PROPOSED REMEDIAL ACTION PLAN

Townley Hill Road Dump Site
State Superfund Project
Catlin, Chemung County
Site No. 808006
February 2012

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

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

Big Flats Branch Library
78 Canal Street
Big Flats, NY 14814
Phone: 607-562-3300

A public comment period has been set from:

2/20/2012 to 3/21/2012

A public meeting is scheduled for the following date:

3/6/2012 at 6:00 PM

Public meeting location:

The Town Hall 1448 Chambers Road, Beaver Dams, NY 14812

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 3/21/2012 to:

Vivek Nattanmai
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
vrnattan@gw.dec.state.ny.us

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information by Email

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

SECTION 3: SITE DESCRIPTION AND HISTORY

Site Location: The site is located in a rural portion of Chemung County, NY. The site is

approximately 7 miles north of route 17. The Site is located within the Susquehanna River basin. An unnamed tributary to Post Creek passes within 500 feet southeast of the Site. Post Creek, a class C stream is located approximately 1700 feet north west of the site.

Site Features: The Site occupies an approximate 10-acre portion of a larger 28 acre property located on Townley Hill Road near the town of Catlin. The surrounding area is rural with small population centers along the Post Creek Valley to the northwest. A private residence is situated approximately 700 feet east of the identified "former drum disposal area" at the Site. The Site is not fenced, although a suspended steel cable across the driveway restricts vehicle access. Two areas of concern identified at the site are the "former drum disposal area" and the "former municipal waste disposal area".

The Site is located on a terrace, and the ground surface of the Site is relatively flat with steeply sloping sides. The surrounding hillsides are wooded, and hardwoods have grown over the original fill area, except for a small area at the crest of the hill. A small pond is located on the western side of the former drum disposal area. A second, smaller pond located to the east of the former drum disposal area is shown on the Site plan. Surface runoff appears to flow into the unnamed tributary to Post Creek located to the southeast of the Site area. Runoff on the western portion of the Site likely flows directly toward Post Creek.

Current zoning: The site is currently zoned as agricultural/residential.

Historic Use(s):

Mr. Joseph E. Lobell owned and operated the Site as a landfill beginning in the late 1950s or early 1960s. Beginning in 1964, the Site was owned by Mr. John A. Mandzak, who operated Superior Salvage Company (aka Superior Hauling and Superior Disposal). Throughout this period, the Site was reportedly used for disposal of municipal solid waste under a permit issued by the Chemung County Department of Health. The Site also reportedly received miscellaneous debris, including tires, junk automobiles, 55-gallon drums, and calcium fluoride sludge (Engineering-Science, 1988). Superior Salvage Company customers reportedly included local municipalities and the City of Corning School District, where Mr. Mandzak was reported to be the maintenance superintendent. Based on available records, approximately 300 drums containing an incinerator ash-like waste material were disposed of at the Site.

According to available historical records from Westinghouse Electric Corporation (Westinghouse), an unknown quantity of calcium fluoride sludge from the Westinghouse Industrial and Government Tube Division manufacturing facility located in Horseheads, New York plant was disposed of in bulk at the "Madzac property" (presumably the Site) between 1964 and 1967. This sludge reportedly consisted of "waste treatment plant sludge intermittently containing traces of lead phosphate and cadmium" from the Westinghouse Horseheads facility. The calcium fluoride sludge was reportedly buried in 8-foot deep trenches to the east of the Site access road.

On October 16, 1967, the Site was closed by the Chemung County Health Department due to complaints of odors and open burning. Beginning in 1969, most of the junked automobiles and other debris were removed by the new owner, Mr. James C. Case. With the assistance of the local offices of the U.S. Department of Agriculture, Soil Conservation Service, Mr. Case enlarged the on-Site pond and placed a soil cover over and revegetated most of the Site.

Chemung County foreclosed on the property in 1998 and subsequently sold the Site in 1999 to Northwoods Hunting Inc., of Ridgeway, Ontario (Northwoods). Northwoods is the current owner of the property that comprises the Site.

In April 1980, the Site was identified by NYSDEC as an inactive hazardous waste disposal site and placed on the Registry of Inactive Hazardous Waste Disposal Sites in New York. In 1983 and 1984, NYSDEC sampled the contents of the drums, and analyzed these drum samples for metals by the Extraction Procedure (EP). Results from the 1984 sampling event indicated an exceedance of the threshold EP toxicity concentrations for cadmium and lead. The Site was subsequently classified as a "Class 2" Site in December 1986.

In December 1996, an "Immediate Investigation Work Assignment Work Plan" was finalized to investigate Site soils, particularly residual cadmium concentrations in soils in the former drum disposal area. In 1997, NYSDEC conducted a focused RI and issued a report in September 1998 that recommended a comprehensive RI/FS be conducted at the Site to investigate potential impacts to soil, sediment, and groundwater.

In 1989, 1995, and 1998, the NYSDOH sampled private wells servicing two homes within one quarter mile of the Site and found no site-related contaminants. As part of the RI, private well samples were collected in 2011 from the two residential supply wells historically sampled to confirm previous findings. Site-related contaminants were not detected in the 2011 private well samples.

Site Geology and Hydrogeology: Soil encountered at the Site during drilling and subsurface investigations consisted of brown and gray, silty sand and silty clay, with varying amounts of rock fragments. Soil thickness varied at the Site from 14.0 feet at Monitoring Well MW-1 to 47.5 feet at Monitoring Well MW 4. Soil thicknesses in southern monitoring wells (MW-3 and MW-4) were greater than those in the northern monitoring wells (MW-1 and MW-2) and are believed to be the result of glacial processes. A glacial terrace likely exists in the southern portion of the Site as evidenced by both the thickness and type of soil (glacial till) observed during drilling activities.

Bedrock in the Site region is of Upper Devonian age and consists of shale and siltstone from the Nunda and West Hill Formations of the West Falls Group. These beds reportedly dip gently to the south and show limited structural deformation. Bedrock was described in the boring logs as moderately hard to hard, gray and brown siltstone and shale. Varying amounts of clay-filled and iron-stained fractures were observed in bedrock, and fossiliferous shale beds were encountered.

Groundwater at the site flows to the west and southwest toward the Post Creek valley. Based on the Site geologic and hydrogeologic data, groundwater flow is believed to be primarily influenced by surface topography and the connectivity of bedrock fractures.

A site location map is attached as Figure 1. The site layout is shown in figure 2.

SECTION 4: LAND USE AND PHYSICAL SETTING

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

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

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

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

CBS Corporatrion

CBS Corporation is the PRP who is the successor to the interests of Westinghouse Electric Corporation, a generator of wastes disposed at the Site. Northwoods Hunting, Inc. which is a Canadian corporation is the current owner of the site.

