RECORD OF DECISION

Ellenville Scrap Iron and Metal Superfund Site

Village of Ellenville, Town of Wawarsing,
Ulster County, New York

United States Environmental Protection Agency
Region II
New York, New York
September 2010

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Ellenville Scrap Iron and Metal Superfund Site
Village of Ellenville, Town of Wawarsing, Ulster County, New York

Superfund Identification Number: NYSFN0204190

STATEMENT OF BASIS AND PURPOSE

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

The New York State Department of Environmental Conservation (NYSDEC) was consulted on the planned remedy, in accordance with CERCLA Section 121(f), 42 U.S.C. Section 9621(f), and NYSDEC concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

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

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for the Ellenville site includes the following components:

- Excavation of selected contaminated soils in six Areas of Concern (AOCs), identified as AOCs 1-6, which include adjacent residential properties where contaminants in the surface soils exceed the cleanup criteria;
- Backfilling of the excavated areas with clean fill;
- Consolidation of the excavated soils from AOCs 1-6 in AOC 1, located in the upper and central portion of the Ellenville site with similarly-contaminated soils;
- Installation of a landfill cap system which meets the substantive requirements of New York State (NYS) Part 360 over the existing landfill and the consolidated soils, including long-term groundwater monitoring; and,
- Development of a Site Management Plan, in accordance with NYS landfill closure requirements, which would include 1) long-term groundwater monitoring, 2) engineering controls with an O&M plan, which may include periodic reviews and/or certifications, and 3) a plan for implementing institutional controls.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. Section 9621, because it meets the following requirements: 1) it is protective of human health and the environment; 2) it meets a level or standard of control of the hazardous substances, pollutants or contaminants, which at least attains the legally applicable or relevant and appropriate requirements under Federal and State laws; 3) it is cost-effective; and, 4) it utilizes permanent solutions and technologies to the maximum extent practicable.

Because this remedy will result in hazardous substances, pollutants or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

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

- Contaminants of concern and their respective concentrations (see ROD, pages 6 – 13; 31 – 32; Tables A-1 – A-3 and Tables 1 – 6);

- Baseline risk represented by the contaminants of concern (see ROD, pages 14 – 20; and Tables 1 – 6);

- Cleanup levels established for contaminants of concern and the basis for these levels (see ROD, pages 21 – 22, 31 – 34; Tables A-1 – A-3);

- Manner of addressing source materials constituting principal threats (see ROD, page 30);

- Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater relied upon in the baseline risk assessment and ROD (see ROD, pages 13 and 31);

- Potential land and groundwater use that will be available at the Ellenville site as a result of the selected remedy (see ROD, pages 13 and 31);

- Estimated capital, annual maintenance, and present-worth costs, discount rate and the number of years over which the remedy cost estimates are projected (see ROD, page 25 and Table B); and

- Key factors used in selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (see ROD, pages 26 – 36)

AUTHORIZING SIGNATURE

Walter E. Mugdan, Director
Emergency and Remedial Response Division

9/30/2010
Date

RECORD OF DECISION FACT SHEET
EPA REGION II

Site

Site name:	Ellenville Scrap Iron and Metal Site
Site location:	Village of Ellenville, Town of Wawarsing, Ulster County, New York
HRS score:	50.27
Listed on the NPL:	October 7, 2002

Record of Decision

Date signed:	September 30, 2010
Selected remedy:	Excavation of contaminated soils from six Areas of Concern, backfilling the excavated areas, placing a cover over the consolidated soils and landfill in the central portion of the site, monitoring of groundwater, implementation of engineering and institutional controls.
Capital cost:	$4,695,938
Annual O&M cost:	$65,700
Present-worth cost:	$5,711,000

Lead

EPA

Primary Contact:	Damian Duda, Remedial Project Manager, (212) 637-4269
Secondary Contact:	Sal Badalamenti, Section Chief, (212) 637-3314

Main PRPs

No viable PRPs

Waste

Waste type:	Semi-volatile organic compounds, polychlorinated biphenyls and metals.
Waste origin:	On-site spills/discharges.
Contaminated media:	Soils

DECISION SUMMARY

Ellenville Scrap Iron and Metal Superfund Site

Village of Ellenville, Town of Wawarsing,
Ulster County, New York

United States Environmental Protection Agency
Region II
New York, New York
September 2010

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ATTACHMENTS

SITE NAME, LOCATION AND DESCRIPTION

The Ellenville Scrap Iron and Metal Site (Ellenville site) (see Figure 1) is a 24-acre, former scrap iron and metal reclamation facility which also includes select residential properties in the vicinity, located on Cape Road, a.k.a., Cape Avenue, and River Street, in the Village of Ellenville, Town of Wawarsing, Ulster County, New York. Approximately 10 acres of the Ellenville site were used for a variety of scrap metal operations and for battery reclamation while it was operated. The Ellenville site is bound to the north by Cape Road; to the south and west by the Beer Kill, a.k.a., Beer Kill Creek; and to the east by residential homes. At the time of its operations, the Ellenville site included an office building, a truck scale, a hydraulic baling machine used for metal cans and other small parts, abandoned automobiles and trucks, scrap metal piles, railroad ties, storage of automobile batteries and emptied casings and assorted brush piles. A Cape Road residential property, directly east of the entrance to the Ellenville site, was formerly part of the facility and was used for the storage and disposal of heavy equipment, as well as automobile batteries. Deteriorated drums were found scattered throughout the property. An existing landfill embankment, approximately 40 feet in height, runs in a crescent along a northwesterly to southeasterly axis bisecting and dividing the Ellenville site into two portions, upper and lower. The landfill is composed of construction and demolition debris, including a variety of finely shredded wastes, scrap brick, concrete, wood and other metal-type debris.

Approximately 4000 people relying on both public and private drinking water supplies live in the area surrounding the Ellenville site.

All buildings and facilities associated with previous site operations were demolished and removed. All other debris piles and other assorted site debris were assessed, sampled and removed. A partial fence is located along some of the perimeter of the property, except where the property borders the Beer Kill.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

From 1950 to 1997, the Ellenville site was owned and operated by Albert and Patricia Koplik, who used it for recycling scrap metal and waste handling, including reclaiming wet cell automobile batteries, old barrels, metal trimmings with oil residue, automotive parts, oil burners and electronic circuit board components.

During 1987-88, the New York State Department of Environmental Conservation (NYSDEC) inspected the Ellenville site several times. During this period, NYSDEC directed the operators to remediate conditions at the Ellenville site. As a result of its efforts, NYSDEC accepted the Ellenville Scrap Iron and Metal (Ellenville Scrap) Settlement of Claim on January 15, 1988. As part of this settlement, the operators agreed to close and cover the area of construction and demolition debris.

From 1990-1992, NYSDEC performed numerous inspection and investigations to evaluate the potential for listing the Ellenville site on the New York State Registry of Inactive Hazardous Waste Disposal Sites. Soil investigations at the Ellenville site showed that numerous waste oil discharges were observed from drum crushing and hydraulic baling operations.

In January 1995, the Kopliks and Ellenville Scrap entered into a consent order with the NYSDEC in which they agreed to prepare and implement a Preliminary Site Assessment. In addition, they were ordered to perform an Interim Remedial Measure on a portion of the Ellenville site surrounding the baling machine. These activities were never performed.

In late 1997, the facility was purchased by John C. Bruno and was used for landfill purposes and as a tire dump. Neither the Kopliks nor Mr. Bruno received a NYSDEC permit to operate as a solid waste management facility or to store tires on the Ellenville site. From 1987 to 1998, NYSDEC conducted numerous inspections and sampled soils both on-site and at adjacent residential properties. Once again, NYSDEC directed the owners to remediate conditions on the Ellenville site. The Ellenville site was abandoned in the 1998-1999 timeframe.

In June 2000, at the request of NYSDEC, the U.S. Environmental Protection Agency (EPA) Region II and its Superfund Technical Assessment and Response Team contractors conducted a sampling event at the facility property and adjacent residential properties as part of EPA's Preliminary Assessment/Site Inspection process. Surface soil samples were collected throughout the facility property and at several adjacent residential properties. Sediments and surface water samples were also collected along Beer Kill. Samples were also collected from a minor amount of ponded leachate emanating from a small area of the landfill embankment at the Ellenville site.

Analytical results from the June 2000 samples indicated contamination in surface soils, as well as in Beer Kill Creek. Since the Beer Kill is used by recreational fishermen and also discharges into two fisheries, a Hazard Ranking System evaluation resulted in the Ellenville site being listed on the National Priorities List on October 7, 2002.

Battery reclamation activities conducted at the adjacent Cape Road residential property resulted in lead contamination of residential soils. Further EPA sampling indicated that the lead contamination extended across the entire residential property, as well as into the face of an embankment that extended out from the rear of the house. [The specific data from EPA's removal efforts are discussed later in the Nature and Extent of Contamination section of this document.] In November/December 2004, EPA implemented a removal action and excavated to a depth of one foot approximately 8200 square feet of contaminated soils from the residential yard and from a portion of the surface of the embankment. EPA disposed of all hazardous materials at off-site permitted facilities. The excavated area of the residential yard was covered and secured with geotextile fabric, backfilled and replanted with sod. Plastic fragments of broken battery casing were found in several samples at-depth and were prevalent along the face of the entire embankment. EPA also installed silt fencing at the base of the embankment to further curtail any erosion into the adjacent area.

The June 2004 removal assessment also included sampling 20 deteriorating and leaking drums, as well as an aboveground tank. The analytical results indicated that the drums contained various hazardous substances including volatile organic compounds (benzene and ethylbenzene), semi-volatile compounds (anthracene and pyrene) and pesticides (lindane and DDT). The contaminant levels indicated that some of the materials in the various containers were characteristic hazardous wastes. These materials were contained and disposed of at off-site permitted facilities. This portion of the removal action was necessary to remove some of the existing, on-site source contamination.

During the 2004 removal action, EPA also demolished the small, on-site office building and loaded the contents for disposal into roll-off containers.

During the Summer/Fall of 2005, EPA performed further cleanup actions at the Ellenville site in preparation for Remedial Investigation (RI) field activities. These actions included the following: 1) clearing, grading and stabilizing the site support area; 2) characterization and off-site disposal of the various debris piles located throughout the site property, including tires, battery casings, wood pallets and concrete and construction debris; 3) characterization for recycle and/or sale of the various scrap iron and steel, as well as the baling, shear and compactor units located on the Ellenville site; 4) dismantling and preparing the abandoned dumpsters, cars, trucks, the baling, shear and compactor units and other heavy equipment for recycle and/or sale as scrap; 5) testing and disposal at approved, regulated facilities of any localized contaminated soils associated with the cleanup of the various debris piles and the metal-processing equipment; 6) demolishing all extant site structures; and, 7) the use of some of the crushed concrete materials and shredded wooden pallets as grading materials for areas of the Ellenville site.

Completion of EPA's maintenance and clearing activities provided a further reduction in the sources of site contamination and also enabled EPA's RI contractor to have better access to the six site Areas of Concern (AOCs) to facilitate the RI media sampling program, which began in 2007. The RI sampling of soils, groundwater, surface water, leachate and sediments was completed in 2008. EPA conducted additional groundwater sampling in 2009 and 2010.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI, the Feasibility Study (FS) and Risk Assessment reports describe the nature and extent of the soil contamination at the Ellenville site, identify the risk to public health and the environment and evaluate remedial alternatives to address the contamination. EPA and NYSDEC's preferred remedy and the basis for that preference were identified in a Proposed Plan. These documents, including the Proposed Plan, were made available to the public in information repositories maintained at the EPA Docket Room in the Region 2 offices at 290 Broadway, 18th Floor, New York, New York and the Ellenville Public Library and Museum, 40 Center Street, Ellenville, New York.

A notice of the commencement of the public comment period, the public meeting date, a description of the preferred remedy, EPA contact information and the availability of the above-referenced documents was published in the *Shawangunk Journal*, a local newspaper, and on the Midhudsonnews.com website on July 29, 2010. The 30-day public comment period ran from July 29 until August 28, 2010. EPA held a public meeting on August 18, 2010 at 7:00 P.M. at the Village of Ellenville Government Center to present the findings of the RI/FS and to answer questions from the public about the Ellenville site, the remedial alternatives and the proposed remedy. The meeting sign-in sheet identified that 17 persons, not including Federal and State officials, attended the meeting. These included area business people, residents, local governmental officials and outside remedial contractors. EPA's contractor, HDR, provided support during the public meeting.

SCOPE AND ROLE OF THE SELECTED REMEDY

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Section 300.5, defines an operable unit as a discrete action that comprises an incremental step toward comprehensively addressing a site's problems. A discrete portion of a remedial response eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site.

The remedy selected in this Record of Decision (ROD) addresses the landfill, the contaminated soils and the groundwater at the Ellenville site. The previously conducted source removal and cleanup actions have reduced the threat of release and potential impact to surface and groundwater. EPA expects that the remediation of the former landfill and the contaminated soils from the six AOCs will alleviate the source of any further surface or groundwater impact by eliminating infiltration and surface water runoff.

While EPA has determined that, given the current site conditions and the anticipated source control remedy, a groundwater remedy for the Ellenville site is not warranted, EPA does not rule out the possibility that a future ROD may be needed to address impacts to groundwater depending on site conditions after the source controls are implemented.

SUMMARY OF SITE CHARACTERISTICS

The field investigation followed the Triad approach to site characterization which is designed to provide a systematic program that employs real-time data and screening techniques. This approach results in a sufficient number of measurement/sampling locations to characterize the nature and extent of contamination in media at the Ellenville site. The RI field activities included a soil gas survey, surface soils sampling (top two feet of soil), test pitting of the landfill, direct push soil borings (below two feet), hydropunching, installation of monitoring wells with downhole geophysics, hydraulic testing, groundwater, surface water and leachate sampling, as well as an evaluation of the site hydrogeology. The use of this systematic approach also allows for critical decisions to be made in the field. The results of this investigation are summarized below.

Site Hydrogeology

The Ellenville site is located on the eastern edge of the Appalachian Plateau and is approximately one mile west of the Valley and Ridge physiographic province. Post glacial alluvium deposits are present on the flat terrain adjacent to Beer Kill, which represents the southern boundary of the Ellenville site. The stratified drift deposits of sand and gravel comprise the overburden aquifer. The bedrock formation produces groundwater primarily through fractures or its secondary permeability.

The Ellenville site is underlain by the unconfined Sandburg Creek Valley Aquifer, which lies within the surficial deposits of glacial till and was deposited as ground moraine. The Sandburg Creek Valley Aquifer consists of poorly sorted sand and gravel of variable texture in association with clay, silty clay, boulder clay and relatively impermeable loam. The thickness of these deposits ranges from 3 to 150 feet. The overlying stratified-drift deposits of sand and gravel comprise the aquifer that sustains Sandburg Creek in the Village of Ellenville. Groundwater flows southeast and discharges to the Sandburg Creek during low flow. The Sandburg Creek Valley Aquifer extends from Phillipsport in Sullivan County to Wawarsing in Ulster County, encompassing the valleys of Homowack Kill, Sandburg Creek and a segment of the Rondout Creek.

The bedrock aquifers supply water to the Village of Ellenville public water supply, as well as individual homes and farms within the Town of Wawarsing. The consolidated rock in the site area has virtually no porosity for groundwater storage or transmittal, but there are minor isolated zones of high porosity and permeability. These bedrock aquifers are usually recharged from unconsolidated overburden from above.

Public water supply wells in the Village of Ellenville, completed in these aquifers, include three wells at 39, 51 and 87 foot depths, respectively. The depth to water at the Ellenville site ranges from under 10 feet below ground surface (bgs) near the Beer Kill on the lower plateau of the Ellenville site to approximately 25 feet bgs on the upper plateau of the Ellenville site. The bedrock formation produces groundwater primarily through fractures or its secondary permeability. Wells completed in sedimentary bedrock formations in this area have reported typical yields of 0.15 gallons per minute per foot (gpm/ft).

Nature and Extent of Contamination

From 1990 until 2006, as discussed above, EPA and NYSDEC conducted various sampling and cleanup efforts at the Ellenville site and discovered a variety of contaminants throughout the site area. During the 2007-2008 timeframe, EPA and its contractor conducted an RI to further define the nature and extent of contamination. During the RI, the affected media that were investigated included surface and subsurface soils, groundwater (including the installation of additional monitoring wells), surface water, sediments, landfill leachate and soil gas.

Soils – General Overview

Analytical results for the site soils were compared to the 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (USCOs) and the Restricted Use Soil Cleanup Objectives (RSCOs) – Residential. Tables A-1, A-2 and A-3 show the contaminant concentrations and the SCOs.

Background Soils

Off-site soils were sampled to determine background concentrations in native soils not impacted by site operations. Background soil sample results for metals and pesticides exceeded USCOs in several instances. For the metals analyzed, lead (in five of ten samples ranged from 79.6 milligrams per kilogram (mg/kg) to 677 mg/kg), mercury (in two samples), and zinc (in two samples) were reported at concentrations exceeding USCOs. In eight of ten background samples, the concentrations of pesticides exceeded USCOs. Based on their widespread distribution, the presence of pesticide compounds indicates historical residential use of pesticides. Polychlorinated biphenyls (PCBs) were not detected in any of the background samples.

Site Soils

In general, the site soils have been impacted by historic operations as evidenced by the type and distribution of contaminants in the area of the landfill, in the area of the former large debris piles at the base of the landfill and along a drainage channel to the southeast of the landfill. Figure 2 shows the site soil sampling locations, including those in the off-property residential areas, as referenced in the discussion below. Figures 3 and 4 show the waste configuration within the landfill and the test pit locations, respectively.

Both surface and subsurface (test pit and direct-push borings) soil samples show concentrations of semi-volatile organic compounds (SVOCs), pesticides, PCBs and various metal concentrations above USCOs at the Ellenville site. In addition, volatile organic chemical (VOC) concentrations above USCOs were detected in some fill materials, as well as in subsurface soils of the landfill. The highest results for PCBs and several polycyclic-aromatic hydrocarbons (PAHs), also SVOCS, detected during the RI were on the lower plateau of the Ellenville site.

Surface and subsurface soils were sampled throughout the site area. Ten landfill test pits were excavated and 30 direct-push soil borings were conducted to investigate the subsurface soils (see Figures 2, 4 and 5, respectively).

During the test pit excavations of the landfill area, the observed thickness of fill ranged from 2 feet bgs at the eastern part, to 8 feet bgs in the western part, to 12 feet bgs in the central part. All test pits exhibited varying amounts and types of debris and staining. Stained layers were especially observed in several test pits between 2 and 6 feet bgs.

In general, the direct-push borings obtained samples at depths between 7 to 10 feet bgs. The materials encountered in the direct-push borings generally consisted of sand and gravel, as well as other fill materials, including ash, slag, brick, scrap metal, glass and plastics at various intervals and are consistent with solid waste material at depth as observed in the test pits.

With respect to metals in surface soils, 11 metals exceeded USCOs with arsenic and manganese at the lowest levels. Zinc, lead, copper, chromium, cadmium, mercury and nickel exceeded their USCOs by a wider margin. The highest concentrations for lead were reported for samples collected 1) near the battery casing wall area, located on the embankment behind the Cape Road residential property, 2) on the former landfill and 3) on the lower plateau of the Ellenville site along a drainage channel to the southeast of the landfill.

With respect to metals in subsurface soils, the direct-push locations identified eight of the 30 locations that had metal concentrations exceeding USCOs, particularly at DP-025 and DP-029, located around the perimeter of the former compactor area.

Concentrations for organic compounds, including total PCBs, also exceeded USCOs at these locations. The test pit locations with the highest metal concentrations were TP-04 and TP-08, in the central portion of the former landfill. Both locations exceeded USCOs for total PCBs and TP-04 for several VOCs.

In general, the metals detected above USCOs with the highest frequencies and magnitudes in soils at the Ellenville site include lead, chromium, mercury, zinc and copper. Additional metals detected were arsenic, cadmium, nickel and silver.

Nine VOCs were detected in surface soils. 2-butanone was detected at a few locations at 0.12 mg/kg (the USCO) or higher. The highest acetone concentration was 0.8 mg/kg with ten samples exceeding the USCO.

With respect to subsurface soils, VOC concentrations above USCOs were found in three direct-push borings and six test pits. In the borings, seven VOCs were reported exceeding USCOs: 2-butanone, acetone, benzene, ethylbenzene, methylene chloride, toluene and total xylenes. Samples from the six test pits also exceeded USCOs for acetone, ethylbenzene and toluene.

PCB concentrations above the USCO are mostly confined to the former landfill and the active areas of site operations in the upper and lower plateau. In surface soils, the concentration of total PCBs was above the USCO of 0.1 mg/kg in 28 of the 58 surface soil samples collected at the former facility property (on the landfill, in the area of the former large debris pile at the base of the landfill and the southeast portion of the lower plateau of the Ellenville site). The highest PCB concentration was 43 mg/kg (SS-014) (lower plateau along a drainage channel to the southeast). This sample also had some of the highest SVOC (PAH) concentrations encountered in surface soils. The second highest total PCB concentration of 12.5 mg/kg was found in DP-026 collected on the edge of the former compactor location.

In subsurface soils, PCB concentrations exceeded the USCO of 0.1 mg/kg at five of the ten test pits and at seven direct-push locations. The highest concentrations of total PCBs in on-site subsurface soils were TP-08 at 55 mg/kg and DP-25 at 20 mg/kg, both collected between four to six feet bgs on the upper plateau. Two PCB samples taken on the lower plateau exceeded the USCO at 0.18 mg/kg and 0.3 mg/kg, respectively. Of the seven direct-push samples above the USCO, four are located around the former compactor excavation area where PCB-contaminated oil and soils were removed by EPA during cleanup activities in 2005.

Eighteen pesticides were detected in site surface soils, including seven at concentrations above USCOs. The most frequently detected pesticides were 4,4'-DDT and dieldrin in six samples. One sample (DP-026) had the most pesticides above USCOs and also the highest concentrations of the detected compounds. In general, the distribution of these compounds appears to be along roadways and near residences where the pesticides may have been applied. On the lower plateau part of the property, these compounds appear to be isolated to one sample near the Beer Kill. As part of a pre-design investigation, additional samples would be proposed for this location to delineate the extent of the impacted area followed by excavation to remove the impacted material.

With respect to subsurface soils, four borings showed pesticide concentrations above USCOs: the substances detected were 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, beta-BHC, endrin and heptachlor. The ten test pit samples showed that pesticide concentrations above USCOs were 4,4'-DDD,4,4'-DDE, 4,4'-DDT, aldrin, dieldrin, and endrin.

With respect to SVOCs, one boring detected seven SVOCs above USCOs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene and phenol. Five test pits showed SVOC concentrations above USCOs, similar to DP-25, although three additional SVOCs (anthracene, dibenzofuran and fluoranthene) were also detected above USCOs in test pit samples.

Thirty SVOCs were detected in surface soil samples at the former facility property. Concentrations of seven SVOCs (all PAHs) exceeded USCOs at 10 of 25 locations. The widespread presence of the PAHs is consistent with the historic site operations, which included extensive burning of debris and spreading of ash on the ground.

Residential Soils

Previous EPA residential investigations documented the presence of high lead concentrations in deeper surface soils (> 12 inches) at the Cape Road residential property where the batteries had been stored and reclaimed. The June 2000 sampling data showed that the Cape Road residential property had elevated levels of lead up to 230,000 milligrams per kilogram (mg/kg) or parts per million (ppm). EPA then proposed, additional sampling at this location to delineate further the extent of lead contamination as part of its June 2004 Removal Assessment. The additional sampling identified total lead concentrations ranging from 380 mg/kg to 28,000 mg/kg. Surface soil samples ranged from 510 mg/kg to 15,000 mg/kg, with an average concentration of 3,710 mg/kg. Subsurface soil samples collected at a depth of 6 to 12 inches ranged from 3,800 mg/kg to 28,000 mg/kg, with an average concentration of 6,920 mg/kg. After EPA's excavation and removal of the lead-contaminated soils, post-excavation samples collected at depths of 12-18 inches bgs indicated lead levels from 160 mg/kg and 170 mg/kg in the southeastern portion of the property. Seven other locations to the north and west of the residence had concentrations between 1,300 and 5,100 mg/kg. In June 2005, EPA also sampled three residences to the south and southeast of the former facility property which showed lead in surface soils (0-6 inches) at levels of between 36 mg/kg and 700 mg/kg.

During the RI, 24 shallow (0 to 6 inches) surface soil samples, plus one duplicate sample, were collected from locations on several residential properties to the south and southeast of the former facility property. Additional soil samples from the 6 to 24-inch interval were collected at five of the 24 locations to determine the vertical extent of metals contamination at the residential properties.

With the exception of PCB concentrations detected in the residential area samples RSS-02 (1.04 mg/kg at 0-24" bgs), RSS-04 (0.13 mg/kg at 0-6" bgs) and RSS-05 (0.11 mg/kg at 6-24" bgs), only the subsurface sample from location RSS-02 exceeded the USCO of 0.1 mg/kg for PCBs and the RSCO-Residential of 1.0 mg/kg for PCBs. Samples RSS-02 through RSS-05 were collected from the Cape Road residential property which was the subject of the EPA removal action in November/December 2004 (discussed previously).

The concentrations of the four VOCs that were detected in residential surface soils were below USCOs. Most of the 16 SVOCs that were detected were PAHs, and only one of these, benzo(b)fluoranthene at 1.3 mg/kg, slightly exceeded the USCO of 1.0 mg/kg. Of the 11 detected pesticides, three (4,4'-DDD, 4,4'-DDE, 4,4'-DDT) in 22 of 28 samples were above USCOs. As discussed previously, the distribution of these compounds appears to be along roadways and near residences where the pesticides may have been applied.

Of the five metals detected, lead had the largest number of concentrations above the USCO of 63 mg/kg (21 of 28 samples). Lead concentrations ranged from 17.4 mg/kg to 8,970 mg/kg and exceeded the RSCO-Residential in seven samples. The other metals which exceeded USCOs were zinc, mercury, silver and copper; only one, copper, exceeded the RSCO-Residential.

Beer Kill Sediments

Three sediment samples were collected from the Beer Kill, upstream to downstream. With the exception of acetone at 0.016 mg/kg, no VOCs were detected in the three Beer Kill sediment samples. Several SVOCs were detected, with the highest concentrations of individual compounds generally detected in the most upgradient sample. The highest concentrations of metals were detected in the most downstream sample although the concentrations detected are generally similar to the detected concentrations in midstream and upstream.

Beer Kill Surface Water

Three surface water samples were collected from the Beer Kill. The sampling stations were selected to characterize water quality upstream from the Ellenville site, adjacent to the Ellenville site and downstream of the Ellenville site. The results indicated the presence of one VOC, chloromethane, at an estimated concentration of 0.19 ug/l, and two SVOCs, butylbenzylphthalate at an estimated 0.82 ug/l and diethylphthalate at an estimated 0.25 g/l at station SWSD-07, the most downstream location. Both butylbenzylphthalate and diethylphthalate were also detected in site soil samples. Pesticides or PCBs were not detected in the three surface water samples from Beer Kill. Four metals were reported above detection limits: calcium, iron, manganese and sodium; however, calcium and sodium concentrations are significantly more elevated in the surface water adjacent to the former facility property. The metals concentrations found in the Beer Kill did not exhibit a discernible trend from upstream to downstream locations.

Surface Water at the Former Facility Property

Two surface water samples were collected on the Ellenville site. One sampling location was on the upper plateau of the Ellenville site, northwest of the former compactor location. The second location was on the lower plateau of the Ellenville site. The results of these surface water samples indicate the presence of the following VOCs: chloroform at an estimated concentration of 0.45 micrograms per liter (ug/l) and chloromethane at an estimated 0.12 ug/l. SVOCs, pesticides and PCBs were not reported above detection limits. The lead concentration found in the lower plateau was 108 ug/l and above the NYS surface water standard of 50 ug/l. No other concentrations exceeded NYS standards. Generally, the presence of several of the metals in the surface water samples in the vicinity of the former facility property corresponds to their elevated concentrations in site soils.

In comparing the surface water results in the vicinity of the former facility property with the Beer Kill results, the past site operations as a scrap metal facility does not appear to have impacted the Beer Kill with metals.

Leachate

The leachate samples, collected from the base of the former landfill, contained two VOCs, several SVOCs (PAHs), one pesticide and several metals. The minor leachate seep is not extensive and currently impacts only a small portion of the Ellenville site. Neither the VOCs nor the pesticide exceeded the respective NYS Class GA groundwater quality standards. The detection of the SVOCs (PAHs) is consistent with their widespread presence in site soils as a result of site operations, which included the burning of large amounts of debris and spreading the ashes on the lower plateau. Benzo(a)pyrene at 0.52 ug/l was the only SVOC that exceeded its Class GA standard of non-detect. Iron, lead and manganese exceeded the Glass GA standards in one sample, LH-01, and manganese only in one sample. The metals concentrations in the leachate samples are generally higher than in on-site surface water samples.

Groundwater

EPA's most recent groundwater sampling results are discussed here in order to reflect the current groundwater conditions. Samples were taken from all seven EPA monitoring wells (see Figure 6). EPA-07 is an upgradient well. There is no defined plume of contaminated groundwater evident at the Ellenville site, but historic sampling results indicated some detections in some wells. In May 2008, October 2008, October 2009 and January 2010, the EPA monitoring wells were sampled for a variety of parameters and compared to Federal and state maximum contaminant levels (MCLs) and/or Class GA standards.

With respect to VOCs, no detections above standards were shown during the four rounds of groundwater sampling (May and October 2008, October 2009 and January 2010). In May 2008, carbon disulfide was detected in EPA-01 at 1.0 ug/l. Carbon disulfide was not detected in EPA-04 and EPA-05; however, in October 2008, it was detected in the latter two monitoring wells at 0.18 ug/l and 0.11 ug/l, respectively. In May 2008, chloromethane was detected in EPA-01, EPA-02 and EPA-07 (1.7 ug/l). [EPA-07 is upgradient of the Ellenville site.] In October 2008, chloromethane was not detected in EPA-02 or EPA-07. In October 2009, three compounds were detected: acetone, toluene and m/p-xylene. Acetone was detected in EPA-03, EPA-05 and EPA-07 with the highest concentration of 9.2 ug/l in EPA-03. Estimated values of toluene (0.1 ug/l) and m/p-xylene (0.056 ug/l) were detected in EPA-03 only. VOCs were not detected during EPA's January 2010 sampling event.

With respect to the SVOCs, with the exception of caprolactam, no detections above Class GA standards were shown during the May and October 2008 groundwater sampling events. Under 10 NYCRR Part 5 requirements, caprolactam is classified as an unspecified organic contaminant and is limited to an MCL of 50 µg/l. In May 2008, caprolactam (used to make artificial fibers) was detected in four wells with a concentration of 150 ug/l in EPA-07 (upgradient), 7.4 ug/l in EPA-03 and 56 ug/l in EPA-04. In October 2008, caprolactam was found at 0.63 ug/l in EPA-04. In October 2008, diethylphthalate concentrations were detected in three wells: EPA-03, EPA-05 and EPA-06 at levels well below the Class GA Gudiance Value of 50 ug/l. The highest concentrations were reported at 0.2 ug/l in EPA-05 and EPA-06 and 0.19 ug/l in EPA-03.

Pesticides and PCBs were not detected during the May or October 2008 events and, therefore, were not sampled in subsequent sampling events.

With respect to metals, over the course of four rounds of sampling, the data showed that antimony, arsenic, chromium and lead concentrations exceeded the Federal or state MCLs or Class GA standards on a relatively limited basis. No general plume of any group of constituents has been observed, but only localized low level impacts and sporadic exceedances have been shown. With respect to sodium, iron and manganese, the data showed exceedances of Class GA standards; there is no Federal or state MCL for sodium. The Federal and state MCL for lead is an action level of 15 ug/l at the tap. For the contaminants of concern (COCs), except for arsenic and lead, the Class GA standards are either the same or more stringent than the Federal and/or state drinking water standards.

The data results from the May 2008 sampling showed lead concentrations (above the action level of 15 ug/l) at EPA-04 (29 ug/l), EPA-05 (20ug/l) and EPA-07 (17ug/l). All subsequent sampling (October 2008, October 2009 and January 2010) showed lead concentrations below the action level or non-detect.

Sodium was detected at levels above the Class GA standard of 20 milligrams per liter (mg/l) in EPA-02, EPA-03, EPA-04 and EPA-07. As discussed above, Federal and state drinking water regulations have no specific limit on sodium concentrations but recommend that water containing more than 20 mg/l should not be used for drinking by persons on severely restricted sodium diets.

The iron and manganese data for the May and October 2008, October 2009 and January 2010 sampling events exceeded the State MCL of 300 ug/l in some of the perimeter wells, namely EPA-03, EPA-04 and EPA-05. For manganese, the highest concentrations for EPA-03, EPA-04 and EPA-05 were 10,000 ug/l, 1320 ug/l and 870 ug/l, respectively. For iron, the highest concentrations for EPA-03, EPA-04 and EPA-05 were 14,000 ug/l, 16,000 ug/l and 11,000 ug/l, respectively. The elevated concentrations of iron and manganese appeared to be related to local conditions, *i.e.*, naturally occurring in the aquifer, since these metals had been detected in concentrations above the standards in the upgradient well (EPA-07) and had also been detected at elevated concentrations in the NYSDEC upgradient well MW-6. As discussed above, there are no Federal MCLs for iron and manganese, only secondary standards. For these compounds, the secondary standards apply to substances in water that cause offensive taste, odor, color, corrosion, foaming, or staining but have no direct affect on health.

Based on some sporadic detections of antimony, chromium and nickel above some standards in EPA-03, it appears that there may have been some residual impacts on the groundwater conditions at this particular location as a result of historical site operations. The following presents the various concentrations of these metals found in EPA-03. Antimony was detected (minimally above the Class GA standard of 3 ug/l) at 3.4 ug/l (October 2008) and 3.6 ug/l (October 2009) but not detected in the May 2008 nor the January 2010 sampling rounds. Arsenic was detected (above the drinking water standard of 10 ug/l) at 95.9 ug/l (October 2009) and 22 ug/l (January 2010) but was not detected in the May nor October 2008 sampling rounds. Chromium was detected (above the Class GA standard of 50 ug/l) at 90 ug/l (October 2009) and 280 ug/l (January 2010) but was not detected in the May 2008 nor October 2008 sampling rounds. Note that the Federal and State MCL for chromium is 100 ug/l. Nickel was detected once (above the Class GA standard of 100 ug/l) at 180 ug/l (Jaunary 2010) but was not detected above the Class GA standard in the May 2008, October 2008 nor October 2009 sampling rounds. Note that there is no Federal MCL for nickel.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The former facility property, which has been used for industrial purposes, is currently unoccupied and unused. The Ellenville site straddles the Village of Ellenville and the Town of Wawarsing. The Town of Wawarsing portion is zoned as RU-Rural; this category is intended to conserve large areas of open space while allowing for very low density development and accommodation of larger land uses of an agricultural, rural or recreational nature. The Village of Ellenville portion is zoned I-1 (restricted industrial). The selected remedy opens the Ellenville site up to future reuse and redevelopment. The groundwater underlying the Ellenville site has a New York State classification of Class GA under 6 NYCRR Part 703. The best use of Class GA groundwater (all fresh groundwater in New York State is Class GA) is a source of potable water supply.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land uses. The baseline risk assessment includes a human health risk assessment and an ecological risk assessment. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The remedial alternative that was chosen for the Ellenville site addresses contamination in the areas of concern (AOCs), as well as the risks and hazards for the AOCs which are presented in the baseline risk assessment summarized in this section.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario:

- Hazard Identification – uses the analytical data collected to identify the contaminants of potential concern at the Ellenville site for each medium, with consideration of a number of factors explained below.
- Exposure Assessment - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed.
- Toxicity Assessment - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response).
- Risk Characterization - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The risk characterization also identifies contamination with concentrations which exceed acceptable levels, defined by the National Contingency Plan (NCP) as an excess lifetime cancer risk greater than 1 x 10-6 – 1 x 10-4, an excess of lifetime cancer risk greater than 1 x 10-6 (i.e., point of departure) combined with site-specific circumstances, or a Hazard Index greater than 1.0; contaminants at these concentrations are considered chemicals of concern (COCs) and are typically those that will require remediation at the Ellenville site. Also included in this section is a discussion of the uncertainties associated with these risks.

