PROPOSED REMEDIAL ACTION PLAN
South Hill Dump

Cortlandville, Cortland Co. New York
Site No. 7-12-009

July 2007

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

PROPOSED REMEDIAL ACTION PLAN

South Hill Dump

Cortlandville, Cortland County, New York
Site No. 7-12-009

May 2007

SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the South Hill Dump . The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this proposed remedy. As more fully described in Sections 3 and 5 of this document, the site was a municipal disposal facility for the Town of Cortlandville from the early 1960's until 1972, although it is reported that local residents used the site for trash disposal as early as 1949 and there is evidence of industrial disposal. These wastes have contaminated the groundwater, surface water, and soils at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to surface soils and exposed waste.

- a significant threat to wildlife associated with potential exposure to surface water, sediments and surface soils.

To eliminate or mitigate these threats, the NYSDEC proposes to install a soil cover system over the disposal area, establish vegetation, and apply institutional controls.

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

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

The NYSDEC has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. This document is a summary of the information that can be found in greater detail in the, July 2003 "Remedial Investigation (RI) Report", the December 2006 Feasability Study (FS), and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

The Cortland Free Library
32 Church Street
Cortland, NY 13045
(607) 753-1042/43 (voice)
Hours M-Th 9:30-8 PM
Fr 9:30-5:30
Sat 9:30-4:30

New York State Department of Environmental Conservation - Region 7 Office
615 Erie Blvd. West
Syracuse, NY 13204
Attn: Gregg Townsend
Phone # 315-426-7403
Hours M-F 8:30-4:45

New York State Department of Environmental Conservation - Central Office
625 Broadway, Floor 12
Albany, NY 12233-7016
Attn: James Drumm
(518) 402-9774
1-888-212-9586
Hours: M-F 8:30-4:45

The NYSDEC seeks input from the community on all PRAPs. A public comment period has been set from {dates} to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for {date} at the {location} beginning at {time}.

At the meeting, the results of the RI/FS will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP. Written comments may also be sent to Mr. Drumm at the above address through {date comment period ends}.

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

Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the NYSDEC's final selection of the remedy for this site.

SECTION 2: SITE LOCATION AND DESCRIPTION

The South Hill Dump consists of approximately 2.5 acres in a rural portion of the Town of Cortlandville, Cortland County, on a six (6) acre property, and is surrounded by woodlands (see Figure 1). The site is approximately 1.25 miles from Route 81. Much of the property is steeply sloped. The surrounding properties are either used for farming or are forest. The nearest residence is approximately 0.25 mile away. The dump operated from the early 1960's until 1972 and received wastes from surrounding communities and local industries.

The site is located in an upland area of the Tioughnioga River valley. The Tioughnioga River flows south from the city of Cortland where five valleys converge. The river flows southeast from the Cortland area approximately 30 miles, where it joins the Chenango River and eventually the Susquehanna River.

The Tioughnioga is one of five major tributaries to the Susquehanna in New York State and the site falls within the Susquehanna River basin, which covers 6,100 square miles in New York. The basin is characterized by highly productive, deep stratified drift aquifers in its valleys. The site and surrounding area also overlie a 25-square mile USEPA designated sole-source aquifer system. The Cortland-Homer-Preble Aquifer System has also been designated by the NYSDEC as a primary aquifer.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The site was operated as a municipal disposal facility by the Town of Cortlandville from the early 1960's until 1972, although it is reported that local residents used the site for trash disposal as early as 1949. During its years of operation, wastes were received from the Village of McGraw and the Towns of Cortlandville and Solon, as well as local industry. Access to the site was reportedly unrestricted. It has also been reported that waste was often allowed to burn during landfill operation, and that at one time a waste oil pit may have existed. Operations are reported to have involved pushing waste over the working face of the landfill with some spreading and compaction. Cover material was reportedly spread one or more times per week. Presently, waste is protruding from the surface of the landfill across much of the site, and includes road construction debris, brush, stumps, tires, white metal, automobile parts, and miscellaneous industrial waste materials. Numerous decomposed drums are present across many areas of the landfill.