The Department signed the Order on Consent on November 22, 2010. This order includes the implementation of the remedial investigation and feasibility study and the implementation of the remedy with site management plan.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,

- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Information

The analytical data collected on this site includes data for:

- groundwater
- surface water
- soil
- sediment

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

Cadmium	Arsenic
Lead	PCB-Aroclor 1254

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- sediment

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

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

IRM Drum Removal

In July 1988, NYSDEC conducted an interim remedial measure (IRM) in which it removed approximately 300 drums containing an ash-type waste and approximately 100 cubic yards (CY) of soil impacted by cadmium. In November 1994, NYSDEC removed an additional 236 CY of soil from the former drum disposal area. Following the IRM, several Site investigations were conducted from 1990 through 1997, including the collection of numerous surface and subsurface soil samples.

IRM Soil Removal

Additional soil samples were collected between September 1991 and June 1993 to evaluate the effectiveness of the drum removal IRM. Shallow (0 to 6 inches in depth) and subsurface (12 to 24 inches in depth) soil samples were collected and analyzed for cadmium. The results of the sampling showed detected concentrations of cadmium of up to 2,100 milligrams per kilogram (mg/kg), leading NYSDEC to remove additional soil. In November 1994, NYSDEC removed soil from the former drum disposal area to a depth of 24 inches below ground surface (bgs), resulting in 236 CY of material being sent off Site for disposal. Confirmatory soil sampling was conducted and indicated the continued presence of cadmium in the remaining soils at the former drum disposal area.

6.3: Summary of Human Exposure Pathways

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

Drinking contaminated groundwater is not expected since private water supply wells that serve structures near the site have been tested and site-related contamination is not present. Access to the site is restricted; however, persons who enter the site may come into contact with contaminants in the soil by walking on the dirt, digging on or below the ground surface, and

otherwise disturbing the soil. In addition, if people enter the on-site ponds, they may come in contact with contaminants present in the pond sediments.

6.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

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

Prior to Remediation:

There are three areas of concern at the site which includes the former drum disposal area, former municipal waste disposal area (landfill) and the pond area. The interim remedial measure (IRM) conducted by NYSDEC at the former drum disposal has removed and disposed approximately 300 drums containing an ash-type waste and approximately 336 cubic yards (CY) of soil impacted by cadmium.

The RI included the sampling of the waste in the landfill area. Consistent with the past use of the Site as a landfill, municipal waste and other debris was identified throughout an approximate 1.8-acre area of the Site. Observations made during test pitting show that this waste is generally about 9 to 12.5 feet thick in the center of the disposal area and gradually thins toward the edges of the indicated disposal area. None of the soil samples collected at these test pits exhibited cadmium concentrations above the commercial soil clean up goal. Calcium fluoride sludge was only identified in one test pit (TP-19) located about 100 feet further to the north; there the sludge was found in a thin lens at 2.5 to 3.0 feet bgs. Although there were sporadic detection of varying concentrations of contaminant of concern, soils in the municipal waste disposal area generally did not exhibit high concentrations of cadmium.

Concentrations of arsenic, antimony, iron, and manganese have been detected above NYSDEC groundwater standard in at least one of the four groundwater monitoring wells present at the Site. Site wells are completed to monitor groundwater in the shallow bedrock aquifer. The presence of these metals in Site groundwater can most likely be attributed to naturally occurring conditions associated with the aquifer properties (e.g., soil mineralogy/rock type, weathering, etc.) as each metal was detected above reporting limits in the upgradient monitoring well (MW-1). Cadmium was not detected above the groundwater standards in any of the wells. Arsenic (48 ppb) and Antimony (3.2 ppb) were detected marginally above groundwater standards. The groundwater standard for Arsenic is 25 ppb and Antimony is 3 ppb.

In 1989, 1995, and 1998 NYSDOH sampled nearby private wells and site-related contaminants were not detected. As part of the RI, private well samples were collected in 2011 to confirm historical sampling results and verify that site-related contamination were not present. The results did not detect any contaminant of concern from the site.

In 1989, 1995, and 1989 NYSDOH sampled nearby private well and site-related contaminants were not detected. As part of the RI, private wells samples were collected in 2011 to confirm historical sampling results and verify that the site-related contaminants were not present. The results did not detect any contaminant of concern from the site.

Sediment samples collected from two small ponds at the site detected arsenic concentrations ranging from 7.0 ppm (SD-4) to 15 ppm (SD-1) exceeding the sediment criterion (6 ppm) in each sediment sample collected. One sediment sample (SD-2) detected cadmium at 4.6 ppm which exceeded the sediment criterion for cadmium (0.6 ppm). Concentrations of one PCB Aroclor (PCB-1254) exceeded the applicable criterion (0.8 ppb) in each sediment sample. PCB-1254 concentrations ranged from 6.8 ppb (SD-4) to 6,700 ppb (SD-2).

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Sediment

RAOs for Public Health Protection

- Prevent direct contact with contaminated sediments.

RAOs for Environmental Protection

- Prevent releases of contaminant(s) from sediments that would result in surface water levels in excess of (ambient water quality criteria).
- Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain.
- Restore sediments to pre-release/background conditions to the extent feasible.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

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

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

The estimated present worth cost to implement the remedy is $1,361,000. The cost to construct the remedy is estimated to be $1,137,000 and the estimated average annual cost is $25,000.

The elements of the proposed remedy are as follows:

1. A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;

- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Excavate the impacted soil from the former drum disposal and test pit areas where total cadmium concentrations were greater than the commercial SCO;

3. Stabilize the excavated soils as needed to assure the material is non-hazardous for cadmium and lead;

4. Treat in-situ (or excavate and treat ex-situ) waste materials in the former municipal waste disposal area identified as exhibiting the characteristic of a RCRA hazardous waste to render materials non-hazardous for cadmium and lead;

5. Consolidate the treated materials in the waste management area (WMA) within the landfill footprint;

6. Grade and re-vegetate as needed to cover excavated areas in the landfill to provide for surface water drainage; and

7. Excavate sediments to one-foot depth using conventional earthmoving equipment, stockpile on site, and allow to dry sufficiently to facilitate handling. Stabilize the sediments and consolidate within the WMA in the landfill footprint.

8. Where it is required make repairs to and improvements of the existing soil cover in the former municipal solid waste disposal area. This work would include removing surface debris, placing geo-textile on the prepared surface, and placing 24 inches of imported clean soil and topsoil and re-vegetate to reduce potential soil erosion.

9. Imposition of an environmental easement in the form of a deed restriction for the controlled property that:
- requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allows the use and development of the controlled property for commercial as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH;
- prohibits agriculture or vegetable gardens on the controlled property; and
- requires compliance with the Department approved Site Management Plan.

10. Site Management Plan is required, which includes the following:
a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in the paragraph above.
Engineering Controls: maintenance of the soil cover.
This plan includes, but may not be limited to:

- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- provisions for the management and inspection of the identified engineering controls;
- Maintain the soil cover periodically. Maintenance will include mowing the cover one time a year, if necessary and repair of any areas of the cover that were damaged or compromised in any way;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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

- monitoring of groundwater to assess the performance and effectiveness of the remedy and
- a schedule of monitoring and frequency of submittals to the Department.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/ polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 6.1.1 are also presented.