Hazard Identification

In this step, the chemicals of potential concern (COPCs) in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence, and bioaccumulation. The risk assessment focused on surface soil, subsurface soil, leachate, groundwater, surface water, and sediment contaminants related to the Ellenville site which may pose significant risk to human health. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of PAHs, metals, PCBs, and pesticides in the surface soils, subsurface soils, leachate and groundwater at concentrations of potential concern.

A comprehensive list of all COPCs can be found in the Baseline Human Health Risk Assessment (BHHRA), entitled "Human Health Risk Assessment Ellenville Scrap Iron and Metal – RI/FS" (USEPA, 2010). This document is available in the Administrative Record file. This ROD focuses on a site-wide evaluation, as well as evaluating off-property residential properties, and localized areas of concern within the on-site property. The contaminated media, concentrations detected, and concentrations utilized to estimate potential risks and hazards for the COCs at the Ellenville site are presented in Table 1.

Exposure Assessment

Consistent with Superfund policy and guidance, the BHHRA is a baseline human health risk assessment and, therefore, assumes no remediation or institutional controls to mitigate or remove hazardous substance releases. Cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the Ellenville site. The RME is defined as the highest exposure that is reasonably expected to occur at a site. For those contaminants for which the risk or hazard exceeded the acceptable levels, the central tendency estimate (CTE), or the average exposure, was also evaluated.

The Ellenville site is currently zoned restricted industrial/rural-residential use, and it is anticipated that the future land use for this area will remain consistent with its current use. The BHHRA evaluated potential risks to populations associated with both current and potential future land uses.

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for exposure to surface soil, subsurface soil, leachate, groundwater, surface water and sediment. Exposure pathways assessed in the BHHRA are presented in Table 2 and included on-site exposure to contaminated media for trespassers and recreational users, commercial/industrial workers, and future residential exposure through incidental ingestion, dermal contact, and inhalation. In addition, off-property residential use was evaluated for incidental ingestion, dermal contact, and inhalation. Typically, exposures are evaluated using a statistical estimate of the exposure point concentration which is usually an upper-bound estimate of the average concentration for each contaminant but, in some cases, may be the maximum detected concentration. A summary of the exposure point concentrations for the COCs in groundwater can be found in Table 1 while a comprehensive list of the exposure point concentrations for all COPCs can be found in the BHHRA.

Toxicity Assessment

Under current EPA guidelines, the likelihood of carcinogenic risks and noncancer hazards due to exposure to site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with EPA's directive on toxicity values. This information for the COCs is presented in Table 3 (noncancer toxicity data summary) and Table 4 (cancer toxicity data summary). Additional toxicity information for all COPCs is presented in the BHHRA.

Risk Characterization

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (*e.g.*, the amount of a chemical ingested from contaminated drinking water) is compared to the RfD or the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds within a particular medium that impacts a particular receptor population.

The HQ for oral and dermal exposures is calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC, rather than the RfD.

HQ = Intake/RfD

Where: HQ = hazard quotient
Intake = estimated intake for a chemical (mg/kg-day)
RfD = reference dose (mg/kg-day)

The intake and the RfD will represent the same exposure period (i.e., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1.0, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1.0 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. A summary of the noncarcinogenic hazards associated with these chemicals for each exposure pathway is contained in Table 5.

It can be seen in Table 5 that the HI for noncancer effects is elevated in each of the AOCs for future on-site residents due to concentrations of metals in surface soil. In addition, the noncancer hazard is elevated in AOC 1 and AOC 3 for future construction/utility workers and for future residential use of groundwater due to concentrations of metals in subsurface soil and groundwater.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unitless probability (1×10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

These risks are probabilities that are usually expressed in scientific notation (such as 1 x 10-4). An excess lifetime cancer risk of 1×10^{-4} indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. Again, as stated in the NCP, the point of departure is 10-6 and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}.

A summary of the estimated cancer risks are presented in Table 6. The results indicated that there are elevated cancer risks for future on-site residents in each of the on-site AOCs as a result of metals, PAHs, and PCBs in the surface soils. In addition, there are elevated cancer risks for construction/utility workers in AOC 1 and AOC 5, as well as elevated cancer risks from exposure to leachate as a result of concentrations of metals, PAHs, and PCBs. Exposure to groundwater for future on-site residents exceeded the acceptable risk range for two metals, arsenic and chromium.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

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

Two of the primary sources of uncertainty identified in the HHRA were associated with environmental sampling and exposure assessment. Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Adequate site characterization is particularly important when a primary source of contamination is buried debris, given the heterogeneity of contamination typically associated with debris. The likely heterogeneity of on-site subsurface conditions was recognized a potential source of uncertainty in the HHRA. This could result in either over- or under estimation of the concentrations present on the Ellenville site.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure. The sampling completed during the remedial investigation was biased towards areas of suspected contamination. The use of these non-random samples is likely to overestimate the concentrations that the average receptor would encounter at the Ellenville site.

There is also a large amount of uncertainty associated with the estimated groundwater cancer risk. The carcinogenic risk associated with exposure to groundwater was estimated using the assumption that all of the chromium detected was in the hexavalent form, which is a carcinogen. As discussed in the risk assessment, chromium occurs in nature primarily in the trivalent form, which is not carcinogenic. Activities conducted at the Ellenville site do not indicate that chromium manufacturing operations were performed, or that chromic acid or other chromates were present, used, or stored on the Ellenville site. Given that historic use hexavalent chromium were not identified, it is unlikely that estimated carcinogenic risk from groundwater is valid. Speciation of the chromium in the groundwater would confirm if the calculated cancer risk is applicable for the Ellenville site. Additionally, chromium was only detected in one well at concentrations above the groundwater criterion.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways is presented in the baseline human health risk assessment report.

Ecological Risk Assessment

A screening-level ecological risk assessment (SLERA) was conducted to evaluate the potential for ecological effects from exposure to surface soils, leachate, groundwater discharging to sediment and surface water, and surface water and sediment from Beer Kill. Surface soils, leachate, groundwater, surface water, and sediment concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors by habitat type. Exposure to terrestrial wildlife via the ingestion of prey and direct soil ingestion to chemicals was also evaluated. A complete summary of all exposure scenarios can be found in the SLERA. Habitat types were identified as upper plateau/landfill, flood plain, forested wetland, residential area, and Beer Kill.

Upper Plateau/Landfill: There is a potential for adverse effects to terrestrial plants/soil invertebrates from direct exposure to chemicals within the upper plateau/landfill area. The soil screening criteria were exceeded for 22 chemicals and the wildlife screening criteria was exceeded for 13 chemicals.

Flood Plain: There is a potential for adverse effects to terrestrial plants/soil invertebrates from direct exposure to chemicals within the upper plateau/landfill area. The soil screening criteria were exceeded for 24 chemicals and the wildlife screening criteria was exceeded for 16 chemicals.

Forested Wetland: There is a potential for adverse effects to terrestrial plants/soil invertebrates from direct exposure to chemicals within the forested wetland area. The soil screening criteria were exceeded for 22 chemicals and the wildlife screening criteria was exceeded for 16 chemicals.

Residential Area: There is a potential for adverse effects to terrestrial plants/soil invertebrates from direct exposure to chemicals within the residential area. The soil screening criteria were exceeded for 19 chemicals and the wildlife screening criteria was exceeded for 10 chemicals.

Beer Kill: Available data indicates minimal potential for adverse effect to aquatic life from direct exposure to chemicals in the Beer Kill sediment and/or surface water. Three inorganic chemicals (lead, manganese, and nickel) and the PAH indeno(1,2,3-cd) pyrene were detected at maximum concentrations exceeding sediment screening values; however, these chemicals only marginally exceeded their screening values (HQs < 5), suggesting a minimal potential for adverse effects. There were no chemicals were detected in surface water above screening criteria which indicates there is no potential for adverse effects to aquatic life. In addition, there was no potential for adverse effects indicated to aquatic-based wildlife from exposure via the ingestion of prey and direct ingestion to chemicals in the Beer Kill.

Other Media Evaluated

In addition to the evaluation of the above exposure pathways, available surficial runoff and leachate data collected from the upland soils area and the most recent round of groundwater data were preliminarily screened in the SLERA. Although these media do not represent complete exposure pathways for ecological receptors, they represent a potential source of chemicals to the environment and the results of these screens can be used to further characterize potential chemical fate and transport pathways associated with the conceptual site model for the ecological risk assessment.

Surfical Runoff: With the exception of lead and zinc, chemical concentrations in surficial runoff remain well below ecological screening values for this media. It is therefore concluded that surficial runoff is unlikely to represent an important pathway for the transport of chemicals of potential ecological concern at the Ellenville site.

Groundwater: Twelve inorganic chemicals were detected in groundwater at concentrations exceeding ecological screening values, and it is possible that groundwater represents a transport pathway for inorganic chemicals of potential ecological concern. However, the low level of exceedance for many of these chemicals, coupled with the level of diffusion/dilution that would be expected to occur prior to discharge suggests that groundwater does not represent an important pathway for transporting chemicals of potential ecological concern.

Leachate: Eleven inorganic chemicals, six PAHs, and bis(2-ethylhexyl)phthalate were detected in leachate at concentrations exceeding ecological screening values, and it is concluded this media may represent a viable transport pathway for chemicals of potential ecological concern.

Based on the results of the ecological risk assessment, a remedial action is necessary to protect the environment from actual or threatened releases of hazardous substances.

Risk Assessment Summary

In summary, metals, PAHs, and PCBs in soils on the Ellenville site contributed to unacceptable risks and hazards to on-site trespassers, commercial/industrial workers, on-site recreational users, and on-site future residents. There ware also unacceptable hazards for off-property residents from metals. Based on the results of the human health and ecological risk assessments, the response action selected in the Record of Decision is necessary to protect the public health or welfare of the environment from actual or threatened releases of contaminants into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) have been developed for the Ellenville site for the protection of public health and the environment based on the findings of the RI. The RAOs are organized by media of concern and specify contaminant type, exposure pathways and preliminary remediation goals based on chemical specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) criteria. The RAOs and ARAR analysis result in setting preliminary remediation goals (PRGs) which identify standards, criteria and guidances (SCGs) that will be used as soil and groundwater cleanup objectives that eliminate or mitigate the significant threat to the public health and environment.

After assessing the levels of area-wide soils contamination, including background soils data, EPA and NYSDEC determined that the RSCOs-Residential would be the most appropriate cleanup objectives for the excavation activities at the Ellenville site. The site-specific RAOs are below.

<u>Groundwater</u>

- Prevent ingestion of water with contaminant concentrations greater than 10 NYCRR Part 5 maximum contaminant levels (MCLs) and Federal MCLs.
- Restore groundwater contaminant concentrations to less than 6 NYCRR Part 703 Class GA water quality standards.
- Prevent discharge of groundwater with contaminant concentrations greater than 6 NYCRR Part 703 Class GA water quality standards to adjacent surface water, *i.e.*, Beer Kill.

<u>Soils</u>

- Prevent ingestion/direct contact to soils with contaminant concentrations greater than 6 NYCRR Part 375 RSCOs-Residential.
- Prevent inhalation of soil dust with contaminant concentrations greater than 6 NYCRR Part 375 RSCOs-Residential.
- Prevent migration of soils with contaminant concentrations greater than 6 NYCRR Part 375 RSCOs-Residential.
- Prevent or minimize impacts to groundwater and/or surface water resulting from soil contamination with concentrations greater than 6 NYCRR Part 375 RSCOs-Residential.

<u>Solid Wastes</u>

- Prevent ingestion/direct contact with solid wastes with contaminant concentrations greater than 6 NYCRR Part 375 RSCOs-Residential.
- Prevent migration of solid wastes with contaminant concentrations greater than NYCRR Part 375 RSCOs-Residential.
- Prevent or minimize impacts to groundwater and/or surface water resulting from solid wastes with concentrations greater than NYCRR Part 375 RSCOs-Residential.

Leachate
• Prevent ingestion of leachate with contaminant concentrations greater than the NYSDEC Class GA water quality standards.
• Prevent migration of leachate with contaminant concentrations greater than the NYSDEC Class GA water quality standards.

Air
• Prevent exposure to or inhalation of volatilized contaminants from the solid wastes.
• Prevent migration of landfill gas generated by the decomposition of solid waste.

DESCRIPTION OF REMEDIAL ALTERNATIVES

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

Detailed descriptions of the remedial alternatives for addressing the site contamination can be found in the FS report. Dividing the Ellenville site into six AOCs facilitated the development and evaluation of remedial alternatives, based on the nature and extent of contamination. The contaminants identified in the six AOCs are described below and are shown in Figure 7:

- AOC 1 - Landfill Area - VOCs, SVOCs, metals, PCBs and pesticides were detected in the soils within the area at concentrations greater than the RSCOs-Residential.
- AOC 2 - Debris Pile Area - SVOCs, metals, PCBs and pesticides were detected in the soils within the area at concentrations greater than the RSCOs-Residential.
- AOC 3 - Dumpster Staging Area - VOCs, metals, and PCBs were detected in the soils within the area at concentrations greater than the RSCOs-Residential.
- AOC 4 - Scattered Debris Area - Metals were detected in the soils at one location within the area at concentrations greater than the RSCOs-Residential.
- AOC 5 - Battery Disposal Area - Metals and PCBs were detected in the soils within the area at concentrations greater than the RSCOs-Residential.
- AOC 6 - Off-Property Residential Area - SVOCs and metals were detected in the soils within the area at concentrations greater than the RSCOs-Residential.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the remedy performance with any potentially responsible parties or procure contracts for design and construction. The remedial alternatives are described in the next section.

Remedial Alternatives for Soils

Based on a pre-screening analyses process used to evaluate technologies and treatment process options, some alternatives identified in the FS were screened out, since they could not be effectively implemented as a result of effectiveness, implementability, cost, current use restrictions and/or topography. The remedial alternatives that were screened out were the following: 2B, (Capping/Off-Site Disposal) 2D (Capping/Off-Site Disposal), 3A (Soil Washing/Off-Site Disposal) and 3B (Capping/Soil Washing/Off-Site Disposal). The final remedial alternatives are 1 (No Action), 2A (Capping/On-Site Consolidation), 2C (Capping/On-Site Consolidation) and 4 (Off-Site Disposal) and are discussed below.

Alternative 1: No Action

Capital Cost	$0
Annual Operation/Maintenance (O&M) Cost	$0
Present-Worth Cost:	$0
Construction Time:	0 months

The "no action" option is included as a basis for comparison with active soil remediation technologies. If no remedial action is taken, contaminants already present in the soils will remain in place and will continue to impact the underlying groundwater. Organic contaminants, *e.g.*, PAHs, may degrade over time because of natural attenuation processes. Metal and PCB contaminants will remain in the site soils for long periods of time with little or no decrease in concentration. There are no capital, O&M nor monitoring costs associated with this alternative. There are no permitting or institutional controls needed for this alternative. This alternative will not meet any of the RAOs for the Ellenville site and is unlikely to be accepted by the state and/or local community.

Alternative 2A – Capping/On-Site Consolidation

Capital Cost	$5,152,800
Annual Operation and Maintenance (O&M) Cost:	$75,500
Present-Worth Cost	$6,323,000
Construction Time:	9 months

Alternative 2A consists of the installation of an impermeable cap in the combined AOCs 1, 2 and 3. Those soils in AOCs 4, 5 and 6 with concentrations greater than the RSCOs-Residential (but which do not constitute hazardous waste) will be excavated and consolidated to AOCs 1-3 prior to capping (on-site consolidation). The impermeable cap will consist of a 60-mil high-density polyethylene (HDPE) liner underlain by a gas collection layer, if needed, and overlain by a 2-foot thick soil protective layer. A fence will also be constructed around the cap perimeter. The proposed cap will meet the substantive requirements of 6 NYCRR Part 360 regulations for a landfill cap.

The excavation and on-site consolidation can be implemented in a relatively short time frame. Further delineation of the impacted soils in a pre-design sampling program would be required as part of the remedial action. Impacted soils would be excavated and transported to the landfill area of AOCs 1, 2 and 3 where the soils would be consolidated prior to installation of the cap. The excavation areas would be backfilled with clean fill imported from an off-site source. Construction of the cap would also be completed in a relatively short time frame. However, long-term monitoring and maintenance costs would also be associated with the cap. A storm water management system would also be incorporated into the cap design to divert storm water flow around and away from the solid waste. It is anticipated that passive vents would be installed into the gas collection layer of the cap. Given that the solid waste appears to be located above the groundwater table, it is expected that contaminated leachate generated, already a small amount, would diminish considerably or possibly cease permanently once the impermeable cap is installed on top of the waste. Therefore, a leachate collection system has not been assumed to be a necessary component of the cap system for the remedial design. A pre-design investigation consisting of test-trenching and exploratory test pits around the perimeter of the solid waste area has been included as part of this alternative. An additional test pit/trench investigation would establish the limits of the solid waste. Any contaminated soils in AOC 1 which are determined to be outside the footprint of the proposed cap will be excavated and consolidated within the footprint of the cap. Any soils or waste materials that are characterized as hazardous waste under EPA's Resource Conservation and Recovery Act (RCRA) would be transported off-site for proper disposal and will not be placed under the cap. Based on available data, the contaminated soils/solid wastes outside the footprint of the landfill cap are not expected to be hazardous wastes.

Groundwater monitoring would be conducted to ensure the long-term protectiveness of the cap and to monitor the groundwater conditions following the excavation and consolidation of impacted soils areas. In addition to the seven existing EPA monitoring wells, additional groundwater monitoring wells would be installed, in accordance with any pertinent 6 NYCRR Part 360 requirements, as part of this alternative and incorporated into a long-term groundwater monitoring program to be set forth in a Site Management Plan (SMP). Institutional and engineering controls, including groundwater use restrictions, and an operation and maintenance (O&M) plan will also be required as part of this alternative and will be reflected in the SMP.

The objectives of this alternative are to prevent or to minimize future human exposure to contaminated soils and to reduce the potential for contaminant migration. The impermeable cap would minimize the further release of contaminants to the groundwater by limiting future storm water infiltration through the contaminated soils.

Alternative 2C – Capping/On-Site Consolidation

Capital Cost	$4,695,938
Annual Operation and Maintenance (O&M) Cost	$65,700
Present-Worth Cost	$5,711,000
Construction Time	9 months

Alternative 2C includes all of the aspects of the Alternative 2A (as discussed above) except that, in Alternative 2C, the cap is limited to AOC 1 and the contaminated soils from AOCs 1-6 would be excavated and consolidated into AOC 1, prior to installation of the cap.

The objectives of this alternative are to prevent or minimize future human exposure to contaminated soils and to reduce the potential for storm water infiltration into the groundwater through the consolidation of contaminated soils beneath the impermeable cap. The impermeable cap would also minimize the further release of contaminants to the groundwater by limiting future storm water infiltration through the contaminated soils. This would also reduce the total area of the cap and the scope of the associated O&M activities.

Alternative 4 – Off-Site Disposal

Capital Cost	$23,822,000
Annual Operation and Maintenance (O&M) Cost	$0
Present-Worth Cost	$23,822,000
Construction Time	6 months

Alternative 4 consists of excavation and off-site disposal of soils with contaminants greater than RSCOs-Residential. This alternative would meet all of the RAOs and return the Ellenville site to pre-release conditions. It would be implemented in a relatively short time frame. However, the alternative has high costs as a result of the extensive quantities of soils which would need to be to be disposed of off-site and the associated costs of such action for excavation, transport and disposal. This alternative would require extensive truck traffic carrying excavated soils through the Ellenville community. There are no long-term monitoring or O&M costs associated with this alternative.

Remedial Alternatives for Groundwater

The three groundwater alternatives [No Action; Monitored Natural Attenuation/Long-Term Monitoring; and Groundwater Pump and Treat] were evaluated in the FS and were presented in the Proposed Plan dated July 29, 2010. However, since the issuance of the Proposed Plan, EPA has determined that it is not necessary to propose groundwater alternatives nor to select an active groundwater remedy for the Ellenville site because 1) limited groundwater contamination (both inorganic and organic) underlies the Ellenville site, 2) the isolated low levels of contamination in the groundwater do not appear to be mobile, show no threat of migration nor a significant area-wide impact on site groundwater, 3) there is no clearly defined inorganic plume in the site groundwater; 4) a comprehensive groundwater monitoring program would be implemented as part of the selected remedy; and, 5) the soil and groundwater data and the current hydrogeologic information at the Ellenville site indicate that the fill material in the landfill proper is located above the water table. While EPA has determined that, given site conditions and the anticipated source control remedy, a groundwater remedy for the Ellenville site is not warranted, EPA does not rule out the possibility that a future ROD may be necessary to address impacts on groundwater depending on the conditions after the source controls are implemented.

COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria set forth in the NCP: overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, short-term effectiveness, implementability, cost and state and community acceptance.

The evaluation criteria are described below.

- Overall protection of human health and the environment refers to whether a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced or controlled through treatment, engineering controls or institutional controls.
- Compliance with ARARs refers to whether a remedy would meet all of the applicable or relevant and appropriate requirements of other Federal and state environmental statutes and requirements or provide grounds for invoking a waiver.
- Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.
- Short-term effectiveness refers to the period needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost includes estimated capital and O&M costs and net present-worth costs.
- State acceptance indicates if, based on its review of the RI/FS and Proposed Plan, the State concurs with the preferred remedy.
- Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

ANALYSIS OF THE NINE CRITERIA

Overall Protection of Human Health and the Environment

Since No Action would be implemented under Alternative 1, this alternative would not provide control of exposure to contaminated soils, offer risk reduction to human health posed by contaminated soils nor provide a groundwater response. The impermeable cap for Alternatives 2A and 2C are similarly protective and both would prevent exposure to the contaminated soils, eliminate migration of contaminated soils from wind blown dust or storm water erosion and mitigate inhalation risks of potential landfill gas. In addition, the impermeable cap would minimize further release of contaminants to the groundwater by limiting future infiltration. Alternative 4 would be protective of human health and the environment, since all contaminated soils would be removed from the Ellenville site and it would essentially be restored to pre-disposal conditions. Direct contact risks would be reduced by removing contaminated soils. Any potential impacts to groundwater would be mitigated by removing contaminated soils. Alternatives 2A and 2C would reduce the potential risks of ingestion of impacted groundwater by preventing any future migration of contamination.

Compliance with ARARs

Alternatives 2A, 2C and 4 would meet 6 NYCRR Part 375 SCOs.

A landfill cover is an action-specific ARAR for site closure. Alternatives 2A and 2C would satisfy this action-specific ARAR. It is not relevant to Alternatives 1 and 4.

Since Alternatives 2A, 2C and 4 would involve the excavation of contaminated soils, they would require compliance with fugitive dust and VOC emission requirements. In addition, Alternative 4 would be subject to Federal and state regulations related to the transportation and off-site treatment/disposal of non-hazardous or hazardous wastes.

The consolidation of contaminated soils could identify a small portion of those soils as a characteristic hazardous waste which may trigger land disposal restriction requirements under RCRA. If the excavated soils are determined to be characteristic hazardous waste, they would be transported off-site for treatment and/or disposal, thus complying with the RCRA hazardous waste requirements including any land disposal restrictions. Based on available data and site conditions, EPA does not expect that the contaminated soils/solid wastes from AOCs 1-6 to be consolidated under the footprint of the landfill cap would be classified as hazardous wastes.

Long-Term Effectiveness and Permanence

Alternative 1 would not reduce risk in the long term, since the contaminants would not be controlled, treated or removed. Alternative 4 would provide the highest degree of long-term effectiveness and permanence because the impacted soils would be permanently removed from the Ellenville site. Unlike Alternatives 2A and 2C, Alternative 4 would also need no long-term reliance on institutional controls. Alternatives 2A and 2C would rely on a soil/HDPE liner meeting the substantive requirements of 6 NYCRR Part 360 to control infiltration to groundwater and to reduce direct contact exposure and migration of impacted soils. Although capping would be effective and reliable, it would be less reliable in the long-term than Alternative 4 (complete removal of contaminated soils), since there would be a potential for cap failure or breach. Alternative 2C would have slightly less long-term impact than Alternative 2A, since it would have a smaller cap footprint which would result in a lower risk of cap failure. Alternatives 2A and 2C would include long-term groundwater monitoring requirements that would provide for monitoring of the effects of the cap on groundwater.

Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

Alternatives 2A, 2C and 4 would not use any treatment technologies to reduce the toxicity, mobility or volume of contaminants through treatment. However, if off-site treatment of any contaminated soils which are determined to be hazardous waste would be required, the selected remedy would provide overall protection by reducing the toxicity, mobility and volume of contamination through treatment. Under Alternatives 2A and 2C, contaminated soils would be contained and less mobile, since they would be controlled by a cap. Contaminated soils in Alternative 4 would be transported for off-site disposal at an approved and permitted facility.

Short-Term Effectiveness

There would be no short-term impacts for Alternative 1. Under Alternatives 2A, 2C and 4, some particulate emissions may result during soil handling, excavation and landfill cap construction. Dust control and soil erosion and sedimentation controls would reduce the short-term impacts. Alternative 4 would pose the greatest short-term impact because the largest volume of soils/solid waste would be disturbed and handled. Similarly, Alternative 2C would pose a slightly larger impact than Alternative 2A because of the consolidation of a greater quantity of impacted soils.

Implementability

Of the active alternatives, Alternative 4 would be the simplest to implement although handling of the solid waste would add some complexity to the alternative. Alternatives 2A and 2C would be slightly more complex to implement because of the cap construction and installation of the geomembrane liner. Long-term O&M, monitoring and inspections of the integrity of the cap would be required. Long-term groundwater monitoring would also be required to assess the effectiveness of the cap in reducing the affect on the groundwater contamination.

Cost

Alternative 1 would have no costs associated with it because no activities would be implemented. Alternative 2C would have the lowest capital cost ($4,695,938) of the active soil alternatives followed by Alternative 2A ($5,152,800). Alternative 4 would have the highest capital cost ($23,822,000) and the lowest O&M costs ($0) of the soil alternatives. Alternatives 2A and 2C would have similar annual O&M costs of $75,500 and $65,700, respectively. After Alternative 1, Alternative 2C would have the lowest overall present value cost ($5,711,000) followed by Alternative 2A ($6,323,000). Alternative 4 would have the highest overall present-worth cost of the soil alternatives ($23,822,000).

State Acceptance

NYSDEC concurs with the selected remedy (see Appendix IV).

Community Acceptance

On the basis of the comments that were received during the public comment period, EPA has concluded that the public generally supports the proposed soil remedy. Public comments were related to future use of the property, soil remediation, remedial alternatives evaluation, site remediation controls, project schedule and local interaction. Responses to the comments that were received during the public comment period are included in the Responsiveness Summary (see Appendix V).

As can be seen by the cost estimates, Alternative 1 (No Action) would be the least costly remedies. Alternative 4 (Off-Site Disposal) would be the most costly remedy with an estimated present-worth cost of $23,822,000. The estimated present-worth cost for the selected remedy (Alternative 2C - On-Site Consolidation and Capping) would be $5,711,000.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430 (a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that 1) act as a reservoir for the migration of contamination to groundwater, surface water or air, or 2) act as a source for direct exposure, in this case soils. Principal threat wastes are those source materials considered to be highly toxic and highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. Conversely, non-principal threat wastes, as those found at the Ellenville site, are those materials that generally can be reliably contained and that would present only a low risk in the event of exposure. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives, using the remedy selection criteria which were described above. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied.

Principal threat wastes at the Ellenville site were previously addressed by EPA's cleanup actions performed during the 2004-2005 timeframe. Existing data, as well as site conditions, does not indicate that principal threat wastes are present at the Ellenville site.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

The proposed remedy (Alternative 2C) is selected as the response action for the Ellenville site. It provides the most cost-effective solution by applying the evaluation criteria under the reasonably anticipated future use of the Ellenville site. The excavation of contaminated soils from AOCs 1-6 and the consolidation of them under a landfill cap (AOC 1) would limit the mobility of the contaminants at the Ellenville site and would prevent exposure to contamination present in the site soils. By limiting the mobility of contaminants, this remedy would also provide protection of the groundwater by reducing the potential for cross media impacts from contamination mobilizing from the soil and entering the groundwater. It is expected that the landfill cap would be effective at preventing further migration of contaminants contained in the landfill proper. Further efforts in assessing the effectiveness of the landfill cap's impact on future groundwater quality would be addressed by the implementation of a groundwater monitoring program that is part of the selected remedy. This program would include the installation of additional monitoring wells.

Alternative 2A would provide similar benefits to Alternative 2C; however, there would be a larger landfill cap. As a result, Alternative 2A would require more maintenance and is less cost-effective. The selected remedy, which would have a reduced cap size, would reduce the scope of any infiltration from a cap system failure and/or cap breach and would provide more usable area for potential reuse and redevelopment of the Ellenville site. EPA strongly supports reuse and redevelopment at Superfund sites. The selected remedy would require less cost than Alternatives 2A and 4. The selected remedy would excavate the contaminated soils in AOCs 1-6 throughout the Ellenville site and consolidate them under a landfill cap which meets the substantive requirements of 6 NYCRR Part 360, in combination with institutional controls that would include groundwater use restrictions. Alternative 4 would be considerably more expensive than Alternative 2A or 2C, requiring a larger excavation effort and off-site disposal.

Alternative 1 was not selected because it would not be protective. Alternative 2A was not selected because of the increased area of the cap which would not afford the opportunity for increased reuse and redevelopment of the Ellenville site. Alternative 4 was not selected, because of the high cost, the impact of the extensive soil excavation and the resulting truck traffic through the community. Therefore, EPA has determined that the selected remedy would meet the soil cleanup objectives and, coupled with groundwater monitoring, would provide the best balance of tradeoffs with respect to the evaluating criteria.

Under the selected remedy, by complying with the requirements of 6 NYCRR Part 360, the Agency is taking effective action to limit exposure to the sources of site contamination, *i.e.*, the landfill contaminants and contaminated soils, and isolating them from being a source of further impact on the groundwater.

The use of 6 NYCRR Part 375 Restricted Soil Cleanup Objectives for Residential soils is based on the data associated with the primary COCs for the Ellenville site. By excavating the soils with that exceed RSCOs-Residential and consolidating these soils under the cap, the potential exposure to the various receptors would be reduced, thus reducing the risk. If the excavated soils are contaminated such that consolidation under the cap is not appropriate, *i.e.*, determined to be hazardous waste, those soils would be transported for off-site treatment and/or disposal. The primary COCs are based on a widespread distribution of contamination over the entire Ellenville site. These include PAHs, PCBs, pesticides and metals, mainly lead, chromium, mercury and zinc. The distribution of the highest concentrations of most COCs is generally limited to the landfill area of the upper plateau and the former stockpile area on the lower plateau. In some cases, as discussed above, background concentrations of these COCs exceed those found on-site.

In the case of pesticides, the general distribution of these compounds appears to be along roadways and near residences where pesticides may have been applied over the course of time. The use of pesticides during site operations is not documented but, considering the nature of the site operations and activities in a natural environment, the use of pesticides would not be uncommon. Outside of the landfill proper and the former stockpile areas, *i.e.*, areas where the primary site operations took place, the presence of these compounds appear to be isolated.

In summary, several of the COCs appear to be inherent to the Ellenville site, as shown by the concentrations detected in some background samples. The COCs that exist in portions of the Ellenville site will undergo remediation, either through excavation, consolidation, capping and/or off-site treatment and/or disposal.

Therefore, as part of a pre-design investigation, additional soils samples would be obtained from these locations in order to delineate the extent of the impacted areas so that the contaminated materials from the AOCs would be excavated and consolidated in AOC 1 under the landfill cap or, if deemed hazardous, would be subject to off-site treatment and/or disposal at permitted facilities.

The selected remedy would be protective of human health and the environment, would provide long-term effectiveness, would achieve ARARs in a reasonable time frame and would be cost-effective among alternatives with respect to the evaluation criteria. EPA, with the concurrence of NYSDEC, has determined that the selected remedy would treat any principal threats and utilize permanent solutions to the maximum extent practicable.

<u>*Description of the Selected Remedy*</u>

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives and public comment, EPA, in conjunction with NYSDEC, has determined that Alternative 2C (On-Site Consolidation and Capping) would best satisfy the requirements of CERCLA Section 121, 42 U.S.C. Section 9621 and would provide the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria, 40 CFR Section 300.430(e)(9) (see Figure 8).

Since the issuance of the Proposed Plan, EPA has determined that it is not necessary to propose groundwater alternatives or select an active remedy for the Ellenville site because 1) limited groundwater contamination (both inorganic and organic) underlies the Ellenville site, 2) the isolated low levels of contamination in the groundwater do not appear to be mobile, show no threat of migration nor a significant area-wide impact on site groundwater, 3) there is no clearly defined inorganic plume in the site groundwater; 4) a comprehensive groundwater monitoring program would be implemented as part of the selected remedy, in accordance with NYS landfill closure requirements; and, 5) the soil and groundwater data and the current hydrogeologic information at the Ellenville site indicate that the fill material in the landfill proper is located above the water table. While EPA has determined that, given site conditions and the anticipated source control remedy, a groundwater remedy for the Ellenville site is not warranted, `EPA does not rule out the possibility that a future ROD may be necessary to address impacts on groundwater depending on the conditions after the source controls are implemented.

The preferred remedy consists of the following: 1) excavation of contaminated soils throughout the six AOCs, including some of the residential properties in the vicinity of the former facility property, where contaminants in the soils exceed the cleanup objectives; 2) backfilling the excavated areas with clean fill; 3) consolidating all excavated soils in the upper and central portion of the Ellenville site identified as AOC 1; 4) off-site disposal of any soils or waste materials that are characterized as hazardous; 5) installing a landfill cap system over AOC 1 which will meet the substantive requirements of NYS Part 360 closure regulations and will cover the existing landfill and the consolidated contaminated soils; and, 6) development of an SMP, in accordance with NYS landfill closure requirements, which would include 1) long-term groundwater monitoring, 2) engineering controls with an O&M plan, which may include periodic reviews and/or certifications, and 3) a plan for implementing institutional controls.