3.2: Remedial History

In 1991, the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

In 1990, the NYSDEC conducted a site inspection and collected soil and leachate samples. Analysis revealed the presence of solvents and pesticides. Based on this data, the observed condition of the landfill (leachate seeps, numerous drum carcasses, etc.) and the reported disposal history, the site was proposed for listing on the New York State Registry of Inactive Hazardous Waste Disposal sites.

In response to site findings, the NYSDEC performed an interim remedial measure (IRM) drum removal. In March of 1991, five drums of hazardous waste were removed from the site. Analysis revealed that the drums contained trichloroethene (TCE). The waste was disposed at Frontier Chemical in Niagara Falls, NY. In 1991 and 1992, the Cortland County Planning Department (CCPD) collected several surface water samples at the site. The samples were collected from the intermittent stream at the toe of the landfill. Analytical data revealed elevated concentrations of the solvents TCE and dichloroethene (DCE). In the 1991 sampling event, a concentration of 200 parts per billion (ppb) of each of these compounds was detected. In 1994, the NYSDEC collected two surface water samples, three sediment samples and three soil samples from the site. Data revealed the presence of TCE and DCE in surface water at levels slightly above the NYSDEC standards, criteria and guidance (SCG) values. These two samples were collected in immediate proximity to the CCPD samples. One sediment sample contained a low concentration (9 ppb) of TCE. A low concentration of PCBs (79 ppb) was also detected in one sediment sample below the applicable SCG. The sediment sample results also revealed slightly elevated concentrations of several metals including copper, mercury, nickel and zinc. Analysis of the soil samples revealed low concentrations of TCE, cadmium, copper and several polyaromatic hydrocarbons.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

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

Town of Cortlandville

Smith Corona

Overhead Doors

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

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI field work was conducted between August 1996 and July 2003. The field activities and findings of the investigation are described in the RI report.

The RI included the following activities:

- A records search was conducted to identify the site history, past operations and probable contaminants of concern. The literature search involved a review and compilation of all available State, County and Town records which pertain to the site.
- A site base map was developed which illustrates the site contours, roadways, property boundaries and sample points.
- A test pit investigation was conducted to visually delineate the extent of subsurface contamination and characterize the shallow overburden geology. Subsurface samples were collected to identify the nature of the contamination present.
- Sediment and surface water samples were collected from visible seeps and from the intermittent stream located at the toe of the landfill.
- Monitoring wells were installed in overburden and bedrock to characterize site geology and hydrogeology. Groundwater samples were collected and analyzed to identify any site impacts to groundwater.
- A Fish and Wildlife Impact Analysis was conducted to identify existing or potential impacts to fish and wildlife.
- Applicable Standards, Criteria, and Guidance (SCGs) were reviewed and compared to on site contaminant levels to assess the threat posed, if any, by the site.

5.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

- Soil SCGs are based on the NYSDEC's Cleanup Objectives ("Technical and Administrative Guidance Memorandum [TAGM] 4046; Determination of Soil Cleanup Objectives and Cleanup Levels.") and 6 NYCRR Subpart 375-6 - Remedial Program Soil Cleanup Objectives.

- Sediment SCGs are based on the NYSDEC's "Technical Guidance for Screening Contaminated Sediments."

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

5.1.2: Nature and Extent of Contamination

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

As described in the RI report, many soil, groundwater and sediment samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs), pesticides, and inorganics (metals). For comparison purposes, where applicable, SCGs are provided for each medium.

Chemical concentrations are reported in parts per billion (ppb) for water and parts per million (ppm) for waste, soil, and sediment.

Table 1 summarizes the degree of contamination for the contaminants of concern in groundwater, surface water, surface soils and sediments and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Investigations consisted of excavation of test pits to collect subsurface soil samples, installation of monitoring wells both above and in the bedrock to collect groundwater samples, and collection of surface water and sediment samples. No surface soil samples were collected. Chemical analysis has revealed the presence of contamination in subsurface soils, sediment, surface water and groundwater.