As specified in NYSDEC guidance, surface soil and test pit soil results were compared to NYSDEC Subpart 375-6 Remedial Program Commercial Category Soil Cleanup Objectives (SCOs). Initial comparisons are to the Unrestricted Use SCOs to provide a preliminary evaluation of soil quality. Following the preliminary evaluation, soil samples were then compared to Commercial SCOs as a means of establishing the clean up goals with regard to current and expected future land use. Use of the Commercial SCOs as the appropriate criteria is based on current and anticipated future Site usage (hunting lease), zoning of the Site (agricultural-residential), and Site exposure scenarios. Unless the former municipal waste disposal area was removed from the Site, future development for residential or agricultural use would be considered highly unlikely.

The groundwater, soil, sediment and surface water samples collected during the investigation were analyzed for VOCs, SVOCs, PCBs and inorganics.

Surface and sub-surface soils

As previously discussed, 23 soil borings (SS-1 through SS-16, SS-18 through SS-21, and SS-26 through SS-28) were advanced to assess the horizontal and vertical extent of cadmium and lead concentrations in soil near the former drum disposal area. Four samples per location were collected at each soil boring. Figure 2 shows all the locations of the soil samples from the landfill and the drum disposal areas.

With the exception of soil samples collected at Soil Borings SS-4, SS-5, SS-13, SS-18, SS-19, and SS-20, cadmium concentrations in the shallow soil samples (0 to 6 inches in depth) were less than the Commercial SCOs. Cadmium concentrations in the six samples with exceedances ranged from 12.8 mg/kg (SS-4 [0’-0.5’]) to 699 mg/kg (SS-18 [0’-0.5’]). The NYSDEC Commercial SCO for cadmium is 9.3 mg/kg. All detected lead concentrations were less than the corresponding Commercial SCO (1,000 mg/kg), and no other constituents

were detected in concentrations exceeding Commercial SCOs in any of the four soil samples (SS-2 [0.5'-1.5'], SS-7 [0.5'-1.5'], SS-11 [0.5'-1.5'], and SS-15 [0.5'-1.5']) that were analyzed for the extended parameter list.

Following the step-wise protocol, the 0.5- to 1.5-feet below ground surface bgs interval samples from Soil Borings SS-4, SS-5, SS-13, SS-18, SS-19, and SS-20 were analyzed for cadmium and lead. The only sample with a concentration exceeding Commercial SCOs was Soil Sample SS-18 (0.5'–1.5') in which the cadmium concentration was 34 mg/kg. The next lower Soil Sample SS-18 (1.5'-2.5') was analyzed and reported to contain a cadmium concentration (19 mg/kg) that again exceeded the Commercial SCO. The final sample collected from this location (SS-18 [2.5'-3.5']) was analyzed, and the detected cadmium concentration (5.3 mg/kg) was less than the applicable Commercial SCO (9.3 mg/kg). The results of the surface soil investigation, in combination with those from the 1997 NYSDEC sampling, provide complete horizontal and vertical delineation of Site soils.

Table 1 - Soil (Former Drum Disposal Area)

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial Use SCG[c] (ppm)	Frequency Exceeding Commercial SCG
VOCs					
SVOCs					
Inorganics					
Arsenic	11.1 – 13.1	13	1/4	16	0/4
Chromium	16.8 – 19.3	30	0/4	1500	0/4
Cadmium	0.097 – 699	2.5	25/47	9.3	13/47
Lead	8 – 68.8	63	2/47	1000	0/47
Pesticides/PCBs					

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.

The primary contaminants found in soils were cadmium and lead during the investigations. These contaminated soils would be addressed in the remedy selection process.

Test Pit Soils and Waste

Analytical results for soil samples collected from the perimeter of the landfill and interior test pits were compared to NYSDEC Unrestricted and Commercial SCOs. The only analyte with concentrations exceeding Commercial SCOs was cadmium. Cadmium exceedances were present in samples collected from TP-3 (0'-0.5'), TP-7 (0'-0.5'), TP-7 (2'-2.5'), TP-16 (2'-2.5'), and TP-16 (3'-3.5') with concentrations ranging from 10.2 mg/kg (TP-3 [0'-0.5']) to 23.2 mg/kg (TP-16 [2'-2.5']). The NYSDEC Commercial SCO for cadmium is 9.3 mg/kg.

A sample of material visibly identified as calcium fluoride sludge was collected at Test Pit TP-19 and analyzed for hazardous waste characteristics and PCBs. The analytical results indicate that the identified calcium fluoride sludge exhibits the characteristics of an RCRA hazardous waste due to the concentration of cadmium in the TCLP leachate (2.1 milligrams per liter [mg/l]) versus the regulatory threshold of 1.0 mg/l. Cadmium concentrations were not elevated in soil samples collected above (TP-19 [0-0.5], 0.37 mg/kg) and below (TP-19 [7-7.5], less than 0.42 mg/kg) the calcium fluoride sludge.

NYSDEC analyzed a subset of test pit soil samples that included Samples TP-8 (0-0.5), TP-13 (10.5-11), TP-15 (8-8.5), and TP-19 (7-7.5). Generally, detected parameters and their concentrations in the NYSDEC and CBS samples are similar with a few exceptions. Detected parameter and concentration differences were most prevalent in Soil Sample TP-13 (10.5-11) as several parameters detected in the CBS sample were not detected in the NYSDEC sample.

Table 2 - Test Pit Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	commercial Use SCG[c] (ppm)	Frequency Exceeding commercial SCG
VOCs					
SVOCs					
Inorganics					
Arsenic	4.4 – 14.7	13	3/33	16	0/33
Cadmium	ND – 23.2	2.5	8/33	9.3	5/33
Lead	3.8 - 289	63	1/33	1000	0/33
Pesticides/PCBs					
Aroclor 1254	ND – 0.88	0.1	5/33	1	0/33

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.

The primary contaminants found in the waste materials and soils from the landfill were cadmium and lead. Calcium fluoride sludge was found in the suspected area of the landfill identified during previous investigations. The sludge exhibits the characteristics of an RCRA hazardous waste for cadmium. The waste and the soils identified as contaminated/hazardous would be addressed in the remedy selection process.

GROUNDWATER CHARACTERIZATION

June 2011 Groundwater Characterization Results

Results from the groundwater sampling events conducted during the RI were compared to NYSDEC Part 703 Groundwater Quality Standards (GQS). The groundwater sample from Monitoring Well MW-4 had reported NYSDEC GQS exceedances for arsenic. Monitoring Well MW-4 detected arsenic at concentration of 48 micrograms per liter (µg/l compared to corresponding NYSDEC GQS of 25 µg/l. Cadmium was not detected above reporting limits in groundwater samples collected from Monitoring Wells MW-1, MW-3, and MW-4. The cadmium concentration in the sample collected in June 2011 from Monitoring Well MW-2 was below the reporting limit but estimated by the laboratory at a concentration of 0.17 µg/l. This estimated cadmium concentration was below the corresponding NYSDEC GQS (5 µg/l).

