Superfund Program Proposed Plan

Price Battery Superfund Site Operable Units 1 & 2 Hamburg, Pennsylvania

July 2015

INTRODUCTION

The United States Environmental Protection Agency (EPA) is issuing this Proposed Remedial Action Plan (Proposed Plan) to present EPA's Preferred Alternative for addressing soils, ground water and sediment at the Price Battery Superfund Site (Site). EPA is the lead agency for the Site, and the Pennsylvania Department of Environmental Protection (PADEP) is the support agency. This Proposed Plan summarizes information from the remedial investigation and feasibility studies (RI/FS) conducted for the Price Battery Site. The remedial investigation (RI) and feasibility study (FS) for the Facility Portion of the Price Battery Site were completed in February 2011 and September 2013, respectively. The Final Comprehensive RI Report for the Residential Portion of the Site was subsequently completed in February 2014. EPA had previously issued an Interim Record of Decision (ROD) for the Residential Portion of the Site on September 30, 2009.

The Price Battery Superfund Site is located in the Borough of Hamburg, Berks County, Pennsylvania. The Site was finalized on the National Priorities List (NPL) on April 27, 2005. The National Superfund Database Identification Number is PAN000305679. The Price Battery Superfund Site includes the former Price Battery manufacturing facility (Facility), adjacent residential areas, and other areas within and near Hamburg, Pennsylvania that were contaminated with antimony, arsenic, and lead. The geographic coordinates of the approximate center of the Site are 40.550 degrees north latitude and 75.98 degrees west longitude.

The Site has been organized by EPA into three separate Operable Units (OUs):

- Operable Unit One (OU-1): Residential Portion
- Operable Unit Two (OU-2): Facility Portion (Exide-owned properties)
- Operable Unit Three (OU-3): Site-Wide Ecological Assessment

In this Proposed Plan, EPA is proposing a final remedy for OU-1, Residential Portion. The remedial actions identified in the interim remedy for OU-1, selected in the September 30, 2009 Interim ROD were completed in 2013; therefore, EPA is now proposing No Further Action as the final remedy for OU-1. This Proposed Plan also describes the final remedial alternative EPA prefers for addressing the Facility Portion (i.e., Exide-owned properties) of OU-2 at the Site to address contaminated soils, sediment, and ground water on and/or beneath these properties. The Preferred Alternatives for OU-2 described in this Proposed Plan are consistent with removal actions and remedial actions already undertaken at the Price Battery Site. OU-3 is not addressed in this Proposed Plan and will be the subject of a separate Proposed Plan and ROD.

This Proposed Plan is being issued as part of EPA's public participation requirements under Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9617, commonly known as Superfund, and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR §300.430 (f)(2). The public's comments will be considered and discussed in the Responsiveness Summary of the Record of Decision, which will document EPA's Selected Remedy for OU-1 and OU-2 of the Price Battery Site. This Proposed Plan summarizes information that can be found in greater detail in the RI/FS reports. The RI/FS reports and other documents are contained in the Administrative Record for the Site. EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the Site, and the Superfund activities that have been conducted to date at the Site. The Administrative Record for the Site can be accessed at www.epa.gov/arweb; search "PA", search "Price Battery", search "Remedial--01" and "Remedial--02" (which are all drop down menus).

The Administrative Record may also be viewed at the following locations:

U.S. EPA-Region III Docket Room
Mr. Paul Van Reed
1650 Arch Street
Philadelphia, PA 19103
(215) 814-3157

Hamburg Public Library
35 North Third Street
Hamburg, PA 19562
(610) 562-2843

EPA's proposed remedial decision for OU-1, Residential Area soils is No Further Action. The remedial actions selected in the September 2009 Interim ROD have been completed. EPA completed cleanup of the Residential Portion of the Price Battery Site in October 2013. As the comprehensive RI for OU-1 progressed, EPA identified additional residential properties for cleanup, and EPA incorporated these properties into the residential remedial action that was ongoing pursuant to the September 2009 Interim ROD for OU-1. EPA has completed the residential cleanup at all eligible properties whose owners provided access. There are no known additional residential properties (for which owners provided access) requiring cleanup. The September 2009 Interim ROD also provided for institutional controls and ongoing public education regarding lead exposure risks. Therefore, because no additional cleanup measures are necessary, EPA's preferred remedial decision for OU-1 is No Further Action, and to establish the OU-1 interim remedy as the final remedy for the Price Battery Site OU-1, Residential Portion.

The Preferred Alternative for OU-2, Facility Portion (i.e., Exide-owned properties of the Site) soils, is Alternative S-4A. The Preferred Alternative is to excavate Principle Threat Waste (PTW) lead-contaminated soils and soils exceeding the Remedial Action Level (RAL) cleanup levels for lead calculated specifically for the Exide-owned properties of the Price Battery Site. Contaminated soil would be excavated to required cleanup levels, stabilized (on-site or off-site), and disposed of in an approved off-site disposal facility. The resulting excavations would be backfilled with reclaimed concrete and/or imported clean soils and graded for potential future commercial/industrial redevelopment of the properties. The Preferred Alternative for sediment is SD-3. Contaminated sediment in Kaercher Creek, on the Exide-owned properties, would be removed and the current gabion mattress liner system reinforced to further stabilize the gabion mattress liner system. Underground pipes currently containing contaminated sediment beneath the Facility would be cleaned out and grouted closed to prevent any additional contamination from entering Kaercher Creek.

No Action is being proposed for ground water because isolated ground water contamination has been determined not to be attributable to Site activities. Additional ground water monitoring wells would be installed, and the monitoring well network on the Facility property would continue to be monitored to insure there are no changes to the existing ground water conditions. Institutional controls would also be implemented on the Exide-owned properties of the Site to prohibit residential use of the Site and set forth any additional requirements for future redevelopment of the properties. The estimated cost of the Preferred Remedy is $ 3,222,823

This Proposed Plan identifies EPA's preferred remedial decision for OU-1 and alternatives for OU-2, and no final decision has been made. EPA may modify the preference, select other response actions, or develop other alternatives based on comments received during this period. EPA, in consultation with PADEP, will announce the selection of remedies for OU-1 and OU-2 at this Site in a Record of Decision. EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 300.430(f)(2) of the NCP. This Proposed Plan fulfills the public notification requirements of CERCLA Sections 113(k)(2)(B), 117(a), and 121(f)(1)(G), 42 U.S.C. §§ 9613(k)(2)(B), 9617(a), and 9621(f)(1)(G).

Comments may be submitted to EPA in writing or emailed to:

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SITE BACKGROUND

Physical Characteristics and Land Use

The Price Battery Superfund Site is located approximately 20 miles north of the City of Reading, in the central to southern portion of the Borough of Hamburg, Berks County, Pennsylvania (Figure 1). The Borough of Hamburg is located at the foot of the Blue Mountains, along the Schuylkill River, just south of Schuylkill County. The Price Battery Superfund Site includes the former Price Battery manufacturing facility, adjacent residential areas, and other areas within and near Hamburg, Pennsylvania that were contaminated with antimony, arsenic, and lead. The Site is within a mixed commercial/industrial/residential area which is approximately 1.2 square miles in size. The commercial/industrial land makes up the minority of the area. The Price Battery facility is zoned industrial, and the residential properties are located north, northwest, northeast, east, southeast, and south of the former Facility. Based on the 2010 U.S. Census data (County of Berks 2013) the total population of Berks County is 411,442 people and consists of 164,827 households. The total population of the Borough of Hamburg is 4,289 people and consists of 2,019 households. The land use in the immediate area outside of the Price Battery Site is mostly residential or agricultural. Commercial properties make up the minority of the adjacent property area.

The former Price Battery facility is located at 246 and 251 Grand Street in the Borough of Hamburg. Kaercher Creek flows through the Borough of Hamburg and through the former Price Battery facility before joining the Schuylkill River located to the southwest of Hamburg. The former Price Battery facility, including all Exide-owned properties, covers approximately nine acres of land in the Borough. The Exide-owned properties (Facility Portion) include the following: Warehouse Parcel, Broom Works Parcel, Main Parcel, and Parking Lot (Figure 2).

History of Activities that Led to Contamination

Price Battery Corporation (Price Battery) was founded in 1918 and has occupied at least a portion of its current location since its inception. The Price Battery facility is currently not in operation. The Facility formerly consisted of three large manufacturing buildings (east building, west building, and the oxide department), including a secondary lead smelter [Main Parcel]; a one-quarter-acre lot located between Peach Alley and Third Street [Parking Lot]; a one-acre plot of land located between Walnut and Pine Streets [Broom Works Parcel]; and a large warehouse and parking lot located on a parcel to the west of Second Street [Warehouse Parcel]. The secondary lead smelter ceased operation in 1971. The majority of the buildings, except the warehouse building, were demolished in 2007 and 2008. Since the demolition of the buildings on the Main Parcel, the Main Parcel is currently covered with the former building floors and foundations, concrete, and bituminous pavement. A chain link fence encompasses the entire boundary of the Main Parcel. All four parcels are shown in Figure 2.

The former east building contained a battery storage room, a warehouse room, a loading dock, north and central dry formation rooms, a plate drying room, a plate storage room, a lead oxide pasting area, a battery assembly area, a grid-casting room, and a laboratory. Interior walls had been degraded by acid corrosion and damaged by heavy equipment in several areas. Several 55-gallon drums, sumps, and trenches containing various materials were formerly located in this building. The former west building consisted of a warehouse room, a loading dock, a wet formation area, a finishing room, and an enveloping room. Drums were formerly located in the enveloping area and the wet formation area. Trenches were located in the wet formation area and the finishing room.

The Warehouse Parcel is situated on an approximate 3.12-acre parcel of land west of Second Street and consists of a 30,000-square-foot steel-frame warehouse constructed in the early 1980's and a parking lot which still remain on the property. The warehouse is the only building on the Exide-owned properties. The parking lot area, which lies south of the warehouse, is covered primarily with asphalt and partially by gravel. Historical maps indicate that portions of this area were once the boat basin of the Hamburg section of the Schuylkill Navigation Canal. Aside from the storage of products and materials for the manufacturing operations, which occurred on the Main Parcel, no other activities are known to have been performed at the Warehouse Parcel. The warehouse was used for document and equipment storage, and a nearby business had been granted permission to utilize the paved areas in front of the building for temporary staging of equipment.

From the 1940s to approximately February 1956, Price Battery owned and operated the lead battery recycling and manufacturing facility located at 246 and 251 Grand Street in Hamburg, Pennsylvania. As part of the battery recycling process, Price Battery also owned and operated a secondary lead smelter at the Facility. The Facility recycled lead-acid batteries and also produced approximately 15,000 new batteries per year. New batteries from the Price Battery facility were delivered to customers, and junk batteries were brought back to the Price Battery facility for recycling. Employees at the Price Battery facility split open the used batteries at the smelter at the Facility and reused the lead plates from the junk batteries in the smelter. Price Battery reused only the lead plates from the batteries. The rest of the battery was considered to be waste and was stored in a dump truck. The waste consisted of asphalt, hard rubber, and plastic casing that may have been contaminated with lead. The bottom of the junk battery casings normally contained a lead residue that had settled to the bottom of the battery casing during the battery's lifetime. This residue resulted from the lead oxide and acid that had been placed in the battery as it was being manufactured. When the dump truck was full of waste battery casings, Price Battery employees drove the truck to various locations in and around Hamburg to dump the waste battery casings. Waste battery casings were also made available for people to pick up from the Facility for use as fill.

Noxious odors and acid fumes were reportedly emitted from the Price Battery facility. In 1941, a citizens' group contacted the Borough of Hamburg with concerns about the Facility's operations. The group's legal counsel indicated that smoke stacks on the Facility emitted lead-contaminated ash produced during the melting of old batteries.

From the 1940s until approximately 1961, Price Battery contracted with Blue Mountain Coal Company (Blue Mountain) to compact battery casing waste after it was dumped in and around Hamburg and to remove slag from the Price Battery facility. The slag was left over from the lead smelting operations at the Facility. Blue Mountain dumped the slag at the locations in Hamburg where Price Battery had dumped the battery casings. Beginning in the early 1960s, Price Battery entered into an agreement with Brown's Battery (Brown's) to send junk batteries that were returned from Price Battery's customers to the Brown's breaking facility located in Shoemakersville, Pennsylvania. Brown's broke open the junk batteries and removed the lead plates for return to the smelter at the Price Battery facility, where the lead plates were reused.

In 1956, General Battery Corporation (General Battery) acquired the Facility from Price Battery. General Battery continued Price Battery's battery-making operations at the Facility, making the same products and using the same equipment until 1971, when General Battery closed its smelter operation. In 1987, General Battery merged into Exide Technologies Inc. (Exide). Exide has been held as a corporate successor-in-interest to General Battery Corporation. Exide ceased manufacturing at the Site in 1995.

Enforcement History

EPA has identified Exide as a potentially responsible party (PRP) at this Site. Exide filed for bankruptcy in 2002, and EPA filed a proof of claim in that bankruptcy for several sites, including the Price Battery Site. Given the nature of the bankruptcy proceeding, EPA did not seek to have Exide conduct the cleanup on residential properties addressed by the 2009 Interim ROD (i.e., properties that are not owned by Exide). However, Exide and EPA executed an Administrative Order on Consent (AOC) on May 30, 2007, under Section 104 of CERCLA, for Exide to perform a RI/FS (RI/FS AOC) of all Exide-owned properties. Exide filed for bankruptcy again in 2013, and EPA has filed a subsequent claim against Exide to, among other things, ensure Exide completes its cleanup obligation at the Exide-owned properties.

