, is calculated.

Dose-Response Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects, such as changes in the normal functions of organs within the body. Some chemicals are capable of causing both cancer and non-cancer health effects.

Risk Characterization: This step summarizes and combines exposure information and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a one-in-ten-thousand excess cancer risk; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the exposure assessment. Current Superfund guidelines for exposures are an individual lifetime excess cancer risk in the range

of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk). For non-cancer health effects, a hazard index (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding Reference Dose (RfD). The key concept for a non-cancer HI is that a threshold level (measured as an HI of less than 1) exists below which non-cancer health effects are not expected to occur. A HI of greater than 1 does not predict disease.

For human health, risks from chemical exposure were estimated for current and future RME individuals at the Site. Specifically, human cancer risks and non-cancer health hazards associated with exposure to the COPCs were evaluated. The results are discussed below.

The Exposure Point Concentrations (EPCs) by media were calculated using a 95% upper confidence limit on the mean where adequate data was available to support the statistical calculation. Where adequate statistical information was not available, the maximum concentration was used. ProUCL Version 3.0 software was used to perform the statistical calculations. Table 8 provides the EPCs for the COPCs exceeding the risk range for groundwater.

The potential receptors evaluated in the HHRA, based on current and future Site land use, are discussed below.

Current/Future Land Use: Adult and adolescent trespassers on the Site. Trespassers may be exposed to surface soil via incidental ingestion and dermal contact. Trespassers may also inhale fugitive dusts containing volatile COPCs released to ambient air from groundwater (*i.e.*, site-wide). Trespassers may also be exposed to COPCs via incidental ingestion and dermal contact with surface water and sediments from the wetland areas.

Future Land Use: Future land use considered potential exposures to industrial workers involved in outdoor activities at the Site. Industrial workers may be exposed to on-site COPCs in surface soil via incidental ingestion, dermal contact, and inhalation of fugitive dust. The workers may also be exposed through inhalation of volatile COPCs that are released to ambient air as a result of volatilization from groundwater (*i.e.*, site-wide). If the event that groundwater underlying the Site is used as a future source of potable water, potential exposures associated with this groundwater exposure include ingestion and dermal contact.

NYSDEC has classified the groundwater under the Site GA, which indicates the potential that this water may be used as a potable water supply in the future. The Site groundwater is not currently used as a drinking water source and residents receive their water primarily from municipal supplies. The closest residential well in the area is located ¼ mile west of the Site. This well was sampled by EPA and found to be free of Site-related contaminants.

Future Indoor Workers: Indoor workers may be exposed via inhalation of volatile COPCs released to indoor air from underlying groundwater (site-wide).

Future Construction Workers: Construction workers may be exposed to COPCs in soil through incidental ingestion and dermal contact and through inhalation of fugitive dust from on-site soil. Construction workers may also be exposed to on-site groundwater through dermal contact. Other exposures include inhalation of volatilized COPCs from on-site groundwater, dermal contact with surface water from wetlands, and ingestion and dermal contact with sediments from the wetlands.

Exposure factors for the RME scenario portraying the highest level of human exposure that could reasonably be expected to occur were used in the risk and hazard index calculations. In addition, the Central Tendency Exposure (CTE) or average risk was calculated where the NCP risk range was exceeded for cancer of 10^{-4} (or 1 in 10,000) or the HI was greater than 1. The exposure assessment evaluated current/future exposures to the various receptors identified above. Professional judgment was used in developing exposure frequency and duration assumptions for trespassers. Current toxicity factors from the IRIS database, EPA's consensus toxicity database, were used in the calculations of cancer risks and noncancer health hazards.

Standard default exposure assumptions were used in the calculations for the adult industrial and construction workers on-site. Cancer risks for the RME and CTE scenarios for the industrial worker are provided in Tables 9 and 10, respectively. Noncancer health hazards for the RME and CTE scenarios are presented in Tables 11 and 12, respectively, for the on-site industrial worker.

Separate analyses were also conducted for the on-site construction worker. The RME cancer risks to the construction worker did not exceed the risk range. The RME noncancer health hazards for the construction worker are provided in Table 13. CTE noncancer HI for the construction workers were not calculated based on the short exposure period (*i.e.*, less than 1 year).

As described above, there are questions regarding the concentrations of COPCs identified in well MW-2S. To address these concerns, separate cancer risk and noncancer health hazard assessments were conducted for the industrial worker in the absence of the data from Well MW-2S. Table 14 provides the list of COPCs and the associated EPCs for the industrial worker. Tables 15 and 16 provide the cancer risks and noncancer HI for the RME industrial worker. Although Table 15 indicates that the risks are within the risk range, the information is presented for completeness. Table 16 identifies hexavalent chromium (HQ = 1.2) and manganese (HQ = 5.9) above an HI = 1. Cancer risks and noncancer health hazards to the construction worker were within the risk range. The toxicity data is summarized in Table 17 for cancer and Table 18 for noncancer health effects.

The results of the HHRA found the RME individual cancer risks and noncancer HI did not exceed the risk range for most exposure scenarios. Exposure scenarios exceeding the risk range are provided below including information on the CTE or average risks where the NCP risk range of 10^{-4} (or 1 in 10,000) was exceeded for cancer or the HI was greater than 1.

Future Industrial Worker: The cancer risks for the future industrial workers at the Site were 3×10^{-4} (three in ten thousand) and the noncancer health hazards for total chemicals was an

HI = 230. The risk is primarily attributed to the future ingestion of groundwater contaminated with arsenic (2.4×10^{-4}) underlying the Site, and the noncancer health assessment where the following chemicals exceeded the range: arsenic (HQ = 1.5), cadmium (HQ = 3.8), hexavalent chromium (HQ = 1.2), iron (HQ = 94), manganese (HQ = 5.9), and thallium (HQ = 119). The CTE or average risk from ingestion of groundwater was 6×10^{-5} (or six in one hundred thousand) from arsenic in groundwater; and an HI = 155 from exposure to thallium (HQ = 81.9), iron (HQ = 66), and cadmium (HQ = 3.5).
The HHRA identified difficulties that occurred in obtaining representative samples from well MW-2S. Possible explanations include the age of the well and the construction materials. The evaluation concluded that the groundwater analytical results collected from well MW-2S during the first and second sampling events might not be considered representative of Site groundwater. Evaluation of the data in the absence of well MW-2S found cancer risks for the future industrial worker of 7×10^{-5}, which is within the risk range. The noncancer health hazards were HI = 8 with the primary COPCs of chromium (HQ = 1.2) and manganese (HQ = 5.9). The CTE or average non-cancer health hazards were an HI = 1.9 with hexavalent chromium (HQ = 1) and manganese (HQ = 0.9) the COPCs.

Construction Worker: The cancer risks to the future construction worker were within the risk range. The noncancer health hazards to the future construction worker were an HI = 5.2 which exceeds the risk range. The COPCs of concern were cadmium (HI = 1.9) and thallium (HI = 1.6).

The HHRA found that all other exposure scenarios for all other receptors were either within or below the risk range and these risks are not discussed further. The HHRA provides details regarding the results of the individual assessments for the other receptors.

Screening Level Ecological Risk Assessment

The objective of the SLERA was to fulfill Steps 1 and 2 outlined in the *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (ERAGS, USEPA, 1997). The draft SLERA was prepared by the Environmental Risk Group (ERG) and is dated August 2006. ERG evaluated potential ecological risk under maximal exposure scenarios in Step 1, and in Step 2 and employed a more realistic food chain model that considered: average concentrations of the constituents of potential ecological concern (COPES); bioavailability of chromium; and, in the case of the modeled omnivorous mammal (raccoon), a distributed diet and typical home range. The SLERA used analytical data from samples collected during the RI and information on the ecological communities present at the Site.

Modeling performed under Step 2 of the SLERA suggests only minimal increased ecological hazard to avian omnivores and insectivores preying on invertebrates exposed to elevated COPEC concentrations at the Site, with remaining ecological receptors at or within acceptable risk levels. The SLERA further indicates that the most significant risk is primarily due to direct soil/fill

exposure. Considering the available data, the SLERA concluded that any ecological impact would be highly localized.

Discussion of Uncertainties in Risk Assessment

The procedure and inputs used to assess risks in this evaluation, as in all such assessments, include uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis,
- environmental parameter measurement,
- fate and transport modeling,
- exposure parameter estimation, and,
- toxicological data.

Uncertainty in environmental sampling arises, in part, from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources, including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the contaminants of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the contaminants of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the baseline human health risk assessment provides upper-bound estimates of the risks to populations near the Site, and it is highly unlikely to underestimate actual risks related to the Site.

Specifically, several aspects of risk estimation contribute uncertainty to the projected risks. Uncertainty associated with sample laboratory analysis and data evaluation is considered low as a result of a quality assurance program which included data validation of each sample result.

In addition to the calculation of exposure point concentrations, several site-specific assumptions regarding future land use scenarios, intake parameters, and exposure pathways are a part of the exposure assessment stage of a baseline risk assessment. Assumptions were based on site-specific conditions to the greatest degree possible, and default parameter values found in EPA risk assessment guidance documents were used in the absence of site-specific data. However, there remains some uncertainty in the prediction of future use scenarios and their associated intake parameters and exposure pathways. The exposure pathways selected for current scenarios were based on the site conceptual model and related data. The uncertainty associated with the selected pathways for these scenarios is low because site conditions support the conceptual model.

Based on the results of the baseline risk assessment, EPA has determined that actual or threatened releases of hazardous substances from the Site, exceed the risk range and continued remedial action is necessary to address this risk.

Basis for Action

Based upon the results of the RI and the human health and ecological risk assessments, EPA has determined that the response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are media-specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs). Other criteria that do not meet the definition of an ARAR, but may also be considered when developing alternatives, are known as to-be-considered criteria (TBCs). Site-specific risk-based levels, as well as the risks defined in the human health and ecological risk assessments, under the current and reasonably-anticipated future land use, are also considered when establishing remedial action objectives.

The following RAOs were established for the Site:

- Reduce or eliminate any direct contact threat associated with the contaminated soils/fill; and
- Minimize or eliminate contaminant migration from contaminated soils to the groundwater.

Soil cleanup goals will be those established pursuant to the TAGM guidelines. These levels are the more stringent cleanup level between a human-health protection value and a value based on protection of groundwater as specified in the TAGM. All of these levels fall within EPA's acceptable risk range. Groundwater cleanup goals will be the more stringent of the state or federal promulgated standards. The cleanup goals were utilized as benchmarks in the technology screening, alternative development and screening, and detailed evaluation of cleanup alternatives presented in the FS report. The constituents of concern for the Site are listed in Table 19.

DESCRIPTION OF ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1) mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA

§121(d), 42 U.S.C. §9621(d) further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives considered for addressing the contamination associated with the Site can be found in the FS report. As the groundwater contamination is limited to a small area under the waste piles, and institutional controls would prevent the use of groundwater under the Site, remedial alternatives do not address treatment of groundwater.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction. This document presents a summary of the remedial alternatives that were evaluated. The alternatives are described below.

REMEDIAL ALTERNATIVES

Alternative 1: No Action

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with other alternatives. Under this alternative, no action would be taken to contain wastes, reduce infiltration into the landfill, eliminate areas of exposed waste, or control and treat leachate discharging from the landfill or address groundwater. Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the Site conditions be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Capital Cost:	$0
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

Alternative 2: Institutional Controls

This alternative would consist of environmental easements and/or restrictive covenants that would be designed to prevent direct contact with the waste/fill material by limiting future Site use. The environmental easements and/or restrictive covenants would also be designed to prevent groundwater use on the Site for drinking water or potable purposes.

Institutional controls for the waste fill would include access restrictions via fencing and/or appropriate signage to prevent the entry of trespassers onto the area of the Site that contains the waste fill piles; maintenance of the existing vegetative cover; and a Soil/Fill Management Plan to provide guidance for handling soil/fill from this area during future Site industrial use (*e.g.*, personal protective equipment requirements during underground utilities construction, methods for disposing of soil/fill removed from excavation, etc.). Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the Site conditions be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Capital Cost:	$153,000
Annual Operation and Maintenance Cost:	$15,500
Present-Worth Cost:	$392,000
Construction Time:	2 months

Alternative 3: Containment/Isolation With Soil Cover Enhancement

This alternative would involve minor regrading of the waste fill piles followed by placement of 6 to 12 inches of topsoil. A suitable seed mix would be spread and raked into the soil to provide for final vegetative cover following cover soil placement. Some reworking of the fill piles would be necessary to ensure uniform coverage. The total base area covered by the waste fill piles is approximately 7 acres.

Site conditions would be reviewed at least once every five years as per CERCLA, because this alternative would result in contaminants remaining on-site above health-based levels.

Capital Cost:	$577,000
Annual Operation and Maintenance Cost:	$14,500
Present-Worth Cost:	$800,000
Construction Time:	5 months

Alternative 4: Consolidation/Containment With Low-Permeability Soil (Part 360-Equivalent) Cover

This alternative would include the environmental easement and/or restrictive covenants described in Alternative 2 above. This Alternative would involve clearing and grubbing a consolidation area in the vicinity of the waste fill piles; consolidating the smaller, outlying waste fill piles with the larger piles to create an approximate 7-acre or less consolidated waste/fill area. See Figure 7 for a map indicating the consolidation area.

The waste piles to be consolidated will be removed to native soil. Results of subsurface data indicate that metal COPCs have not migrated substantially in native soil below the bottom of the waste fill piles. The consolidated waste fill would be graded to promote surface water drainage, and capped with a low permeability soil cover, *i.e.*, consistent with 6 New York Code Rules Regulations Part 360. The cap would consist of the following components:

- 6-12 inches topsoil, and
- 18-24 inches low permeability soil

The Site conditions would be reviewed at least once every five years as per CERCLA, because this alternative would result in contaminants remaining on-site above health-based levels.

Capital Cost:	$1M
Annual Operation and Maintenance Cost:	$15,000
Present-Worth Cost:	$1.3 M
Construction Time:	7months

Alternative 5: Excavation/Off-Site Disposal

This alternative would involve excavation of a total of approximately 48,000 tons of waste/fill material from the waste piles with transport of excavated materials to a permitted, off-site disposal facility for treatment and/or disposal. Where necessary, the areas would then be backfilled with clean soil to match the surrounding grade, covered with topsoil, and seeded to promote vegetative growth. On-site dewatering of the sludge fill and/or admixing with drier soils would be required during removal of saturated materials in order to eliminate free liquid. The estimated amount of material requiring disposal is 60,000 tons, assuming admixing was employed at a rate of approximately one ton dry soil to two tons of sludge fill material.

Since the waste would be removed, the waste piles will no longer be acting as a source of contamination to the groundwater and would no longer present potential health and environmental impacts.

Capital Cost:	$4.8 M
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$4.8
Construction Time:	6 months

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA Section 121, 42 U.S.C. §9621 by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 C.F.R. §300.430(e)(9), and Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-01 (*Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA: Interim Final*, October 1988). The detailed analysis consisted of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

Threshold Criteria - *The first two criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.*

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements or other federal and state environmental statutes and regulations or provide grounds for invoking a waiver. Other federal or state advisories, criteria, or guidance are TBCs. TBCs are not required by the NCP, but the NCP recognizes that they may be very useful in determining what is protective of a site or how to carry out certain actions or requirements.

Primary Balancing Criteria - *The next five criteria (3-7) are known as "primary balancing criteria." These criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given the site-specific data and conditions.*

3. *Long-Term effectiveness and permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume through treatment* is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6. *Implementability* is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. *Cost* includes estimated capital, O&M, and net present-worth costs.

Modifying Criteria - *The final two evaluation criteria (8 and 9) are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred remedy and cause another response measure to be considered.*

8. *State acceptance* indicates whether, based on its review of the RI/FS report, RI/FS report addendum, and Proposed Plan, the State concurs with, opposes, or has no comments on the Selected Remedy.

9. *Community acceptance* refers to the public's general response to the alternatives described in the RI/FS report, RI/FS report addendum, and Proposed Plan.

A comparative analysis of these alternatives based upon the evaluation criteria noted above, follows.

Overall Protection of Human Health and the Environment

Alternative 1 (no action) and Alternative 2 (institutional controls) would not be protective of human health and the environment because they would not minimize infiltration and groundwater flow into the waste/fill material, thereby allowing further leaching of contaminants into the aquifer. Alternative 2, would prevent direct contact with the waste/fill piles; but would do not protect terrestrial mammals from soil contamination.

Alternatives 3 and 4 would provide good overall protection of human health and the environment by containing waste with a landfill cap and controlling landfill gas through venting. Alternative 4 would be more protective than Alternative 3 because it requires a thicker cap of low permeability material to reduce infiltration, thereby reducing the generation of leachate which would mobilize contaminants into the groundwater. Alternative 5 would be the most protective because it would permanently remove the source of contamination to the groundwater and would prevent future direct contact with the waste.

Compliance with ARARs

There are currently no federal or state promulgated chemical-specific ARARs for contaminant levels in soils. ARARs include 6 NYCRR Part 360 requirements for closure and post-closure of municipal landfills, which apply to Alternatives 3 and 4. The Part 360 regulations require that the landfill cap promote runoff, minimize infiltration, and maintain vegetative growth for slope stability. Unlike Alternative 3, Alternative 4 would include an equivalent cap design as specified in 6 NYCRR Part 360. Alternative 5 would be subject to New York State and federal regulations related to the transportation and off-site treatment/disposal of wastes. The potentially applicable ARARs and TBCs for the Site are shown in Table 20.

Long-Term Effectiveness and Permanence

Alternatives 1 and 2 would involve no active remedial measures and, therefore, would not be effective in eliminating potential exposure to contaminants in soil or groundwater. These alternatives would allow the continued migration of contaminants from the soil to the groundwater.

A landfill cap is considered a reliable remedial measure that, when properly designed and installed, provides a high level of protection. Of the two cap alternatives considered in detail, Alternative 3 would be less reliable in protecting human health and the environment than Alternative 4 because it allows more precipitation to infiltrate through the waste piles which would result in a greater degree of leaching of contaminants to groundwater. Post-closure operation and maintenance requirements would ensure the continued effectiveness of the landfill cap. Alternatives 3 and 4 also provide for effective long-term management measures through groundwater monitoring.

Alternative 5 would be the most effective alternative over the long term, as the removal of the contaminated material eliminates the possibility of leaching of contaminants to groundwater.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 1 and 2 would provide no reduction in toxicity, mobility or volume. Compared to Alternative 3, Alternative 4 would provide greater reduction in the mobility of contaminants by restricting infiltration through a thicker low permeability landfill cap, which would reduce the further leaching of contaminants to groundwater.

Alternative 5 would reduce the mobility of waste in the waste/fill piles. However, admixing the sludge fill with drier soils in order to meet landfill acceptance criteria would increase the volume of sludge fill requiring disposal.

Short-Term Effectiveness

Alternatives 1 and 2 do not include any physical construction measures in any areas of contamination and, therefore, would not present any potential adverse impacts on property workers or the community as a result of its implementation.

There are short-term risks associated with Alternatives 3 and 4. These alternatives include caps, which would involve clearing, grubbing, and regrading of the waste piles. Alternative 4 would present a somewhat greater short-term risk than Alternative 3 since it would require excavation and consolidation of the waste piles which would result in greater generation of dust and noise than Alternative 3. This risk would be minimized by the use of personal protective equipment and dust suppression techniques. Alternative 4 would be more effective in the short-term than Alternative 3 because it would limit leachate production to a greater extent than Alternative 3. All three action alternatives (Alternatives 3, 4 and 5) can be accomplished in about the same time frame, namely five to seven months.

There would be short-term risks and the possibility of disruption of the community associated with Alternative 5. These include: an increase in traffic flow along local roads for an approximately six-month period; noise from heavy equipment use; and strong odors. This traffic would raise dust and increase noise levels locally. However, proper construction techniques and operational procedures would minimize these impacts. Short-term risks to workers could be increased to the extent that surficial wastes are encountered during excavation activities, but this risk would be minimized through the use of personal protection equipment.

Once the surface of the waste/fill is consolidated and is completely covered or removed, these short-term impacts to the community, workers, and the environment would no longer be present.

Implementability

Alternatives 1 and 2 would be the easiest soil alternatives to implement, as there are no active remedial measures to undertake. Alternatives 3 and 4 can be readily implemented from an engineering standpoint and utilize commercially available products and accessible technology.

Alternative 5 would pose several implementability issues including truck traffic coordination through the residential neighborhood and the City, as well as odor. These issues could be addressed through appropriate mitigative measures.

Cost

The estimated capital, operation, maintenance, and monitoring (O&M), and 30-Year present-worth costs for each of the alternatives are presented below. The annual O&M costs for Alternatives 2, 3, 4, and 5 would include groundwater monitoring.

Alternative	Capital	Annual O&M	Total Present Worth
1	$0	$0	$0
2	$153,000	$15,500	$392,000
3	$577,000	$14,500	$800,000
4	$1,000,000	$15,000	$1,300,000
5	$4,800,000	$0	$4,800,000

Alternative 5, excavation, has the highest cost of any alternative with a capital cost of $4.8 million. Of the two containment alternatives, Alternative 3 has the lower capital and O & M costs, resulting in a net present worth of $800,000 because it uses less cover and minimal fill. Alternative 4 has a higher cost, with a net present worth of $1,300,000.

State Acceptance

NYSDEC concurs with the Selected Remedy.

Community Acceptance

During the public comment period, the community expressed its support for the Selected Remedy. These comments are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430 (a)(1)(iii)(A)). Identifying principal threat wastes combines concepts of both hazard and risk. The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur.

Consistent with OSWER Directive 9380.8-06FS (dated November 1991), EPA compared the results of the risk assessment to the risk level of 10^{-3} (one in a thousand) identified with principal threat waste where treatment alternatives are recommended. The risk levels found at the Site were below

the level of 10^{-3} where treatment is recommended. The materials located in the waste/fill piles are non-mobile contaminated source materials of low to moderate toxicity and, therefore, can be classified as non-principal threat wastes.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the results of the Site investigation, the requirements of CERCLA, the detailed analysis of the response measure, and public comments, EPA and the New York State of Environmental Conservation have determined that Alternative 4 (Consolidation/Containment with Low Permeability Soil (Part 360-equivalent) Cover and Institutional Controls) to be the preferred remedy for the Site.

The Selected Remedy would provide the most cost-effective solution applying the evaluation criteria given reasonably anticipated future land use of the Site. Waste piles moved during consolidation would be removed to native soil. Removal to this depth would insure that any remaining contaminants will be within background concentrations. Results of subsurface soil samples taken below the waste piles indicate that metal COPCs have not migrated substantially in native soil below the bottom of the waste fill piles.

Capping would prevent direct contact and reduce infiltration, thereby reducing the generation of leachate which mobilizes contaminants into the groundwater. EPA is not proposing an active groundwater remedy because of limited groundwater contamination underlying the waste piles at the Site and the fact that the contaminated groundwater is not currently used as a drinking water source. Instead, institutional controls would be required to prevent the use of groundwater at the Site.

Given these factors, the selected alternative provides the best balance of trade-offs among alternatives with respect to the evaluating criteria. EPA and NYSDEC believe that the selected alternative would be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and treatment technologies to the maximum extent practicable.

Description of the Selected Remedy

The major components of the Selected Remedy include the following

- Consolidating the waste/fill piles into 7 acres or less, then capping the consolidated wastes with a low permeability soil cover, consistent with the requirements of 6 NYCRR Part 360, including seeding with a mixture to foster natural habitat. Waste piles moved during consolidation will be removed to native soil. Removal to this depth will insure that any remaining contaminants will be within background concentrations.

- Imposing institutional controls in the form of an environmental easement/restrictive covenant filed in the property records of Cattaraugus County that will at a minimum require: (a) restricting activities on the Site that could compromise the integrity of the cap; and (b) restricting the use of groundwater as a source of potable or process water unless groundwater quality standards are met.

- Developing a site management plan that provides for the proper management of all Site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of groundwater to ensure that, following the soil consolidation and capping, the contamination is attenuating and groundwater quality continues to improve; (b) an inventory of any use restrictions on the Site; (c) necessary provisions for ensuring the easement/covenant remains in place and is effective; (d) provision for any operation and maintenance required of the components of the remedy; and (e) the owner/operator or entity responsible for maintenance of the Site to complete and submit periodic certifications concerning the status of the institutional and engineering controls for the Site.

- Evaluating Site conditions at least once every five years to ensure that the remedy continues to protect public health and the environment.

Summary of the Estimated Remedy Costs

The estimated present-worth cost is $1,300,000. This includes an estimated O&M cost of $15,000 for 30 years. Detailed cost estimates for the Selected Remedy can be found in Table 21. The information in the cost estimate summary table is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Difference, or a ROD amendment. This cost estimate is an order-of-magnitude engineering cost estimate that is expected to be within +50% to -30% of the actual project cost.

Expected Outcomes of the Selected Remedy

The results of the risk assessment indicate that the Site, if not remediated, may present an unacceptable risk to the future industrial and construction workers from groundwater ingestion of groundwater and dermal contact with groundwater at the Site, respectively.

The Selected Remedy will allow the following potential land and groundwater use:

Land Use

The Site is currently zoned for industrial use and has been used for this purpose since it was operated for purposes of waste disposal. The remedial action goals considered potential industrial use of the

Site. Implementation of the remedy will eliminate potential risks associated with exposure to contaminated groundwater. Although soil was not a risk driver for the Site, exposure to contaminated soil will be controlled through consolidation of the waste, followed by containment and institutional controls. Once implemented, the remedy will help restore the property to beneficial use.

Groundwater Use

Under the Selected Remedy, the excavation and containment of contaminated soil will reduce the source of groundwater contamination at the Site. Institutional controls will be established to ensure that groundwater at the Site is not utilized as a source of potable water unless maximum contaminant levels are attained.

STATUTORY DETERMINATIONS

As previously noted, Section 121(b)(1) of CERCLA mandates that a remedial action must be protective of human health and the environment, be cost effective, and utilize permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at the Site. Section 121(d) of CERCLA further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to section 121(d)(4) of CERCLA. As discussed below, EPA has determined that the Selected Remedy meets the requirements of Section 121 of CERCLA.

Protection of Human Health and the Environment

The Selected Remedy, Alternative 4, will adequately protect human health and the environment through the containment of Site contaminants in soil via the low permeability soil cover, and from Site groundwater via the implementation of institutional controls.

Compliance with ARARs and Other Environmental Criteria and other Criteria Advisories or Guidance (TBCs)

While there are no federal or New York State soil ARARs, one of the remedial action goals is to meet NYSDEC soil cleanup levels as TBCs. A summary of potential ARARs, as well as TBCs, which will be complied with during implementation of the Selected Remedy is presented in Table 20. At the completion of the response action, the remedy will have complied with appropriate ARARs.

Cost-Effectiveness

EPA has determined that the Selected Remedy is cost effective in mitigating the risks posed by contaminated soil and groundwater. Section 300.430(f)(ii)(D) of the NCP requires evaluation of cost

effectiveness. Overall effectiveness is determined by the following three balancing criteria: long-term effectiveness and permanence; reduction of toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness is then compared to cost to ensure that the remedy is cost effective. The Selected Remedy meets the criteria and provides for overall effectiveness in proportion to its cost. The estimated present worth of the Selected Remedy is $1,300,000. See Table 21 for a detailed cost estimate for Alternative 4, the selected Remedy.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

EPA has determined that the Selected Remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable, and provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and considering State and community acceptance.

Although the Selected Remedy does not remove the waste piles and contaminated soil, capping would prevent direct contact with Site contaminants and reduce infiltration. Institutional controls will prevent the use of groundwater at the Site.

Preference for Treatment as a Principal Element

The statutory preference for remedies employing treatment as a principal element would not be applicable for the waste piles themselves because the waste does not meet the risk-based criteria for principal threat waste, and treatment of the waste is neither practicable nor cost-effective when compared to the other protective remedies. The exact location of any hazardous waste that may have been disposed in the waste piles is unknown. Therefore, the entire landfill volume, approximately 60,000 tons, would require excavation and removal in order to effectively treat the waste. Odor controls would be required during the removal work due to strong odors expected during waste fill excavation, handling and transport. Odor controls would be of limited effectiveness, however, for such an excavation. The excavation of such a large volume of waste would provide an overall level of protection comparable to the Selected Remedy, but at a significantly higher cost. Furthermore, *in-situ* treatment of waste is technically impractical because no discrete areas, contaminated by high level of an identifiable waste type which represented a principal threat to public health or the environment, were located within the waste piles.

EPA is not proposing groundwater treatment because of limited groundwater contamination underlying the waste piles at the Site. Instead, institutional controls will be a more cost effective measure to prevent the use of groundwater at the Site and groundwater monitoring will be implemented to confirm the gradual improvement of groundwater quality.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be

conducted at least every five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Site was released for public comment on August 11, 2006 and the public comment period ran through September 9, 2006. The Proposed Plan identified Alternative 4, Consolidation/Containment with a Low-Permeability Soil (Part 360-Equivalent) Cover and Institutional Controls as the preferred remedy to address the soil and groundwater, respectively. Based upon its review of the written and oral comments submitted during the public comment period, EPA determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: NOV 21 2006

SUBJECT: Record of Decision for the Peter Cooper Markhams Superfund Site

FROM: John E. La Padula, P.E., Chief
New York Remediation Branch

TO: George Pavlou, Director
Emergency and Remedial Response Division

Attached for your approval is the Record of Decision (ROD) for the Peter Cooper Markhams Superfund Site, located in the Town of Dayton, Cattaraugus County, New York.

The ROD calls for consolidating the waste/fill piles into 7 acres or less, then capping the consolidated wastes with a low permeability soil cover, consistent with the requirements of 6 NYCRR Part 360, including seeding with a mixture to foster natural habitat and institutional controls.

The estimated present-worth cost of the remedy is $1.3 million.

The public comment period ran from August 11, 2006 to September 9, 2006. A public meeting to discuss the preferred remedy was held on August 22, 2006. On the basis of comments received during the public comment period, the public generally supports the proposed remedy. Responses to the written comments that were received during the public comment period and to comments received at the public meeting are included in the Responsiveness Summary (see Appendix V).

The ROD has been reviewed by the New York State Department of Environmental Conservation, the New York State Department of Health, and the appropriate program offices within Region II. All comment received are reflected in this document.

If you have questions or comments on this document, I am available to discuss them at your convenience.