One pesticide (delta-BHC) was detected in the Monitoring Well MW-2 sample, and one VOC (carbon disulfide) was detected in the Monitoring Well MW-4 sample. Both concentrations were below the applicable NYSDEC GQS.

September 2011 Groundwater Characterization Results

Similar to the June 2011 results, groundwater at Monitoring Well MW-4 exhibited exceedances for arsenic at concentration of 44 µg/l when compared to corresponding NYSDEC GQS of 25 µg/l. Cadmium was detected not detected above reporting limits in groundwater samples collected from Monitoring Wells MW-1, MW-3, and MW-4. The cadmium concentration in the sample collected from Monitoring Well MW-2 was below the reporting limit but estimated by the laboratory at a concentration (0.20 µg/l) well below the corresponding NYSDEC GQS (5 µg/l).

One VOC (acetone) was detected in each monitoring well sample at an estimated concentration, and the concentrations did not exceed the applicable standard. SVOCs, pesticides, and PCBs were not detected above laboratory detection limits in any sample.

Table 3 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
SVOCs			
Inorganics			
Arsenic	ND – 48	25	2/10
Iron	190 – 2700	300	8/10
Manganese	3.6 – 540	300	4/10
Pesticides/PCBs			

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

The primary contaminant found in groundwater was arsenic in one **upgradient** monitoring well and would be addressed in the remedy selection process. Figure 2 shows the locations of the monitoring wells.

SURFACE WATER CHARACTERIZATION

SVOCs, pesticides, PCBs, and cyanide were not detected above laboratory reporting limits. Two VOCs (acetone and toluene) were detected; however, their concentrations were estimated by the laboratory because the concentrations were reported to be between the reporting limit and the method detection limit. Acetone and toluene concentrations did not exceed the corresponding NYSDEC surface water criteria (Class D fresh water). Each TAL metal except zinc was detected in at least one surface water sample; however, none of the concentrations exceeded NYSDEC surface water standards. Fluoride was detected in each sample collected, but NYSDEC has not promulgated a surface water standard for fluoride.

NYSDEC analyzed the surface water sample collected at Sample Location SW-2. Detected parameters and concentrations in the NYSDEC surface water sample were consistent with the consultant's results.

No site-related surface water contamination of concern was identified during the RI. Therefore, no remedial

alternatives need to be evaluated for surface water.

SEDIMENT CHARACTERIZATION

For screening to identify potential COCs, sediment analytical results were conservatively compared to the most stringent NYSDEC Sediment Criteria provided in the Technical Guidance for Screening Contaminated Sediments (NYSDEC, 1999).

Concentrations of several metals exceeded NYSDEC sediment criteria. The following provides a summary of the sediment exceedances.

- Arsenic: Detected arsenic concentrations exceeded the corresponding sediment criterion (6 mg/kg) in each sediment sample collected. Arsenic concentrations ranged from 7.0 mg/kg (SD-4) to 15 mg/kg (SD-1).
- Cadmium: Detected concentrations exceeded the corresponding sediment criterion (0.6 mg/kg) in the sample and duplicate sample collected as Sediment Sample SD-2. Cadmium concentrations detected at Sediment Sample SD-2 were 3.8 mg/kg and 4.6 mg/kg.
- Iron: Detected iron concentrations exceeded the corresponding sediment criterion (2 percent or 20,000 mg/kg) in each sediment sample collected. Iron concentrations ranged from 25,000 mg/kg (2.5 percent, SD-2 duplicate sample and SD-4) to 30,000 mg/kg (3.0 percent, SD-1).
- Nickel: Detected nickel concentrations exceeded the corresponding sediment criterion (16 mg/kg) in each sediment sample collected. Nickel concentrations ranged from 23 mg/kg (SD-2 duplicate sample and SD-4) to 30 mg/kg (SD-1).

Two pesticides (4,4'-DDT and gamma-chlordane) exceeded sediment criteria in Sediment Sample SD-2 and its duplicate. In Sediment Sample SD-2 and its duplicate, 4,4'-DDT was reported at concentrations of 340 µg/kg and 100 µg/kg while gamma-chlordane concentrations were 60 µg/kg and 22 µg/kg. Concentrations of one PCB Aroclor (PCB-1254) exceeded the applicable criterion in each sediment sample. PCB-1254 concentrations ranged from 6.8 µg/kg (SD-4) to 6,700 µg/kg (SD-2).

For PCBs, the "Technical Guidance for Screening Contaminated Sediments" lists four screening values that correspond to different levels of protection. The values for these criteria were calculated using the assumed value of organic carbon content and are listed in Table A.

Table A

Levels of Protection	PCB screening Criterion	Frequency of Exceedance
Wildlife Bioaccumulation	14.0 ppb	4/5
Benthic Aquatic Life Chronic Toxicity	0.193 ppm[b]	1/5
Benthic Aquatic Life Acute Toxicity	27.6 ppm	0/5

a - ppb; parts per billion or micrograms per kilogram, µg/kg
b - ppm; parts per million or milligrams per kilogram, mg/kg

The calculations in Table A were based on a assumed organic carbon content of 1%. Based on the calculated values included in the table and consistent with the clean up criteria used in similar sites, the PCB clean up criteria for the sediment at this site is established at 0.2 ppm. The sediment removal using the PCB clean up criterion would address the pesticide contamination found in the sediment.

Table 4 - Sediment

Detected Constituents	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)	Frequency Exceeding SCG
VOCs			
SVOCs			
Inorganics			
Arsenic	7 – 15	6	5/5
Cadmium	0.072 – 4.6	0.6	2/5
Iron	25000 – 30000	20000	5/5
Nickel	23 – 30	16	5/5
Pesticides/PCBs			
PCB-1254	0.068 – 6.7	0.2	~~5~~ 2/5
4,4'-DDT	ND – 0.340		
Gamma-chlordane	ND – 0.060		

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in sediment;
b - SCG: The Department's "Technical Guidance for Screening Contaminated Sediments."

In addition to the primary contaminant of concern for the site, PCBs, pesticides, nickel and arsenic were found in the sediment samples. The impacted sediment would be addressed in the remedy selection process. Figure 2 shows the locations of all the sediment samples.

RESIDENTIAL SUPPLY WELL ASSESSMENT

Residential supply well samples were collected and analyzed for TCL VOCs using USEPA Method 524.2 (the USEPA analytical protocol applicable to drinking water) and for TAL metals using USEPA Methods 6010B and 7412A. The analytical results were compared to Part 5, Subpart 5-1, 10NYCRR of the New York State Sanitary Code. These include primary MCLs, secondary MCLs, and copper and lead action levels.