In each sample submitted for inorganic analysis, at least one analyte was detected above SCG levels. The presence of inorganic compounds is typical of solid waste landfills.

Several SVOCs were detected at concentrations above SCGs in soil samples collected during the test pit program. Benzo(a)pyrene, benzo(a)anthracene and chrysene were detected above SCGs. Phenol was also detected above SCGs in several test pit soil samples. SVOC concentrations did not exceed SCGs in soil boring samples or sediment, and in general were found at concentrations less than 1 ppm. SVOCs did not exceed SCGs in surface water or groundwater, with the exception of bis(2-ethylhexyl)phthalate, which was detected above SCGs in five of the six surface water samples.

The only VOC's detected during the RI were TCE, DCE, vinyl chloride and low levels of tetrachloroethylene (PCE), benzene, toluene, ethylbenzene and xylene (BTEX). These compounds were detected in groundwater, sediment and soil borings.

The only pesticide detected above the SCGs was 4,4-DDT. It was detected in test pit soils and sediments.

Waste Materials

Potential source areas that may be contributing to contamination in other media at the site are shown on Figure 3. Source areas are believed to be confined within the limits of the landfill waste, an area of approximately 2.5 acres.

Waste identified during the RI/FS will be addressed in the remedy selection process.

Surface and Subsurface Soils

Figure 3 depicts the estimated extent of landfill materials based upon the RI Test Pit Investigation results. According to the RI, dumping activities were confined to about 2.5 acres of the site. Concentrations of chrysene and phenol exceed SCGs in soil at five test pit locations within the landfill area. Concentrations of metals such as lead and zinc exceeded the SCGs at almost all locations. Sample locations are shown on Figure 2. The location of surface debris observed during an April 2005 site walk is also indicated on Figure 3. Site surface debris would also be considered during the development of remedial alternatives for soil.

Surface and subsurface soil contamination identified during the RI/FS will be addressed in the remedy selection process.

Surface Water and Sediments

Sediment contamination exceeding SCGs is present at all sediment sample locations at the edge of the landfill's waste disposal area. However, all samples collected at the perimeter of the property were below SCGs. Sample locations are shown on Figure 2. Surface water contamination exceeding SCGs is present at surface water sample locations SW002 through SW006. Surface water and sediment samples were collected from the ditch along the eastern boundary of the site. This ditch receives flow from the roadside ditch and culvert via the swale in the northern portion of the site, surface runoff from the landfill area, and groundwater (leachate) seeps located along the southeastern edge of the landfill area. The entire length of this drainage is approximately 1,040 feet, from the culvert at South Hill Road to where the ditch leaves the site to the southeast.

Surface water and sediment contamination identified during the RI/FS will be addressed in the remedy selection process.

Groundwater

Groundwater samples were collected on May 22, 1997. The analytical data showed elevated levels of several volatile compounds including DCE and TCE in both MW-3S and MW-3B. These wells are located at the toe of the landfill. The concentrations of DCE and TCE in MW-3S were 18 ppb and 80 ppb, respectively. The concentrations of DCE and TCE in MW-3B were 56 ppb and 540 ppb, respectively. Wells 2D, 2B, 2S, 4S and 4B which are further away from the waste mass show no exceedances of SCGs. No semivolatile compounds, or pesticides were detected above groundwater standards in any of the wells.

Several inorganic compounds were detected above groundwater standards during the 1997 sampling. Aluminum, cobalt, iron, manganese, vanadium and sodium were observed above groundwater quality standards. When compared to the background concentrations of the compounds, as observed in upgradient monitoring wells MW-1S and MW-1B, only iron and sodium were elevated in concentration. A concentration of iron of 47,600 ppb was observed in well MW-2B versus the background concentration, as observed in MW-1B, of 21,400 ppb. The groundwater quality standard is 300 ppb. Concentrations of sodium in wells MW-3S and MW-3B of 20,900 ppb and 23,600 ppb, respectively, were slightly elevated when compared to the groundwater standard of 20,000 ppb.