History of Previous Environmental Investigations

Exide Removal Actions

EPA conducted removal assessment activities at the Price Battery facility from July through October 2002. The assessment included multi-media sampling, test pit excavations, monitoring well installation, and x-ray fluorescence (XRF) analysis. Based on EPA sampling results, the Price Battery facility was found to be heavily contaminated with lead, arsenic, and antimony. On June 23, 2003, pursuant to Section 106 of CERCLA, EPA entered into an AOC with Exide to perform a removal action (Removal AOC) at the Price Battery facility including restricting access to the Price Battery facility and mitigating the threat due to the presence of hazardous substances, among other things. Under the Removal AOC, Exide capped soils on the Broom Works Parcel, paved previously unpaved areas on the Warehouse Parcel, capped sediments in Kaercher Creek on the Main Parcel, and removed waste materials from the Facility including from within any sumps or trenches. A more detailed description is provided below:

Broom Works Parcel Capping: Pursuant to the Removal AOC, Exide was required to mitigate the threat of direct exposure to lead contamination greater than 1,000 parts per million (ppm) within any fenced area. Since surface soils on the Broom Works Parcel contained total lead concentrations as high as 120,000 ppm, the Broom Works Parcel soils were capped, and the parcel was fenced. The cap consisted of a non-woven geotextile installed over a smoothly graded and compacted soil subgrade and covered by 8 inches of crushed stone.

Kaercher Creek Sediment Capping: Exide capped sediments in Kaercher Creek within the property boundary of the Main Parcel. Total lead concentrations detected in the sediments ranged from 4,867 ppm to 24,090 ppm. The cap consisted of approximately 6,500 square feet of 6-inch thick gabion mattresses grouted in place to ensure stability.

Main Parcel Building Cleanout: This process included the pumping and removal of liquid and solid residual waste materials from the Facility sumps, pits, and trenches. After removal of the residual waste materials, the sumps, pits, and trenches were cleaned until their surfaces were visually absent of waste, dirt, or sediment. The areas were subsequently backfilled with stone and capped with 4 to 6 inches of concrete. Liquid and solid wastes were transported off-site for disposal.

Institutional Controls: A Declaration of Use and Deed Restriction (Deed Restriction) was placed on all of the Exide-owned parcels in 2004 as required by the November 12, 2002 Removal Action Memorandum and the Removal AOC. Among other things, the Deed Restriction prohibited use of the Exide properties for residential, recreational, schools, day care facilities, or other uses which could potentially expose children to contamination.

Building Decontamination and Demolition: Although not a specific requirement of the Removal AOC, Exide had the existing buildings on the Main Parcel decontaminated and demolished to grade in the summer and fall of 2007. The decontamination and demolition activities consisted of steam cleaning/pressure washing all remaining equipment and structural components to remove visual contamination pursuant to the requirements of the Resource Conservation and Recovery Act (RCRA) "Debris Rule" codified at 40 CFR §268.45. Following decontamination, the buildings were demolished, and the demolition debris was segregated for off-site disposal or recycling, as appropriate. The remaining floor slabs and paved surfaces of the Main Parcel were swept and pressure washed.

EPA Removal Actions

A separate EPA removal action began on May 12, 2003, to address residential properties contaminated with lead in the vicinity of the former Price Battery facility. From May 2003 through October 2004, this removal action entailed the excavation of residential soils contaminated with lead above 400 ppm from residential yards and the decontamination of residential interiors. An action level for lead dust on floors of 40 micrograms per square foot ($\mu g/ft^2$) was used for interior decontamination consistent with EPA regulations for lead-based paint abatement. In the absence of a site-specific cleanup level for lead-in-soil at the commencement of the removal actions, EPA conservatively used the 400 ppm screening level for lead-in-soil at residential properties as the cleanup level in order to start work as quickly as possible until a residential site-specific lead-in-soil cleanup level was determined for the Price Battery Site, Residential Portion.

During the course of EPA's 2004 removal activities, EPA collected additional information in order to develop a risk assessment and calculate a residential site-specific cleanup level for lead-in-soil that would be protective of children who might be exposed to lead contamination in the soils. This site-specific risk assessment ultimately established a residential cleanup level for lead-in-soil of 572 ppm. Beginning in April 2005, the removal action entailed the excavation of lead-contaminated soils above 572 ppm for lead to "clean" soil (lead soil levels below 572 ppm), unless physical barriers such as tree roots, foundations, etc., prohibited excavation of soils to "clean". In such cases where all lead-contaminated soil above 572 ppm could not be removed, a visual barrier (i.e., orange construction fencing) was placed to indicate the remaining soils potentially contained lead above 572 ppm. The removal action was completed on September 30, 2010, and thereafter, EPA utilized its remedial authority, pursuant to the 2009 Interim ROD for OU-1, for the remediation of the remaining residential properties.

Remedial Response

EPA divided the Price Battery Superfund Site into three operable units (OUs). OU-1 addresses lead-contaminated-residential soils and interiors within and near the Borough of Hamburg; OU-2 addresses the Facility Portions of the Price Battery Site (i.e., the Exide owned properties); and OU-3 is a site-wide ecological assessment. These OUs and actions taken are further discussed below.

Operable Unit One (OU-1) – Residential Portion

Beginning in 2005, and concurrent with the ongoing residential removal actions described above, EPA also initiated a RI/FS for OU-1 to determine the full nature and extent of residential contamination at the Site, to characterize the risks to human health and the environment, and to evaluate alternatives to clean up the residential contamination. The initial findings of the RI/FS are presented in an Interim Remedial Investigation Report for OU-1 (February 2009) and Interim Feasibility Study Report (May 2009) and are documented in an Interim ROD for OU-1, dated September 30, 2009.

The selected remedy in the Interim ROD entailed residential exterior soil excavation and specialized interior cleaning to remove lead-contaminated soils and dust at impacted residential properties, consistent with the ongoing EPA removal action at the time. The Interim ROD authorized work to be performed under remedial authority, instead of removal authority, and enabled EPA to continue to address immediate Site risks while additional work was performed to determine the full nature and extent of residential contamination at the Site. The cleanup of residential properties was completed by EPA in October 2013. The Final Comprehensive RI Report detailing the full nature and extent of the residential contamination and documenting EPA's sampling and cleanup efforts was finalized in February 2014. Cleanup at all known contaminated residential properties, whose owners provided access to EPA for cleanup, has been completed. EPA demobilized from the Site in October 2013 after the completion of the residential cleanup.

Operable Unit Two (OU-2) – Facility Portion

OU-2 addresses all Exide-owned properties within the Borough of Hamburg, including ground water below the properties, which includes the Main Parcel (Facility property), Warehouse Parcel, Broom Works Parcel, and Parking Area. On May 30, 2007, EPA entered into an RI/FS AOC with Exide to perform the OU-2 RI/FS. Exide made the determination to demolish the buildings on the Main Parcel. Pursuant to the AOC, Exide was to initiate the RI/FS after demolition activities were completed. Exide began demolition activities in June 2007 and completed demolition and debris disposal in early 2008. Exide began the RI/FS fieldwork pursuant to the May 30, 2007 RI/FS AOC in September 2008. The RI was completed in February 2011, followed by the FS in September 2013.

Operable Unit Three (OU-3) – Ecological Assessment

OU-3 addresses potential ecological risks associated with former operation of the Price Battery facility with the focus being the investigation of Mill Creek, Kaercher Creek, and the Schuylkill River. The OU-3 RI is currently being performed by EPA and will be the subject of a separate Proposed Plan and ROD when completed.

SITE CHARACTERISTICS

Operable Unit One (OU-1) – Residential Portion

The primary objectives of the OU-1 RI were to determine the extent of residential lead contamination due to lead battery manufacturing and smelting activities at the former Price Battery facility. Subsequent to the completion of the interim RI/FS in 2009, the aerial extent of the Residential Portion of the Site was expanded and additional residential sampling was conducted to define the full extent of residential contamination. It became clear during the interim RI/FS that contamination extended beyond the original estimated boundaries of the Site. The interim approach was used to convert the ongoing cleanup from removal authority to remedial authority as quickly as possible while additional sampling continued to further define the boundaries. Ultimately, the full aerial extent of contamination from deposition of lead dust from the former Price Battery facility encompassed an approximate 1.2-square mile area comprised of the following locations (Figure 3):

- A large area east of the Schuylkill River, bounded by Girard Avenue, Mulberry Alley, and Port Clinton Avenue to the north; Front Street, PA Route 61, and the Schuylkill River to the west; Hawk Ridge Drive to the south; and Kaercher Creek Park and some properties east of the Hamburg Borough in Windsor Township to the west;

- A small eastern area, along Windsor Castle Road; and

- An area west of the Schuylkill River primarily along West State Street and Diamond Drive in Tilden Township.

EPA believes these areas represent the full extent of aerial lead deposition from the Price Battery facility operations. Because EPA suspected that the source of lead contamination in the outer fringes of this area may not be attributable to deposition of air-borne particulates from the former smelter (based on previous air modeling conducted during the Interim RI), alternate source contributions to the lead contamination in these fringe areas were investigated in two additional studies. These studies included a lead-based paint (LBP) assessment of residential homes and a lead speciation study performed by EPA's National Enforcement Investigation Center (NEIC). The results of the LBP assessment and the NEIC lead speciation study are included in the Administrative Record for the Site.

The general conclusion of these studies was that properties in the northernmost and westernmost fringe areas of the OU-1 portion of the Site were impacted, at least partially, by air-borne deposition of lead particulates. NEIC determined that potentially between 16 percent and 33 percent of the lead in the northernmost properties was likely from the battery smelter emissions. EPA determined that, although this contribution was small, as a conservative approach, these properties would nonetheless be eligible for remedial action. However, based on these results, EPA did not expand its investigation any further beyond these properties. EPA believes the lateral extent of lead in surface soil primarily due to smelter operations has been determined.

In total 6,467 surface soil samples were collected from 1,145 properties, 449 subsurface soil samples were collected from 160 properties, and 4,934 dust samples were collected from 500 houses during the

OU-1 RI. EPA has completed significant cleanup of lead-contaminated soil and interior dust at residential properties within the Borough of Hamburg and adjacent areas utilizing both removal and remedial cleanup authorities. As of September 12, 2013, EPA had conducted cleanups at 555 residential property exteriors. This is 92 percent of all known contaminated residential properties where lead concentrations were above the lead preliminary remediation goal (PRG) of 572 ppm in residential soil. Similarly, EPA had conducted removal and remedial actions that cleaned the interiors at 402 residential properties. This is 81 percent of the homes identified as having lead-contaminated indoor dust above the hazard level of 40 $\mu g/ft^2$ for lead dust on floors. The remaining properties with lead contamination were not made accessible to EPA. No additional properties are scheduled for cleanup. EPA completed the remedial action for OU-1 in October 2013.

Operable Unit Two (OU-2) – Facility Portion

Exide conducted the OU-2 RI/FS for the Exide-owned portions of the Price Battery Superfund Site. The OU-2 RI was conducted in two phases (Phase I and Phase II) and consisted of multimedia sampling including soils, sediments, and ground water. A Baseline Human Health Risk Assessment (BHHRA) and a Screening Level Ecological Risk Assessment (SLERA) were also completed as part of the OU-2 RI/FS. A summary of the findings of these investigations is provided below.

OU-2 Geology and Site Soils

The bedrock in the area of the Price Battery Site consists of the Ordivician Hamburg Sequence formation, which consists predominately of gray, greenish-gray, purple, and maroon shale, siltstone, and greywacke. The shallow soils beneath the majority of the Main Parcel and all of the Broom Works Parcel and Parking Lot are "made land" consisting of soils derived from miscellaneous shales and sandstone materials. The western edge of the Main Parcel and the Warehouse Parcel is underlain by the Philo Silt, which is associated with the floodplain deposits of the Schuylkill River. Previous Site investigations have identified additional types of fill containing cinders and ash believed to be derived from coal-fired furnaces and steam engines, cinders and stone fill placed by the railroad as ballast within the railroad right-of-way, and zones of fill containing varying amounts of battery casings and slag.

Soil samples from on-site soil borings were collected on each of the four Exide-owned properties and analyzed for lead, arsenic, and antimony with a subset of the soil samples also analyzed for the full target analyte list (TAL) metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and polychlorinated biphenyls (PCBs). In general, soil borings were completed to a depth of 12 feet below ground surface (bgs) or 4 feet below the native soil/fill interface, whichever was deeper; and samples were collected from various depths within that range. Table 1 summarizes the occurrence of the most commonly detected contaminants in the fill during the OU-2 RI.

Table 1: Soil Contaminant Detections

	Parcel	Samples/Detections	Low (ppm)	High (ppm)	Mean (ppm)
Antimony	Main	109/106	0.18	14,300	335.5
Arsenic	Main	109/109	1.9	4.530	53.1
Lead	Main	109/109	9.8	125,000	7,435
PAHs**	Main	8/12	0.09	189.4	16.2
Antimony	Warehouse	30/30	0.13	447	88.3
Arsenic	Warehouse	30/30	2.6	68	14.5
Lead	Warehouse	30/30	26.5	32,000	6,892
PAHs**	Warehouse	5/5	0.78	9.50	5.25
Antimony	Broom Works	23/23	0.7	119	15.0
Arsenic	Broom Works	23/23	1.2	26.4	11.4
Lead	Broom Works	23/23	14.1	2,280	524.8
PAHs**	Broom Works	3/3	2.29	10.9	6.00
Antimony	Parking Lot	13/13	0.95	10.2	2.90
Arsenic	Parking Lot	13/13	3.6	80.2	25.5
Lead	Parking Lot	13/13	11.9	1,210	258.6
PAHs**	Parking Lot	3/3	0.64	21.1	11.8

PAHs = Polycyclic Aromatic Hydrocarbons
** Sum of individual PAH concentrations detected

Consistent with previous investigations, soil borings encountered a layer of fill material immediately beneath the pavement of the floor slabs of the Main Parcel. The thickness of the fill material encountered on the Main Parcel during the OU-2 RI varied from 1.5 to 7.5 feet. Native soils encountered beneath the fill were comprised of a gray to brown silt with varying amounts of clay and/or sand and, generally, did not exhibit impacts from historic Site operations, although some specific impacts were noted.

In general, analytical results for shallow fill that post-dates commencement of manufacturing operations at the Price Battery facility shows elevated concentrations of lead, arsenic, and occasionally antimony. The occurrence of lead, antimony, and arsenic at the high concentrations observed at the Site is linked to the soil fill materials (often containing slag and/or battery casings), surficial deposits believed to be the result of fugitive dust, and/or the management of lead-bearing wastes on the ground surface.