VOCs were not detected in either residential supply well sample above laboratory reporting limits. Several metals were detected in each residential well sample, but these detected metals concentrations were less than primary MCLs. The metals concentrations present are likely attributed to naturally occurring groundwater conditions.

These findings are consistent with those from earlier sampling conducted by the New York State Department of Health (NYSDOH). In 1989, 1995, and 1998, the NYSDOH sampled the private well servicing the nearest home within one-quarter mile of the site and found no site-related constituents.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Alternative 1 – No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment. The no action alternative would allow impacted soils and RCRA waste to remain on Site and allow future Site users to potentially be exposed to these materials. Impacted sediments in the on-Site ponds, and the associated potential ecological risks, would likewise not be addressed. The potential for future exposure to arsenic concentrations in groundwater would not be addressed. In accordance with NYSDEC guidance and the NCP, the no action alternative is carried through the detailed evaluation and comparison of alternatives to provide a benchmark for assessing the performance of other alternatives.

Present Worth: *$0*
Capital Cost: *$0*
Annual Costs: *$0*

Alternative 2 – On-Site Consolidation and Low Permeable Cap with Access and Institutional Controls

Alternative 2 provides on-Site containment of the impacted soils and wastes to eliminate the potential for direct-contact exposure to these materials and to reduce the potential for COCs to leach from subsurface soils or waste and disperse into groundwater. This alternative involves the excavation of the impacted soil from the former drum disposal area, the cadmium contaminated soils from the landfill and impacted sediments from the on-Site ponds and place them in a designated waste management area (WMA) located in the former municipal waste disposal area corresponding to the refined limits of calcium fluoride sludge. The excavated areas will be backfilled with clean, imported fill and grading the area to drain properly. Imported clean soil will be placed on the consolidated material to establish suitable grades for capping. Install a multilayer, low-permeability capping system with surface water management controls in the 0.6 acres of the consolidated area (WMA) in the landfill. Disturbed areas would be revegetated including the excavated portion of the former drum disposal area, the former municipal waste disposal area, and the WMA.

This alternative provides for repairs to and improvements of the existing soil cover over the balance of the former municipal solid waste disposal area. This work would include removing surface debris, placing geotextile on the prepared surface, and placing up to 24 inches of imported clean soil and topsoil where needed to repair the existing soil cover.

Long-term monitoring and maintenance of the capped area and fencing would be required. The cost estimate is prepared based on a 30 year monitoring and maintenance of the landfill. It is assumed that monitoring would include groundwater and sediment monitoring for a period of 5 years and based on the results of the monitoring an evaluation would be done to continue or discontinue monitoring.

Institutional controls in the form of a deed notice (already in place) and restrictive covenants would be put into place. With on-Site containment, the restrictive covenants would also prohibit use of on-Site groundwater. As an alternative, if an on-Site water supply were needed, the Site owner could install, operate, and maintain a point-of-use groundwater treatment system approved by NYSDOH.

Present Worth: *$1,192,000*
Capital Cost: *$968,000*
Annual Costs: *$25,000*

Alternative 3 – On-Site Treatment, Consolidation, and Containment with Access and Institutional Controls

Alternative 3 provides similar on-Site containment of the impacted soils and wastes as Alternative 2 to eliminate the potential for direct-contact exposure to impacted materials. In this alternative, however, impacted soils and identified RCRA hazardous waste would be treated via ex-situ or in-situ stabilization to reduce the potential for COCs to leach from subsurface soils or waste and disperse into groundwater. The stabilization treatment would render hazardous material non-hazardous and achieve applicable LDRs and UTS for cadmium and lead.

In addition to civil construction requirements and the confirmatory sampling and analysis program, the remedial design for this alternative would involve treatability studies to determine the appropriate additives (*e.g.*, phosphates, pozzolonic materials) and dosages. Treatability studies would also examine the correlation of total versus TCLP cadmium and lead concentrations to determine which materials require treatment.

This alternative would include the excavation of the impacted soil from the former drum disposal area, the cadmium contaminated soils from the former municipal waste disposal area, impacted sediments from the on-Site ponds and waste materials from the former municipal waste disposal area identified as exhibiting the characteristic of a RCRA hazardous waste and stabilize the soils and waste to assure the material is non-hazardous and leachable cadmium and lead concentrations meet LDRs and UTS for cadmium and lead. The treated materials would be consolidated into the designated WMA within the former municipal waste disposal area. The excavated areas will be backfilled with clean, imported fill and grading the area to drain properly. Grade and place imported clean soil as needed to establish suitable grades and a minimum 2-foot thick soil

cover over the WMA. Disturbed areas would be revegetated including the excavated portion of the former drum disposal area, the former municipal waste disposal area, and the WMA.

This alternative also provides for repairs to and improvements of the existing soil cover over the balance of the former municipal solid waste disposal area (*i.e.*, outside of the WMA). This work would include removing surface debris, placing geotextile on the prepared surface, and placing up to 24 inches of imported clean soil and topsoil. Like other disturbed areas at the Site, these soil areas would then be revegetated to reduce potential soil erosion.

Long-term monitoring and maintenance of the capped area and fencing would be required. The cost estimate is prepared based on a 30 year monitoring and maintenance of the landfill. It is assumed that monitoring would include groundwater and sediment monitoring for a period of 5 years and based on the results of the monitoring an evaluation would be done to continue or discontinue monitoring.

Institutional controls in the form of a deed notice (already in place) and restrictive covenants would be put into place. With on-Site containment, the restrictive covenants would also prohibit use of on-Site groundwater. As an alternative, if an on-Site water supply were needed, the Site owner could install, operate, and maintain a point-of-use groundwater treatment system approved by NYSDOH.

Present Worth: *$1,361,000*
Capital Cost: *$1,137,000*
Annual Costs: *$25,000*

Alternative 4 – On-Site Treatment; Off-Site Transportation and Disposal

Alternative 4 provides for the excavation, treatment (as needed), and off-Site disposal of impacted soils and buried waste. This alternative eliminates the potential for direct-contact exposure to impacted materials and reduces the potential for COCs to leach from subsurface soils or waste and disperse into groundwater.

In addition to civil construction requirements and the confirmatory sampling and analysis program, the remedial design for this alternative would involve treatability studies to determine the appropriate additives (*e.g.*, phosphates, pozzolonic materials) and dosages. Treatability studies would also examine the correlation of total versus TCLP cadmium and lead concentrations to determine which materials require treatment.

This alternative would involve the excavation of the impacted soil from the former drum disposal, test pit areas where total cadmium concentrations were greater than the Commercial SCO, impacted sediments from on-site ponds and waste materials in the former municipal waste disposal area identified as exhibiting the characteristic of a RCRA hazardous waste and stabilize the soils, sediment and waste as needed to assure the material is non-

hazardous and leachable cadmium and lead concentrations meet LDRs and UTS for cadmium and lead. The stabilized material would be transported off-site for proper disposal. Excavate areas would be backfilled with clean fill. Grade and shape as needed to cover the exposed areas in the landfill to provide for proper drainage. Disturbed areas would be revegetated including the excavated portion of the former drum disposal area, the former municipal waste disposal area and the landfill area.