Attachment

C:\transmittal ROD memo.wpd

SYMBOL -->	WNYRS	WNYRS	NYRB	ORC	ORC	ERRD	ERRD
SURNAME >	HENRY	LYNCH	LAPADULA	SHANNAHAN	LIEBER	FRISCO	PAVLOU
DATE ----->	9/27/06	9/25/06	9/29	See attached concurrence	9/29	11/21/06	

Concurred 11/21/06

500037

PETER COOPER LANDFILL SUPERFUND SITE
ROD

APPENDIX I

FIGURES

SUMMARY OF FIGURES

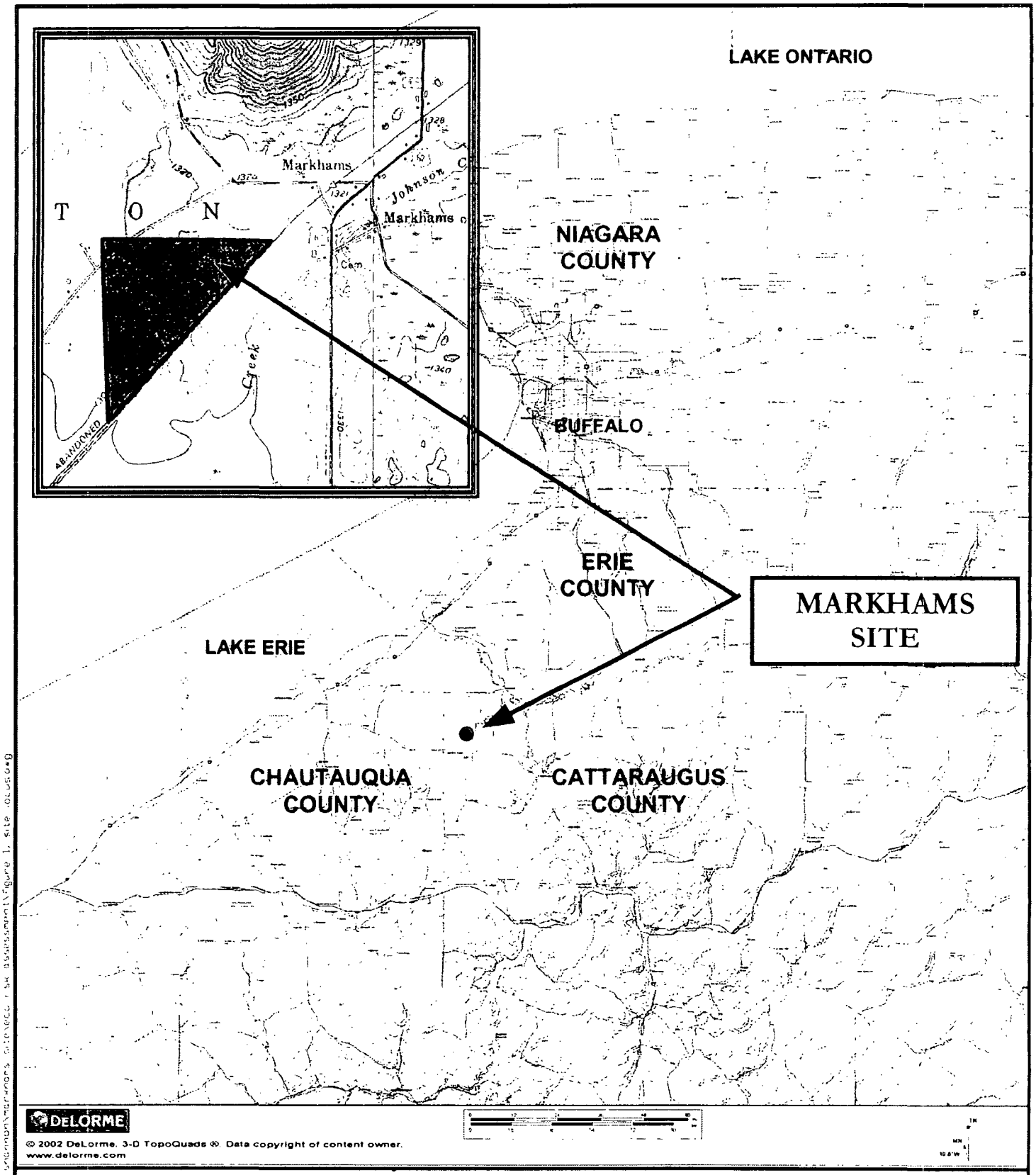


FIGURE 1
SITE LOCATION MAP

PETER COOPER MARKHAMS SITE
DAYTON, NEW YORK

500040

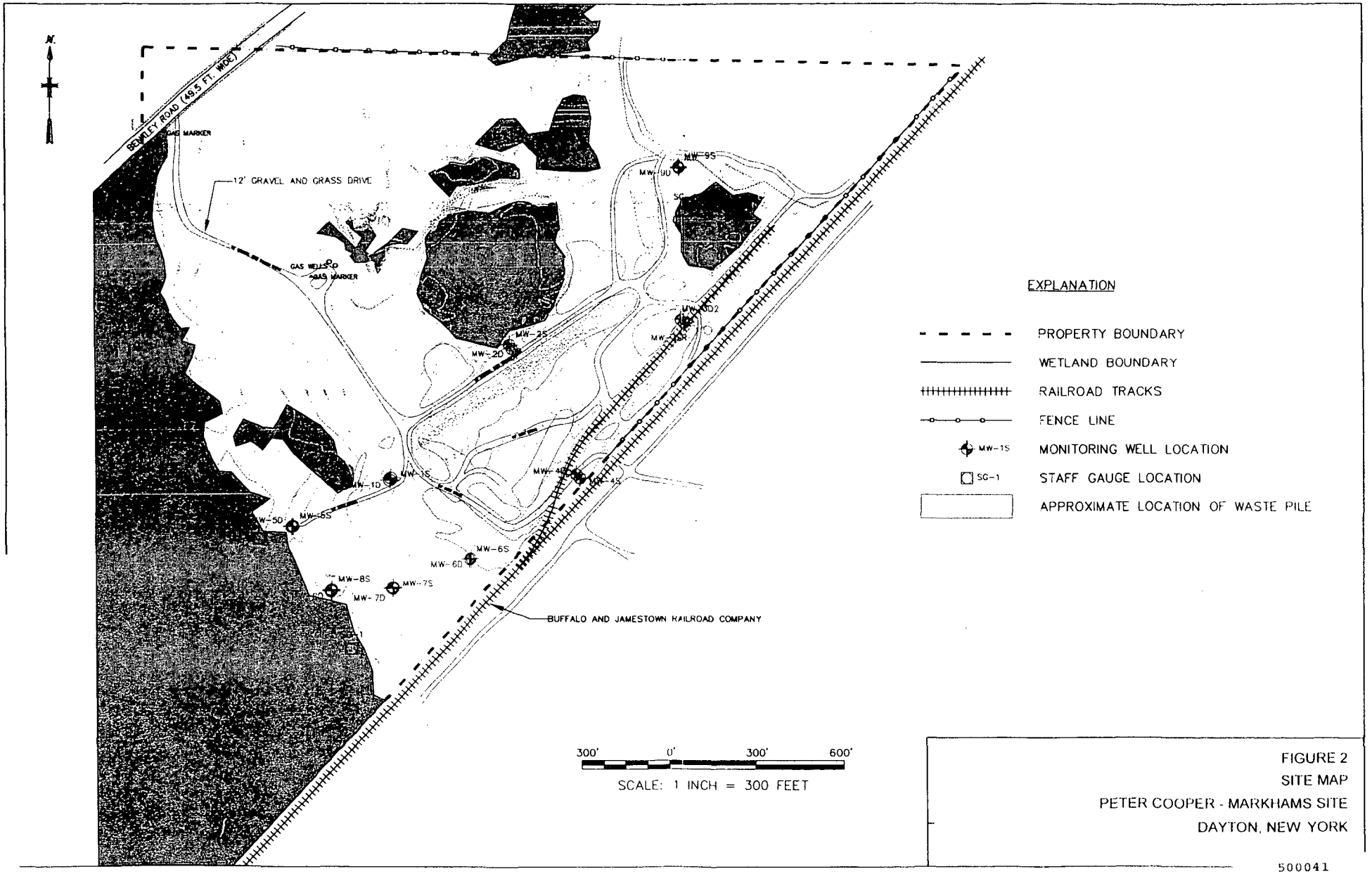


FIGURE 2
SITE MAP
PETER COOPER - MARKHAMS SITE
DAYTON, NEW YORK

500041

DATE: FEBRUARY 2002

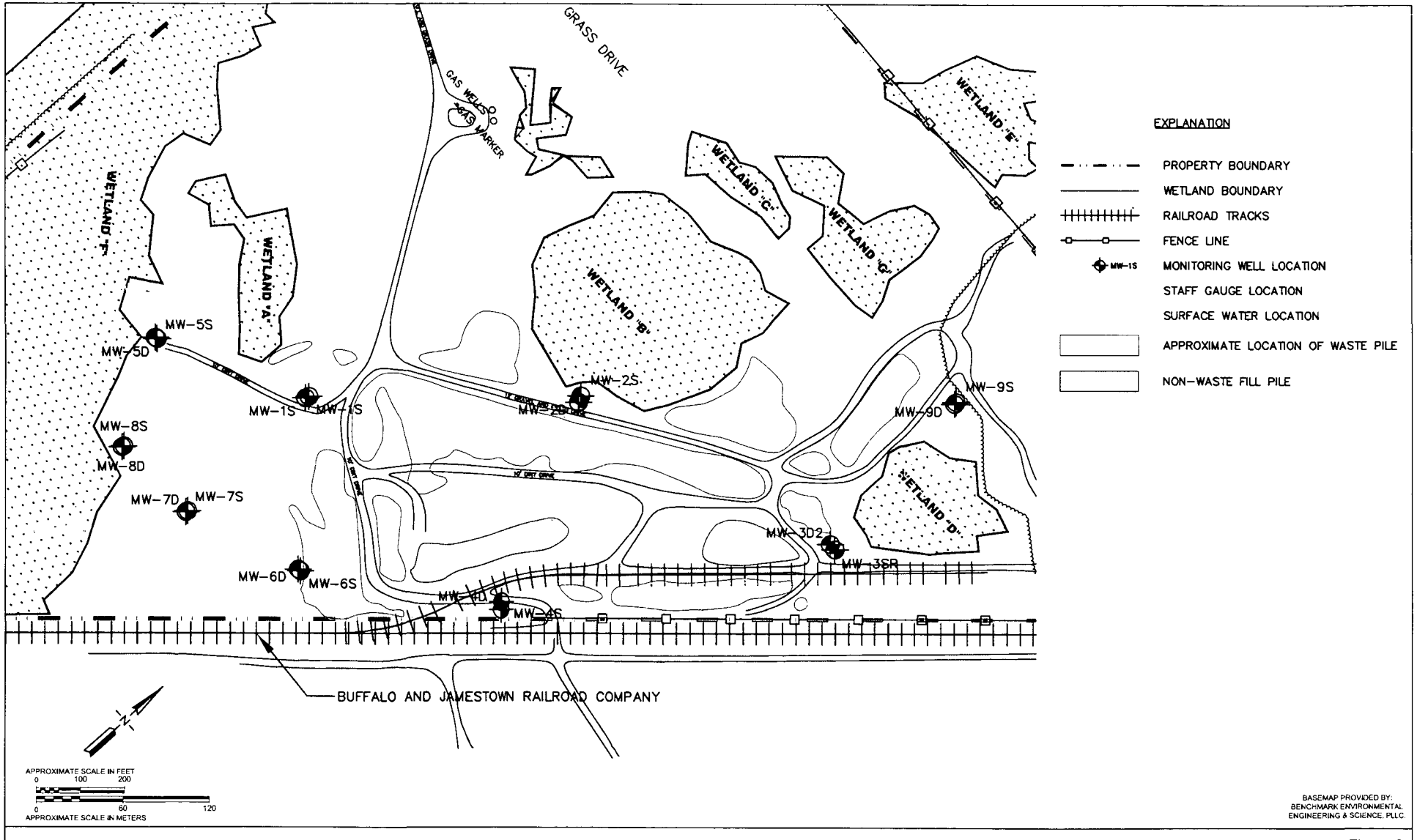


Figure 3
Monitoring Well, Staff Gauge, and Surface Water Locations
Peter Cooper Markhams Site
Dayton, New York

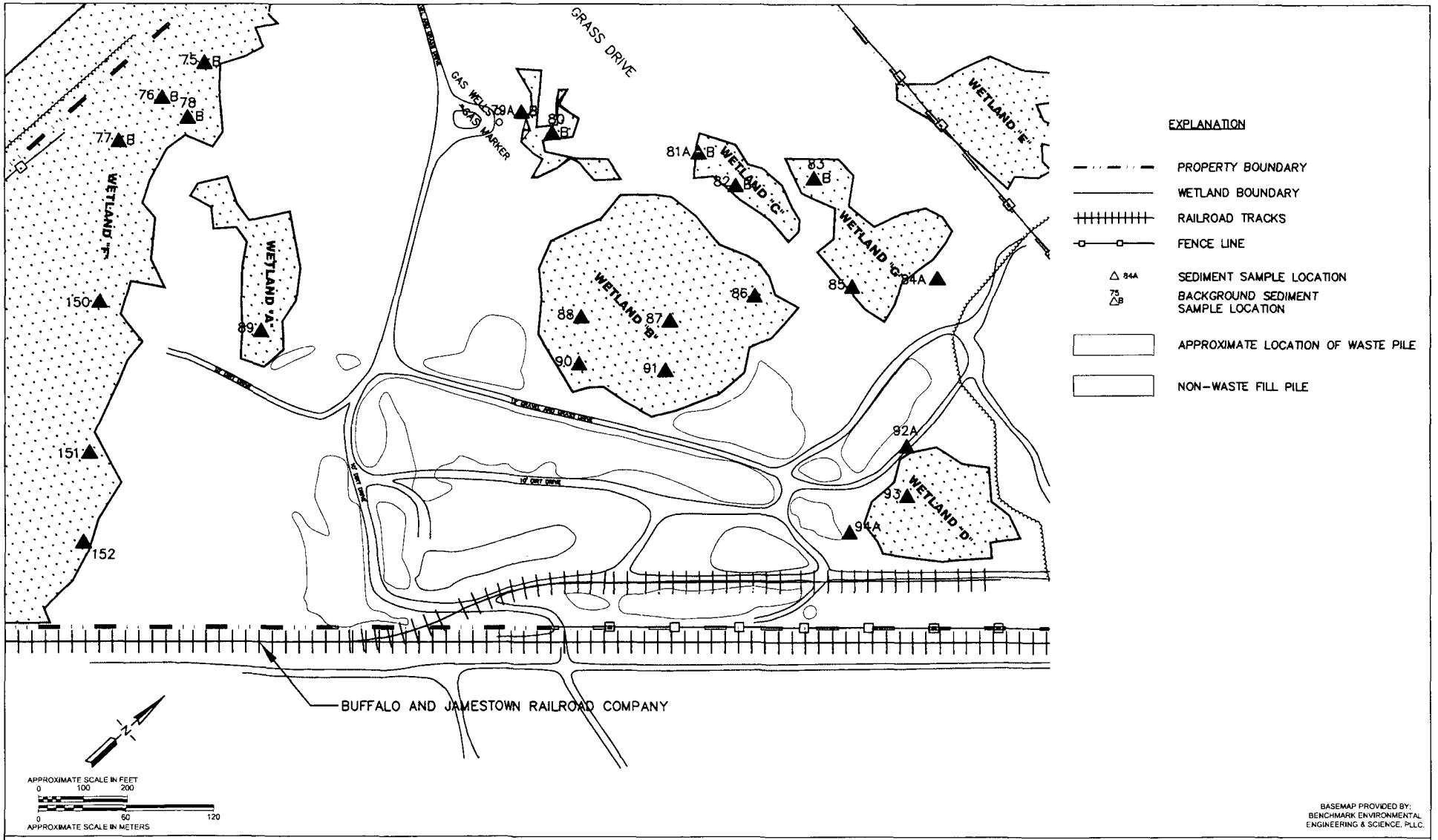


Figure 4
Sediment and Background Sediment Sample Locations
Peter Cooper Markhams Site
Dayton, New York

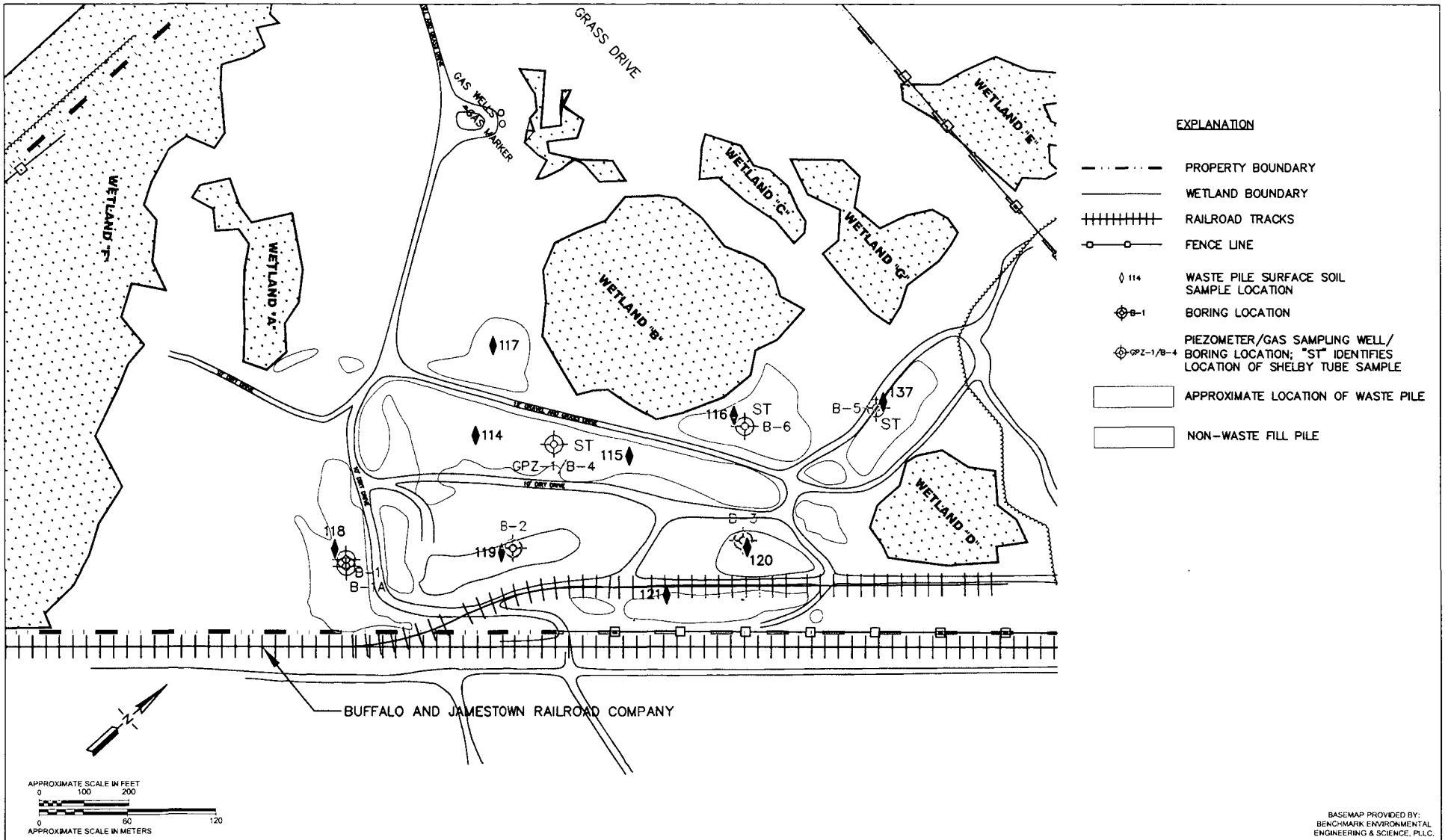


Figure 5
Surface and Subsurface Soil Waste Fill Pile Sample Locations
Peter Cooper Markhams Site
Dayton, New York

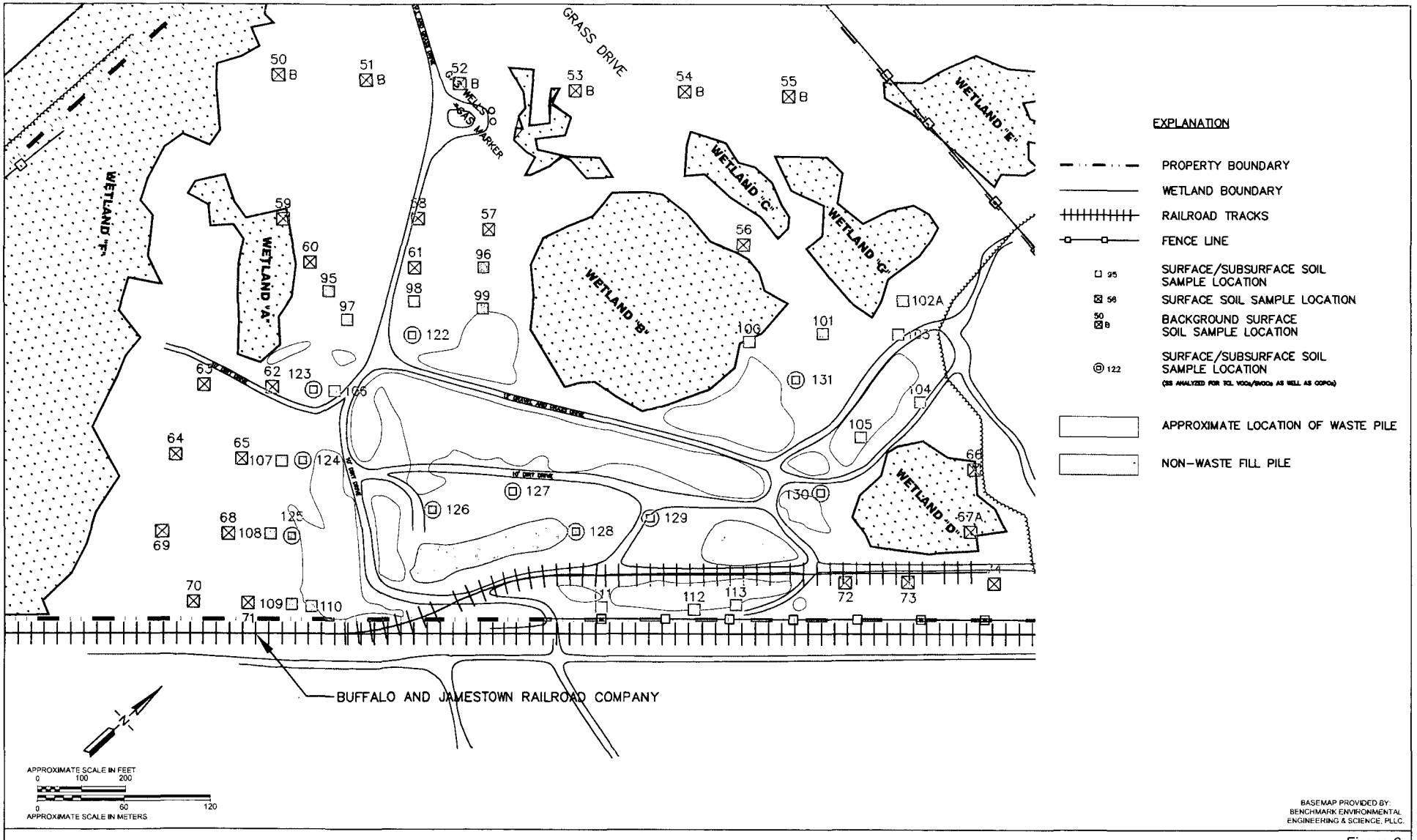
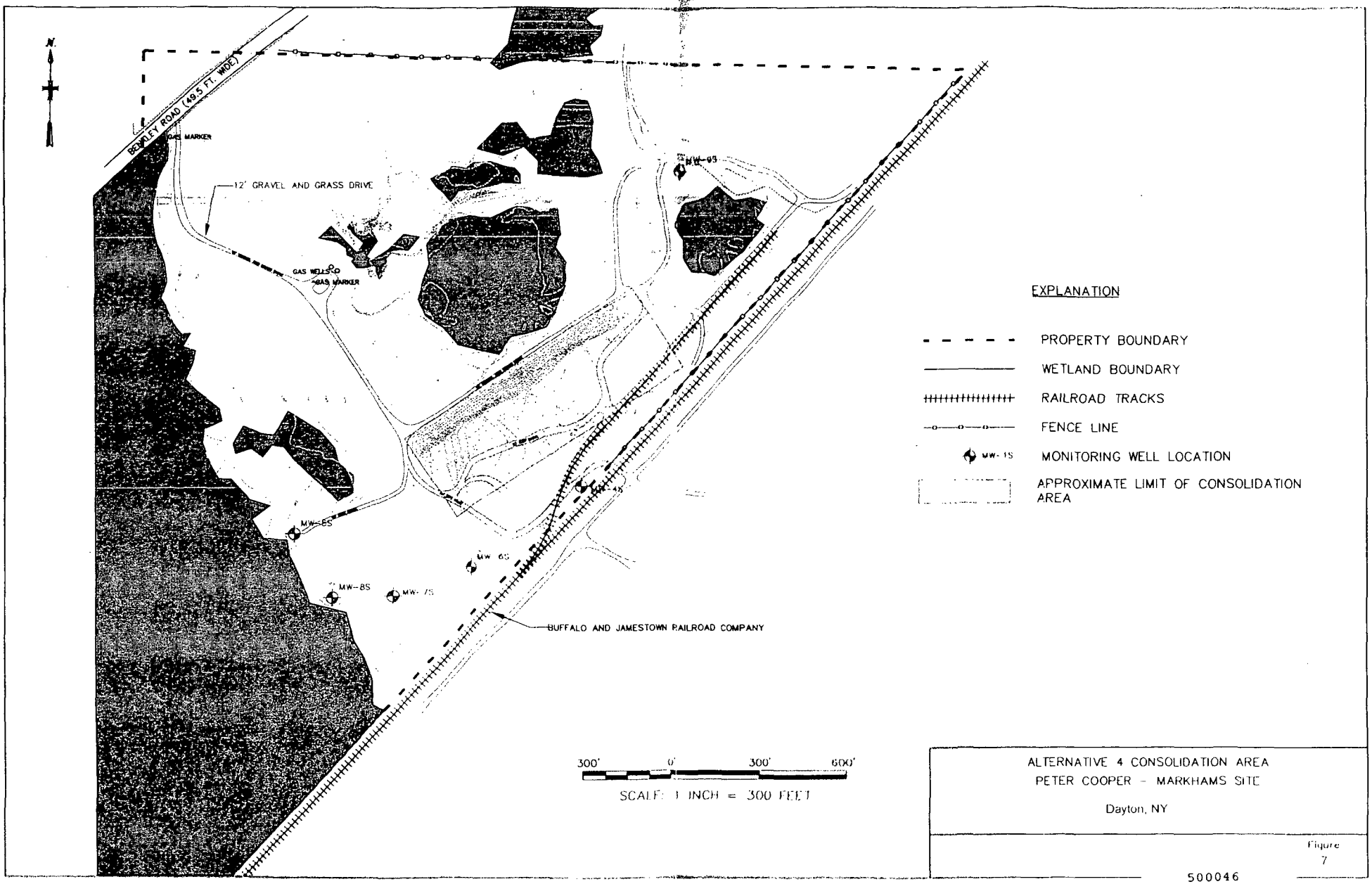


Figure 6
Perimeter and Background Surface and Subsurface Soil Sample Locations
Peter Cooper Markhams Site
Dayton, New York

500045



ALTERNATIVE 4 CONSOLIDATION AREA
PETER COOPER - MARKHAMS SITE
Dayton, NY

Figure
7

500046

PETER COOPER LANDFILL SUPERFUND SITE
ROD

APPENDIX II

TABLES

SUMMARY OF TABLES

Table 1a

ANALYTICAL RESULTS FROM SHALLOW OVERBURDEN GROUNDWATER SAMPLES

Peter Cooper Markhams Site
Dayton, New York

	Groundwater Criteria[2]		Sample Location, Sample Identification 8, and Date Collected[1]															
			MW-1S		MW-2S		MW-3SR		MW-4S		MW-5S		MW-6S		MW-7S		MW-8S		MW-9S	
			110701171	042302196	110701170	042302193	110601161	042202190	dry	042402202	110701168	042502209	110801181	042402208	110801178	042402205	110601165	042302198	110501158	042202187
Constituent[2]	TOG	PRG	11/7/2001	4/23/2002	11/7/2001	4/23/2002	11/6/2001	4/22/2002	11/5/2001	4/24/2002	11/7/2001	4/25/2002	11/8/2001	4/24/2002	11/8/2001	4/24/2002	11/6/2001	4/23/2002	11/5/2001	4/22/2002
Volatile Organic Compounds, micrograms per liter																				
Acetone	50*	610	10 U	5 UJ	NA	21 J	10 U	5 UJ	NA	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ
Benzene	1	0.34	10 U	0.22 J	NA	[redacted]	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Bromodichloromethane	50*	0.18	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Bromoform	50*	8.5	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Bromomethane	--	8.7	10 U	1 U	NA	1 U	10 U	1 U	NA	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 U	10 U	1 U
2-Butanone (Methyl ethyl ketone)	50*	1900	10 U	5 UJ	NA	3.1 J	10 U	5 UJ	NA	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ
Carbon Disulfide	--	1000	10 U	1 U	NA	0.35 J	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	0.28 J	10 U	1 U	10 U	1 U
Carbon Tetrachloride	5	0.17	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Chlorobenzene	5	110	10 U	0.27 J	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Chloroethane	5	4.6	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Chloroform	7	6.2	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Chloromethane (Methyl chloride)	5	1.5	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Dibromochloromethane	50*	0.13	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,3-Dichlorobenzene	3	5.5	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,4-Dichlorobenzene	3	0.50	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,2-Dichlorobenzene	3	370	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,2-Dibromo-3-chloropropane	0.04	0.048	10 U	1 UJ	NA	1 UJ	10 U	1 UJ	NA	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ
Dichlorodifluoromethane	5	390	10 UJ	1 U	NA	1 U	10 UJ	1 U	NA	1 UJ	10 UJ	1 UJ	10 UJ	1 UJ	10 UJ	1 UJ	10 UJ	1 U	10 U	1 U
1,2-Dibromoethane (Ethylene dibromide)	0.0006	0.00076	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1-Dichloroethane	5	810	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,2-Dichloroethane	0.6	0.12	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1-Dichloroethene	5	340	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,2-Dichloropropane	1	0.16	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
cis-1,2-Dichloroethene	5	61	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	0.54 J	10 U	1 U
cis-1,3-Dichloropropene	0.4**	0.40	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
trans-1,3-Dichloropropene	0.4**	0.40	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
trans-1,2-Dichloroethene	5	120	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Ethylbenzene	5	2.9	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
2-Hexanone	50*	--	10 U	5 U	NA	5 U	10 U	5 U	NA	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U
Isopropylbenzene (Cumene)	5	660	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Methyl tertbutyl ether	--	13	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Methylene chloride	5	4.3	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
4-Methyl-2-pentanone (Methyl isobutyl ketone)	--	160	10 U	5 U	NA	5 U	10 U	5 U	NA	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U
Styrene	5	1600	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1,2,2-Tetrachloroethane	5	0.055	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Tetrachloroethene	5	0.66	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Toluene	5	720	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,2,4-Trichlorobenzene	5	190	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1,1-Trichloroethane	5	3200	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1,2-Trichloroethane	1	0.20	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Trichloroethene	5	0.028	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	[redacted]	[redacted]	10 U	1 U
Trichlorofluoromethane	5	1300	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	59000	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Vinyl chloride	2	0.020	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Total Xylenes (1,2-, 1,3-, and 1,4-Xylene)	5	210	10 U	3 U	NA	3 U	10 U	3 U	NA	3 U	10 U	3 U	10 U	3 U	10 U	3 U	10 U	3 U	10 U	3 U
Cyclohexane	--	35000	10 U	5 U	NA	5 U	10 U	5 U	NA	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U
Methyl acetate	--	6100	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Methylcyclohexane	--	5200	10 U	1 U	NA	1 U	10 U	1 U	NA	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Semi-Volatile Organic Compounds, micrograms per liter																				
Acenaphthene	20*	370	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Acenaphthylene	--	--	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Acetophenone	--	--	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Anthracene	50*	1800	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Atrazine	7.5	0.30	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Benzaldehyde	--	3600	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Benzo(a)anthracene	0.002*	0.092	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Benzo(b)fluoranthene	0.002*	0.092	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	[redacted]	10 U	10 U	NA
Benzo(k)fluoranthene	0.002*	0.92	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Benzo(ghi)perylene	--	--	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Benzo(a)pyrene	ND	0.0092	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Benzoic acid	--	150000	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Benzyl alcohol	--	11000	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Biphenyl (1,1'-Biphenyl)	5	300	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Bis(2-chloroethoxy)methane	5	--	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Bis(2-chloroethyl)ether	1.0	0.010	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2,2'-Oxybis(1-chloropropane) (Bis(2-chloro-1-methylethyl)ether)	5	0.27	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Bis(2-ethylhexyl) phthalate	5	4.8	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	[redacted]	NA	10 U	NA	10 U	10 U	10 U	NA