The selected remedy would effectively remove the sources of contamination, *i.e.*, contaminated soils, from potentially further impacting groundwater. During the pre-design phase, additional groundwater monitoring wells would be installed and incorporated into a comprehensive, long-term site-wide groundwater monitoring program. This program would be developed to determine and to monitor the effects of the cap system on both the shallow and bedrock aquifers. Institutional controls, including groundwater well restrictions, would also be put in place on the Ellenville site.

During the pre-design investigation, the areal extent of soil contamination would be further delineated in order to refine 1) the location of the necessary excavations and 2) the quantities of impacted soils to be consolidated under the landfill cap. Sampling would be performed to verify achievement of cleanup goals. Clean fill would be used to backfill all excavated areas, and disturbed surfaces would be restored to existing conditions. The actual extent of the excavation and the volume of the excavated soils would be based on a comprehensive pre-design sampling program.

Also, during the pre-design phase, as a result of recorded soil gas levels, an evaluation of the potential for soil vapor intrusion would be conducted. Sub-slab sampling would be conducted at adjacent residences during the winter heating season. Depending on the results, appropriate follow-up action would be taken.

If the results of the soil vapor evaluation warrant it, developers at the Ellenville site may be required to perform a soil vapor intrusion evaluation prior to any future construction and, if necessary, include impermeable barriers and/or incorporate appropriate subslab depressurization systems or other vapor mitigation technology to prevent any vapors from impacting indoor air, as appropriate.

Appropriate institutional controls would be relied upon at the Ellenville site which may include an environmental easement or other restrictive covenant to be filed in the property records of Ulster County that 1) would prevent any disruption to the landfill cap, 2) would include groundwater use restrictions on the Ellenville site, and 3) would allow for residential use of the portion of the property not capped, as well as restricted residential, commercial and/or industrial use, as defined in 6 NYCRR Part 475.

In accordance with EPA Region 2's Clean and Green policy and in order to maximize the net environmental benefits, EPA would evaluate the maximum use of sustainable technologies and practices, as appropriate, during the design, construction and operation of the selected remedy.

Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the Ellenville site be reviewed every five years. Also, provisions would be made for periodic reviews and certifications of the institutional and engineering controls. If justified by these reviews, additional remedial actions may be implemented at the Ellenville site.

Summary of the Estimated Selected Remedy Costs

A detailed cost estimate for the selected remedy can be found in Table B. The information in the cost estimate summary table is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering pre-design and design of the selected remedy.

Any major cost changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Differences or a ROD amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50% to -30% of the actual project cost.

STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances, pollutants or contaminants at a site. For the reasons discussed below, EPA has determined that the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy will be protective of human health and the environment.

The implementation of the selected remedy would not pose unacceptable short-term risks or cross-media impacts. If off-site treatment and/or disposal of contaminated soils is determined to be required, the selected remedy would also provide overall protection by reducing the toxicity, mobility and volume of contamination through treatment.

Compliance with ARARs and Other Environmental Criteria

A summary of the ARARs and Other Criteria, Advisories, or Guidance TBCs which will be complied with during implementation of the selected remedy is presented below.

- NYS - 6 NYCRR Part 360 Landfill Requirements
- NYS - 6 NYCRR Part 475 Soil Cleanup Objectives.
- NYS Drinking Water Standards - 10 NYCRR Part 5
- NYS - Groundwater Quality Standards - 6 NYCRR Parts 703
- National Primary Drinking Water Standards (MCLs and MCLGs - 40 CFR 141
- NYS Regulations for Prevention and Control of Air Contamination and Air Pollution - 6 NYCRR Part 200
- TSCA - 40 CFR Part 761
- RCRA Identification and Listing Of Hazardous Waste - 40 CFR Part 261
- RCRA Land Disposal Restrictions - 40 CFR Part 268
- Regional Screening Levels for Chemical Contaminants at Superfund Sites, EPA, September 12, 2008.

Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP Section 300.430(f)(1)(ii)(D)). Overall effectiveness is based on the evaluations of: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Based on the comparison of overall effectiveness (discussed above) to cost, the selected soil remedy would meet the statutory requirement that Superfund remedies be cost-effective in that it is the least-costly alternative that would achieve the remediation goals in a reasonable time frame.

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital and annual maintenance costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual maintenance costs were calculated for the estimated life of an alternative using a 7% discount rate. The estimated present-worth cost of the selected soil alternative, using a 30-year time interval, is $5,711,000.

While the active soil alternatives that were considered would effectively achieve the remedial action objectives and would provide the same degree of protection of human and ecological receptors, the selected remedy would be the least-costly action alternative which is protective. Therefore, EPA believes that the cost of the selected remedy would provide the best balance in proportion to its overall effectiveness.

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

The selected remedy would provide the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP Section 300.430(f)(1)(i)(B), such that it would represent the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the Ellenville site. In addition, the selected remedy would provide protection of human health and the environment, long-term effectiveness, would be able to achieve the ARARs and would be cost-effective.

If off-site treatment and/or disposal of excavated contaminated soils is determined to be required, then this treatment would reduce the toxicity, mobility and volume of the contaminants where the soils were located. Such treatment would permanently address that particular soils contamination.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element may not addressed by the selected remedy, since previous cleanup actions that were performed during the 2004-2005 timeframe addressed principal threat materials at the Ellenville site.

Based on the screening analyses, Alternatives 3A [Soil Washing/Off-Site Disposal] and 3B [Capping/Soil Washing/Off-Site Disposal] were screened out due to potential difficulty in implementation relative to other alternatives without providing significant additional effectiveness. Soil washing may be less effective as a result of the complex mixture of wastes at the Ellenville site. Formulating the washing may be difficult and a complex treatment train with sequential washing may be required to achieve the SCOs. Additional treatment is likely to be required to address the waste wash waters.

If off-site treatment and/or disposal of excavated contaminated soils that are deemed hazardous are determined to be required then this treatment would reduce the toxicity, mobility and volume of the contaminants where the soils were located. This treatment could also be an alternative treatment technology. The statutory preference for remedies that employ treatment as a principal element would be satisfied under the selected remedy.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan, released for public comment on July 29, 2010, identified and evaluated four remedial alternatives to address the soils contamination at the Ellenville site: 1) No Action; 2) 2A-consolidate/cap under AOCs 1-3; 3) 2C-Consolidate/Cap under AOC 1; and 4) Off-Site Disposal and three remedial alternatives were identified and evaluated to address groundwater contamination at the Ellenville site: 1) no action, 2) monitored natural attenuation/long-term monitoring, and 3) groundwater pump and treat. The Proposed Plan proposed Alternative 2C (Consolidate/Cap) as the preferred soil remedy and Alternative G1 – No Action as the preferred groundwater remedy.

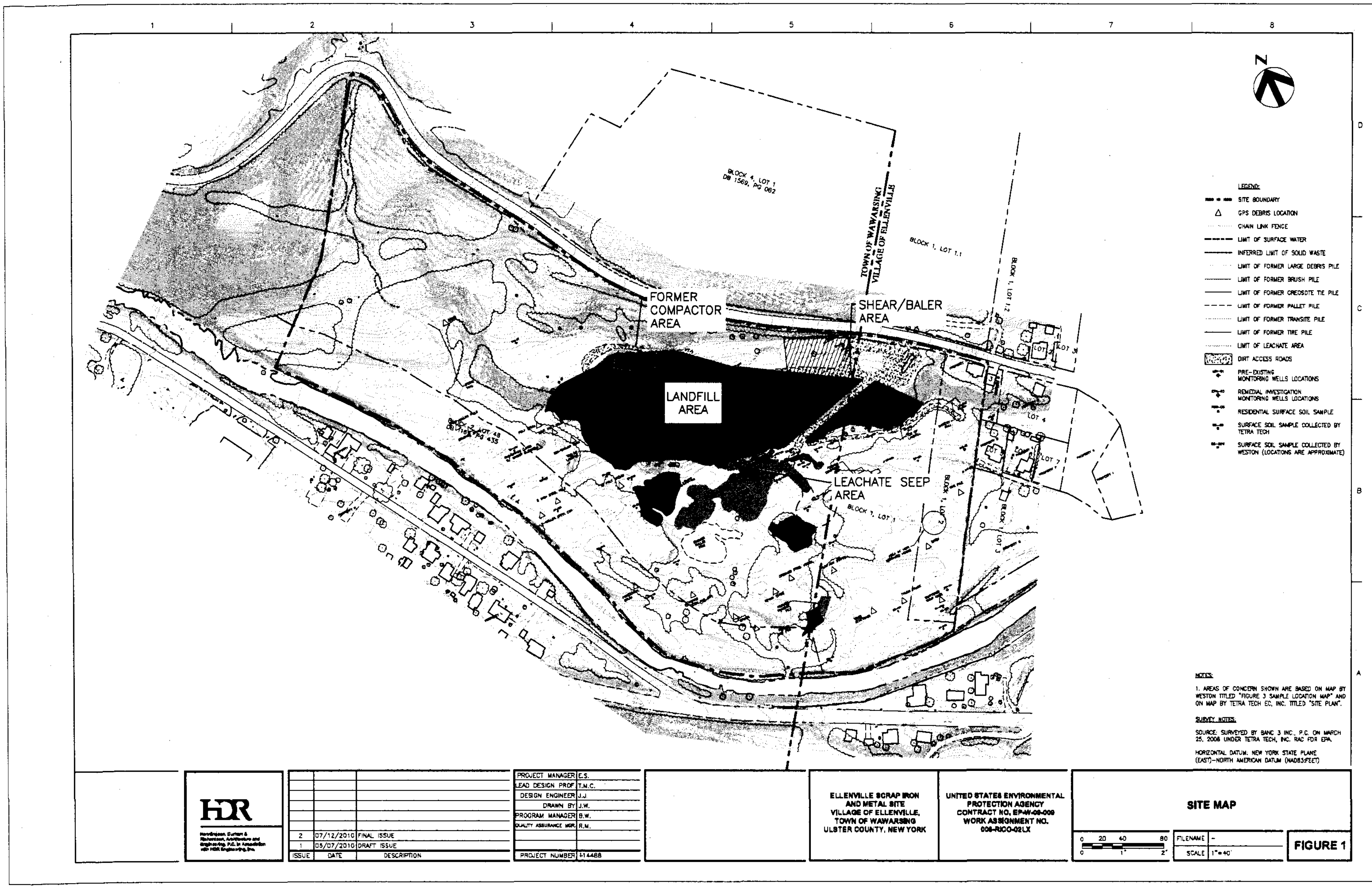
Since the issuance of the Proposed Plan, EPA has determined that it is not necessary to propose groundwater alternatives nor to select an active groundwater remedy for the Ellenville site because 1) limited groundwater contamination (both inorganic and organic) underlies the Ellenville site, 2) the isolated low levels of contamination in the groundwater do not appear to be mobile, show no threat of migration nor a significant area-wide impact on site groundwater, 3) there is no clearly defined inorganic plume in the site groundwater; 4) a comprehensive groundwater monitoring program would be implemented as part of the selected remedy; and, 5) the soil and groundwater data and the current hydrogeologic information at the Ellenville site indicate that the fill material in the landfill proper is located above the water table. While EPA has determined that, given site conditions and anticipated source control remedy, a groundwater remedy for the Ellenville site is not warranted, EPA does not rule out the possibility that a future ROD may be necessary to address impacts on groundwater depending on the conditions after the source controls are implemented.

Appropriate institutional controls that include groundwater use restrictions on the Ellenville site are included as part of the Alternatives 2A and 2C.

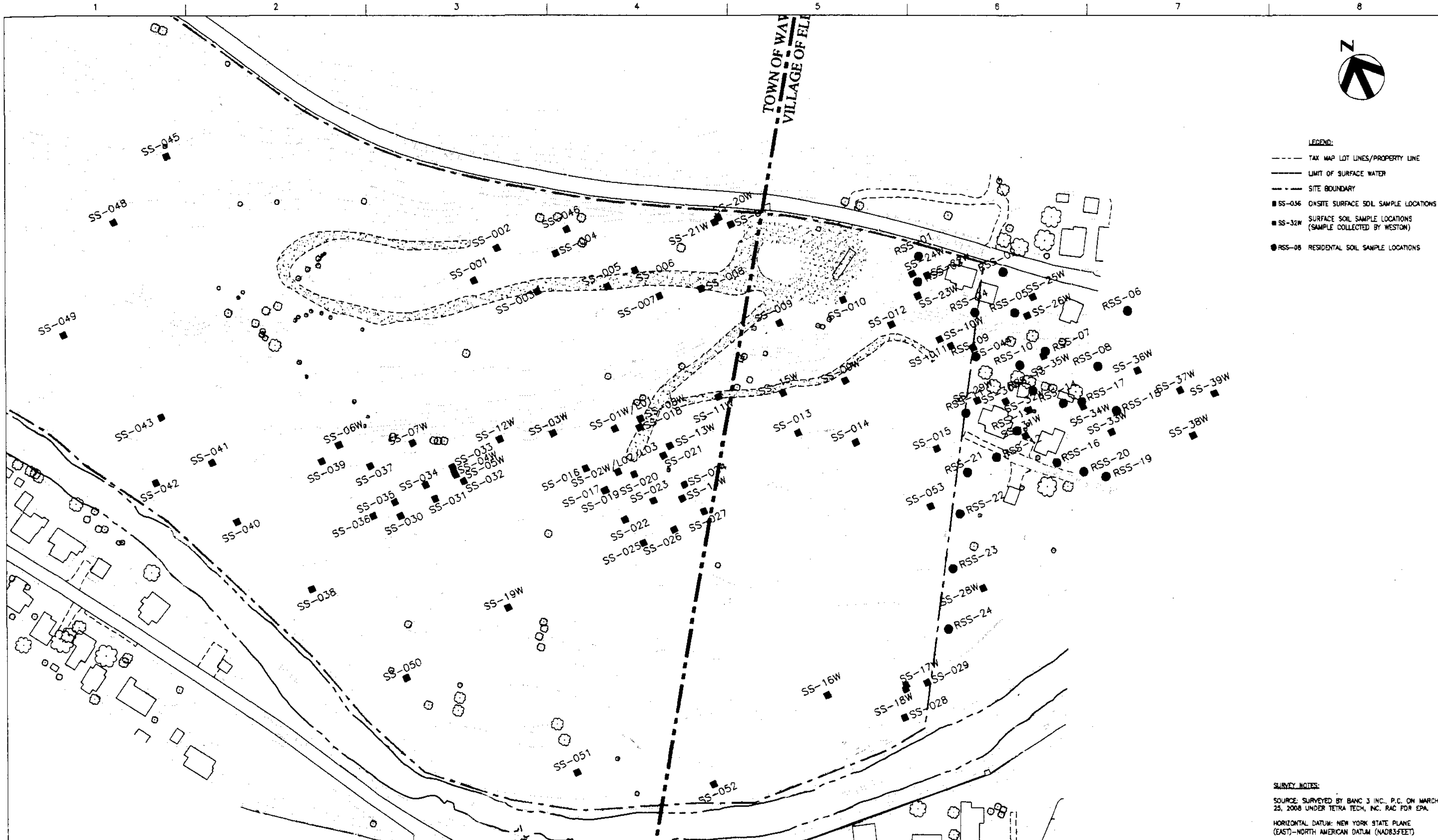
All written and verbal comments submitted during the public comment period were reviewed by EPA. All comments and EPA responses are included in the Responsiveness Summary (APPENDIX V). Upon review of these comments, EPA has determined that, other than those groundwater modifications discussed above, no significant changes to the soils remedy as it was originally proposed in the Proposed Plan were necessary.

APPENDIX I

FIGURES



N
BLOCK 4, LOT 1
DB 1569, PG 062
TOWN OF WAWARSING
VILLAGE OF ELLENVILLE
BLOCK 1, LOT 1.1
BLOCK 1, LOT 1.2
FORMER
COMPACTOR
AREA
SHEAR/BALER
AREA
LANDFILL
AREA
LEACHATE SEEP
AREA
BLOCK 1, LOT 1
BLOCK 1, LOT 2
BLOCK 1, LOT 3
LOT 2
LOT 3
LOT 4
LOT 7
LEGEND:
SITE BOUNDARY
GPS DEBRIS LOCATION
CHAIN LINK FENCE
LIMIT OF SURFACE WATER
INFERRED LIMIT OF SOLID WASTE
LIMIT OF FORMER LARGE DEBRIS PILE
LIMIT OF FORMER BRUSH PILE
LIMIT OF FORMER CREOSOTE TIE PILE
LIMIT OF FORMER PALLET PILE
LIMIT OF FORMER TRANSITE PILE
LIMIT OF FORMER TIRE PILE
LIMIT OF LEACHATE AREA
DIRT ACCESS ROADS
PRE-EXISTING MONITORING WELLS LOCATIONS
REMEDIAL INVESTIGATION MONITORING WELLS LOCATIONS
RESIDENTIAL SURFACE SOIL SAMPLE
SURFACE SOIL SAMPLE COLLECTED BY TETRA TECH
SURFACE SOIL SAMPLE COLLECTED BY WESTON (LOCATIONS ARE APPROXIMATE)
NOTES:
1. AREAS OF CONCERN SHOWN ARE BASED ON MAP BY WESTON TITLED "FIGURE 3 SAMPLE LOCATION MAP" AND ON MAP BY TETRA TECH EC, INC. TITLED "SITE PLAN".
SURVEY NOTES:
SOURCE: SURVEYED BY BANC 3 INC., P.C. ON MARCH 25, 2008 UNDER TETRA TECH, INC. RAC FOR EPA.
HORIZONTAL DATUM: NEW YORK STATE PLANE (EAST)-NORTH AMERICAN DATUM (NAD83:FEET)
HDR
2 07/12/2010 FINAL ISSUE
1 05/07/2010 DRAFT ISSUE
ISSUE DATE DESCRIPTION
PROJECT MANAGER E.S.
LEAD DESIGN PROF T.N.C.
DESIGN ENGINEER J.J.
DRAWN BY J.W.
PROGRAM MANAGER B.W.
QUALITY ASSURANCE MGR. R.M.
PROJECT NUMBER 114488
ELLENVILLE SCRAP IRON AND METAL SITE
VILLAGE OF ELLENVILLE, TOWN OF WAWARSING
ULSTER COUNTY, NEW YORK
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO. 006-RICO-02LX
SITE MAP
0 20 40 80
0 1" 2"
FILENAME -
SCALE 1"=40'
FIGURE 1



HDR
Henningson, Durham & Richardson, Architecture and Engineering, P.C. in Association with HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
2	07/01/2010	FINAL ISSUE
1	02/19/2010	DRAFT ISSUE

PROJECT MANAGER	E.S.
LEAD DESIGN PROF.	T.M.C.
DESIGN ENGINEER	J.J.
DRAWN BY	J.W.
PROGRAM MANAGER	B.W.
QUALITY ASSURANCE MGR	R.M.
PROJECT NUMBER	414488

ELLENVILLE SCRAP IRON AND METAL SITE
VILLAGE OF ELLENVILLE, TOWN OF WAWARSING
ULSTER COUNTY, NEW YORK

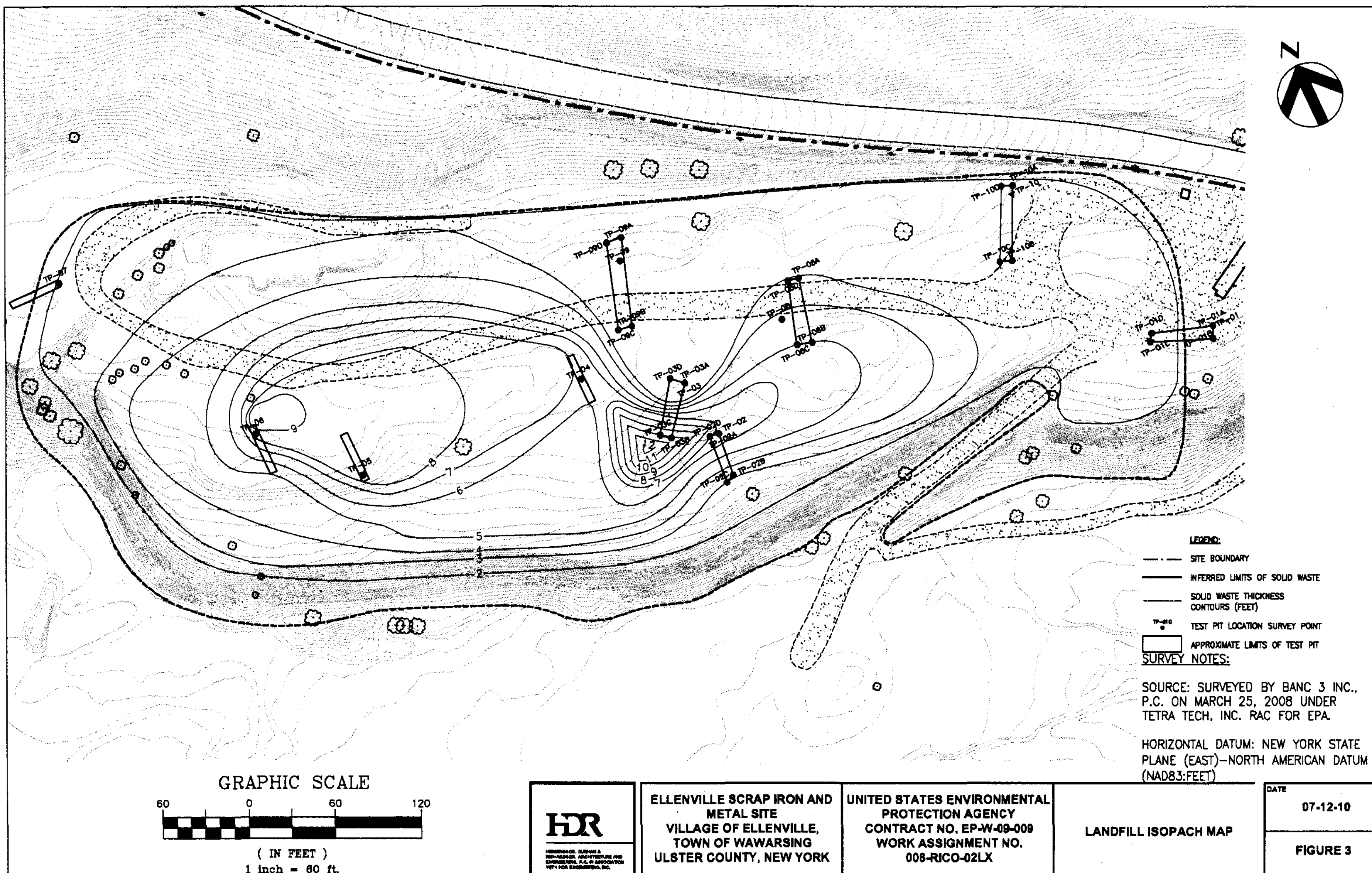
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO. 006-RICO-02LX

SURFACE SOIL SAMPLE LOCATIONS

0 15 30 60
0 1" 2"

FILENAME -
SCALE 1"=30'

FIGURE 2

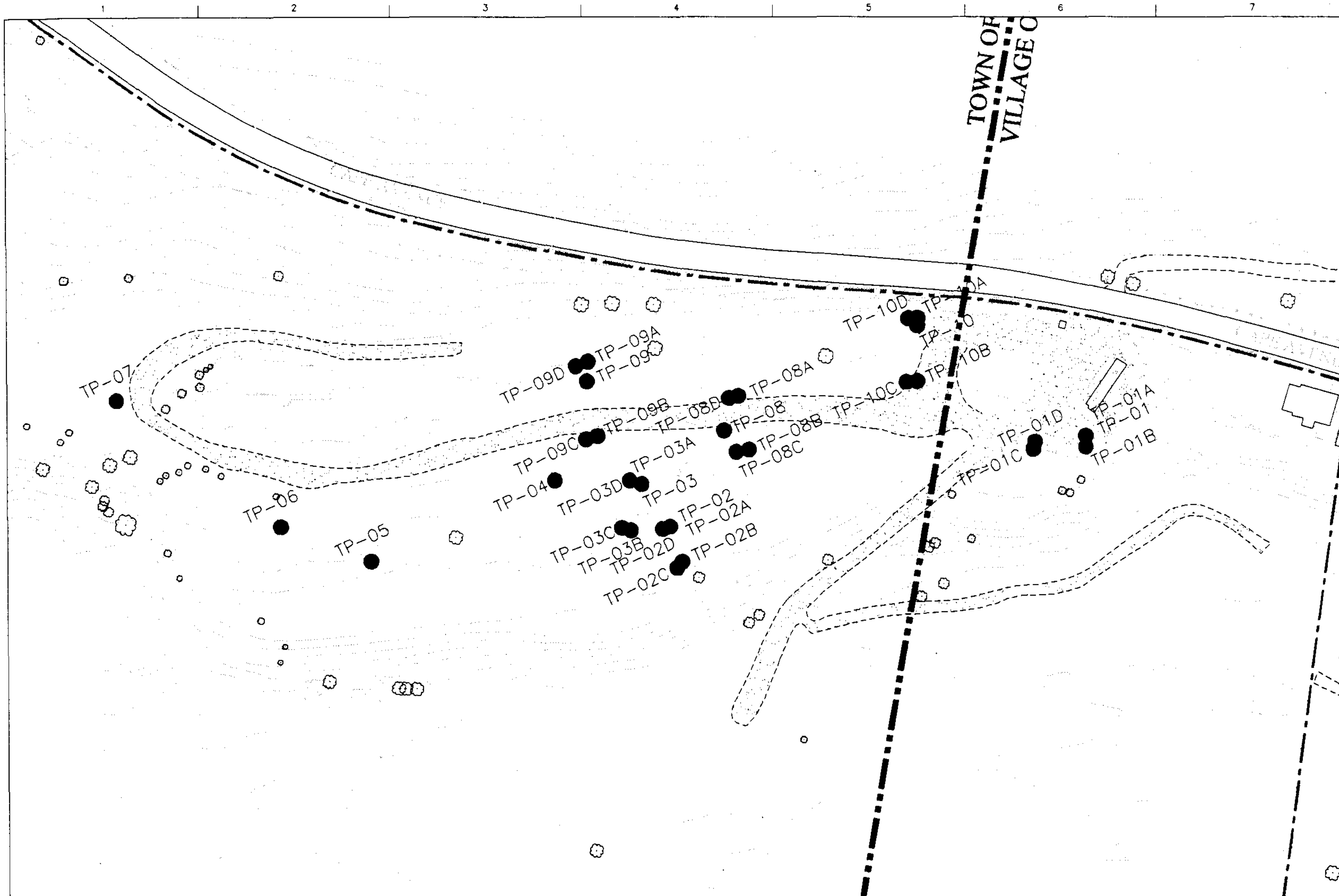


SURVEY NOTES:

SOURCE: SURVEYED BY BANC 3 INC., P.C. ON MARCH 25, 2008 UNDER TETRA TECH, INC. RAC FOR EPA.

HORIZONTAL DATUM: NEW YORK STATE PLANE (EAST)–NORTH AMERICAN DATUM (NAD83:FEET)

HDR	ELLENVILLE SCRAP IRON AND METAL SITE VILLAGE OF ELLENVILLE, TOWN OF WAWARSING ULSTER COUNTY, NEW YORK	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY CONTRACT NO. EP-W-09-009 WORK ASSIGNMENT NO. 008-RICO-02LX	LANDFILL ISOPACH MAP	DATE 07-12-10 FIGURE 3



LEGEND:

- TAX MAP LOT LINES/PROPERTY LINE
- LIMIT OF SURFACE WATER
- SITE BOUNDARY
- TP-01 TEST PIT LOCATIONS

SURVEY NOTES:

SOURCE: SURVEYED BY BANC 3 INC., P.C. ON MARCH 25, 2008 UNDER TETRA TECH, INC. RAC FOR EPA.

HORIZONTAL DATUM: NEW YORK STATE PLANE (EAST)–NORTH AMERICAN DATUM (NAD83:FEET)

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LEAD DESIGN PROF.	T.M.C.
DESIGN ENGINEER	J.J.
DRAWN BY	J.W.
PROGRAM MANAGER	B.W.
QUALITY ASSURANCE MGR	R.M.
PROJECT NUMBER	114488

ELLENVILLE SCRAP IRON AND METAL SITE
VILLAGE OF ELLENVILLE,
TOWN OF WAWARSING
ULSTER COUNTY, NEW YORK

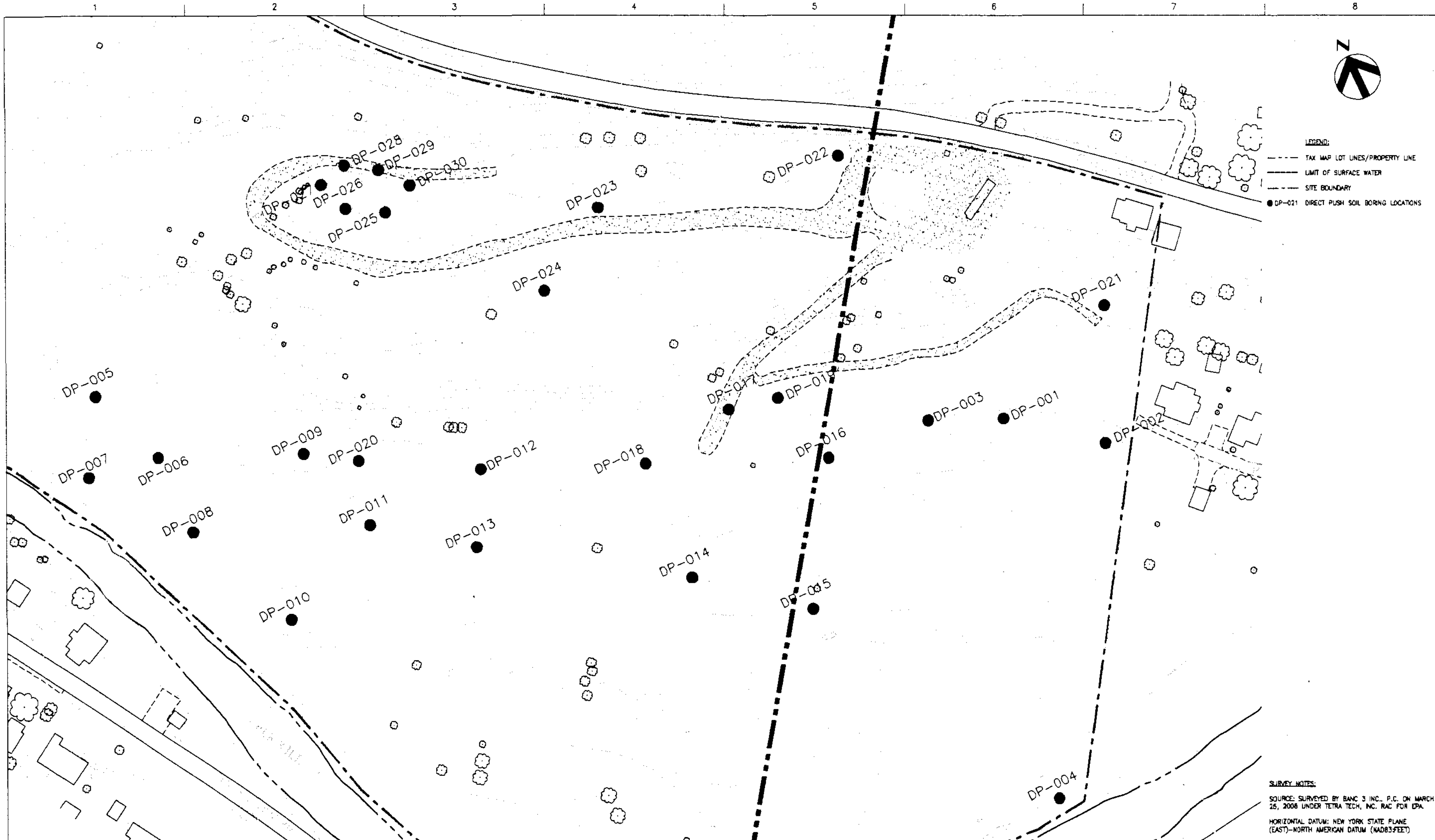
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO. 009-RICO-02LX

TEST PIT LOCATIONS

0 10 20 40
0 1" 2"

FILENAME	–
SCALE	1"=20'

FIGURE 4



HDR

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PROGRAM MANAGER	B.W.
QUALITY ASSURANCE MGR.	R.M.
PROJECT NUMBER	114488

ELLENVILLE SCRAP IRON AND METAL SITE
VILLAGE OF ELLENVILLE,
TOWN OF WAWARSING
ULSTER COUNTY, NEW YORK

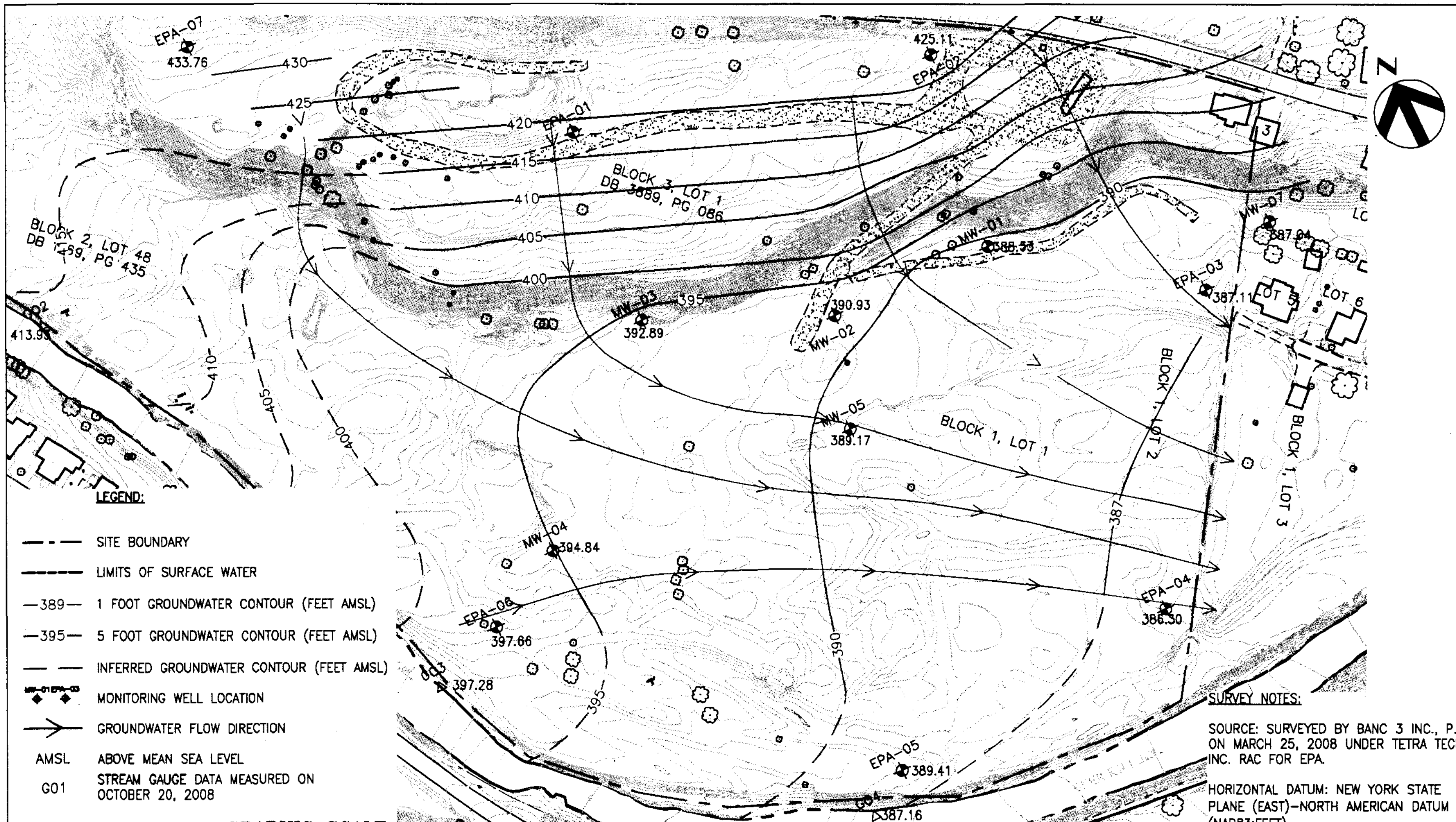
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO. 008-RICO-02LX