As with Alternatives 2 and 3, Alternative 4 provides for repairs to and improvements of the existing soil cover in the former municipal solid waste disposal area. This work would include removing surface debris, placing geotextile on the prepared surface, and placing up to 24 inches of imported clean soil and topsoil. Like other disturbed areas at the Site, these soil areas would then be revegetated to reduce potential soil erosion.

Long-term monitoring and maintenance of the capped area and fencing would be required. The cost estimate is prepared based on a 30 year monitoring and maintenance of the landfill. It is assumed that monitoring would include groundwater and sediment monitoring for a period of 5 years and based on the results of the monitoring an evaluation would be done to continue or discontinue monitoring.

The only institutional control would be a covenant against residential and agricultural development, consistent with the Site's use as an MSW landfill. The restrictive covenants would also prohibit use of on-Site groundwater. If an on-Site water supply were needed, the Site owner could, as an alternative, install, operate, and maintain a point-of-use groundwater treatment system approved by NYSDOH.

Present Worth: *$2,021,000*
Capital Cost: *$1,797,000*
Annual Costs: *$25,000*

Alternative 5: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative would include: removal of the municipal solid waste landfill from the Site, in addition to the excavation, treatment (as needed), and off-Site disposal of identified impacted soils and buried waste to eliminate the potential for direct-contact exposure to impacted materials and reduce the potential for COCs to leach from subsurface soils or waste and disperse into groundwater.

This alternative would involve performing the treatability studies for soil stabilization, excavating the impacted soil from the former drum disposal and test pit areas, excavating the waste from the landfill including the RCRA hazardous waste (calcium fluoride sludge), removing the sediment from the ponds, stabilizing the soil and sediment and transporting the stabilized material and waste to off-site landfill for proper disposal.

The arsenic present in Monitoring Well MW-4 groundwater would be evaluated with a pilot-scale (*i.e.*, five-year) pump and treatment operation. This groundwater evaluation would also involve five years of post-remedial monitoring to confirm that groundwater conditions. No further maintenance, monitoring, or institutional controls are required.

Present Worth: *$6,957,000*
Capital Cost: *$6,779,000*
Annual Costs: *$40,000*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1. No Action	0	0	0
2. On-Site Consolidation and Containment with Access and Institutional Controls	968,000	25,000	1,192,000
3. On-Site treatment, consolidation, and containment with Access and Inst. Controls	1,137,000	25,000	1,361,000
4. On-Site Treatment; Off-Site Transportation and Disposal	1,797,000	25,000	2,021,000
5. Restoration to Pre-Disposal or Unrestricted Conditions	6,779,000	40,000	6,957,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 3, on-site treatment, consolidation and containment with access and institutional controls as the remedy for this site. Alternative 3 would achieve the remediation goals for the site by the excavation of the impacted soil from the former drum disposal, test pit areas where total cadmium concentrations were greater than the Commercial SCO, impacted sediments from on-site ponds and waste materials in the former municipal waste disposal area identified as exhibiting the RCRA characteristic hazardous waste and stabilize the soils, sediment and waste as needed. The stabilized material would be consolidated in the Waste Management Area (WMA) in the landfill. Alternative 3 provides for repairs to and improvements of the existing soil cover in the former municipal solid waste disposal area. Alternative 3 requires deed restriction to prevent the use of groundwater at the site. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 3.

Basis for Selection

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

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

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

The proposed remedy alternative 3 would satisfy this criterion by removing the contaminated soils, sediments and RCRA characteristic hazardous waste, solidify on-site (if necessary) and consolidating in the landfill. Alternative 3 addresses the groundwater contamination by placing a deed restriction and/or install, operate, and maintain a point-of-use groundwater treatment system. Alternative 1 (No Action) does not provide any protection to public health and the environment and will not be evaluated further. Alternative 5 would meet the threshold criteria by removing contaminated soil, sediments and entire landfill with the waste for off-site and treatment of groundwater. Alternative 4 also comply with this criterion but to a lesser degree.

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

Alternative 3 complies with SCGs to the extent practicable. It addresses areas of contamination and complies with the soil cleanup objectives by removal and treatment. Alternatives 2, 4 and 5 also comply with this criterion. Because Alternatives 2, 3, 4, and 5 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

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

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

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

Long-term effectiveness is best accomplished by those alternatives involving excavation of the contaminated soils, sediments and waste (Alternatives 2 thru 5). Alternatives 2 and 3 results in removal of all of the contaminated soils, sediments and waste at the site for consolidation in the existing landfill with a deed restriction for groundwater and long-term monitoring and maintenance. Alternative 4 would result in the removal of all the contaminated soil, sediment and waste for treatment on-site and disposal off-site, but require a deed restriction and long-term monitoring. Alternative 5 will remove contaminated soil, sediment and the landfill waste and treat the groundwater and would achieve long-term effectiveness. But removing the existing landfill from the site to dispose in another landfill would be counter-productive.

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

Alternatives 2 and would control potential exposures with consolidation and will reduce the toxicity and mobility but not the volume of contaminants remaining. Alternative 4 requires the excavation, treatment and off-site disposal of approximately 4000 cubic yards of contaminated soil, sediment and waste. Alternative 4 would reduce the toxicity, mobility and volume. Alternatives 2, 3 and 4 would require deed restriction for groundwater use and long-term maintenance of the capped area. Similar to Alternative 4, Alternative 5 would also reduce the toxicity, mobility and volume of contaminants. The groundwater would be treated and the toxicity and mobility will be reduced.

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

Alternatives 2 through 5 all have short-term impacts which could easily be controlled; however, Alternative 5 would have the highest impact because of the excavation of large volume of soil and waste. The time needed to achieve the remediation goals is the shortest for Alternative 5 and longer for other Alternatives.

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

Alternatives 2, 3 and 4 are favorable in that they are readily implementable. Alternative 5 is also implementable, but the volume of waste and soil excavated under this alternative would necessitate increased truck traffic on local roads for several months.

7. Cost-Effectiveness. Capital costs and annual 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 of the alternatives 2, 3 and 4 do not vary significantly. Alternative 2 has a low cost, but the contaminated soil would not be addressed other than by institutional controls and a low permeable cap in waste management area. With its large volume of soil to be handled, Alternative 5 (excavation and off-site disposal) would have the highest cost and would be cost-prohibitive.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

Since the anticipated use of the site is commercial, Alternatives 2, 3 and 4 would include more restrictive land use that Alternative 5 because the landfill will still remain at the site. Alternative 5 would remove the landfill waste along with all the contaminated soil and sediment. However, alternatives 2 thru 4 would require a deed restriction and needs long-term maintenance of the existing landfill and monitoring of the groundwater.