Table 1a

ANALYTICAL RESULTS FROM SHALLOW OVERBURDEN GROUNDWATER SAMPLES

Peter Cooper Markhams Site
Davison, New York

			Sample Location, Sample Identification #, and Date Collected [1]																	
	Groundwater Criteria [3]		MW-1S		MW-2S		MW-3SR		MW-4S		MW-5S		MW-6S		MW-7S		MW-8S		MW-9S	
			110701171	042302196	110701170	042302193	110601161	042202190	dry	042402202	110701168	042302209	110801181	042402208	110801178	042402205	110601165	042302198	110501150	042202187
Constituent [2]	TOG	PRG	11/7/2001	4/23/2002	11/7/2001	4/23/2002	11/6/2001	4/22/2002	11/5/2001	4/24/2002	11/7/2001	4/23/2002	11/8/2001	4/24/2002	11/8/2001	4/24/2002	11/6/2001	4/23/2002	11/5/2001	4/22/2002
4-Bromophenyl phenyl ether	--	--	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Butyl benzyl phthalate	50*	7300	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Caprolactam	--	18000	10 U	NA	NA	10 UJ	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 UJ	10 U	NA
Carbazole	--	3.4	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
4-Chloroaniline	5	150	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
4-Chloro-3-methylphenol	--	--	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2-Chloronaphthalene (beta-Chloronaphthalene)	10*	490	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2-Chlorophenol	--	30	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
4-Chlorophenyl phenyl ether	--	--	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Chrysene	0.002*	9.2	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Dibenzo(a,h)anthracene	--	0.0092	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Dibenzofuran	--	24	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Di-n-butyl phthalate (Dibutyl phthalate)	50	3600	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
1,2-Dichlorobenzene	3	370	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
1,3-Dichlorobenzene	3	5.5	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
1,4-Dichlorobenzene	3	0.50	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
3,3'-Dichlorobenzidine	5	0.15	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2,4-Dichlorophenol	5	110	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Diethyl phthalate	50*	29000	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2,4-Dimethylphenol	50*	730	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Dimethyl phthalate	50*	360000	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
4,6-Dinitro-2-methylphenol	--	--	25 U	NA	NA	25 U	25 U	NA	NA	NA	25 U	NA	25 U	NA	25 U	NA	25 U	25 U	25 U	NA
2,4-Dinitrophenol	10*	73	25 U	NA	NA	25 UJ	25 UJ	NA	NA	NA	25 U	NA	25 U	NA	25 U	NA	25 UJ	25 UJ	25 UJ	NA
2,4-Dinitrotoluene	5	73****	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2,6-Dinitrotoluene	5	36****	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Di-n-octyl phthalate	50*	1500	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Fluoranthene	50*	1500	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	0.6 J	10 U	10 U	NA
Fluorene	50*	240	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Hexachlorobenzene	0.04	0.042	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Hexachlorobutadiene	0.5	0.86	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Hexachlorocyclopentadiene	5	220	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Hexachloroethane	5	4.8	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Indeno(1,2,3-cd)pyrene	0.002*	0.092	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Isophorone	50*	71	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2-Methylnaphthalene	--	--	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2-Methylphenol	--	1800	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
4-Methylphenol	--	180	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Naphthalene	10*	6.2	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2-Nitroaniline	5	1.0	25 U	NA	NA	25 U	25 U	NA	NA	NA	25 U	NA	25 U	NA	25 U	NA	25 U	25 U	25 U	NA
3-Nitroaniline	5	--	25 U	NA	NA	25 U	25 U	NA	NA	NA	25 U	NA	25 U	NA	25 U	NA	25 U	25 U	25 U	NA
4-Nitroaniline	5	--	25 U	NA	NA	25 UJ	25 U	NA	NA	NA	25 U	NA	25 U	NA	25 U	NA	25 U	25 U	25 U	NA
Nitrobenzene	0.4	3.4	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2-Nitrophenol	--	--	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
4-Nitrophenol	--	--	25 U	NA	NA	25 UJ	25 U	NA	NA	NA	25 U	NA	25 U	NA	25 U	NA	25 U	25 U	25 U	NA
N-nitrosodiphenylamine	50*	14	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
N-Nitroso-Di-n-propylamine	--	0.010	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Pentachlorophenol	1***	0.56	25 U	NA	NA	25 U	25 U	NA	NA	NA	25 U	NA	25 U	NA	25 U	NA	25 U	25 U	25 U	NA
Phenanthrene	50*	--	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Phenol	1***	22000	10 U	NA	NA	2 J [illegible]	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Pyrene	50*	180	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	0.5 J	10 U	10 U	NA
1,2,4-Trichlorobenzene	5	190	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
2,4,5-Trichlorophenol	--	3600	25 U	NA	NA	25 U	25 U	NA	NA	NA	25 U	NA	25 U	NA	25 U	NA	25 U	25 U	25 U	NA
2,4,6-Trichlorophenol	--	3.6	10 U	NA	NA	10 U	10 U	NA	NA	NA	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA
Total Metals, micrograms per liter																				
Aluminum	--	36000	200 U	NA	[illegible] 36400 J	536	654	NA	NA	NA	200 U	NA	499	NA	382	NA	200 U	NA	200 U	NA
Antimony	3	15	60.0 U	NA	[illegible] 72.6 J	60.0 U	60.0 U	NA	NA	NA	60.0 U	NA	60.0 U	NA	60.0 U	NA	60.0 U	NA	60.0 U	NA
Arsenic	25	0.045	10.0 U	10 U	[illegible] 133 J	10.0 U	10.0 U	10 U	NA	10 U	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U
Barium	1000	2600	200 U	NA	517 J	200 U	200 U	NA	NA	NA	200 U	NA	200 U	NA	200 U	NA	200 U	NA	200 U	NA
Beryllium	3*	73	5.0 U	NA	5.0 U	5.0 U	5.0 U	NA	NA	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA
Cadmium	5	18	5.0 U	NA	[illegible] 150 J	5.0 U	5.0 U	NA	NA	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA
Calcium	--	--	318000 J	NA	217000 J	26000	58300 J	NA	NA	NA	250000 J	NA	402000 J	NA	310000 J	NA	205000 J	NA	[illegible]	NA
Chromium	50	55000*	10.6	10 U	[illegible] 981	17.2	10.0 U	10 U	NA	10 U	10.0 U	10 U	18.8	18.3	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U
Cobalt	--	730	50.0 U	NA	251 J	50.0 U	50.0 U	NA	NA	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA
Copper	200	1500	25.0 U	NA	[illegible] 2220 J	25.0 U	25.0 U	NA	NA	NA	25.0 U	NA	25.0 U	NA	25.0 U	NA	25.0 U	NA	25.0 U	NA
Iron	300*	11000	[illegible] 11100 J	NA	[illegible] 31600 J	94300	827 J	NA	NA	NA	267 J	NA	1070 J	NA	[illegible] 11000 J	NA	218 J	NA	126 J	NA
Lead	25	15	10.7	NA	[illegible] 1020 J	29.1	3.0 U	NA	NA	NA	3.0 U	NA	9.7	NA	3.0 U	NA	3.0 U	NA	3.0 U	NA
Magnesium	35000*	--	[illegible] 42000	NA	39400 J	5000 U	9520	NA	NA	NA	36900	NA	96400	NA	75900	NA	[illegible]	NA	[illegible]	NA
Manganese	300*	880	[illegible] 15000	NA	9800 J	804	33.7 J	NA	NA	NA	210 J	NA	13500 J	NA	254 J	NA	4220 J	NA	15.1 J	NA
Nickel	100	730*	40.0 U	NA	2820 J	83.4	40.0 U	NA	NA	NA	40.0 U	NA	40.0 U	NA	40.0 U	NA	40.0 U	NA	40.0 U	NA
Potassium	--	--	5000 UJ	NA	9290 J	5000 U	5000 UJ	NA	NA	NA	5000 UJ	NA	5000 UJ	NA	5000 UJ	NA	5000 U	NA	5000 U	NA

Table 1a

ANALYTICAL RESULTS FROM SHALLOW OVERBURDEN GROUNDWATER SAMPLES

Peter Cooper Markhams Site
Dayton, New York

			Sample Location, Sample Identification #, and Date Collected [1]																	
	Groundwater Criteria [2]		MW-1S		MW-2S		MW-3SR		MW-4S		MW-5S		MW-6S		MW-7S		MW-8S		MW-9S	
Constituent [3]	TOG	PRG	110701171 11/7/2001	042302196 4/23/2002	110701170 11/7/2001	042302193 4/23/2002	110601161 11/6/2001	042202190 4/22/2002	dry 11/5/2001	042402202 4/24/2002	110701168 11/7/2001	042502209 4/25/2002	110801181 11/8/2001	042402208 4/24/2002	110801178 11/8/2001	042402205 4/24/2002	110601165 11/6/2001	042302198 4/23/2002	110501158 11/5/2001	042202187 4/22/2002
Selenium	10	180	5.0 U	NA	39.2 J	7.2	5.0 U	NA	NA	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA
Silver	50	180	10.0 U	NA	10.0 U	10 U	10.0 U	NA	NA	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA
Mercury	0.7	11	0.200 UJ	NA	0.200 U	0.2 U	0.200 UJ	NA	NA	NA	0.200 UJ	NA	0.200 UJ	NA	0.200 UJ	NA	0.200 UJ	NA	0.200 UJ	NA
Sodium	20000	--	3550	NA	8170 J	5000 U	6050	NA	NA	NA	7730	NA	5000 U	NA	27800	NA	7210	NA	11200	NA
Thallium	0.5*	2.4	10.0 U	NA	1300 J	13.5	10.0 U	NA	NA	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA
Vanadium	--	260	50.0 U	NA	50.0 U	50.0 U	50.0 U	NA	NA	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA
Zinc	2000*	11000	20.0 UJ	NA	146000 J	3090	20.0 UJ	NA	NA	NA	20.0 UJ	NA	36.1 N	NA	20.0 UJ	NA	20.0 UJ	NA	20.0 U	NA
Hexavalent Chromium, micrograms per liter																				
Total Hexavalent Chromium	50	110	10 UJ	10 UJ	10 UJ	56 UJ	14 UJ	10 UJ	NA	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Other Geochemical Parameters, milligrams per liter																				
Ammonia	2 (NH_3 + NH_4^+ as N)	--	2.8	2.0	NA	0.2	0.10 U	0.10 U	NA	0.33	0.10 U	0.10 U	2.9	0.24	0.10 U	0.10 U	0.57	0.34	0.10 U	0.10 U
Bicarbonate Alkalinity	--	--	409	NA	NA	NA	143 J	NA	NA	NA	435	NA	335	NA	446	NA	308	NA	131	NA
Carbonate Alkalinity	--	--	5.0 U	NA	NA	NA	5.0 U	NA	NA	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA
Nitrate	10 (as N)	10	12.4	8.0	NA	0.5 U	4.0	3.1	NA	32.5	3.7	2.8	42.3	50.9	0.50 U	0.5 U	32.8	14.6	2.9	9.3
Sulfate	250	--	602	616	NA	54.3	34.3	25.6	NA	768	309	159	1060	676	760	695	220	104	40.0	31.4
Sulfide	0.05* (as H_2S)	--	1.0 U	NA	NA	NA	1.0 U	NA	NA	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA
Total Dissolved Solids	--	--	1450	NA	NA	NA	185	NA	NA	NA	1080	NA	2100	NA	1480	NA	677	NA	232	NA
Total Organic Carbon	--	--	9.2	NA	NA	NA	1.0	NA	NA	NA	6.3	NA	15.7	NA	8.8	NA	7.3	NA	1.2	NA
Ferrous Iron	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.2	NA	0.10 U	NA	NA	NA
Field Measured Parameters																				
Temperature, °C	--	--	11.6	8.07	12.67	6.28	11.26	6.72	NA	8.33	10.9	7.14	9.99	9.41	10.17	8.77	10.8	7.6	10.97	6.02
pH, standard units	--	--	6.34	6.45	6.64	7.19	6.73	6.92	NA	6.42	6.75	6.81	6.45	6.61	6.7	6.8	6.53	6.9	7.49	7.36
Specific Conductivity, µS/cm	--	--	2620	1929	208	844	413	455	NA	1702	2065	822	4024	2428	3109	1959	1236	755	256	540
Dissolved Oxygen, mg/L	--	--	0.36	0.19	0.59	1.7	4.97	3.53	NA	0.61	2.42	0.07	0.35	0.06	0.55	0.04	0.26	0.1	2.84	8.41
Oxidation-Reduction Potential, mV	--	--	117	32.9	218.3	252.5	155.1	55.3	NA	22.3	119	67.3	34.5	13.9	150	169.6	28.9	4.6	197.8	1.8
Turbidity, NTU	--	--	1.91	10	110	262[4]	21	30	NA	15	7.69	2	2.4	0.2	29.1	12.4	11	17	31	11.2
Ferrous Iron, mg/L	--	--	6	8.6	NA	NA	0	0	NA	0.8	0	NA	0	0	6.8	7	0	0	0	0

Notes:

1. Sample locations provided on Plate 1
2. Data qualifications reflect 100% data validation performed by Data Validation Services
3. Groundwater criteria is from NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS), Ambient Water Quality Standards and Guidance Values for Groundwater (June 1998) and U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) for Tap Water (2004)
4. Turbidity was measured in the laboratory

µS/cm = microSiemens per centimeter
mg/L = milligrams per liter
mV = millivolts
NTU = Nephelometric Turbidity Unit
NA = not analyzed
ND means a non-detectable concentration by the approved analytical methods

-- indicates no criteria exists
* indicates a guidance value
** applies to the sum of cis- and trans-1,3-dichloropropene
*** applies to the sum of phenolic compounds (total phenols)
**** PRG for mixture of 2,4- and 2,6-dinitrotoluene is 0.197 mg/L
^ PRG for Chromium III (no PRG exists for Total Chromium)
^^ TOG for sum of Iron and Manganese is 500 ug/L
^^^ PRG for Nickel (soluble salts)

indicates exceedance of groundwater criteria or guidance value

ORGANIC DATA QUALIFIERS

U = compound was analyzed for, but not detected, reported with detection limit value
J = an estimated value, either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when a compound meets the identification criteria but the result is less than the quantitation limit

INORGANIC DATA QUALIFIERS

U = element was analyzed for, but not detected, reported with the detection limit
J or B = estimated value or value greater than or equal to the instrument detection limit, but less than the quantitation limit

Table 1b

ANALYTICAL RESULTS FROM DEEP OVERBURDEN GROUNDWATER SAMPLES

Peter Cooper Markhams Site
Dayton, New York

	Groundwater Criteria[1]		Sample Location, Sample Identification #, and Date Collected[1]																	
			MW-1D		MW-2D		MW-3D2		MW-4D		MW-5D		MW-6D		MW-7D		MW-8D		MW-9D	
			110701173	042302194	110601163	042302192	110601162	42202191	110501160	042402201	110701169	042602211	110801180	042402207	110801177	042402203	110601167	042302200	110501157	042202188
Constituent[2]	TOG	PRG	11/7/2001	4/23/2002	11/6/2001	4/23/2002	11/6/2001	4/22/2002	11/5/2001	4/24/2002	11/7/2001	4/26/2002	11/8/2001	4/24/2002	11/8/2001	4/24/2002	11/6/2001	4/23/2002	11/5/2001	4/22/2002
Volatile Organic Compounds, micrograms per liter																				
Acetone	50*	610	10 U	5 UJ	25	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	74	5 UJ	10 U	6.3 J	10 U	5 UJ
Benzene	1	0.34	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	0.32 J
Bromodichloromethane	50*	0.18	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Bromoform	50*	8.5	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Bromomethane	5	8.7	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 U	10 U	1 U
2-Butanone (Methyl ethyl ketone)	50*	1900	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ	10 U	5 UJ
Carbon Disulfide	--	1000	1.1 J	1 U	1.2 J	1 U	10 U	0.24 J	2.6 J	1.1	10 U	1 U	10 U	1 U	1.8 J	0.25 J	10 U	0.22 J	1.7 J	12
Carbon Tetrachloride	5	0.17	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Chlorobenzene	5	110	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Chloroethane	5	4.6	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Chloroform	7	6.2	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Chloromethane (Methyl chloride)	5	1.5	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Dibromochloromethane	50*	0.13	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,3-Dichlorobenzene	3	5.5	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,4-Dichlorobenzene	3	0.50	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,2-Dichlorobenzene	3	370	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,2-Dibromo-3-chloropropane	0.04	0.048	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ	10 U	1 UJ
Dichlorodifluoromethane	5	390	10 UJ	1 U	10 UJ	1 U	10 UJ	1 U	10 U	1 UJ	10 UJ	1 UJ	10 UJ	1 UJ	10 UJ	1 UJ	10 UJ	1 U	10 U	1 U
1,2-Dibromoethane (Ethylene dibromide)	0.0006	0.00076	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1-Dichloroethane	5	810	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,2-Dichloroethane	0.6	0.12	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1-Dichloroethene	5	340	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,2-Dichloropropane	1	0.16	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
cis-1,2-Dichloroethene	5	61	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
cis-1,3-Dichloropropene	0.4**	0.40	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
trans-1,3-Dichloropropene	0.4**	0.40	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
trans-1,2-Dichloroethene	5	120	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Ethylbenzene	5	2.9	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
2-Hexanone	50*	--	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U
Isopropylbenzene (Cumene)	5	660	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Methyl tertbutyl ether	--	13	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Methylene chloride	5	4.3	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
4-Methyl-2-pentanone (Methyl isobutyl ketone)	--	160	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U
Styrene	5	1600	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1,2,2-Tetrachloroethane	5	0.055	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Tetrachloroethene	5	0.66	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Toluene	5	720	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,2,4-Trichlorobenzene	5	190	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1,1-Trichloroethane	5	3200	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1,2-Trichloroethane	1	0.20	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Trichloroethene	5	0.028	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Trichlorofluoromethane	5	1300	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	59000	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Vinyl chloride	2	0.020	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Total Xylenes (1,2-, 1,3-, and 1,4-Xylene)	5	210	10 U	3 U	10 U	3 U	10 U	3 U	10 U	3 U	10 U	3 U	10 U	3 U	10 U	3 U	10 U	3 U	10 U	3 U
Cyclohexane	--	35000	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U
Methyl acetate	--	6100	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Methylcyclohexane	--	5200	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U
Semi-Volatile Organic Compounds, micrograms per liter																				
Acenaphthene	20*	370	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Acenaphthylene	--	--	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Acetophenone	--	--	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Anthracene	50*	1800	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Atrazine	7.5	0.30	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Benzaldehyde	--	3600	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Benzo(a)anthracene	0.002*	0.092	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Benzo(b)fluoranthene	0.002*	0.092	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Benzo(k)fluoranthene	0.002*	0.92	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Benzo(ghi)perylene	--	--	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Benzo(a)pyrene	ND	0.0092	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Benzoic acid	--	150000	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Benzyl alcohol	--	11000	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Biphenyl (1,1'-Biphenyl)	5	300	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Bis(2-chloroethoxy)methane	5	--	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Bis(2-chloroethyl)ether	1.0	0.010	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2,2'-Oxybis(1-chloropropane) (Bis(2-chloro-1-methylethyl)ether)	5	0.27	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Bis(2-ethylhexyl) phthalate	5	4.8	0.7 J	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	2 J	NA	2 J	NA	19	NA
4-Bromophenyl phenyl ether	--	--	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Butyl benzyl phthalate	50*	7300	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Caprolactam	--	18000	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Carbazole	--	3.4	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA

Table 1b

ANALYTICAL RESULTS FROM DEEP OVERBURDEN GROUNDWATER SAMPLES

Peter Cooper Markhams Site
Dayton, New York

	Groundwater Criteria[4]		Sample Location, Sample Identification #, and Date Collected[1]																			
			MW-1D		MW-2D		MW-3D2		MW-4D		MW-5D		MW-6D		MW-7D		MW-8D		MW-9D	
			110701173	042302194	110601163	042302192	110601162	42202191	110501160	042402201	110701169	042602211	110801180	042402207	110801177	042402203	110601167	042302200	110501157	042202188
Constituent[2]	TOG	PRG	11/7/2001	4/23/2002	11/6/2001	4/23/2002	11/6/2001	4/22/2002	11/5/2001	4/24/2002	11/7/2001	4/26/2002	11/8/2001	4/24/2002	11/8/2001	4/24/2002	11/6/2001	4/23/2002	11/5/2001	4/22/2002
4-Chloroaniline	5	150	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
4-Chloro-3-methylphenol	--	--	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2-Chloronaphthalene (beta-Chloronaphthalene)	10*	490	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2-Chlorophenol	--	30	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
4-Chlorophenyl phenyl ether	--	--	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Chrysene	0.002*	9.2	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Dibenzo(a,h)anthracene	--	0.0092	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Dibenzofuran	--	24	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Di-n-butyl phthalate (Dibutyl phthalate)	50	3600	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	3 J	NA	10 U	NA	10 U	NA
1,2-Dichlorobenzene	3	370	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
1,3-Dichlorobenzene	3	5.5	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
1,4-Dichlorobenzene	3	0.50	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
3,3'-Dichlorobenzidine	5	0.15	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2,4-Dichlorophenol	5	110	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Diethyl phthalate	50*	29000	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2,4-Dimethylphenol	50*	730	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Dimethyl phthalate	50*	360000	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
4,6-Dinitro-2-methylphenol	--	--	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA
2,4-Dinitrophenol	10*	73	25 U	NA	25 UJ	NA	25 UJ	NA	25 UJ	NA	25 U	NA	25 U	NA	25 U	NA	25 UJ	NA	25 UJ	NA
2,4-Dinitrotoluene	5	73****	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2,6-Dinitrotoluene	5	36****	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Di-n-octyl phthalate	50*	1500	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Fluoranthene	50*	1500	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Fluorene	50*	240	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Hexachlorobenzene	0.04	0.042	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Hexachlorobutadiene	0.5	0.86	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Hexachlorocyclopentadiene	5	220	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Hexachloroethane	5	4.8	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Indeno(1,2,3-cd)pyrene	0.002*	0.092	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Isophorone	50*	71	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2-Methylnaphthalene	--	--	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2-Methylphenol	--	1800	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
4-Methylphenol	--	180	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Naphthalene	10*	6.2	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2-Nitroaniline	5	1.0	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA
3-Nitroaniline	5	--	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA
4-Nitroaniline	5	--	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA
Nitrobenzene	0.4	3.4	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2-Nitrophenol	--	--	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
4-Nitrophenol	--	--	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA
N-nitrosodiphenylamine	50*	14	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
N-Nitroso-Di-n-propylamine	--	0.010	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Pentachlorophenol	1***	0.56	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA
Phenanthrene	50*	--	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	2 J	NA	1 J	NA	10 U	NA
Phenol	1***	22000	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Pyrene	50*	180	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
1,2,4-Trichlorobenzene	5	190	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
2,4,5-Trichlorophenol	--	3600	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA	25 U	NA
2,4,6-Trichlorophenol	--	3.6	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA	10 U	NA
Total Metals, micrograms per liter																				
Aluminum	--	36000	320	NA	5660	NA	200 U	NA	200 U	NA	232	NA	200 U	NA	819	NA	2060	NA	3020	NA
Antimony	3	15	60.0 U	NA	60.0 U	NA	60.0 U	NA	60.0 U	NA	60.0 U	NA	60.0 U	NA	60.0 U	NA	60.0 U	NA	60.0 U	NA
Arsenic	25	0.045	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U
Barium	1000	2600	200 U	NA	519	NA	200 U	NA	200 U	NA	230	NA	200 U	NA	200 U	NA	314	NA	200 U	NA
Beryllium	3*	73	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA
Cadmium	5	18	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA
Calcium	--	--	266000 J	NA	57200 J	NA	52400 J	NA	57300 U	NA	228000 J	NA	356000 J	NA	284000 J	NA	45300 J	NA	55800 U	NA
Chromium	50	55000'	15.1	15.2	15.1	10 U	10.0 U	10 U	10.0 U	10 U	10.0 U	10 U	11.9	13.2	13.3	10 U	10.0 U	10 U	10.0 U	10 U
Cobalt	--	730	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	10.0 U	NA
Copper	200	1500	25.0 U	NA	25.0 U	NA	25.0 U	NA	25.0 U	NA	25.0 U	NA	25.0 U	NA	25.0 U	NA	25.0 U	NA	25.0 U	NA
Iron	300''	11000	15500 J	NA	7850 J	NA	413 J	NA	1090 J	NA	14100 J	NA	4340 J	NA	10200 J	NA	2660 J	NA	2880 J	NA
Lead	25	15	3.0 U	NA	3.0 U	NA	3.0 U	NA	3.0 UJ	NA	3.0 U	NA	3.0 U	NA	3 J	NA	3.0 U	NA	3.0 UJ	NA
Magnesium	35000*	--	76400	NA	11600	NA	10800	NA	11600	NA	40800	NA	125000	NA	75200	NA	8220	NA	11000	NA
Manganese	300''	880	268 J	NA	299 J	NA	72.1 J	NA	297 J	NA	812 J	NA	2330 J	NA	3375 J	NA	114 J	NA	141 J	NA
Nickel	100	730'''	40.0 U	NA	40.0 U	NA	40.0 U	NA	40.0 U	NA	40.0 U	NA	40.0 U	NA	40.0 U	NA	40.0 U	NA	40.0 U	NA
Potassium	--	--	19600 J	NA	5000 UN	NA	5000 UJ	NA	5000 U	NA	5000 U	NA	5000 UJ	NA	5000 UJ	NA	5000 UJ	NA	5000 U	NA
Selenium	10	180	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA
Silver	50	180	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA
Mercury	0.7	11	0.200 UJ	NA	0.200 UJ	NA	0.200 UJ	NA	0.200 UJ	NA	0.200 UJ	NA	0.200 UJ	NA	0.200 UJ	NA	0.200 UJ	NA	0.200 UJ	NA
Sodium	20000	--	22300	NA	5000 U	NA	5000 U	NA	5850	NA	15500	NA	7110	NA	20700	NA	11400	NA	5990 U	NA
Thallium	0.5*	2.4	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA	10.0 U	NA
Vanadium	--	260	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA	50.0 U	NA
Zinc	2000*	11000	20.0 UJ	NA	25.9 J	NA	20.0 UJ	NA	20.0 U	NA	20.0 U	NA	20.0 UJ	NA	23.1 J	NA	20.0 UJ	NA	20.0 U	NA
Dissolved Metals, micrograms per liter																				
Aluminum	--	36000	NA	NA	200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 1b

ANALYTICAL RESULTS FROM DEEP OVERBURDEN GROUNDWATER SAMPLES

Peter Cooper Markhams Site
Dayton, New York

	Groundwater Criteria[3]		Sample Location, Sample Identification #, and Date Collected[1]																	
			MW-1D		MW-2D		MW-3D2		MW-4D		MW-5D		MW-6D		MW-7D		MW-8D		MW-9D	
			110701173	042302194	110601161	042302192	110601162	42202191	110501160	042402201	110701169	042602211	110801180	042402207	110801177	042402203	110601167	042302200	110501157	042202188
Constituent[2]	TOG	PRG	11/7/2001	4/23/2002	11/6/2001	4/23/2002	11/6/2001	4/22/2002	11/5/2001	4/24/2002	11/7/2001	4/26/2002	11/8/2001	4/24/2002	11/8/2001	4/24/2002	11/6/2001	4/23/2002	11/5/2001	4/22/2002
Antimony	3	15	NA	NA	60.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	25	0.045	NA	NA	10.0 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	1000	2600	NA	NA	443	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	3*	73	NA	NA	5.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	5	18	NA	NA	5.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	--	--	NA	NA	45800 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	50	55000*	NA	NA	10.0 U	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	--	730	NA	NA	50.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	200	1500	NA	NA	25.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	300**	11000	NA	NA	3510	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	25	15	NA	NA	3.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	35000*	--	NA	NA	8040	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	300**	880	NA	NA	161 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	100	730***	NA	NA	40.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	--	--	NA	NA	5000 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	10	180	NA	NA	10.6 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	50	180	NA	NA	10.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.7	11	NA	NA	0.200 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	20000	--	NA	NA	5000 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.5*	2.4	NA	NA	10.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	--	260	NA	NA	50.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2000*	11000	NA	NA	20.0 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexavalent Chromium, micrograms per liter																				
Total Hexavalent Chromium	50	110	10 UJ	10 UJ	(10000 U) R	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	321 NJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	(10000 U) R	10 UJ	(10000 U) R	10 UJ
Soluble Hexavalent Chromium	50	110	NA	NA	10 UJ	10 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other Geochemical Parameters, milligrams per liter																				
Ammonia	2 (NH_3 + NH_4^+ as N)	--	5113	5150	0.10 U	0.10 U	0.10 U	0.10 U	0.68	0.58	0.17	0.18	6.2	0.53	0.11	0.10 U	0.14	0.10 U	0.10 U	0.10 U
Bicarbonate Alkalinity	--	--	608	NA	143	NA	135	NA	174	NA	450	NA	519	NA	436	NA	146	NA	108	NA
Carbonate Alkalinity	--	--	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA
Nitrate	10 (as N)	10	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U
Sulfate	250	--	748	624	12.6	8.5	48.7	53.6	25.0	12.5	288	243	1040	723	603	584	27.4	13.7	57.3	59.7
Sulfide	0.05* (as H_2S)	--	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA	1.0 U	NA
Total Dissolved Solids	--	--	1490	NA	155	NA	178	NA	210	NA	973	NA	1770	NA	1220	NA	133	NA	223	NA
Total Organic Carbon	--	--	17.8	NA	5.6 J	NA	4.9	NA	6.7	NA	9.3	NA	13.3	NA	12.8	NA	4.1	NA	5.5	NA
Soluble Organic Carbon	--	--	NA	NA	14.1 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Field Measured Parameters																				
Temperature, °C	--	--	10.48	10.65	10.45	8.46	10.01	7.48	9.53	8.99	10.2	8.41	9.85	9.55	9.52	8.61	9.43	8.46	10.08	7.83
pH, standard units	--	--	6.73	6.76	7.32	7.61	7.65	7.91	7.5	7.41	6.91	6.89	6.45	6.53	6.72	6.91	7.5	7.79	7.36	7.71
Specific Conductivity, µS/cm	--	--	3718	2700	340	309	369	544	253	373	2024	1056	3619	2148	2891	1865	341	319	237	541
Dissolved Oxygen, mg/L	--	--	0.46	0.03	0.65	0.11	1.2	0.17	0.59	0.09	0.45	0.03	0.44	0.07	0.29	0.06	0.5	0.04	0.77	0.23
Oxidation-Reduction Potential, mV	--	--	190	199	239.1	211.1	230	259.9	159	218.8	208	226.1	76	42.5	160.6	181.4	211	251.2	32	398.9
Turbidity, NTU	--	--	10.17	16	500	130	1.9	12	3.3	4.54	11.9	11	2.97	12	45.8	19.6	48.5	26.7	43	4.36
Ferrous Iron, mg/L	--	--	6.2	7	1.4	0	0	0.5	1.6	1.2	6	5.8	NA	0	4.6	7	NA	0.8	0	1

Notes:

1. Sample locations provided on Plate 1
2. Data qualifications reflect 100% data validation performed by Data Validation Services
3. Groundwater criteria is from NYSDEC Division of Water, Technical and Operational Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values for Groundwater (June 1998) and U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) for Tap Water (2004)

µS/cm = microSiemens per centimeter
mg/L = milligrams per liter
mV = millivolts
NTU = Nephelometric Turbidity Unit
NA = not analyzed
ND means = non-detectable concentration by the approved analytical methods
(value) = concentration reported by the laboratory prior to being rejected by data validation
R = rejected concentration as a result of data validation

-- indicates no criteria exists
* indicates a guidance value
** applies to the sum of cis- and trans-1,3-dichloropropene
*** applies to the sum of phenolic compounds (total phenols)
**** PRG for mixture of 2,4- and 2,6-dinitrotoluene is 0.099 ug/L
† PRG for Chromium III (no PRG exists for Total Chromium)
†† TOG for sum of Iron and Manganese is 500 ug/L
††† PRG for Nickel (soluble salts)

Bold, underlined, italicized values indicates exceedance of groundwater criteria or guidance value

ORGANIC DATA QUALIFIERS
U = compound was analyzed for, but not detected, reported with detection limit value
J = an estimated value, either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when a compound meets the identification criteria but the result is less than the quantitation limit

INORGANIC DATA QUALIFIERS
U = element was analyzed for, but not detected reported with the detection limit
For B = a value greater than or equal to the instrument detection limit, but less than the quantitation limit
R = a value estimated or not reported due to the presence of interferences
N = spike sample recovery is not within the quality control limits

Table 2

ANALYTICAL RESULTS FOR COVER SOIL SAMPLES FROM TOP OF FILL PILES

Peter Cooper Markhams Site
Dayton, New York

	Soil Criteria[3]				*Sample Location, Identification, and Date Collected*[1]								
Constituent[2]	*Eastern USA Background*	*Region 9 PRG*	*Soil Screening Level*	*Site Background Level*	*Lathe #118 101001037 10/10/2001*	*Lathe #117 101101064 10/11/2001*	*Lathe #114 101101065 10/11/2001*	*Lathe #115 101101066 10/11/2001*	*Lathe #116 101101067 10/11/2001*	*Lathe #137 101101068 10/11/2001*	*Lathe #121 101101092 10/11/2001*	*Lathe #119 101101096 10/11/2001*	*Lathe #120 101201097 10/12/2001*
Total Metals, milligrams per kilogram													
Arsenic	3 - 12**	1.6	29	ND to 8.1	9.5	5.8	30.2	18.0	10.3	13.1	7.1	16.9	95.5
Chromium	1.5 - 40**	450	38	7.8 to 31.8	2840	35900/20600[4]	28000	18100/13300[4]	13100	1440/1480[4]	65300/28000[4]	2110	29200 J/22800 J[4]
Hexavalent Chromium	--	64	38	--	(0.62 U) R	(0.93 U)R/6.8[4]	(11.6 U) R	(0.6 U)R/51.8[4]	(3.4 U) R	(0.51 U)R/5.4[4]	(0.89 U)R/18.2[4]	(0.48 U) R	(20.3 U)R/63.3 J[4]
Other Parameters													
Leachable Total Organic Carbon, mg/kg	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	1510
Total Organic Carbon, mg/kg	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	18.8
Total Organic Carbon, %	--	--	--	--	1.1 J	2.2 J	13.2 J	11.2 J	13.2 J	4.2 J	4.5 J	2.5 J	NA

Notes:

1. Sample locations provided on Plate 1
2. Data qualifications reflect 100% data validation performed by Data Validation Services
3. Soil criteria is from NYSDEC Division of Environmental Remediation, Technical and Administrative Guidance Memorandum #4046 for Eastern USA Background Heavy Metals Concentration in Soil (January 1994), U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil (October 2004), and U.S. EPA Soil Screening Guidance, Generic Soil Screening Levels for Migration to Groundwater (July 1996)
4. Confirmation sample, collected December 2003

indicates concentration is above all soil criteria.