DIRECT PUSH SOIL BORING LOCATIONS

0 12.5 25 50
0 1" 2"

FILENAME	-
SCALE	1"=25'

FIGURE 5



LEGEND:

- SITE BOUNDARY
- LIMITS OF SURFACE WATER
- —389— 1 FOOT GROUNDWATER CONTOUR (FEET AMSL)
- —395— 5 FOOT GROUNDWATER CONTOUR (FEET AMSL)
- INFERRED GROUNDWATER CONTOUR (FEET AMSL)
- MW-01 EPA-03 MONITORING WELL LOCATION
- GROUNDWATER FLOW DIRECTION
- AMSL ABOVE MEAN SEA LEVEL
- G01 STREAM GAUGE DATA MEASURED ON OCTOBER 20, 2008

GRAPHIC SCALE

100 0 100 200

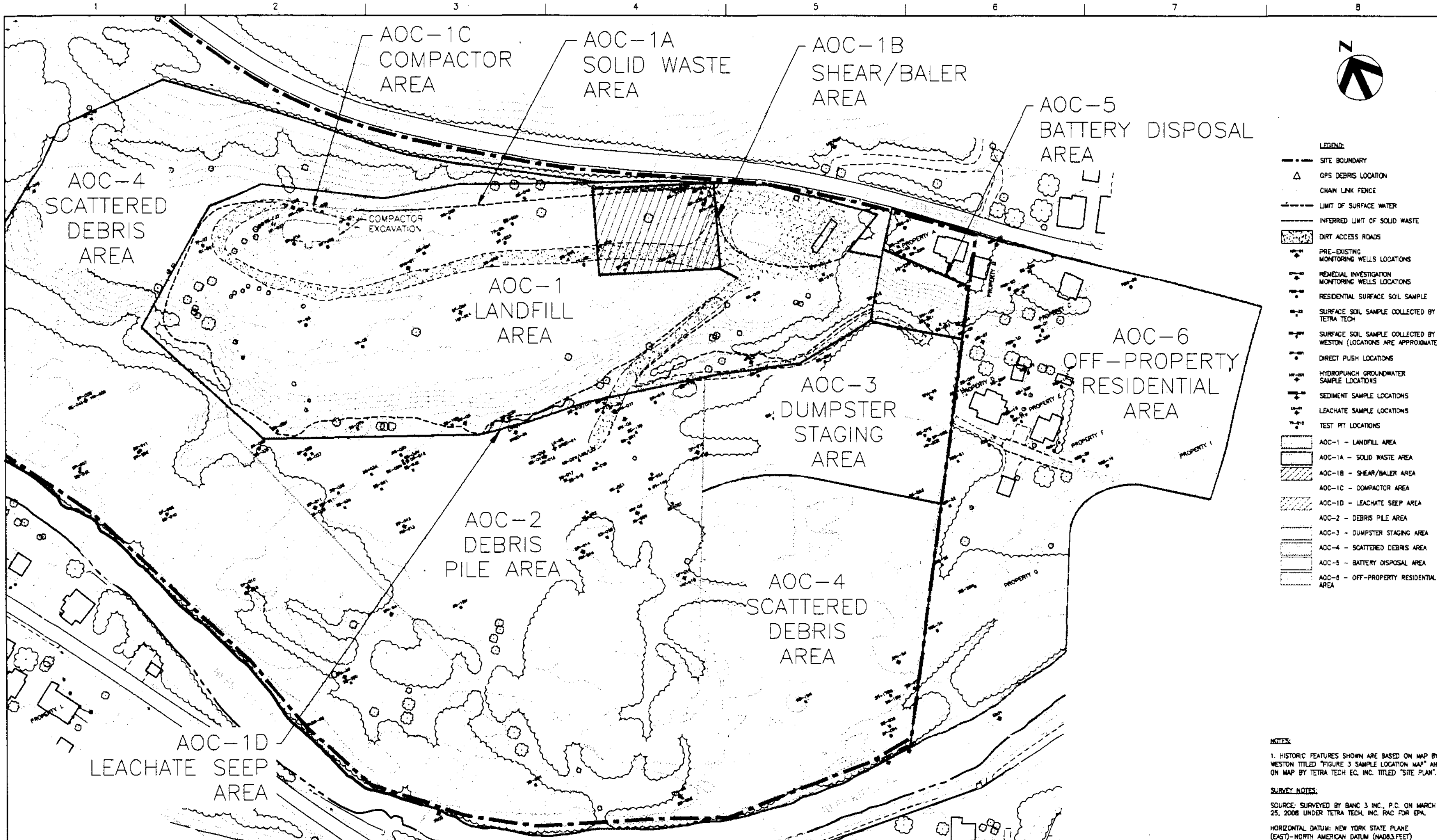
(IN FEET)
1 inch = 100 ft.

SURVEY NOTES:

SOURCE: SURVEYED BY BANC 3 INC., P.C. ON MARCH 25, 2008 UNDER TETRA TECH, INC. RAC FOR EPA.

HORIZONTAL DATUM: NEW YORK STATE PLANE (EAST)–NORTH AMERICAN DATUM (NAD83;FEET)

HDR	ELLENVILLE SCRAP IRON AND METAL SITE VILLAGE OF ELLENVILLE, TOWN OF WAWARSING ULSTER COUNTY, NEW YORK	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY CONTRACT NO. EP-W-09-009 WORK ASSIGNMENT NO. 008-RICO-02LX	GROUNDWATER ELEVATION CONTOURS OF EPA MONITORING WELLS	DATE 07-12-10 FIGURE 6



NOTES:

1. HISTORIC FEATURES SHOWN ARE BASED ON MAP BY WESTON TITLED "FIGURE 3 SAMPLE LOCATION MAP" AND ON MAP BY TETRA TECH EC, INC. TITLED "SITE PLAN".

SURVEY NOTES:

SOURCE: SURVEYED BY BANC 3 INC., P.C. ON MARCH 25, 2006 UNDER TETRA TECH, INC. RAC FOR EPA.

HORIZONTAL DATUM: NEW YORK STATE PLANE (EAST)-NORTH AMERICAN DATUM (NAD83:FEET)

HDR

Henningson, Durham & Richardson, Architecture and Engineering, P.C. in Association with HDR Engineering, Inc.

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ELLENVILLE SCRAP IRON AND METAL SITE
VILLAGE OF ELLENVILLE, TOWN OF WAWARSING
ULSTER COUNTY, NEW YORK

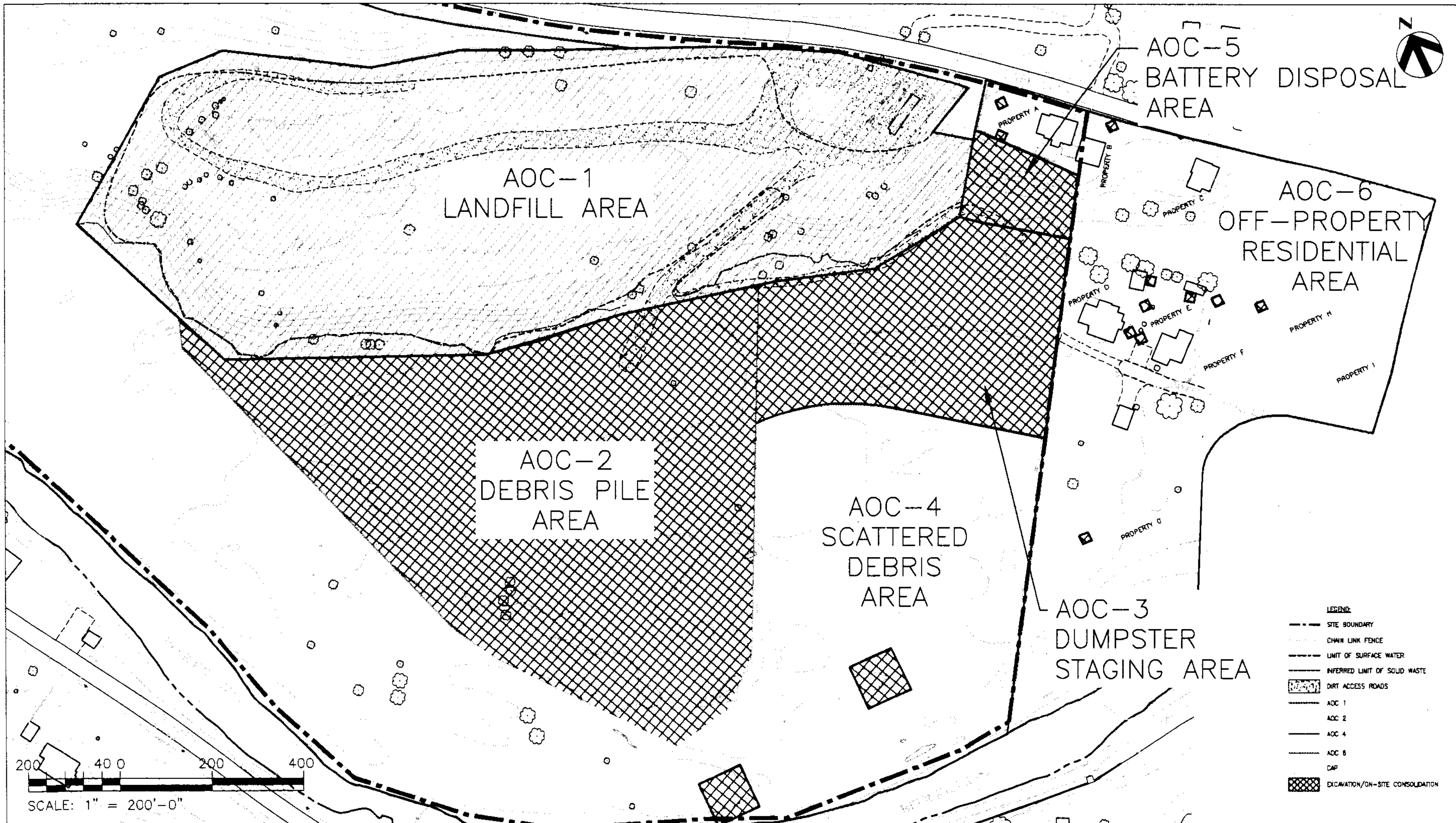
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO. 009-RICO-02LX

AREAS OF CONCERN

0 30 60 120
0 1" 2"

FILENAME	-
SCALE	1"=60'

FIGURE 7



SURVEY NOTES:

SOURCE: SURVEYED BY BANC 3 INC., P.C. ON MARCH 25, 2008 UNDER TETRA TECH, INC. RAC FOR EPA.

HORIZONTAL DATUM: NEW YORK STATE PLANE (EAST)-NORTH AMERICAN DATUM (NAD83:FEET)

NOTES:

1. HISTORIC FEATURES SHOWN ARE BASED ON MAP BY WESTON TITLED "FIGURE 3 SAMPLE LOCATION MAP" AND ON MAP BY TETRA TECH EC, INC. TITLED "SITE PLAN".

HDR

ELLENVILLE SCRAP IRON AND METAL SITE VILLAGE OF ELLENVILLE, TOWN OF WAWARSING ULSTER COUNTY, NEW YORK	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY CONTRACT NO. EP-W-09-009 WORK ASSIGNMENT NO. 008-RICO-02LX	ALTERNATIVE 2C - CAPPING/ON-SITE CONSOLIDATION	DATE 07-12-2010 FIGURE 8

ELLENVILLE SCRAP IRON AND METAL SUPERFUND SITE
RECORD OF DECISION

APPENDIX II

TABLES

TABLE A - 1

Ellenville Scrap Iron and Metal Site
Soils Sampling Results Summary
SVOCs

Analyte*	NYSDEC Unrestricted Use SCOs [mg/kg]	NYSDEC Restricted Use Residential SCOs [mg/kg]	Range of Concentration [mg/kg]
2-Methylnaphthalene	-	-	0.066 J – 2.4
4-Methylphenol	0.33	0.33	0.068 J
Acenaphthene	20	100	0.012 J – 9.6
Acenaphthylene	100	100	0.059 J – 3.9
Acetophenone	-	-	0.023 J – 6.3
Anthracene	100	100	0.011 J – 19
Benzaldehyde	-	-	0.019 J – 1.3
Benzo(a)anthracene	1	1	0.023 J – **42**
Benzo(a)pyrene	1	1	0.045 J – **38**
Benzo(b)fluoranthene	1	1	0.063 J – **54**
Benzo(g,h,i)perylene	100	100	0.065 J – 8.2
Benzo(k)fluoranthene	0.8	1	0.026 J – **20**
Biphenyl	-	-	0.026 J – 0.92
Bis(2-ethylhexyl)phthalate	-	-	0.044 J – 30
Butylbenzylphthalate	-	-	0.014 J – 200
Caprolactam	-	-	0.077 – 7.1
Carbazole	-	-	0.0071 J – 9.3
Chrysene	1	1	0.017 J – **40**
Dibenzo(a,h)anthracene	0.33	0.33	0.053 J – **3.3**
Dibenzofuran	7	14	0.079 J – 6.6
Dimethylphthalate	-	-	0.047 – 1.3
Di-n-butylphthalate	-	-	0.011 J – 1.4
Di-n-octylphthalate	-	-	0.22 – 2.5
Fluoranthene	100	100	0.036 J – 83
Fluorene	30	100	0.0073 J – 9.1
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.099 J – **14**
Naphthalene	12	100	0.067 J – 11
Phenanthrene	100	100	0.015 J – 73
Phenol	0.33	100	0.023 J – 0.037 J
Pyrene	100	100	0.037 J – 84

Notes: **The table includes only compounds reported above detection limits**

Bold - Exceeds 6 NYCRR Part 375 Restricted Use Soil Cleanup Objectives (SCOs) - Residential

J - Estimated value

NA – Not applicable

TABLE A -2

Ellenville Scrap Iron and Metal Site

Soils Sampling Results Summary

Pesticides and PCBs

Analyte*	**NYSDEC Unrestricted Use SCOs [mg/kg]**	**NYSDEC Restricted Use Residential SCOs [mg/kg]**	**Range of Concentration [mg/kg]**
4,4'-DDD	0.0033	2.6	0.0018 J – 0.055 J
4,4'-DDE	0.0033	1.8	0.00042 J – 0.028 JN
4,4'-DDT	0.0033	1.7	0.0009 J – 0.97 J
Aldrin	0.005	0.019	0.0056
alpha-Chlordane	0.094	0.91	0.00061 – 0.045 J
beta-BHC	0.036	0.072	0.00077 J
delta-BHC	0.04	100	0.00041 J – 0.058 J
Dieldrin	0.005	0.039	0.0067 JN – 0.068 J
Endosulfan I	2.4**	4.8	0.0083 J – 0.015
Endosulfan II	2.4**	4.8	0.0023 J – 0.67 J
Endosulfan sulfate	2.4**	4.8	0.0049 J – 0.029 J
Endrin	0.014	2.2	0.00062 J – 0.11 J
Endrin aldehyde	-		0.0034 J – 0.096 J
Endrin ketone	-		0.00031 J – 0.068
(Lindane)	0.1	0.28	0.003 J – 0.022 J
gamma-Chlordane	-		0.0011 J – 0.32
Heptachlor	0.042	0.42	0.00016 J – 0.028
Heptachlor epoxide	-		0.0099 J – 0.027 J
Aroclor-1016	SCO for Total PCBs	SCO for Total PCBs	0.88 J
Aroclor-1242	SCO for Total PCBs	SCO for Total PCBs	0.031 J – 5.4
Aroclor-1248	SCO for Total PCBs	SCO for Total PCBs	0.048 JN – 0.66
Aroclor-1254	SCO for Total PCBs	SCO for Total PCBs	0.75 – **4.8**
Aroclor-1260	SCO for Total PCBs	SCO for Total PCBs	0.017 J – **43** J
Total PCBs (Summed)	0.1	1	0.017 J – **43** J

Notes: **The table includes only compounds reported above detection limits**

** For the sum of endosulfan I, endosulfan II and endosulfan sulfate

Bold - Exceeds NYSDEC Restricted Use Soil Cleanup Objectives (SCOs) - Residential

J or JN - Estimated value or presumptive estimated concentration

NA – Not applicable

TABLE A-3

Ellenville Scrap Iron and Metal Site
Soils Sampling Results Summary
Metals

Analyte*	NYSDEC Unrestricted Use SCOs [mg/kg]	NYSDEC Restricted Use Residential SCOs [mg/kg]	Range of Concentration [mg/kg]
Aluminum	-		3,410 J – 43,900
Antimony	-		0.3 J – 50.4
Arsenic	13	16	2.3 – **19.7**
Barium	350	350	27.2 J – **1,790**
Beryllium	7.2	14	0.17 J – 1.2
Cadmium	2.5	2.5	0.14 J – **18.6** J
Calcium	-		609 – 78,000
Chromium	30**	36**	7 – **1,850**
Cobalt	-		2.6 J – 20.6
Copper	50	270	10.1 – **3,220**
Cyanide	27	27	0.24 J – 5.5 J
Iron	-		7,130 – 109,000
Lead	63	400	13.4 – **3,280**
Magnesium	-		991 – 11,300
Manganese	1,600	2,000	116 J – 1,640
Mercury	0.18	0.81	0.059 J – **2.6** J
Nickel	30	140	7.1 – **369**
Potassium	-		137 J – 1,260
Selenium	3.9	36	0.3 J – 3.4 J
Silver	2	36	0.11 J – 8.9
Sodium	-		151 J – 441 J
Thallium	-		0.6 J – 2.2 J
Vanadium	-		5.7 J – 841
Zinc	109	2,200	45 – **6,740**

Notes: **The table includes only compounds reported above detection limits**

** For trivalent chromium

Bold - Exceeds NYSDEC Restricted Use Soil Cleanup Objectives (SCOs) - Residential.

J - Estimated value

NA – Not applicable

TABLE B

COST ESTIMATE SUMMARY FOR ALTERNATIVE 2C - CAPPING/ON-SITE CONSOLIDATION

Site:	Ellenville Scrap Iron and Metal Site	**Description:**	Alternative 2C consists of installing an impermeable cap on AOC 1. Soil in AOCs 1 through 6 with concentrations greater then the residential SCOs will be excavated and relocated to AOC 1 prior to capping (on-site consolidation).
Location:	Ulster County, New York		
Phase:	Feasibility Study (-30% - +50%)		
Base Year:	2010		
Date:	July 12, 2010		

Item No.	Description	Year	Quantity		Total
CAPITAL COSTS:					
1	**Mobilization and Demobilization**			**$**	**103,700**
2	**Site Preparation**			**$**	**122,750**
3	**Earthwork, Off-Site Disposal**			**$**	**-**
4	**Earthwork, On-Site Consolidation**			**$**	**1,131,900**
5	**Cap Construction**			**$**	**1,297,988**
6	**Sampling and Analysis**			**$**	**176,100**
7	**Site Restoration**			**$**	**170,000**
8	**H&S, Community Air Monitoring**			**$**	**129,000**
	Sub-Total			**$**	**3,131,438**
	Contingency		25%	$	783,000
	Sub-Total			**$**	**3,914,438**
	Project Management		5%	$	196,000
	Remedial Design		8%	$	313,000
	Construction Management		6%	$	235,000
	Institutional Controls			$	37,500
	TOTAL CAPITAL COST			**$**	**4,695,938**
ANNUAL O&M COST:					
Item No.	**Description**		**Quantity**		**Total**
1	**Annual Inspection and Sampling**			**$**	**22,000**
2	**Maintenance**			**$**	**19,200**
	Sub-Total			**$**	**41,200**
	Contingency		25%	$	10,000
	Sub-Total			**$**	**51,200**
	Project Management		5%	$	3,000
	Technical Support		8%	$	4,000
	Institutional Controls			$	7,500
	TOTAL ANNUAL O&M COST			**$**	**65,700**
PERIODIC COSTS:					
Item No.	**Description**	**Year**	**Quantity**		**Total**
1	**Five Year Review**			**$**	**25,000**
2	**Long Term Maintenance**	**5**		**$**	**26,000**
3	**Long Term Maintenance**	**10**		**$**	**43,500**
PRESENT VALUE ANALYSIS:	Rate of Return: 7%		Interest Rate: 3%		
Item No.	**Cost Type**	**Year**	**Total Cost**		**Present Value**
1	**Capital Cost**	0		**$**	**4,695,938**
2	**Annual O&M Cost**	1-30	65,700	**$**	**815,274**
3	**Periodic Costs**			**$**	**199,294**
	TOTAL PRESENT VALUE OF ALTERNATIVE			**$**	**5,711,000**

TABLE 1
Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: AOC 1 Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
AOC 1 Surface soil	Antimony	2.5	77	mg/kg	19/25	32.7	mg/kg	97.5% KM (Cheb)
	Chromium VI	12.5	12,100	mg/kg	24/24	5,740	mg/kg	99% Cheb (mean, std)
	Iron	17,000	224,000	mg/kg	23/23	68,400	mg/kg	95% H-UCL
	Benzo[a]anthracene	0.062	30	mg/kg	21/23	24	mg/kg	99% KM (Cheb)
	Benzo[a]pyrene	0.084	34	mg/kg	20/23	25.9	mg/kg	99% KM (Cheb)
	Benzo[b]fluoranthene	0.088	40	mg/kg	20/23	18.5	mg/kg	95% KM (Cheb)
	Benzo[k]fluoanthene	0.069	28	mg/kg	20/23	17.1	mg/kg	99% KM (Cheb)
	Chrysene	0.085	31	mg/kg	22/23	24.5	mg/kg	99% KM (Cheb)
	Dibenzo[a,h]anthracene	0.053	7.4	mg/kg	14/18	5.86	mg/kg	99% KM (Cheb)
	Indeno[1,2,3-cd]pyrene	0.088	20	mg/kg	19/22	13.3	mg/kg	99% KM (Cheb)
	Aroclor 1254	0.051	4.8	mg/kg	9/24	0.932	mg/kg	95% KM (t) UCL
	Aroclor 1260	0.051	7.6	mg/kg	20/25	2.39	mg/kg	95% KM (Cheb)
	Arsenic	3	26.3	mg/kg	25/25	12.4	mg/kg	95% KM (t)

Scenario Timeframe: Current/Future
Medium: Surface and Subsurface Soil
Exposure Medium: AOC 1 Surface and Subsurface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
AOC 1 Surface and Subsurface soil	Arsenic	2.2	37.4	mg/kg	37/38	8.9	mg/kg	95% App. Gamma
	Antimony	2.5	76.7	mg/kg	24/38	2.8	mg/kg	95% KM (BCA)
	Chromium VI	10.6	12,100	mg/kg	37/37	162	mg/kg	95% Cheb (mean, std)
	Copper	6.2	7460	mg/kg	37/37	303	mg/kg	95% Cheb (mean, std)
	Iron	17,100	224,000	mg/kg	28/28	28,800	mg/kg	95% App. Gamma
	Manganese	278	3,260	mg/kg	38/38	773	mg/kg	95% App. Gamma
	Benzo[a]anthracene	0.056	50	mg/kg	29/36	17.4	mg/kg	95% KM (Cheb)
	Benzo[a]pyrene	0.028	43	mg/kg	29/36	28.6	mg/kg	99% KM (Cheb)
	Benzo[b]fluoranthene	0.062	41	mg/kg	28/36	18.3	mg/kg	95% KM (Cheb)
	Benzo[k]fluoanthene	0.057	38	mg/kg	28/36	22.9	mg/kg	99% KM (Cheb)
	Dibenzo[a,h]anthracene	0.053	7.4	mg/kg	19/31	1.8	mg/kg	95% KM (BCA)
	Indeno[1,2,3-cd]pyrene	0.028	28	mg/kg	27/35	16.1	mg/kg	99% KM (BCA)
	Aroclor 1254	0.051	5.7	mg/kg	15/36	0.939	mg/kg	95% KM (t)
	Aroclor 1260	0.032	30	mg/kg	25/37	9.77	mg/kg	99% KM (Cheb)

TABLE 1 (cont'd)

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
AOC 2 Surface soil	Aroclor-1254	0.14	2.3	mg/kg	4/33	1.27	mg/kg	95% KM (t)
	Arsenic	3.6	14.1	mg/kg	33/33	8.9	mg/kg	95% App. Gamma
	Chromium VI	12.6	622	mg/kg	32/33	162	mg/kg	95% Cheb (mean, std)
	Cobalt	6.9	16	mg/kg	33/33	9.68	mg/kg	95% App. Gamma
	Iron	4,500	61,500	mg/kg	33/33	28,800	mg/kg	95% App. Gamma
	Manganese	324	1,490	mg/kg	33/33	773	mg/kg	95% App. Gamma
	Benzo[a]anthracene	0.092	42	mg/kg	30/33	17.4	mg/kg	95% KM (Cheb)
	Benzo[a]pyrene	0.1	38	mg/kg	30/33	15.3	mg/kg	95% KM (Cheb)
	Benzo[b]fluoranthene	0.082	54	mg/kg	32/33	24.9	mg/kg	95% KM (Cheb)
	Benzo[k]fluoanthene	0.072	20	mg/kg	30/33	10.3	mg/kg	95% KM (Cheb)
	Dibenzo[a,h]anthracene	0.084	4.1	mg/kg	21/31	1.16	mg/kg	95% KM (Per. Boot)
	Indeno[1,2,3-cd]pyrene	0.083	14	mg/kg	28/32	6.66	mg/kg	95% KM (Cheb)
	Aroclor 1260	0.05	13	mg/kg	16/33	1.35	mg/kg	95% KM (t)
Exposure Point	**Chemical of Concern**	**Concentration Detected**		**Concentration Units**	**Frequency of Detection**	**Exposure Point Concentration (EPC)**	**EPC Units**	**Statistical Measure**
		Min	**Max**					
AOC 3 Surface soil	Aroclor-1254	0.65	0.65	mg/kg	1/6	0.65	mg/kg	Max
	Aluminum	7,460	10,900	mg/kg	7/7	10,900	mg/kg	Max
	Antimony	2.1	105	mg/kg	5/7	105	mg/kg	Max
	Arsenic	3.6	18	mg/kg	7/7	18	mg/kg	Max
	Barium	103	5,130	mg/kg	7/7	5,130	mg/kg	Max
	Cadmium	0.5	14.9	mg/kg	7/7	14.9	mg/kg	Max
	Cobalt	8.1	15.7	mg/kg	7/7	15.7	mg/kg	Max
	Copper	20.4	10,400	mg/kg	7/7	10,400	mg/kg	Max
	Iron	22,100	43,800	mg/kg	6/7	43,800	mg/kg	Max
	Manganese	543	2.010	mg/kg	7/7	2.010	mg/kg	Max
	Vanadium	11	204	mg/kg	7/7	204	mg/kg	Max
	Zinc	54.6	16,000	mg/kg	7/7	16,000	mg/kg	Max
	Benzo[a]anthracene	0.31	5.4	mg/kg	4/7	5.4	mg/kg	Max
	Benzo[a]pyrene	0.25	3.3	mg/kg	5/7	3.3	mg/kg	Max
	Benzo[b]fluoranthene	0.32	10	mg/kg	5/7	10	mg/kg	Max
	Benzo[k]fluoanthene	0.16	2.3	mg/kg	5/7	2.3	mg/kg	Max
	Dibenzo[a,h]anthracene	0.12	0.46	mg/kg	3/7	0.46	mg/kg	Max
	Indeno[1,2,3-cd]pyrene	0.22	1.5	mg/kg	5/7	1.5	mg/kg	Max
	Aroclor 1260	0.15	43	mg/kg	5/6	43	mg/kg	Max
	Chromium IV	12.9	56.2	mg/kg	7/7	56.2	mg/kg	Max

TABLE 1 (cont'd)

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
AOC 4 Surface soil	Antimony	0.3	115	mg/kg	8/19	28.2	mg/kg	95% KM (t)
	Arsenic	3.5	10.9	mg/kg	19/19	6.73	mg/kg	95% Student's t
	Cobalt	2.9	8.6	mg/kg	19/19	7.7	mg/kg	95% Student's t
	Copper	8.7	853	mg/kg	15/15	639	mg/kg	95% Cheb (mean, std)
	Iron	8,390	40,700	mg/kg	19/19	20;300	mg/kg	95% App. Gamma
	Manganese	166	1,640	mg/kg	19/19	975	mg/kg	95% Student's t
	Benzo[a]anthracene	0.023	1.3	mg/kg	6/19	0.266	mg/kg	95% KM (t)
	Benzo[a]pyrene	0.045	1.7	mg/kg	4/18	0.368	mg/kg	95% KM (t)
	Benzo[b]fluoranthene	0.063	2	mg/kg	7/19	2	mg/kg	Max
	Benzo[k]fluoanthene	0.026	1.1	mg/kg	4/18	na	mg/kg	Max
	Dibenzo[a,h]anthracene	1.4	1.4	mg/kg	1/18	1.4	mg/kg	na
	Indeno[1,2,3-cd]pyrene	0.1	0.88	mg/kg	2/18	0.88	mg/kg	Max
	Chromium VI	6.8	18.4	mg/kg	17/17	12	mg/kg	95% Student t
Exposure Point	**Chemical of Concern**	**Concentration Detected**		**Concentration Units**	**Frequency of Detection**	**Exposure Point Concentration (EPC)**	**EPC Units**	**Statistical Measure**
		Min	**Max**					
AOC 5 Surface soil	Antimony	0.94	50.4	mg/kg	2/5	28.4	mg/kg	97.5% KM (Cheb)
	Arsenic	3	12.9	mg/kg	5/5	13.3	mg/kg	95% KM (BCA)
	Cobalt	4.9	13.7	mg/kg	3/5	13.6	mg/kg	95% Modified t
	Iron	8,900	38,200	mg/kg	5/5	82,500	mg/kg	95% Cheb (mean, std)
	Manganese	239	620	mg/kg	5/5	887	mg/kg	95% App. Gamma
	Benzo[a]anthracene	0.064	0.5	mg/kg	2/4	0.5	mg/kg	Max
	Benzo[a]pyrene	0.066	0.5	mg/kg	2/4	0.5	mg/kg	Max
	Benzo[b]fluoranthene	0.091	0.7	mg/kg	3/5	0.7	mg/kg	Max
	Dibenzo[a,h]anthracene	na	Na	mg/kg	na	na	mg/kg	na
	Indeno[1,2,3-cd]pyrene	0.16	0.16	mg/kg	¼	0.16	mg/kg	Max
	Chromium VI	3.6	18.1	mg/kg	5/5	18.1	mg/kg	Max
Exposure Point	**Chemical of Concern**	**Concentration Detected**		**Concentration Units**	**Frequency of Detection**	**Exposure Point Concentration (EPC)**	**EPC Units**	**Statistical Measure**
		Min	**Max**					
AOC 6 Surface soil	Lead	10.9	230000	mg/kg	na	na	mg/kg	Average/property
	Antimony	0.28	2210	mg/kg	22/45	549	mg/kg	99% KM (Cheb)

TABLE 1 (cont'd)

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Leachate	Benzo[a]anthracene	0.46	4	µg/l	2/7	4	µg/l	Max
	Benzo[a]pyrene	0.52	4	µg/l	2/7	4	µg/l	Max
	Benzo[b]fluoranthene	0.65	0.65	µg/l	1/7	0.65	µg/l	Max
	Benzo[k]fluoanthene	0.21	6	µg/l	2/7	6	µg/l	Max
	Chrysene	0.37	5	µg/l	2/7	5	µg/l	Max
	Dibenzo[a,h]anthracene	1	1	µg/l	1/7	1	µg/l	Max
	Indeno[1,2,3-cd]pyrene	3	3	µg/l	1/7	3	µg/l	Max
	Aroclor 1260	0.54	0.54	µg/l	1/7	0.54	µg/l	Max
	Chromium VI	3.6	110	µg/l	3/8	110	µg/l	Max
Exposure Point	**Chemical of Concern**	**Concentration Detected**		**Concentration Units**	**Frequency of Detection**	**Exposure Point Concentration (EPC)**	**EPC Units**	**Statistical Measure**
		Min	**Max**					
Groundwater	Aluminum	130	5,940	mg/kg	8/11	4,160	mg/kg	95% KM (Cheb)
	Arsenic	0.99	95.5	mg/kg	7/16	21.7	mg/kg	95% KM (t)
	Chromium VI	0.79	280	mg/kg	9/16	59.3	mg/kg	95% KM (BCA)
	Cobalt	0.48	11.4	mg/kg	3/16	11.4	mg/kg	Max
	Manganese	9.2	10,000	mg/kg	16/16	2,760	mg/kg	95% App. Gamma

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in each AOC, leachate and groundwater (i.e., the concentration that will be used to estimate the exposure and risk from each COC). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived.

TABLE 2

SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Soil	Surface soil	On-site soil (0-2 ft.)	Trespasser	Adult/Child	Ingestion/Dermal/Inhalation	Quant	Trespassers are possible, but not likely due to fencing.
	Leachate	Leachate	Leachate area	Trespasser	Adult/Child	Ingestion/Dermal/Inhalation	Quant	Trespassers are possible, but not likely due to fencing.
	Soil	Surface soil	Off-site Residential Parcels	Resident	Adult/Child	Ingestion/Dermal/Inhalation	Quant	Potentially complete exposure pathway
	Sediment	Sediment in Beer Kill	Beer Kill sediment	Recreational User	Adult/Child	Ingestion/Dermal	Quant	Recreational activities are possible based on site information and reconnaissance.
	Surface water	Surface water in Beer Kill	Beer Kill surface water	Recreational User	Adult/Child	Ingestion/Dermal	Quant	Recreational activities are possible based on site information and reconnaissance.
	Soil Gas	Indoor air	Off-site Residential Parcels	Residents	Adult/Child	Inhalation	Qual	Residences located with 100 ft. of soil gas concentrations above screening values.