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

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

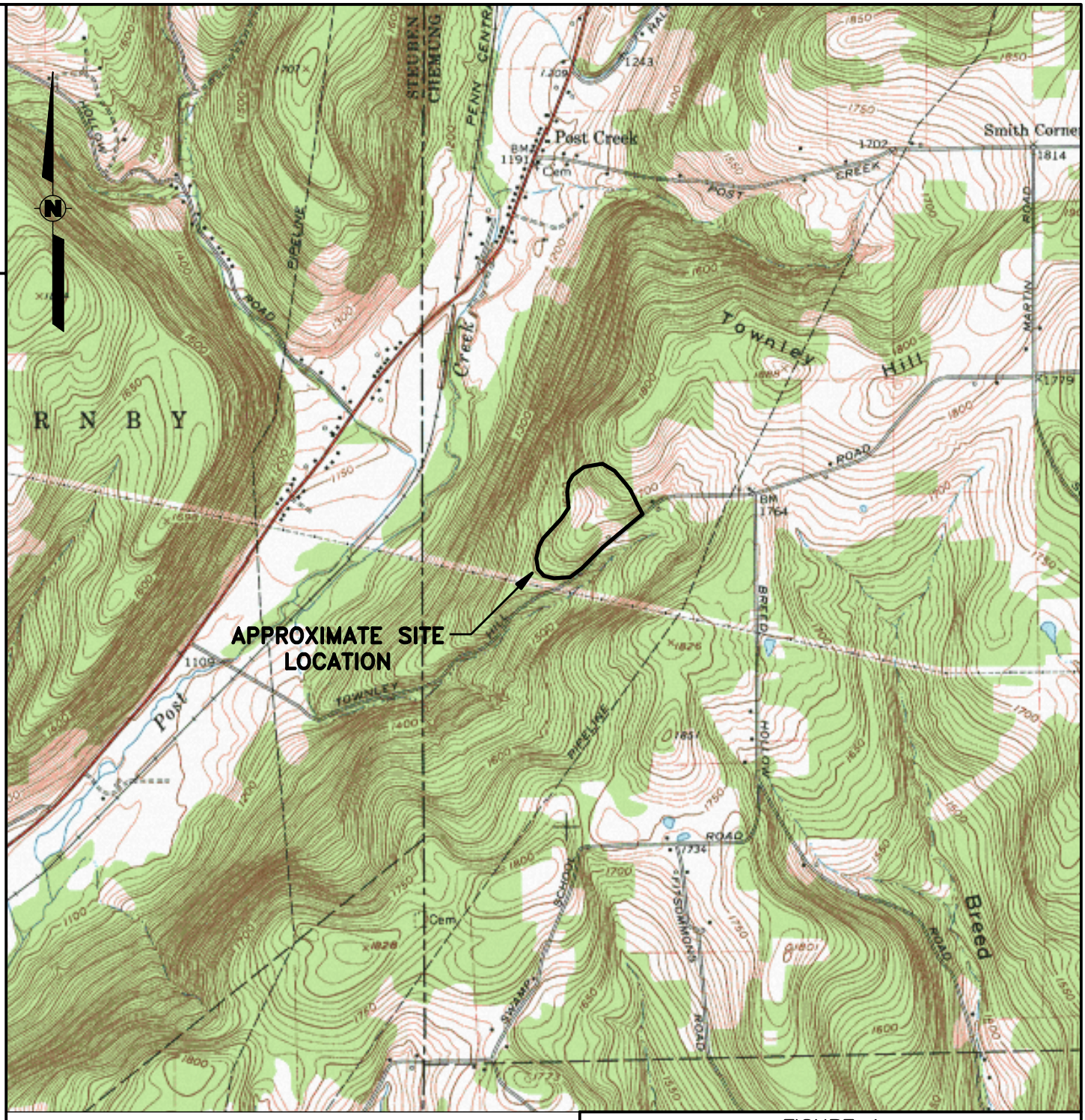
Alternative 3 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.

Table 5

Remedial Action Objectives (RAOs) for Protection of Public Health and the Environment	**Selected Remedial Actions for Protection of Public Health and the Environment**
Groundwater RAOs for Protection of Public Health	
Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards	- Prohibit groundwater use as an Institutional Control. Deed Restriction that restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH
Groundwater RAOs for Environmental Protection	
Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable	- Contaminants of concern remaining at the site will be contained in the landfill and covered with two (2) feet of clean fill. Leachable contamination will be treated so the contamination will not migrate into the groundwater and the treated material will be consolidated in the landfill.

Prevent the discharge of contaminants to surface water.	- Contaminants of concern remaining at the site will be contained in the landfill and covered with two (2) feet of clean fill. The landfill will be contoured to promote water runoff.
Soil RAOs for Protection of Public Health	
Prevent ingestion/direct contact with contaminated soil	- Achieved by excavating soil areas exceeding SCGs and consolidating soil into the landfill and covered with two (2) feet of clean fill. - A Site Management Plan for fill materials that reside under the cover system to prevent future exposure potential.
Soil RAOs for Environmental Protection	
Prevent migration of contaminants that would result in groundwater or surface water contamination	- Contaminants of concern remaining at the site will be contained in the landfill and covered with two (2) feet of clean fill. Leachable contamination will be treated so the contamination will not migrate into the groundwater and the treated material will be consolidated in the landfill.
Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.	- Achieved by excavating soil areas exceeding SCGs and consolidating soil into the landfill landfill and covered with two (2) feet of clean fill. - A Site Management Plan for fill materials that reside under the cover system to prevent future exposure potential.
Sediment RAOs for Protection of Public Health	
Prevent direct contact with contaminated sediments	- Contaminated sediments will be excavated to one-foot depth stabilized and consolidated within the landfill.
Sediment RAOs for Environmental Protection	
Prevent releases of contaminant(s) from sediments that would result in surface water levels in excess of (ambient water quality criteria)	- Contaminated sediment will be excavated, stabilized and then consolidated in the landfill. The landfill will be covered with 24 inches of clean fill and contoured to promote water runoff.
Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain	- Achieved by excavating sediments exceeding SCGs and consolidating sediments into the landfill landfill and covered with two (2) feet of clean fill. - A Site Management Plan for fill materials that reside under the cover system to prevent future exposure potential.
Restore sediments to pre-release/background conditions to the extent feasible	- Excavate sediments to one-foot depth using conventional earthmoving equipment, stockpile on site, and allow to dry sufficiently to facilitate handling. Stabilize the sediments and consolidate within the WMA in the landfill footprint. The excavated areas will be backfilled with clean, imported fill.