** indicates a New York State background concentration

-- indicates no criteria exists

(value) = concentration reported by the laboratory prior to being rejected by data validation

ND = non-detect

R = rejected concentration as a result of data validation.

NA = not analyzed

INORGANIC DATA QUALIFIERS:

E = value estimated or not reported due to the presence of interferences.

U = compound was analyzed for, but not detected. Reported with detection limit value.

ORGANIC DATA QUALIFIERS:

J = an estimated value, either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when a compound meets the identification criteria but the result is less than the quantitation limit

Table 3

ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES FROM PERIMETER OF FILL PILES

Peter Cooper Markhams Site
Dayton, New York

	Soil Criteria[3]			*Sample Location, Sample Identification #, and Date Collected*[1]									
Constituent[2]	*Eastern USA/ Site Background*	*Region 9 PRG*	*Soil Screening Level*	*Lathe #129 101201098 10/12/2001*	*Lathe #128 101201100 10/12/2001*	*Lathe #127 101201102 10/12/2001*	*Lathe #126 101201104 10/12/2001*	*Lathe #130 101201106 10/12/2001*	*Lathe #131 101201109 10/12/2001*	*Lathe #124 101201111 10/12/2001*	*Lathe #125 101201113 10/12/2001*	*Lathe #123 101201115 10/12/2001*	*Lathe #122 101201118 10/12/2001*
Volatile Organic Compounds, micrograms per kilogram[4]													
Chloromethane	--	2.6	--	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Bromomethane (Methyl bromide)	--	13	0.20	10 UJ	16 UJ	19 UJ	15 UJ	10 UJ	9 UJ	11 UJ	10 UJ	9 UJ	15 UJ
Vinyl chloride	--	0.75	0.010	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Chloroethane	--	6.5	--	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Methylene chloride	--	21	0.020	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Acetone	--	6000	16	10 U	16 U	54 U	15 U	180 U	190 U	250 U	270 U	210 U	550 U
Carbon Disulfide	--	720	32	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	2 J	15 U
1,1-Dichloroethene	--	410	0.060	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,1-Dichloroethane	--	1700	23	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Chloroform	--	12	0.60	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,2-Dichloroethane	--	0.60	0.020	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
2-Butanone (Methyl ethyl ketone	--	27000	--	10 U	16 U	19 U	15 U	20 U	15 U	21 U	19 U	14 U	50 B
1,1,1-Trichloroethane	--	1200	2.0	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Carbon Tetrachloride	--	0.55	0.070	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Bromodichloromethane	--	1.8	0.60	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,2-Dichloropropane	--	0.74	0.030	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
cis-1,3-Dichloropropene	--	1.8*	0.004*	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Trichloroethene	--	0.11	0.060	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Dibromochloromethane	--	2.6	0.40	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,1,2-Trichloroethane	--	1.6	0.020	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Benzene	--	1.3	0.030	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
trans-1,3-Dichloropropene	--	1.8*	0.004*	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Bromoform	--	220	0.80	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
4-Methyl-2-pentanone (methyl isobutyl ketone	--	2800	--	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
2-Hexanone (Methyl butyl ketone	--	--	--	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Tetrachloroethene	--	3.4	0.060	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Toluene	--	520	12	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,1,2,2-Tetrachloroethane	--	0.93	0.0030	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Chlorobenzene	--	530	1.0	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Ethylbenzene	--	20	13	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Styrene	--	1700	4.0	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Total Xylenes	--	420	210	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
cis-1,2-Dichloroethene	--	150	0.40	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
trans-1,2-Dichloroethene	--	230	0.70	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Dichlorodifluoromethane	--	310	--	6 J	6 J	19 U	3 J	10 U	9 U	11 U	10 U	9 U	15 U
Trichlorofluoromethane	--	2000	--	7 J	6 J	19 U	3 J	10 U	9 U	11 U	10 U	9 U	15 U
Methyl tertbutyl ether	--	160	--	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,2-Dibromoethane	--	0.028	--	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
Isopropylbenzene (Cumene)	--	2000	--	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,3-Dichlorobenzene	--	63	--	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,4-Dichlorobenzene	--	7.9	2.0	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,2-Dichlorobenzene	--	370	17	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,2-Dibromo-3-chloropropane	--	2.0	--	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U
1,2,4-Trichlorobenzene	--	3000	5.0	10 U	16 U	19 U	15 U	10 U	9 U	11 U	10 U	9 U	15 U

500056

Table 3

ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES FROM PERIMETER OF FILL PILES

Peter Cooper Markhams Site
Dayton, New York

	Soil Criteria[1]			*Sample Location, Sample Identification #, and Date Collected*[1]									
Constituent[2]	*Eastern USA/ Site Background*	*Region 9 PRG*	*Soil Screening Level*	*Lathe #129 101201098 10/12/2001*	*Lathe #128 101201100 10/12/2001*	*Lathe #127 101201102 10/12/2001*	*Lathe #126 101201104 10/12/2001*	*Lathe #130 101201106 10/12/2001*	*Lathe #131 101201109 10/12/2001*	*Lathe #124 101201111 10/12/2001*	*Lathe #125 101201113 10/12/2001*	*Lathe #123 101201115 10/12/2001*	*Lathe #122 101201118 10/12/2001*
Tentatively Identified Compounds, micrograms per kilogram[4]													
Hexane				(6 BJN) R	(9 BJN) R	(12 BJN) R			(5 BJN) R	(6 BJN) R	(6 BJN) R		(8 BJN) R
Unknown Alcoho									5 J				
Unknown									58 J	19 J	39 J	32 J	92 J
Semi-Volatile Organic Compounds, micrograms per kilogram[4]													
Acenaphthene	--	29000	570	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Acenaphthylene	--	--	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Acetophenone	--	--	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Anthracene	--	100000	12000	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Atrazine	--	7.8	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Benzo(a)anthracene	--	2.1	2.0	370 U	470 U	520 U	27 J	20 J	360 U	400 U	370 U	380 U	490 U
Benzo(b)fluoranthene	--	2.1	5.0	370 U	46 J	38 J	82 J	44 J	360 U	400 U	370 U	380 U	43 J
Benzo(k)fluoranthene	--	21	49	370 U	28 J	520 U	41 J	370 U	360 U	400 U	370 U	380 U	490 U
Benzo(ghi)perylene	--	--	--	370 U	31 J	520 U	43 J	370 U	360 U	400 U	370 U	380 U	490 U
Benzo(a)pyrene	--	0.21	8.0	370 U	34 J	31 J	71 J	22 J	360 U	400 U	370 U	380 U	490 U
Benzaldehyde	--	62000	--	370 U	470 U	520 U	460 U	370 U	43 J	140 J	170 J	380 U	490 U
Biphenyl (1,1-Biphenyl	--	350	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Bis(2-chloroethoxy)methane	--	--	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Bis(2-chloroethyl)ethe	--	0.55	0.00040	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
2,2'-Oxybis(1-Chloropropane) (Bis(2-chloro-1-methylethyl)ether	--	7.4	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Bis(2-ethylhexyl) phthalate	--	120	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
4-Bromophenyl phenyl ethe	--	--	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Butyl benzyl phthalate	--	100000	930	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
4-Chloroaniline	--	2500	0.70	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
4-Chloro-3-methylpheno	--	--	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
2-Chloronaphthalene (beta-Chloronaphthalene	--	23000	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
2-Chloropheno	--	240	4.0	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
4-Chlorophenyl phenyl ethe	--	--	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Caprolactam	--	100000	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Carbazole	--	86	0.60	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Chrysene	--	210	160	370 U	32 J	520 U	34 J	24 J	360 U	400 U	370 U	380 U	490 U
Dibenzo(a,h)anthracene	--	0.21	2.0	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Dibenzofuran	--	3100	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Di-n-butyl phthalate (Dibutyl phthalate	--	62000	2300	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
3,3'-Dichlorobenzidine	--	3.8	0.0070	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
2,4-Dichloropheno	--	1800	1.0	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Diethyl phthalate	--	100000	--	370 U	1180 U	1300 U	460 U	930 U	360 U	400 U	370 U	380 U	490 U
2,4-Dimethylpheno	--	12000	9.0	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Dimethyl phthalate	--	100000	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
4,6-Dinitro-2-methylpheno	--	--	--	910 U	1180 U	1300 U	1160 U	930 U	900 U	1000 U	930 U	940 U	1210 U
2,4-Dinitropheno	--	1200	0.30	910 U	1180 U	1300 U	1160 U	930 U	900 U	1000 U	930 U	940 U	1210 U
2,4-Dinitrotoluene	--	1200**	0.0008**	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
2,6-Dinitrotoluene	--	620**	0.0007**	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Di-n-octyl phthalate	--	25000	10000	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Fluoranthene	--	22000	4300	370 U	33 J	520 U	40 J	59 J	360 U	400 U	370 U	380 U	51 J
Fluorene	--	26000	560	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Hexachlorobenzene	--	1.1	2.0	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Hexachlorobutadiene	--	22	2.0	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Hexachlorocyclopentadiene	--	3700	400	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Hexachloroethane	--	120	0.50	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Indeno(1,2,3-cd)pyrene	--	2.1	14	370 U	470 U	520 U	40 J	370 U	360 U	400 U	370 U	380 U	490 U
Isophorone	--	1800	0.50	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
2-Methylnaphthalene	--	--	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
2-Methylpheno	--	31000	15	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
4-Methylpheno	--	3100	--	370 U	40 J	60 J	110 J	370 U	360 U	400 U	370 U	380 U	490 U
Naphthalene	--	190	84	370 U	47 J	46 J	33 J	370 U	360 U	400 U	370 U	380 U	490 U
2-Nitroaniline	--	18	--	910 U	1180 U	1300 U	1160 U	930 U	900 U	1000 U	930 U	940 U	1210 U
3-Nitroaniline	--	--	--	910 U	1180 U	1300 U	1160 U	930 U	900 U	1000 U	930 U	940 U	1210 U

Table 3

ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES FROM PERIMETER OF FILL PILES

Peter Cooper Markhams Site
Dayton, New York

	Soil Criteria[3]			*Sample Location, Sample Identification #, and Date Collected*[1]									
Constituent[2]	*Eastern USA/ Site Background*	*Region 9 PRG*	*Soil Screening Level*	*Lathe #129 101201098 10/12/2001*	*Lathe #128 101201100 10/12/2001*	*Lathe #127 101201102 10/12/2001*	*Lathe #126 101201104 10/12/2001*	*Lathe #130 101201106 10/12/2001*	*Lathe #131 101201109 10/12/2001*	*Lathe #124 101201111 10/12/2001*	*Lathe #125 101201113 10/12/2001*	*Lathe #123 101201115 10/12/2001*	*Lathe #122 101201118 10/12/2001*
4-Nitroaniline	--	--	--	910 U	1180 U	1300 U	1160 U	930 U	900 U	1000 U	930 U	940 U	1210 U
Nitrobenzene	--	100	0.10	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
2-Nitrophenol	--	--	--	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
4-Nitrophenol	--	--	--	910 U	1180 U	1300 U	1160 U	930 U	900 U	1000 U	930 U	940 U	1210 U
N-nitrosodiphenylamine	--	350	1.0	330 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
N-Nitroso-Di-n-propylamine	--	0.25	0.000050	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Pentachlorophenol	--	9.0	0.030	910 U	1180 U	1300 U	1160 U	930 U	900 U	1000 U	930 U	940 U	1210 U
Phenanthrene	--	--	--	370 U	470 U	520 U	460 U	24 J	360 U	400 U	370 U	380 U	490 U
Phenol	--	100000	100	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Pyrene	--	29000	4200	370 U	27 J	520 U	35 J	42 J	360 U	400 U	370 U	380 U	35 J
2,4,5-Trichlorophenol	--	62000	270	910 U	1180 U	1300 U	1160 U	930 U	900 U	1000 U	930 U	940 U	1210 U
2,4,6-Trichlorophenol	--	62	0.20	370 U	470 U	520 U	460 U	370 U	360 U	400 U	370 U	380 U	490 U
Total Metals, milligrams per kilogram													
Arsenic	3 - 12**/ND to 8.1	1.6	29	9.2	35.6	55.1	12.4	10.0	8.2	9.0	9.7	9.2	12.7
Chromium	1.5 - 40**/7.8 to 31.8	450	38	66.5	8990/8800[4]	11800/2600[4]	4460	3050	36.3	43.0	13.7	85.6/58.0[4]	1150/11600[4]
Hexavalent Chromium	--	64	38	(0.45 U) R	(0.57 U)R/33.0[4]	(0.64 U)R/3.8	(0.57 U) R	(0.45 U) R	(0.52 U) R	(0.49 U) R	(0.46 U) R	(0.47 U)R/2.5[4]	(2.0 U)R/7.7[4]
Other Parameters													
Total Moisture Content, %	--	--	--	15.3	31.7	45.9	28.7	19.6	16.7	16.6	17.7	18.1	31.2

Notes:

1. Sample locations provided on Plate 1
2. Data qualifications reflect 100% data validation performed by Data Validation Services
3. Soil criteria is from NYSDEC Division of Environmental Remediation, Technical and Administrative Guidance Memorandum #4046 for Eastern USA Background Heavy Metals Concentration in Soil (January 1994), U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil (October 2004), and U.S. EPA Soil Screening Guidance, Generic Soil Screening Levels for Migration to Groundwater (July 1996)
4. Confirmation samples, collected December 2003

shaded indicates concentration is above all soil criteria.

(value) = concentration reported by the laboratory prior to being rejected by data validation
ND = non-detect
R = rejected concentration as a result of data validation
NA = not analyzed

* indicates criteria is for 1,3-Dichloropropene (no individual criteria exists for cis- or trans-1,3-Dichloropropene)

** PRG and SSL for mixture of 2,4- and 2,6-dinitrotoluene is 2.5 mg/kg and 0.0008 mg/kg, respectively
** indicates a New York State background concentration

ORGANIC DATA QUALIFIERS:
U = compound was analyzed for, but not detected, reported with detection limit value
J = an estimated value, either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when a compound meets the identification criteria but the result is less than the quantitation limit
B = used when the analyte is found in the associated blank, as well as in the sample
N = presumptive evidence of a compound; used only for tentatively identified compounds (TIC), where the identification is based on the Mass Spectral library search; it is applied to all TIC results

INORGANIC DATA QUALIFIERS:
U = element was analyzed for, but not detected; reported with the detection limit

500058

Table 4

ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES ADJACENT TO AND DOWNGRADENT FROM FILL PILES

Peter Cooper Markhams Site
Dayton, New York

	Soil Criteria [3]				Sample Location, Sample Identification #, and Date Collected [1]							
Constituent [2]	Eastern USA Background	Region 9 PRG	Soil Screening Level	Site Background Level	Lathe #106 101001028 10/10/2001	Lathe #62 101001030 10/10/2001	Lathe #63 101001031 10/10/2001	Lathe #64 101001033 10/10/2001	Lathe #65 101001034 10/10/2001	Lathe #107 101001035 10/10/2001	Lathe #108 101001038 10/10/2001	Lathe #68 10001040 10/10/2001
Total Metals, milligrams per kilogram												
Arsenic	3 - 12**	1.6	29	ND to 8.1	8.8	8.0	8.1	3.0	9.1	11.7	7.1	7.8
Chromium	1.5 - 40**	450	38	7.8 to 31.8	434	12.4	8.9	24.3	19.0	2260/8970 [4]	13.1	8.5
Hexavalent Chromium	--	64	38	--	(0.47 U) R	(0.57 U) R	(0.58 U) R	(0.91 U) R	(2.8 U) R	(0.51 U)R/29.6 [4]	(2.2 U) R	(0.5 U) R

	Soil Criteria [3]				Sample Location, Identification, and Date Collected [1]							
Constituent [2]	Eastern USA Background	Region 9 PRG	Soil Screening Level	Site Background Level	Lathe #69 101001041 10/10/2001	Lathe #70 101001042 10/10/2001	Lathe #71 101001043 10/10/2001	Lathe #109 101001044 10/10/2001	Lathe #110 101001046 10/10/2001	Lathe #97 101001048 10/10/2001	Lathe #95 101001050 10/10/2001	Lathe #60 101001052 10/10/2001
Total Metals, milligrams per kilogram												
Arsenic	3 - 12**	1.6	29	ND to 8.1	10.8	7.1	9.2	8.1	6.5	10.2	6.6	8.6
Chromium	1.5 - 40**	450	38	7.8 to 31.8	8.7	15.2	7.1	10.6	9.4	12.9	12.5	13.8
Hexavalent Chromium	--	64	38	--	(0.52 U) R	(0.48 U) R	(2.7 U) R	(0.49 U) R	(0.95 U) R	(0.49 U) R	(0.85 U) R	(0.58 U) R

	Soil Criteria [3]				Sample Location, Identification, and Date Collected [1]							
Constituent [2]	Eastern USA Background	Region 9 PRG	Soil Screening Level	Site Background Level	Lathe #59 101001054 10/10/2001	Lathe #98 101001055 10/10/2001	Lathe #61 101001057 10/10/2001	Lathe #58 101001058 10/10/2001	Lathe #57 101001059 10/10/2001	Lathe #96 101001060 10/10/2001	Lathe #99 101001062 10/10/2001	Lathe #105 101001069 10/10/2001
Total Metals, milligrams per kilogram												
Arsenic	3 - 12**	1.6	29	ND to 8.1	1.9	3.7	10.1	7.4	8.1	7.6	7.3	9.0
Chromium	1.5 - 40**	450	38	7.8 to 31.8	11.1	8.8	12.7	14.2	12.8	11.9	333	3520
Hexavalent Chromium	--	64	38	--	(0.54 U) R	(0.53 U) R	(0.48 U) R	(0.45 U) R	(0.52 U) R	(0.48 U) R	(0.63 U) R	(0.52 U) R

Table 4

ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES ADJACENT TO AND DOWNGRADENT FROM FILL PILES

Peter Cooper Markhams Site
Dayton, New York

	Soil Criteria [3]				Sample Location, Identification, and Date Collected [1]							
Constituent[2]	Eastern USA Background	Region 9 PRG	Soil Screening Level	Site Background Level	Lathe #104 101001071 10/10/2001	Lathe #103 101001073 10/10/2001	Lathe #102A 101001076 10/10/2001	Lathe #101 101001078 10/10/2001	Lathe #100 101001080 10/10/2001	Lathe #56 101001082 10/10/2001	Lathe #66 101001083 10/10/2001	Lathe #67A 101001084 10/10/2001
Total Metals, milligrams per kilogram												
Arsenic	3 - 12**	1.6	29	ND to 8.1	8.6	8.1	8.6	6.6	4.7	7.5	6.5	8.1
Chromium	1.5 - 40**	450	38	7.8 to 31.8	315	19.5	13.4	13.4	43.4	14.4	18.4	71.9
Hexavalent Chromium	--	64	38	--	(0.47 U) R	(0.45 U) R	(0.46 U) R	(0.53 U) R	(0.5 U) R	(0.57 U) R	(0.49 U) R	(0.5 U) R

	Soil Criteria [3]				Sample Location, Identification, and Date Collected [1]					
Constituent[2]	Eastern USA Background	Region 9 PRG	Soil Screening Level	Site Background Level	Lathe #74 101001085 10/10/2001	Lathe #73 101001086 10/10/2001	Lathe #72 101001087 10/10/2001	Lathe #113 101001088 10/10/2001	Lathe #112 101001090 10/10/2001	Lathe #111 101001093 10/10/2001
Total Metals, milligrams per kilogram										
Arsenic	3 - 12**	1.6	29	ND to 8.1	11.4	6.3	9.0	16.9	12.2	11.4
Chromium	1.5 - 40**	450	38	7.8 to 31.8	32.1	23.3	33.9	7660/4760[4]	1090 J/1230[4]	543 J
Hexavalent Chromium	--	64	38	--	(0.51 U) R	(0.54 U) R	(0.47 U) R	(0.64 U)R/19.8 [4]	(0.47 U)R/3.8 [4]	(0.46 U) R

Notes

1. Sample locations provided on Plate 1
2. Data qualifications reflect 100% data validation performed by Data Validation Services
3. Soil criteria is from NYSDEC Division of Environmental Remediation, Technical and Administrative Guidance Memorandum #4046 for Eastern USA Background Heavy Metals Concentration in Soil (January 1994), U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil (October 2004), and U.S. EPA Soil Screening Gui dance, Generic Soil Screening Levels for Migration to Groundwater (July 1996)
4. Confirmation samples, collected December 2003

(value) = concentration reported by the laboratory prior to being rejected during data validation
R = rejected concentration as a result of data validation

indicates concentration is above all soil criteria.

INORGANIC DATA QUALIFIERS:
U = element was analyzed for, but not detected; reported with detection limit value
E = value estimated or not reported due to the presence of interferences.

	Sample Type, Sample Identification #, and Date Collected [1]			
Constituent[2]	Composite 101501151 10/15/2001	Composite 101501154 10/15/2001	Composite 101501155 10/15/2001	Composite 101501156 10/15/2001
Total Organic Carbon, mg/L	3.6	1.4	1.8	1.2

Notes:

1. Sample locations provided on Plate 1
2. Data qualifications reflect 100% data validation performed by Data Validation Services

Sample 101501151 is a composite of Lathes #62, 72, and 111
Sample 101501154 is a composite of Lathes #108, 68, 70, 109, and 96
Sample 101501155 is a composite of Lathes #106, 104, 56, 129, and 126
Sample 101501156 is a composite of Lathes #63, 64, 65, 66, 69, and 71

Table 5

ANALYTICAL RESULTS FOR SUBSURFACE SOIL SAMPLES FROM PERIMETER OF FILL PILES

Peter Cooper Markhams Site
Dayton, New York

	Soil Criteria[3]				*Sample Location, Sample Identification #, and Date Collected*[1]							
Constituent[2]	*Eastern USA Background*	*Region 9 PRG*	*Soil Screening Level*	*Site Background Level*	*Lathe #106 101001029 10/10/2001*	*Lathe #107 101001036 10/10/2001*	*Lathe #108 101001039 10/10/2001*	*Lathe #109 101001045 10/10/2001*	*Lathe #110 101001047 10/10/2001*	*Lathe #97 101001049 10/10/2001*	*Lathe #95 101001051 10/10/2001*	*Lathe #98 101001056 10/10/2001*
Total Metals, milligrams per kilogram												
Arsenic	3 - 12**	1.6	29	ND to 8.1	8.3 J	10.1 J	8.8 J	10.1 J	6.7 J	9.1 J	7.7 J	3.7 J
Chromium	1.5 - 40**	450	38	7.8 to 31.8	19700 J	6520 J	16.4 J	14.0 J	15.8 J	14.2 J	16.2 J	13.9 J
Hexavalent Chromium	--	64	38	--	0.93 UJ	0.48 UJ	0.49 UJ	0.48 UJ	0.50 UJ	0.48 UJ	0.50 UJ	0.53 UJ

	Soil Criteria[3]				*Sample Location, Sample Identification #, and Date Collected*[1]						
Constituent[2]	*Eastern USA Background*	*Region 9 PRG*	*Soil Screening Level*	*Site Background Level*	*Lathe #96 101001061 10/10/2001*	*Lathe #99 101001063 10/10/2001*	*Lathe #105A 101001070 10/10/2001*	*Lathe #104 101001072 10/10/2001*	*Lathe #103 101001075 10/10/2001*	*Lathe #102A 101001077 10/10/2001*	*Lathe #101 101001079 10/10/2001*
Total Metals, milligrams per kilogram											
Arsenic	3 - 12**	1.6	29	ND to 8.1	8.8 J	7.4 J	19.0 J	10.9 J	17.6 J	9.9 J	8.1 J
Chromium	1.5 - 40**	450	38	7.8 to 31.8	13.9 J	36.0 J	11000 J	48.0 J	16.6 J	14.8 J	16.7 J
Hexavalent Chromium	--	64	38	--	0.63 UJ	0.51 UJ	0.58 UJ	0.45 UJ	0.45 UJ	0.47 UJ	0.50 UJ

	Soil Criteria[3]				*Sample Location, Sample Identification #, and Date Collected*[1]						
Constituent[2]	*Eastern USA Background*	*Region 9 PRG*	*Soil Screening Level*	*Site Background Level*	*Lathe #100 101001081 10/10/2001*	*Lathe #113 101001089 10/10/2001*	*Lathe #112 101001091 10/10/2001*	*Lathe #111 101001094 10/10/2001*	*Lathe #129 101201099 10/12/2001*	*Lathe #128 101201101 10/12/2001*	*Lathe #127 101201103 10/12/2001*
Total Metals, milligrams per kilogram											
Arsenic	3 - 12**	1.6	29	ND to 8.1	7.9 J	12.6 J	9.2 J	11.5 J	8.4	28.9	26.8
Chromium	1.5 - 40**	450	38	7.8 to 31.8	60.1 J	4820 J	398 J	1150 J	36.7	6460	12400
Hexavalent Chromium	--	64	38	--	0.48 UJ	1.3 UJ	0.66 UJ	0.47 UJ	0.45 UJ	0.58 UJ	0.68 UJ

	Soil Criteria[3]				*Sample Location, Identification, and Date Collected*[1]						
Constituent[2]	*Eastern USA Background*	*Region 9 PRG*	*Soil Screening Level*	*Site Background Level*	*Lathe #126 101201105 10/12/2001*	*Lathe #130 101201108 10/12/2001*	*Lathe #131 101201110 10/12/2001*	*Lathe #124 101201112 10/12/2001*	*Lathe #125 101201114 10/12/2001*	*Lathe #123 101201116 10/12/2001*	*Lathe #122 101201119 10/12/2001*
Total Metals, milligrams per kilogram											
Arsenic	3 - 12**	1.6	29	ND to 8.1	16.1	8.4	11.1	9.8	7.9	9.5	6.0
Chromium	1.5 - 40**	450	38	7.8 to 31.8	7850	341	30.8	17.3	15.2	12600	126
Hexavalent Chromium	--	64	38	--	0.60 UJ	0.48 UJ	0.45 UJ	0.70 UJ	0.49 UJ	0.58 UJ	0.78 UJ

Notes:

1. Sample locations provided on Plate 1. Sample depth is 6 to 12 inches below ground surface.
2. Data qualifications reflect 100% data validation performed by Data Validation Services.
3. Soil criteria is from NYSDEC Division of Environmental Remediation, Technical and Administrative Guidance Memorandum #4046 for Eastern USA Background Heavy Metals Concentration in Soil (January 1994), U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil (October 2004), and U.S. EPA Soil Screening Guidance, Generic Soil Screening Levels for Migration to Groundwater (July 1996)

shaded indicates concentration is above all soil criteria

** indicates a New York State background concentration
-- indicates no criteria exists
ND = non-detect

INORGANIC DATA QUALIFIERS:
N = spike sample recovery is not within the quality control limits
J = a value greater than or equal to the instrument detection limit, but less than the quantitation limit
U = element was analyzed for, but not detected; reported with detection limit value

Table 6

ANALYTICAL RESULTS FOR NATIVE SUBSURFACE SOIL SAMPLES FROM MONITORING WELLS AND BORINGS

Peter Cooper Markhams Site
Dayton, New York

Constituent [2]	Soil Criteria [3] Eastern USA Background	Region 9 PRG	Soil Screening Level	Site Background Level	Sample Location, Identification, and Date Collected [1] B-1A; 9-10 fbgs 100201003 10/2/2001	B-1A; 10-11 fbgs 100201004 10/2/2001	B-1A; 17-19 fbgs 100201005 10/2/2001	MW-8S; 4-6 fbgs 100401007 10/4/2001	B-4; 15-16 fbgs 100501009 10/5/2001	B-4; 23-25 fbgs 100501010 10/5/2001	B-4; 16-17 fbgs 100501013 10/5/2001
Total Metals, milligrams per kilogram											
Arsenic	3 - 12**	1.6	29	ND to 8.1	8.1	11.3	9.6	12.7	8.6	4.7	13.4
Chromium	1.5 - 40**	450	38	7.8 to 31.8	32.5	65.1	19.6	12.6	39.2	29.2	1150
Hexavalent Chromium	--	64	38	--	0.44 UJ	0.43 UJ	0.44 UJ	0.46 UJ	0.45 UJ	0.45 UJ	0.48 UJ

Constituent [2]	Soil Criteria [3] Eastern USA Background	Region 9 PRG	Soil Screening Level	Site Background Level	Sample Location, Identification, and Date Collected [1] B-5; 8-9 fbgs 100901019 10/9/2001	B-5; 9-10 fbgs 100901020 10/9/2001	B-5; 14-16 fbgs 100901021 10/9/2001	B-6; 6.5-7.5 fbgs 100901023 10/9/2001	B-6; 7.5-8.5 fbgs 100901024 10/9/2001	B-6; 9-11 fbgs 100901025 10/9/2001
Total Metals, milligrams per kilogram										
Arsenic	3 - 12**	1.6	29	ND to 8.1	9.2	7.6	5.4	8.0	8.9	11.7
Chromium	1.5 - 40**	450	38	7.8 to 31.8	18.4	12.4	9.8	43.9	5860	36.9
Hexavalent Chromium	--	64	38	--	0.43 UJ	0.45 UJ	0.48 UJ	0.46 UJ	0.47 UJ	0.45 UJ

Notes:

indicates concentration is above all soil criteria

1. Sample locations provided on Plate 1
2. Data qualifications reflect 100% data validation performed by Data Validation Services
3. Soil criteria is from NYSDEC Division of Environmental Remediation, Technical and Administrative Guidance Memorandum #4046 for Eastern USA Background Heavy Metals Concentration in Soil (January 1994), U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil (October 2004), and U.S. EPA Soil Screening Guidance, Generic Soil Screening Levels for Migration to Groundwater (July 1996)
4. Groundwater criteria is from NYSDEC Divison of Water, Technical and Operational Guidance Series (TOGs) Ambient Water Quality Standards and Guidance Values (June 1998) and U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) for Tap Water (2004)

** indicates a New York State background concentration
-- indicates no criteria exists
NA = not analyzed

INORGANIC DATA QUALIFIERS:
U = element was analyzed for, but not detected; reported with detection limit value
J = a value greater than or equal to the instrument detection limit, but less than the quantitation limit

TABLE 7
SELECTION OF EXPOSURE PATHWAYS POSING UNACCEPTABLE RISKS
Peter Cooper MarkhamsSuperfund Site, Cattaraugus County, New York

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age[1]	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Groundwater	Groundwater	On-site Groundwater	Industrial worker	Adult	Ingestion Dermal Contact	Quant.	Groundwater is classified as GA by NYSDEC (potable uses). The potential exists in the future that the groundwater may be used as a potable source if the site is redeveloped for industrial/commercial uses.
Future	Groundwater	Groundwater	On-site Groundwater	Construction Worker	Adult	Dermal Contact	Quant.	Potentially completed exposure pathway in the event that the site is redeveloped.