Additional groundwater samples were collected in September of 2001. The analytical data showed elevated levels of several volatile compounds including DCE and TCE in both MW-3S and MW-3B. The

concentrations of DCE and TCE in MW-3S were 264 ppb and 200 ppb, respectively. The concentrations of DCE and TCE in MW-3B were 97 ppb and 360 ppb, respectively. Again, no semivolatile compounds or pesticides were detected above groundwater standards in any of the wells and the wells at the site boundary were below SCGs for volatiles.

Groundwater contamination identified during the RI/FS will be addressed in the remedy selection process.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

In response to site observations, the NYSDEC performed an IRM drum removal program before starting the RI. The purpose of the program was to characterize the contents of drums observed to contain product, and properly dispose of these drums. In March of 1991, five drums were removed from the site. Analysis revealed that the drums contained TCE.

An additional IRM was performed during the RI Test Pit Investigation. Excavation of TP-40 was terminated when water reportedly containing non aqueous phase liquids (NAPL) was observed flowing into the hole. TP-40 is located at the site's eastern edge near the area where the five drums of waste containing TCE were removed in 1991. Drums and drum remnants were also observed to be present, but all the drums appeared to be empty. The area was fenced off, sorbent pads were applied to contain the liquids and a spill response contractor was procured. On March 17, 1997, the contractor pumped 660 gallons of liquid into a tanker truck. Samples were collected for analysis to characterize the liquid for off-site disposal. Analysis revealed the presence of DCE, TCE, vinyl chloride, acetone, methylphenol and several inorganics including calcium, iron, magnesium and potassium.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 5.3 of the RI report . An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

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

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

Current complete exposure pathways are limited to direct contact by trespassers with contaminated sediment and exposed waste. Exposed waste, such as construction debris and white-goods, may also present a physical hazard. Because of the site's remote location, current exposure pathways involving other media are not complete. Potential future exposure pathways include direct contact with sediment, surface and subsurface soil by on-site remedial workers. The remedy will prohibit future consumption of contaminated groundwater on site and soil vapor intrusion into occupied structures from volatilization of compounds in

the groundwater will also not occur, as no structures will be allowed. The potential exposure to contaminated groundwater or soil vapor downgradient of the site in the future is unlikely because of the proximity of the site boundary to the unnamed stream.

5.4: Summary of Environmental Assessment

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

Analysis of leachate, stained soil, sediment and surface water has revealed the primary contaminants of concern are solvents and pesticides. Low levels of metals such as arsenic, copper, lead and cadmium were also detected in surface water subsurface soils and sediments. Semivolatile contaminants including benzo(a)pyrene, benzo(a)anthracene, phenol and chrysene were also detected in sub-surface soils and these detections may be evidence that burning of the waste occured. Investigations indicate the landfill is contaminating the groundwater and an intermittent stream at the toe of the landfill.

Field observations and analytical results from environmental samples indicate that groundwater, surface soil, surface water, and sediment are potential complete exposure pathways for wildlife located on and downgradient of the site. Chemicals disposed on-site were detected in leachate (groundwater), surface water, and sediment samples. However, field observations and sample results indicate that ecologically significant migration of chemicals in surface water and sediment to the unnamed stream south of the site is unlikely. Concentrations in downgradient groundwater, surface water, and sediment samples collected near the site property line (approximately 500 feet from the landfill area) were near or below analytical detection limits. Furthermore, little aquatic vegetation was observed in the stream during the site visit, and the bottom sediment consists mostly of a mixture of rock and gravel with very little organic content.

The following environmental exposure pathways and ecological risks have been identified:

Site contamination has the potential to impact the groundwater resource in the Cortland-Homer-Preble aquifer system. The Cortland-Homer-Preble Aquifer System has also been designated by the NYSDEC as a primary aquifer. The site is situated at the eastern edge of this aquifer system.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

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

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

- exposures of persons and wildlife at or around the site to waste, sediment and surface soil;
- the release of contaminants from the waste into groundwater that may create exceedances of groundwater quality standards;
- prevent releases of contaminants from the waste that would result in surface water levels in excess of ambient water quality criteria.