TABLE 2 (cont'd)

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Soil	Surface soil	On-site soil (0-2 ft.)	Resident	Adult/Child	Ingestion/Dermal/Inhalation	Quant	Residential land use possible in the future.
				Commercial /Industrial Worker	Adult	Ingestion/Dermal/Inhalation	Quant	Commercial/Industrial use possible in the future.
				Recreation User	Adult/Child	Ingestion/Dermal/Inhalation	Quant	Recreational activities are possible based on site information and reconnaissance.
		Subsurface soil	Subsurface soil (0-10 ft.)	Construction/Utility Worker	Adult	Ingestion/Dermal/Inhalation	Quant	Construction/Utility use possible in the future.
	Leachate	Leachate	Leachate area	Resident	Adult/Child	Ingestion/Dermal/Inhalation	Quant/Qual	Residential land use possible in the future.
				Recreational User	Adult/Child	Ingestion/Dermal	Quant	Recreational activities are possible based on site information and reconnaissance.
				Commercial/Industrial Worker	Adult	Ingestion/Dermal/Inhalation	Quant/Qual	Construction/Utility use possible in the future.
	Groundwater	Groundwater	Groundwater	Resident	Adult/Child	Ingestion/Dermal	Quant	Residential land use possible in the future.
				Commercial /Industrial Worker	Adult	Ingestion/Dermal	Quant	Commercial/Industrial use possible in the future.
			Shallow groundwater	Construction/Utility Worker	Adult	Dermal/Inhalation	Quant/Qual	Construction/Utility use possible in the future.
	Soil Gas	Soil Gas	Indoor air	Resident	Adult/Child	Inhalation	Qual	Residential land use possible in the future.
				Commercial /Industrial Worker	Adult	Inhalation	Qual	Commercial/Industrial use possible in the future.

Quant = Quantitative risk analysis performed.

Summary of Selection of Exposure Pathways

Table 2 describes the exposure pathways associated with the groundwater that were evaluated for the risk assessment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are included. In addition, each AOC was evaluated for future residential and construction/utility workers for exposure to surface soil and subsurface soil.

TABLE 3
Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Aroclor-1254	Chronic	2.0E-05	mg/kg-day	96%	2.0E-05	mg/kg-day	Eyes, nails, immune system	300	IRIS	3/31/2010
Aluminum	Chronic	1.0E+00	mg/kg-day	-----	1.0E+00	mg/kg-day	CNS	100	PPRTV	10/23/2006
Antimony	Chronic/subchronic	4.0E-04	mg/kg-day	15%	6.0E-05	mg/kg-day	Blood glucose	1000	IRIS (HEAST)	3/31/2010
Arsenic	Chronic/subchronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Skin	3	IRIS (HEAST)	3/31/2010
Barium	Chronic	2.0E-01	mg/kg-day	7%	1.4E-02	mg/kg-day	Kidney	300	IRIS	3/31/2010
Cadmium	Chronic	5.0E-04	mg/kg-day	5%	2.5E-05	mg/kg-day	Kidney	10	IRIS (ATSDR)	3/31/2010
Chromium VI	Chronic	3.0E-03	mg/kg-day	2.5%	7.5E-05	mg/kg-day	-----	900	IRIS	3/31/2010
Cobalt	Chronic	3.0E-04	mg/kg-day	-----	3.0E-04	mg/kg-day	Iodine uptake	3000	PPRTV	8/25/2008
Copper	Chronic/subchronic	4.0E-02	mg/kg-day	-----	4.0E-02	mg/kg-day	GI	-----	HEAST	7/31/1997
Iron	Chronic	7.0E-01	mg/kg-day	-----	7.0E-01	mg/kg-day	GI	1.5	PPRTV	9/12/2008
Manganese	Chronic	2.4E-02	mg/kg-day	4%	9.6E-04	mg/kg-day	CNS	1	IRIS	3/31/2010
Vanadium	Chronic	5.0E-03	mg/kg-day	2.6%	1.3E-04	mg/kg-day	Hair	100	IRIS	3/31/2010
Zinc	Chronic	3.0E-01	mg/kg-day	-----	3.0E-01	mg/kg-day	ESOD	3	IRIS	3/31/2010

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates:
Aroclor-1254	-----	-----	-----	-----	-----	-----	-----	-----	-----
Aluminum	Chronic	5.0E-03	mg/m^3	-----	-----	Cognitive impairment	300	PPRTV	9/12/2008
Antimony	-----	-----	-----	-----	-----	-----	-----	-----	-----
Arsenic	Chronic	1.5E-05	mg/m^3	-----	-----	CNS	30	Cal EPA (RSL)	12/01/2008
Barium	Chronic	5.0E-04	mg/m^3	-----	-----	Developmental	1000	HEAST	7/31/1997
Cadmium	Chronic	1.0E-05	mg/m^3	-----	-----	Kidney	9	ATSDR	07/01/2008
Chromium VI	Chronic	1.0E-04	mg/m^3	-----	-----	Lung	300	IRIS	3/31/2010
Cobalt	Chronic	6.0E-06	mg/m^3	-----	-----	Respiratory	300	PPRTV	8/25/2008
Copper	-----	-----	-----	-----	-----	-----	-----	-----	-----
Iron	-----	-----	-----	-----	-----	-----	-----	-----	-----
Manganese	Chronic	5.0E-05	mg/m^3	-----	-----	CNS	1000	IRIS	3/31/2010
Vanadium	-----	-----	-----	-----	-----	-----	-----	-----	-----
Zinc	-----	-----	-----	-----	-----	-----	-----	-----	-----

Key : na: No information available
IRIS: Integrated Risk Information System, U.S. EPA
NCEA: National Center for Environmental Assessment
HEAST: Health Effects Assessment Summary Tables
EPA: Environmental Protection Agency
CNS: Central Nervous System
GI: Gastrointestinal tract
ESOD: Erythrocyte Cu, AN-superoxide dismutase

Summary of Toxicity Assessment : Table 3 provides non-carcinogenic risk information which is relevant to the contaminants of concern at each AOC, leachate, and groundwater. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi).

TABLE 4
Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Benzo[a]antracene	7.3E-01	$(mg/kg/day)^{-1}$	7.3E-01	$(mg/kg/day)^{-1}$	B2	ECAO	03/01/94
Benzo[a]pyrene	7.3E+00	$(mg/kg/day)^{-1}$	7.3E+00	$(mg/kg/day)^{-1}$	B2	IRIS	03/31/10
Benzo[b]fluoranthene	7.3E-01	$(mg/kg/day)^{-1}$	7.3E-01	$(mg/kg/day)^{-1}$	B2	ECAO	03/01/94
Benzo[k]fluoranthene	7.3E-02	$(mg/kg/day)^{-1}$	7.3E-02	$(mg/kg/day)^{-1}$	B2	ECAO	03/01/94
Chrysene	7.3E-03	$(mg/kg/day)^{-1}$	7.3E-03	$(mg/kg/day)^{-1}$	B2	ECAO	03/01/94
Dibenzo[a,h]anthracene	7.3E+00	$(mg/kg/day)^{-1}$	7.3E+00	$(mg/kg/day)^{-1}$	B2	EACO	03/01/94
Indeno[1,2,3-cd]pyrene	7.3E-01	$(mg/kg/day)^{-1}$	7.3E-01	$(mg/kg/day)^{-1}$	B2	EACO	03/01/94
Aroclor-1254	2.0E+00	$(mg/kg/day)^{-1}$	2.0E+00	$(mg/kg/day)^{-1}$	B2	IRIS	03/31/10
Aroclor-1260	2.0E+00	$(mg/kg/day)^{-1}$	2.0E+00	$(mg/kg/day)^{-1}$	B2	IRIS	03/31/10
Dieldrin	1.6E+01	$(mg/kg/day)^{-1}$	1.6E+01	$(mg/kg/day)^{-1}$	B2	IRIS	03/31/10
Arsenic	1.5E+00	$(mg/kg/day)^{-1}$	1.5E+00	$(mg/kg/day)^{-1}$	A	IRIS	03/31/10
Chromium VI	5.0E-01	$(mg/kg/day)^{-1}$	5.0E-01	$(mg/kg/day)^{-1}$	D	NJDEP	03/31/10

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Benzo[a]antracene	-----	-----	-----	-----	-----	-----	-----
Benzo[a]pyrene	-----	-----	-----	-----	-----	-----	-----
Benzo[b]fluoranthene	-----	-----	-----	-----	-----	-----	-----
Benzo[k]fluoranthene	-----	-----	-----	-----	-----	-----	-----
Chrysene	1.1E-05	$(\mu g/m3)^{-1}$	-----	-----	-----	CalEPA	-----
Dibenzo[a,h]anthracene	-----	-----	-----	-----	-----	-----	-----
Indeno[1,2,3-cd]pyrene	1.1E-04	$(\mu g/m3)^{-1}$	-----	-----	-----	CalEPA	-----
Aroclor-1254	5.7E-04	$(\mu g/m3)^{-1}$	-----	-----	B2	IRIS	03/31/10
Aroclor-1260	5.7E-04	$(\mu g/m3)^{-1}$	-----	-----	B2	IRIS	03/31/10
Dieldrin	4.6E-03	$(\mu g/m3)^{-1}$	-----	-----	B2	IRIS	03/31/10
Arsenic	4.3E-03	$(\mu g/m3)^{-1}$	-----	-----	A	IRIS	03/31/10
Chromium VI	8.4E-02	$(\mu g/m3)^{-1}$	-----	-----	A	IRIS	03/31.10

Key:
A - Human carcinogen
EPA – U.S. Environmental Protection Agency
IRIS: Integrated Risk Information System, U.S. EPA
ECAO: Environmental Criteria and Assessment Office
na: No information available

EPA Weight of Evidence:
B1 - Probable Human Carcinogen-Indicates that limited human data are available
B2 - Probable Human Carcinogen-Indicates sufficient evidence is associated with the site and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E- Evidence of noncarcinogenicity
2A - Probable human carcinogen
2B - Possible human carcinogen

Summary of Toxicity Assessment : This table provides carcinogenic risk information which is relevant to the contaminants of concern in groundwater. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 5

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: On-site Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 1 Surface Soil	AOC 1 Surface soil	AOC 1 Surface Soil	Chromium VI	-----	3	<1	<1	4
							Hazard Index Total	4

Scenario Timeframe: Future
Receptor Population: On-site Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC1 Surface soil	AOC 1 Surface soil	AOC 1 Surface soil	Antimony	Blood glucose	1.1	<1	<1	1.1
			Chromium VI	-----	25	<1	<1	25
			Iron	GI	1.3	<1	<1	1.3
							Hazard Index Total	31

Scenario Timeframe: Future
Receptor Population: On-site Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 1 Surface and subsurface soil	AOC 1 Surface and subsurface soil	AOC 1 Surface and subsurface soil	Arsenic	Skin	0.14	<1	-----	0.14
			Chromium VI	-----	0.62	-----	2.2	2.8
			Copper	GI	0.11	-----	-----	0.11
			Iron	GI	0.40	-----	-----	0.4
			Manganese	CNS	0.12	-----	3	3.1
							Hazard Index Total	7

TABLE 5 (cont'd)

Scenario Timeframe: Future
Receptor Population: On-site Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 2 Surface soil	AOC 2 Surface soil	AOC 2 Surface soil	Aroclor-1254	Immune system	0.8	<1	-----	0.8
			Arsenic	Skin	0.4	<1	<1	0.4
			Chromium VI	-----	0.7	-----	<1	0.7
			Cobalt	Iodine uptake	0.4	-----	<1	0.4
			Iron	GI	0.5	-----	-----	0.5
			Manganese	CNS	0.4	-----	<1	0.4
							Hazard Index Total	4

Scenario Timeframe: Future
Receptor Population: On-site Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 3 Surface soil	AOC 3 Surface soil	AOC 3 Surface soil	Antimony	Blood glucose	0.4	-----	-----	0.4
			Copper	GI	0.4	-----	-----	0.4
			Manganese	CNS	0.1	-----	<1	0.1
							Hazard Index Total	2

TABLE 5 (cont'd)

Scenario Timeframe: Future
Receptor Population: On-site Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 3 Surface soil	AOC 3 Surface soil	AOC 3 Surface soil	Aroclor-1254	Immune system	0.5	0.2	-----	0.7
			Aluminum	CNS	0.1	-----	<1	0.1
			Antimony	Blood glucose	3.4	-----	-----	3.4
			Arsenic	Skin	0.8	0.07	<1	0.8
			Barium	Kidney	0.3	-----	<1	0.3
			Cadmium	Kidney	0.4	0.02	-----	0.4
			Cobalt	Iodine uptake	0.7	-----	<1	0.7
			Copper	GI	3.3	-----	-----	3.3
			Iron	GI	0.8	-----	-----	0.8
			Manganese	CNS	1.1	-----	<1	1.1
			Vanadium	Hair	0.5	-----	-----	0.5
			Zinc	ESOD activity	0.7	-----	-----	0.7
							Hazard Index Total	13

Scenario Timeframe: Future
Receptor Population: On-site Resident
Receptor Age: Construction/Utility Worker

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 3 Surface soil	AOC 3 Surface soil	AOC 3 Surface soil	Antimony	Blood glucose	0.8	-----	-----	0.8
			Arsenic	Skin	0.2	<1	<1	0.2
			Copper	GI	0.8	-----	-----	0.8
							Hazard Index Total	2

TABLE 5 (cont'd)

Scenario Timeframe: Future **Receptor Population:** On-site Resident **Receptor Age:** Child								
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Primary Target Organ**	**Non-Carcinogenic Risk**			
					Ingestion	**Dermal**	**Inhalation**	**Exposure Routes Total**
AOC 4 Surface soil	AOC 4 Surface soil	AOC 4 Surface soil	Antimony	Blood glucose	0.9	-----	-----	0.9
			Arsenic	Skin	0.3	<1	<1	0.3
			Cobalt	Iodine uptake	0.3	-----	<1	0.3
			Copper	GI	0.2	-----	-----	0.2
			Iron	GI	0.4	-----	-----	0.4
			Manganese	CNS	0.5	-----	<1	0.5
							Hazard Index Total	3

Scenario Timeframe: Future **Receptor Population:** On-site Resident **Receptor Age:** Child								
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Primary Target Organ**	**Non-Carcinogenic Risk**			
					Ingestion	**Dermal**	**Inhalation**	**Exposure Routes Total**
AOC 5 Surface soil	AOC 5 Surface soil	AOC 5 Surface soil	Antimony	Blood glucose	2	-----	-----	2
			Arsenic	Skin	0.6	<1	<1	0.6
			Cobalt	Iodine uptake	0.6	-----	<1	0.6
			Iron	GI	0.7	-----	-----	0.7
			Manganese	CNS	0.3	-----	<1	0.3
							Hazard Index Total	4

Scenario Timeframe: Future **Receptor Population:** On-site Resident **Receptor Age:** Adult								
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Primary Target Organ**	**Non-Carcinogenic Risk**			
					Ingestion	**Dermal**	**Inhalation**	**Exposure Routes Total**
AOC 6 Soil	AOC 6 Surface soil	AOC 6 Surface Soil	Antimony	Blood glucose	2	-----	-----	2
							Hazard Index Total	2

TABLE 5 (cont'd)

Scenario Timeframe: Future Receptor Population: On-site Resident Receptor Age: Child								
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 6 Surface soil	AOC 6 Surface soil	AOC 6 Surface soil	Antimony	Blood glucose	19	-----	-----	19
							Hazard Index Total	19

Scenario Timeframe: Future Receptor Population: On-site Resident Receptor Age: Adult								
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Aluminum	CNS	0.1	<1	-----	0.1
			Arsenic	Skin	2	<1	-----	2
			Cobalt	Iodine uptake	1	<1	-----	1
			Manganese	CNS	3	<1	-----	3
							Hazard Index Total	8

Scenario Timeframe: Future Receptor Population: On-site Resident Receptor Age: Child								
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Aluminum	CNS	0.4	<1	-----	0.4
			Arsenic	Skin	7	<1	-----	7
			Chromium VI	-----	2	<1	-----	2
			Cobalt	Iodine uptake	4	<1	-----	4
			Manganese	CNS	11	1.2	-----	11
							Hazard Index Total	28

N/A – not available at this time due to no reference dose being available – non-cancer hazards are underestimated
GI: Gastrointestinal
CNS: Central Nervous System
ESOD: Erythrocyte Cu, AN-superoxide dismutase

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure for each AOC and groundwater. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects. Lead was also identified as a contaminant of concern at the site through comparison with a lead value generated using the EPA's IEUBK model.

TABLE 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: On-site Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 1 Surface Soil	AOC 1 Surface Soil	AOC 1 Surface Soil	Benzo[a]anthracene	1.53E-04	6.74E-5	3.32E-09	2.20E-04
			Benzo[a]pyrene	1.64E-3	7.25E-04	3.57E-04	2.37E-03
			Benzo[b]fluoranthene	1.17E-04	5.19E-05	2.55E-09	1.69E-04
			Benzo[k]fluoranthene	1.04E-05	2.36E-09	4.59E-06	1.5E-05
			Chrysene	1.55E-06	6.85E-07	3.37E-10	2.24E-06
			Dibenzo[a,h]anthracene	3.72E-04	1.64E-04	8.81E-09	5.36E-04
			Indeno[1,2,3-cd]pyrene	8.45E-05	3.73E-05	1.84E-09	5.36E-04
			Aroclor-1254	2.93E-06	1.29E-06	2.63E-10	4.22E-06
			Aroclor-1260	7.52E-06	3.31E-06	6.73E-10	1.08E-05
			Arsenic	2.93E-05	2.77E-06	2.64E-08	3.21E-05
			Chromium (VI)	2.50E-02	-----	3.19E-04	2.53E-02
						Total Risk =	2.9E-02

Scenario Timeframe: Current/Future
Receptor Population: On-site Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 1 Surface and Subsurface Soil	AOC 1 Surface and Subsurface Soil	AOC 1 Surface and Subsurface Soil	Benzo[a]anthracene	5.85E-07	2.28E-07	4.61E-09	8.17E-07
			Benzo[a]pyrene	9.64E-06	3.76E-06	7.61E-08	1.35E-05
			Benzo[b]fluoranthene	6.15E-07	2.40E-07	4.85E-09	8.60E-07
			Benzo[k]fluoranthene	7.71E-08	3.01E-08	6.09E-09	1.13E-07
			Dibenzo[a,h]anthracene	6.05E-07	2.36E-07	5.21E-09	8.46E-07
			Indeno[1,2,3-cd]pyrene	5.42E-07	2.11E-07	4.28E-09	7.57E-07
			Aroclor-1254	8.66E-08	3.64E-08	1.29E-09	1.24E-07
			Aroclor-1260	9.02E-07	3.79E-07	1.35E-08	1.29E-06
			Arsenic	9.21E-07	8.29E-06	1.38E-07	1.14E-06
			Chromium (VI)	8.79E-05	-----	7.73E-04	8.61E-04
						Total Risk =	8.8E-04

TABLE 6 (cont'd)

Scenario Timeframe: Current/Future
Receptor Population: On-site Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 2 Surface Soil	AOC 2 Surface Soil	AOC 2 Surface Soil	Benzo[a]anthracene	1.11E-04	4.88E-05	2.40E-09	1.59E-04
			Benzo[a]pyrene	9.73E-04	4.29E-04	2.11E-08	1.40E-03
			Benzo[b]fluoranthene	1.58E-04	6.97E-05	3.43E-09	2.28E-04
			Benzo[k]fluoranthene	6.51E-06	2.87E-06	1.41E-09	9.38E-06
			Dibenzo[a,h]anthracene	7.33E-05	3.23E-05	1.74E-09	1.06E-04
			Indeno[1,2,3-cd]pyrene	4.22E-05	1.86E-05	9.17E-10	6.08E-05
			Aroclor-1254	3.99E-06	1.75E-06	3.57E-10	5.74E-06
			Aroclor-1260	4.24E-06	1.86E-06	3.79E-10	6.10E-06
			Arsenic	2.10E-05	1.98E-06	1.89E-08	2.30E-05
			Chromium (VI)	7.02E-04	-----	3.18E-05	7.34E-04
						Total Risk =	2.7E-03

Scenario Timeframe: Current/Future
Receptor Population: On-site Resident
Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
AOC 3 Surface Soil	AOC 3 Surface Soil	AOC 3 Surface Soil	Benzo[a]anthracene	3.43E-05	1.51E-05	7.44E-10	4.94E-05
			Benzo[a]pyrene	2.09E-04	9.24E-05	4.55E-09	3.02E-04
			Benzo[b]fluoranthene	6.34E-05	2.80E-05	1.38E-09	9.14E-05
			Benzo[k]fluoranthene	1.46E-06	6.44E-07	3.17E-10	2.10E-06
			Dibenzo[a,h]anthracene	2.92E-05	1.29E-05	6.92E-10	4.21E-05
			Indeno[1,2,3-cd]pyrene	9.52E-06	4.20E-06	2.07E-10	1.37E-05
			Aroclor-1254	2.05E-06	9.00E-07	1.83E-10	2.95E-06
			Aroclor-1260	1.35E-04	5.95E-05	1.21E-08	1.95E-04
			Arsenic	4.25E-05	4.01E-06	3.83E-08	4.65E-05
			Chromium (VI)	2.44E-04	-----	5.91E-06	2.50E-04
						Total Risk =	9.9E-04

TABLE 6 (cont'd)

Scenario Timeframe:	Current/Future						
Receptor Population:	On-site Resident						
Receptor Age:	Adult/Child						
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Carcinogenic Risk**			
				Ingestion	**Dermal**	**Inhalation**	**Exposure Routes Total**
AOC 4 Surface Soil	AOC 4 Surface Soil	AOC 4 Surface Soil	Benzo[a]anthracene	1.69E-06	7.45E-07	3.67E-11	2.43E-06
			Benzo[a]pyrene	2.33E-05	1.03E-05	5.07E-10	3.36E-05
			Benzo[b]fluoranthene	1.27E-05	5.60E-06	2.76E-10	1.83E-05
			Dibenzo[a,h]anthracene	8.88E-05	3.92E-05	2.10E-09	1.28E-04
			Indeno[1,2,3-cd]pyrene	5.58E-06	2.46E-06	1.21E-10	8.05E-06
			Arsenic	1.59E-05	1.50E-06	1.43E-08	1.74E-05
			Chromium VI	5.20E-05	-----	1.26E-06	5.32E-05
						Total Risk =	2.6E-04

Scenario Timeframe:	Current/Future						
Receptor Population:	On-site Resident						
Receptor Age:	Adult/Child						
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Carcinogenic Risk**			
				Ingestion	**Dermal**	**Inhalation**	**Exposure Routes Total**
AOC 5 Surface Soil	AOC 5 Surface Soil	AOC 5 Surface Soil	Benzo[a]anthracene	3.24E-06	1.43E-06	7.03E-11	4.66E-06
			Benzo[a]pyrene	3.17E-05	1.40E-05	6.89E-10	4.57E-05
			Benzo[b]fluoranthene	4.44E-06	9.65E-11	1.96E-06	6.40E-06
			Indeno[1,2,3-cd]pyrene	1.01E-05	4.48E-06	2.41E-10	1.46E-05
			Aroclor 1260	1.26E-06	5.54E-07	1.13E-10	1.81E-06
			Arsenic	3.05E-05	2.87E-06	2.74E-08	3.34E-05
			Chromium VI	7.86E-05	-----	1.90E-06	8.05E-05
						Total Risk =	1.9E-04

Scenario Timeframe:	Current/Future						
Receptor Population:	On-site Construction/Utility Worker						
Receptor Age:	Adult						
Medium	**Exposure Medium**	**Exposure Point**	**Chemical of Concern**	**Carcinogenic Risk**			
				Ingestion	**Dermal**	**Inhalation**	**Exposure Routes Total**
AOC 5 Surface and Subsurface Soil	AOC 5 Surface and Subsurface Soil	AOC 5 Surface and Subsurface Soil	Benzo[a]pyrene	1.68E-04	6.57E-05	1.33E-06	2.35E-04
			Arsenic	8.93E-07	8.03E-08	1.34E-07	1.11E-06
			Chromium (VI)	4.17E-07	-----	3.67E-06	4.09E-06
						Total Risk =	2.4E-04

TABLE 6 (cont'd)

Scenario Timeframe: Current/Future Receptor Population: On-site Trespasser Receptor Age: Adult/Child							
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Leachate	Leachate	Leachate	Benzo[a]anthracene	8.35E-08	9.74E-05	-----	9.75E-05
			Benzo[a]pyrene	8.35E-07	1.67E-03	-----	1.67E-03
			Benzo[b]fluoranthene	1.36E-08	2.75E-05	-----	2.75E-05
			Benzo[k]fluoranthene	1.20E-08	2.38E-05	-----	2.38E-05
			Chrysene	1.04E-09	1.22E-06	-----	1.22E-06
			Dibenzo[a,h]anthracene	2.09E-07	6.45E-04	-----	6.54E-04
			Indeno[1,2,3-cd]pyrene	6.26E-08	1.27E-04	-----	1.27E-04
			Aroclor 1260	6.26E-09	1.43E-04	-----	1.43E-04
			Chromium (VI)	1.57E-06	7.93E-05	-----	8.09E-05
						Total Risk =	3.5E-03

Scenario Timeframe: Current/Future Receptor Population: On-site Recreator Receptor Age: Adult/Child							
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Leachate	Leachate	Leachate	Benzo[a]anthracene	8.35E-08	9.74E-05	-----	9.75E-05
			Benzo[a]pyrene	8.35E-07	1.67E-03	-----	1.67E-03
			Benzo[b]fluoranthene	1.36E-08	2.75E-05	-----	2.75E-05
			Benzo[k]fluoranthene	1.20E-08	2.38E-05	-----	2.38E-05
			Chrysene	1.04E-09	1.22E-06	-----	1.22E-06
			Dibenzo[a,h]anthracene	2.09E-07	6.45E-04	-----	6.45E-04
			Indeno[1,2,3-cd]pyrene	6.26E-08	1.27E-04	-----	1.27E-04
			Aroclor 1260	6.26E-09	1.43E-04	-----	1.43E-04
			Chromium (VI)	1.57E-06	7.93E-05	-----	8.09E-05
						Total Risk =	2.8E-03

Scenario Timeframe: Future Receptor Population: On-site Residents Receptor Age: Adult/Child							
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Arsenic	5.7E-04	2.77E-06	-----	5.77E-04
			Chromium (VI)	2.05E-03	9.61E-04	-----	3.01E-03
						Total Risk =	3.6E-03

Summary of Risk Characterization - Carcinogens

The table presents cancer risks for each AOC, leachate, and groundwater exposure for all routes of exposure combined. As stated in the National Contingency Plan, the point of departure is 10^{-6} and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}.

ELLENVILLE SCRAP IRON AND METAL SUPERFUND SITE
RECORD OF DECISION

APPENDIX III

ADMINISTRATIVE RECORD INDEX

107221

ELLENVILLE SCRAP IRON AND METAL SITE
OPERABLE UNIT ONE
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

1.0 SITE IDENTIFICATION

1.2 Notification/Site Inspection Reports

P. 100001 - 100353
DOC. ID 107213
Report: Hazard Ranking System Documentation Package, Ellenville Scrap Iron and Metal, Ellenville, Ulster County, New York, CERCLIS ID No.: NYSFN0204190, Volume 1 of 2, prepared by Region II Site Assessment Team, Roy F. Weston, Inc., prepared for United States Environmental Protection Agency, August 2001.

P. 100354 - 101394
DOC. ID 107214
Report: Hazard Ranking System Documentation Package, Ellenville Scrap Iron and Metal, Ellenville, Ulster County, New York, CERCLIS ID No.: NYSFN0204190, Volume 2 of 2, prepared by Region II Site Assessment Team, Roy F. Weston, Inc., prepared for United States Environmental Protection Agency, August 2001.

1.3 Preliminary Assessment Reports

P. 101395 - 102348
DOC. ID 107215
Report: Final Integrated Assessment Report, Ellenville Scrap Iron and Metal, Ellenville, Ulster County, New York, CERCLIS ID No.: NYSFN0204190, prepared by Roy F. Weston, Inc., prepared for United States Environmental Protection Agency, January 2001.

P. 102349 - 103640
DOC. ID 107216
Report: Final Integrated Assessment Report, Ellenville Scrap Iron and Metal, Ellenville, Ulster County, New York, CERCLIS ID No.: NYSFN0204190, Volume II of II, prepared by Roy F. Weston, Inc., prepared for United States Environmental Protection Agency, January 2001.

2.0 REMOVAL RESPONSE

2.1 Sampling and Analysis Plans

p. 200001 - 200005
DOC. ID 108555

Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP: Initial-1, prepared by Mr. Jack Harmon, OSC, U.S. EPA Region II, Removal Action Branch, prepared for W. McCabe, U.S. EPA, R. Salkie, U.S. EPA, G. Zachos, U.S. EPA, J. Rotola, U.S. EPA, C. Clifford, U.S. EPA, J. LaPadula, U.S. EPA, D. Duda, U.S. EPA, R. Byrnes, U.S. EPA, A. Raddant, U.S. DOI, R. Marino, NYSDEC, D. Crosby, NYSDEC, T. Grier, 5202G, B. Bellow, PAD, S. Messier, NYSDOH, C. Kelley, 2RST, December 3, 2004.

2.2 Sampling and Analysis Data/Chain of Custody Forms

P. 200006 - 200193
DOC. ID 107217

Letter to Mr. James D. Harkay, On-Scene Coordinator, U.S. Environmental Protection Agency, Removal Action Branch, from Ms. Sukanya Basu, RST Site Project Manager, Weston Solutions, Inc., re: Ellenville Scrap Iron and Metal Site, Ellenville, NY - Site Clean-up and Radiation Survey Report, January 5, 2006. (Attachment: Report: Site Clean-up and Radiation Survey, Ellenville Scrap Iron and Metal Site, Ellenville, Ulster County, New York, prepared by Region II Removal Support Team, Weston Solutions, Inc., prepared for U.S. Environmental Protection Agency, Region II - Removal Action Branch, January 5, 2006.)

3.0 REMEDIAL INVESTIGATION

3.3 Work Plans

P. 300001 - 300261
DOC. ID 107218

Report: Final Remedial Investigation/ Feasibility Study Work Plan, Ellenville Scrap Iron and Metal Site, Town of Wawarsing, Village of Ellenville, Ulster County, New York, prepared by Tetra Tech EC, Inc., prepared for U.S. Environmental Protection Agency, Region 2, June 2006.

P. 300262 - 300706 Report: Quality Assurance Project Plan for Remedial Investigation/Feasibility Study, Appendix A to Work Plan for Ellenville Scrap Iron and Metal Site, Town of Wawarsing, Village of Ellenville, Ulster County, New York, prepared by Tetra Tech EC, Inc., prepared for U.S. Environmental Protection Agency, Region 2, December 2006.

DOC. ID 107219

P. 300707 - 300862 Report: Health and Safety Plan, Appendix B, for Ellenville Scrap Iron and Metal Superfund Site, Town of Wawarsing, Village of Ellenville, Ulster County, New York, prepared by Tetra Tech EC, Inc., prepared for U.S. Environmental Protection Agency, Region 2, March 2007.

DOC. ID 107220

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - 400190 Report: Final Feasibility Study Report, United States Environmental Protection Agency, Ellenville Scrap Iron and Metal Site, Town of Warwarsing, Village of Ellenville, Ulster County, New York, prepared by HDR, prepared for U.S. Environmental Protection Agency, Region 2, July 2010.

DOC. ID 108556

108559

ELLENVILLE SCRAP IRON AND METAL SITE
OPERABLE UNIT ONE
ADMINISTRATIVE RECORD FILE UPDATE
INDEX OF DOCUMENTS

2.0 REMOVAL RESPONSE

2.1 Sampling and Analysis Plans

P. 200194 - 200196
Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:3, prepared by Mr. James D. Harkay, OSC, U.S. EPA Region II, Removal Action Branch, prepared for R. Salkie, U.S. EPA, J. Rotola, U.S. EPA, G. Zachos, U.S. EPA, D. Duda, U.S. EPA, A. Carpenter, U.S. EPA, C. Garvey, U.S. EPA, R. Byrnes, U.S. EPA, B. Bellow, PAD, K. Eastman, NYSDEC, J. Dolaway, Town of Wawarsing, E. Auerbach, Village of Ellenville, C. Kelley, RST, May 24, 2005.
DOC.ID 108560

P. 200197 - 200199
Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:4, prepared by Mr. James D. Harkay, OSC, U.S. EPA Region II, Removal Action Branch, prepared for R. Salkie, U.S. EPA, J. Rotola, U.S. EPA, G. Zachos, U.S. EPA, D. Duda, U.S. EPA, A. Carpenter, U.S. EPA, C. Garvey, U.S. EPA, R. Byrnes, U.S. EPA, B. Bellow, PAD, K. Eastman, NYSDEC, J. Dolaway, Town of Wawarsing, E. Auerbach, Village of Ellenville, C. Kelley, RST, June 3, 2005.
DOC.ID 108561

P. 200200 - 200202
Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:5, prepared by Mr. James D. Harkay, OSC, U.S. EPA Region II, Removal Action
DOC.ID 108562

Branch, prepared for R. Salkie, U.S. EPA, J. Rotola, U.S. EPA, G. Zachos, U.S. EPA, D. Duda, U.S. EPA, A. Carpenter, U.S. EPA, C. Garvey, U.S. EPA, R. Byrnes, U.S. EPA, B. Bellow, PAD, K. Eastman, NYSDEC, J. Dolaway, Town of Wawarsing, E. Auerbach, Village of Ellenville, C. Kelley, RST, June 13, 2005.

P. 200203 - 200205
DOC.ID 108563
Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:6, prepared by Mr. James D. Harkay, OSC, U.S. EPA Region II, Removal Action Branch, prepared for R. Salkie, U.S. EPA, J. Rotola, U.S. EPA, G. Zachos, U.S. EPA, D. Duda, U.S. EPA, A. Carpenter, U.S. EPA, C. Garvey, U.S. EPA, R. Byrnes, U.S. EPA, B. Bellow, PAD, K. Eastman, NYSDEC, J. Dolaway, Town of Wawarsing, E. Auerbach, Village of Ellenville, C. Kelley, RST, L. Hahn, Tetra Tech EC, June 20, 2005.

P. 200206 - 200209
DOC.ID 108564
Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:7, prepared by Mr. James D. Harkay, OSC, U.S. EPA Region II, Removal Action Branch, prepared for R. Salkie, U.S. EPA, J. Rotola, U.S. EPA, G. Zachos, U.S. EPA, D. Duda, U.S. EPA, A. Carpenter, U.S. EPA, C. Garvey, U.S. EPA, R. Byrnes, U.S. EPA, B. Bellow, PAD, K. Eastman, NYSDEC, J. Dolaway, Town of Wawarsing, E. Auerbach, Village of Ellenville, C. Kelley, RST, L. Hahn, Tetra Tech EC, June 27, 2005.

P. 200210 - 200214
DOC.ID 108565
Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:8, prepared by Mr. James D. Harkay, OSC, U.S. EPA Region II, Removal Action Branch, prepared for R. Salkie, U.S. EPA, J. Rotola, U.S. EPA, G. Zachos, U.S. EPA, D. Duda, U.S. EPA, A. Carpenter, U.S. EPA, C. Garvey, U.S. EPA, R. Byrnes, U.S. EPA, B. Bellow, PAD, K. Eastman, NYSDEC, J.

Dolaway, Town of Wawarsing, E. Auerbach, Village of Ellenville, C. Kelley, RST, L. Hahn, Tetra Tech EC, July 5, 2005.

P. 200215 - 200219 Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:9, prepared by Mr. James D. Harkay, OSC, U.S. EPA Region II, Removal Action Branch, prepared for R. Salkie, U.S. EPA, J. Rotola, U.S. EPA, G. Zachos, U.S. EPA, D. Duda, U.S. EPA, A. Carpenter, U.S. EPA, C. Garvey, U.S. EPA, R. Byrnes, U.S. EPA, B. Bellow, PAD, K. Eastman, NYSDEC, J. Dolaway, Town of Wawarsing, E. Auerbach, Village of Ellenville, C. Kelley, RST, L. Hahn, Tetra Tech EC, July 11, 2005.