Shallow fill that predates manufacturing operations is generally lacking in inorganic constituents above the residential soil screening levels but did contain elevated concentrations of polycyclic aromatic hydrocarbons (PAHs). PAHs are a broad range of organic compounds resulting from the incomplete combustion of fossil fuels, including coal. The PAHs occur in fill material comprised of cinders and ash believed to be utilized for construction of the railroad bed and minor filling, and do not appear to be related to past battery manufacturing operations. Coal ash and cinders are fairly ubiquitous in the area and also were found in multiple residential yards during the OU-1 residential cleanup. PAHs were found in 100% of the fill samples analyzed for PAHs on the Broom Works Parcel (a former railroad right-of-way north of the Main Parcel) and the Parking Lot Parcel (a residential parcel east of the Main Parcel). Neither the Broom Works Parcel nor Parking Lot Parcel were ever subject to site manufacturing operations. On the Main Parcel, there is no correlation between elevated lead concentrations in soil and elevated PAH concentrations in soil.

VOC results identified elevated levels of benzene, toluene, ethylbenzene, and xylene (BTEX compounds) in the southeast corner of the Main Parcel. These soils occur in the vicinity of a former gasoline underground storage tank (UST) and will be addressed outside the context of the CERCLA remedial action contemplated in this Proposed Plan. Closure of the UST and remediation of the BTEX-contaminated soils will be conducted under PADEP authority and requirements.

OU-2 Sediment

Sediment samples from the stream bed of Kaercher Creek were collected from depositional locations based on field observations and analyzed for lead, arsenic, and antimony. During the OU-2 Phase I RI, sediment samples were collected from five locations on the Main Parcel and three locations upstream of the Main Parcel. Four additional upstream sediment samples were subsequently collected from sediment depositional areas in the general vicinity of the Apple Alley Bridge during the OU-2 Phase II RI (Figure 4). Sediment sampling results are provided in Table 2 below.

Table 2: Kaercher Creek Sediment Sampling Results

	Residential Cleanup Level*	EPA Freshwater Sediment Screening Level	KC-SED-1 On-site	KC-SED-2 On-site	KC-SED-3 On-site	KC-SED-4 On-site
Antimony	31	2	10.5	6.3	4.6	10
Arsenic	15	9.8	3.4	10.6	8.3	5.1
Lead	572	35.8	850	1150	851	1540

	Residential Cleanup Level*	EPA Freshwater Sediment Screening Level	KC-SED-5 On-site	KC-SED-6 Upstream	KC-SED-7 Upstream	KC-SED-8 Upstream
Antimony	31	2	5.2	3.6	2.7	1.2
Arsenic	15	9.8	6.5	39.1	7.2	4.1
Lead	572	35.8	1770	401	243	131

	Residential Cleanup Level*	EPA Freshwater Sediment Screening Level	Apple Alley (Upstream)				
			1	1D	2	3	4
Antimony	31	2	5.8	1.2	2.7	0.87	2
Arsenic	15	9.8	7.5	5.7	6.7	4.9	4
Lead	572	35.8	545	226	330	175	230

All results in ppm
*OU-1 site-specific soil cleanup levels.
On-site – sediment samples collected within Main Parcel
KC-SED – Kaercher Creek Sediment Sampling Location

Sediment sampling results were compared to the OU-1 residential site-specific soil cleanup levels for potential human health impacts and to the EPA Region III Biological Technical Assistance Group (BTAG) freshwater sediment screening levels for potential ecological impacts. The Kaercher Creek sediment sampling identified concentrations of lead and antimony in the Creek sediment on the Main Parcel above the gabion mattress liner system installed during the removal action which were found to be typically higher than metals concentrations in sediments upstream. Lead results from sediment samples collected from upstream of the Main Parcel revealed lead levels below the OU-1 residential site-specific soil lead cleanup level of 572 ppm in all upstream samples. Lead results in Kaercher Creek sediment samples collected within the Main Parcel were above the established OU-1 site-specific residential cleanup value of 572 ppm with a maximum result of 1,770 ppm of lead. All of the Kaercher Creek sediment samples (upstream and on the Main Parcel) exceeded the freshwater sediment screening level for lead of 35.8 ppm. No Kaercher Creek sediment samples exceeded the OU-1 residential site-specific soil cleanup level for antimony of 31 ppm for residential soil; however, 9 of 12 sediment samples exceeded the antimony freshwater sediment screening level of 2.0 ppm. One sediment sample upstream exceeded both the residential site-specific soil cleanup level and freshwater sediment screening level for arsenic with a concentration of 39.1 ppm. One sediment sample within the Main Parcel exceeded the freshwater sediment screening level for arsenic with a concentration of 10.6 ppm. All other sediment samples were below both the residential site-specific soil cleanup level and freshwater sediment screening level for arsenic. Kaercher Creek sediment samples collected by EPA in 2002, prior to capping of the Kaercher Creek sediments with the gabion mattress liner system under the 2003 AOC, showed lead levels ranging from 4,867 ppm to 24,090 ppm.

In addition, an investigation within the covered area of Kaercher Creek (the portion of Kaercher Creek underlaying the Facility foundation) within the Main Parcel was performed to evaluate the sidewalls of the Creek for pipes and penetrations (other openings). A total of 12 pipes were identified as part of this investigation, and the sediment in a representative number of those pipes was sampled (Figure 5). Sampling identified sediment in two pipes with antimony and lead concentrations an order of magnitude or more greater than the concentrations observed upstream. The results of sediment sampling in several pipes (identified as Pipes 1, 2, 3, and 12) revealed lead concentrations exceeding the residential site-specific human health lead cleanup level of 572 ppm. The highest lead result (26,300 ppm) was recorded in a 12-inch-diameter corrugated metal pipe (Pipe 3). All seven of the pipe sediment samples collected exceeded freshwater sediment screening levels for lead. The highest arsenic result (94.4 ppm) and the highest antimony result (85.2 ppm) were in Pipe 2. Five of the seven samples exceeded the freshwater sediment screening level for antimony of 2.0 ppm, and two of the seven samples exceeded the freshwater sediment screening level for arsenic of 9.8 ppm.

Although the amount of Creek bed sediment data is very limited and no evaluations have been conducted related to stream sedimentology, the information suggests that sediment in the 12-inch diameter corrugated metal pipe identified as "Pipe 3" may, in particular, be a source of contaminated sediment containing elevated levels of lead and antimony that discharges to the Creek. Ultimately the bedload from upstream sediment and the contributions from the pipes may be contributing to elevated metals concentrations observed in sediment which re-accumulated within the gabion mattress liner system on the Main Parcel. However, the gabion mattress liner system itself appears to be in good condition and functioning as a cap for the impacted sediment beneath the gabion mattress liner system addressed during the 2003 removal action. If the gabion mattress liner system were to be damaged or otherwise breached, the underlying sediment could become exposed to the erosive forces of the Creek and be transported downstream.

Table 3: Pipe Sediment Sampling Results

Parameter	EPA Region III Soil Screening Levels		EPA Region III Freshwater Sediment Screening Level	Pipe #						
	Industrial	Residential* Soil		1	2	3	4	6	11	12
Antimony	470	31	2	9.9	85.2	53.4	3.8	0.48	2.0	4.4
Arsenic	480	15	9.8	3.8	94.4	10.2	5.7	3.9	7.4	4.6
Lead	800	572	35.8	670	6130	26300	542	116	350	647

All results in ppm
*OU-1 site-specific cleanup levels.

OU-2 Ground Water

Ground water was sampled from seven overburden and four bedrock monitoring wells on the Exide-owned properties during the OU-2 RI. Depth to ground water ranged from approximately 4 to 8 feet bgs for the overburden wells. The potentiometric ground water surface is 1 to 2.5 feet below the Kaercher Creek stream bed (Figure 6). Therefore, ground water is not discharging into Kaercher Creek. Ground water flow in both the overburden and the shallow bedrock is generally west-southwest towards the Schuylkill River which is consistent with regional ground water flow. In addition, a downward gradient was documented between the overburden and bedrock wells ranging from approximately 2.2 feet along the east side of the Main Parcel to less than 0.1 feet in the southwest corner of the Warehouse Parcel.

Lead exceeded the EPA Region III risk-based screening level of 15 micrograms per liter (μg/l) for lead in tap water (there currently is no maximum contaminant level (MCL) promulgated pursuant to the Safe Drinking Water Act, and codified at 40 CFR Part 141, for lead) in one unfiltered sample from bedrock well 3 (BW-3) at a concentration of 57.3 μg/l. The associated filtered sample, however, was non-detect for lead (<3.0 μg/l). Unfiltered samples measure the total concentration of metals in ground water whereas filtered samples measure the dissolved metals in ground water. Samples for metals analysis are often filtered to remove suspended particulate matter in the water sample. Lead has a strong affinity towards soil particles, and in general, the smaller the soil particle, the greater the affinity. Once adsorbed to a soil particle, lead is not easily released. The variability between the filtered and unfiltered lead result for BW-3 is likely a reflection of turbidity (i.e., suspended particulate matter) in the well resulting from well development difficulties. Arsenic and antimony analytical results did not exceed their respective MCL in any ground water sample collected during the OU-2 RI, although the arsenic results in monitoring well 7 (MW-7) were above the tap water EPA risk-based screening level.

Several PAHs were detected in the ground water sample from MW-2 above their corresponding MCLs and/or risk-based screening levels for tap water during the second round of ground water sampling although they were below detection limits during the first round. PAH impacts in MW-2 were not observed in MW-3 situated approximately 90 feet downgradient, suggesting that the PAH ground water contamination is very isolated in nature. MW-2 is located in the former railroad right-of-way which extends south from the Broom Works Parcel through the Main Parcel. As discussed earlier, PAHs appear to be related to "historic" fill containing cinders and ash that predate Facility operations. The PAHs are believed to be associated with the construction of the railroad tracks in the mid to late 1880s and localized filling using cinders and ash from coal fired heaters, and therefore, not site-related.

A few VOCs were detected during the OU-2 ground water sampling events, although they were typically below the reporting limits with the only noteworthy exceptions being BTEX compounds in nested well pair MW-6 and BW-6, which are an overburden well and bedrock well, respectively. Benzene was detected in overburden well MW-6 at 67 μg/l; although in bedrock well BW-6, benzene was only detected at 6.0 μg/l. The BTEX compounds are associated with an UST in the southeastern corner of the Main Parcel, and the ground water impacted by BTEX compounds appears to be limited in extent to the southeastern corner of the Main Parcel. Exide represents that the UST was a gasoline storage tank; therefore, closure of the UST is deferred to PADEP authority.

The depth of ground water beneath the Site occurs below the bottom of the fill except at the west end of the Warehouse Parcel and possibly in a portion of the Main Parcel. Therefore, ground water interaction with the contaminated fill is limited. Furthermore, based on the ground water sample results, it can be inferred that, even after the many decades the fill material has been in place, very limited ground water impact has occurred. The contaminants which may be present in the fill are not prone to dissolution and transport by ground water in contact with the fill material or surface water infiltrating from the surface through the fill material to ground water.

The potential drinking water aquifer in the vicinity of the Site is the Ordovician sandstone and siltstone bedrock. The overburden in the vicinity of the Site, and regionally, consists of inter-fingering, low permeability silts, clays and sand lenses. Under EPA's ground water classification guidelines, ground water at the Site would be classified as a Class II aquifer. A Class II aquifer is defined as a current and/or potential source of drinking water and water having other beneficial uses. Ground water in the overburden unit above bedrock, however, is not used for supplying drinking water, because bedrock ground water is used as the drinking water source in that area.

The former Facility and the surrounding community are serviced by a public water supply for potable water, although industrial and manufacturing operations along Route 61 south and west of the Facility were purported to have private water supply wells. Public water is provided by the Borough of Hamburg from municipal supply wells located outside of the Borough in Windsor Township. The Borough of Hamburg requires that users within 150 feet of a public supply waterline connect to public water. A detailed well search performed as part of the OU-2 RI identified 11 industrial withdraw wells, 3 unused wells, and 1 overburden ground water monitoring well within 0.5 miles of the intersection of Grand Street and Second Street. The search also identified one domestic well 0.46 miles away situated on the north side of State Street on the west side of the Schuylkill River (Tilden Township). All of the wells identified (except the overburden well) have casings that extend through the overburden unit into bedrock; and the wells extend to depths typically between 200 feet to 500 feet bgs. Water production occurs within distinct bedrock zones.

In addition to the OU-2 ground water sampling, a limited amount of sampling of private residential wells was conducted by EPA during the OU-1 RI in areas within the lead depositional areas but where public water is not available (i.e., Tilden Township). The ground water results did not indicate that Site-related metals are impacting residential ground water quality in OU-1 (outside the Exide-owned properties). Concentrations of Site-related metals in the residential ground water samples were all below MCLs.

SCOPE AND ROLE OF RESPONSE ACTION IDENTIFIED IN THIS PROPOSED PLAN

This Proposed Plan describes EPA's preferred remedial decision for OU-1 (Residential Portion) and preferred remedial alternatives for OU-2 (Facility Portion) at the Price Battery Superfund Site, which have been contaminated primarily with lead, arsenic, and antimony by the former Price Battery facility. On September 30, 2009, an Interim ROD was issued for OU-1 for the cleanup of residential exteriors and interiors consistent with previous removal actions. The 2009 Interim ROD converted the ongoing residential cleanup at the time from removal authority to remedial authority. As a Comprehensive OU-1 RI continued to delineate the full nature and extent of the residential contamination, newly identified residential properties were included in the ongoing remedial action. EPA completed the cleanup of the last residential property, whose owner provided access to EPA for cleanup, in September 2013, and EPA subsequently demobilized from the Site in October 2013. Human health risks at these residential properties were addressed pursuant to the Interim ROD. Therefore, because all known contamination exceeding clean up criteria at contaminated residential properties (whose owners provided access) has been addressed, EPA's preferred remedial decision for OU-1 is No Further Action.