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

- ambient groundwater quality standards and
- soil cleanup standards.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

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

A summary of the remedial alternatives that were considered for this site is discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

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

Alternative 1: No Further Action

The No Further Action alternative recognizes remediation of the site conducted under previously completed IRMs. To evaluate the effectiveness of the remediation completed under the IRMs, only continued monitoring is necessary.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Limited Action

Present Worth: *$1,391,000*
Capital Cost: *$182,000*
Annual Costs:
(Years 1-5): *$101,000*
(Years 5-30): *$25,000*

This alternative includes institutional controls, engineering controls and long term environmental monitoring.

Institutional controls include implementing land-use restrictions to limit site access, prohibit subsurface activity and installation of drinking water wells in the area of contamination. Land-use restrictions would be implemented through environmental easements. The existing site fence would be expanded to encompass the entire property and warning signs would be posted. Long-term maintenance of fencing and warning signs are included in the alternative. Surface and ground water will be monitored quarterly. After five years, the frequency of monitoring could be reduced from quarterly to annual. Construction of the fence could be completed in three months.

Alternative 3: 6 NYCRR 360 CAP

Present Worth: *$3,484,000*
Capital Cost: *$1,809,000*
Annual Costs:
(Years 1-5): *$153,000*

(Years 6-10): *$75,000*
(Years 11-30): *$45,000*

This alternative would cap the landfill with a cover compliant with current 6 NYCRR Part 360 regulations, including a gas venting layer, impermeable cover liner, barrier protection layer and topsoil. The site would be fenced. Institutional controls and long term environmental monitoring would be necessary. Pre-design investigations would be conducted to provide site-specific data needed to conduct final design of the remedial actions. The investigations would include a shallow test pit investigation to identify the extent of landfill materials at the site. Once the extent of the landfill materials is identified, bulky metal surface debris would either be removed and potentially recycled, or crushed and consolidated at the base of the landfill tier embankments. The presence of steep embankment slopes at the edge of the landfill tiers would require placement of clean fill materials and/or regrading to provide a stable slope for cover system construction. The cap would greatly reduce percolation of precipitation into the waste mass, thereby reducing leachate generation and contaminant migration. Construction of the cover system would require rerouting of the drainage ditch to an area beyond the toe of the constructed cover system.

To address potential landfill leachate, the cover system would include a leachate collection system. The leachate collection system would consist of a toe drain with subsurface drain pipes along the downgradient perimeter of the landfill material to collect leachate. The leachate would be drained to a central location for collection and proper off-site disposal.

Because contamination above SCGs would remain on site, institutional controls as described in Alternative 2 would be implemented to prevent exposure. Environmental monitoring would be similar to Alternative 2 with additional air monitoring at the perimeter (for methane as per 6 NYCRR 360.2.f.ii). The results would be used to evaluate the effectiveness and protectiveness of this alternative. After five years, the frequency of monitoring would be reduced from quarterly to annual. Maintenance activities would include periodic inspection and, if necessary, repair of the cover system and fence. The pre-design investigations would take approximately three months and the design another three. Construction of the cap could be completed in one construction season.

Alternative 4: HOT SPOT REMOVAL

Present Worth: *$2,392,000*
Capital Cost: *$1,275,000*
Annual Costs:
(Years 1-5): *$125,000*
(Years 5-30): *$45,000*

This alternative would entail excavation within the landfill. While no specific hot spot areas were delineated during the RI, it is known that the landfill contains drum carcasses, and some may contain residual waste. Institutional and engineering controls as well as long term environmental monitoring would be necessary. It is estimated that approximately 500 cubic yards of contaminated soil would be removed along with the drum material.