DOC.ID 108566

P. 200220 - 200225 Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:10, prepared by Mr. James D. Harkay, OSC, U.S. EPA Region II, Removal Action Branch, prepared for R. Salkie, U.S. EPA, J. Rotola, U.S. EPA, G. Zachos, U.S. EPA, D. Duda, U.S. EPA, A. Carpenter, U.S. EPA, C. Garvey, U.S. EPA, R. Byrnes, U.S. EPA, B. Bellow, PAD, K. Eastman, NYSDEC, J. Dolaway, Town of Wawarsing, E. Auerbach, Village of Ellenville, C. Kelley, RST, L. Hahn, Tetra Tech EC, August 22, 2005.

DOC.ID 108567

P. 200226 - 200230 Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:11, prepared by Mr. James D. Harkay, OSC, U.S. EPA Region II, Removal Action Branch, prepared for R. Salkie, U.S. EPA, J. Rotola, U.S. EPA, G. Zachos, U.S. EPA, D. Duda, U.S. EPA, A. Carpenter, U.S. EPA, C. Garvey, U.S. EPA, R. Byrnes, U.S. EPA, B. Bellow, PAD, K. Eastman, NYSDEC, J. Dolaway, Town of Wawarsing, E. Auerbach, Village of Ellenville, C. Kelley, RST, L. Hahn, Tetra Tech EC, November 4, 2005.

DOC.ID 108568

P. 200231 - 200236

DOC.ID 108569

Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:10, prepared by Mr. James D. Harkay, OSC, U.S. EPA Region II, Removal Action Branch, prepared for R. Salkie, U.S. EPA, J. Rotola, U.S. EPA, G. Zachos, U.S. EPA, D. Duda, U.S. EPA, A. Carpenter, U.S. EPA, C. Garvey, U.S. EPA, R. Byrnes, U.S. EPA, B. Bellow, PAD, K. Eastman, NYSDEC, J. Dolaway, Town of Wawarsing, E. Auerbach, Village of Ellenville, C. Kelley, RST, L. Hahn, Tetra Tech EC, November 10, 2005.

P. 200237 - 200241

DOC.ID 108570

Report: U.S. EPA, Pollution Report, Ellenville Scrap Iron & Metal Site, Ellenville, Ulster County, New York, POLREP:2, prepared by Mr. Jack Harmon, OSC, U.S. EPA Region II, Removal Action Branch, prepared for J. Rotola, U.S. EPA, D. Harkay, U.S. EPA, M. Pane, U.S. EPA, G. Zachos, U.S. EPA, B. Grealish, U.S. EPA, E. Wilson, U.S. EPA, V. Capon, U.S.EPA, D. Duda, U.S. EPA, T. Grier, 5202G, C. Kelley, 2RST, June 30, 2010.

3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P. 300863 - 301253

DOC.ID 108571

Report: Final Remedial Investigation Report for the Ellenville Scrap Iron and Metal Site, Town of Wawarsing, Village of Ellenville, Ulster County, New York, prepared by HDR, prepared for U.S. Environmental Protection Agency, Region 2, July 2, 2010.

P. 301254 - 301908

DOC.ID 108572

Report: Final Remedial Investigation Report for the Ellenville Scrap Iron and Metal Site, Town of Wawarsing, Village of Ellenville, Ulster County, New York, (Appendices A-F and H-I), prepared by HDR, prepared for U.S. Environmental Protection Agency, Region 2, July 2, 2010.

P. 301909 - Report: Final Remedial Investigation
302748 Report for the Ellenville Scrap Iron and Metal Site, Town of Wawarsing, Village of
DOC.ID 108573 Ellenville, Ulster County, New York, (Appendix G - Risk Assessment), prepared by HDR, prepared for U.S. Environmental Protection Agency, Region 2, July 2, 2010.

8.0 HEALTH ASSESSMENTS

8.1 ATSDR Health Assessments

P. 800001 - Report: Public Health Assessment for
800057 Ellenville Scrap Iron and Metal, Village of Ellenville, Town of Wawarsing, Ulster County, New York, prepared by New York State
DOC.ID 108574 Department of Health, Center for Environmental Health, Under a Cooperative Agreement with The U.S. Department of Health & Human Services, Agency for Toxic Substances and Disease Registry, Division of Health Assessment and Consultation, Superfund and Program Assessment Branch, Atlanta, Georgia, February 1, 2006.

10.0 PUBLIC PARTICIPATION

10.9 Proposed Plan

P. 10.00001 - Report: Superfund Program Proposed Plan,
10.00022 Ellenville Scrap Iron and Metal Superfund Site, Ulster County, New York, prepared by
DOC.ID 108575 U.S. Environmental Protection Agency, Region 2, July 2010.

APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation
Office of the Director, 12th Floor
625 Broadway, Albany, New York 12233-7014
Phone: (518) 402-9706 • **Fax:** (518) 402-020
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

SEP 30 2010

Walter Mugdan, Director
Emergency and Remedial Response Division
USEPA Region II
290 Broadway
New York, NY 10007-1866

Re: Ellenville Scrap Iron and Metal, Site No. 356022
Village of Ellenville, Ulster County
Record of Decision

Dear Mr. Mugdan:

The New York State Department of Environmental Conservation (Department) and the New York State Department of Health (NYSDOH) have reviewed the September 2010 Record of Decision for the Ellenville Scrap and Tim Superfund Site prepared by the United States Environmental Protection Agency (USEPA) located in the Village of Ellenville, Ulster County. The primary objective of the action is to address human health and environmental risks associated with soil and groundwater contaminants identified on and off-site.

EPA's Selected Plan is Alternative 2C – Cap (AOC 1) and On-site Consolidation (AOCs 2-6) for soils. The plan includes: 1) excavation of soil hot spots throughout five discontinuous Areas of Concern (AOCs) where contaminants in the surface soils exceed the residential soil cleanup objectives, 2) backfilling the excavated areas with clean fill meeting the residential soil cleanup objectives, 3) consolidating all excavated soils in the upper and central portion of the Site (AOC-1), 4) installing a landfill cap system that meets the substantive requirements of NYS Part 360 over the existing landfill (AOC-1) and the relocated contaminated surface soils and 5) development of a site management plan to include long-term groundwater monitoring and engineering and institutional controls.

During the pre-design phase, additional bedrock groundwater monitoring wells will be installed and incorporated into the Site Management Plan which will include a groundwater monitoring program. This program will be developed to determine and monitor the effects of the cap remedy on both the shallow and deeper bedrock aquifer to reduce contaminant levels to below Federal and State standards.

During the pre-design investigation, the areal extent of surface soil hot spots will be further delineated in order to better define 1) the location of excavations and 2) the quantities of impacted soils to be consolidated under the landfill cap

Post-excavation sampling will be performed to verify achievement of residential soil cleanup objectives. Clean fill will be used to backfill all excavated areas, and disturbed surfaces will be restored to current conditions.

Also, during the pre-design phase, as a result of recorded soil gas levels, an evaluation of the potential for soil vapor intrusion will be conducted. Sub-slab sampling will be conducted at adjacent residences during the winter heating season. Accordingly, with respect to any future development at the Site, any new construction should include impermeable barriers and/or incorporate appropriate sub-slab depressurization systems or other vapor mitigation technology in order to prevent any subsurface vapors from impacting indoor air.

Institutional controls would be enacted at the Site which would include the development of an environmental easement or other restrictive covenant to be filed in the property records of Ulster County that would 1) prevent any disruption to the landfill cap and 2) a groundwater use restriction on the Site. Transfer of the Ellenville Site to the Department is anticipated to occur one year after substantial completion and determination that the remedy is operational and functional.

Based on this information, the Department concurs with the selected remedy and believes it is protective of human health and the environment. If you have any questions, please contact Mr. David Crosby or Ms. Kathryn Eastman at (518) 402-9662.

Sincerely,

Dale A. Desnoyers, Director
Division of Environmental Remediation

ec: S. Ervolina
E. Moore
R. Schick
D. Crosby
K. Eastman
S. Bates, NYSDOH
F. Navratil, NYSDOH
D. Duda, USEPA
S. Badalamenti, USEPA

ELLENVILLE SCRAP IRON AND METAL SUPERFUND SITE
RECORD OF DECISION

APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
FOR THE
RECORD OF DECISION

ELLENVILLE SCRAP IRON AND METAL SUPERFUND SITE
VILLAGE OF ELLENVILLE, TOWN OF WAWARSING
ULSTER COUNTY, NEW YORK

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period for the Ellenville Scrap Iron and Metal Superfund site (Ellenville site) selected remedy as presented in the Proposed Plan. The Ellenville site lies within the boundaries of both the Village of Ellenville (Village) and the Town of Wawarsing (Town). This summary also provides the responses by the U.S. Environmental Protection Agency (EPA) to those comments and concerns. All comments summarized in this document have been considered in EPA's final decision in the selection of a comprehensive remedy.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The Remedial Investigation (RI), the Feasibility Study (FS) and Risk Assessment reports describe the nature and extent of the contamination at the Ellenville site, identify the risk to public health and the environment and evaluate remedial alternatives to address the contamination. EPA, in conjunction with the New York State Department of Environmental Conservation (NYSDEC), identified the preferred remedy and the basis for that preference in a July 2010 Proposed Plan. These documents, including the Proposed Plan, were made available to the public in information repositories maintained at the EPA Docket Room in the Region 2 offices at 290 Broadway, 18th Floor, New York, New York and the Ellenville Public Library and Museum, 40 Center Street, Ellenville, New York.

A notice of the commencement of the public comment period, the public meeting date, a description of the preferred remedy, EPA contact information and the availability of the above-referenced documents was published in the Shawangunk Journal, a local newspaper, and on the Midhudsonnews.com website on Thursday, July 29, 2010. The 30-day public comment period ran from July 29 until August 28, 2010. EPA held a public meeting on August 18, 2010 at 7:00 P.M. at the Village of Ellenville Government Center to present the findings of the RI/FS and to answer questions from the public about the Ellenville site, the remedial alternatives and the proposed remedy. The meeting sign-in sheet identified that 17 persons, not including Federal and state officials, attended the meeting. These included area business people, residents, local governmental officials and outside remedial contractors. EPA's contractor, HDR, provided EPA support during the public meeting. As part of the remedial investigation process, a number of citizen participation activities were undertaken in an effort to inform and educate the public about conditions at the Ellenville site and the remedial alternatives. EPA performed a house-to-house canvassing with announcement flyers of the public meeting. EPA also interviewed some of the residents that will be affected by the selected remedy. A public meeting transcript was also provided.

Attached to the Responsiveness Summary are the following Appendices:

- Appendix A - Proposed Plan
- Appendix B – Public Notice in the Shawangunk Journal
- Appendix C - August 18, 2010 Public Meeting Attendance Sheet
- Appendix D - Written Comments (Emails) Submitted During the Public Comment Period

SUMMARY OF COMMENTS AND RESPONSES

Comments and/or questions were received at the public meeting and in writing via e-mail. A summary of the comments provided at the public meeting and in writing, as well as EPA's responses, is provided below:

Comment #1: Is EPA considering cleaning up properties down on River Street?

EPA Response #1: Yes, some soils in residential yards which are adjacent to the Ellenville site property which exceed the New York State (NYS) soil cleanup objectives for residential use will be excavated and consolidated under the proposed landfill cap. The excavated areas will then be backfilled with clean soil and restored. EPA will seek to secure access agreements from the owners of these properties in order to be able to perform the remedial work.

Comment #2: Some commenters want EPA to remove all contaminated soils, as well as the landfill proper from the Ellenville site. Also, one of these commenters presented an overview of the remediation that occurred at the Napanoch Paper Mill (Napanoch site) which is a NYS Superfund site and indicated that all contaminated soils were removed and disposed of and/or treated at off-site permitted facilities. The Napanoch site is located about three miles north of Ellenville. This commenter also inquired that since soils were removed at the Napanoch site why could they not also be removed at the Ellenville site. EPA's Remedial Alternative #4 was the full removal of all contaminated soils including the landfill waste materials from the Ellenville site.

EPA Response #2: In an effort to compare the Ellenville site with the Napanoch site, EPA contacted representatives of the NYSDEC who provided information regarding the investigation and remediation of the Napanoch site (Site No. 356014).

Over its nearly 100-year history, the Napanoch Paper Mill was an active paper manufacturing facility producing a variety of paper products. Over the years, the mill was subject to multiple fires until it was completely destroyed by fire in 1977. Additional information relative to the Napanoch site is available at the following NYS Registry database website:
http://www.dec.ny.gov/cfmx/extapps/derexternal/haz/details.cfm.

The remediation that was conducted at the Napanoch site was necessary to alleviate a principle threat to human health and the environment. There is no real correlation with the scrap iron reclamation activities that occurred on the Ellenville site with that of the manufacturing operations and process waste disposal that occurred at the Napanoch site. The levels of PCBs found at the Napanoch site were found to be hazardous waste and had to be incinerated or landfilled at off-site permitted facilities so that they could not be consolidated and managed on-site. As shown by the PCB contamination levels found at the Napanoch site, the remedial actions performed by NYSDEC which included the excavation and off-site treatment and/or disposal of the various wastes found there were warranted to protect human health and the environment.

In comparison, the excavation of all contaminated soils at the Ellenville site is not warranted as was the case with the Napanoch Paper Mill facility. The Ellenville site was never a manufacturing facility, *i.e.*, no specific operations that were conducted at the Ellenville site created process wastes. The low levels of PCBs found at the Ellenville site were found to be well below levels which would be classified as hazardous waste. In addition, the majority of the Ellenville site soils to be consolidated are impacted by metals and not PCBs. However, as part of the selected remedy and during the course of EPA's pre-design phase of the work, if either the metals-impacted and/or the PCB-impacted soils are identified as hazardous waste, these soils will be disposed of at off-site permitted facilities. (See also EPA Response #6 below.) Any materials deemed hazardous will not be consolidated under the landfill cap. Furthermore, full excavation and removal of all materials, including the landfill proper, would create some serious short-term impacts and concerns to the local community associated with increased potential for dust generation, volatiles generation, truck traffic and noise.

The installation of a landfill cap at the Ellenville site is protective of human health and the environment and is cost effective.

<u>Comment #3</u>: One commenter was concerned that the contaminated soils or toxic waste were being moved from the Village to the Town. As a resident of the Town, the commenter wanted to know to where in the Town the soils (toxic waste) were being moved?

<u>EPA Response #3</u>: Since the Ellenville site property is located within both the Village and the Town, the cleanup proposal indicated that contaminated soils would be consolidated under one capped area, approximately 10 acres in size, on the Town side of the property. The soils or other wastes will not be removed from the Ellenville site and placed somewhere else within the Town community. The proposed remedy excavates soils from the various areas of concern (AOCs) and consolidates them into AOC-1 within the confines of the existing Ellenville site boundaries. As part of the construction project, the landfill cap would be fenced off, maintained and monitored. After the cleanup of the 24-acre Ellenville site, the 14 acres that are not capped could potentially be available for re-use and/or redevelopment.

<u>Comment #4</u>: Two commenters asked about property maintenance. Who will continue to monitor the cap once it is installed? There is some concern that the Village or the Town would be responsible. When the work is completed, will there be funds made available to the Village and Town for maintenance of the property, *i.e.*, mowing grass, brush cutting, etc.? We don't want a wilderness.

<u>EPA Response #4</u>: EPA will maintain the landfill cap and perform maintenance and monitoring for the first year following determination that the remedy is operational and functional. Typically, mowing of the cap will be a part of the maintenance activities to be conducted at the Ellenville site. Also, the regulatory agencies do not want trees planted where the roots can impact the integrity of the cap. The cap requires regular inspections and maintenance activities. One reason for this is to ensure that there has been no erosion of the cover materials.

Subsequently, EPA expects to transfer the Ellenville site to the NYSDEC once 1) the construction is complete; 2) site plans and reports are approved; and, 3) institutional controls are in place. This transfer is anticipated to take one year after substantial completion and determination that the remedy is operational and functional. Once the transfer agreement has been executed, NYSDEC will be responsible for continued maintenance and monitoring of the landfill cap.

At the present time, EPA would envision that NYSDEC would perform 1) the groundwater monitoring, 2) the cap inspection and repair, if necessary, 3) any grass mowing, 4) any fence maintenance, and 5) any other activities associated with maintaining the property. EPA and NYSDEC believe that once the soil cleanup objectives have been met the areas outside of the landfill cap will be available for re-use and redevelopment. There are many such sites in New York State that are maintained by the NYSDEC using State Superfund monies.

Comment #5: Will the contamination located on the battery casing wall behind the Cape Road property be addressed?

EPA Response #5: Yes. During the pre-design phase of the project, further sampling will be performed in order to delineate locations on the battery casing wall where contaminated areas would be excavated and consolidated.

Comment #6: How will EPA deal with hazardous wastes?

EPA Response #6: Any excavated soils which, through testing, are deemed to be hazardous will be sent for disposal to off-site permitted facilities; these materials may require treatment at the facility prior to disposal. Any materials deemed hazardous will not be consolidated under the landfill cap.

Comment #7: Will there be any gasses released once the landfill is capped?

EPA Response #7: Gas venting is part of the substantive requirements of 6 NYCRR Part 360 for landfill capping. Depending on the quantity and distribution of gasses from the landfill, there may be a need to capture the vented gasses and treat them. For the Ellenville site, we expect that passive gas venting would be a sufficient response. Any gasses generated by the Ellenville site are expected to be related to the decay of organic materials, such as vegetation, construction and demolition debris or other organic matter within the landfill proper and/or in the consolidated soils and not from the inorganic compounds, i.e., metals, within the landfill proper and/or in the consolidated soils. EPA will ensure that any gasses vented into the atmosphere would not affect nearby residences.

Comment #8: What types of soils are located in the 10-acre parcel that will be capped?

EPA Response #8: The soils currently on the upper plateau are a mixture of demolition materials and sandy, silty soils. The soils used during the construction of the landfill cap will be clean soils as per the specifications and NYS regulations governing soils used in landfill caps and covers (see 6 NYCRR Part 375-6.7(d)) that are identified during design. The waste mix in the landfill is above the water table so that the cap will prevent any further infiltration into the overburden aquifer.

Comment #9: What could be the future use of the remediated Ellenville site property?

EPA Response #9: As previously discussed, the Ellenville site property area lies within the limits of both the Village and the Town. The parcel located within the Village limits is zoned industrial; the parcel located within the Town limits is zoned rural. EPA is cleaning up the AOCs to the NYS residential soil cleanup objectives. Depending on the wishes of the owner and the local zoning requirements, the portion of the property that is not capped could be used for residential purposes. The owner of the property is responsible for complying with all local zoning regulations and the approved Site Management Plan for the Ellenville site. The community, *i.e.*, the Village and/or the Town, will have input into the reuse of the Ellenville site through their local planning departments.

Comment #10: Was any comparison made with respect to current contamination and the nature of the soils before the operations began.

EPA Response #10: Yes, in order to determine the level of soils contamination that occurs during a facility's site operations, EPA normally compares existing data from the facility with that gathered from historical or background conditions. In the case of the Ellenville site, EPA and its contractors reviewed background soils data in the area and compared that data to the data gathered from the soil sampling performed during the remedial investigation. In some instances, background concentrations were above those found at the Ellenville site, *e.g.*, pesticides 4,4' DDT and 4,4' DDE, which may have been the result of pesticide use in the area. In other instances, background concentrations were below those found at the Ellenville site. For example, lead was typically found at much higher concentrations at the Ellenville site than in the background samples.

Comment #11: Was dioxin found at the Ellenville site?

EPA Response #11: EPA has no historical information or data to indicate that dioxin was ever found at the Ellenville site. EPA found no dioxin during its remedial investigation activities.

Comment #12: Two commenters asked whether asbestos has been found at the Ellenville site.

EPA Response #12: Yes, during its previous removal activities, EPA did find transite panels which contained asbestos. Approximately 30 cubic yards of transite panels were subsequently staged, removed from the property and disposed of at off-site, permitted facilities. During the remedial investigation, EPA found no asbestos during the test-pitting and sampling activities of the landfill.

Comment #13: What is the status of the residential properties? Where are the areas to be remediated?

EPA Response #13: During EPA's remedial investigation, soil sampling was conducted at adjacent residential properties. In certain locations, soils were found to be contaminated with lead at concentrations above the NYS residential soil cleanup objectives. During EPA's pre-design phase of the work, the exact extent of soil contamination will be delineated. Subsequently, during the

remedial action, the residential soils will be excavated from the residential properties and consolidated under the capped consolidation area in AOC-1.
Comment #14: What is the area of contaminated soils that will be excavated and consolidated on the upper plateau which has been designated as AOC-1?

EPA Response #14: EPA estimates that the excavated soils to be consolidated comprise roughly eight acres: AOC 1 – 1.87 acres; AOC 2 – 4.13 acres; AOC 3 – 1.38 acres; AOC 4 - 0.11 acres; AOC 5 - 0.24 acres and AOC 6 - 0.03 acres.

Comment #15: What is the depth of soils to be excavated?

EPA Response #15: The proposed limits of excavation are from one foot to four feet down, depending on the AOC location of the contaminated soils to be excavated. These limits are based on the NYS soil cleanup objectives.

Comment #16: When will the work to excavate and install the cap commence?

EPA Response #16: EPA expects to finish the pre-design and design phases of the work by Spring 2011. Construction is estimated to begin soon after with substantial completion by Fall 2011. EPA will maintain the landfill cap and perform monitoring for the first year following substantial completion and determination that the remedy is operational and functional. As stated above in EPA Response #4, EPA expects to transfer the Ellenville site to the NYSDEC once 1) the construction is complete; 2) site plans and reports are approved; and, 3) institutional controls are in place. When the transfer has been executed, NYSDEC will be responsible for continued maintenance and monitoring of the landfill cap. Also, EPA will perform five-year reviews for the Ellenville site.

Comment #17: Can the Village of Ellenville water lines be extended onto the Ellenville site property?

EPA Response #17: Yes, however, depending on the configuration of any new utility lines, including water, no excavation or disruption would be permitted in or directly around the landfill cap area. The integrity of the cap must be maintained. Also, the installation of any utility lines, including water distribution lines, would be the responsibility of either the Village or the current property owner. EPA would not be able to extend the water line onto the property as part of its remedial activities. Depending on how the property will be redeveloped, if it all, the creation of any new public water service areas is a local matter provided such work is performed in conformance with the approved Site Management Plan.

Comment #18: One commenter would like to be considered as a clay soil source for use under the selected remedy or for any other project in the area and would also like any bidders to be made aware of this available source. The commenter has a nearby 150-acre farm that has plenty of access for machinery and heavy equipment that would be used to excavate the clean soils. The clay has been specified in the past for suitable use for landfill caps. The material is clean and contains little rock material.

EPA Response #18: During EPA's pre-design phase of the work, this information, *i.e.*, the availability of nearby clean landfill cap materials, will be provided to the U.S. Army Corps of Engineers which will be overseeing the remedial action contractor.

ELLENVILLE SCRAP IRON AND METAL SUPERFUND SITE
RECORD OF DECISION

APPENDIX V - RESPONSIVENESS SUMMARY

APPENDIX A

PROPOSED PLAN

Superfund Proposed Plan

U.S. Environmental Protection Agency, Region II

Ellenville Scrap Iron and Metal Superfund Site

Ulster County, New York

July 2010

MARK YOUR CALENDAR

July 29, 2010 – August 28, 2010: Public comment period related to this Proposed Plan.

August 18, 2010 at 7:00 P.M.: Public meeting at the Ellenville Government Center, 2 Elting Court, Village of Ellenville.

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the contaminated soils and groundwater at the Ellenville Scrap Iron and Metal Superfund site (Site) and identifies the preferred remedy with the rationale for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA), in consultation with the New York State Department of Environmental Protection (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the soil contamination at the Site and the associated human health and ecological risks that are summarized in this Proposed Plan are described in the July 2010 Remedial Investigation Report (RI Report) and July 2010 Human Health Risk Assessment Report (HHRA Report), respectively, and the remedial alternatives summarized in this Proposed Plan are described in the July 2010 Feasibility Study Report (FS). EPA and NYSDEC encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted.

This Proposed Plan is being provided as a supplement to the above-noted documents to inform the public of EPA and NYSDEC's preferred remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred alternative. EPA and NYSDEC's preferred alternative consists of the following: 1) excavation of contaminated soils throughout six Areas of Concern (AOCs), which include some adjacent residential properties, where contaminants in the surface soils exceed the cleanup criteria, 2) backfilling the excavated areas with clean fill, 3) consolidating all excavated soils in the upper and central portion of the Site, 4) installing a landfill cap system which meets the substantive requirements of NYS Part 360 over the existing landfill and the relocated contaminated soils and 5) development of a site management plan to include long-term groundwater monitoring and engineering and institutional controls, incorporating periodic reviews and certifications.

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

COMMUNITY ROLE IN SELECTION PROCESS

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and FS reports and this Proposed Plan have been made available to the public for a public comment period which begins on July 29, 2010.

A public meeting will be held during the public comment period at the Ellenville Government Center on August 18, 2010 at 7:00 P.M. to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedy and to receive public comments.

INFORMATION REPOSITORIES

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

Ellenville Public Library
40 Center Street
Village of Ellenville, New York 12428
Telephone: (845) 647-5530

Hours:Monday – Thursday : 9:30 AM to 8 PM
Friday : 9:30 AM to 3:00 PM
Saturday : 9:30 A.M. to 5:00 PM

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

Hours:Monday – Friday : 9:00 AM to 5:00 PM

The Proposed Plan can also be found under "Additional Documents" on EPA's Ellenville Scrap Iron and Metal website:
www.epa.gov/region02/superfund/npl/ellenville

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

Written comments on the Proposed Plan should be addressed to:

Damian Duda
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866
Telephone: (212) 637-4269
Fax: (212) 637-3966
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SCOPE AND ROLE OF ACTION

This Proposed Plan presents a long-term remedial action, focusing on the cleanup of the entire Site. The primary objectives of this action are to remediate the contaminated soils at the Site which could potentially come in contact with human and ecological receptors and to minimize any impacts to the groundwater.

SITE BACKGROUND

Site Description

The Ellenville Scrap Iron and Metal Site (the Site) [see Figure 1] is a 24-acre, former scrap iron and metal reclamation facility, located at 34 Cape Road in the Village of Ellenville, Town of Warwarsing, Ulster County, New York. Approximately 10 acres of the Site were used for a variety of scrap metal operations and battery reclamation. The Site is bound to the north by Cape Road; to the south and west by Beer Kill Creek; and to the east by residential homes. The Site consisted of an office building, a truck scale, a hydraulic baling machine used for metal cans and other small parts, abandoned automobiles and trucks, scrap metal piles, railroad ties, storage of automobile batteries and emptied casings and assorted brush piles. The Cape Road residential property, directly east of the entrance to the Site, was formerly part of the facility and was used for the storage and disposal of heavy equipment, as well as automobile batteries. Deteriorated drums were found scattered throughout the property. An existing landfill embankment, approximately 40 feet in height, runs in a crescent along a northwesterly to southeasterly axis bisecting and dividing the Site into two portions, upper and lower. The landfill is composed of construction and demolition debris, including a variety of finely shredded wastes, scrap brick, concrete, wood and other metal-type debris.

Approximately 4000 people relying on both public and private drinking water supplies live in the area surrounding the Site.

All buildings and facilities associated with previous Site operations have been demolished and removed. All other debris piles and other assorted Site debris have also been removed. A fence is located along some of the perimeter of the property.

In order to delineate the Site contaminants more clearly, the Site is divided into six AOCs which are defined as follows:

- AOC 1 - Landfill Area – This AOC is the upgradient plateau area of the Site adjacent to Cape Road where a majority of Site operations were conducted.
- AOC 2 - Debris Piles Area – This AOC is adjacent to the southern boundary on the landfill area on the lower plateau area of the Site. This area was used for storing large debris piles (scrap metal, pallets, rail road ties, tires, transite and battery casings). In 2005, EPA removed the debris piles.
- AOC 3 - Dumpster Staging Area – This AOC is located adjacent to and south of the landfill area. The area was used for the storage of solid waste dumpsters and was isolated from the debris piles area

(AOC 2) because of the amounts of the surficial debris observed in the area.

- AOC 4 - Scattered Debris Area – This AOC is located along the southern boundary of the Site, extends along the Beer Kill and to the north of the landfill area, contains older growth trees and was scattered with a variety of smaller debris piles (drums, scrap metal, etc.). In 2005, EPA also removed this debris material.
- AOC 5 - Battery Disposal Area – This AOC is located adjacent to and east of the landfill (the Cape Road residential property). Battery casings were disposed on this property and on the hillside behind the residence.
- AOC 6 - Off-Property Residential Area – This AOC is located on the eastern part of the Site and includes several residential properties.

Site History

From 1950 to 1997, the Site was owned and operated by Albert and Patricia Koplik, who used the Site for recycling scrap metal and waste handling, including reclaiming wet cell automobile batteries, old barrels, metal trimmings with oil residue, automotive parts, oil burners and electronic circuit board components.

During 1987-88, NYSDEC inspected the Site several times. During this period, NYSDEC directed the operators to remediate conditions at the Site. As a result of its efforts, NYSDEC accepted the Ellenville Scrap Iron and Metal Settlement of Claim on January 15, 1988. As part of this settlement, the operators agreed to close and cover the area of construction and demolition debris.

From 1990-1992, NYSDEC performed numerous inspection and investigations to evaluate the potential for listing the Site on the NYS Registry of Inactive Hazardous Waste Disposal Sites. Soil investigations at the Site showed that numerous waste oil discharges were observed from drum crushing and hydraulic baling operations.

In January 1995, the Kopliks and Ellenville Scrap Iron and Metal entered into a Consent Order with the NYSDEC in which they agreed to prepare and implement a Preliminary Site Assessment. In addition, they were ordered to perform an Interim Remedial Measure on a portion of the Site surrounding the baling machine. These activities never occurred.

In late 1997, the facility was purchased by John C. Bruno and was used for landfill purposes and as a tire dump. Neither the Kopliks nor Mr. Bruno received a NYSDEC permit to operate as a solid waste management facility or to store tires on the Site. From 1987 to 1998, the NYSDEC conducted numerous inspections and sampled soils both on-site and at adjacent residential properties. Once again, NYSDEC directed the owners to remediate conditions on the Site. The Site was abandoned in the 1998-1999 time frame.

In June 2000, at the request of NYS, U.S. Environmental Protection Agency (EPA) Region II and its Superfund Technical Assessment and Response Team (START) contractors conducted a sampling event at the Site and adjacent residential properties as part of EPA's Integrated Site Assessment process. Surface soil samples were collected throughout the Site and at several adjacent residential properties. Sediments and surface water samples were also collected along Beer Kill Creek. Samples were also collected from the ponded leachate emanating from the landfill embankment.

Analytical results from the June 2000 samples indicated contamination in surface soils, as well as in Beer Kill Creek. Because the creek is used by recreational fishermen and also discharges into two fisheries, a Hazard Ranking System evaluation resulted in the Site's being listed on the National Priorities List on October 7, 2002.

Prior to EPA's involvement, the Village of Ellenville, in response to public concerns, arranged for the disposal of approximately 3000 tires being stored at the Site.

Prior to collecting samples during the RI, EPA's Removal program performed some necessary actions at the Site in order to excavate some contaminated soils and to clear the site of excessive debris and assorted on-site structures. Accordingly, from October - December 2004, EPA performed sampling and conducted a Removal Action at the Site. At this time, the Site buildings were demolished. Waste oils in aboveground tanks, approximately twenty drums containing various hazardous materials and excavated lead-contaminated residential soils were all disposed of at permitted off-site facilities. As a result of prior operations conducted at the Cape Road residential property, the property was subject to an EPA Removal action where soils contaminated with elevated levels of lead and polychlorinated biphenyls (PCBs) were removed and disposed off-site.

During Summer and Fall 2005, EPA performed further Removal cleanup actions to prepare the Site for RI/FS activities. These actions included the following 1) clearing, grading and stabilizing the Site support area; 2) characterization and off-site disposal of the various debris piles, located throughout the Site property, including tires, battery casings, wood pallets and concrete and construction debris; 3) characterization for recycle and/or sale of the various scrap iron and steel, as well as the baling units, located on the Site; 4) dismantling and preparing the abandoned dumpsters, cars, trucks and other heavy equipment for recycle and/or sale as scrap;

and, 5) testing and disposal at approved, regulated facilities of any localized contaminated soils, associated with the cleanup of the various debris piles and the metal-processing equipment.

Completion of the Site clearing activities enabled the initiation of the RI sampling program, which began in 2007. The RI sampling was completed in 2008. Additional groundwater sampling was conducted by EPA in 2009 and 2010.

Site Geology/Hydrogeology

The Site is located on the eastern edge of the Appalachian Plateau and is approximately one mile west of the Valley and Ridge physiographic province. Post glacial alluvium deposits are present on the flat terrain adjacent to Beer Kill, which represents the southern boundary of the Site. The stratified drift deposits of sand and gravel comprise the overburden aquifer. The bedrock formation produces groundwater primarily through fractures or its secondary permeability.

The Site is underlain by the unconfined Sandburg Creek Valley Aquifer, which lies within the surficial deposits of glacial till and deposited as ground moraine. The Sandburg Creek Valley Aquifer consists of poorly sorted sand and gravel of variable texture in association with clay, silty clay, boulder clay and relatively impermeable loam. The thickness of these deposits ranges from 3 to 150 feet. The overlying stratified-drift deposits of sand and gravel comprise the aquifer that sustains Sandburg Creek in Ellenville. Groundwater flows southeast and discharges to the Sandburg Creek during low flow. The Sandburg Creek Valley Aquifer extends from Phillipsport in Sullivan County to Wawarsing in Ulster County, encompassing the valleys of Homowack Kill, Sandburg Creek and a segment of the Rondout Creek.

The bedrock aquifers supply water to individual homes or farms. The consolidated rock in the Site area has virtually no porosity for groundwater storage or transmittal, but there are isolated zones of high porosity and permeability. These bedrock aquifers are usually recharged from unconsolidated overburden from above.

Public water supply wells in Ellenville, completed in this aquifer, include a 39-ft well, an 87-ft well and the other at 51 ft. The depth to water at the Site ranges from under 10 feet below ground surface (bgs) near the Beer Kill on the lower plateau of the Site to approximately 25 feet bgs on the upper plateau of the Site. The bedrock formation produces groundwater primarily through fractures or its secondary permeability. Wells completed in sedimentary bedrock formations in this area have reported yields typically 0.15 gpm/ft.

RESULTS OF THE REMEDIAL INVESTIGATION

The RI sampling was conducted from 2007-2008. From 1990 until 2006 (prior to the RI), as discussed above, EPA and NYSDEC conducted various sampling and cleanup up efforts at the Site and discovered a variety of contaminants. During the RI, affected media were investigated: surface and subsurface soils, groundwater [including installation of new monitoring wells], surface water, sediments, landfill leachate and soil gas.

Background Soils

Off-site soils were sampled to determine background concentrations in native soils not impacted by Site operations. Analytical results were compared to the NYS Part 375 Soil Cleanup Objectives (SCOs) for Unrestricted Use SCOs (USCOs).