TABLE 8 - GROUNDWATER
SUMMARY OF CHEMICALS OF CONCERN and EXPOSURE POINT CONCENTRATION
Peter Cooper MarkhamsSuperfund Site, Cattaraugus County, New York

Scenario Timeframe: ***Future***
Medium **Groundwater**
Exposure Medium: **Groundwater**

Exposure Point	Chemicals of Potential Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Arithmetic Mean	Maximum					
Groundwater-site wide	Arsenic	1.40E+01	1.30E+02	ug/l	1/15	5.1E+01	ug/l	95% UCL
	Cadmium	8.5E+00	5.0E+01	ug/l	1/8	3.4E+01	ug/l	95% UCL
	Hexavalent Chromium*	650*	3.21E+02	ug/l	1/16	3.2E+02	ug/l	Max
	Iron	4.10E+05	3.20E+06	ug/l	8/8	3.2E+06	ug/l	Max
	Manganese	5.50E+03	1.50E+04	ug/l	8/8	1.5E+04	ug/l	Max.
	Thallium	1.70E+02	1.30E+03	ug/l	2/8	8.7E+02	ug/l	95% UCL

* Samples from deep groundwater. The mean is greater than the maximum since the calculation included two non-detect concentrations at 10,000 ug/l.

"D" reflects compound identified in an analysis at a secondary dilution factor
"JD" reflects an estiamed value identified in an analysis at a secondary dilution factor.
"N" = normal
"T" = transformed
* From deep well otherwise data is from shallow wells.

TABLE 9 - INDUSTRIAL WORKER
RISK CHARACTERIZATION SUMMARY CANCER RISKS *
REASONABLE MAXIMUM EXPOSURE
Peter Cooper Markhams Superfund Site, Dayton, New York

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: > 18 years

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Ingestion	Inhalation	Dermal	External Radiation	Exposure Routes Total Risks
Groundwater	Potable	Shower/Faucets	Arsenic	2.4E+04	NA	7.3E+07	NA	2.4E+04
	Tap Water							

Total	2.40E+04

* Includes data from Well MW-2S

TABLE 10 - INDUSTRIAL WORKER
RISK CHARACTERIZATION SUMMARY CANCER RISKS *
CENTRAL TENDENCY EXPOSURE
Peter Cooper Markhams Superfund Site, Gowanda, New York

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: > 18 years

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Ingestion	Inhalation	Dermal	External Radiation	Exposure Routes Total Risks
Groundwater	Potable	Shower/Faucets	Arsenic	5.9E-05	NA	2.6E-07	NA	5.9E-05
	Tap Water							
							Total	5.90E-05

* Includes data from Well MW-2S

TABLE 11 - INDUSTRIAL WORKER
RISK CHARACTERIZATION SUMMARY NON-CANCER HAZARDS *
REASONABLE MAXIMUM EXPOSURE
Peter Cooper Markhams Landfill Superfund Site, Dayton, New York

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: > 18 years

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total HI
Groundwater	Potable Tap	Showers	Antimony	Blood	1.0	NA	0.02	1.0
	Water	faucet	Arsenic	Skin	1.5	NA	0.005	1.5
			Cadmium	Kidney	0.6	NA	3.19	3.8
			Chromium (hexavalent)	Lung	0.9	NA	0.23	1.2
			Iron	No Observed Adverse Effect Level (NOAEL)	92.8	NA	0.88	93.6
			Manganese	Central Nervous System (CNS)	5.5	NA	0.42	5.9
			Thallium	Blood	116.0	NA	2.88	119.0

TOTAL HI	230

Total (Blood)	120
Total (NOAEL)	94
Total (CNS)	5.9
Total (Kidney)	3.8
Total (Skin)	1.5
Total (Lung)	1.2

* Includes Well MW-2S.

TABLE 12 - INDUSTRIAL WORKER
RISK CHARACTERIZATION SUMMARY NON-CANCER HAZARDS*
CENTRAL TENDENCY EXPOSURE
Peter Cooper Markhams Superfund Site, Dayton, New York

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: > 18 years

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total HI
Groundwater	Potable Tap	Showers	Antimony	Blood	0.7	NA	0.02	0.7
	Water	faucet	Arsenic	Skin	1.0	NA	0.00	1.0
			Cadmium	Kidney	0.4	NA	3.10	3.5
			Chromium (hexavalent)	Lung	0.6	NA	0.20	0.9
			Iron	No Observed Adverse Effect Level (NOAEL)	64.9	NA	0.90	1.1
			Manganese	Central Nervous System (CNS)	0.0	NA	0.40	0.5
			Thallium	Blood	79.1	NA	2.80	81.9

TOTAL HI	90

Total (Blood)	82.6
Total (NOAEL)	1.1
Total (CNS)	0.5
Total (Kidney)	3.5
Total (Skin)	1.0
Total (Lung)	0.9

* Includes Well MW-2S.

TABLE 13 - CONSTRUCTION WORKER
RISK CHARACTERIZATION SUMMARY NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Peter Cooper Markhams Superfund Site, Dayton, New York

Scenario Timeframe: Future
Receptor Population: Adult
Receptor Age: > 18 years

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total HI
Groundwater	Groundwater	Tap Water	Cadmium	Kidney	NA	NA	1.9	1.9
			Thallium	Blood	NA	NA	1.6	1.6
			Iron	No Observed Adverse Effect Level (NOAEL)	NA	NA	0.6	0.6
			Chromium (hexavalent)	Lung	NA	NA	0.4	0.4

TOTAL HI	4.5

Total (Kidney)	1.9
Total (Blood)	1.6
Total (NOAEL)	0.6
Total (Lung)	0.4

TABLE 14 - GROUNDWATER CONCENTRATIONS IN ABSENCE OF WELL MW-2S
SUMMARY OF CHEMICALS OF CONCERN AND EXPOSURE POINT CONCENTRATIONS
Peter Cooper Markhams Superfund Site, Dayton, New York

Scenario Timeframe **Future**
Medium **Groundwater**
Exposure Medium: **Groundwater**

Exposure Point	Chemicals of Potential Concern	Concentration Detected		Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Arithmetic Mean	Maximum					
Groundwater-site wide	Benzo(b)fluoranthene	__ ***	6.00E-01	ug/l	1/8	6.0E-01	ug/l	Maximum
	Bis(2-ethylhexyl)phthalate	"-- ****	5.0E+00	ug/l	1/8	5.0E+00	ug/l	Maximum
	Trichloroethylene	2.50E+00	4.20E+00	ug/l	2/14	4.2E+00	ug/l	Maximum
	Chromium (hexavalent)**	650 *****	3.20E+02	ug/l	1/16	3.2E+02	ug/l	Maximum
	Manganese	5.50E+03	1.50E+04	ug/l	8/8	1.5E+04	ug/l	Maximum

Excludes well MW-2S
** Data from deep well
*** All samples were non-detects at levels of 10 ug/l. Only one detection was found at a concentration of 0.6 ug/l.
**** Only one detection at a concentration of 5 ug/l was found. All other samples were non-detects at 10 ug/l.
***** The Arithmetic Mean is greater than the Maximum based on including two samples with non-detect limits of 10,000 ug/l which influenced the mean.
"JD" reflects an estiamed value identified in an analysis at a secondary dilution factor.
"N" = normal
"T" = transformed
* From deep well otherwise data is from shallow wells.

TABLE 15 - INDUSTRIAL WORKER (Excludes Data from Well MW-2S)
RISK CHARACTERIZATION SUMMARY CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
Peter Cooper Markhams Superfund Site, Dayton, New York

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: > 18 years

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Ingestion	Inhalation	Dermal	External Radiation	Exposure Routes Total Risks
Groundwater	Groundwater	Tap Water	Benzo(b)fluoranthene	1.4 E-6	NA	3.5 E-5	NA	3.7E-05
			Bis(2-ethylhexyl)phthalate	2.2 E-7	NA	1.2 E-5	NA	1.3E-05
			Trichloroethylene	5.3 E-6	NA	9.8 E-7	NA	6.3E-06
							Total	5.6E-05

* Excludes well MW-2S

TABLE 16 - INDUSTRIAL WORKER (Excludes Well MW-2S)
RISK CHARACTERIZATION SUMMARY NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Peter Cooper Markhams Landfill Superfund Site, Gowanda, New York

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: > 18 years

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total HI
Groundwater	Potable Tap	Showers	Chromium (hexavalent)	Lung	0.9	NA	0.23	1.2
	Water	faucet	Manganese	CNS	5.5	NA	0.40	5.9

TOTAL HI	7.1

Total (Lung)	1.2
Total (CNS)	5.9

* Excludes Well MW-2S.

CENTRAL TENDENCY EXPOSURE
Peter Cooper Markhams Superfund Site, Dayton, New York

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: > 18 years

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total HI
Groundwater	Potable Tap	Showers	Chromium (hexavalent)	Lung	0.6	NA	0.39	1.0
	Water	faucet	Manganese	CNS	0.5	NA	0.41	0.9

TOTAL HI	1.9

Total (Lung)	1
Total (CNS)	0.9

* Excludes Well MW-2S.

TABLE 17
CANCER TOXICITY SUMMARY TABLE
Peter Cooper Markhams Superfund Site, Dayton, New York

Pathways: Ingestion/Inhalation

Radionuclide of Concern	Oral Cancer Slope Factor	Dermal Cancer Slope Factor	Slope Factor Units	Inhalation Unit Risk Factor	Unit Risk Factor Units	Weight of Evidence Cancer Guidelines Description	Source	Date
Arsenic	1.5	1.5	$(mg/kg\text{-}day)^{-1}$	4 E-03	(mg/m3)-1	A	IRIS	10/18/2004
Cadmium						**	IRIS	12/20/2004
Thallium						D	IRIS	7/17/2006
Iron						NA	IRIS	7/17/2005
Chromium (hex)						D	IRIS	10/18/2004
Antimony						NA	IRIS	7/17/2006
Manganese						D	IRIS	10/18/2004

A - Known Carcinogen
D = Not classifiable

IRIS - Integrated Risk Information System
HEAST = Health Effects Assessment Summary Table.
NA - not applicable
** Cadmium is classified as B1. However the IRIS file also notes that "Seven studies in rats and mice wherein cadmium salts (acetate, sulfate, chloride) were administered orally have shown no evidence of carcinogenic response.

TABLE 18
NON-CANCER TOXICITY SUMMARY TABLE
Peter Cooper Markhams Superfund Site, Dayton, New York

Pathways: Ingestion/Inhalation

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfD		Primary Target Organ	Combined Uncertainty/ Modifying Factors	Source	Date
		Value	Units				
Arsenic	Chronic	3.00E-04	mg/kg-day	Skin	3	IRIS	2/13/2003
Cadmium	Chronic	5.00E-04	mg/kg-day	**Kidney**	10	IRIS	10/18/2004
Thallium	Chronic	6.60E-05	mg/kg-day	**Blood**	3000	IRIS	10/18/2004
Iron *	Chronic	3.00E-01	mg/kg-day	NOAEL	1	STSC	7/1/2006
Chromium (hex)	Chronic	3.00E-03	mg/kg-day	**None reported**	900	IRIS	10/18/2004
Antimony	Chronic	4.00E-04	mg/kg-day	**Blood**	1000	IRIS	10/18/2004
Manganese	Chronic	2.40E-02	mg/kg-day	**CNS**	1	IRIS	10/18/2004

* This chemical is currently under review through the EPA Superfund Technical Support Center. As a result of this review process the value may change.

TABLE 19

PETER COOPER MARKHAMS SITE

Constituents of Concern

Media	Constituents of Concern [1]	Range of Detected Concentrations [2]
Waste Fill Piles	Arsenic Chromium Hexavalent Chromium Zinc	7.1 – 65.6 mg/kg 4,490 – 46,000 mg/kg 4.7 mg/kg 408 – 900 mg/kg
Shallow Overburden Groundwater	Hexavalent Chromium Manganese Iron	<10 – 14 µg/L 33 – 15,000 µg/L 218 – 11,100 µg/L
Deep Overburden Groundwater	Hexavalent Chromium Manganese Iron	10 – 321 µg/L [3] 72 – 2330 µg/L 413 – 15,500 µg/L

Notes:

1. For ease of discussion, the term "constituents of concern" (COCs) has been applied to both waste fill and groundwater media.

2. Range of detected concentrations does not include analytical results for MW-2S from Nov. 2001.

3. Concentration of 321 ug/L was detected in MW-5D in Nov. 2001 but was flagged by laboratory as estimated and its presence was not confirmed during Apr. 2002 sampling event.

TABLE 20
POTENTIAL ARARs AND TBCs
PETER COOPER MARKHAMS SITE

Standard, Requirement, Criteria or Limitation	Citation or Reference	Description/Comments
Surface Water and Groundwater:		
RCRA Groundwater Protection Standards and Maximum Concentration Limits	40 CFR 264, Subpart F	Establishes criteria for groundwater consumption. Groundwater is/will not be used for potable purposes. Potentially relevant for off-site groundwater quality.
NYSDEC Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations	6NYCRR Parts 701- 703	Establishes groundwater and surface water quality criteria. Applicable to existing surface water quality, off-site groundwater quality, and runoff/ groundwater migration. Establishes criteria for groundwater consumption.
NY Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations	TOGS 1.1.1, June 1998 (April 2000 addendum)	Compilation of ambient water quality standards and guidance values. To be considered for off-site groundwater quality.
Clean Water Act, National Pretreatment Standards	40 CFR 403.5	General pretreatment regulations for discharge to POTWs – potentially applicable for alternatives involving discharges to sanitary sewer.
Air:		
New York State Air Quality Classifications and Standards	6NYCRR Parts 256 and 257	Establishes air quality standards protective of public health. Potentially applicable to disruptive activities.
National Primary and Secondary Ambient Air Quality Standards (NAAQS)	40 CFR Part 50	Establishes primary and secondary ambient air quality standards to protect public health and welfare. Potentially applicable to disruptive activities.
National Emission Standards for Hazardous Air Pollutants (NESHAPs)	40 CFR Part 61	Standards by which owners/operators emitting HAPs must abide. Potentially applicable to alternatives involving air emissions.
Clean Air Act Section 101, Approval and Promulgation of Implementation Plan	40 CFR Parts 52	Requires development of a fugitive and odor emission control plan for implementation during excavation and consolidation actions. Potentially applicable to waste fill remediation alternatives.
NYSDEC Guidance for Fugitive Dust Suppression and Particulate Monitoring at Inactive Hazardous Waste Sites.	NYSDEC TAGM 4031	Establishes guidance for community air monitoring and controls to monitor and mitigate fugitive dusts during intrusive activities at NY State inactive hazardous waste sites – to be considered for disruptive activities.

TABLE 20
POTENTIAL ARARs AND TBCs
PETER COOPER MARKHAMS SITE

Standard, Requirement, Criteria or Limitation	Citation or Reference	Description/Comments
Air (continued):		
NY State Air Regulations – General Provisions and General Prohibitions	6NYCRR Parts 200 and 211	Part 201 requires owners of sources to restrict emissions. Part 211 prohibits air emissions that are injurious to humans, plants, animals or property, or which unreasonably interfere with the comfortable enjoyment of life or property. Potentially applicable to alts. involving air emissions.
NY State Air Permits and Certifications	6NYCRR Part 201	Requires owners and/or operators of air contamination sources to obtain a permit or registration certificate. Potentially applicable to alternatives involving air emissions.
NYSDEC Division of Air Resources - Guidelines for the Control of Toxic Ambient Air Contaminants	NYSDEC DAR-1, December 2003 (formerly Air Guide 1)	Establishes process emissions guidance limits based on assumed diffusion rates and inhalation by downwind receptor. To be considered for remedial activities having process emissions.
OSHA General Industry Air Contaminants Standard	29 CFR 1910.1000	Establishes Permissible Exposure Limits for workers exposed to airborne contaminants. Applicable to disruptive activities.
Soil and Sediment:		
NYSDEC Determination of Soil Cleanup Objectives and Cleanup Levels	NYSDEC TAGM HWR-94-4046, January 1994 and Dec. 2000 Addendum	Establishes residential soil cleanup goals based on human health criteria, background levels, and groundwater protection. To be considered for site soils.
NYSDEC Inactive Hazardous Waste Disposal Sites	6NYCRR Part 375	Establishes procedures for inactive hazardous waste disposal site identification, classification, and investigation activities, as well as remedy selection and interim remedial actions. To be considered for waste fill.
USEPA Soil Screening Guidance	Technical Background Document and Users Guide, May 1996 revisions	Presents a framework for developing risk-based, soil screening levels for protection of human health. Provides a tiered approach to site evaluation and screening level development for NPL sites. To be considered for site soils.

TABLE 20
POTENTIAL ARARs AND TBCs
PETER COOPER MARKHAMS SITE

Standard, Requirement, Criteria or Limitation	Citation or Reference	Description/Comments
Soil and Sediment (continued):		
USEPA Preliminary Remediation Goals	USEPA Region IX, October 2002, Updated per EPA Toxicity Guidance Memo of 12/12/04	Presents residential and non-residential soil cleanup goals based on human health criteria and groundwater protection. To be considered for site soils.
NYSDEC Technical Guidance for Screening Contaminated Sediment	NYSDEC, January 1999	Presents preliminary sediment screening criteria for consideration against further ecological assessment. To be considered for site sediments.
Solid, Hazardous, and Non-Hazardous Waste:		
NY State Solid Waste Management Facility Regulations	6NYCRR Part 360	Establishes procedures for constructing, monitoring, and closing regulated solid waste management facilities. Also establishes beneficial use criteria for solid waste materials.
NYSDEC Inactive Hazardous Waste Disposal Sites	6NYCRR Part 375	Establishes procedures for inactive hazardous waste disposal site identification, classification, and investigation activities, as well as remedy selection and interim remedial actions. To be considered for waste fill piles.
NY State Solid Waste Transfer Permits	6NYCRR Part 364	Establishes procedures to protect the environment from mishandling and mismanagement of all regulated waste transported from a site of generation to the site of ultimate treatment, storage, or disposal. Potentially applicable for alternatives involving off-site disposal.
Criteria for Municipal Solid Waste Landfills	40 CFR Part 258	Establishes minimum national criteria under the RCRA for all municipal solid waste landfill (MSWLF) units and under the Clean Water Act for solid waste landfills that are used to dispose of sewage sludge. Potentially applicable for waste fill piles.
NYSDEC Land Disposal Restrictions	6NYCRR Part 376	Identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may be land disposed. Potentially relevant to disposal alternatives for waste fill.

TABLE 20
POTENTIAL ARARs AND TBCs
PETER COOPER MARKHAMS SITE

Standard, Requirement, Criteria or Limitation	Citation or Reference	Description/Comments
Solid, Hazardous, and Non-Hazardous Waste (continued):		
NYSDEC Guidelines for the Selection of Remedial Actions at Inactive Hazardous Waste Sites	TAGM HWR-90-4030, May 1990	Establishes procedures for evaluating remedial alternatives at listed inactive hazardous waste sites undergoing remediation. To beconsidered.
Proposed Requirements for Hybrid Closures	52 Federal Register 8711	Combined waste-in-place and clean closures – to be considered.
DOT Rules for Hazardous Materials Transport	(49 CFR 107, 171.1 - 171.5).	Establishes requirements for shipping of hazardous materials. Potentially applicable for alternatives involving off-site disposal.
Occupational Safety and Health Act (29 USC 651 et seq.)	29 CFR Part 1910 and 1926	Describes procedures for maintaining worker safety. Applicable to site construction activities.
New York State Environmental Conservation Law	NYSECL 27-1318	Provides requirement for institutional controls and/or engineering controls as components of a remedial work plan.
Other:		
USEPA Health Effects Assessment Summary Tables (HEAST)	Risk Assessment Publication Developed by the Radiation Protection Program, April 2001	Radionuclides tables for estimating cancer risks at sites managed under CERCLA.
USEPA Integrated Risk Information System (IRIS)	www.epa.gov/iris	Database of human health effects that may result from exposure to various substances found in the environment.
Executive Order 11990, Protection of Wetlands	40 CFR Part 6, Appendix A	Requires evaluation of actions to minimize the destruction, loss, or degradation of wetlands. Potentially applicable to remedial alternatives involving construction near wetland areas.
Wetlands Permit Regulations	40 CFR Part 232	Potentially relevant and appropriate to remedial alternatives involving construction near wetland areas.
National Historic Preservation Act	16 CFR Part 470	Requires avoiding impacts on cultural resources having historical significance. Potentially applicable to remedial alternatives involving construction.

TABLE 20
POTENTIAL ARARs AND TBCs
PETER COOPER MARKHAMS SITE

Standard, Requirement, Criteria or Limitation	Citation or Reference	Description/Comments
Other (continued):		
Endangered Species Act	50 CFR Part 402	Actions must not threaten the continued existence of a listed species nor destroy critical habitat. Potentially applicable to remedial alternatives involving construction.
Freshwater Wetlands Act (ECL Article 24 and Article 71, Title 23)	6NYCRR Part 662-665	Requires evaluation of actions to preserve, protect, and conserve freshwater wetlands to prevent the despoliation and destruction of freshwater wetlands, and to regulate use and development of such wetlands to secure the natural benefits of freshwater wetlands. Potentially applicable to remedial alternatives involving construction near wetland areas.
Endangered and Threatened Species of Fish and Wildlife	6NYCRR Part 182	Requires evaluation of actions to conserve endangered or threatened species. Potentially applicable to alternatives involving changes in site cover or topography.
CERCLA/SARA/NCP	(40 CFR Part 300)	Provides foundation for federal hazardous waste/hazardous material regulations. Applicable to remedial alternative selection.
USEPA Policy on Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites	OSWER Directive 9200.4-17p, April 1999	Clarifies USEPA's policy regarding the use of monitored natural attenuation for the cleanup of contaminated soil and groundwater. To be considered.

Table 21

Cost Estimate - Alternative 4, Selected Alternative
Peter Cooper Markhams Site

Item	Quantity	Units	Unit Cost	Total Cost
Contractor Mobilization/Demobilization	1	LS	$ 25,000.00	$ 25,000
12' W Crushed Stone Access Road Reconstruct	1300	LF	$ 12.00	$ 15,600
Health and Safety/Community Air Monitoring	1	LS	$ 20,000.00	$ 20,000
Subtotal:				**$ 60,600**
Institutional Controls				
Deed Restrictions (groundwater)[1]	1	LS	$ 6,500.00	$ 6,500
Subtotal:				**$ 6,500**
Low-Permeability Soil Cover				
Clearing/Grubbing	12	Acre	$ 3,000.00	$ 36,000
On-Site Consolidation (incl. trucking, place & compact)	17214	CY	$ 5.00	$ 86,071
4" Perforated Gas Vents (1/acre)	120	LF	$ 50.00	$ 6,000
18" Low-Permeability Soil ($1x10^{-6}$ cm/s)	19360	CY	$ 20.00	$ 387,200
6" Topsoil	6453	CY	$ 25.00	$ 161,333
Seeding[2]	12	Acre	$ 2,500.00	$ 30,000
Subtotal:				**$ 706,605**
Subtotal Capital Cost				**$ 773,705**
Engineering/Contingency (35%)				**$ 268,522**
Total Capital Cost	Table 23			**$ 1,042,226**

Annual Operation Maintenance & Monitoring (OM&M):				
Groundwater Sampling / Reporting	2	Event	$ 5,500.00	$ 11,000
Site Maintenance / Mowing	2	Yr	$ 1,500.00	$ 3,000
CERCLA 5-Year Review[3]	1	Lump Sum	$ 1,000.00	$ 1,000
Total Annual OM&M Cost				**$ 15,000**
Number of Years (n):				30
Interest Rate (I):				5%
p/A Value:				15.3725
OM&M Present Worth (PW):				**$ 230,588**

Total Present Worth (PW): Capital Cost + OM&M PW	**$ 1,272,814**

Notes:
1. Deed restrictions are not included in Engineering/Contingency costs.
2. Includes seeding of areas cleared following consolidation
3. Annual cost represents 1/5 of 5-year review cost

PETER COOPER MARKHAMS SUPERFUND SITE
RECORD OF DECISION

APPENDIX III

ADMINISTRATIVE RECORD INDEX

PETER COOPER (MARKHAMS) SUPERFUND SITE
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.3 Work Plans

P. 300001 - 300295 Report: Remedial Investigation/Feasibility Study Work Plan, Peter Cooper Markhams Site, Dayton, NY, prepared by Benchmark Environmental Engineering & Science, PLLC, and Geomatrix Consultants, Inc., prepared for U. S. EPA Region 2, February 2001, revised September 2001.

P. 300296 - 300705 Report: Quality Assurance Project Plan for Remedial Investigation/Feasibility Study, Peter Cooper Markhams Site, Dayton, NY, prepared by Benchmark Environmental Engineering & Science, PLLC, and Geomatrix Consultants, Inc., prepared for U. S. EPA Region 2, February 2001, revised September 2001.

7.0 ENFORCEMENT

7.3 Administrative Orders

P. 700001 - 700045 United States Environmental Protection Agency Administrative Order for Remedial Investigation/ Feasibility Study, In the Matter of the Peter Cooper (Markhams) Superfund Site, Albert Trostel & Sons Co; Badger State Tanning Co.; Blackhawk Leather Ltd.; Brown Group, Inc.; Garden State Tanning, Inc.; Irving Tanning Company; Prime Tanning Company, Inc.; S. B. Foot Tanning Company; Seton Company; Viad Corp.; Wilhelm Enterprises Corporation, Respondents, Proceeding under Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §9606(a), Index No. CERCLA-02-2000-2033, September 27, 2000.

PETER COOPER (MARKHAMS) SUPERFUND SITE
ADMINISTRATIVE RECORD FILE UPDATE #2
INDEX OF DOCUMENTS*

3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P. 300706 - 300842 Report: Remedial Investigation Report, Volume I of II - Text, Tables, Plate, and Figures, Peter Cooper Markhams Site, Dayton, New York, prepared by Geomatrix Consultants in association with Benchmark Environmental Engineering & Science, PLLC, February 2005, Revised and Submitted as Final, July 2006.

P. 300843 - 301206 Report: Remedial Investigation Report, Volume II of II - Appendices, Peter Cooper Markhams Site, Dayton, New York, prepared by Geomatrix Consultants in association with Benchmark Environmental Engineering & Science, PLLC, February 2005, Revised and Submitted as Final, July 2006.

P. 301207 - 301209 Remedial Investigation Report Addendum: Letter to Mr. Tom Forbes, P.E., Benchmark Environmental Engineering & Science, from Mr. Kevin Lynch, Section Chief, Western New York Remediation Section, re: Addendum to the Remedial Investigation Report, Peter Cooper Markhams Site, Dayton, New York, July 28, 2006.

* Data are summarized in several of these documents. The actual data, QA/QC, chain of custody, etc. are compiled at various EPA offices and can be made available at the record repository upon request. Bibliographies in the documents and in the references cited in this Record of Decision are incorporated by reference in the Administrative Record. Many of these documents referenced in the bibliographies are publically available and readily accessible. Most of the guidance documents referenced in the bibliographies are available on the EPA website (www.epa.gov). If copies of the documents cannot be located contact the EPA Project Manager (Sherrel Henry at (212) 637-4273). Copies of the administrative record documents that are not available in the administrative record repository files at the Town of Dayton, Town Building can be made available at this location upon request.

P. 301210 - 301511 Report: Baseline Human Health Risk Assessment, Peter Cooper Markhams Site, Town of Dayton, New York, prepared by Geomatrix Consultants, Inc., Benchmark Environmental Engineering & Science, PLLC, July 2006.

P. 301512 - 301745 Report: Screening Level Ecological Risk Assessment for Peter Cooper Markhams Site, prepared by Environmental Risk Group, Benchmark Environmental Engineering & Science, PLLC, August 2006.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - 400231 Report: Feasibility Study Report, Peter Cooper Markhams Site, Dayton, New York, prepared by Benchmark Environmental Engineering & Science, PLLC, July 2006.

8.0 HEALTH ASSESSMENTS

8.1 ATSDR Health Assessments

P. 800001 - 800024 Report: Public Health Assessment, Peter Cooper-Markhams, Dayton, Cattaraugus County, New York, EPA Facility ID; NYD980592547, prepared by New York State Department of Health Under the Cooperative Agreement with the Agency for Toxic Substances and Disease Registry, August 26, 2002.

PETER COOPER (MARKHAMS) SUPERFUND SITE
ADMINISTRATIVE RECORD FILE UPDATE #3
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P. 301746 - 301818 Report: Site Health and Safety Plan for Remedial Investigation Activities, Peter Cooper Markhams Site, Dayton, NY, prepared by Benchmark Environmental Engineering & Science, PLLC, January 2001.

P. 301819 - 301925 Report: Pathway Analysis Report, Peter Cooper Markhams Site, Town of Dayton, New York, prepared by Geomatrix Consultants, Inc., Benchmark Environmental Engineering and Science, PLLC, August 2002.

10.0 PUBLIC PARTICIPATION

10.2 Community Relations Plans

P. 10.00001- 10.00036 Report: Community Involvement Plan, Peter Cooper Corporation (Markhams) Superfund Site, Town of Dayton, Cattaraugus County, New York, prepared by Ecology and Environment, Inc., prepared for U.S. EPA, Region 2, May 2002.

PETER COOPER MARKHAMS SUPERFUND SITE
RECORD OF DECISION

APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, 12th Floor
625 Broadway, Albany, New York 12233-7011
Phone: (518) 402-9706 • **FAX:** (518) 402-9020
Website: www.dec.state.ny.us

Denise M. Sheehan
Commissioner

SEP 28 2006

Mr. George Pavlou
Director
Emergency and Remedial Response Division
U. S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, NY 10007-1866

Re: Peter Cooper Markhams Site No. 905003B
Dayton, Cattaraugus County

Dear Mr. Pavlou:

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the September 2006 Amendment to the Record of Decision (ROD) for the Peter Cooper Markhams site. The ROD is acceptable to NYSDEC and we concur with the remedy described in the ROD.

If you have any questions or concerns, please contact Martin Doster at (716) 851-7220.

Sincerely,

Dale A. Desnoyers
Director
Division of Environmental Remediation

c: C. O'Connor, NYSDOH
R. Fedigan, NYSDOH
E. Wohlers, CCHD

500088

PETER COOPER MARKHAMS SUPERFUND SITE
ROD

APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
FOR THE PETER COOPER MARKHAMS SUPERFUND SITE
TOWN OF DAYTON, CATTARAUGUS COUNTY, NEW YORK

RESPONSIVENESS SUMMARY
FOR THE
PETER COOPER MARKHAMS SUPERFUND SITE
TOWN OF DAYTON, CATTARAUGUS COUNTY, NEW YORK

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the Peter Cooper Markhams Superfund site (Site) remedial investigation and feasibility study (RI/FS) and Proposed Plan. This Summary provides the responses of the U.S. Environmental Protection Agency (EPA) to those comments and concerns. All comments summarized in this document have been considered in EPA's final decision in the selection of a remedy to address the contamination at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The RI and FS Reports describe the nature and extent of the contamination at and emanating from the Site and evaluate remedial alternatives to address this contamination. The Proposed Plan was prepared by EPA, with concurrence by the New York State Department of Environmental Conservation (NYSDEC), and finalized in August 2006. A notice of the Proposed Plan and commencement of the public comment period, the public meeting date, contact information, and the availability of above-referenced documents was published in *Dunkirk Observer* on August 11, 2006, consistent with the requirements of National Oil and Hazardous Substances Pollution Contingency Plan (NCP) §300.430(f)(3)(i)(A).