Excavated soil and drums would be sampled for characterization prior to transportation for off-site disposal. Following hot spot removal, excavated areas would be backfilled with clean fill, the steeper slopes regraded and the landfill re-vegetated. Because contamination above SCGs would remain on-site, institutional controls, maintenance and environmental monitoring would be implemented similar to Alternative 2. The pre-design investigations and design would take approximately three months. Construction of the remedy could be completed in one construction season.

Alternative 5: HOT SPOT REMOVAL WITH 6 NYCRR 360 CAP

Present Worth: *$4,131,000*
Capital Cost: *$2,491,000*
Annual Costs:
(Years 1-5): *$153,000*
(Years 5-30): *$72,000*

This alternative is a combination of Alternatives 3 and 4. Excavation within the landfill to locate and remove drums and contaminated soil as in Alternative 4 would be followed by consolidation and capping of the landfill as in Alternative 3. Since portions of the landfill would be excavated to determine the locations of hot spots, consolidation could provide significant savings over Alternative 3 by reducing the footprint of the landfill. Because contamination above SCGs would remain on-site, institutional controls, maintenance and environmental monitoring would be implemented similar to Alternative 3. Design efforts would take approximately three months and construction could be completed in one construction season.

Alternative 6 :EXCAVATION OF ENTIRE LANDFILL AND DISPOSAL AT AN OFF-SITE LOCATION

Present Worth: *$5,096,000*
Capital Cost: *$5,096,000*
Annual Costs:
(Years 1-5): *$25,000*
(Years 5-30): *$0*

This alternative includes excavation and off-site disposal of the entire landfill. Excavated soil, sediment, and waste would be sampled for characterization prior to transportation for off-site disposal. Waste excavation, handling, and staging would be conducted similar to Alternative 4. After excavation, some limited environmental monitoring would be necessary to ensure that all the waste had been removed. The pre-design investigations would take approximately three months. Excavation of the landfill could be completed in two construction seasons.

Alternative 7 :TWO FOOT SOIL COVER OVER THE LANDFILL

Present Worth: *$2,040,000*
Capital Cost: *$824,000*
Annual Costs:
(Years 1-5): *$124,000*
(Years 5-30): *$43,000*

This alternative would “close” the landfill in compliance with 6 NYCRR Part 360 requirements in effect at the time the landfill was last used for waste disposal. Scrap metal on the surface would be removed and recycled or disposed off-site. A two foot soil cover would be placed over the entire landfill to prevent wildlife or trespasser contact with waste currently exposed at the surface. The landfill will be regraded during the cover installation, vegetation would be established, and the drainage ditch would be re-routed to an area beyond the toe of the constructed cover system. These actions will reduce infiltration of precipitation through the waste mass and reduce contaminant migration. Institutional and engineering controls, land use restrictions and long term monitoring of groundwater, surface water and sediment would be performed to verify the effectiveness of the remedy at reducing infiltration. Maintenance activities would include periodic inspection and, if necessary, repair of the cover system. The pre-design investigations would take approximately three months and the design another three. Construction of the soil cover could be completed in one construction season.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the NYSDEC has determined to be applicable on a case-specific basis.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectivness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

This final criterion is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the NYSDEC will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The NYSDEC is proposing Alternative 7 as the remedy for this site. The elements of this remedy are described at the end of this section.

Alternative 7 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It would achieve the remediation goals for the site by containing the waste that creates the potential threat to public health and the environment, it would reduce infiltration of precipitation, thus significantly reducing leaching of contaminants to groundwater and contaminant migration. The soil cover would also prevent exposures to trespassers and wildlife. Because contamination above SCGs would remain on site, institutional controls would be implemented.

Alternative 2 does not meet the threshold criteria for protecting human health and the environment because it does not protect trespassers and wildlife from direct contact to exposed waste. In addition to Alternative 7, Alternative 3 (6 NYCRR PART 360 CAP), Alternative 4 (HOT SPOT REMOVAL), Alternative 5 (HOT SPOT REMOVAL WITH 6 NYCRR 360 CAP), and Alternative 6 (EXCAVATION OF ENTIRE LANDFILL) also comply with the threshold criteria. Therefore, the five balancing criteria are particularly important in selecting a final remedy for the site.