Background soil sample results for metals and pesticides exceeded USCOs in several instances. For the metals analyses, lead (in 5 of 10 samples ranged from 79.6 milligrams per kilogram (mg/kg) to 677 mg/kg), mercury (in 2 samples), and zinc in two samples) were reported at concentrations exceeding USCOs. In 8 of the 10 background samples, the concentrations of pesticides exceeded USCOs. Based on their widespread distribution, the presence of pesticide compounds indicates historical residential use. PCBs were not detected in any of the background samples.

Site Soils

In general, soils at the Ellenville Scrap Metal Site have been impacted by historic Site operations as evidenced by the type and distribution of contaminants in the area of the landfill, in the area of the former large debris piles at the base of the landfill and along a drainage channel to the southeast of the landfill.

Both on-site surface and subsurface [test pit and direct-push borings] soil samples show concentrations of Semi-Volatile Organic Compounds (SVOCs), pesticides, PCBs and metal concentrations above USCOs. In addition, VOC concentrations above USCOs are present in the subsurface soils of the landfill. The highest results for PCBs and several poly-aromatic hydrocarbons (PAHs) (SVOCs) detected during the RI were on the lower plateau of the Site.

Surface soils were sampled throughout the Site area. Ten landfill test pits were excavated and 30 direct-push soil borings were conducted.

During the test pit excavation of the landfill area, the observed thickness of fill ranged from 2 feet bgs at the eastern part, to 8 feet bgs in the western part, to 12 feet bgs in the central part. All test pits exhibited varying amounts and types of debris and staining. Stained layers were observed in test pits between 2 and 6 feet bgs.

In general, the direct-push borings were at depths between 7 to 10 feet bgs. The material encountered in the direct-push borings generally consisted of sand and gravel. Other materials include ash, slag, brick, metal, glass and plastics at various intervals. These materials are consistent with material observed in the test pits.

With respect to metals in surface soils, 11 metals exceeded USCOs with arsenic and manganese at the lowest levels. Zinc, lead, copper, chromium, cadmium, mercury and nickel exceeded their USCOs by a wider margin. The highest concentrations for lead were reported for samples collected 1) near the battery casing wall area on the lower plateau of the Site, located on the slope behind the Cape Road residential property, 2) on the landfill and 3) the lower plateau of the Site along a drainage channel to the southeast of the landfill.

With respect to metals in subsurface soils, at the direct-push locations, eight of the 30 locations had metal concentrations exceeding USCOs, particularly at DP-025 and DP-029, located around the perimeter of the former compactor area. Concentrations for organic compounds, including total PCBs, also exceeded USCOs at these locations. The test pit locations with the highest metal concentrations were TP-04 and TP-08, in the central portion of the on-site landfill. Both locations exceeded USCOs for total PCBs and TP-04 for several VOCs.

In general, the metals detected above USCOs with the highest frequencies and magnitude in both on- and off-site soils include lead, chromium, mercury, zinc and copper. Additional metals detected were arsenic, cadmium, nickel and silver.

Nine VOCs were detected in on-site surface soils. 2-butanone and acetone were found at a few locations at 0.12 mg/kg exceeding USCOs. The highest acetone concentration was 0.8 mg/kg.

With respect to surface soils, VOC concentrations above USCOs were found in three direct-push borings and six test pits. In the borings, seven VOCs were reported exceeding USCOs: 2-butanone, acetone, benzene, ethylbenzene, methylene chloride, toluene and total xylenes. The six test pits exceeded USCOs for acetone, ethylbenzene and toluene.

PCB concentrations above the USCO are mostly confined to the Site. In surface soils, the concentration of total PCBs were above the USCO of 0.1 mg/kg in 28 of the 58 surface soil samples collected on-site (on the landfill, in the area of the former large debris pile at the base of the landfill and the southeast portion of the lower plateau of the Site). The highest PCB concentration was 43 mg/kg (SS-014) (lower plateau along a drainage channel to the southeast). This sample also had some of the highest SVOC (PAH) concentrations encountered in surface soils. The second highest total PCB concentration of 12.5 mg/kg was found in DP-026, collected on the edge of the former compactor excavation. Total PCB concentrations in 12 samples exceeded USCOs (seven locations on the upper plateau and five on the lower plateau).

In subsurface soils, PCB concentrations exceeded the USCO of 0.1 mg/kg at five of the ten test pits and at seven direct-push locations. The highest concentrations of total PCBs in on-Site subsurface soils were TP-08 at 55 mg/kg and DP-25 at 20 mg/kg, both collected between 4 to 6 feet bgs on the upper plateau. Two PCB samples taken on the lower plateau exceeded the USCO at 0.18 mg/kg and 0.3 mg/kg, respectively. Of the seven direct-push samples above the USCO, four are located around the former compactor excavation area where PCB-contaminated oil and soils were removed by EPA during cleanup activities in 2005.

Eighteen pesticides were detected in Site surface soils, including seven at concentrations above USCOs. The most frequently detected pesticides were 4,4-DDT and dieldrin in six samples. One sample (DP-026) had the most pesticides above USCOs and also the highest concentrations for the detected compounds. In general, the distribution of these compounds appears to be along roadways and near residences where the pesticides may have been applied. On-site, these compounds appear to be isolated to one sample near the Beer Kill. As part of a pre-design investigation, additional samples would be proposed for this location to delineate the extent of the impacted area followed by excavation to remove the impacted material.

With respect to subsurface soils, four borings showed pesticide concentrations above USCOs: 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, beta-BHC, endrin and heptachlor. The ten test pit samples had pesticide concentrations above USCOs: 4,4'-DDD,4,4'-DDE, 4,4'-DDT, aldrin, dieldrin, and endrin. Pesticide concentrations above USCOs appear to be pervasive to the area.

With respect to SVOCs, one boring detected six SVOCs above USCOs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene and phenol. Five test pits had

SVOC concentrations above USCOs, similar to DP-25 although dibenzo(a,h)anthracene, dibenzofuran and fluoranthene were also detected above USCOs in one or more test pit samples.

Thirty SVOCs were detected in on-site surface soil samples. Concentrations of seven SVOCs (all PAHs) exceeded USCOs between 10 and 25 locations. The widespread presence of the PAHs is consistent with the historic Site operations, which included extensive burning of debris and spreading of ash on the ground.

Residential Soils

During the RI, 24 shallow (0 to 6") surface soil samples plus one duplicate sample were collected from locations on several residential properties to the south and southeast of the Site. Additional soil samples from the 6 to 24-inch interval were collected at five of the 24 locations to determine the vertical extent of metals contamination at the residential properties. These soils were also compared to USCOs, as well as the NYS Part 375 Restricted Use SCOs - Residential (RRSCOs). With the exception of PCB concentrations detected in the residential area samples RSS-02 (1.04 mg/kg at 0-24" bgs), RSS-04 (0.13 mg/kg at 0-6" bgs) and RSS-05 (0.11 mg/kg at 6-24" bgs), only the subsurface sample from location RSS-02 exceeded the USCO of 0.1 mg/kg for PCBs and the RRSCO of 1.0 mg/kg. Samples RSS-02 through RSS-05 were collected from the Cape Road residential property which was the subject of an EPA removal action in November 2004.

The concentrations of the four VOCs that were detected in residential surface soils were below USCOs. Most of the 16 SVOCs that were detected were PAHs, and only one of these, benzo(b)fluoranthene at 1.3 mg/kg, slightly exceeded the NYSDEC USCOs of 1.0 mg/kg. Of the 11 detected pesticides, four (4,4'-DDD, 4,4'-DDE, 4,4'-DDT (22 of 28 samples).

Of the five metals, lead had the largest number of concentrations above the USCO of 63 mg/kg (21 of 28 samples). Lead concentrations ranged from 17.4 mg/kg to 8,970 mg/kg and exceeded the RRSCO in seven samples. The other metals which exceeded USCOs were zinc, mercury, silver and copper; only one, copper, exceeded the RRSCO.

Previous EPA residential investigations documented the presence of high lead concentrations in deeper surface soils (> 12") at the Cape Road residential property. After EPA's excavation and removal of the lead-contaminated soils, post-excavation samples collected at depths of 12-18 inches bgs indicated lead levels from 160 mg/kg and 170 mg/kg in the southeastern portion of the property to as high as 45,000 mg/kg at one location to the northwest of the residence. Seven other locations to the north and west of the residence had concentrations between 1,300 and 5,100 mg/kg. In June 2005, EPA sampled the three residences to the south of the Site showing lead concentrations in surface soils (0-3 inches) between 36 mg/kg and 700 mg/kg.

Beer Kill Sediments

Three sediment samples were collected from the Beer Kill, upstream to downstream. With the exception of acetone at 0.016 mg/kg, no VOCs were detected in the three Beer Kill sediment samples. Several SVOCs were detected, with the highest concentrations of individual compounds generally detected in the most upgradient sample. The highest concentrations of metals were detected in the most downstream sample although the concentrations detected are generally similar to the detected concentrations in midstream and upstream.

On-Site Surface Water

Two surface water samples were collected from on-site locations. One sampling location was on the upper plateau of the Site, northwest of the former compactor location. The second location was on the lower plateau of the Site. The results for the on-site surface water samples indicate the presence of the following VOCs: chloroform at an estimated concentration of 0.45 micrograms per liter (ug/l) and chloromethane at an estimated 0.12 ug/l. SVOCs, pesticides and PCBs were not reported above detection limits. The lead concentrations found in the lower plateau were 108 ug/l and above the NYS surface water standard of 50 ug/l. No other concentrations exceeded NYS standards. The presence of several of the metals in the on-site surface water samples corresponds to their elevated concentrations in Site soils.

Beer Kill Surface Water

Three surface water samples were collected from the Beer Kill. The stations were selected to characterize water quality upstream from the Site, adjacent to the Site and downstream of the Site. The results indicated the presence of one VOC, chloromethane, at an estimated concentration of 0.19 ug/l, and two SVOCs, butylbenzylphthalate at an estimated 0.82 ug/l and diethylphthalate at an estimated 0.25 ug/l at station SWSD-07, the most downstream surface sampling location. Both butylbenzylphthalate and diethylphthalate were also detected in Site soil samples. Pesticides or PCBs were not detected in the three surface water samples from Beer Kill. Four metals were reported above detection limits: calcium, iron, manganese and sodium; however, calcium and sodium concentrations are significantly more elevated in the on-site surface water. The metals concentrations found in the Beer Kill did not exhibit a discernible trend from upstream to downstream locations.

Comparing the on-site surface water results with the Beer Kill results, the past Site usage as a scrap metal facility does not appear to have impacted the Beer Kill with metals.

Leachate

The leachate samples contained two VOCs, several SVOCs (PAHs), one pesticide and several metals. Neither the VOCs nor the pesticide exceeded the respective Class GA standards. The detection of the SVOCs (PAHs) is consistent with their widespread presence in Site soils by Site usage, which included the burning of large amounts of debris and spreading the ashes on the lower plateau. Benzo(a)pyrene at 0.52 ug/l was the only SVOC that exceeded its Class GA standard of non-detect. Iron, lead and manganese exceeded the Glass GA standards in one sample LH-01 and manganese only in one sample. The metals concentrations in the leachate samples are generally higher than in on-site surface water samples.

Groundwater

The most recent groundwater sampling results are discussed here in order to reflect the current conditions with respect to any groundwater contamination. In May 2008, October 2008, October 2009 and January 2010, the EPA monitoring wells were sampled for a variety of parameters and compared to NYS Class GA standards.

With respect to VOCs, in May 2008, carbon disulfide was detected in EPA-01 at 1.0 ug/l. Carbon disulfide was not detected in EPA-04 and EPA-05 but, in October 2008, was detected at 0.18 ug/l and 0.11 ug/l, respectively. In May 2008, chloromethane was detected in EPA-01, EPA-02, and EPA-07 (1.7 ug/l in EPA-07). In October 2008, chloromethane was not detected in EPA-02 nor EPA-07. In October 2009, three compounds were detected: acetone, toluene and m/p-xylene. Acetone was detected in EPA-03, EPA-05 and EPA-07 with highest concentration of 9.2 ug/l in EPA-3. Estimated values of toluene (0.1 ug/l) and m/p-xylene (0.056 ug/l) were detected in EPA-03 only. All concentrations were below Class GA standards. VOCs were not detected during the January 2010 event.

With respect to the SVOCs, in May 2008, caprolactam (used to make artificial fibers) was detected in four wells with a concentration of 150 ug/l in EPA-07, 7.4 ug/l in EPA-03, 56 ug/l in EPA-04 and in a duplicate from EPA-05. In October 2008, caprolactam was found at 0.63 ug/l in EPA-04. In May and October 2008, it was not detected in EPA-05. Caprolactam is covered under NYSDOH Part 5 level of 50 μg/L for unspecified organic contaminants. In October 2008, diethylphthalate concentrations were estimated in three wells: EPA-03, EPA-05 and EPA-06. The highest concentration was reported at 0.2 ug/l in EPA-05 and EPA-06 and 0.19 ug/l in EPA-03.

Pesticides and PCBs were not detected during the May and October 2008 events.

With respect to metals, the data showed antimony, chromium, lead, nickel and sodium with concentrations exceeding the Class GA standards on a relatively limited basis. The elevated concentrations of iron and manganese appeared to be related to local conditions, since these metals were detected in concentrations exceeding the Class GA standards in the upgradient well EPA-07 and were also detected at elevated concentrations in the NYSDEC upgradient well MW-6. The concentrations of iron and manganese also exceeded the Class GA standards in some of the perimeter wells (EPA-03, EPA-04, and EPA-05. During May 2008, a lead concentration of 29 ug/l was detected (above the Class GA standard of 15ug/l) in EPA-04; however, in October 2008, lead was not detected in EPA-04. In October 2009, EPA-03, EPA-04 and EPA-05 exceeded Class GA standards for manganese with the highest concentration (4,500 ug/l) in EPA-03. Antimony (3.6 ug/l), arsenic (95.5 ug/l) and chromium (90 ug/l) were also detected above the Class GA standard in EPA-03 only. In January 2010, manganese concentrations exceeded the Class GA standard in EPA-03, EPA-04, EPA-05 and EPA-06 with the highest concentration (10,000 ug/l) in EPA-03. Chromium (280 ug/l) and nickel (180 ug/l) were also detected above the Class GA standard in EPA-03. In January 2010, antimony was not detected in EPA-03, and the arsenic concentration was 22 ug/l, below the Class GA standard of 25 ug/l. Based on the concentrations detected in EPA-03, there appears to be a historical Site operation impact on the groundwater conditions at this well location.

RISK SUMMARY

The purpose of the risk assessment is to identify potential cancer risks and noncancer health hazards at the site assuming that no further remedial action is taken. A baseline human health risk assessment was performed to evaluate current and future cancer risks and noncancer health hazards based on the results of the RI. A screening-level ecological risk assessment (SLERA) was also conducted to assess the risk posed to ecological receptors due to site-related contamination.

Human Health Risk Assessment

As part of the RI/FS, a baseline human health risk assessment was conducted to estimate the risks and hazards associated with the current and future effects of contaminants on human health and the environment. A baseline human health risk assessment is an analysis of the potential adverse human health effects caused by hazardous-substance exposure in the absence of any actions to control or mitigate these under current and future land uses.

A four-step human health risk assessment process was used for assessing site-related cancer risks and noncancer health hazards. The four-step process is comprised of: Hazard Identification of Chemicals of Potential Concern (COPCs), Exposure Assessment, Toxicity Assessment, and Risk Characterization (see adjoining box "What is Risk and How is it Calculated").

The baseline human health risk assessment began with selecting COPCs in the various media, *i.e.*, soils, groundwater, surface water and sediments,that could potentially cause adverse health effects in exposed populations. The current and future land use scenarios included the following exposure pathways and populations:

- On-site Trespassers and Recreational Users: ingestion, dermal contact and inhalation of surface soils and ingestion and dermal contact with leachate for adults and children.
- Recreational users in Beer Kill: ingestion and dermal contact with surface water and sediments for adults and children.
- On-site Residents: ingestion, dermal contact and inhalation of surface soils, ingestion and dermal contact with leachate and ingestion and dermal contact with groundwater for adults and children.
- On-site Commercial/Industrial Workers: ingestion, dermal contact and inhalation of surface soils and ingestion and dermal contact with leachate for adults.
- On-site Construction/Utility Workers: ingestion, dermal contact, and inhalation of subsurface soils (0-10 feet) and dermal contact with leachate and shallow groundwater for adults.
- Off-property Residents: ingestion, dermal contact, and inhalation of surface soils for adults and children.

WHAT IS RISK AND HOW IS IT CALCULATED?

Human Health Risk Assessment:

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

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

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

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

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one in ten thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one in ten thousand to a one in a million excess cancer risk. For non-cancer health effects, a "hazard index" (HI) is calculated. The key concept for a non-cancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as Chemicals of Concern or COCs in the final remedial decision or Record of Decision.

In this assessment, exposure point concentrations were estimated using either the maximum detected concentration of a contaminant or the 95% upperconfidence limit (UCL) of the average concentration. Chronic daily intakes were calculated based on the reasonable maximum exposure (RME), which is the highest exposure reasonably anticipated to occur at the site. The RME is intended to estimate a conservative exposure scenario that is still within the range of possible exposures. Central tendency exposure (CTE) assumptions, which represent typical average exposures, were also developed. A complete summary of all exposure scenarios can be found in the baseline human health risk assessment.

Surface Soils

Risks and hazards were evaluated for current and future exposure to surface soils on-site and off-site. The populations of interest included adult and child trespassers and recreational users, adult and child residents and adult commercial workers. The hazard index for on-site child residents and off-site adult and child residents were above the EPA acceptable value of 1. The cancer risks for all of the populations evaluated exceeded or were at the upper-bound of the acceptable EPA risk range of 1.0E-06 to 1.0E-04. The contaminants of concern (COCs) that were identified for soils include PAHs, PCBs and metals (Table 1).

Table 1. Summary of hazards and risks associated with surface soils.

Receptor	Hazard Index	Cancer Risk
On-site Trespasser - Adult	0.1	**7.2E-04**
On-site Trespasser - Child	1	
On-site Recreational user - Adult	0.1	**7.3E-04**
On-site Recreational user - Child	1	
On-site Resident - Adult	1	**6.5E-03**
On-site Resident - Child	**9**	
On-site Commercial/ Industrial Worker	0.7	**3.7E-04**
Off-site Resident - Adult	**2**	**1.0E-04**
Off-site Resident - Child	**19**	
COCs include: benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, indeno[1,2,3-cd]pyrene, Arolcor-1254, Aroclor-1260, arsenic, chromium VI, copper, iron and lead		

Subsurface Soils

Risks and hazards were evaluated for the potential future exposure to subsurface soils. The population of interest included adult construction/utility workers. Both the hazard index and cancer risk exceeded the EPA acceptable hazard and risk values. The COCs that were identified include PAHs and metals (Table 2).

Table 2. Summary of hazards and risks associated with subsurface soils.

Receptor	Hazard Index	Cancer Risk
On-site Construction/Utility Worker	**5**	**2.1E-04**
COCs include: benzo[a]pyrene, chromium VI, arsenic, manganese, and lead		

Leachate

Risks and hazards were evaluated for current and future exposure to leachate on-site. The populations of interest included adult and child trespassers, recreational users, and adult construction/utility workers. The hazard indexes for the populations of interest were below EPA's acceptable value of 1. The cancer risks for all of the populations evaluated exceeded EPA's acceptable risk range of 1.0E-06 to 1.0E-04. The COCs, identified for soils, include PAHs, pesticides, PCBs and metals (Table 3).

Table 3. Summary of hazards and risks associated with leachate.

Receptor	Hazard Index	Cancer Risk
On-site Trespasser – Adult	0.05	**3.5E-03**
On-site Trespasser – Child	0.1	
On-site Recreational user – Adult	0.05	**2.8E-03**
On-site Recreational user – Child	0.1	
On-site Commercial/ Industrial Worker	0.2	**2.1E-03**
COCs include: benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, indeno[1,2,3-cd]pyrene, dieldrin, Aroclor-1260, arsenic, and chromium VI		

Groundwater

Risks and hazards were evaluated for current and future exposure to groundwater on Site. The populations of interest included on-site adult and child residents and adult construction/utility workers. The hazard indexes for the on-site adult and child resident exceeded the EPA acceptable value of 1. The cancer risk for adult and child on-site residents also exceeded the acceptable EPA risk range of 1.0E-06 to 1.0E-04. The COCs, identified for groundwater, include a variety of metals (Table 4).

Table 4. Summary of hazards and risks associated with groundwater.

Receptor	Hazard Index	Cancer Risk
On-site Residents - Adult	**8**	**3.6E-03**
On-site Residents - Child	**28**	
On-site Construction/ Utility Worker	0.07	4.8E-06
COCs include: aluminum, arsenic, chromium IV, cobalt, lead, and manganese		

Surface Water and Sediments

Risks and hazards were evaluated for current and future exposure to surface water and sediments from Beer Kill. The populations of interest included on-site adult and child recreational users. The hazard indexes and cancer risks for all of the populations evaluated were below or within the EPA acceptable values. There were no COCs identified for surface water or sediments (Table 5).

Table 5. Summary of hazards and risks associated with sediments and surface water.

Receptor	Hazard Index	Cancer Risk
On-site Recreational user - Adult	0.02	6.4E-06
On-site Recreational user - Child	0.2	
There were no COCs identified in surface water or sediments.		

Sitewide Summary

The risks and hazards for the populations of interest were also summed across all exposure pathways and media to obtain an estimate of the site-wide risks and hazards for the site. The hazard indexes for on-site residents, both adult and child, on-site construction/utility workers and off-site residents, both adult and child, exceed the EPA acceptable value of 1. The cancer risk fro all of the populations evaluated also exceed the EPA acceptable risk range of 1.0E-06 to 1.0E-04 (Table 6).

Table 6. Summary of hazards and risks for all receptors summed across all pathways and media.

Receptor	Hazard Index	Cancer Risk
On-site Trespasser - Adult	0.2	**3.5E-03**
On-site Trespasser - Child	1	
On-site Recreational user - Adult	0.2	**3.6E-03**
On-site Recreational user - Child	1	
On-site Resident - Adult	**10**	**3.5E-02**
On-site Resident - Child	**38**	
On-site Commercial/ Industrial Worker	0.9	**2.3E-03**
On-site Construction/Utility Worker	**5**	**2.1E-04**
Off-site Resident - Adult	**2**	**1.0E-04**
Off-site Resident - Child	**19**	

Areas of Concern (AOCs)

Additionally, exposure to smaller units of the Site were also evaluated for on-site adult and child residents and adult construction/utility workers (Table 7). The evaluation of the AOCs indicates that each AOC has non-cancer hazards for at least one population and elevated cancer risks for all of the evaluated populations.

Table 7. Summary of hazards and risks associated with soils, leachate, groundwater, sediments, and surface water exposure from all pathways from AOC 1 through 5.

AOC	Receptor	Hazard Index	Cancer Risk
1	On-site Resident - Adult	**4**	**8.0E-02**
	On-site Resident - Child	**31**	
	On-site Construction/ Utility Worker	**7**	**8.8E-04**
2	On-site Resident - Adult	0.5	**2.7E-03**
	On-site Resident - Child	**4**	
	On-site Construction/ Utility Worker	0.4	**3.9E-05**
3	On-site Resident - Adult	**2**	**1.0E-03**
	On-site Resident - Child	**13**	
3	On-site Construction/ Utility Worker	**2**	**2.2E-05**
4	On-site Resident - Adult	0.3	**2.6E-04**
	On-site Resident - Child	**3**	
	On-site Construction/ Utility Worker	0.8	**4.2E-06**
5	On-site Resident - Adult	0.5	**1.9E-04**
	On-site Resident - Child	**4**	
	On-site Construction/ Utility Worker	0.7	**2.4E-04**
6	Off-site Resident - Adult	**2**	**1.0E-04**
	Off-site Resident - Child	**19**	

Based on the results of the human health risk assessment, a remedial action is necessary to protect public health, welfare and the environment from actual or threatened releases of hazardous substances.

Ecological Risk Assessment

A SLERA was conducted to evaluate the potential for ecological effects from exposure to surface soils, leachate, groundwater discharging to sediments and surface water, and surface water and sediments from Beer Kill creek. Surface soils, leachate, groundwater, surface water, and sediment concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors by habitat type. Exposure to terrestrial wildlife via the ingestion of prey and direct soil ingestion to chemicals was also evaluated. A complete summary of all exposure scenarios can be found in the SLERA. Habitat types were identified as upper plateau/landfill, flood plain, forested wetland, residential area, and Beer Kill creek.

Upper Plateau/Landfill: There is a potential for adverse effects to terrestrial plants/soil invertebrates from direct exposure to chemicals within the upper plateau/landfill area. The soil screening criteria were exceeded for 22 chemicals and the wildlife screening criteria was exceeded for 13 chemicals.

Flood Plain: There is a potential for adverse effects to terrestrial plants/soil invertebrates from direct exposure to chemicals from migration from the upper plateau/landfill area. The soil screening criteria were exceeded for 24 chemicals and the wildlife screening criteria was exceeded for 16 chemicals.

Forested Wetland: There is a potential for adverse effects to terrestrial plants/soil invertebrates from direct exposure to chemicals within the forested wetland area. The soil screening criteria were exceeded for 22 chemicals and the wildlife screening criteria was exceeded for 16 chemicals.

Residential Area: There is a potential for adverse effects to terrestrial plants/soil invertebrates from direct exposure to chemicals within the residential area. The soil screening criteria were exceeded for 19 chemicals and the wildlife screening criteria was exceeded for 10 chemicals.

Beer Kill Creek: Available data indicates minimal potential for adverse effect to aquatic life from direct exposure to chemicals in the Beer Kill sediments and/or surface water. Three inorganic chemicals (lead, manganese, and nickel) and the PAH indeno(1,2,3-cd) pyrene were detected at maximum concentrations exceeding sediment screening values; however, these chemicals only marginally exceeded their screening values (HQs < 5), suggesting a minimal potential for adverse effects. There were no chemicals detected in surface water above screening criteria which indicates there is no potential for adverse effects to aquatic life. In addition, there was no potential for adverse effects indicated to aquatic-based wildlife from exposure via the ingestion of prey and direct ingestion to chemicals in the Beer Kill.

Based on the results of the ecological risk assessment, a remedial action is necessary to protect the environment from actual or threatened releases of hazardous substances.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) have been developed for the Site for the protection of public health and the environment based on findings of the RI. The RAOs are organized by media of concern and specify contaminant type, exposure pathways and preliminary remediation goals based on chemical specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) criteria. The ARAR preliminary remediation goals (PRGs) identify Standards, Criteria, and Guidances (SCGs) that will be utilized to establish soil and groundwater cleanup objectives that eliminate or mitigate the significant threat to the public health and environment. The Site-specific RAOs are below.

Groundwater

- Prevent ingestion of water with contaminant concentrations greater than NYSDEC Technical & Operational Guidance Series (TOGS) groundwater (Class GA) water quality standards.
- To the extent practicable, restore groundwater contaminant concentrations to less than the NYSDEC TOGS groundwater (Class GA) water quality standards
- Prevent discharge of groundwater with contaminant concentrations greater than the NYSDEC TOGS groundwater (Class GA) water quality standards to adjacent surface water (Beer Kill).
- Prevent discharge of groundwater with contaminant concentrations greater than the NYSDEC TOGS groundwater (Class GA) water quality standards to adjacent surface water (Beer Kill).
- To the extent practicable, restore groundwater contaminant concentrations to less than the NYSDEC TOGS groundwater (Class GA) water quality standards.
- Prevent exposure to or inhalation of volatilized contaminants from groundwater with concentrations greater than the NYSDEC TOGS groundwater (Class GA) water quality standards.

Soils

- Prevent ingestion/direct contact of soils with contaminant concentrations greater than NYSDEC RRSCOs.
- Prevent inhalation of soil dust with contaminant concentrations greater than NYSDEC RRSCOs.
- Prevent off-site migration of soils with contaminant concentrations greater than NYSDEC RRSCOs.
- Prevent or minimize impacts to groundwater and/or surface water resulting from soil contamination with concentrations greater than NYSDEC Protection of Groundwater SCOs.
- Prevent off-site migration of soils with contaminant

concentrations greater than NYSDEC Part 375 Protection of Ecological Resources SCOs.

Solid Wastes
- Prevent ingestion/direct contact with solid wastes with contaminant concentrations greater than NYSDEC RRSCOs.
- Prevent off-site migration of solid wastes with contaminant concentrations greater than NYSDEC RRSCOs.
- Prevent or minimize impacts to groundwater and/or surface water resulting from solid wastes with concentrations greater than NYSDEC Protection of Groundwater SCOs.
- Prevent ingestion of leachate with contaminant concentrations greater than the NYSDEC Class GA water quality standards.
- Prevent off-site migration of leachate with contaminant concentrations greater than the NYSDEC Class GA water quality standards.

- Prevent exposure to or inhalation of volatilized contaminants from the solid wastes.
- Prevent migration of landfill gas generated by the decomposition of solid wastes.

Surface Water
- None.

Sediments
- None.

Air
- See inhalation RAOs listed above.

SUMMARY OF REMEDIAL ALTERNATIVES

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

Detailed descriptions of the remedial alternatives for addressing the Site contamination can be found in the FS report. Dividing the Site into six (6) Areas of Concern (AOCs) facilitated the development and evaluation of remedial alternatives, based on the nature and extent of contamination.

- AOC 1 - Landfill Area - VOCs, SVOCs, metals, PCBs and pesticides were detected in the soils within the area at concentrations greater than the RRSCOs.
- AOC 2 - Debris Pile Area - SVOCs, metals, PCBs and pesticides were detected in the soils within the area at concentrations greater than the RRSCOs.
- AOC 3 - Dumpster Staging Area - VOCs, metals, and PCBs were detected in the soils within the area at concentrations greater than the RRSCOs.
- AOC 4 - Scattered Debris Area - Metals were detected in the soils at one location within the area at concentrations greater than the RRSCOs.
- AOC 5 - Battery Disposal Area - Metals and PCBs were detected in the soils within the area at concentrations greater than the RRSCOs.
- AOC 6 - Off-Property Residential Area - SVOCs and metals were detected in the soils within the area at concentrations greater than the RRSCOs.

The six AOCs are shown in Figure 2.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the remedy performance with any potentially responsible parties or procure contracts for design and construction. The alternatives are described below.

SOIL REMEDIAL ALTERNATIVES

Based on the screening analyses and evaluations performed in the FS, remedial alternatives 2B, 2D, 3A and 3B were screened out of the final alternatives which are discussed below.

Alternative 1: No Action

Capital Cost	$0
Annual Operation/Maintenance (O&M) Cost	$0
Present-Worth Cost:	$0
Construction Time:	0 months

The "no action" option is included as a basis for comparison with active soil remediation technologies. If no remedial action is taken, contaminants already present in the soils will remain in place and will continue to impact the underlying groundwater. Organic contaminants (PAHs) may degrade over time due to natural attenuation processes. Metal and PCB contaminants will remain in the Site soils for long periods of time with little or no decrease in concentration. There are no capital, operations/maintenance/ monitoring costs associated with this alternative. There are no permitting or institutional legal restrictions needed for this alternative. This alternative will not meet any of the RAOs for the Site and is unlikely to be accepted by the state and/or local community.

Alternative 2A – Capping/On-Site Consolidation

Capital Cost:	$5,152,800
Annual Operation and Maintenance (O&M) Cost:	$75,500
Present-Worth Cost:	$6,323,000
Construction Time:	9 months

Alternative 2A consists of the installation of an impermeable cap in the combined AOCs 1, 2 and 3. Soils in AOC-4, 5 and 6 with concentrations greater than the RRSCOs will be excavated and relocated to AOC-1, prior to any capping (on-site consolidation). The impermeable cap will consist of a 60-mil high-density polyethylene (HDPE) liner underlain by a gas collection layer, if needed, and overlain by a 2-foot thick soil protective layer. A fence will also be constructed around the cap perimeter. The proposed cap will meet the substantive requirements of 6 NYCRR Part 360 regulations for a landfill cap.

The excavation and on-site consolidation can be implemented in a relatively short time frame. Delineation of the soil impacts in either a pre-design or post-excavation sampling program would be required as part of the remedial action. Impacted soils would be excavated and transported to the landfill area of AOC 1, 2 and 3 where the soils will be relocated, prior to installation of the cap. The excavation will be backfilled with clean fill imported from an off-site source. Construction of the cap can also be completed in a relatively short time frame. However, long-term monitoring and maintenance costs are also associated with the cap. A storm water management system will be incorporated into the cap design to divert storm water flow around and away from the solid waste. It is anticipated that passive vents will be installed into the gas collection layer of the cap. Given that the solid waste appears to be located above the groundwater table, it is expected that leachate generation will diminish considerably or cease permanently once the impermeable cap is installed on top of the waste. Therefore, a leachate collection system has not been assumed as part of the remedial design. A pre-design investigation consisting of test trenching and exploratory test pits around the perimeter of the solid waste area has been included as part of this alternative. The test pit/trench investigation will establish the limits of the solid waste. Any contaminated soils in AOC 1 which are determined to be outside the footprint of the proposed cap will be excavated and relocated within the footprint of the cap. Any soils or waste materials that are characterized as hazardous will be transported off-site for proper disposal and will not be placed under the cap. Based on available data, it is anticipated that hazardous waste will not be encountered at the Site.

In addition to the seven existing EPA monitoring wells, additional bedrock groundwater monitoring wells will be installed as part of this alternative and incorporated into a long-range groundwater monitoring program to be set forth in a Site management plan.

Institutional and engineering controls will also be required as part of this alternative to be set forth in a site management plan.

The objectives of this alternative are to prevent or minimize future human exposure to contaminated soils and to reduce the potential for infiltration into the groundwater through the consolidation of contaminated soils beneath the impermeable cap.

Alternative 2C – Capping/On-Site Consolidation

Capital Cost:	$4,695,938
Annual Operation and Maintenance (O&M) Cost:	$65,700
Present-Worth Cost:	$5,711,000
Construction Time:	9 months

Alternative 2C includes all of the aspects of the Alternative 2A (as discussed above) except that, in Alternative 2C, the cap is limited to AOC-1 and the contaminated soils from all other AOCs (2, 3, 4, 5, and 6) will be excavated and consolidated into AOC-1 prior to installing the cap.

The objectives of this alternative are to prevent or minimize future human exposure to contaminated soils and to reduce the potential for infiltration into the groundwater through the consolidation of contaminated soils beneath the impermeable cap.

Alternative 4 – Off-Site Disposal

Capital Cost:	$23,822,000
Annual Operation and Maintenance (O&M) Cost:	$0
Present-Worth Cost:	$23,822,000
Construction Time:	6 months

Alternative 4 consists of excavation and off-site disposal of soils with contaminants greater than RRSCOs. This alternative will meet all of the RAOs and return the Site to pre-release conditions. This alternative can be implemented in a relatively short time frame. However, this alternative has high costs as a result of the extensive quantities of soils to be disposed of off-site and the associated costs of such action for excavation, transport and disposal. This alternative will require extensive truck traffic carrying excavated soils through the Ellenville community. There are no long term monitoring, maintenance or operations costs associated with this alternative.