This Proposed Plan also describes the proposed alternative for OU-2 to address soil and sediment contamination on the Exide-owned parcels of the Price Battery Site. In addition, EPA has initiated a Remedial Investigation designated as OU-3 to further study surface water, sediment, and ecological risk in areas outside the scope of OU-1 and OU-2. A final remedy for OU-3 will be the subject of a subsequent Proposed Plan and ROD.

SUMMARY OF SITE RISKS

What is Risk and How is it Calculated?

A Superfund human health risk assessment estimates the "baseline risk." The baseline risk is the estimate of the likelihood of health problems occurring if no cleanup action were taken at a site. To estimate a baseline risk, EPA undertakes a four-step process:

Step 1: Analyze Contamination
Step 2: Estimate Exposure
Step 3: Assess Potential Health Dangers
Step 4: Characterize Site Risk

In Step 1, EPA looks at the concentration of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies help EPA to determine which contaminants are most likely to pose the greatest threat to human health.

In Step 2, EPA considers the different ways that people might be exposed to the contaminants identified in Step 1, the contaminant concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, EPA calculates a reasonable maximum exposure scenario which portrays the highest level of human exposure that could reasonably be expected to occur.

In Step 3, EPA uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential health risks. EPA considers two types of risk: cancer risk and non-cancer risk. The likelihood of any kind of cancer case resulting from a Superfund site is generally expressed as an upper bound probability, for example a "1 in 10,000 chance (1E-04)." In other words, for every 10,000 people that could be exposed, one extra cancer case *may* occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected from all other causes. For non-cancer human health effects, EPA calculates a "hazard index (HI)." The key concept here is that a "threshold level" (measured usually as a hazard index of less than 1) exists below which non-cancer health effects are no longer predicted.

In Step 4, EPA determines whether site risks are great enough to potentially cause health problems for people at or near the site. The results of the three previous steps are combined, evaluated, and summarized. EPA adds up the potential risks from the individual contaminants and exposure pathways and calculates a total site risk.

Calculating Risks from Exposure to Lead

The risk assessment for lead is unique. Lead does not lend itself to traditional risk assessment methods described above because there are no scientifically agreed upon toxicity values for lead. Due to the inability to use traditional risk assessment methods, lead is regulated based on blood lead levels (BLL). EPA's health protection goal is to limit exposure to soil lead levels to ensure that a typical (or hypothetical) child, or group of similarly exposed children, would have an estimated risk of no more than a 5% probability of exceeding a BLL of 10 micrograms per deciliter (μg/dl). The Centers for Disease Control (CDC) recommends that the goal of all lead poisoning prevention activities should be to reduce children's BLLs below 10 μg/dl. Blood lead concentration can be correlated with both exposure and adverse health effects. Existing evidence indicates that adverse health effects occur even at very low exposures to lead (e.g., subtle neurological effects in children have been observed at low doses). To predict blood lead concentration and the probability of a child's blood lead concentration exceeding 10 μg/dl based on a given exposure scenario from multiple sources, a model can be applied which considers lead exposure and toxicokinetics (the absorption, distribution, metabolism, and excretion of lead in the body) in a child to calculate an exposure level that satisfies the risk reduction goal. The Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children is used to predict the risk of elevated BLLs in children and to establish cleanup levels for lead.

The IEUBK Model was used for developing the site-specific lead-in-soil cleanup level of 572 ppm for the Price Battery OU-1 residential cleanup. However, because the future use of the various parcels comprising the Exide-owned properties of the Price Battery Site OU-2 is expected to remain commercial/industrial, and not residential, EPA's Adult Blood Lead Model (ALM) was used for assessing risks from lead exposures at OU-2. BLLs in adolescents and adults are assessed using the ALM. EPA's target for an adult female is to protect a developing fetus to ensure that the fetus has no more than a 5% probability of having a BLL above 10 µg/dl. This goal is based on protecting the fetus of a pregnant site worker.

Borough of Hamburg Redevelopment Planning

Existing zoning of the Exide-owned properties is Business Development (BD) which allows for a variety of commercial and industrial uses; new residential uses are specifically prohibited by the 2004 Deed Restriction implemented pursuant to the Removal AOC. The properties surrounding the Exide-owned properties are similarly zoned, with the exception of the Peach Alley frontage, which is zoned Borough and Village Center (VC). According to the Borough's Redevelopment Area Plan, no zoning text changes are proposed; however, some zoning map amendments are suggested to implement the goals of the plan. The proposed map amendments would include a rezoning of the Main Parcel to VC Borough and Village Center.

Although no specific plans or proposals have been put forth, permitted uses within the VC District would include a variety of commercial, residential, and institutional uses, as well as the creation of a recreational trail through the area. At the request of the Borough of Hamburg, the potential for a recreational trail crossing the Main Parcel, Broom Works Parcel, and Parking Lot Parcel was considered in the development of alternatives for OU-2. However, during recent discussions with Borough officials regarding the recreational trail, Borough officials indicated that the proposed location of the recreational trail has changed, and it is currently envisioned to follow Front Street and not cross the Exide-owned parcels, as originally contemplated. Deed restrictions already in-place for the Exide-owned properties are intended to preclude residential development on those properties, and therefore, the preferred alternatives for OU-2 focus on non-residential exposure scenarios which is consistent with the VC District zoning.

Summary of Site-Related Risks for OU-2

The current and likely future use of the Exide-owned properties is commercial/industrial. Currently the majority of the parcels are paved, covered with buildings, or covered with a stone cap that limits access to soils. These parcels currently have deed restrictions against disturbing the existing cover or using the properties for residential or recreational use or for day cares or schools. However, risks from exposure to contaminated soil for a hypothetical future resident were assessed by comparison of detected concentrations to the EPA residential site-specific cleanup levels for lead (572 ppm), arsenic (15 ppm), and antimony (31 ppm) in soils developed during the Price Battery OU-1 residential cleanup. The results of this screening analysis show that residential risks from soil exposures under baseline conditions at the Exide-owned parcels would be unacceptable.

In addition, risks from exposure to contaminated sediment were also evaluated. In the absence of establishing a screening level for recreational exposure to lead, arsenic, and antimony in sediment, sediment contaminant concentrations were screened against the residential soil site-specific cleanup numbers developed during OU-1. Using residential soil cleanup numbers as a screening criteria for recreational sediment exposure is a very conservative approach and overestimates the potential recreational use exposure risk to sediment. The results of this sediment screening analysis show that risks from sediment exposures under baseline conditions at the Exide-owned parcels would also be unacceptable.

Future exposures to soil may occur if the parcels are redeveloped or the asphalt/stone cap is removed for utility maintenance. Therefore, a detailed exposure assessment was performed for various commercial/industrial scenarios that included specific users and exposure conditions for each of the Exide-owned parcels. The results of a "hot spot" (i.e., areas of high contamination relative to other areas of the Site) analysis showed that soil lead concentrations on the Main Parcel are generally higher in the northeast quadrant of the Main Parcel, both in surface soils and subsurface soils. The Main Parcel was divided into two areas for the purposes of evaluation: Main Parcel A and Main Parcel B (Figure 7). Main Parcel B occupies the northeast quadrant of the Main Parcel, and Main Parcel A occupies the remainder of the Main Parcel. These two areas were each evaluated as a separate exposure area, although the division was based on differences in lead concentrations rather than expectations of exposure patterns. The other three parcels evaluated included the Warehouse, Broom Works, and Parking Lot.

Four receptors were evaluated based on exposure assumptions on each parcel as follows:

- Current Utility Worker (exposed to soil depths 0 – 5 feet)
- Hypothetical Future Office Worker 1 (exposed to soil depths 0 – 1.25 feet)
- Hypothetical Future Office Worker 2 (exposed to soil depths 0 – 10 feet)
- Future Construction Worker (exposed to soil depths 0 – 17 feet, including dermal exposure to ground water)
- Hypothetical Residential Exposure to Ground Water as a Drinking Water Source

Dermal contact with overburden ground water could occur by Construction Workers during construction activities. In addition, although the Site is not currently and will not likely be used for residential use (the former Facility and surrounding community are served by a public water supply), overburden and bedrock ground water risks were evaluated for a future hypothetical residential exposure scenario. There is no widespread ground water contaminant plume at the Site. The residential exposure scenario assumed that a hypothetical residential well could be placed anywhere on-site, and that a resident would be exposed to the concentrations from only that well. Thus, ground water risks were evaluated for individual wells, rather than averaging across all wells within an exposure area. Individual wells were selected from each exposure area that represented the greatest potential risk.

Contaminants of Concern

EPA considers lead, arsenic and antimony as the primary site-related contaminants of concern (COCs) that will be addressed for the Price Battery Site.

The BHHRA for OU-2 of the Price Battery Site identified manganese, PAHs, and BTEX compounds as contributing to the potential risks from the exposure to soils and ground water at the Site. However, manganese concentrations in ground water are comparable to background concentrations and likely not site-related. The PAHs appear to be related to coal ash and cinders in the fill material which pre-dates battery manufacturing operations at the Site and are therefore not site-related. The BTEX compounds are associated with a gasoline UST. Exide represents that the UST was a gasoline storage tank; therefore, closure of the UST will be addressed by the responsible party pursuant to PADEP's UST regulatory authority. Although manganese, PAHs, and BTEX compounds proceeded through the risk assessment process, they are not considered site-related COCs, and EPA will not be proposing any further action to address these contaminants.

Estimated Cancer and Non-Cancer Risks

The estimated cancer and non-cancer risks are discussed below by exposure area for the non-lead contaminants. Cancer and non-cancer risks are summarized in Table 4. Table 4 presents the total risk for each receptor. The total risk is the sum of all the risk pathways (i.e., ingestion, inhalation, and dermal contact with contaminants). Detailed risk calculation tables for each receptor and each individual pathway are presented in Appendix D of the OU-2 Baseline Human Health Risk Assessment Report (BHHRA). Specifically, Appendix D Table 6 of the BHHRA provides a detailed risk summary and includes the percent contribution of each exposure pathway to the total risk, as well as the contaminant contributing the majority of the risk of each pathway.

Calculated total risks include, where applicable, risks associated with exposure to manganese, PAHs, and BTEX which are not considered site-related contaminants and not COCs; therefore, risk values presented in Table 4 are overestimated.

Cancer Risks

In order to evaluate carcinogenic risk, EPA has identified an acceptable risk range of 1 in 10,000 (1E-04) to 1 in 1,000,000 (1E-06), which represents the increased risk of cancer from exposure to site-related contaminants. Cancer risks posed to all Worker receptors were determined to be less than or equal to 2E-05 in the Broom Works Parcel, Parking Lot, and Warehouse Parcel (Table 4). In Main Parcel A, cancer risks posed were found to be at or below 1E-05 for both Office Workers and the Utility Worker. Cancer risk for the Construction Worker in Main Parcel A was determined to be 1E-04; the majority of the risk was found to be from dermal contact with overburden ground water, where most of the risk is posed by exposure to dibenzo(a,h)anthracene (non-site-related contaminant). In Main Parcel B, cancer risk was determined to be 1E-05 for the Utility Worker and Construction Worker, and 1E-04 for Office Worker 2. Cancer risk for Office Worker 1 was determined to be 4E-04; about 80% of the risk is from the soil ingestion pathway, and all of the cancer risk is posed by exposure to arsenic.

For the hypothetical resident exposed to ground water on the Exide-owned properties, cancer risk exceeded EPA's acceptable risk range for exposure to overburden ground water in MW-2 (8E-02); the majority of the risks posed are from ingestion of and dermal contact with dibenzo(a,h)anthracene in overburden ground water. Dibenzo(a,h)anthracene is a PAH likely from the coal ash and cinders deposited at the Site and not site-related since it appears that the coal ash and cinders were used as fill material prior to the commencement of battery manufacturing operations. Cancer risks were 1E-04 for overburden monitoring wells MW-6 and MW-7; the majority of the cancer risks posed are from the ingestion of benzene (non-site-related contaminant) and arsenic, respectively.

Non-Cancer Risks

Non-cancer risks were found to be less than or equal to the target HI of 1 for all receptors in the Broom Works Parcel and Parking Lot (Table 4). Non-cancer risks were below 1 for the Utility Worker in all exposure areas. In the Warehouse Parcel, non-cancer risks were less than 1 for all receptors except the Construction Worker (HI of 2). In Main Parcels A and B, the total HI for both Office Workers ranged from 3 to 11, and the HIs for the Construction Worker were 25 and 18, respectively. For the Office Worker and Construction Worker, nearly all the risk posed was found to be from the soil ingestion pathway, and the major risk contributor is antimony.

For the hypothetical resident exposed to on-site ground water, non-cancer risks were below 1 in monitoring wells BW-6 and MW-2. Non-cancer risks were greater than 1 for exposure to ground water from bedrock monitoring wells BW-3 and BW-7, and overburden monitoring wells MW-1, MW-6, and MW-7. Non-cancer risks for the hypothetical resident exposed to ground water from these wells ranged from 2 to 18 for the child and 1.5 to 8 for the adult. The majority of the risks posed from exposure to ground water in overburden well MW-6 are from the ingestion of benzene and inhalation of xylenes (non-site-related contaminants) while showering. For the other wells, the majority of the risks posed were found to be from the ingestion of manganese (non-site-related contaminant).

Manganese accounts for 75 to 99% of the non-cancer risks to residents hypothetically exposed to ground water from wells MW-1, MW-7, BW-3, and BW-7. However, manganese concentrations in ground water are comparable to background concentrations. Manganese concentrations exceed their respective background concentration only in overburden well MW-7 and bedrock well BW-7, in the southwest corner of the Warehouse Parcel. Therefore, the manganese risks from the other wells are likely due to naturally occurring background concentrations. If manganese were eliminated from the risk assessment, the HI for the child resident would be 1 or below for these wells. Without manganese, overburden monitoring well MW-6 is the only well with ground water posing unacceptable non-cancer risk for the resident, with benzene via ingestion and xylenes via inhalation during showering accounting for the majority of the risk. The benzene and xylenes are associated with a gasoline UST and not –site-related COCs. Exide represents that the UST was a gasoline storage tank; therefore, closure of the UST will be addressed by the responsible party pursuant to PADEP's UST regulatory authority.