A copy of the Proposed Plan was mailed to all persons on the Site mailing list. The public notice established a thirty-day comment period from August 11, 2006 through September 9, 2006. The RI and FS Reports, Proposed Plan, and supporting documents were made available to the public in both the Administrative Record and information repositories maintained at the EPA Docket Room in the Region 2 offices at 290 Broadway in Manhattan, and at the Town of Dayton Town Building located at 9100 Route 62 in South Dayton, New York.

EPA held a public meeting on August 22, 2006 at the Fireman's Activity Hall on Maple Street in South Dayton, New York to present the findings of the RI/FS, discuss the proposed remedial action, and to answer questions from the public about the Site and the remedial alternatives under consideration. The purpose of the meeting was to inform local officials and interested citizens about the Superfund process, to discuss the Proposed Plan, to receive comments on the Proposed Plan, and to respond to questions from area residents and other interested parties. Responses to the written comments received during the public comment period and to comments received at the public meeting are included in this Responsiveness Summary.

SUMMARY OF COMMENTS AND EPA'S RESPONSES

A summary of the comments presented at the public meeting and in writing, as well as EPA's responses to them, are provided below. The comments and responses have been organized as follows:

A. Oral Comments Received at the August 22, 2006 Public Meeting concerning Site ownership and responsible parties, future uses of the Site property, implementation of the Selected Alternative, and extent of Site contamination.

B. Written Comments Received During the Comment Period

A. ORAL COMMENTS RECEIVED AT THE AUGUST 22, 2006 PUBLIC MEETING

Site Ownership and Potentially Responsible Parties (PRPs)

Comment #1: A citizen asked who are the current owners of the Site property.

EPA Response #1: The property is owned by the Peter Cooper Corporations, namely, Rousselot Gelatin Corporation, and its parent, Rousselot, S.A. of Paris, France. These companies purchased the property in 1976 as part of an assets purchase from the former Peter Cooper Corporation (PCC). The assets purchased included the right to the use of the PCC name, and Rousselot changed its name to PCC in 1976. PCC was dissolved in 1996. Under New York law, a dissolved corporation such as PCC can remain as the property owner. PCC, therefore, remains the property owner, but the property, for all practical purposes, is effectively abandoned.

Comment #2: A citizen stated that the County removed the property from its tax role and is not collecting any taxes and wanted to know why the County doesn't take the property.

EPA Response #2: This comment can best be addressed by the County.

Comment #3: A citizen stated that there is a sign at the Site entrance with the name Deter Environmental and wanted to know how they are involved with the Site.

EPA Response #3: A natural gas wellhead is located north of the fill piles areas and is owned by Deter Environmental. Deter Environmental has no involvement with the Site.

Comment #4: A citizen asked why there are no signs posted at the property and what are the property boundaries.

EPA Response #4: The Site property is remotely located approximately one-quarter mile down an access road off Bentley Road. EPA evaluated potential risks to current trespassers on the Site property and determined that the risks did not exceed EPA's risk range. The primary risks at the

Site were from the ingestion of contaminated groundwater by the future site worker and exposures to the future construction worker. For these reasons, no signs were posted. During remedial construction, EPA intends to post signage identifying Superfund remediation activities.

The Site encompasses approximately 103 acres and is bordered to the northwest by Bentley Road, to the northeast by a wooded property and farm field, to the southeast by a railroad right-of-way, and to the southwest by hardwood forest. An approximately 5-foot high berm, which provides an elevated bed for the Buffalo and Jamestown Railroad Company (also known as Erie-Lackawanna Railroad) rail track, runs along the entire southeast border of the Site. A dirt access road extends to the fill area from Bentley Road and continues around a portion of the fill area perimeter. A chain is across the entrance to the Site to prevent unauthorized vehicular access.

Comment #5: A citizen asked how many potentially responsible parties (PRPs) are there at the Site.

EPA Response #5: The Wilhelm Enterprises Corporation (WEC) is the renamed original Peter Cooper Corporation and is a PRP as the former owner/operator of the Site during periods of waste disposal. There are five generator PRPs who participated in implementation of the Remedial Investigation/Feasibility Study at the Site, Brown Group, Inc., Seton Company, GST Automotive Leather, Prime Tanning Company, Inc., and Viad Corp.

Future Site Use

Comment #6: A citizen asked what are the future plans and possible future uses of the Site.

EPA Response #6: Future plans for the Site would be dependent on what a future owner might envision limited by the current industrial zoning of the property. Use restrictions will be necessary on the seven acres that will contain the consolidated wastes. Environmental easements will be placed on the property to ensure that the groundwater at the Site is not used for any drinking or potable purposes and that no activities are conducted on the seven acres consolidated waste area that would disturb the cap that will be placed on that area. It is crucial that the cap stays intact. The cap has two purposes. The first is to prevent contact with the waste materials. The second is to reduce infiltration of rainfall into the waste material, thereby reducing the generation of leachate which mobilizes contaminants into the groundwater.

Comment #7: A citizen asked if the zoning of the Site property will change to ensure that the Site is not used in the future.

EPA Response #7: The Site property has been zoned and used for industrial purposes for the last one hundred years. It is not anticipated that the zoning will change. However, these land use decisions are governed by the local authorities and not by the federal government.

Future uses of the Site will be restricted by environmental easements and/or restrictive covenants to preclude the extraction of groundwater for drinking or potable purposes (unless groundwater

quality standards are met) or activities (such as digging or excavation) that would result in disturbance of the cap on the seven-acre consolidated waste area. Other uses of the 103-acre property that would not entail extraction of groundwater or disturbance of the seven-acre consolidated waste fill area would not be restricted (although there may be additional restrictions on wetland areas). EPA's Superfund Redevelopment Program encourages the return of hazardous waste sites to safe and productive uses. While remediating Superfund sites and assuring that they are protective of human health and the environment, EPA works with communities and other partners to consider future use opportunities and integrate appropriate reuse options into the remedial process.

Extent of Site Contamination

Comment #8: A citizen asked if groundwater samples were taken off-site and if so, was any contamination found.

EPA Response #8: As part of the remedial investigation conducted by the PRPs at the Site with EPA oversight, groundwater samples were only taken from wells on the Site property. The contamination found was limited to an area very near to the waste piles. Based on these results, since groundwater contamination was determined to be localized and contained on the Site, additional sampling was not conducted off-site.

However, in response to the community's request, EPA sampled two private wells located downgradient and 1/4 mile west of the Site. No Site-related contaminants were detected in these wells.

Comment #9: The citizen indicated that he lived on Bentley Road and asked if contaminated groundwater was moving toward his property, possibly via a channel that runs along the train tracks.

EPA Response #9: While the property in question is downgradient from the Site, the results of the remedial investigation indicated that groundwater contamination is localized on Site in the area of the waste piles. Also, as indicated in EPA's response to the preceding comment, the two closest private wells located downgradient of the Site were sampled by EPA and no Site-related contaminants were detected in these wells.

Comment #10: The resident from Bentley Road noted seeing oil in ditches on his property and asked if samples were taken on his property.

EPA Response #10: During a remedial investigation, sampling begins at the suspected source of the contamination and continues outward to determine how far the contamination extends. Once sampling results no longer show contamination, no additional samples are taken farther from the source. No samples were taken from the resident's property as it is beyond the area of contamination. Site groundwater and soil samples were tested for petroleum products and none

were detected. Therefore, the source of the oil in the ditches would not be believed to be associated with the Site.

Implementation of Recommended Alternative

Comment #11: A citizen stated that the preferred alternative did not include a liner beneath the fill pile and asked about the possibility of leachate generation.

EPA Response #11: The waste piles will be consolidated and capped without adding a liner or other material. During the Remedial Investigation, no seeps or significant erosional features were observed on the fill piles. The proposed landfill cap will utilize low permeability material designed to reduce infiltration of rainfall into waste material, thereby reducing the generation of leachate which mobilizes contaminants into the groundwater.

Comment #12: Two citizens asked who will pay to implement the remediation of the Site and how long will it take.

EPA Response #12: It is EPA's policy to have the parties responsible for the contamination pay for site remediation. Following the issuance of the Record of Decision, EPA typically sends special notice letters to the PRPs and invokes a 120-day period established by the Superfund law for EPA to negotiate with PRPs to conduct site remediation. At the end of the 120-day period, if no agreement is reached, then EPA has the following options:

> EPA may decide to perform the remedy utilizing funds from the Superfund and then pursue a Section 107 cost recovery claim against the PRPs; or
>
> EPA may issue a Unilateral Administrative Order to the PRPs under Section 106(a) of CERCLA directing the PRPs to implement the remedy.

The time frames for site remediation activities will vary based on a number of factors including the response from the PRPs. Given the nature of the remedy, typical time frames for site remediation would include six months for negotiation with PRPs, 1.5 years to prepare the remedial design, and one year for construction activities. These time frames tally to about three years to implement the remediation.

B. WRITTEN COMMENTS RECEIVED DURING THE COMMENT PERIOD.

The following comments are from the Cooperating PRP Group submitted in a letter to EPA dated September 8, 2006.

Comment #13: Human health and ecological risk assessments would not support a decision to install a cover system at the high end of the soil range (12 inches of top soil and 24 inches of low permeability soil) listed in Alternative 4. A less costly cover comprised of 6 inches of top soil and 18 inches of low permeability ($1 X10^{-6}$) cover soil was the basis of the estimated cost for this alternative ($1.3 million) in the Feasibility Study. This cover would be more than adequate from a human health, ecological risk, or cost perspective.

EPA Response #13: Remedial actions under CERCLA must comply with Applicable or Relevant and Appropriate Requirements (ARARs). New York Code Rules Regulations (NYCRR) Part 360 regulations for landfill closure is an ARAR for the Site. Therefore, the cover system must include certain components to meet these standards. The details of the cover systems will be established during the design of the remedial action.

Comment #14: The provisions of 6NYCRR Part 360-1.7(a)(3)(viii)(d) which provide that: "final cover requirements for landfills with an approved closure plan that have ceased to accept waste before October 9, 1993 must meet the closure and post-closure requirements of the regulations in effect the day the closure plan was approved." Since there were no regulations governing closure or post-closure requirements in effect at the time of the landfill closure in 1972, the closure of the landfill at the Site in accordance with a court order implemented subject to the supervision of the NYSDEC satisfied these regulatory requirements. Accordingly, no closure or post-closure requirements are necessary to satisfy the NYCRR Part 360 regulations and only requirements of the 1972 closure plan are applicable to this Site.

EPA Response #14: The provisions of 6NYCRR Part 360-1.7(a)(3)(viii)(d) are clearly inapplicable to the Site by the very language of the provision which requires that the proposed "grandfathered" closure would have been in compliance with the regulations in effect the day the closure plan was approved. In the instant case, there was no approval of a closure plan pursuant to regulations in effect at the time of closure, since there simply were no regulations in effect at the time addressing such landfill closures. NYSDEC supervision of the landfill closure pursuant to a court order does not satisfy the prerequisites of 6NYCRR Part 360-1.7(a)(3)(viii)(d) which was intended to address closure of solid waste landfills that were effectuated under pre-1993 regulatory provisions for closure of solid waste landfills. These provisions were not intended to relate back to 1972 when no such regulations existed.

The provisions of 6NYCRR Part 360-1.7(a)(3)(viii)(d) also were never intended to address CERCLA or Inactive Hazardous Waste (IHW) Sites. The Site is currently classified as a Class 2 Site on the New York State Registry of IHW Sites. IHW sites are those sites which are determined by the NYSDEC to present a significant threat to the public health or the environment and are subject to requirements established under the Environmental Conservation Law (ECL) Article 27, Title 13 and regulated under 6 NYCRR Part 375. Part 375 establishes different and additional requirements than those set forth in Part 360. NYSDEC, accordingly, does not apply the provisions of 6NYCRR Part 360-1.7(a)(3)(viii)(d) to the closure of CERCLA and IHW sites. In fact, NYSDEC deems these provisions inapplicable when additional work beyond an approved closure plan is required at any site, not just CERCLA or IHW sites. If a CERCLA/IHW site, however, does not contain "categorical" or "listed wastes" as defined in the federal Resource Conservation and Recovery Act or the ECL, the provisions of Part 360 may be deemed "relevant and appropriate" for use at such sites, even though it would not be deemed "applicable" to the CERCLA/IHW site. Accordingly, Part 360 has been identified by EPA as being "relevant and appropriate" to the Site.

Furthermore, remedial actions under CERCLA must attain ARARS identified at the time of ROD signature [40 CFR §300.430(f)(1)(ii)(B); see Fed. Reg. 8757-58 (March 8, 1990)]. Notwithstanding the nature of any closure of the landfill in the 1970's and the facts that the landfill was not properly maintained and the cap was allowed to erode, the above-cited provision in the NCP leads inexorably to the conclusion that the current requirements of Part 360 are relevant and appropriate to the conditions at the Site.

RESPONSIVENESS SUMMARY

APPENDIX V-a

PROPOSED PLAN

Peter Cooper Markhams Superfund Site

Cattaraugus County, New York

EPA

Region 2

August 2006

PURPOSE OF PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the contaminated soil and groundwater at the Peter Cooper Markhams Superfund site (Site), and identifies the preferred remedy with the rationale for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the contamination at the Site and the alternatives summarized in this Proposed Plan are described in the June 2006 remedial investigation (RI) report and July 2006 feasibility study (FS) report, respectively. EPA and NYSDEC encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site.

This Proposed Plan is being provided as a supplement to the FS report to inform the public of EPA and NYSDEC's preferred remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated. EPA's preferred remedy consists of consolidating and capping waste piles to prevent exposures to the waste. Capping would prevent direct contact and reduce infiltration, thereby reducing the generation of leachate which mobilizes contaminants into the groundwater. EPA would rely on institutional controls to limit groundwater use at the Site. Institutional controls would also be established to prevent disturbance of the cap.

The remedy described in this Proposed Plan is the preferred remedy for the Site. Changes to the preferred remedy, or a change from the preferred remedy to another remedy, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered in this Proposed Plan and in the detailed analysis section of the FS report because EPA and NYSDEC may select a remedy other than the preferred remedy.

MARK YOUR CALENDAR

August 11, 2006 - September 9, 2006: Public comment period on the Proposed Plan.

August 22, 2006 at 6:30 p.m.: Public Meeting at the Fireman's Activity Hall, Maple Street, South Dayton, New York 14138

COMMUNITY ROLE IN SELECTION PROCESS

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and FS reports and this Proposed Plan have been made available to the public for a public comment period which begins on August 11, 2006 and concludes on September 9, 2006.

A public meeting will be held during the public comment period at the Fireman's Activity Hall on August 22, 2006 at 6:30 p.m. to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedy, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy.

INFORMATION REPOSITORIES

Copies of the Proposed Plan and supporting documentation are available at the following information repositories:

Town of Dayton
Town Building
9100 Route 62
South Dayton, New York 14138
(716)532-9449

Hours: Monday, Tuesday and Thursday:
8:00 a.m.- 12:30 p.m
Friday: 1:00 p.m. - 4:00 p.m.

USEPA-Region II
Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308

Hours: Monday - Friday
9:00 A.M. - 5:00 P.M.

Written comments on this Proposed Plan should be addressed to:

Sherrel Henry
Remedial Project Manager
New York Remediation Branch
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866

Telefax: (212) 637-3966
Internet: henry.sherrel@epa.gov

SCOPE AND ROLE OF ACTION

The primary objectives of this action are to remediate the sources of contamination at the Site, reduce and minimize the downward migration of contaminants to the groundwater, control landfill gas, and minimize any potential future health and environmental impacts from exposure to the waste.

SITE BACKGROUND

Site Description

The Peter Cooper Markhams Superfund Site (the Site), is located off Bentley Road approximately 6 miles south of the Village of Gowanda in the Town of Dayton, Cattaraugus County, New York. The Site is approximately 103 acres in size and is bordered to the northwest by Bentley Road, to the northeast by a wooded property and farm field, to the southeast by a railroad right-of-way, and to the southwest by hardwood forest. Site access is restricted by a locked cable gate at the Bentley Road entrance. Surrounding property is entirely rural, consisting of small farm fields, open meadow, and forests.

The majority of the Site is characterized by mature hardwood tree cover, as well as open fields. A portion of the Site contains several covered/vegetated fill piles arranged in an elliptical pattern. The fill piles vary in size and elevation, with base dimensions ranging from approximately 1,100 - 160,000 square feet and elevations of 5 to 15 feet above surrounding grade. The total area covered by fill piles (base area) is approximately 7 acres.

No structures are present on the property, with the exception of a natural gas wellhead located east of the access drive. Figure 1 shows the Site area.

Site History

The Site was used for the disposal of wastes remaining after the manufacturing process from a former animal glue and adhesives plant located in Gowanda, New York. This waste, known as "cookhouse sludge" because of a cooking cycle that occurred just prior to extraction of the glue, is derived primarily from chrome-tanned hides obtained from tanneries. Vacuum filter sludge produced during dewatering of cookhouse sludge was also disposed at the Site. The waste material has been shown to contain elevated levels of chromium, arsenic, zinc, and several organic compounds.

Peter Cooper Corporations (PCC) reportedly purchased the Site in 1955. PCC sold the Site in 1976 to a foreign company that was subsequently renamed Peter Cooper Corporation. From approximately 1955 until September 1971, it was reported that approximately 9,600 tons of waste material from the Gowanda plant were placed at the Site over an approximately 15-acre area.

Pursuant to a New York State Supreme Court Order (8th J.D. Cattaraugus County) dated June 1971, PCC transferred approximately 38,600 additional tons of waste materials from the Gowanda Landfill to the Site.

Previous Investigations

The NYSDEC completed preliminary Site Investigations in 1983 and 1985 and identified the presence of arsenic, chromium and zinc in soil samples. The results of these investigations are available in Appendix A of the 2006 RI.

In 1986, pursuant to a Consent Order with NYSDEC, PCC commissioned O'Brien & Gere Engineers, Inc. (OBG) to perform a Remedial Investigation and Feasibility Study (RI/FS) at the Site. In conjunction with the 1989 OBG RI, interim remedial measures were performed in 1989 to remove a number of buried containers that had been disposed within an isolated area of the Site . The containers held off-specification animal glue and oil. The containers and impacted soils were excavated and transported off-site for disposal.

The 1989 OBG RI indicated the presence of total chromium, hexavalent chromium and arsenic above background levels in waste materials and some adjacent soils. Low levels of these contaminants were also detected in groundwater wells installed immediately adjacent to the fill piles. None of the samples tested exhibited hazardous waste (toxicity) characteristics. OBG completed a FS for the Site in March 1991. The FS recommended a remedial alternative involving consolidation, compaction, and covering of the waste materials.

However, because the waste at the Site did not meet the statutory definition in effect at the time in New York State for an inactive hazardous waste disposal site, NYSDEC could not use State funds to implement a remedial program. Consequently, the NYSDEC removed the site from its Registry of Inactive Hazardous Waste Disposal Sites.

In 1993, EPA conducted a Site Sampling Inspection, which included the collection and analysis of soil and surface water samples from the Site. Chromium and arsenic were detected in soils above background concentrations within the waste piles.

Based on the above information, the Site was added to the EPA's National Priorities List (NPL) on February 3, 2000. On September 29, 2000, USEPA issued a Unilateral Administrative Order (UAO) to several potentially responsible parties (PRPs) to perform the RI/FS for the Site. The RI/FS was performed by Benchmark Environmental Engineering and Science, PLLC and Geomatrix Consultants, Inc, consultants for the PRPs, subject to EPA oversight.

Site Geology

The Site is located on glacial sediments deposited in pre-glacial Conewango Lake. Two distinct types of fill material have been disposed of at the Site: a waste-fill material consisting of dewatered sludge, silt, sand and gravel, and a non-waste fill, consisting of native soil mixed with occasional debris from building construction (i.e.. shingles, concrete, plastic, etc.). Fill materials are generally unsaturated and cover the glacially-derived soils. The thickness of the fill material ranges from approximately 2 to 15 feet.

The overburden thickness at the Site is reported to be approximately 440 feet based on the well log for the gas well located near the entrance road to the Site. Native glacially derived materials consist of a glacial outwash unit, and a lacustrine (lake deposited) unit. The outwash deposits are continuous across the Site, and consist of poorly sorted fine to coarse sand and fine gravel. The outwash unit varies in thickness from 8 feet near the center of the Site to a maximum of 18 feet at the southwest corner of the Site. Lacustrine silt and fine sand are located below the outwash sand. The lacustrine deposits are locally stratified, and exhibit discontinuous, alternating layers of silt and clay suggesting periods of a deep water depositional environment.

Six, noncontiguous, distinct wetland areas were identified during the RI. The wetland areas are generally characterized by slightly lower topography with a thin layer (< 2 feet) of vegetative matter, detrital matter and peat.

Each of the larger wetland areas was assigned an alphabetic designation (Wetland A through F). Standing water is present seasonally (generally December through April months) in all of the wetland areas. Wetland B, located north of the fill piles, retains standing surface water longer than the other wetland areas on the Site. Wetland F, the largest wetland area on-Site, contains both wetland vegetation and large trees with high water demand (cottonwoods and poplars).

Hydrogeology

Groundwater monitoring well screens were installed in the outwash sand deposits and in the lacustrine fine sand and silt deposits at the Site.

Groundwater is present from approximately 1.5 feet below ground surface to over 14 feet deep and seasonally fluctuates within a five-foot range. Groundwater levels measured in the deep monitoring wells near the fill piles were generally lower than the shallow wells, indicating a slight downward vertical hydraulic gradient.

However, water levels measured in deep monitoring wells farther downgradient of the fill piles were generally higher than the shallow wells, indicating an upward vertical hydraulic gradient in the southwestern portion of the Site.

Groundwater flows generally in a southwesterly direction at the Site toward the locally significant groundwater discharge area, Wetland F. During periods of higher groundwater elevations, localized groundwater discharge also occurs to Wetland D. The upward vertical hydraulic gradients that exist below and downgradient of the fill piles indicate groundwater at the Site is strongly influenced by Wetland F and groundwater will ultimately flow toward Wetland F located southwest of the fill piles.

RESULTS OF THE REMEDIAL INVESTIGATION

The Remedial Investigation characterized the physical properties of the soil fill piles, soil around the perimeter of the fill piles (perimeter surface soils), native subsurface soils, wetland sediments, groundwater and soil gas as described below.

Chemical and physical data were collected to determine the nature and extent of contamination associated with the Site. Media sampled during the RI included: waste fill; surface and subsurface soil; groundwater; wetland surface water; wetland sediments; and soil vapor landfill gas. All field activities were conducted with oversight by EPA's contractor, TAMs Consultants, Inc., now known as Earth Tech. The constituent concentrations detected during this RI are generally consistent with the data from the 1989 RI. The results of the RI are summarized below.

Waste Fill

No seeps or significant erosional features were observed on the fill piles. Waste fill samples were collected from three borings. The three samples were analyzed for total metal constituents of potential concern (COPCs), identified as arsenic, total chromium, and hexavalent chromium. The COPCs were also analyzed utilizing the EPA Synthetic Precipitation Leaching Procedure (SPLP) to assess the leachability of the waste fill contaminants to the groundwater.

The metal COPCs detected at maximum concentration in the waste fill were arsenic (65.6 mg/kg), chromium (31,200 mg/kg), and hexavalent chromium (4.7 mg/kg).

The concentrations of pollutants in SPLP leachate can be measured and compared to groundwater quality criteria to determine if groundwater contamination is likely. The analysis of leachable metal COPCs detected the following maximum concentrations: arsenic (14.2 µg/L), chromium (1,010 µg/L), and hexavalent chromium (22.0 µg/L). The groundwater criterion for arsenic and total chromium are 25 ug/L and 50 ug/L, respectively. The data suggests the potential for impact to groundwater.

Soil Contamination

Surface and subsurface soil samples were collected at the Site. Surface soils samples were collected from the following three distinct locations: upgradient of the fill piles, surface of the fill piles, and areas adjacent to the fill piles. There are currently no federal or state promulgated standards for contaminant levels in soils. As a result, soil sampling data were compared to the New York State cleanup objectives defined in the Technical and Administrative Guidance Memorandum (TAGM)[1].

Site background (SB) surface soil samples were collected at six locations upgradient of the fill piles and analyzed for arsenic and chromium. Background concentrations ranged from nondetectable to 8.1 mg/kg for arsenic and 7.8 to 31.8 mg/kg for total chromium. TAGM soil cleanup objectives for arsenic and total chromium are 7.5 mg/kg or SB and 10 mg/kg or SB, respectively.

Nine surface soil samples were collected from the surface of the fill piles and analyzed for metal COPCs. Arsenic concentrations were detected in seven of the nine soil samples above the soil cleanup objective at a maximum concentration of 95.5 mg/kg. Total chromium was detected at all nine locations above the soil cleanup objective at a maximum concentration of 65,300 mg/kg.

A total of 48 discrete surface soil samples were collected adjacent to and downgradient from the waste fill piles and analyzed for metal COPCs. Arsenic concentrations were detected in 19 of the 48 soil samples above the soil cleanup objective at a maximum concentration of 55.1 mg/kg. Total chromium concentrations were detected in 42 of the 48 soil samples above the soil cleanup objective at a maximum concentration of 11,800 mg/kg.

Ten of the samples were also analyzed for VOCs and SVOCs. No VOCs or SVOCs were detected above the soil cleanup objectives.

Perimeter subsurface soil samples were collected at 29 sample locations from depths of 6 to 12 inches below ground surface (bgs) and analyzed for metal COPCs. Arsenic concentrations were detected in 24 of the 29 samples above the soil cleanup objective with a maximum concentration of 28.9 mg/kg. Total chromium was detected at all 29 locations above the soil cleanup objective at a maximum concentration of 19,700 mg/kg.

Subsurface soil samples were also collected from monitoring wells and soil boring locations. Native soil

---

[1] *Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, Division of Hazardous Waste Remediation, January 24, 1994.*

samples (nonwaste fill) were collected below the waste fill from four soil borings at three discrete intervals: immediately below the waste fill/native soil interface, the subsequent one-foot incremental depth, and soil immediately above the water table. A subsurface soil sample was also collected from the unsaturated zone (1 foot above the water table) at monitoring well location MW-8S. Discrete native soil samples were analyzed for metal COPCs (arsenic, chromium, and hexavalent chromium) at each of the depth.

Arsenic concentration ranged from 4.7 to 13.4 mg/kg and was detected at 11 of the 13 locations sampled ,slightly above the soil cleanup objective.

Total chromium concentrations were detected above the soil cleanup objective at three boring locations: B-1A (10 -11 fbgs), B-4 (16 to 17 fbgs, depth interval of 1 to 2 feet below the waste fill) and B-6 (7.5 to 8.5 fbgs, depth interval of 1 to 2 feet below the waste fill). The total chromium concentrations at these locations were 65.1 mg/kg, 1,150 mg/kg and 5,860 mg/kg, respectively. Total chromium concentrations below these sample depths were within SB levels. Hexavalent chromium was not detected in any of the samples analyzed. These data indicate that metal COPCs have not migrated substantially in native soil below the bottom of the waste fill piles.

Groundwater Contamination

Groundwater samples collected from nine shallow and nine deep overburden monitoring wells, during two rounds of sampling, were compared to groundwater regulatory levels including water quality standards. Data were also collected to evaluate the movement of groundwater in these areas and the extent of contamination.

Two COPC metals, arsenic and total chromium were detected above the ground water criteria in MW-2S during the first round of sampling. Arsenic was detected at a maximum concentration of 133 µg/L, which is, above the groundwater criteria of 25 µg/L. Total chromium was detected at a maximum concentration of 981 µg/L, which is above the groundwater criteria of 50 ug/L. Hexavalent chromium was not detected in any of the groundwater samples. Inorganic constituents such as ammonia, nitrate, and sulfate are elevated at various locations in groundwater downgradient of the fill piles.

In the RI report, the PRPs' consultants described difficulties they experienced in obtaining representative samples from well MW-2S possibly related to its age and construction materials. They concluded that the groundwater analytical results collected from well MW-2S during the first and second sampling events might not be representative of site groundwater. EPA acknowledges the information presented by the PRPs' consultant. However, EPA believes that until further monitoring is conducted, a definitive conclusion that water samples from MW-2S are not representative of groundwater quality in the surrounding formation cannot be supported. Nonetheless, even if the data from monitoring well MW-2S were to be completely discounted, other groundwater data from the site demonstrate that there is an unacceptable noncancer health hazard for the future industrial worker. However, based on data from the other wells at the site, it appears that the area of groundwater contamination may be limited to a relatively small area, under the waste piles.

To address the limitations of the sampling from monitoring well MW-2S, any groundwater monitoring program at the site would include replacing MW-2S and conducting analytical sampling for metals.

Wetland Surface Water Contamination

Surface water samples were collected from wetland areas and analyzed for metal COPCs. Surface water criteria for applicable analyte detection comparisons are found in New York State Division of Water Technical and Operational Guidance Series (TOGS) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998.

Arsenic and total chromium were not detected in the surface water samples. Hexavalent chromium was detected at 13.0 µg/L in SW-2, above the surface water criteria of 11 µg/L, during the first sampling round; however, the result was flagged as estimated by the laboratory and the detected presence of this contaminant was not confirmed during the second sampling round nor was total chromium detected in the sample above the reporting limit of 10 µg/L.

Sulfate was detected at a maximum concentration of 337 mg/L in SW-1, above the surface water criterion of 250 mg/L in surface water sample collected from Wetland F. However, sulfate concentration was detected below the surface water criterion during the second sampling event. Surface water in Wetland F receives groundwater discharge with elevated sulfate concentrations. Sulfate was detected in Wetlands B and D at maximum concentrations of 34.5 mg/L and 27.8 mg/L, respectively. Sulfide was not detected in any of the surface water samples.

Ammonia was detected during the second sampling event in sample SW-2 at a concentration of 110 ug/L, above the surface water criterion of 2.5 ug/L, but was not detected at that location during the first sampling event or at other surface water sample locations.

Wetland Sediment Contamination

Sediment sampling data were compared to the Low Effect Level (LEL) and Severe Effect Level (SEL) sediment quality guideline values presented in NYSDEC Division of Fish, Wildlife, and Marine Resources Technical Guidance for Screening Contaminated Sediments for arsenic and chromium.

Background wetland sediment samples were collected at nine sample locations during the first sampling event and analyzed for arsenic and chromium. Arsenic concentrations ranged from 1.4 to 10.3 mg/kg and total chromium concentration ranged from 7.8 to 23.1 mg/kg.

Arsenic concentrations were detected in five of the nine background sediment samples above the LEL of 6.0 mg/kg, but below the SEL of 33 mg/kg, at a maximum concentration of 10.3 mg/kg. All of the total chromium background samples were below both the LEL of 26 mg/kg and the SEL of 110 mg/kg.

Fourteen sediment samples were collected from wetland areas near and downgradient from the waste fill piles during the initial sampling event and analyzed for metal COPCs. The metal COPCs detected included arsenic which ranged from 2.3 to 11.4 mg/kg, total chromium which ranged from 9.2 to 215 mg/kg and hexavalent chromium which ranged from 1.3 to 18.3 mg/kg.

Total chromium concentrations in 7 of the 14 wetland sediment samples were detected above the LEL of 26 mg/kg at a maximum concentration of 97.8 mg/kg. Total chromium was not detected above the SEL of 110 mg/kg. Arsenic concentrations were detected below both the LEL of 6.0 mg/kg and the SEL of 33 mg/kg. Hexavalent chromium was detected in two of the sediment samples. A sediment quality criterion is not available for hexavalent chromium.

Wetland F is the receptor of groundwater discharge from the Site. Metal COPCs detected in samples collected from this wetland were not elevated compared to Site background.

Soil Gas Contamination

Two field-measured soil vapor samples were analyzed using a calibrated multi-gas meter at gas probe GPZ-1; one during the initial monitoring event and the other during the second monitoring event. The soil vapor monitoring data are summarized as follows:

The lower explosive limit (percent of methane in air) exceeded the range of the instrument (0 to 5% methane) in both samples, indicating high methane levels. Hydrogen sulfide was detected at low levels (1 to 4 ppm) during the first monitoring event, and ranged from 195 to 305 ppm during the second monitoring event. Hydrogen sulfide has a "rotten egg" odor with a very low concentration threshold. Oxygen content was detected near 0% (0.4 to 0.9 %) during the first monitoring event, indicating an anoxic or anaerobic subsurface condition, and ranged from 6.1 to 9.8 % during the second monitoring event. Carbon monoxide was detected at low levels (3 to 6 ppm) during the first monitoring event and ranged from 103 to 185 ppm during the second monitoring event. No vapors were detected in ambient air on or near the waste fill piles, indicating the elevated hydrogen sulfide and methane detected in the gas probe are not being emitted in significant quantities and/or they are being dispersed in ambient air.