Alternative 7 would have some controllable short term adverse impacts, including dust generation during construction and increased truck traffic. However, all alternatives which comply with the threshold criteria would have short term impacts to some degree. Alternatives 3, 4, 5 and 6 would have larger adverse impacts, since both dust and truck traffic would be increased.

Alternative 6 would provide the best long term effectiveness and permanence since the entire landfill would be excavated and disposed off site. However, the price of Alternative 6 is prohibitive by comparison. Alternative 5 may provide marginally better long term effectiveness if intact drums which contained waste were discovered and removed.

All of the alternatives are readily implementable using standard construction techniques.

There would be some reduction in toxicity under all the alternatives as the waste decomposes and natural attenuation breaks down the chemical constituents. Alternative 6 would provide reduction of the waste on site, and Alternatives 3, 5 and 7 will reduce the mobility of the waste by capping/covering the landfill. The cost to implement Alternative 7 is significantly less than all the other alternatives that are protective of the environment

The estimated present worth cost to implement the remedy is $2,040,000. The cost to construct the remedy is estimated to be $824,000 and the estimated annual average costs are expected to be $124,000 for the first five years and $43,000 for the remaining years. However, it is possible that the actual annual costs of implementing the remedy may be significantly lower than the estimated costs detailed above, because the annual sampling costs can be reduced over time. As trends are established, some sampling parameters can be eliminated and the frequency of sampling can be reduced.

The elements of the proposed remedy are as follows:

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

2. A soil cover would be constructed over all fill areas to prevent exposure to contaminated soils and minimize percolation. The soil cover would consist of eighteen (18) inches of clean fill and six inches of topsoil. Vegetation would be established, and runoff control devices would be constructed to reduce erosion.

3. Imposition of an institutional control in the form of an environmental easement that would require (a) compliance with the approved site management plan; (b) restricting the use of groundwater as

a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; and (c) the property owner or person implementing the remedy to complete a periodic certification of institutional and engineering controls.

4. Development of a site management plan which would include the following institutional and engineering controls: (a) management of the final cover system to maintain the cover and restrict excavation in the cover area; (b) environmental monitoring including groundwater, surface water, and sediment; (c) identification of any use restrictions on the site; (d) fencing to control site access; and (e) provisions for the continued proper operation and maintenance of the components of the remedy.

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

Since the remedy results in untreated hazardous waste remaining at the site, a long-term monitoring program would be instituted. This program would allow the effectiveness of the landfill cover to be monitored and would be a component of the long-term management for the site.

TABLE 1
Nature and Extent of Contamination
March, 1997 to September, 2001

SEDIMENT	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
PCB/Pesticides	4,4-DDD	ND to 0.012	0.01	1 of 7
	4,4-DDE	ND to 0.055	0.01	1 of 7
	4,4- DDT	ND to 0.2	0.01	1 of 7
	alpha-Chlordane	ND to 0.0017	0.001	1 of 7
Inorganic Compounds	Antimony	ND to 8.4	2	3 of 7
	Arsenic	ND to 7.3	6	3 of 7
	Cadmium	ND to 8.3	0.6	3 of 7
	Chromium	15.4 to 97.7	26	2 of 7
	Copper	13.6 to 60.5	16	5 of 7
	Lead	15.5 to 334	31	4 of 7
	Manganese	521 to 1970	460	7 of 7
	Nickel	27.7 to 91.5	16	7 of 7
	Silver	ND to 2.4	1	1 of 7
	Zinc	170 to 1240	1	7 of 7