Table 4: Summary of Cancer and Non-Cancer Risks

Exposure Area	Receptor	Total Excess Lifetime Cancer Risk[(1)]	Total Hazard Index[(1)]
Broom Works	Office Worker 1	4E-06	0.2
	Office Worker 2	5E-06	0.1
	Utility Worker	5E-07	0.01
	Construction Worker	4E-07	0.8
Main Parcel A	Office Worker 1	5E-06	**5**
	Office Worker 2	1E-05	**4**
	Utility Worker	2E-06	0.3
	Construction Worker	**1E-04**	**25**

Exposure Area	Receptor	Total Excess Lifetime Cancer Risk(1)	Total Hazard Index(1)
Main Parcel B	Office Worker 1	**4E-04**	**11**
	Office Worker 2	**1E-04**	**3**
	Utility Worker	1E-05	0.3
	Construction Worker	1E-05	**18**
Parking Lot	Office Worker 1	2E-05	0.2
	Office Worker 2	1E-05	0.1
	Utility Worker	2E-06	0.01
	Construction Worker	1E-06	1
Warehouse	Office Worker 1	5E-06	0.3
	Office Worker 2	4E-06	0.2
	Utility Worker	6E-07	0.02
	Construction Worker	6E-07	**2**
Resident(2)	MP Well BW-3	NA	**3**
	MP Well BW-6	1E-05	0.2
	MP Well MW-1	6E-05	**7**
	MP Well MW-2	**8E-02**	0.0009
	MP Well MW-6	**1E-04**	**2**
	MP Well BW-7	5E-06	**9**
	MP Well MW-7	**1E-04**	**18**
MP-A Hot Spot	Construction Worker	3E-08	0.04
	Office Worker 2	3E-07	0.00009

(1) Calculated total risks include, where applicable, risks associated with exposure to manganese, PAHs, and BTEX which are not considered site-related contaminants and not COCs; therefore, risk values presented in this table are overestimated.
(2) The Hazard Index reflects non-cancer risks to a child resident exposed to ground water on the Exide-owned properties. Results for the Adult Resident are in the BHHRA.
NA = Not applicable because there were no carcinogenic COCs in this well
Bolded values indicate exceedance of EPA risk ranges.

Lead Risks in Soil

Risks associated with lead exposure were also evaluated and are presented as a probability that predicted BLLs would exceed target ranges (Table 5). Unacceptable risks posed by lead contaminated soil were found to exceed the target probability of 5% for Office Worker 1, Office Worker 2, and the Construction Worker in Main Parcel A, Main Parcel B, and the Warehouse Parcel. Lead risks did not exceed the target probability for any receptor in the Broom Works or Parking Lot parcels. Lead risks for the Current Utility Worker did not exceed the target probability of 5% in any of the five exposure areas.

Table 5: Summary of Soil Lead Risks

Exposure Area	Office Worker 1 (0-1.25 ft)	Office Worker 2 (0-10 ft)	Utility Worker (0-5.25 ft)	Construction Worker (0-17 ft)
Main Parcel A	**58%**	**18%**	0.05%	**64%**
Main Parcel B	**97%**	**78%**	2%	**98%**
Warehouse	**60%**	**14%**	0.06%	**59%**
Broom Works	0.2%	0.06%	0.003%	0.7%
Parking Lot	0.02%	0.01%	0.003%	0.05%

Note: Lead risk given as the predicted probability of fetal blood lead > 10 ug/dl

Ecological Risks

An ecological exposure evaluation was conducted of the Exide-owned properties to determine if any ecological habitat existed, and a Screening Ecological Risk Assessment (SLERA) was completed for sediment sampling results for the Main Parcel portion of Kaercher Creek.

Results for soil and sediment were screened against their respective EPA Region III BTAG Screening Levels (for soil and freshwater sediment benchmarks for sediment) to determine the nature and extent of potential environmental contamination at the Main Parcel. Based on these results, and for the purpose of the SLERA, lead, arsenic, and antimony were selected as contaminants of potential ecological concern (COPECs) in soil and sediment at the Exide-owned properties that make up part of the Site.

The results of the ecological exposure evaluation of the terrestrial portions of the Exide-owned properties supported the conclusion that the barrier created by the pavement, concrete, structures and crushed stone and geotextile cap covering the parcels prevented a complete exposure pathway between ecological receptors and OU-2 Site soils. Therefore, no complete ecological pathways for soils exist on the property and the soil pathway was not further evaluated.

The ecological exposure evaluation of the Kaercher Creek portions of the Main Parcel identified ecological habitat containing limited amounts of vegetative cover and potential foraging areas. Sediment deposits along and within Kaercher Creek resulted in metals contaminant levels for lead, arsenic, and antimony above the EPA Region III BTAG Freshwater Sediment Screening levels. Outside the covered portion of the Creek (where exposure to receptors would be expected to be highest), sediment deposits were largely limited to the Creek edges and along the walls of the channel. Sediment depths ranged from less than an inch to approximately 12 inches along the channel wall, where terrestrial vegetation was observed. This sediment is entirely isolated from the original Creek channel sediments which are now covered by the gabion mattress liner system installed as part of the 2003 removal action.

The sediment surface area outside the covered portion of the Creek is approximately 2,300 ft^2, most of which is covered by vegetation. Only a small area of approximately 900 ft^2 is available as aquatic substrate in this area. Small mussels, larval fish and crayfish have been observed in this area. Although no other aquatic animals were observed, the possibility exists that small transient fish, invertebrates, reptiles, and amphibians may occasionally be present. However, given its size, highly modified benthic structure (gabion mattress liner system) and limited resources (shallow water depth, absence of cover/habitat, lack of consistent food/prey), it is unlikely that significant resident populations of these animals are present. Higher order animals that may also transiently inhabit this area include small mammals and birds. Mammals may include rodents, raccoons, fox, and squirrels. Birds may include passerines, piscivorous birds (e.g., heron), and an occasional raptor. As noted for other possible inhabitants in this area, habitat and other resources are too limiting to accommodate resident populations, and all would be expected to be transient.

In order to evaluate the sediments that have accumulated in the Creek since installation of the gabion mattress liner system, sampling was conducted on the Main Parcel and upstream portions of Kaercher Creek. The possible source of the sediments deposited since the capping of the Creek bottom include bed load from areas upstream of the Main Parcel, sediment laden stormwater discharged to the Creek by the municipal storm sewers, and sediment contributed by pipes discharging at the Exide owned properties that border the Creek. Since the levels of metals contamination found on the Main Parcel portion of Kaercher Creek are higher than those found in sediment samples immediately above the point at which flow enters the Main Parcel, sources other than sediment transport from upstream may be responsible. The pipe sediment sampling results, especially sediment in Pipe 3, suggest those sediments as possible source materials to the Main Parcel portion of Kaercher Creek. Potential downstream migration and deposition of these contaminated sediments is possible.

To determine which contaminants (i.e., lead, arsenic, and antimony) posed a risk, a Hazard Quotient (HQ) was calculated, where HQ = sediment concentration/EPA Region III freshwater sediment screening levels. If the HQ is greater than or equal to 1, contaminant concentrations are considered sufficiently high that they could produce adverse ecological effects and are, therefore, retained as ecological contaminants of concern (COCs). Based on sediment sampling results previously discussed, concentrations of arsenic (1/5 samples), lead (5/5 samples), and antimony (5/5 samples) sampled on Main Parcel Creek sediments did exceed freshwater sediment screening levels.

Risks were estimated by comparing single-points of exposure (i.e., sediment concentrations) with media specific (i.e., sediment) benchmarks. Screening level results indicate that potential ecological risks exist for sediment-based aquatic life, and to a lesser extent, direct and indirect exposure by higher trophic-level organisms. Although HQs are not a risk measure in terms of likelihood or probability of adverse effects, they do provide a benchmark for assessing potential risk.

The results of the ecological risk characterization are summarized in Table 6. The highest measured sediment contaminant concentrations were used and resulted in HQs of 49.4, 1.08, and 5.25 for lead, arsenic, and antimony, respectively. The highest levels are typically used to help ensure that potential threats to the environment are not missed and that the levels of risk are not underestimated. On that basis, lead represented the highest risk to organisms. Since arsenic was observed only slightly above an HQ of 1, in only one sample, it is relatively insignificant as an ecological COC and not expected to have a significant potential for risk or effect among exposed ecological receptors. Antimony was detected in all five Main Parcel samples with HQ results ranging from 2.3 to 5.5. Antimony has a very diverse level and manifestation of effect among biota, but at the low levels observed, is not expected to pose a significant adverse effect to ecological receptors.

Table 6: Kaercher Creek Sediment Ecological Risk Characterization
Main Parcel Portion

	EPA Freshwater Sediment Screening Level	KC-SED-1 On-site		KC-SED-2 On-site		KC-SED-3 On-site		KC-SED-4 On-site	
Parameter		Result	HQ	Result	HQ	Result	HQ	Result	HQ
Antimony	2	10.5	5.25	6.3	3.15	4.6	2.3	10	5
Arsenic	9.8	3.4	0.35	10.6	1.08	8.3	0.85	5.1	0.52
Lead	35.8	850	23.74	1150	32.12	851	23.77	1540	43.02

	EPA Freshwater Sediment Screening Level	KC-SED-5 On-site		KC-SED-6 Off-site		KC-SED-7 Off-site		KC-SED-8 Off-site	
Parameter		Result	HQ	Result	HQ	Result	HQ	Result	HQ
Antimony	2	5.2	2.6	3.6	1.8	2.7	1.35	1.2	0.6
Arsenic	9.8	6.5	0.66	39.1	3.99	7.2	0.73	4.1	0.42
Lead	35.8	1770	49.44	401	11.2	243	6.79	131	3.66

All results in ppm
On-site – sediment samples collected within Main Parcel
Off-site – sediment samples collected outside the Main Parcel
KC-SED – Kaercher Creek Sediment Sampling Location

In summary, ecological COCs include lead, arsenic, and antimony. EPA believes that the potential for direct and indirect sediment-based ecological effects is present, but the limited habitat and likely future remediation of contaminant sources precluded the need to further quantify ecological risk. EPA believes that sediment contained in pipes beneath the Main Parcel could contribute contaminated sediment to the Kaercher Creek bed load in areas downstream from the Main Parcel; therefore, remediation of the sediment in the pipes and within the gabion mattress liner system is necessary.

A comprehensive ecological assessment has also been initiated by EPA for Kaercher Creek (other than on Exide-owned properties), Mill Creek, and the Schuylkill River to further quantify risks to ecological habitat in areas of the Site outside the Exide-owned properties of the Price Battery Site. This ecological assessment once completed will be part of a subsequent OU-3 decision. A final remedy for OU-3 will be the subject of a future Proposed Plan and ROD.

Basis for Action

The BHHRA and ecological risk characterization assessment found that the former Price Battery facility manufacturing operations contaminated soil and sediments with lead, arsenic, and antimony above levels that are protective of human health and the environment and are summarized below.

Soils

For soils on the Exide-owned portions of the Price Battery Site OU-2, EPA has determined there is a basis for action for the following reasons:

- Lead results were above the established OU-1 site-specific residential cleanup value of 572 ppm; therefore, residential risks from soil exposures under baseline conditions at the Exide-owned parcels would be unacceptable.

- Unacceptable risks posed by lead contaminated soil were found to exceed the target probability of 5% for Office Worker 1, Office Worker 2, and the Construction Worker in Main Parcel A, Main Parcel B, and the Warehouse Parcel.

- Unacceptable cancer risks posed primarily by arsenic contaminated soil were found to exceed the acceptable cancer risk range for Office Worker 1 and Office Worker 2 in Main Parcel B.

- Unacceptable noncancer risks posed by antimony and arsenic were found to exceed an HI of 1 for Office Worker 1, Office Worker 2, and the Construction Worker in Main Parcel A and Main Parcel B.

Sediment

For sediment in Kaercher Creek within the Main Parcel of the Exide-owned portions of the Price Battery Site OU-2, EPA has determined there is a basis for action for the following reasons:

- Lead results were above the established OU-1 site-specific residential cleanup value of 572 ppm with a maximum result of 1,770 ppm of lead.

- Lead, arsenic, and antimony exceed EPA freshwater sediment screening levels for ecological receptors

- Unacceptable ecological risks posed primarily by lead and arsenic were found to exceed an HQ of 1 for ecological receptors

- Accumulated contaminated sediment in Kaercher Creek and pipes may be transported to downstream ecological receptors.

Ground Water

For ground water on the Exide-owned portions of the Price Battery Site OU-2, EPA has determined there is no basis for action for the following reasons:

- PAH contamination in overburden monitoring well MW-2 appears to be isolated in nature and related to fill material containing coal ash and cinders used as railroad ballast which pre-dates operation of the Price Battery facility and is therefore not site-related. Monitoring well MW-2 is located in the former railroad right of way.

- BTEX compounds detected in overburden well MW-6 and bedrock well BW-6 appear to be isolated in nature and attributable to a gasoline UST in the southeastern corner of the Main Parcel. Exide represents that the UST was a gasoline storage tank; therefore, closure of the UST will be addressed by the responsible party pursuant to PADEP's UST regulatory authority.

- Elevated detections of lead in bedrock monitoring well BW-3 is believed to be the result of turbidity within the well resulting from well development difficulties and not representative of ground water quality.

- Arsenic was detected above its risk-based screening level in only one well (MW-7) but was below its corresponding MCL.

REMEDIAL ACTION CLEANUP OBJECTIVES

To protect the human health and the environment from potential current and future health risks, remedial action objectives (RAO) have been developed to address contaminated soil and sediment and for monitoring of ground water at the Price Battery Site OU-2.

The RAOs developed for Price Battery OU-2 are presented in Table 7 below:

Table 7: Price Battery OU-2 Remedial Action Objectives

MEDIUM	OBJECTIVE
Soil:	Prevent direct human exposure to soils above the preliminary remediation goals (PRGs) for lead and risk-based concentrations (RBCs) for antimony and arsenic. Prevent potential future impact to stream sediment and surface water by soil erosion from the Facility. Protect ecological receptors from exposure to contaminated soils above ecologically protective values.
Ground Water:	Monitor ground water to insure that the isolated ground water contaminant concentrations do not change.
Sediment:	Minimize the potential for exposure of human receptors to sediment containing COCs in excess of the residential soil screening levels. Eliminate existing on-site accumulations of contaminated sediment in Kaercher Creek and pipes, which sediments could be transported to downstream ecological receptors. Prevent on-site exposure of ecological receptors to sediment containing COCs above EPA freshwater sediment screening benchmarks.