SUMMARY OF SITE RISKS

As part of the RI/FS, a baseline human health risk assessment (HHRA) and screening level ecological risk assessment (SLERA) were conducted to estimate the current and future effects of contaminants in soils and sediments, groundwater and surface water on human health and the environment. The HHRA and SLERA provide analyses of the potential adverse human health and ecological effects caused by the release of hazardous substances from the Site. Both assessments evaluate the risks in the absence of any actions or controls to mitigate these releases under current and future land uses. Consistent with the NYSDEC GA groundwater classification, the groundwater was evaluated as a potable water supply although the site groundwater is not currently used as a drinking water source. Residential wells are in the area of the site. The closest well is located 1/4 mile west of the site. This well was sampled by EPA and found to be free of site-related contaminants.

Human Health Risks

Detailed results of the HHRA can be found in a document titled "Baseline Risk Assessment" , dated July 2006, prepared by Geomatrix Consultants, Inc. and Benchmark Environmental Engineering and Science, PLLC, and reviewed by EPA. The HHRA risk estimates are based on current/future reasonable maximum exposure (RME) scenarios developed taking into account various health protective exposure assumptions about the frequency and duration of an individual's exposure to the soil, sediment, and volatilized contaminants from groundwater, groundwater (shallow and deep), and surface water.

The HHRA also evaluated the toxicity of the contaminants of potential concern found at the site. RME exposure and central tendency exposures (CTE) or average exposures are included. Central Tendency or average exposures were calculated for those pathways that exceeded a risk level of 1×10^{-4} (or one in ten thousand) or a Hazard Index (HI) of 1 for noncancer health effects (HI =1).

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the COPCs at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health effects.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk) with 10^{-6} being the point of departure. For non-cancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a noncancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which non-cancer health effects are not expected to occur.

Determinations regarding remedial action at the site are based on the RME scenarios which exceeded the risk range. The NCP outlines a risk range from cancer risk of one in a million (1×10^{-6}) to one in ten thousand (1×10^{-4}) and a HI of one for noncancer health effects.

As described in the box "WHAT IS RISK AND HOW IS IT CALCULATED?", the HHRA followed a four step process that includes: Hazard Identification, Dose-Response, Exposure Assessment and Risk Characterization. A brief description of the results of each of these steps is provided below.

Hazard identification. The HHRA used data meeting all appropriate QA/QC requirements. Data sets included past investigations of the landfill area supplemented with additional sampling to support the HHRA conducted in 2003. The HHRA evaluated Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCS), Target Analyte List (TAL), and hexavalent chromium data collected during the RI. Some of the chemicals found at the landfill occur as natural components of soil and others are present due to past activities associated with the site. The assessment identified a large number of Contaminants of Potential Concern (COPC) that were evaluated in the HHRA. Based on this analysis, the primary COPCs that exceeded the risk range described above included: antimony, arsenic, cadmium, hexavalent chromium, iron, manganese and thallium in groundwater.

Dose-Response. Toxicity data was obtained from EPA's consensus toxicity database the Integrated Risk Information System and other appropriate sources. Toxicity data included weight of evidence classifications for carcinogens and chemical-specific toxicity values for cancer andnoncancer health effects. Toxicity values for inhalation, dermal and ingestion of COPCs in the landfill were selected based on the potential routes of exposure and available toxicity information. The Adult Lead model was used to evaluate exposures to lead in groundwater.

Exposure Assessment. The HHRA focused on current and future health effects to both adult and adolescent trespassers, future outdoor and indoor industrial workers, and future construction workers from contaminants in soil and groundwater. Exposure routes included incidental ingestion, inhalation of volatilized chemicals from soils, and dermal contact with surface and subsurface soil and groundwater.

The HHRA evaluated exposures in the absence of institutional controls or remedial actions. These receptor populations were considered "reasonable maximum exposure," and therefore protective of human health under the current and future exposure scenarios. The HHRA included standard default exposure assumptions. The

exposure point concentration was calculated using EPA statistical software. EPA approved models for estimating indoor air and fugitive dust emissions were also used in the assessment.

Risk Characterization. Chemical data from the previous steps were combined to calculate cancer risks and noncancer health hazards expressed as a total Hazard Index (HI) or individual Hazard Quotients (HQ). The HHRA found the risks did not exceed the risk range for most exposure scenarios. Exposure scenarios exceeding the risk range are provided below including information on the Central Tendency or average risks where the upper bounds of the risk range of 10^{-4} or an HI = 1 were exceeded.

- **Future Industrial Worker**. The cancer risks for the future industrial workers at the site were 3×10^{-4} (three in ten thousand) and noncancer health hazards for total chemicals were an HI = 230. The cancer risks and noncancer HI exceed the risk range. The risk is primarily attributed to the future ingestion of groundwater underlying the site contaminated with arsenic (2.4×10^{-4}) and the noncancer health assessment for arsenic (HQ = 1.5); cadmium (HQ = 3.8); hexavalent chromium (HQ = 1.2); iron (HQ = 94), manganese (HQ = 5.9) and thallium (HQ = 119). The Central Tendency or average risk from ingestion of groundwater was (6×10^{-5} (or six in one hundred thousand) from arsenic in groundwater; and the HI was 90 which was primarily attributable to potential exposure to thallium (HQ = 81.9) and cadmium (HQ = 3.5).

  In the HHRA, the PRPs' consultant described difficulties they experienced in obtaining representative samples from well MW-2S possibly related to its age and construction materials. They concluded that the groundwater analytical results collected from well MW-2S during the first and second sampling events might not be representative of site groundwater. Nonetheless, even if the data from monitoring well MW-2S were to be completely discounted, other groundwater data demonstrate that there is an unacceptable noncancer health hazard for the future industrial worker (HI = 8 with the primary contaminants hexavalent chromium (HQ = 1.2) and manganese (HQ = 5.9).

  The Central Tendency or average noncancer health hazards were an HI = 1.9 which were attributable to hexavalent chromium (HQ = 1.0) and manganese (HQ = 0.9).

- **Future Construction Worker**. Future construction workers at the landfill had cancer risks of 3×10^{-6} and a noncancer HI = 5.2. The chemicals contributing to an HI greater than one were cadmium (HI = 1.9) and thallium (HI = 1.6).

The HHRA found that other exposure scenarios for other receptors were either within or below the risk range.The HHRA provides details regarding the results of these individual assessments.

Ecological Risks

A Screening-Level Ecological Risk Assessment (SLERA) was prepared to assess the potential ecological risks associated with chemicals detected at and adjacent to the Site. The objective of the SLERA was to fulfill Steps 1 and 2 outlined in the *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (ERAGS, USEPA, 1997b). The draft SLERA was prepared by Environmental Risk Group (ERG).

The SLERA was prepared as a two-step process, with Step I modeling risks to ecological receptors under maximum (worst case) exposure scenarios, and Step II employing a more likely food chain model that considered: average concentrations of the constituents of concern; bioavailability of chromium; and, in the case of the modeled omnivorous mammal (raccoon), a distributed diet and typical home range.

Modeling performed under Step II of the SLERA suggests only minimal increased ecological hazard to avian omnivores and insectivores preying on invertebrates exposed to elevated COPC concentrations at the Site, with remaining ecological receptors at or within acceptable risk levels. The SLERA further indicates that the most significant potential risk is primarily due to direct soil/fill exposure. Considering the available data, the SLERA concluded that any ecological impact would be highly localized.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and site-specific risk-based levels.

The following RAOs were established for the Site:

- Reduce or eliminate any direct contact threat associated with the contaminated soils/fill; and

- Minimize or eliminate contaminant migration from contaminated soils to the groundwater.

Soil cleanup objectives will be those established pursuant to the TAGM guidelines. These levels are the more stringent cleanup level between a human-health protection value and a value based on protection of groundwater as specified in the TAGM. All of these levels fall within EPA's acceptable risk range.

Groundwater cleanup goals will be the more stringent of the state or federal promulgated standards.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS report. As the groundwater contamination is limited to a small area, under the waste piles and institutional controls would be required to prevent the use of groundwater under the Site, remedial alternatives do not address the groundwater. The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction.

The remedial alternatives are described below.

REMEDIAL ALTERNATIVES

ALTERNATIVE 1: NO ACTION

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with other alternatives. Under this alternative, no action would be taken to contain wastes, reduce infiltration into the landfill, eliminate areas of exposed waste, or control and treat leachate discharging from the landfill or address groundwater. Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the Site conditions be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Capital Cost:	$0
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

ALTERNATIVE 2: INSTITUTIONAL CONTROLS

This alternative would consist of environmental easements and/or restrictive covenants that would be designed to prevent direct contact with the waste/fill material by limiting future Site use. The environmental easements and/or restrictive covenants would also be designed to prevent groundwater use on the Site for drinking water or potable purposes.

Institutional controls for the waste fill would include access restrictions via fencing and/or appropriate signage to prevent the entry of trespassers onto the area of the Site that contains the waste fill piles; maintenance of the existing vegetative cover; and a Soil/Fill Management Plan to provide guidance for handling soil/fill from this area during future Site industrial use (e.g., personal protective equipment requirements during underground utilities construction, methods for disposing of soil/fill removed from excavation, etc.). Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the Site conditions be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Capital Cost:	$153,000
Annual Operation and Maintenance Cost:	$15,500
Present-Worth Cost:	$392,000
Construction Time:	2 months

ALTERNATIVE 3: CONTAINMENT/ISOLATION WITH SOIL COVER ENHANCEMENT

This alternative would involve minor regrading of the waste fill piles followed by placement of 6 to 12 inches of topsoil. A suitable seed mix would be spread and raked into the soil to provide for final vegetative cover following cover soil placement. Some reworking of the fill piles would be necessary to ensure uniform coverage. The total base area covered by the waste fill piles is approximately 7 acres.

Site conditions would be reviewed at least once every five years as per CERCLA, because this alternative would result in contaminants remaining on-site above health-based levels.

Capital Cost:	$577,000
Annual Operation and Maintenance Cost:	$14,500
Present-Worth Cost:	$800,000
Construction Time:	5 months

ALTERNATIVE 4: CONSOLIDATION/CONTAINMENT WITH LOW-PERMEABILITY SOIL (PART 360-EQUIVALENT) COVER

This alternative would include the environmental easement described in Alternative 2 above. This Alternative would involve clearing and grubbing a consolidation area in the vicinity of the waste fill piles; consolidating the smaller, outlying waste fill piles to the larger piles to create an approximate 7 acre or less consolidated waste/fill area.

The waste piles to be consolidated will be removed to native soil. Results of subsurface data indicate that metal COPCs have not migrated substantially in native soil below the bottom of the waste fill piles. The consolidated waste fill would be graded to promote surface water drainage, and capped with a low permeability soil cover i.e., consistent with 6 New York Code Rules Regulations Part 360. The cap would consist of the following components:

6-12 inches topsoil
18-24 inches low permeability soil

The site conditions would be reviewed at least once every five years as per CERCLA, because this alternative would result in contaminants remaining on-site above health-based levels.

Capital Cost:	$1M
Annual Operation and Maintenance Cost:	$15,000
Present-Worth Cost:	$1.3 M
Construction Time:	7months

Additional Components of the Remedial Action Common to Alternatives 3 and 4

The containment alternatives, consistent with NYSDEC closure requirements, would require post-closure operation and maintenance to operate and maintain the vegetative cover and gas venting systems. In addition, a gas, air, and groundwater monitoring program would be required.

Current New York State landfill closure regulations require the installation of a passive gas venting system comprised of at least one gas vent riser per acre, to minimize landfill gas build-ups within the fill.

ALTERNATIVE 5: EXCAVATION/OFF-SITE DISPOSAL

This alternative would involve excavation of a total of approximately 48,000 tons of waste/fill material from the waste piles with transport of excavated materials to a permitted, off-site disposal facility for treatment and/or disposal. Where necessary, the areas would then be backfilled with clean soil to match the surrounding grade, covered with topsoil, and seeded to promote vegetative growth. On-site dewatering of the sludge fill and/or admixing with drier soils would be required during removal of saturated materials in order to eliminate free liquid. The estimated amount of material requiring disposal is 60, 000 tons, assuming admixing was employed at a rate of approximately one ton dry soil to two tons of sludge fill material.

Since the waste would be removed, the waste piles will no longer be acting as a source of contamination to the groundwater and would no longer present potential health and environmental impacts.

Capital Cost:	$4.8 M
Annual Operation and Maintenance Cost:	$0
Present-Worth Cost:	$4.8
Construction Time:	6 months

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, *Overall protection of human health, and the*

environment, Compliance with applicable, or relevant and appropriate requirements, Long-term effectiveness and permanence, Reduction of toxicity, mobility, or volume through treatment, Short-term effectiveness, Implementability, Cost, and State and Community acceptance.

The evaluation criteria are described below.

1. Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with ARARs addresses whether or not a remedy would meet all of the applicable, or relevant and appropriate requirements of Federal and State environmental statutes and requirements or provide grounds for invoking a waiver.

3. Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, that a remedy may employ.

5. Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation periods until cleanup goals are achieved.

6. Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed.

7. Cost includes estimated capital and operation and maintenance costs, and the present-worth costs.

8. State acceptance indicates if, based on its review of the RI/FS and the Proposed Plan, the State supports, opposes, and/or has identified any reservations regarding the preferred alternative.

9. Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS Reports.

A comparative analysis of these alternatives based upon the evaluation criteria noted above follows.

Overall Protection of Human Health and the Environment

Alternative 1 (no action) and Alternative 2 (institutional controls) would not be protective of human health and the environment because they would not minimize infiltration and groundwater flow into the waste/fill material, thereby allowing further leaching of contaminants into the aquifer; they would prevent direct contact with the waste/fill piles; and they would do not protect terrestrial mammals from soil contamination.

Alternatives 3 and 4 would provide good overall protection of human health and the environment by containing waste with a landfill cap and controlling landfill gas through venting. Alternative 4 would be more protective than Alternative 3 because it requires a thicker cap of low permeability material to reduce infiltration, thereby reducing the generation of leachate which would mobilize contaminants into the groundwater. Alternative 5 would be the most protective because it would permanently remove the source of contamination to the groundwater and would prevent future direct contact with the waste.

Compliance with ARARs

There are currently no federal or state promulgated standards for contaminant levels in soils. Action-specific ARARs include 6NYCRR Part 360 requirements for closure and post-closure of municipal landfills. The Part 360 regulations require that the landfill cap promote runoff, minimize infiltration, and maintain vegetative growth for slope stability. Unlike Alternative 3, Alternative 4 would include an equivalent cap design as specified in 6 NYCRR Part 360. Alternative 5 would be subject to New York State and federal regulations related to the transportation and off-site treatment/disposal of wastes.

Long-Term Effectiveness and Permanence

Alternatives 1 and 2 would involve no active remedial measures and, therefore, would not be effective in eliminating potential exposure to contaminants in soil or groundwater. These alternatives would allow the continued migration of contaminants from the soil to the groundwater.

A landfill cap is considered a reliable remedial measure that, when properly designed and installed, provides a high level of protection. Of the two cap alternatives considered in

detail, Alternative 3 would be less reliable in protecting human health and the environment than Alternative 4 because it allows more precipitation to infiltrate through the waste piles which would result in a greater degree of leaching of contaminants to groundwater. Post-closure operation and maintenance requirements would ensure the continued effectiveness of the landfill cap.

Alternative 5 would be the most effective alternative over the long term.

Reduction in Toxicity, Mobility, or Volume through treatment

Alternatives 1 and 2 would provide no reduction in toxicity, mobility or volume.

Compared to Alternative 3, Alternative 4 would provide greater reduction in the mobility of contaminants by restricting infiltration through a thicker low permeability landfill cap, which would reduce the further leaching of contaminants to groundwater.

Alternative 5 would reduce the mobility of waste in the waste/fill piles. However, admixing the sludge fill with drier soils in order to meet landfill acceptance criteria would increase the volume of sludge fill requiring disposal.

Short-Term Effectiveness

Alternatives 1 and 2 do not include any physical construction measures in any areas of contamination and, therefore, would not present any potential adverse impacts on property workers or the community as a result of its implementation.

There are short-term risks associated with Alternatives 3 and 4. These alternatives include caps, which would involve clearing, grubbing, and regrading of the waste piles. Alternative 4 would present a somewhat greater short-term risk than Alternative 3 since it would require excavation and consolidation of the waste piles which would result in greater generation of dust and noise than Alternative 3 . Alternative 4 would be more effective in the short-term than Alternative 3 because it would limit leachate production to a greater extent than Alternative 3. All three action alternatives (Alternatives 3, 4 and 5) can be accomplished in about the same time frame namely five to seven months.

There would be short-term risks and the possibility of disruption of the community associated with Alternative 5. These include: an increase in traffic flow along local roads for an approximately six-month period; noise from heavy equipment use; and strong odors. This traffic would raise dust and increase noise levels locally. However, proper construction techniques and operational procedures would minimize these impacts. Short- term risks to workers could be increased to the extent that surficial wastes are encountered during excavation activities, but this risk would be minimized through the use of personal protection equipment.

Once the surface of the waste/fill is consolidated and is completely covered or removed, these short-term impacts to the community, workers, and the environment would no longer be present.

Implementability

Alternatives 1 and 2 would be the easiest soil alternatives to implement, as there are no active remedial measures to undertake.

Alternatives 3 and 4 can be readily implemented from an engineering standpoint and utilize commercially available products and accessible technology.

Alternative 5 would pose several implementability issues including truck traffic coordination through the residential neighborhood and the City and odor. These issues would be addressed through appropriate mitigative measures.

Cost

The estimated capital, operation, maintenance, and monitoring (O&M), and 30-Year present-worth costs for each of the alternatives are presented below. The annual O&M costs for Alternatives 2, 3, 4, and 5 would include groundwater monitoring.

Alternative	Capital	Annual O&M	Total Present Worth
1	$0	$0	$0
2	$153,000	$15,500	$392,000
3	$577,000	$14,500	$800,000
4	$1,000,000	$15,000	$1,300,000
5	$4,800,000	$0	$4,800,000

Alternative 5, excavation, has the highest cost of any alternative with a capital cost of $4.8 million. Of the two containment alternatives, Alternative 3 has the lower capital and O & M costs, resulting in a net present worth of $800,000 because it uses less cover and minimal fill. Alternative 4 has the highest cost, with a net present worth of $1,300,000.

State Acceptance

NYSDEC concurs with the preferred alternative.

Community Acceptance

Community acceptance of the preferred alternative will be assessed in the ROD following review of the public comments received on the Proposed Plan.

PROPOSED REMEDY

Based upon an evaluation of the various alternatives, EPA and NYSDEC recommend Alternative 4 (Consolidation/Containment with low permeability soil (Part 360-Equivalent) cover and Institutional Controls as the preferred remedy for the Site. Specifically, this would involve the following:

- Consolidating the waste/fill piles into 7 -acres or less then capping with a low permeability soil cover, consistent with the requirements of 6 NYCRR Part 360, including seeding with a mixture to foster natural habitat. Waste piles moved during consolidation will be removed to native soil. Removal to this depth will insure that any remaining contaminants will be within background concentrations.

- Imposing institutional controls in the form of an environmental easement and/or restrictive covenants that would require: (a) restricting the use of groundwater as a source of potable or process water unless groundwater quality standards are met; (b) restricting activities on the site that could compromise the integrity of the cap; and (c) the owner/operator to complete and submit periodic certifications that the institutional and engineering controls are in place;

- Developing a site management plan that provides for the proper management of all Site remedy components post-construction, such as institutional controls, and that shall also include: (a) monitoring of groundwater to ensure that, following the capping, the contamination is attenuating and groundwater quality continues to improve; (b) identification of any use restrictions on the Site; and (c) provision for any operation and maintenance required of the components of the remedy; and

- Evaluating Site conditions at least once every five years to ensure that the remedy continues to protect public health and the environment.

Basis for the Remedy Preference

The preferred alternative would provide the most cost-effective solution applying the evaluation criteria given reasonably anticipated future land use of the site. Waste piles moved during consolidation would be removed to native soil. Removal to this depth would insure that any remaining contaminants will be within background concentrations. Results of subsurface soil samples taken below the waste piles indicate that metal COPCs have not migrated substantially in native soil below the bottom of the waste fill piles.

Capping would prevent direct contact and reduce infiltration, thereby reducing the generation of leachate which mobilizes contaminants into the groundwater. EPA is not proposing an active groundwater remedy because of limited groundwater contamination underlying the waste piles at the Site; instead, institutional controls would be required to prevent the use of groundwater at the site.

Given these factors, the selected alternative provides the best balance of trade-offs among alternatives with respect to the evaluating criteria. EPA and NYSDEC believe that the selected alternative would be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and treatment technologies to the maximum extent practicable.

RESPONSIVENESS SUMMARY

APPENDIX V-b

PUBLIC NOTICE

Dunkirk Observer
August 11, 2006

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY INVITES THE PUBLIC COMMENT ON THE PROPOSED REMEDY FOR THE PETER COOPER MARKHAMS SUPERFUND SITE.

The U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) will hold a public meeting on August 22, 2006 at 6:30 p.m., in the Fireman's Activity Hall, Maple Street, South Dayton, New York to discuss the findings of the remedial investigation and feasibility study (RI/FS) and the Proposed Plan for the Peter Cooper Markhams Superfund site.

EPA is issuing the Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, and Section 300.430(f) of the National Oil and Hazardous Substances Pollution Contingency Plan.

The primary objectives of this action are to reduce or eliminate any direct contact threat, eliminate or minimize the migration of contaminants to the groundwater, and minimize any potential future health and environmental impacts. The main features of the preferred remedy include consolidation and capping of contaminated soils and institutional controls.

The remedy described in this Proposal Plan is the preferred remedy for the Site. Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered in the detailed analysis of the RI/FS report because EPA and NYSDEC may select a remedy other than the preferred remedy.

The administrative record file, which contains the information upon which the selection of the response action will be based, is available at the following location:

Town of Dayton Town Building
9100 Route 62 South Dayton, New York 14138
(716) 532-9449

Responses to the comments received at the public meeting and in writing during the public comment period, which runs from August 11, 2006 to September 9, 2006, will be documented in the Responsiveness Summary section of the Record of Decision, the document which formalizes the selection of the remedy. All written comments should be addressed to:

Sherrel Henry
Remedial Project Manager
New York Remediation Branch
United States Environmental Protection Agency
290 Broadway, 20th Floor
New York, NY 10007-1866
Telefax: (212) 637-3966
E-mail: henry.sherrel@epa.gov

In addition, if you have any other questions pertaining to this site please contact:

Mike Basile
Community Involvement Coordinator
Public Affairs Division
United States Environmental Protection Agency
186 Exchange Street
Buffalo, New York 14202
(716) 551-4410
E-mail: basile.michael@epa.gov

500114

RESPONSIVENESS SUMMARY

APPENDIX V-c

AUGUST 22, 2006 PUBLIC MEETING SIGN-IN SHEET

Peter Cooper Markhams Superfund Site – Public Meeting

South Dayton Fire Hall
Maple Street, South Dayton, New York 14138
August 22, 2006

PLEASE PRINT

NAME	ADDRESS	PHONE #
Carol Sheibley	Village of Gowanda 29 E. Main St., Gowanda, N.Y. 14070	(716) 532-3353
Tom Forbes	Benchmark Environmental 726 Exchange St. Suite 624 Buffalo, NY 14210	(716) 856-0599
Tim Latshaw	9389 Merrill Dr. South Dayton, NY 14138	(716) 988-5044
Sylvia Patterson	Seneca Nation EPD	(716) 532-2316
Beryl Pierce	Seneca Nation EPD	532-3546
Sandra Bentley	Town of Dayton	532-5440
Crystal Abers	9822 Mosier Rd So. Dayton Catt Co. Leg. Chairman	5323868
Marcia Moulton	NYSDEC	716 851-7220
Peggy Sheldon	Town of Dayton	988-5757
DAVID RANKE	11948 Markham Wesley RD Gowanda	532-3850
Mark Thompson	12411 BENTLEY	474-9946
Gary Beck	1 Leo Moss Drive (Catt County Olean, N.Y. 14760 Health Dept	716 373-8050
Michael Joy	333 Buffalo Ave N.Y. Williamsville NY 14221	716 772 5544
Mike Hutchinson	21 East Main Gowanda NY	716-532-5931

500116

RESPONSIVENESS SUMMARY

APPENDIX V-d

AUGUST 22, 2006 PUBLIC MEETING TRANSCRIPT

PUBLIC MEETING

* * * * * * * * * *

IN RE: Peter Cooper
Markhams Superfund Site

ORIGINAL

* * * * * * * * * *

BEFORE: Michael J. Basile, Chair
Kevin Lynch, Member
Sherrel Henry, Member
Marian Olsen, Member
Thomas Lynch, Member

HEARING: Tuesday, August 22, 2006
6:30 p.m.

LOCATION: Fireman's Activity Hall
Maple Street
S. Dayton, New York

WITNESSES: Kevin Lynch, Sherrel Henry,
Marian Olsen

Reporter: Shannon C. Fortsch

I N D E X

E X H I B I T S

Number	Description	Page Offered
	NONE OFFERED	

P R O C E E D I N G S

MR. BASILE:

Mike Basile, I'm the EPA Community Involvement Coordinator for the Peter Cooper Markhams Site in the public meeting that we will hold this evening. I work out of an office in Buffalo and we used to have an office at Niagra Falls and we've moved in the last year and you'll probably see my name on a lot of the correspondence that relates to the site.

The purpose of this evenings meeting is to discuss the findings of the remedial investigation, the feasibility study, and the proposed plan the EPA and the New York State Department of Environmental Conversation have evaluated for your review.

We are currently on a 30 public accounting period, which began on August the 11th and will end on September the 9th for this site.

We at EPA, we value your public input and we thank you for being here this evening. As a reminder, we will have question and answer period following our presentations this evening. But if you leave here this evening and you think of something, remember that the public comment period is open until September the 9th and on the bottom of the agenda the information is provided, the name, and the address of our project manager for this site, Sherrel Henry, who you will be hearing from this evening.

We've established like we do at all Superfund sites, our information repository.

The information repository for this site is in the Town of Dayton Town Building on 9100 Route 62 in South Dayton.

As the facilitator for this evenings meeting I just ask that you give our three presenters the opportunity to make their presentation and just hold your questions for the question and answer period.

We do have a court reporter who is here this evening taking all of the comments, both from ourselves as well as you the public. And during the question and answer period the only thing I ask you to do is just please stand and state your name and your address and spell your name and address for our court reporter, Shannon.

At this time I'd like to just introduce the folks that

are going to be speaking this evening. Our first speaker will Kevin Lynch, he's the Western New York Section Chief, followed by Sherrel Henry and Marian Olsen. Sherrel is the project manager and Marian Olsen is our human health risk assessor.

So at this time I'd like to turn the program over to Kevin Lynch who will talk to you about the Superfund process. Kevin.

MR. LYNCH:

Thanks, Mike. My name is Kevin Lynch, I'm the Chief of the Western New York Superfund Sections, we work out of an office in New York City. At this time I am giving just a quick summary of the law and the regulations we work under and how we go about making a decision, how we're

going to address the site. Before 1980 the federal government, EPA, had no way to address the site like the Peter Cooper Markham Site. In fact, they had no way to address any kind of environmental emergency with how we do go out there in a positive way and do something. So Congress passed the Superfund law, the law known as the Comprehensive Environmental Response, Compensation and Liability Act. And that did two things. It gave us the authority to take action of the site and a way to pay for it. It's called the Superfund Law because it did create a fund that we can use to study and cleanup sites. And it also allowed us to pursue what we call responsible parties to cleanup the site

work, pay for the site cleanup. A responsible party is anyone who owned or operated the site, anyone who generated the hazardous substances or came to the site, or anyone who transported those substances to the site. It also gave us authority to take actions at the site. The actions we could take are two different types of actions. One is a short term action to take care of an emergency situation or prevent an emergency situation from occurring. This would be like if we discovered that people are drinking contaminated water, we could give them an alternate water supply or if a warehouse or garage was found with drums of flammable substances, we can go in and take those out.

It's a short term fix either to prevent an emergency from happening or actually moving into an emergency situation. The other way we can address a site is when we call for remedial action. That's intended to be a long term permanent fix. In order to do this we have to have the sites placed on the national priorities list. What that is, we've discovered that there are tens of thousands of sites out there and the national priorities list is a list where we try to put on the ones with the potential for the most harm. Going into it we don't necessarily know which explored sites are, because we haven't completed the studies. But in order to look at this list,

most of the sites are referred to us by the States, either New York State, usually it's the Department of Environmental Conservation or the Department of Health will refer a site to us, we'll take the information they have about a site, we may go out and grab some samples of the substances that are out there ourselves at that time, and take information such as the population that's close to the site, where the nearest water supply is.

Take all this information and put it into mathematical model and a number comes out at the end. If it's above that number it's eligible for the national priority's list. If it's below it's not eligible and most of the sites are addressed by the States.

The importance of

getting a site on the national priority's list is we can then use that fund, the Superfund, in order to pay for the remediation of the site.

The process that will decide what we will do on the sites on the national priorities list, is first we do what's called a remedial investigation and the feasibility study.

A remedial investigation is a study where we go out and we take environmental samples, we will put monitoring wells in, we will look at what the local geology is, we will take samples of the soil, samples of the water, samples of sediment.

What we're trying to determine is the nature and extent of the problem. What's out there, what problems are they causing, where is it

likely to go, and what problems can it cause then.

We take that information then and do what we call a feasibility study. A feasibility study is looking at different alternative solutions to that problem and we evaluate them according to non-criteria that's given to us in our regulations.

The first two criteria are the most important, we call the threshold criteria. The overall protection of human health in the environment and compliance with applicable and relevant and appropriate requirements.

We cannot select a remedy that is not protective of human health and the environment.

The second criteria, the acronym is ARARs are Applicable

Requirements are kind of obvious. If there's a law regulation out there that directly applies to the conditions of the site we have to follow it.

The relevant appropriate requirements are if there are regulations out there that don't directly apply, the law wasn't written for directly that provision would be similar to the clean drinking water act, where you have maximum contaminant limits that have to be met before you can supply the drinking water.

That doesn't directly apply to a Superfund site, but since it really makes sense that we use a regulation like that, we then have to. It's kind of a way of making sure that we don't like use loopholes to go and do

something that we shouldn't be doing.

The other criteria are long-term effectiveness and permanence, reduction of toxicity, mobility, or volume by treatment, short-term effectiveness, what we look at there is, well we look at the different alternative solutions. We want to make sure that we're not creating a problem while we're trying to solve another problem.

We look at implementability, we look at cost, state acceptance, and community acceptance. What we do is we analyze each alternative looking at those criteria, we compare one to the other, and select what we think is the most appropriate solution to the problem.

How we determine

community acceptance is when we go through this process we put together what we call a proposed plan to document the --- you may have been sent and the ones that are at the table that you have today, which summarizes those studies, it puts out what we think is the most effective solution, the proposed solution for the problem. We have the public meeting and we solicit comments from the public.

We then take that information to decide what to do. We publish that on what's called a record of decision, after that we go through the design and the implementation of that action. And the ultimate goal in that is to delete the site from the national priorities list.

MR. BASILE:

Sherrel Henry is the project manager for the sites and she will go through the summary of the site history and the remedial investigations.

MS. HENRY:

Good evening, ladies and gentlemen. I recognize a lot of faces in the audience. This is an aerial photograph of the Peter Cooper Markham's site. The site is approximately 103 acres and it's located just off Bentley Road in Markhams.

Site features include wetland areas, that's depicted in blue, and a railroad story In addition, there is a gas well, which is one of the only features on the site that's located there.