Groundwater Remedial Alternatives

Alternative G1 – No Action

Capital Cost:	$0
Annual Operation and Maintenance (O&M) Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

Alternative G1 – No Action provides a basis for comparison with other groundwater remedial alternatives. If no remedial action is taken, the limited occurrences of contaminants present in the groundwater would remain. There are no capital, operations, maintenance or monitoring costs associated with this alternative. There are no permitting or institutional legal restrictions needed for this alternative.

Alternative G2 – Monitored Natural Attenuation

Capital Cost:	$63,625
Annual Operation and Maintenance (O&M) Cost:	$51,000
Present-Worth Cost:	$770,000
Construction Time:	0 months

There is no active remedial action associated with Alternative G2. However, there is a long-term monitoring component to this alternative. In addition to the seven existing EPA monitoring wells, additional bedrock groundwater monitoring wells will be installed as part of this alternative. Sampling of the groundwater monitoring wells will be completed on a semiannual basis for an estimated period of 30 years. Groundwater samples will be analyzed for VOCs, SVOCs, metals and PCBs.

Alternative G3 – Groundwater Pump and Treat

Capital Cost:	$629,000
Annual Operation and Maintenance (O&M) Cost:	$416,900
Present-Worth Cost:	$5,896,000
Construction Time:	9 months

Alternative G3 represents an active remedial option consisting of pumping and treating groundwater to remove contaminant mass from higher concentration areas of the aquifer and establish hydraulic control of the aquifer to minimize any off-site migration. Due to the radial flow at the Site, it is assumed that three extraction wells pumping at approximately 10 gpm each would be required to control the aquifer at the Site. A 30-gpm treatment system capable of removing VOCs [carbon units] and metals [ion exchange] would be required.

Pump and treat systems have relatively long time frames of operation (an estimated 30 years is assumed). The treatment system will require a small enclosure (building) that is assumed to be located near the Site entrance to facilitate utility service. This alternative assumes that treated effluent will be discharged to an infiltration system and would require an SPDES permit equivalent.

COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria: overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, short-term effectiveness, implementability, cost and state and community acceptance.

The evaluation criteria are described below.

- Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced or controlled through treatment, engineering controls or institutional controls.
- Compliance with ARARs addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other Federal and state environmental statutes and requirements or provide grounds for invoking a waiver.
- Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.
- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.
- Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost includes estimated capital and operation and maintenance costs and net present-worth costs.
- State acceptance indicates if, based on its review of the RI/FS and Proposed Plan, the State concurs with the preferred remedy.
- Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

Overall Protection of Human Health and the Environment

Since no action would be implemented, Alternatives 1 and G1 would not provide control of exposure to contaminated soils, offer no reduction in risk to human health posed by contaminated soils and provide no groundwater response. The impermeable cap for Alternatives 2A and 2C would prevent exposure to the contaminated soils, eliminate migration of contaminated soils due to wind blown dust or storm water erosion and mitigate inhalation risks of potential landfill gas. In addition, the impermeable cap would minimize further release of contaminants to the groundwater by limiting future storm water infiltration through the cap. Alternative 4 would be protective of human health and the environment, since all contaminated soils would be removed from the Site with the Site essentially being restored to pre-disposal conditions. Direct contact risks would be reduced by removing contaminated soils. Potential impacts to groundwater will be mitigated by removing contaminated soils. Alternative G3 reduces the risks of ingestion of impacted groundwater, by preventing any future migration of contaminated groundwater through extraction and treatment.

Compliance with ARARs

Alternatives 2A, 2C and 4 would meet NYS Part 375 SCOs.

Alternative G3 would meet Class GA standards. Alternatives 1, G1 and G2 would not meet ARARs.

A landfill cover is an action-specific ARAR for site closure. Alternatives 2A and 2C satisfy this action-specific ARAR. It is not relevant to Alternatives 1 and 4.

Since Alternatives 2A, 2C and 4 would involve the excavation of contaminated soils, they would require compliance with fugitive dust and VOC emission requirements. In addition, Alternative 4 would be subject to Federal and state regulations related to the transportation and off-site treatment/disposal of wastes.

Long-Term Effectiveness and Permanence

Alternatives 1 and G1 would not reduce risk in the long term, since the contaminants would not be controlled, treated or removed. Alternative 4 provides the highest degree of long-term effectiveness and permanence, because the impacted soils are permanently removed from the Site. Alternative 4 would have no long-term reliance on institutional controls. Alternatives 2A and 2C rely on a soil/HDPE liner meeting the substantive requirements of NYS Part 360 to control infiltration to groundwater, direct contact exposure and migration of impacted soils. Although capping is effective and reliable, it is less reliable in the long-term than Alternative 4 (full soils removal) due to potential for cap failure. Alternative 2C has slightly less impact than Alternative 2A as a result of a smaller cap footprint and resulting lower risk of cap failure. Alternatives 2A and 2C have long-term groundwater monitoring requirements. Alternative G3 permanently removes contaminants from the groundwater aquifer and irreversibly treats VOCs and metal contaminants.

Reduction of Toxicity, Mobility, or Volume of Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

Alternatives 2A, 2C and 4 do not use any treatment technologies to reduce the toxicity, mobility or volume of contaminants through treatment. Under Alternatives 2A and 2C, contaminated soils, although controlled by a cap, would remain on Site. Contaminated soils in Alternative 4 would be transported for off-site disposal at an approved landfill facility. Alternative G3 uses treatment technologies to reduce the hazards posed by contaminants in the groundwater at the Site. Alternative G2 uses no treatment technologies but allows for the natural attenuation of contaminated groundwater.

Short-Term Impacts and Effectiveness

There are no short-term impacts for the No Action alternatives (1 and G1). Under Alternatives 2A, 2C and 4, some particulate emissions may result during soil handling, excavation and landfill cap construction. Dust control and soil erosion and sedimentation controls would reduce the short-term impacts. Alternative 4 poses the greatest impact, since the largest volume of soils/solid waste will be disturbed and handled. Similarly, Alternative 2C poses a slightly larger impact than Alternative 2A because of the relocation of a greater quantity of impacted soils. Alternative G2 has the greatest short-term effectiveness as contaminated groundwater remains in situ and is not extracted to the surface. Alternative G3 increases the risks of exposure, ingestion and inhalation of contaminants by workers and the community because contaminated groundwater is extracted to the surface for treatment. Safety techniques including alarmed monitoring equipment and fencing would be used to minimize exposure risks.

Implementability

Alternative 4 would be the simplest to implement although handling of the solid waste will add some complexity to the alternative. Alternatives 2A and 2C are slightly more complex to implement because of the cap construction and installation of the geomembrane liner. Long-term inspection and maintenance to maintain the integrity of the cap would be required. Long-term groundwater monitoring would also be required to assess the effectiveness of the cap in reducing the affect on the groundwater contamination. Alternative G1 would be the simplest of the groundwater remedies to implement. Alternative G2 would be more complex. Alternative G3 would require construction of a treatment plant requiring readily available engineering services, treatment and equipment. All treatment technologies are well established and proven. However, monitoring of the groundwater aquifer and treatment plant effluent would be required to assess the effectiveness of the system.

Cost

The no action Alternatives (1 and G1) have no cost because no activities are implemented. Alternative 2C has the lowest capital cost ($4,695,938) of the active soil alternatives followed by Alternative 2A ($5,152,800). Alternative 4 has the highest capital cost ($23,822,000) and the lowest operations and maintenance costs ($0) of the soil alternatives. Alternatives 2A and 2C have similar annual operations and maintenance costs of $75,500 and $65,700, respectively. Alternative 2C has the lowest overall present value cost ($5,711,000) followed by Alternative 2A ($6,323,000). Alternative 4 has the highest overall present value cost of the soil alternatives ($23,822,000). Alternative G2 has lower capital, ($63,625) operations and maintenance ($51,000) and overall present value cost ($770,000), compared to Alternative G3 with ($629,000 capital), ($416,900 operations and maintenance) and ($5,896,000 present value cost).

State Acceptance

NYSDEC concurs with the preferred remedy.

Community Acceptance

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

PROPOSED REMEDY

Based upon an evaluation of the various alternatives, EPA, in conjunction with NYSDEC, recommends Alternative 2C – Capping (AOC 1) and On-site Consolidation (AOCs 1-6) for soils and Alternative G1 - No Action for groundwater as the preferred remedy for the Site (See Figure 3).

The preferred remedy consists of the following: 1) excavation of contaminated soils throughout the six AOCs, which includes some adjacent residential properties, where contaminants in the soils exceed the cleanup objectives, 2) backfilling the excavated areas with clean fill, 3) consolidating all excavated soils in the upper and central portion of the Site (AOC 1), 4) installing a landfill cap system which meets the substantive requirements of NYS Part 360 over the existing landfill and the relocated contaminated soils (AOC-1) and 5) development of a site management plan to include long-term groundwater monitoring and engineering and institutional controls, incorporating periodic reviews and certifications.

Alternative 2C includes the component of long-term groundwater monitoring. EPA is not proposing an active groundwater remedy and selected Alternative G1, because of limited groundwater contamination (both inorganic and organic) underlying the Site. The isolated low levels of contamination do not appear to be mobile, show no migration off-site and do not show a significant area-wide impact on groundwater from the Site. There is also no clearly defined plume of inorganics in the groundwater.

Alternative 2C effectively removes the sources of contamination in the soils from potentially further impacting groundwater. During the pre-design phase, additional bedrock groundwater monitoring wells will be installed and incorporated into a sitewide management plan which will include a groundwater monitoring program which is part of this preferred alternative. This program will be developed to determine and monitor the effects of the cap remedy on both the shallow and deeper bedrock aquifer to reduce contaminant levels to below Federal and State standards. Institutional controls, *i.e.*, groundwater well restrictions, will be put in place on the Site.

During the pre-design investigation, the areal extent of soil contamination would be further delineated in order to better define 1) the location of the excavations and 2) the quantities of impacted soils to be consolidated under the landfill cap. Post-excavation sampling would be performed to verify achievement of cleanup goals. Clean fill would be used to backfill all excavated areas, and disturbed surfaces would be restored to current conditions.

Since background samples collected near the Site showed levels above USCOs, delineating and excavating the contaminated soils to USCOs would be difficult. Specifically, the RAO would be more stringent than background conditions. Thus, after assessing the levels of area-wide soil contamination, the use of the RR SCOs would satisfy the cleanup objectives for the Site. By removing the soils with the highest concentrations of contaminants and consolidating these soils under the cap, the potential exposure will be reduced thus reducing any risk.

Also, during the pre-design phase, as a result of recorded soil gas levels, an evaluation of the potential for soil vapor intrusion will be conducted. Sub-slab sampling will be conducted at adjacent residences during the winter heating season. Accordingly, with respect to any future development at the Site, any new construction should evaluate and include impermeable barriers and/or incorporate appropriate subslab depressurization systems or other vapor mitigation technology in order to prevent any subsurface vapors from impacting indoor air. Institutional controls would be enacted at the Site which would include the development of an environmental easement or other restrictive covenant to be filed in the property records of Ulster County that 1) would prevent any disruption to the landfill cap, 2) would include groundwater use restrictions on the Site and 3) would allow for residential use of the non-landfill portion of the property, as well as restricted residential, commercial and/or industrial use.

Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the Site be reviewed every five years. Also, provisions will be made for periodic reviews and certifications of the institutional and engineering controls, pursuant to 6NYCRR 375. If justified by these reviews, additional remedial actions may be implemented at the Site.

Basis for the Remedy Preference

Alternative 2C provides the most cost-effective solution, applying the evaluation criteria given the reasonably anticipated future use of the Site. The installation of a landfill cap would reduce contaminant mobility thus limiting any migration to the groundwater as a result of infiltration.

As a result of the installation of a landfill cap, the limited groundwater contamination underlying the Site and the incorporation of a long-term groundwater monitoring program into Alternative 2C, Alternative G1 is the preferred groundwater alternative.

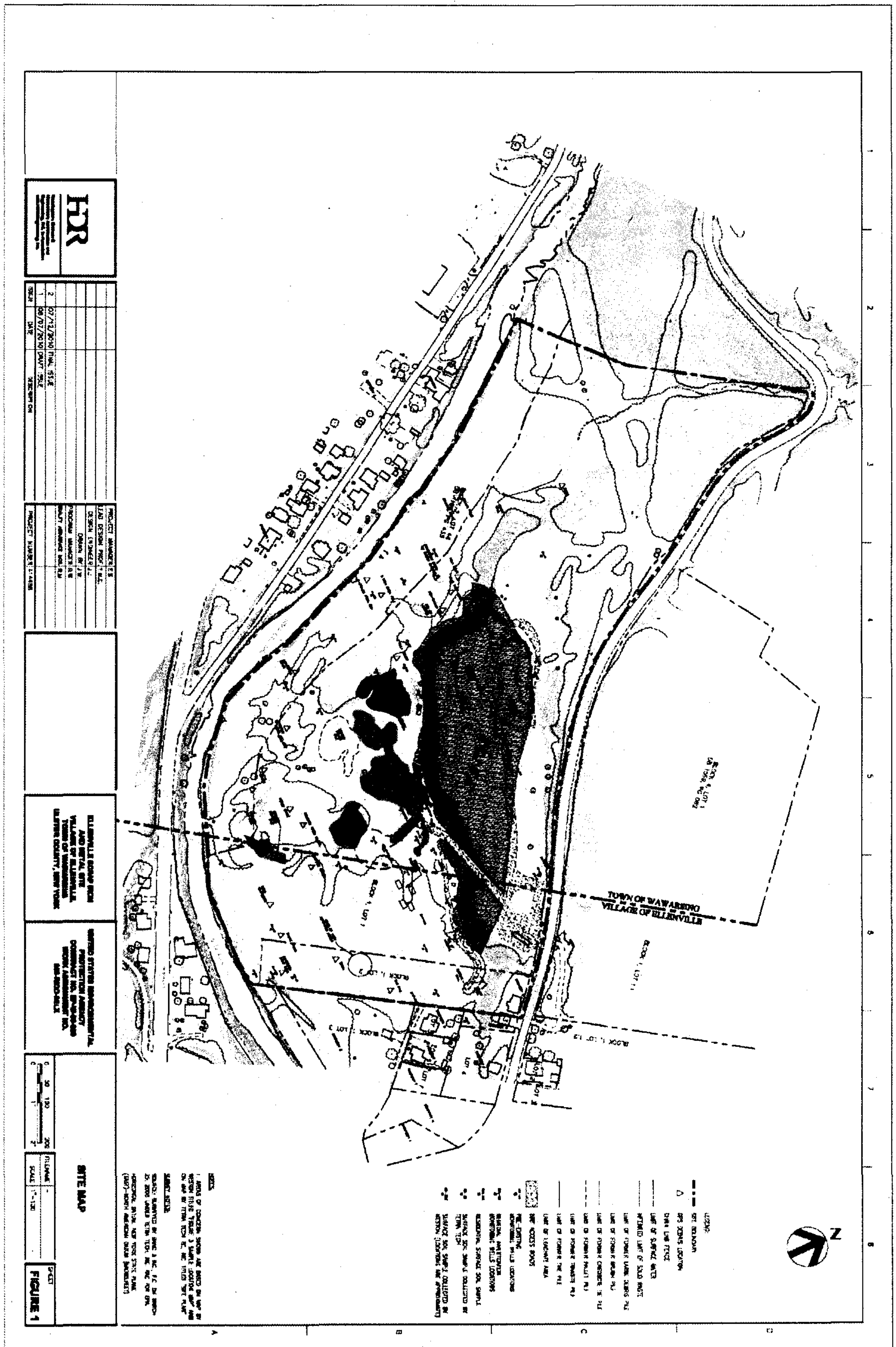
The preferred remedy of excavating the contaminated soils from AOCs 1 through 6 and consolidating them under the landfill cap (AOC 1) would provide protection of the groundwater. Alternative 2A would provide a similar remedial action even though there is less soil consolidation; however, there would be a larger landfill cap. As a result, Alternative 2A would require more maintenance and is less cost-effective. Alternative 2C, with a reduced cap size, would provide more usable area for potential reuse and redevelopment of the Site. EPA strongly supports reuse and redevelopment at Superfund sites. Alternative 2C requires less cost than Alternative 2A and 4. Alternative 2C excavates the contaminated soils in the AOCs throughout the Site and consolidates them under a landfill cap which meets the substantive requirements of NYS Part 360, in combination with engineering and institutional controls. Alternative 4 is considerably more expensive than Alternative 2A or 2C, requiring a large excavation effort and off-site disposal.

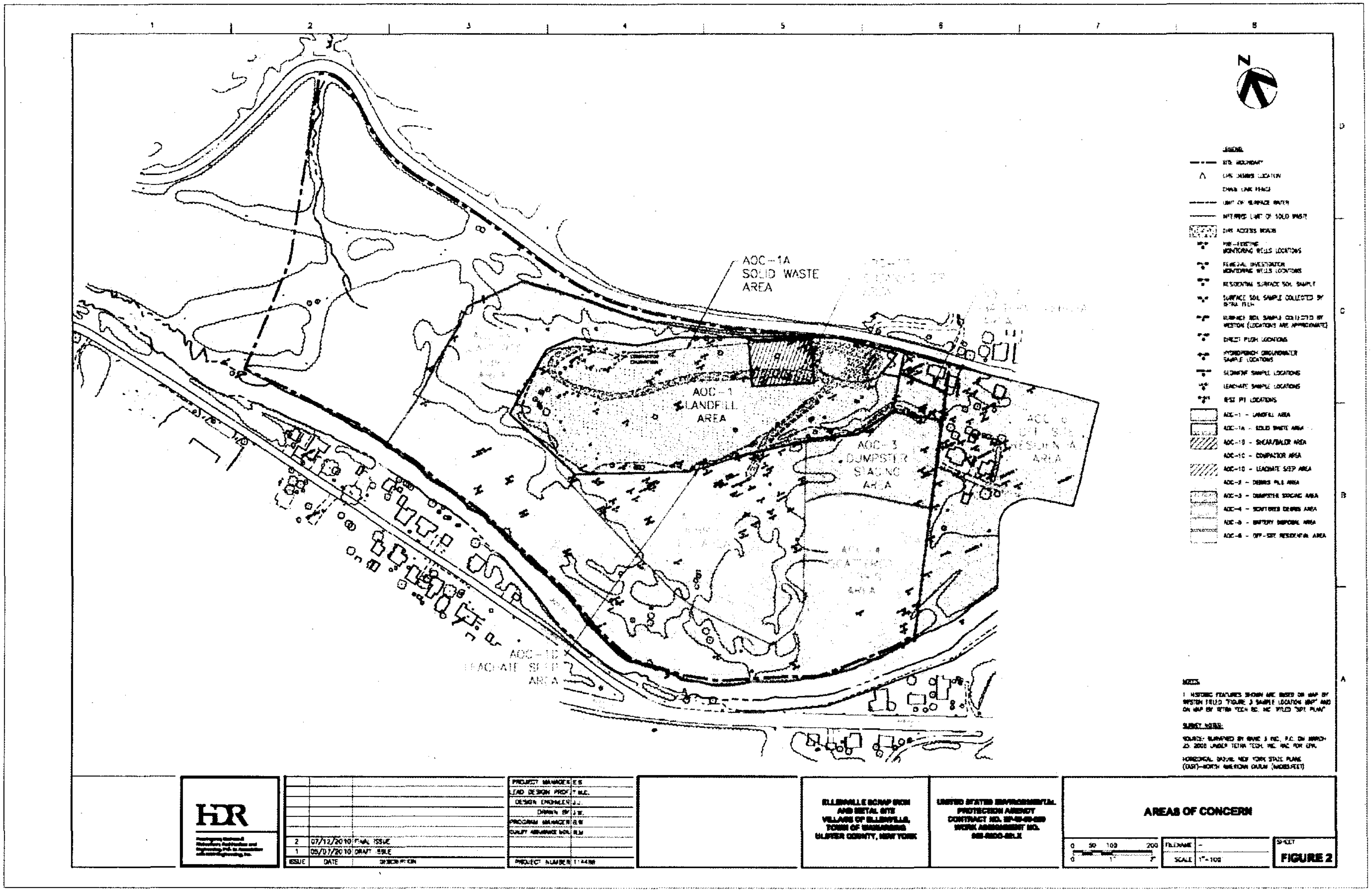
Alternative 1 was not selected, because it is simply a baseline for comparison with other alternatives. Alternative 2A was not selected, because of the increased area of the cap and does not afford the opportunity for increased redevelopment and reuse of the Site. Alternative 4 was not selected, because of the impact of the extensive truck traffic through the community and its high cost. Therefore, EPA believes that Alternative 2C would meet the soil cleanup objectives and afford extensive groundwater monitoring to provide the best balance of tradeoffs with respect to the evaluating criteria.

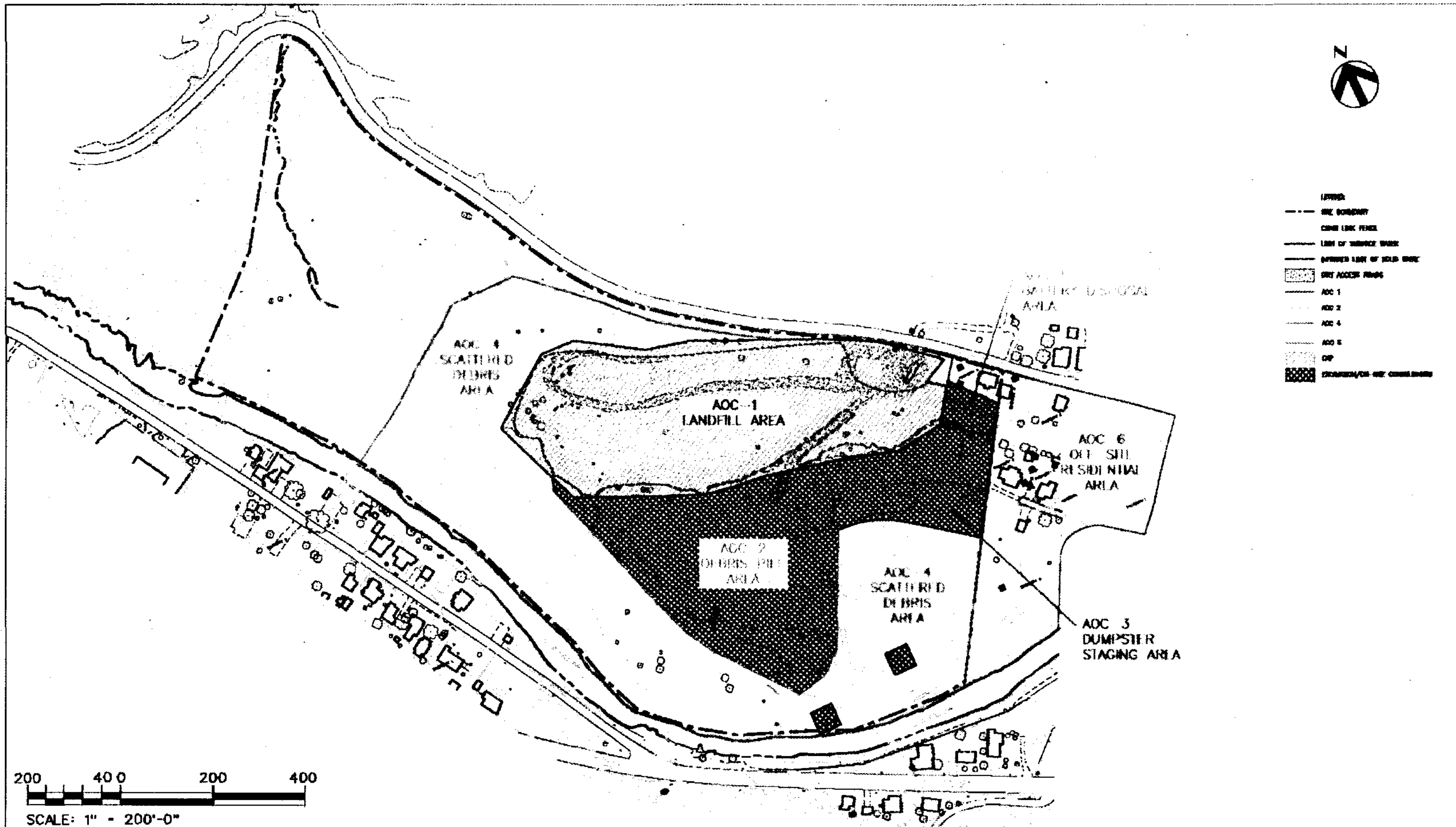
The preferred remedy would be protective of human health and the environment, provide long-term effectiveness, achieve ARARs in a reasonable time frame and be cost-effective among alternatives with respect to the evaluation criteria.

In accordance with EPA Region 2's Clean and Green policy and in order to maximize the net environmental benefits, EPA will evaluate the use of sustainable technologies and practices during the design, construction and operation of the selected remedy.

EPA, in conjunction with NYSDEC, believes that the preferred remedy would treat principal threats and utilize permanent solutions to the maximum extent practicable. Under Alternatives 2C and G1, the Agency is taking effective action to remove the sources of contamination in the soils from potentially further impacting groundwater.


HDR
TOWN OF WAWARSING
VILLAGE OF ELLENVILLE
SITE MAP
FIGURE 1


AOC-1A
SOLID WASTE
AREA
AOC-1
LANDFILL
AREA
AOC-3
DUMPSTER
STAGING
AREA
AOC-1C
LEACHATE SEEP
AREA
AREAS OF CONCERN
FIGURE 2
HDR
ELLENVILLE SCRAP IRON
AND METAL SITE
VILLAGE OF ELLENVILLE,
TOWN OF WAWARSING
ULSTER COUNTY, NEW YORK
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY
2 07/12/2010 FINAL ISSUE
1 05/07/2010 DRAFT ISSUE
ISSUE DATE DESCRIPTION
PROJECT NUMBER 114488
SCALE 1"=100



SURVEY NOTES:

SOURCE: SURVEYED BY BANC 3 INC., P.C. ON MARCH 25, 2008 UNDER TETRA TECH, INC. RAC FOR EPA.

HORIZONTAL DATUM: NEW YORK STATE PLANE (EAST)—NORTH AMERICAN DATUM (NAD83:FEET)

NOTES:

1. HISTORIC FEATURES SHOWN ARE BASED ON MAP BY WESTON TITLED "FIGURE 3 SAMPLE LOCATION MAP" AND ON MAP BY TETRA TECH FC, INC. TITLED "SITE PLAN".

HDR

ELLENVILLE SCRAP IRON AND METAL SITE
VILLAGE OF ELLENVILLE,
TOWN OF WAWARSING
ULSTER COUNTY, NEW YORK

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CONTRACT NO. EP-W-09-009
WORK ASSIGNMENT NO.
008-RICO-02LX

ALTERNATIVE 2C - CAPPING/ON-SITE CONSOLIDATION

DATE 07-12-2010

FIGURE
FIGURE 3

ELLENVILLE SCRAP IRON AND METAL SUPERFUND SITE
RECORD OF DECISION

APPENDIX V - RESPONSIVENESS SUMMARY

APPENDIX B

PUBLIC NOTICE

Local Government

The United States Environmental Protection Agency Invites Public Comment on the Proposed Cleanup Plan for the Ellenville Scrap Iron and Metal Superfund Site

The Proposed Plan for the Ellenville Superfund site identifies the preferred cleanup plan with the rationale for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA), in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under federal laws governing cleanup of hazardous waste sites. We encourage the public to be a part of the site decision-making process.

EPA's preferred cleanup plan consists of the following: 1) excavation of contaminated soils throughout six "Areas of Concern", 2) backfilling the excavated areas with clean material, 3) consolidating all excavated soils in the upper portion of the site and landfill area, 4) installing a landfill cap over the existing landfill and over the relocated contaminated soils and 5) development of a site management plan to include long-term ground- water monitoring and engineering and institutional controls.

EPA invites you to attend a public meeting to discuss the preferred cleanup plan and the other cleanup plans considered. The public meeting will be held on:

Wednesday, August 18, 2010 @ 7:00 PM
Ellenville Government Center – 2 Elting Court
Village of Ellenville, New York

EPA is taking written comments on the Ellenville Scrap Iron and Metal site through August 28, 2010. The Proposed Plan and other site documents are available at the Village of Ellenville Public Library at 40 Center Street (845-647-5530) and EPA's New York offices. The Proposed Plan is also available on EPA's Ellenville Scrap Iron and Metal Web site under "Additional Documents" at:

www.epa.gov/region02/superfund/npl/ellenville.

To submit comments, please write to Damian Duda, project manager at U.S. EPA, 290 Broadway, 20th Floor, NY, NY, 10007 or by e-mail to duda.damian@epa.gov Questions should be directed to David Kluesner, EPA's community involvement coordinator, at 212-637-3653 or tollfree at 800-346-5009 or, by e-mail at kluesner.dave@epa.gov.

ELLENVILLE SCRAP IRON AND METAL SUPERFUND SITE
RECORD OF DECISION

APPENDIX V - RESPONSIVENESS SUMMARY

APPENDIX C

AUGUST 18, 2010
PUBLIC MEETING ATTENDANCE SHEET

ELLENVILLE SCRAP IRON & METAL SUPERFUND SITE
PROPOSED PLAN PUBLIC MEETING SIGN-IN SHEET

Project:	Ellenville Scrap Iron & Metal Site	**Date**	Wednesday, August 18, 2010
Held At	Ellenville Government Center	**Place**	Village of Ellenville, NY

Name & Affiliation (if any)	Address	Phone	E-Mail
Richard Hamlin	167 Hotel Rd Remsen NY 13438	315-269-3114	rhamlin@conticorp.com
David Henning	1208 Barnesdale Rd	609 221 9283	
Marlene L Chapin	34 Cape Ellenville	647-5823	
Patty Steinhoff village trustee	Ellenville		Steinhoff 647P yahoo
Wendy Robinson	3 Lake Street Goldens Bridge NY 10526		wrobinson @kedafa.com
Alex Rosario mid-hudson news			
William + Sarajean Harris	29 Cape Ave, Ellenville NY 12428	647-9143	
Dolores Sherry	26 Greenfield Rd	647-7266	
David Mille (ECC)	1125 Route 22 west Bridgewater, NJ		
Lou Seijido	2045 Hwy Edison, NJ	978-318-9095	Lseijido@conticorp.com
Gloria Seijido	1 Berwick Place	"	gsevision@aol.com
Mary Sheeley	2 ELTING Ct Ellenville	647-7080 x 300	msheeley@villageofellenville.com
Leonard m Distel	1748 vista Hts al Ellenville	647-6520 ext 6	
Tim Distel			
Morton Bennett	BURLISON Ave Ellenville NY		
Tod Westlake Shawangunk Journal	1 Market St P.O.Box 669 Ellenville 12428	(845) 647-9190 " 633-6079	tod@gunkjournal.com
BRIAN A. SCHUG JR	43 Tuthill Ave Ellenville, NY 12428	845-647-4556	toxicbas@verizon.net

ELLENVILLE SCRAP IRON AND METAL SUPERFUND SITE
RECORD OF DECISION

APPENDIX V - RESPONSIVENESS SUMMARY

APPENDIX D

WRITTEN COMMENTS (EMAILS) SUBMITTED DURING THE PUBLIC COMMENT PERIOD

Ellenville site
McNally, John M
to:
Damian Duda
08/23/2010 07:43 AM
Show Details

Damian,

In the current clean up plan is any soil going to be removed off site or will it all be capped? Also, has a consulting firm been chosen to manage the project? Any information is appreciated.

Thank you.

http://www.dailyfreeman.com/articles/2010/08/20/news/doc4c6dfd2f0e036405758450.txt

John McNally
Project Services Business Development Manager
Clean Harbors Environmental Services
41 Tompkins Point Road
Newark, NJ 07114
Mobile: 201.538.0109
Fax: 973.643.6050
Email: mcnally.john@cleanharbors.com
Web: www.cleanharbors.com

Ellenville Scrap Iron Metal site - Ellenville, NY
Colleen Preston
to:
Damian Duda
08/23/2010 04:07 PM
Show Details

Dear Mr. Duda,
This article prompted me to contact you. I'm wondering if you could provide me with a timeline of remedial activities; when do you think the remedial action will begin, once the proposed plan is finalized?

Is the Proposed Plan available online? If not, is there any way I can receive it electronically?

Who would be handling the procurement process for subcontractors?

My company, ENTACT, is a national remedial construction firm with significant experience in soil remediation. Ultimately, we are interested in finding out how we could be a resource for the physical cleanup work here. Any information you could provide me would be greatly appreciated.

Thank you (in advance), and I look forward to hearing from you soon.

Best Regards,

Colleen Preston
ENTACT Environmental Services
3129 Bass Pro Drive
Grapevine, TX 76051
Main: (972) 580-1323
Direct: (469) 293-4390
Email: cpreston1@entact.com
www.entact.com

Cleanup plan for former Ellenville scrap metal site reviewed at meeting

Friday, August 20, 2010
By Mid-Hudson News Network
ELLENVILLE — The EPA held a public information and comment session in the village of Ellenville on Wednesday to discuss the proposed cleanup plan for a contaminated, 24-acre former scrap metal site that lies in both the town of Wawarsing and Ellenville.

About 10 acres of the Ellenville Scrap Iron Metal property were specifically used for scrap metal operations during the 1950s, which included battery disposal. The property is bound to the north by Cape Road and to the south by Good Beer Kill.

Damian Duda, who is managing the EPA project, said the areas of concern on the site include a former landfill, debris pile area, scattered debris area, battery disposal area, and off-site residential property.

Ellenville Toxic Waste
Bill
to:
Damian Duda
08/27/2010 02:22 AM
Show Details

Mr. Duda,
August 27, 2010

After reading the August 26th edition of the Shawangunk Journal ~~TOXIC TALK ~~ it said that the site plan shows that the soils will be moved from the Village of Ellenville into the Town of Wawarsing...

I am a resident of Wawarsing and have family in different parts of same.. All residents, as far as I know are on well water.. I am asking you sir, WHERE in Wawarsing will this TOXIC WASTE be disposed of???

Thank you,
William Spylios
Phone # (845) 647-1934

re Ellenville Superfund site
CWN4
to:
Damian Duda
08/29/2010 08:49 PM
Show Details

Hi Damian:

My name is Wally Nichols and I'm a resident of the town of Wawarsing. I saw the EPA's preferred clean-up plan and I wanted to discuss one step in particular (Step 4).

Might you be so kind as to give me a shout when you get a minute?

Thanks,

Wally

203 858 3634

Hi Damian re Clay landfill cap Ellenville Superfund site Sept 1 2010
CWN4
to:
Damian Duda
09/01/2010 03:20 PM
Cc:
CWN4, norwegianwoodfrm
Show Details

Hi Damian- thanks for the time today. So we'd like to be considered as a clay source for this, or any project in the area. We have a 150 acre farm with plenty of access for machinery and heavy equipment.

Please let any bidders know about us. The clay has been spec-ed out in the past for suitable use as landfill caps when they were doing that a couple decades ago.

It's great clean stuff with no rocks at all. We will underbid anyone so that might keep overall costs down. Plus we';re pretty close.

Thanks,

Wally and Cori Nichols
203 858 3634

Norwegian Wood Farm
(PO BOX 96)
or
15 Old Queens Highway
Kerhonkson, NY 12446