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Semivolatile Organic	Benzo(a)anthracene	ND to 0.76	0.224	3 of 24
Compounds (SVOCs)	Benzo(a)pyrene	ND to 0.78	0.061	7 of 24
	Chrysene	ND to 0.81	0.22	2 of 24
	Phenol	ND to 1.4	0.03	3 of 24
Inorganic	Arsenic	4.8 to 40.7	7.5/SB (7-12)	6 of 24
Compounds	Barium	45.6 to 904	300/SB (15-600)	3 of 24
	Cadmium	ND to 49.8	10/SB (0.01-1)	4 of 24
	Calcium	688 to 61,900	SB (13-35,000)	2 of 24
	Chromium	11.8 to 435	50/SB (1.5-40)	8 of 24
	Copper	11.9 to 1820	25/SB (1-50)	12 of 24
	Iron	6,350 to 569,000	SB (2,000-500,000)	1 of 24
	Lead	7.5 to 2,910	SB (14)	18 of 24
	Magnesium	461 to 9,510	SB (100-500)	9 of 24
	Mercury	ND to 0.79	0.10	11 of 24
	Nickel	15.3 to 249	13/SB (0.5-25)	19 of 24
	Zinc	50.7 to 4130	20/SB (9-50)	24 of 24

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	DCE	ND to 56	5	2 of 8
	TCE	ND to 540	5	2 of 8
Inorganic Compounds	Aluminum	463 to 11500	100	8 of 8
	Cobalt	ND to 7.1	5	1 of 8
	Iron	811 to 47,600	300	8 of 8
	Manganese	25 to 876	300	3 of 8
	Sodium	1,900 to 23,600	20,000	2 of 8
	Vanadium	ND to 17.7	14	1 of 8

SURFACE WATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	1,1-DCE	ND to 180	5	1 of 6
	TCE	ND to 530	110	1 of 6
	Vinyl Chloride	ND to 32	0.7	1 of 6
Semivolatile Organic	BIS(2-ethylhexyl)phthalate	ND to 18	0.6	5 of 6
Inorganic Compounds	Aluminum	137 to 283,000	100	6 of 6
	Antimony	ND to 105	10	2 of 6
	Barium	0.137 to 283	1,000	2 of 6
	Cadmium	ND to 16.2	1.2	3 of 6
	Chromium	ND to 457	207	1 of 6
	Cobalt	ND to 237	5	5 of 6
	Copper	2.9 to 595	24	5 of 6
	Iron	105 to 242,000	300	5 of 6
	Lead	ND to 2,970	4	5 of 6
	Magnesium	3,710 to 102,000	35,000	2 of 6
	Manganese	0.0049 to 11	300	5 of 6
	Mercury	ND to 28	0.2	2 of 6
	Nickel	ND to 819	96	2 of 6
	Silver	ND to 11	0.1	2 of 6
	Vanadium	ND to 405	14	5 of 6
	Zinc	9.4 to 14,500	30	5 of 6
	Total Cyanides	ND to 32	5.2	1 of 6

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

[b] SCG = standards, criteria, and guidance values;

[c] ND= not detected
[d] SB=site background

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alternative 1 No Action	0		
Alternative 2 Limited Action	$180,000	$100,000 (years 1-5) $65,000 (years 6-10) $40,000 (years 11-30)	$1,400,000
Alternative 3 6 NYCRR 360 Cap	$1,800,000	$150,000 (years 1-5) $75,000 (years 6-10) $45,000 (years 11-30)	$3,500,000
Alternative 4 Hot Spot Removal	$1,300,000	$130,000 (years 1-5) $80,000 (years 6-10) $55,000 (years 11-30)	$2,400,000
Alternative 5 Hot Spot Removal and a 6 NYCRR Part 360 Cap	$2,500,000	$150,000 (years 1-5) 100,000 (years 6-10) $75,000 (years 11-30)	$4,100,000
Alternative 6 Excavation Of Entire Landfill and Disposal at an Off-Site Location	$5,100,000	$130,000 (years 1-5) $45,000 (years 6-30)	$6,200,000
Alternative 7 Construction of Soil Cover	$820,000	$124,000 (years 1-5) $43,000 (years 6-30)	$2,000,000