From around 1955 to 1971 the site was used as a disposal facility for waste that was generated from a glue

manufacturing plant located in Gowanda, New York, which is approximately six miles South of the Markhams site. What happened is that waste from the Gowanda site was brought to the Markhams site and they were placed in piles on around 15 acres of the site. As you can see, you know, these waste piles vary in size, but what you may not be able to tell is that they also vary in height. The heights range from approximately five feet to a little over 25 feet. There was various investigations that was done prior to EPA arriving at the site. And these investigation included investigation by New York State DEC. And when DEC performed their investigation because of regulation that was in effect at the time, they

weren't able to take action, so they referred the site to EPA. The site was placed on the national priorities list, as Kevin discussed earlier, in February of 2000. And once the site was placed we negotiated with the PRP and a unilateral order was issued to several PRPs in September of 2000. And with this order the PRP, you know, they had to do the remedial investigation and feasibility study. As Kevin discussed, as part of the remedial investigation, you know, you have to sample the ground water, so wells were placed. These wells were placed throughout the site. We took --- wells were placed upgrading into the site and downgrading just to see, you know, so we could compare what's upgrading from what we

were picking up downgrading. So several wells were placed on the site. We also took gas samples from the waste piles. In addition from the wetlands areas, we took surface water samples and also sediment samples, just to see what was going on in the wetlands area. To get coverage we needed to find out what was in the waste and if the waste was affecting soil, you know, next or adjacent to the waste piles. So various samples were taken. We took background samples and various surface soil samples from on top of the waste and next to the waste piles. In addition, subsurface soil samples were drilled, were taken from six to 12 feet below grade. Once we collected all the samples they were sent to

the lab and a report was generated based on the results and a copy of the remedial investigation dated July 2006 is located in the repository as Mike talked about earlier. The basic conclusions of the remedial investigation were that waste piles, fill material, contain elevated levels of metals including chromium and arsenic. Elevated levels of gas were not found in or adjacent to the --- around the waste site. And the surface soil over the waste piles were also found to be contaminated with arsenic and chromium. In addition, but what interesting is that soil, they drilled wells to take surface soil samples below the waste pile and the native soil, we realy didn't find contamination

from, you know, leach into the waste, below the waste pile. In addition, site related contaminants were detected in groundwater, but it was limited to one area, to one well which was very close to the waste pile. And at conclusion of the remedial investigation, a risk assessment is then conducted. And one was done at this site and Marian will now discuss the repercussions.

MS. OLSEN:

Thanks, Sherrel. As Sherrel mentioned I'm the Human Health Risk Assessor for the site and this evening I'll also be giving a very brief overview of the ecological risk assessment. At Superfund sites we do both, we do human health and ecological assessments. And

basically what a risk assessment is, is a way of providing a framework for evaluating the contamination that's been found at the site, looking at exposures, who was being exposed at what concentrations, and that forms the part of the exposure assessment.

We also look at the toxicity of the chemicals that are found at the site. We combine the exposure with the toxicity to calculate risks.

Two risks are calculated. One is a cancer risk and the other is non-cancer health hazards. And this provides with a framework for making a determination as to whether remediation is appropriate and necessary at the site.

And the way in which

this is developed is to look at what is in the Superfund law and that was what Kevin mentioned, the national contingency plan. We look at whether we have exceeded the risk range that is established within that regulation and I'll talk about that in a little bit more detail in a moment.

The risk assessment looks at current and future conditions, so we're basically saying what happens if we do absolutely nothing at this site, what are the risks to people that may come into contact with the site?

We look at baseline conditions. Again, in the absence of any controls to prevent people from going onto the site. And we also look at risks to a reasonably maximally exposed individual, and that's

an individual whose activities will bring them into contact more frequently with the site than maybe an average individual.

For the exposure assessment we're looking at where the exposures are complete, where would people either currently or in the future come into contact with the material at the site.

So we're looking at where are the locations on the site where this may occur. We're looking at what happens to these contaminants on the site. Are they transported through putridive dust or something of that nature.

We're looking at where people will actually come in contact with it. On this site we have one area where we have the waste piles, but then there

are other areas that have less contamination, so we're looking at both of those.

We also look at routes of exposure, how would people come in contact? Would they inhale the materials because they became available, would they ingest them, such as ground water or maybe dermal contact where it contacts the skin?

And we also look at the question of who was being exposed? And we're looking at different agents of populations, adolescents, adults, children, and how they may come in contact with the contamination at the site.

So this assessment based on the fact that the land is currently zoned as industrial, we looked at current exposure scenarios, and these are the

adult and adolescent trespassers.

We also looked at future if this property was to go up and used for industrial purposes and this is just an assumption that we're making to look at potential for how the property may be used. We're looking at an outdoor and indoor worker and we're also looking at a construction worker.

So we're combining a data that Sherrel just talked about from the site, from the waste pile area, combining that with the exposure and the toxicity of the chemicals to calculate risks.

The routes of exposure that we looked at were the soils, so in that case we're looking at potential ingestion. We're looking at contact with

the skin and inhalation.
For groundwater we're again making assumption about potential future use where the workers onsite may be getting their drinking water from a well that's put into the waste piles and that would be their exposure.
And then we're also looking at surface water and sediment. And again this is incidental ingestion and dermal contact.
The risk assessment results, these are, I apologize because they're not on the slide, but I'd just like to walk you through it and we can answer more questions. And also of this details of how this was developed, all of the information that was used is available in the risk assessment document, which is

in the repository.
In looking at the data
what we found is that there was
one well MW-2S that was
identified and this was in the
waste piles and had the highest
concentrations. So we looked
at that as a unique area
because the concentrations were
significantly different from
other parts of the site.
So we did a risk
assessment for this section and
we did a risk assessment for
the site wide exposures. And
what we found in both cases was
that we exceeded the risk
range, which gives us support
for taking action at the site.
We looked at all of
those receptors that I talked
about current, adolescent, and
adult trespassers and the
future of the industrial
worker, outdoor/indoor, and the

construction worker. And the results of this found and I'm concentrating here on where we have increased concerns and we're above the risk range.

So what we found from ingestion of drinking water in the future if the worker were to receive their drinking water 225 days per year for 25 years from this one location, what would their risks be? And we found that the risk was three in 10,000, which exceeds the risk range and the primary contaminant of concern is arsenic.

We also looked at the potential for non-cancer health affects for this worker and we looked at what is considered a hazardous index. And that's basically looking at how high this is above the exposures that we would consider would

not have adverse health effects.

So typically we're looking at an HI of one, so this 230 times higher. And what were found were the main contaminants of concern were arsenic, cadmium, chromium, iron, manganese, and thallium.

I should also mention that EPA as well as the County Health Department did offsite monitoring of wells and did not find the levels were of concern in those wells related to the site, so that also was done separately.

So what we're really talking about is onsite. This is the results of looking at the concentrations onsite.

In the future we also looked at a construction worker who may be exposed through digging down through the waste

into the deeper sections. And we found that that risk was three in a million, which is within the risk range, and primary contaminant was arsenic in soil.

And we looked at the non-cancer hazard, which was 5.2 again exceeding a hazard index of one, and the two chemicals of concern were thallium and cadmium.

For the scenarios that we looked at we did not find that the risk range was exceeded.

We also looked at the site wide data excluding well MW-2S and what we found for our outdoor worker was the cancer risk was within the risk range. In the future with the non-cancer hazard exceeded a hazard index one, and the main contaminants were chromium and

manganese in groundwater.
We also looked at the
future construction worker and
these results indicate that
we're within the risk range for
cancer and non-cancer. And the
other exposures to the
sediments in soils were not
found to exceed the risk range.
As I mentioned, in
addition to doing the human
health assessment, which
provides information then for
Sherrel and also for Kevin to
use in their management
decision, we also conducted an
ecological risk assessment, and
it's the same type of an
approach where you're looking
at hazards to ecological
receptors such birds and
vertebrates and plants on the
site.
And what they found as a
result of that assessment were

that the risks were within the range for ecological receptors evaluated and therefore, the actions that are being recommended tonight are based on the human health assessment. This information that I just summarized is again, the last step in the remedial investigation and then this information is used by Sherrel in the feasibility study to look at remedial alternatives and remedial action objectives. So I'll turn this back to Sherrel.

MS. HENRY:

Like Marion said, one risk was identified at the site. We have to come up with site --- an objective for addressing the risks. And as Marion said, there were two areas of unacceptable risks. The first was industrial

worker, possibly ingested groundwater. And the second was contact with the waste for a construction worker. So a remedial action objective that we came up with was to reduce or eliminate direct contact associated with contamination from the soil or the fill. And also to minimize or eliminate contaminant migration from the waste into the groundwater. And you know, once this is done we have to come up with alternatives to address the risks posed by the site. For this site we looked at five different alternatives. The first of which was no action alternative, which is required at all Superfund sites. And that's basically you would leave the site as it is, you would do nothing. The second alternative

that we looked at was institution of controls. These would be in the form of an environmental easements and/or restrictive covenants. That would basically being safe, so that no one could drink the water at the site, and also to protect, to restrict activity at the site.

Alternative three was containment and isolation with a soil cover. And this would involve minor regrading of the waste pile and covering it with six inches of topsoil. Basically what would happen is that the waste piles on site would be, they would be lightly graded, but they would stay within this area and then they would be covered with soil.

Alternative four, which is consolidation and containment with low-

permeability soil cover, such as clay, and it would be a part 360 equivalent. And what that is, part 360 is the regulation that governs how you would close a landfill.

And this would involve clearing and consolidation of the waste piles and then you would cover it, once it's consolidated you would cover it with 18 to 24 inches of low permeability soil and this would act as a barrier so that rain water couldn't mix with the waste and then get into the groundwater. And this would be capped with six to 12 inches of topsoil so that grass could grow over the cover.

And again, these waste piles, instead of staying there, they would be consolidated into a seven acre, which would look something like

this.
So all the waste piles would be consolidated into approximately seven acres and it would be covered.
The fifth alternative that we looked at was excavation and offsite disposal. Basically, the waste would be digged up approximately 48,000 tons and this would be taken offsite for disposal.
So once we compared all the alternatives to the nine criteria Kevin discussed and one of the criteria, which is four, range from across from alternative one, which is no action, range of zero to $4,800,000.
And all the alternatives are compared to the nine criteria, which Kevin went through in detail. And the

reason why we're here today is to get your input on the proposed remedy that EPA is recommending for remediation at the Markhams's site.

And the proposed remedy is alternative four, which is consolidation with a low-permeability soil cover. And like I said before, it would include 18 to 24 inches of a barrier protection, low-permeability soil cover, followed by six to 12 inches of top soil.

The cap would be graded in order to so that water will not puddle under the cap and it will be able to run off.

In addition, to address the contaminations of the groundwater, environmental easement would be put in place to restrict anyone from drinking the groundwater on

site.
And also, a site management plan would be put in place to deal with any operation and maintenance issues.
In addition, because we're leaving waste in place, EPA Superfund requires that you do a five-year review to make sure everything's okay with the site, that the grass is in place, and it's being maintained.
Like I said, what EPA is proposing is alternative four. The site, like I said, would look something like this.
Once we get comments from the community, we will summarize that in a responsive summary, which would be part of the record of decision, which would document the remedy that is finally selected for the

site. I'll turn it over to Mike.

MR. BASILE:

As I indicated at the beginning of the meeting, I thank you for letting our presenters make their presentations this evening. And we do have two individuals in the office representing other agencies that have been very active at the Peter Cooper Markhams site Maurice Moore from the DEC region out of Buffalo. And Gary Beck from the Cattaraugus Health Department.

At this time, we would entertain questions that you may have. I'll just ask you to raise your hand, I'll recognize you, ask if you wouldn't mind stating your name and your address, and spelling your name for our court reporter.

Questions?

MR. THOMPSON:

My name is Mark Thompson, T-H-O-M-P-S-O-N. I live at 124 Bentley Road. Who are the current owners of this property now?

MS. HENRY:

The current owner is a phone company, it's the Peter Cooper Corporation. I guess you could say Peter Cooper Corporation Two. What happened is that the original owner of the site sold it to a foreign company who then retained the name Peter Cooper Corporation and we haven't been able to locate them.

MR. THOMPSON:

This property is also tax exempt as I understand it, so that the County doesn't take it back?

MR. BASILE:

I believe the County could take it if they wanted to. I believe that since it is a Superfund site, there is probably more liability associated with them building that it would be.

MR. THOMPSON:

What is this called Deter Environmental do they have the sign for the place?

MR. BASILE:

On the site?

MR. THOMPSON:

Turn key environmental down at across the entrance?

MS. HENRY:

The gas wells, that I showed you have been located on the site, that's their well.

MR. THOMPSON:

They're in charge of that?

MS. HENRY:

Yeah, that's their well.

MR. THOMPSON:
Where is this one well you're talking about this navigation, can we get a map of where that is?
MS. HENRY:
They're located right here, MW-2F, this is what is very close to the well. This is the well --- and that well, it wasn't a new well that was installed, that's an existing well that was put in as part of previous investigations.
MR. THOMPSON:
I did some work back in there a couple of years ago opening wells?
MS. HENRY:
That was part of the remedial investigation that we conducted ---.
MR. THOMPSON:
Conducted some samples, but they didn't go down produce

them to the land owners they did them up on the road, so you're talking about adjacent well sites those well sites were the foundation on the landowners around the property. Where were they done.

MS. HENRY:

Are you talking about ---?

MR. THOMPSON:

You said there was samples taken away from those sites that were showing contamination ---

MS.HENRY:

What we did ---

MR. THOMPSON:

Could you tell me where those sites were?

MR. BASILE:

None of them were taken off the site then?

MS. HENRY:

The groundwater

contamination is basically limited to this area right here, these are downgrading wells from the waste pile, and we really didn't find anything ---.

MR. THOMPSON:

Groundwater is traveling towards my property?

MR. HENRY:

It's traveling here and what's happening is that it's recharging, runoff is recharging to this wetland right here. And like I said, if we didn't find anything in these wells, which is very close to the waste pile, you know, you really don't expect to find anything further down.

MR. THOMPSON:

There's a main channel that runs right along the train tracks that run right through my property that has the water,

so contamination's coming down through.

MS. HENRY:

The thing is, is that when it comes down --- this is wetland F and most any water that's running down here is actually the majority of the water that's recharging into this wetland.

MR. BASILE:

You took samples in the --- surface water samples.

MS. HENRY:

Yeah, we took surface water samples and they were ---.

MR. THOMPSON:

So you took surface water samples off of my property but not any of the adjacent landowners?

MS. HENRY:

But normally what happens if there's

contamination then we tend to find it, you know, closer to where the waste pile is, closer to the site. So if you're not finding it there, we really wouldn't expect to find anything downgrading.

MR. THOMPSON:

A lot of my ditches are full of oil and stuff from sediment. Sits right on top of the water, I mean my ditches don't drain, so it just sits on top.

MR. BASILE:

From sediment?

MR. THOMPSON:

Yeah, you could see on my property, well the ditch is running down towards to the tracks.

MR. BASILE:

I understand there's oil coming off the site onto your property?

MR. THOMPSON:
I don't know where it's coming from, but all my ditches are full of oil and that's why I'm wondering if they took any samples on my property and I was not aware of it.
MR. BASILE:
Now what we do when you do an investigation is we start at what we believe is the source of any contamination and go outward from there and we do stop when we find out that there is no more contamination beyond it, because we feel that we've identified the problems associated with that site.
MR. THOMPSON:
All right. So the oil on my property is coming from my property?
MR. BASILE:
Well, we don't believe it's ---. Actually, you can

probably come up and talk to us after, so we can show you the maps where we took the samples and we can show you what we did and maybe figure out what's going on?

MR. THOMPSON:

What do you want to use this property for once you do anything to it? You were suggesting you use number four and burry a seven acre site, what are you going to do with it then?

MS. HENRY:

You mean do with the site?

MR. THOMPSON:

With the site exactly? Are you going to change the zoning so it's no longer to be meant for industrial there or?

MR. BASILE:

What we'll do is put an environmental easement on the

site, so that no one can put a well into the contaminated water.

MR. THOMPSON:

So what if someone does come and put something else on there?

MR. BASILE:

And what also we'll do is have a site manager plan and on this easement will say anything that's done on the site cannot disturb that cap. The idea of the cap is twofold. One is to keep anybody from touching any of the hazardous materials. And the other is to stop rain water from going through the hazardous materials and to have hazardous substances run off the main water. In order to do that, obviously the cap has to stay in place. So we will be doing

periodic inspections to make sure that happens. We will put restrictions on the land, that the land can't be used in a way that it would disrupt that.

MR. THOMPSON:

What I'm looking for here is a change of zoning so that people can't use it period.

MR. BASILE:

Land use decisions are not federal decisions, they're local decisions.

MR. THOMPSON:

Well, we can change that on a local level and change it back to just top soil.

MR. BASILE:

The industrial is probably the most --- other sites have been --- Superfund sites have been reused. Years ago when that happened if there would be a development plan in

place now, someone would have a plan, they want to use it and incorporate that cap through the plan. Once you do get that cap on there, you pretty much can take that out of productive use.

MR. THOMPSON:

That would definitely --- with seven acres of --- with everything else except for the wetlands.

MS. HENRY:

Uh-huh (yes).

MR. BASILE:

Right.

MR. THOMPSON:

I mean you can do whatever you want with it?

MR. BASILE:

Right. You can do anything that the local zoning will allow to happen as long as it doesn't affect --- as in you wouldn't be able to put a well

in even right outside of it, that would draw contamination out, or you couldn't do anything that would disturb that cap. But you could go off the cap and you could use that land for something else.

MR. THOMPSON:

My last question is why isn't this property posted right now? There's no boundaries to know where it is. My property line, I don't know where it is. I know it was surveyed when you were there a couple of years ago.

MR. BASILE:

There is the roadance law, but you're right, we should look into that.

MS. HENRY:

Any other questions?

MR. HUTCHIOSON:

Mike Hutchioson, H-U-T-C-H-I-O-S-O-N. The fill

pile that you're going to create, there will be no liner underneath it you're not envisioning any leachate generation?

MR. BASILE:

What we'll be doing is pushing all of the piles to make it one big pile then and covering it there. We will not be putting a liner underneath it. In fact, a good deal of the waste material probably won't even be moved. We'll just be consolidating it to one area and then have a cap placed on top of it.

And the idea for the cap would if --- prior to the building a new fill, you would put a liner underneath it, but in this --- when you're closing a landfill, you would just put a cap on it to try to prevent ---.

MR. HUTCHIOSON:
Do you have an estimate on what the leachate area would be?
MR. BASILE:
One thing that I should note is that since the groundwater has not --- the contamination hasn't migrated off that area or the pile in the first place in all these years. We think this can only improve things and maybe even less likely to migrate further.
MS. HENRY:
Any other questions?
MR. BASILE:
Yes, Mike?
MR. HUTCHIOSON:
Long term stewardship in this --- who's going to pay for the plan?
MR. BASILE:
All of them. The question, I guess that I was

expecting to answer is what's going to happen next and when will it be? When will we be out there doing anything on the site. After we make a decision, we will approach the potentially responsible parties and attempt to have them remediate the site.

What we want to do is under the EPA over site, we would like them to actually go out there and do the work. If we go into a period of negotiations with them, it usually lasts four to six months.

The result of a negotiation are what's accepted in convincing them that they should do this. Another thing that can happen is that they will tell us they'll pay for it right then and we will go do it.

If that fails, we could order them to do it, or we could use the fund for them to do it and then go out after them to pay us back afterwards. So right now we don't know who's actually going to be doing the paying for it. EPA will be involved in this site, because if we leave waste on site, we are required every five years to do this review to make sure that the remedy we have selected and implemented remains protected. And the environmental easement that will be put on the site, restricting the site, the State will have stewardship of that easement to be sure no one disturbs the cap or extracts the groundwater.

MR. HUTCHIOSON:

Are there different PRPs at this site or the use of a

PRP at this site?
MR. BASILE:
Recently, we can't find.
There's a French company, which is defunct and we haven't been able to find any representatives of them or any assets that they had. If we can find them, believe me they will be, but we haven't been able to.
MR. HUTCHIOSON:
Are there any regulations that say you can't use the PRPS?
MS. HENRY:
Here they are. They're basically the same PRP, except for New York.
MR. LYNCH:
We do have some of the 11 manufacturers who said wait to the original glue factory and we also have the owners of the Peter Cooper Corporation as

they sold that to Vucele' (phonetic) that their assets are put into a trust and will still exist and they are a responsible party and we expect them to step up to the plate and pay for that. They were the group that did the actual study other than our own.

And the other timing on this is that it should take about six months period of negotiations where we'll decide who actually does the work or pays for the work, then we would go through a design period and I think that it would be probably about two years before we go out there and actually move dirt.

MR. BASILE:

Any other questions? If there aren't any other questions, I'll just remind you once again that we are still on

the 30 day public comment period, which ends on September the 9th. All the documents that we talked about this evening the risk assessment, the remedial investigation, feasibility study, are located in your local repository. Once we've received anymore public comment, we will then issue, as Kevin indicated, a record of decision, you'll hear about the record of decision of course, in correspondence as well as through the local media. And if there aren't any further questions, we'll remain for a short period of time following and I thank you for participating. Thanks for taking the time to come out this evening. Thank you.

PUBLIC HEARING CONCLUDED

AT 7:20 P.M.

C E R T I F I C A T E

I HEREBY CERTIFY THAT THE FOREGOING PROCEEDINGS WERE REPORTED STENOGRAPHICALLY BY ME AND THEREAFTER REDUCED TO TYPEWRITING AND THAT THIS TRANSCRIPT IS A TRUE AND ACCURATE RECORD THEREOF.

SARGENT'S COURT REPORTING SERVICE, INC.

COURT REPORTER

RESPONSIVENESS SUMMARY

APPENDIX V-e

LETTER SUBMITTED DURING THE PUBLIC COMMENT PERIOD

KELLEY DRYE
COLLIER SHANNON

John L. Wittenborn
Partner
202.342.8514
jwittenborn@kelleydrye.com

September 8, 2006

Ms. Sherrel Henry
US Environmental Protection Agency
Region II
Emergency and Remedial Response Division
290 Broadway, 20th Floor
New York, NY 10007-1866

Re: Peter Cooper Landfill NPL Site, Markhams New York
Comments on USEPA August 2006 Proposed Plan

Dear Ms. Henry:

On behalf of Wilhelm Enterprises, Inc. and the Tannery PRP Group, composed of Brown Shoe, GST Automotive Leather, Prime Tanning Company, Seton Leather, and Viad Corp (collectively the "Cooperating PRP Group") we submit the following comments on the U.S. Environmental Protection Agency's Proposed Plan, dated August 2006, for remediation of the Peter Cooper Superfund Site located in the Township of Dayton, New York (Markhams Site). Having fully cooperated with EPA since February 2001 in developing plans for a remediation of the Markhams Site, and having prepared and implemented, through Benchmark Environmental Engineering and Science, PLLC ("Benchmark"), the Remedial Investigation and Feasibility Study, we are hopeful that these comments will be carefully considered as EPA develops a final remedy for the Markhams Site.

I. The Risk Assessment for the Site Demonstrates that a Minimal "Part 360" Equivalent Cover System Is More Than Sufficient to Fully Protect Against All Identified Risk

The approved Human Health Risk Assessment for the Markhams Site (Geomatrix Consultants, July 2006) concluded that risks from soil and waste fill contaminant exposure pathways are within acceptable ranges under the current (unconsolidated, uncovered) condition. Thus, frankly, even the "No Action" alternative, or at minimum an Institutional Control alternative, would be sufficient to protect against human health risks. Certainly, a full Part 360 equivalent cover system is unnecessary for that purpose. While the PRP Group is not recommending the "No Action" alternative or a remedy that includes only an institutional control, or even Alternative 3 (a 6-12 inch soil cover), the risk assessment makes clear that the final remedy need not assume all of the attributes of a full Part 360 cover system in order to provide adequate public health protection.

The only unacceptable human health risks identified in the risk assessment were attributable to site groundwater ingestion for the hypothetical future industrial worker, and dermal contact with groundwater for the hypothetical future construction worker, with the latter of these only posing unacceptable risk if MW-2S is considered representative of site-wide groundwater conditions. As discussed in the July 2006 Feasibility Study, MW-2S data is not believed to be representative of Site groundwater. Accordingly, site groundwater ingestion by the hypothetical future industrial worker is the only potential exposure pathway yielding unacceptable health risks. The August 2006 Proposed Plan calls for addressing this exposure path via an institutional control, in the form of an environmental easement and/or restrictive covenants, that would restrict the use of groundwater as a source of potable or process water unless groundwater quality standards are met. While EPA may argue that a thicker, lower permeability cover will better assure that groundwater is protected from effects of leaching of waste/fill constituents, Synthetic Precipitation Leaching Procedure ("SPLP") testing performed during the Feasibility Study illustrates very low leaching potential for the constituents of concern.[1] In fact, if a dilution attenuation factor (DAF) of 100 were applied to the leachate generated via the SPLP test, the constituents of concern would meet Class GA groundwater quality standards.(***Note***: a DAF of 100 is consistent with NYSDEC policy per TAGM HWR-94-4046). Thus, there is no human health risk that has been identified at the Site that would necessitate implementation of a full Part 360 cover system with compaction levels less than 1 x 10^{-6} cm/sec.

The cover system in Alternative 4 (the preferred remedy) includes 6-12 inches of top soil and 18-24 inches of low permeability soil. The ostensible purpose of these soil cover system components is to achieve the two Remedial Action Objectives identified in the Proposed Plan:

- Reduce or eliminate any direct contact threat associated with the contaminated soils/fill; and

- Minimize or eliminate contaminant migration from contaminated soils to the groundwater.

The first of the Remedial Action Objectives can easily be met by using 6 inches of top soil and 18 inches of low permeability (1 x 10^{-6} cm/sec) cover material. Two feet of cover soil would completely eliminate any direct contact risk. The second remedial action objective is also achieved by placing a minimum level of cover material (24 inches) compacted to a permeability level of 1 x 10^{-6} cm/sec.

[1] The waste piles have been undisturbed at this site for more than 30 years. It is highly unlikely that the addition of more cover material will have any impact on leaching rates for the Chemicals of Concern.

Alternative 4 is already estimated to cost approximately $500,000 more than Alternative 3, without any significant additional environmental or human health protection. The estimated costs for Alternative 4 in the Feasibility Study Report ($1.3 million present value) does not contemplate 36 inches of cover soil, or for a compaction level less than 1 x 10^{-6} cm/sec. Thus, a remedy requiring a cover system at the high end of the Alternative 4 range would be even more expensive for no additional benefit.

The approved Screening-Level Ecological Risk Assessment for the Markhams Site (Environmental Risk Group, August 2006) concluded that unacceptable ecological risks are likely highly localized, and are attributable primarily to direct soil/fill exposure. Placement and maintenance of a cover comprised of 6 inches of top soil and 18 inches of low permeability (1 x 10^{-6}) cover soil is more than adequate to protect against incidental waste fill contact by site wildlife. Thus, a more protective remedy also is not warranted or justified from an ecological risk or cost perspective.

II. To the Extent New York State "Part 360" Regulatory Requirements Are Appropriately Identified As An "Applicable or Relevant and Appropriate Requirement" (ARAR) for the Markhams Site, the Proposed Plan Clearly Exceeds All Part 360 Applicable Requirements

In Comments submitted to EPA on June 1, 2005 relating to determination of the appropriate remedy to be implemented at the Peter Cooper Landfill Superfund Site at Gowanda, New York (Gowanda Site), the Cooperating PRP Group demonstrated that 6 NYCRR Part 360 is not an ARAR for the Gowanda Site. For identical reasons, Part 360 is not an appropriate ARAR for Markhams[2] However, as with the Gowanda Site, even if Part 360 is identified as an ARAR for this Site, a cover system consisting of 6 inches of top soil and 18 inches of low permeability (1 x 10^{-6} cm/sec) cover soil fully complies with all applicable Part 360 requirements.

As stated in our submissions on the Gowanda remedial action plan, to the extent that the landfill closure and post-closure requirements of 6 NYCRR Part 360 constitute an ARAR for the Markhams Site, that ARAR, by definition and requirement, includes 6 NYCRR Part 360-1.7(a)(3)(viii)(d), which provides, in pertinent part:

> (viii) Landfills shall meet the following closure and post closure requirements: . . . (d) landfills with an approved closure plan that have ceased to accept waste before

[2] 6 NYCRR Part 360 became effective on December 31, 1988. Landfills closed prior to that date are not required to comply with the current Part 360 requirements. Because the Markhams Site "landfill" was closed with the approval of the New York State Department of Conservation (NYDEC) in 1972, Part 360 is not appropriately identified as an ARAR in developing a remedy for the Superfund Site.

October 9, 1993 must meet the closure and post-closure requirements of the regulations in effect the day the closure plan was approved.

For landfills (1) that ceased accepting waste before October 9, 1993; and (2) that had an approved closure plan, the *only requirements* that must be met under Part 360 are the closure and post-closure requirements *of the regulations in effect the day the closure plan was approved.*

The Markhams Site "landfill" meets the two criteria of subpart (d) of Part 360. PCC used the Site for disposal from 1955, when the company purchased the Markhams property, until 1972, when animal glue production ceased at the Gowanda Plant. As of September 1971, it was reported that approximately 9,600 tons of residuals had been placed at the Peter Cooper Markhams Site over an approximately 15-acre area. In addition, PCC transferred approximately 38,600 tons of previously accumulated residual materials from its Gowanda site to the Markhams Site between August 1971 and late 1972. These materials were transferred to Markhams as part of and in compliance with a June 1971 New York State Supreme Court Order and Judgments, Index No. 30356, which required PCC to remove all or part of the residual piles that had accumulated on the Gowanda property between approximately 1925 and October 1970. PCC's 1971/72 transfer of materials to Markhams pursuant to this Order was the last disposal activity that occurred at the Markhams Site. Accordingly, the Site ceased accepting waste long prior to October, 1993.

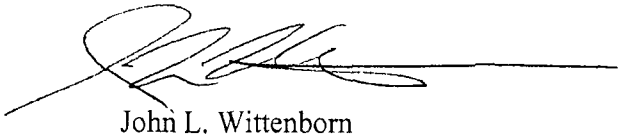
Closure of the Markhams landfill was conducted pursuant to a closure plan approved by DEC. DEC brought suit and obtained a judgment against PCC that required closure of the Gowanda Site under NYDEC's supervision and to NYDEC's satisfaction. That closure plan, contained in PCC's Solid Waste Management Report, dated September, 1971, required the Gowanda waste to be removed and transferred to the Markhams landfill. The Report identified with great specificity how the waste would be disposed of and handled at Markhams. The nearly two year chain of correspondence between NYSDEC and PCC following issuance of the New York State Supreme Court Order and Judgment undeniably demonstrates that DEC was fully aware of and approved the plan for waste placement and closure at the Markhams Site. NYSDEC supervised and approved the work at Markhams (as well as Gowanda) and has involved in and satisfied with the closure activities relative to the Markhams landfill.

In 1972, there were no New York State regulations governing closure and post-closure requirements. Accordingly, under Part 360's applicable subpart (d), no closure or post-closure requirements need be met to satisfy the Part 360 regulatory framework. Only the requirements of the 1972 closure plan are applicable to this site. That closure plan was approved and carried out to DEC's satisfaction. Thus, to the extent that Part 360 is identified as an ARAR for the Markhams Site, no additional closure or capping requirements are necessary to fully satisfy this regulation.

Notwithstanding the absence of a specific ARAR compelling them to do so, the Cooperating PRP Group proposed in its Feasibility Study to enhance the current cover system in existence at the Site by consolidating the waste/fill material at the Site, followed by installation of a protective low permeability cover system. Such a cover system will meet both the site Remedial Action Objectives and any ARAR based on Part 360.

The cooperating PRPs support a remedy for the Markhams site that is sufficient to address the minimal level of risk identified at the site. The risks do not warrant a full Part 360 cover system that would add significant additional cost without any significant reduction in risk. Alternative 4 that includes a 6 inch top soil layer and 18 inches of law permeability (1×10^{-6}) cover soil is more than sufficient to meet the Remedial Action Objectives and the requirements of CERCLA. Any cover system more protective than this is unnecessary and unwarranted.

Sincerely,



John L. Wittenborn
Counsel to Tannery PRP Group