Determination of Risk-Based Concentration for Lead

A risk-based concentration (RBC) is the average concentration in an exposure area that will result in an acceptable risk to a particular receptor (for lead, this term is referred to as the preliminary remediation goal (PRG), but the term RBC will be used for consistency). Lead-in-soil RBCs are risk-based target cleanup levels that must be met *on average* throughout the exposure area. It is acceptable to leave concentrations that exceed the cleanup level (RBC) for lead-in-soil, as long as the post-remediation *average* concentration in an exposure area does not exceed the RBC for lead-in-soil. The soil lead RBC calculated for the Office Worker is 2,240 ppm and 941 ppm for the Construction Worker.

The Remedial Action Level (RAL) is the concentration above which soil must be addressed so that the post-remediation *average* concentration meets the specified target cleanup level (i.e., meets the RBC). The RAL is a cleanup level (i.e., a remedial trigger concentration) that ensures the post-cleanup average concentration within an exposure area achieves the target cleanup level with a specified level of confidence.

The RBCs and corresponding RALs for lead calculated for the exposure scenarios with potentially unacceptable risk are presented in Table 8. **To be conservative, the lowest lead RAL (8,669 ppm) will be applied as the target remedial level for all parcels and all soil depths**, except to the extent that contaminated soil cannot be removed because of field conditions (i.e., physical constraints, maintaining safe excavation slopes, etc.).

Table 8: Soil Lead RBCs and RALs

Receptor	Soil Depth	RBC (ppm)	RAL (ppm)		
			Main Parcel A	Main Parcel B	Warehouse
Office Worker 1	0-1.25 ft	2,240	27,615	12,285	8,669
Office Worker 2	0-10 ft	2,240	35,000	25,300	28,500
Construction Worker	0-17 ft	941	35,000	8,748	9,313

Determination of Risk-Based Concentrations for Arsenic and Antimony

The OU-2 BHHRA includes calculations of arsenic and antimony RBCs in soil for each of the exposure scenarios evaluated. The lowest calculated RBCs were 100 ppm for arsenic (Office Worker) and 46 ppm for antimony (Construction Worker). Elevated levels of antimony and arsenic were generally correlated with elevated levels of lead, and the BHHRA concluded that performing a remedial action to meet the RALs for lead in soil will result in average concentrations of antimony and arsenic below the RBCs identified above.

No unacceptable risk from lead, arsenic, or antimony was identified for the exposure scenarios evaluated in the BHHRA on the Broom Works Parcel or the Parking Lot.

Principal Threat Wastes in Soils

For the purposes of Price Battery OU-2 only, principal threat wastes (PTW) are defined as those materials containing antimony, arsenic or lead at concentrations two orders of magnitude (i.e., 100 times) higher than the RBCs calculated in the OU-2 BHHRA. Although the BHHRA calculated RBCs for a number of exposure scenarios, for simplicity, the lowest calculated RBCs were used to calculate PTW levels. PTWs are defined as those soils with concentrations of one or more constituents above the concentrations in Table 9.

Table 9: Principle Threat Waste Levels

	RBC (ppm)	PTW (ppm)
Antimony	46	4,600
Arsenic	100	10,000
Lead	941	94,100

Relative to these concentrations, PTWs have been identified to exist only on Main Parcels A and B. No PTWs have been identified on the Warehouse, Broom Works, or Parking Lot Parcels.

Contaminants of Concern in Sediment

The COCs in sediment are antimony, arsenic and lead. Sediment contained in the pipes and penetrations (openings in the Kaercher Creek concrete channel wall), and sediment within and on top of the gabion mattresses, must be removed, sealed, or otherwise mitigated to prevent the potential for contaminated sediment transport to downstream ecological receptors and prevent on-site exposure of ecological receptors to sediment containing COCs above levels of concern. Based on a determination in the SLERA that the Main Parcel portions of Kaercher Creek have limited ecological value, remedial action will focus on eliminating contaminated sediment accumulations in the Main Parcel portions of Kaercher Creek and in pipes with the potential to become eroded and transported to downstream ecological receptors. Although Kaercher Creek within the Main Parcel has limited ecological value, this action will also prevent exposure of ecological receptors within the Main Parcel portion of Kaercher Creek to sediment containing COCs above EPA freshwater sediment screening levels. Therefore, the following ecological freshwater sediment screening levels (Table 10) have been identified as the cleanup levels for sediment for the Main Parcel portions of Kaercher Creek and sediment contained in the pipes:

Table 10: Sediment Cleanup Levels

	Human Health*	Ecological
Lead	572	35.8 (TEC)
Arsenic	15	9.79 (TEC)
Antimony	31	3.0 (UET)

All results in ppm
*Site specific residential levels developed by EPA for OU-1
TEC = NOAA Threshold Effect Concentrations
UET = Upper Effects Threshold

Because the freshwater sediment screening levels are lower than the site-specific residential cleanup levels developed during OU-1, EPA will use the more stringent of the two as cleanup levels for protection of human health and ecological receptors[1].

SUMMARY OF REMEDIAL ALTERNATIVES

The Superfund law (CERCLA) requires that any remedy selected to address contamination at a hazardous waste site must be protective of human health and the environment, cost-effective, in compliance with regulatory and statutory provisions that are applicable or relevant and appropriate requirements (ARARs), and consistent with the NCP to the extent practicable.

1 Site-specific ecological sediment cleanup values were not calculated for Kaercher Creek. EPA believes that the potential for direct and indirect sediment based ecological effects is present, but the limited habitat and likely future remediation of contaminant sources by addressing sediment found in the open pipes discharging to Kaercher Creek precluded the need to further quantify ecological risk and the results of the SLERA sufficed. Therefore, the use of the sediment screening ecological values as sediment cleanup levels is reasonable given the limited extent of remediation necessary of Kaercher Creek within the Main Parcel.

Summary of Major ARARS

Operable Unit One

ARARs for OU-1 were identified in the September 30, 2009 Interim ROD for the Residential Portion of the Price Battery Site. No additional ARARs for OU-1 have since been identified. The remedial action at OU-1 is complete, and all ARARs identified in the OU-1 Interim ROD were met during the remedial action.

Operable Unit Two

EPA has identified the following substantive federal and state requirements as applicable or relevant and appropriate requirements (ARARs) or otherwise worthy of consideration during the evaluation of the remedial alternatives in this Proposed Plan.

Off-site disposal of excavated soil from site remediation activities will be determined by whether or not the soil passes the Toxicity Characteristic Leaching Procedure (TCLP) for lead and arsenic. If excavated soils pass the TCLP, then the soil may be disposed of in a permitted nonhazardous Resource Conservation and Recovery Act (RCRA) waste storage, treatment, or disposal facility. If excavated soils do not pass the TCLP, the soils may be stabilized on-site until confirmed to pass TCLP and then disposed of in a permitted nonhazardous waste storage, treatment, or disposal facility. Otherwise, excavated soils that do not pass the TCLP will be disposed of at a permitted RCRA Subtitle C hazardous waste storage, treatment, or disposal facility for stabilization and/or disposal.

The Commonwealth of Pennsylvania has promulgated standards for lead, antimony, and arsenic for soil cleanup under Pennsylvania Act 2, Title 25 PA Code 250; however, for the Price Battery Superfund Site OU-2, a risk-based site-specific cleanup standard was determined through the Superfund risk assessment, which is also consistent with Pennsylvania Act 2, Title 25 PA Code 250.

In addition to ARARs, EPA may implement other federal or state policies, guidelines, or proposed rules capable of reducing the risks posed by a site. Such To-Be-Considered (TBC) standards, while not legally binding (because they have not been promulgated), may be used in conjunction with ARARs as part of the risk assessment conducted for each CERCLA site to set protective cleanup levels and goals. EPA considered the Area of Contamination Policy and its applicability to the remediation of the Exide-owned properties of the Price Battery Superfund Site, specifically the Warehouse Parcel and the Main Parcel. The Area of Contamination Policy allows RCRA hazardous waste to be managed within an Area of Contamination without triggering the RCRA Land Ban Restrictions (which require further treatment of such waste) if the waste is solely managed for consolidation on-site. The Area of Contamination policy was first articulated in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). See 53 FR 51444 for detailed discussion in proposed NCP preamble; 55 FR 8758-8760, March 8, 1990 for final NCP preamble discussion. See also, most recent EPA guidance, March 13, 1996 EPA memo, "Use of the Area of Contamination Concept During RCRA Cleanups." See also, "Management of Remediation Waste under RCRA," EPA530-F-98-026 (October 1998).

In the case of the Warehouse Parcel and the Main Parcel, EPA has determined that, consistent with the Area of Contamination Policy, although these parcels are separated by a public right-of-way, the parcels may be considered as one Area of Contamination for the purposes of consolidating excavated soil from one parcel to another. This decision is based, in part, on the discovery of some lead contamination above background values for the area in subsurface soils below the paved public right-of-way.

Additional ARARs concerning minimization of any effects of remediation on historic properties, or landmarks; consideration of flood plain hazards and flood plain management; avoiding adverse impact to wetlands; clean backfill requirements; and best practices to prevent fugitive dust emissions during any remedial activity were all identified during the evaluation of remedial alternatives. A more detailed description of these ARARs can be found in the ARARs Appendix to this Proposed Plan.

Remedial Alternatives for OU-2

Remedial alternatives for Price Battery OU-2 are presented below. The alternatives are numbered to correspond with alternatives presented in the 2013 Final FS for the Exide-owned portions of the Price Battery Site.

Common Components to all Alternatives

The Declaration of Use and Deed Restriction (Deed Restriction) placed on all of the Exide-owned parcels in 2004 as required by the November 12, 2002 Removal Action Memorandum and Removal AOC is incorporated as a common component in all the proposed alternatives discussed below. Among other things, the Deed Restriction prohibited use of the Exide properties for residential, recreational, schools, day care facilities, or other uses which could potentially expose children to contamination. Additional institutional controls ("ICs") will be required limiting access for future development, improvement, and use of the Exide-owned properties where residual risk may remain after cleanup. ICs will include activity and use restrictions enacted through proprietary (e.g., easements, covenants) and/or governmental (e.g., zoning requirements) controls to prevent use of the property that will pose an unacceptable risk to receptors. The exact type of IC implemented will be determined by EPA in consultation with PADEP and local government agencies. The restrictions in the current Declaration of Use and Deed Restriction will be incorporated into any new institutional controls.

In addition, Five Year Reviews are an element common to all the remedial alternatives. Five Year Reviews are required on all Superfund sites when there is waste left in place. In the case of this Site, lead-contaminated soils and sediments will be left in place for all the alternatives above levels that allow for unlimited exposure and unrestricted use of the Exide-owned properties.

SOIL ALTERNATIVES

Alternative S-1: No Action

Estimated Capital Cost: $0
Estimated Annual O&M Cost: $0
Estimated Present Worth Cost: $0
Estimated Construction Timeframe: N/A
Estimated Time to Achieve RAOs: N/A

The NCP requires that EPA include a "No Action" Alternative in its remedy selection decision making process. Under the No Action Alternative, no cleanup measures would be implemented. The purpose of the No Action Alternative is to provide a baseline to compare the other clean up alternatives. The No Action Alternative would not meet any of the cleanup objectives described earlier in this Proposed Plan. Furthermore, the No Action Alternative would not provide the controls necessary to protect human health and the environment from the Site-related lead, arsenic, and antimony soil contamination other than the current deed restriction on the property which prohibits residential use. There are no costs to implement, operate, and maintain this Alternative. However, because existing contaminated soils would remain in place, EPA will conduct Five-Year Reviews as required by Section 121(c) of CERCLA.

Alternative S-2: Institutional Controls

Estimated Capital Cost: $20,900
Estimated Annual O&M Cost: $5,400
Estimated Present Worth Cost: $87,909
Estimated Construction Timeframe: 1 Week
Estimated Time to Achieve RAOs: NA

Alternative S-2 would control risks primarily through limitation of access to areas of contamination. Debris remaining from past Site operations would be removed. The perimeter fence around the Main Parcel would remain for security and general safety purposes, at least until the property is sold or redeveloped. Institutional controls (ICSs) would provide notice that contamination is known to exist and that uncontrolled intrusive activities are limited or restricted. Future excavation for redevelopment or utility work would be limited to depths and locations where contamination has been shown not to present unacceptable risks or done only within carefully developed procedures approved by EPA in consultation with PADEP. No residential use of the properties would be permitted. ICs would include activity and use restrictions enacted through proprietary (e.g., easements, covenants) and/or governmental (e.g., zoning requirements) controls to prevent use of the property that would pose an unacceptable risk to receptors. The exact type of IC implemented would be determined by EPA in consultation with PADEP and local government agencies. The restrictions in the current Declaration of Use and Deed Restriction would be incorporated into any new institutional controls.

Activities would include semi-annual inspections of overall site conditions to confirm no disturbance is occurring, evaluating the integrity of the site cover system (including the existing gabion mattress liner system), and ensuring that the institutional controls remain protective. EPA would conduct Five-Year Reviews as required by Section 121(c) of CERCLA.

Alternative S-3: Excavation, Stabilization, and Off-Site Disposal of Soils Defined as Principal Threat Waste; Capping Remaining Soils In-Place; Institutional Controls

Estimated Capital Cost: $1,109,994
Estimated Annual O&M Cost: $4,050
Estimated Present Worth Cost: $1,160,251
Estimated Construction Timeframe: 22 Weeks
Estimated Time to Achieve RAOs: 22 Weeks

Alternative S-3 improves the Site for potential re-use and/or redevelopment while minimizing the amount of excavation and soils management. Under this alternative, PTW soils would be excavated, stabilized, and disposed off-site at an approved disposal facility. Stabilization of excavated PTW soils could occur either on-site or off-site, as necessary, to meet disposal requirements. Any soils exceeding the RAL which overlay the PTW soils would be removed and managed consistent with the PTW soils. Other RAL soils not overlying the PTW soils would not be excavated and remain in-place. Approximately 1,540 cubic yards (cy) and 1,310 cy of soil would be excavated from Main Parcel A and Main Parcel B, respectively. Soils would be excavated to depths ranging from approximately 2 feet to 6 feet below ground surface. No excavation would occur on the Warehouse Parcel because there are no identified PTW soils on this parcel.