DRAWING NUMBER 01304A1



SCALE

0 2000 4000 FEET

REFERENCES:

7.5–MIN. TOPOGRAPHIC QUADRANGLE
BIG FLATS, NY, DATED 1969
PHOTOINSPECTED 1976
SCALE 1:24000

QUADRANGLE LOCATION

FIGURE 1

SITE LOCATION MAP

TOWNLEY HILL ROAD DUMP SITE
CHEMUNG COUNTY, NEW YORK

PREPARED FOR
CBS CORPORATION
PITTSBURGH, PENNSYLVANIA

CUMMINGS RITER CONSULTANTS, INC.

DRAWING NUMBER 01304A1

REVISION	DATE	DESCRIPTION

DRAWN BY:	T.N. Fitzroy	DATE:	08–06–01
CHECKED BY:	M.J. Valentine	DATE:	11–19–04
APPROVED BY:	W.A. Baughman	DATE:	11–19–04

DRAWING NUMBER 01304E11

PLOT SCALE: 1=1

TP-2 SAMPLE
TP-2 LOW
TP-1/SAMPLE
TP-1/LOW
APPROXIMATE FORMER MUNICIPAL WASTE DISPOSAL AREA
TP-19 SAMPLE
TP-3/SAMPLE
TP-3/LOW
TP-4/SAMPLE
TP-4/LOW
TP-4
TP-12
TP-12/SAMPLE
TP-12/LOW
TP-13 V LOW @ 10'
MW-1
A'
B
MW-2
TP-5/LOW
TP-5/SAMPLE
TP-5
TP-14 V LOW @ 11'
TP-10
TP-11/LOW
TP-11/SAMPLE
TP-10/LOW
TP-10/SAMPLE
TP-6/SAMPLE
TP-6/LOW
TP-9/LOW
TP-6
TP-8
TP-15 V LOW @ 5'
TP-8/LOW
TP-8/SAMPLE
TP-7A
TP-7
TP-7B
TP-7C
TP-7/LOW
TP-16/SAMPLE
TP-16 SURFICIAL WASTE ONLY
TP-7/SAMPLE
SW-1/SED-1
WE 1640.8
TP-18 NO WASTE
SS-9
SS-10
SS-11
SS-8
SS-12
SS-20
SS-21
SS-7
SS-28
SS-13
SS-19
SS-14
SS-18
APPROXIMATE FORMER DRUM DISPOSAL AREA
SS-15
SS-6
SW-3/SED-3
SS-5
SS-27
SS-4
SW-2/SED-2
SS-16
SS-2
SS-26
SS-1
SS-3
TP-20 NO WASTE
MW-3
A
TP-17 NO WASTE
MW-4
B'
SW-4/SED-4
TOWNLEY HILL ROAD

LEGEND:

- MW-1 — MONITORING WELL LOCATION
- TP-18 — SURVEYED TEST PIT SAMPLE/LIMIT OF BURIED WASTE (LOW) LOCATION
- SS-18 — SURFACE SOIL SAMPLE LOCATION
- SW-1/SED-1 — SURFACE WATER AND SEDIMENT SAMPLE LOCATION
- CROSS SECTION LINES

SCALE
40 0 40 80 FEET

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED

CUMMINGS RITER CONSULTANTS, INC.
CORPORATE HEADQUARTERS
300 Penn Center Blvd.
Suite 800
Pittsburgh, PA 15235
(412) 241-4500
Fax: (412) 241-7500

FIGURE 2
SITE PLAN

TOWNLEY HILL ROAD DUMP SITE
CHEMUNG COUNTY, NEW YORK

PREPARED FOR
CBS CORPORATION
PITTSBURGH, PENNSYLVANIA

SIZE	SCALE	REV.	DRAWING NUMBER
E	1" = 40'	X	01304E11

DRAWN BY:	T.N. Fitzroy	DATE: 8-15-11
CHECKED BY:	C.L. Nix	DATE: 10-28-11
APPROVED BY:	M.J. Valentine	DATE: 10-28-11

DRAWING NUMBER 01304E16

PROPOSED DITCHES

TP-3 SOIL AREA

PROPOSED SEDIMENT POND

APPROXIMATE FORMER MUNICIPAL WASTE DISPOSAL AREA

PROPOSED STABILIZED CONSTRUCTION ENTRANCE

PROPOSED DITCHES

TP-16 SOIL AREA

TP-5 SOIL AREA

WE 1640.8

APPROXIMATE FORMER DRUM DISPOSAL AREA

TOWNLEY HILL ROAD

LEGEND:

- APPROXIMATE LIMIT OF EXISTING SOIL COVER – TO BE REPAIRED/UPGRADED, AS NECESSARY
- APPROXIMATE EXTENT OF MSW (DASHED WHERE INFERRED)
- CONCEPTUAL LIMITS OF WASTE MANAGEMENT AREA (ENGINEERED SOIL COVER)
- PROPOSED FENCE (MECHANICAL OR VEGETATIVE)
- APPROXIMATE LIMITS OF CLEARING AND GRUBBING (SEE NOTE BELOW)
- REFINED APPROXIMATE LIMIT OF CALCIUM FLUORIDE SLUDGE BASED ON 1997 NYSDEC FOCUSED REMEDIAL INVESTIGATION ACTIVITIES AND 2011 CBS REMEDIAL INVESTIGATION ACTIVITIES.
- APPROXIMATE LIMITS OF CADMIUM-IMPACTED SOIL 1-FOOT EXCAVATION DEPTH
- APPROXIMATE LIMITS OF CADMIUM-IMPACTED SOIL 2.5-FOOT EXCAVATION DEPTH
- APPROXIMATE LIMITS OF CADMIUM-IMPACTED SOIL 3-FOOT EXCAVATION DEPTH
- APPROXIMATE LIMITS OF CADMIUM-IMPACTED SOIL 4-FOOT EXCAVATION DEPTH
- APPROXIMATE LIMITS OF SEDIMENT REMOVAL (1-FOOT DEPTH)

NOTE:

IN THE EXISTING SOIL COVER AREA, CLEARING AND GRUBBING WILL ONLY BE CONDUCTED WHERE NECESSARY TO REPAIR/UPGRADE THE EXISTING SOIL COVER.

SCALE
40 0 40 80 FEET

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED

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CORPORATE HEADQUARTERS
300 Penn Center Blvd.
Suite 800
Pittsburgh, PA 15235
(412) 241-4500
Fax: (412) 241-7500

FIGURE 3

ALTERNATIVE 3

TOWNLEY HILL ROAD DUMP SITE
CHEMUNG COUNTY, NEW YORK

PREPARED FOR
CBS CORPORATION
PITTSBURGH, PENNSYLVANIA

SIZE	SCALE	REV.	DRAWING NUMBER
E	SCALE: 1" = 40'	X	01304E16

DRAWN BY:	D.J. Martino	DATE: 11-18-11
CHECKED BY:	C.L. Nix	DATE: 01-23-12
APPROVED BY:	B. Geno	DATE: 01-23-12

PLOT SCALE: 1=1