The excavations would be backfilled with reclaimed concrete and soils segregated during excavation of the PTW soils (and proven to be below the PADEP non-residential statewide health standards) and/or imported clean fill material. Backfilling would be performed to levels at or near existing grades except as coordinated with site redevelopment activities. Imported clean soil must have maximum concentrations of no more than 50 ppm and 15 ppm for lead and arsenic, respectively. All other chemical parameters for the imported soil would meet Pennsylvania Clean Fill criteria. The existing concrete/asphalt cover over RAL soils would be maintained as a cap, or buildings and pavement associated with future redevelopment, if they occur, function as a cap. Any future redevelopment, if known, would be incorporated into the cap design. If the scope of future redevelopment is not known, the cap would be designed to the extent possible to accommodate a variety of potential redevelopment options. The IC requirements of Alternative S-2 are included in this Alternative. Because existing contaminated soils will remain in place, EPA would conduct Five-Year Reviews as required by Section 121(c) of CERCLA.

Alternative S-4A: Excavation, Stabilization, and Off-Site Disposal of Soils defined as Principal Threat Waste and Soils Exceeding the Remedial Action Level; Institutional Controls

Estimated Capital Cost: $2,731,416
Estimated Annual O&M Cost: $3,713
Estimated Present Worth Cost: $2,777,484
Estimated Construction Timeframe: 54 Weeks
Estimated Time to Achieve RAOs: 54 Weeks

Alternative S-4A also would improve the Site for potential re-use and/or redevelopment. Alternative S-4A goes beyond Alternative S-3 in that all PTW and RAL soils would be excavated, stabilized, and disposed off-site at an approved disposal facility. Soils below the site-wide RAL would remain in-place. Stabilization of excavated PTW and RAL soils could occur either on-site or at an off-site disposal facility, as necessary, to meet disposal requirements. Approximately 1,820 cy, 2,470 cy, and 3,900 cy of soil would be excavated from Main Parcel A, Main Parcel B, and the Warehouse Parcel, respectively.

Concrete pavement, floor slabs, and foundations overlying the RAL and PTW soils will be segregated, cleaned to remove residual contamination (based on visual observations) pursuant to the requirements of RCRA, crushed, and stockpiled. Crushed material will be analyzed for inorganic constituents and the results compared against the PADEP Statewide Health Standards for non-residential soils (direct contact) prior to reuse as backfill. Imported clean soil shall have maximum concentrations of no more than 50 ppm lead and 15 ppm arsenic. All other chemical parameters for the imported soil would meet Pennsylvania Criteria for Management of Fill. Backfilling would be performed to levels at or near existing grades except as coordinated with site redevelopment activities. Any crushed material used for backfilling will be overlain by imported clean fill. Institutional controls would be imposed that protect or control future redevelopment/land use at the Site and would require control of soils generated during future construction activities as such soils (i.e., soils above the RBC but less than the RAL) could represent a risk if not properly managed. Residential redevelopment would be prohibited. The IC requirements of Alternative S-2 are included in this Alternative. Because existing contaminated soils would remain in place, EPA would conduct Five-Year Reviews as required by Section 121(c) of CERCLA.

Alternative S-4B: Excavation, Stabilization and Off-Site Disposal of Soils defined as Principal Threat Waste; Excavation and On-Site Consolidation of Soils Exceeding the Remedial Action Level; Institutional Controls

Estimated Capital Cost: $1,691,585
Estimated Annual O&M Cost: $13,500
Estimated Present Worth Cost: $1,859,107
Estimated Construction Timeframe: 56 Weeks
Estimated Time to Achieve RAOs: 56 Weeks

Alternative S-4B also would improve the Site for potential re-use and/or redevelopment. This alternative is similar to Alternative S-4A in that all PTW soils and RAL soils would be excavated. Excavated PTW soils would be stabilized and disposed off-site. However, RAL soils would not be disposed off-site, but rather they would be consolidated into a single capped area on-site. Soils below the RAL would remain in-place. The excavated RAL soils would be placed in a designated consolidation area on one of the Exide-owned properties without stabilization. All four Exide-owned parcels are considered one Area of Contamination. Consolidation within the Area of Contamination would not represent hazardous waste generation, and would not trigger RCRA Land Disposal Restrictions or minimum technology requirements. RCRA Corrective Action Management Unit (CAMU) requirements would not be triggered because the RAL soils would not be stabilized. The specific location for the consolidation area could be adapted to fit future land development concepts, but would most likely result in a consolidation area in the northeast corner of the Main Parcel. The consolidation area would be created by excavating an area and depth to accommodate the volume of RALs soil and the cap. A 24-inch thick cap (consisting of soil and/or pavement) would be placed across the consolidation area. The edges of the cap would be flush with surrounding grades and grading would be designed to avoid sharp changes in grade, slopes greater than a ratio of 3 horizontal to 1 vertical and finished grades greater than 5+/- feet above surrounding grades. The depth of the consolidation area would be limited by ground water. In addition, other soils (i.e., soils with concentrations below the Site-wide RAL) excavated during creation of the consolidation area could be utilized for backfill of the excavation areas and for capping. The IC requirements of Alternative S-2 are included in this Alternative. EPA would conduct Five-Year Reviews as required by Section 121(c) of CERCLA.

SEDIMENT ALTERNATIVES

Alternative SD-1: No Action

Estimated Capital Cost: 0
Estimated Annual O&M Cost: 0
Estimated present Worth Cost: 0
Estimated Construction Timeframe: NA
Estimated Time to Achieve RAOs: NA

The No Action Alternative is required by CERCLA as the basis for comparison with other alternatives. This alternative involves no action to reduce the risks posed by sediments at the Site. None of the contaminated sediments would be addressed. Utilizing the No Action Alternative, the contaminated sediment above and below the gabion mattresses and within piping that discharges into Kaercher Creek at the Site would remain in-place, and the current deed restrictions would remain in-place. EPA would conduct Five-Year Reviews as required by Section 121(c) of CERCLA.

Alternative SD-2: Institutional Controls

Estimated Capital Cost: $20,900
Estimated Annual O&M Cost: $5,400
Estimated present Worth Cost: $87,909
Estimated Construction Timeframe: 1 Week
Estimated Time to Achieve RAOs: NA

Alternative SD-2 is a limited construction alternative that would control human health risks primarily through limitation of access to areas of contamination. The perimeter fence around the Main Parcel would remain for security and general safety purposes, at least until the property is sold or redeveloped. The gabion mattress liner system in the Creek would be included in this alternative, ensuring that the integrity of the stream liner system is documented and maintained. The gabion mattress stream liner system is approximately 6,500 square feet (ft^2) and includes an estimated 100 cy of impacted stream sediment within the gabions. Sediment in the underground pipes would remain under this alternative. Periodic maintenance and inspection of the Site are included in the cost estimate for this alternative. Activities include semi-annual inspections of overall Site conditions, including soil and sediment areas to confirm no disturbance is occurring and to evaluate the integrity of the Site cover system (including the gabion mattress liner system). Institutional controls would be implemented to provide notice that contamination is known to exist and prohibit removal of the existing gabion mattress or excavation of soils within or along the Creek. EPA would conduct Five-Year Reviews as required by Section 121(c) of CERCLA.

Alternative SD-3: Sediment Removal and Stream Liner; Institutional Controls

Estimated Capital Cost: $265,605
Estimated Annual O&M Cost: $2,700
Estimated Present Worth Cost: $299,109
Estimated Construction Timeframe: 14 Weeks
Estimated Time to Achieve RAOs: 14 Weeks

Alternative SD-3 is specific to addressing sediment in Kaercher Creek on the Main Parcel, including contributions from the Site drainage pipes. The former building floors enclosing (across the top of) the Creek and the loose sediment contained within or on the gabion mattresses would be removed. The accumulated sediment in the mattresses would be removed to the extent practicable using a vacuum truck. The gabion mattress would be filled with grout or concrete to encapsulate any remaining sediment that cannot be removed from within the gabion mattresses and bolster the structural stream liner system. Existing walls of the channel or portions thereof may need to be reconstructed to ensure long-term stability. Existing pipes that open into the Creek and the sediment contained within them would be cleaned, removed, and/or sealed. Any accumulated sediment that is removed would be disposed off-site, placed in the on-site consolidation area, or used as backfill in on-site soil excavation areas. The gabion mattresses would then be grouted to ensure long term stability and permanence. The estimated volume of sediment to be removed would be approximately 100 cy and 10 cy from the gabion mattresses and pipes, respectively. Institutional controls would be implemented to prohibit removal of the existing gabion mattress or excavation of soils within or along the creek. EPA would conduct Five-Year Reviews as required by Section 121(c) of CERCLA.

Alternative SD-4: Stream Realignment

Estimated Capital Cost: $817,742
Estimated Annual O&M Cost: $6,075
Estimated Present Worth Cost: $893, 126
Estimated Construction Timeframe: 61 Weeks
Estimated Time to Achieve RAOs: 61 Weeks

Alternative SD-4 was originally developed to complement and enhance the recreational trail envisioned by the Borough of Hamburg crossing the Main Parcel portion of the Price Battery Site. However, since the development of Alternative SD-4 in the FS, recent discussions with Hamburg Borough officials regarding the recreational trail indicated that the proposed location of the recreational trail has changed and is currently envisioned to follow Front Street and not cross the Exide-owned parcels as originally contemplated. Nonetheless, Alternative SD-4 remains a viable Alternative to address sediment contamination in Kaercher Creek within the Main Parcel.

Under Alternative SD-4, Kaercher Creek on the Exide parcels would be relocated and reconstructed along the original alignment for the trail envisioned by the Borough of Hamburg within the Main Parcel. The Creek would have been integrated with the trail by creating a natural stream bank approaching the

Creek from the proposed trail. The area available for redevelopment would be maximized by creating a retaining wall along the west and northwest side of the Creek. A 75 +/- foot wide buffer would be created along Peach Alley for the walking trail, and the Creek would be relocated along the west side of proposed buffer. The cross-sectional area for the new channel would be increased to increase flow capacity. Pipes 2 and 3 and the accumulated sediment within these pipes would be removed. Efforts would be made to naturalize the new stream bed and vegetate the stream banks to enhance ecological habitat and improve surface water quality. The original channel alignment would be backfilled with structural fill, abandoning the existing gabion mattress and contaminated sediments in-place. The existing concrete walls would be demolished and recycled for use as backfill, or the walls would be abandoned in-place. The approximate volume of sediment abandoned-in-place (primarily beneath the gabion mattress) would be 350 cy with lead concentrations ranging from 4,867 ppm to 24,090 ppm with an average of 14,787 ppm. The volume of gabion mattress to be abandoned-in-place would be approximately 100 cy. Because contaminated sediment would be abandoned in place, EPA would conduct Five-Year Reviews as required by Section 121(c) of CERCLA.

GROUND WATER PREFERRED DECISION

EPA's preferred decision for ground water is No Action. Ground water contamination observed at the Price Battery Site is either not site-related, or it is related to petroleum contamination that will be deferred to PADEP under its authorities for appropriate action. PAH contamination in overburden monitoring well MW-2 appears to be isolated in nature and related to fill material containing coal ash and cinders used as railroad ballast which pre-dates operation of the Price Battery facility and is not site-related. Monitoring well MW-2 is located in the former railroad right of way. BTEX compounds detected in overburden well MW-6 and bedrock well BW-6 appear to be isolated in nature and associated with a gasoline UST in the southeastern corner of the Main Parcel. Exide represents that the UST was a gasoline storage tank; therefore, closure of the UST will be addressed by the responsible party pursuant to PADEP's UST regulatory authority. Elevated detections of lead in bedrock monitoring well BW-3 is the result of turbidity within the well resulting from well development difficulties and not representative of ground water quality. Arsenic was detected above its risk-based screening level in only one well (MW-7) but was below its corresponding MCL.

However, ground water monitoring would be conducted to ensure that contaminant concentrations remain stable at the Site and would serve as an early indicator should ground water contaminant concentrations change following implementation of the remedial action. At a minimum, approximately two additional ground water monitoring wells would be installed for monitoring (after soil remediation, if selected). Monitoring well BW-3 would also be redeveloped or replaced to address turbidity issues within that well. Quarterly ground water sampling would be conducted. Monitoring data would be reviewed annually for statistical trends beginning after 2 years (eight quarters). The need for continued ground water monitoring would be re-evaluated at 5-year intervals concurrent with Five-Year Reviews as required by Section 121(c) of CERCLA.

EVALUATION OF ALTERNATIVES

Criteria Used To Compare Cleanup Alternatives

The remedial alternatives summarized in this Proposed Plan have been evaluated against the nine decision criteria set forth in the NCP, 40 C.F.R. § 300.430(e)(9). These nine criteria are organized into three categories: threshold criteria, primary balancing criteria, and modifying criteria. Threshold criteria must be satisfied in order for an alternative to be eligible for selection. Primary balancing criteria are used to weigh major trade-offs among alternatives. Modifying criteria are formally taken into account after public comments have been received.

The criteria and the evaluation of each alternative against such criteria are set forth below:

Threshold Criteria

Overall Protectiveness of Human Health and the Environment assesses whether an alternative eliminates, reduces, or controls threats to public health and the environment through treatment, engineering controls, or institutional controls.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets all of the applicable or relevant and appropriate requirements of environmental statutes and regulations.

Primary Balancing Criteria

Long-Term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time once cleanup goals are achieved.

Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment evaluates the degree to which treatment will be used to reduce the toxicity, mobility, or volume of contaminants causing site risks.

Short-Term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during construction and implementation.

Implementability considers the technical and administrative feasibility of implementing the remedy, including factors such as the relative availability of materials and services.

Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

Modifying Criteria

State/Support Agency Acceptance considers whether the state agrees with EPA's Preferred Alternative.

Community Acceptance considers whether the local community agrees with EPA's Preferred Alternative. This criterion is assessed in the Record of Decision following a review of public comments received on the Proposed Plan.

Evaluation of Alternatives

The above nine criteria are used to evaluate the cleanup alternatives in order to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how each alternative compares to the other options.

1. Overall Protection of Human Health and the Environment

Soil Alternatives

The No Action Alternative does not provide adequate protection of human health and the environment, because it does not eliminate or control the current and future risks from exposure to contaminated soils. The No Action Alternative will not be discussed further in the nine criteria analysis because it does not satisfy the threshold criterion of providing overall protection to human health and the environment. Alternative S2, Institutional Controls, provides some protection of human health and the environment through monitoring of areas of concern and instituting controls to prevent exposure. Alternative S-2 relies on institutional controls rather than physical means of addressing contamination and does not address PTWs. Therefore, Alternative S-2 does not achieve the degree of protectiveness afforded by the other alternatives evaluated.

Alternative S-4A, Excavation and Off-Site Disposal, provides protection at the Site through the removal of all soils with lead concentrations in excess of the site-wide RAL, including PTW soils. This provides the most permanent means of risk reduction among the soil alternatives evaluated and produces a site that can be redeveloped without posing an unacceptable risk to construction workers or future users or requiring overly restrictive controls for material handling. Alternative S-3, Excavation and Off-Site Disposal of PTW, is not as protective as Alternative S-4A because it leaves materials on the Warehouse Parcel and Main Parcels A and B that can represent an unacceptable risk to future construction workers and would require special procedures to protect human health during redevelopment. Alternative S-4B consolidates varying amounts of RAL soils in an on-site consolidation unit under an engineered cap to provide protection by preventing future exposure instead of being sent for off-site disposal. Although Alternative S-4B is protective, it does not achieve the same protectiveness as Alternative S-4A.

Sediment Alternatives

The No Action Alternative does not provide adequate protection of human health and the environment, because it does not eliminate or control the current and future risks from contaminated sediment on the Main Parcel or potential transport of contaminated sediment downstream. The No Action Alternative will not be discussed further in the nine criteria analysis because it does not satisfy the threshold criterion of providing overall protection to human health and the environment. Alternative SD-2 provides minimal protection to human health and the environment by relying on institutional controls to prevent exposure and disturbance of the current gabion mattress system. However, because SD-2 does not include removal of sediments from the gabion mattresses and pipes, there is the potential for continuing contamination of downstream sediments. Contaminated sediment could potentially be released during storm events thereby potentially affecting downstream ecological habitat. Both Alternatives SD-3 and SD-4 are protective of human health and the environment, because contaminated sediment would be removed or the Creek channel relocated, thereby decreasing the potential for contaminated sediment release downstream. Alternative SD-4 provides nominally more protection than Alternative SD-3 because the stream channel would be relocated, whereas contaminated sediment would remain capped in-place under the current gabion mattress system liner of Alternative SD-3, even though contaminated sediment would be removed from within the gabion mattresses. Alternative SD-4 would provide this nominal additional protection at a higher cost and would be more difficult to implement.

2. Compliance with ARARs

Any cleanup alternative selected by EPA must comply with all applicable or relevant and appropriate federal and state environmental requirements or provide the basis upon which such requirement(s) can be waived. *Applicable* requirements are those environmental standards, requirements, criteria, or limitations promulgated under federal or state law that are legally applicable to the remedial action to be implemented at the Site. *Relevant and appropriate* requirements, while not being directly applicable, address problems or situations sufficiently similar to those encountered at the site that their application is well-suited to the particular circumstance.

EPA will also consider to-be-considered material (TBCs) along with ARARs. TBCs are non-promulgated advisories or guidance issued by federal or state governments that are not legally binding and do not have the status of potential ARARs. However, EPA may use the TBCs in determining the necessary level of cleanup for protection of human health and the environment.

A complete listing of ARARs and TBCs for the preferred alternatives for OU-2 of the Price Battery Site is presented in the ARARs Appendix to this Proposed Plan.

<u>Soil Alternatives</u>

Alternative S2, Institutional Controls, does not meet chemical-specific ARARs, because contaminated PTW soils and RAL soils will remain in-place without further treatment. In addition, the cover provided by the existing pavement floor would be less than the two foot thickness called for by PADEP requirements (25 PA Code 288.234); therefore, the action-specific ARAR for capping would not be met unless provisions for demonstrating the acceptability of utilizing alternative cover systems are implemented. Alternatives S-3, S-4A and S-4B would meet action-specific ARARs related to erosion and sediment control, contact water discharge, Land Disposal Restrictions, off-site waste handling and on-site waste handling. Alternatives S-4A and S-4B would meet chemical-specific ARARs related to soil and air. Alternative S-3 meets chemical-specific ARARs related to air, but does not meet chemical-specific ARARs related to soil if RAL soils are allowed to remain on-site without a permanent cover.

Sediment Alternatives

Alternatives SD-1 and SD-2 do not meet chemical-specific ARARs (i.e., EPA freshwater sediment screening levels) for freshwater sediment as the risk associated with the potential release of contaminated sediments downstream would not be addressed. Alternative SD-3 would meet the freshwater sediment chemical-specific ARAR since sediment on the gabion mattress liner system and within the pipes beneath the Main Parcel would be addressed. Alternatives SD-3 and SD-4 would meet the action-specific ARAR for work in waterways and location-specific ARARs of the Clean Water Act by bypassing flow during the work and implementing sediment controls. Alternative SD-3 would further meet Clean Water Act requirements by incorporating measures to collect and treat pore water from within the sediment/gabion matrix. Alternative SD-4 would meet the freshwater sediment chemical-specific ARAR since sediment within the pipes beneath the Main Parcel would be removed, and sediment within the gabion mattress liner system would be abandoned in-place.

3. Long-Term Effectiveness and Permanence

Soil Alternatives

Alternative S-2 by itself is not considered to provide long-term effectiveness and permanence. The most significant potential sources of contamination would remain even though institutional controls would be implemented to require special management of impacted soils during intrusive activities. Alternative S-4A provides the highest degree of long term protectiveness because all RAL and PTW soils would be excavated and disposed off-site. Alternatives S-3 and S-4B also provide long-term protectiveness but not to the same degree as Alternative S-4A since RAL soils would remain on-site under a cap or within a capped on-site consolidation unit. Although Alternatives S-3, S4A, and S-4B all could be susceptible to future disturbance, properly implemented institutional controls and routine monitoring/inspections would mitigate potential problems. Long-term protectiveness would be dependent on the ability to enforce and maintain ICs; however, any ICs necessary for Alternative S-4A would be less burdensome than the ICs for the other soil alternatives because Alternative S-4A would leave the least contamination in-place of all the soil alternatives.

Sediment Alternatives

Alternative SD-2 would not provide long-term effectiveness and permanence since the most significant potential sources of contamination would remain. Although institutional controls could provide some measure of protection against disturbance of contaminated sediment in the pipes and Kaercher Creek, contaminated sediment transport downstream could remain a possibility during storm events. Alternative SD-3 would achieve long-term protectiveness through removal of contaminated sediment, stabilizing the gabion mattress system, and addressing contaminated sediment in the underground pipes. Although SD-3 could be susceptible to future disturbance, properly implemented institutional controls and routine monitoring/inspections would mitigate potential problems. Alternative SD-4 would also provide long-term protectiveness and is most conducive with the permanent, long-term use of the Site.

4. Reduction of Toxicity, Mobility, or Volume Through Treatment

Soil Alternatives

Alternative S-2 does not provide any reduction in toxicity, mobility or volume through treatment since it relies solely on institutional controls. Alternatives S-3, S-4A and S-4B provide for varying amounts of reduction in toxicity, mobility or volume through treatment (i.e., stabilization) and off-site disposal of PTW soils. However, Alternatives S-3 and S-4B both allow RAL soils to remain on Site untreated either under the existing cover or an engineered cap. Alternative S-4A provides for the greatest reduction in toxicity, mobility, or volume through treatment (i.e., stabilization) by excavating all RAL soils, in addition to the PTW soils, and treating these soils (pending TCLP results) via stabilization, either on-site or off-site, prior to disposal of these soils in an approved off-site disposal facility.

Sediment Alternatives

Alternative SD-2 would not reduce the toxicity, mobility, or volume of contaminants in Kaercher Creek since it relies solely on institutional controls. Alternatives SD-3 and SD-4 would reduce the toxicity, mobility, and volume of contamination in the Creek through the removal of contaminated sediment or relocation of the Creek but not through treatment of the contamination. However, Alternative SD-3 could reduce the toxicity and mobility of contaminants in sediment removed from the gabion mattresses and pipes through treatment if the sediment would require stabilization prior to off-site disposal based on TCLP results. Alternative SD-4 would not reduce the mobility, toxicity or volume of contaminated sediment through treatment because the current channel, including the contaminated sediments within the gabion mattresses, would be abandoned-in-place underneath a cap. However, Alternative SD-4 could reduce the toxicity and mobility of contaminants in sediment removed from the pipes through treatment, if the sediment would require stabilization prior to off-site disposal based on TCLP results.

5. Short-Term Effectiveness

Soil Alternatives

Alternative S-2 would not have significant short-term effectiveness issues. Little or no field activities would be necessary to implement Alternative S-2, and the implementation of institutional controls would not take long. Alternatives S-3, S-4A, and S-4B would all pose short-term impacts related to construction activities, but impacts to workers and the community can readily be controlled. During soil excavation, consolidation, stabilization (if conducted on-site), and handling activities, there is the potential for the spreading of contaminants as airborne dust. The construction specifications would include specific measures to control dust, and, when properly implemented, exposures would be significantly reduced to workers and the local community. Dust suppression measures including water sprays or manufactured dust-suppression products would be used. Air monitoring would be conducted during activities with the potential for dust generation. Additionally, the potential remains for off-site migration of Site materials via sediment erosion during construction. Specific erosion and sediment control measures such as silt fences, silt socks, or hay bales would be taken to mitigate this possibility. Erosion and sediment control measures would be selected during preparation of the construction specifications. Impacts on traffic on the local roads by vehicular traffic between the Site and the highway would be limited to delivery of construction materials and equipment, contractor personnel and truck traffic being sent off-site for disposal, and hauling clean soil fill and cap materials back to the Site. Alternative S-4A and S-4B would have greater short-term impacts than Alternative S-3 because of the amount of material to be handled and transported. The number of trucks for off-site disposal of contaminated soil could be approximately 200 to 300 trucks over one to two months with an equal amount for import of clean soil for Alternatives S-3 and S-4B and as much as 500 to 800 trucks over a two to four month period for Alternative S-4A. The RAOs for soil would be met at the completion of construction.

Sediment Alternatives

Alternative SD-1 is essentially implemented, and since there would be no construction, there would not be any short-term impact on the community, workers, or the environment. Similarly, Alternative SD-2 would not have significant short-term effectiveness issues. For Alternative SD-3, during removal and handling of sediment, there could be the potential for the spreading of contaminants in suspended sediment washing downstream, dust (for dry sediment accumulated in pipes), or tracking by workers and equipment. These short-term impacts could be adequately controlled through appropriate erosion and sediment control measures. There will be some truck traffic associated with the removal of sediment, but it would not be expected to be significant and can be controlled with the implementation of appropriate traffic safety measures. The short-term impacts due to construction would likely be similar to Alternative SD-3 for Alternative SD-4, but impacts to workers and the community can be readily controlled similar to Alternative SD-3. The RAOs for sediment would be met at the completion of the construction activities.

6. Implementability

Soil Alternatives

Alternative S-2 is essentially already implemented at the Site. Institutional controls are currently in place; however, they would need to be re-evaluated and modified to account for possible future redevelopment of the properties. Alternatives S-3, S-4A, and S-4B are readily implementable with proper planning and design. The excavation and management of soils and construction of the cap are common environmental construction activities and will not require the use of specialized equipment, techniques, or labor resources. Implementation of a capping solution would optimally be coordinated with a specific redevelopment plan to determine site grading requirements. Administrative implementability is not a concern for on-site construction and post-construction administrative/institutional controls, because Exide owns all of the properties to be remediated.

Sediment Alternatives

All of the sediment alternatives are implementable. Alternative SD-2 is essentially already implemented at the Site. However, the current institutional controls would need to be re-evaluated and/or modified to provide the greatest degree of protection. Alternative SD-3 is most readily implementable with proper planning and design. Alternative SD-4, Creek Realignment, would be the most difficult to implement, but can provide the greatest overall benefit relative to optimizing the contiguous usable areas of the

Main Parcel and integrating community plans. However, SD-4 would be more difficult to implement than Alternative SD-3 and would provide only marginally more long-term protectiveness than SD-3 at a higher cost.

7. Cost

Soil and Sediment Alternatives

Alternative S-4A has the highest cost due to volume of soil being removed and sent off-site for disposal. Alternative S-1 and S-2 involve minimal construction, and therefore their costs are much lower. Alternative SD-4 is more expensive than Alternative SD-3 by approximately $600,000 and would be more difficult to implement than Alternative SD-3 with little additional risk reduction benefit. The only costs associated with the No Further Action alternative for ground water are the annual monitoring costs and costs associated with the installation of approximately two additional monitoring wells. The cost of the Alternatives is provided in Table 11 below.

Table 11: Remedial Alternative Costs

	Capital Costs	Annual O&M Costs	Present Worth Costs*
SOIL			
Alternative S-1	$0	$0	$0
Alternative S-2	$20,900	$5,400	$87,909
Alternative S-3	$1,109,994	$4,050	$1,160,251
Alternative S-4A	$2,731,416	$3,713	$2,777,484
Alternative S-4B	$1,691,585	$13,500	$1,859,107
SEDIMENT			
Alternative SD-1	$0		$0
Alternative SD-2	$20,900	$5,400	$87,909
Alternative SD-3	$265,605	$2,700	$299,109
Alternative SD-4	$817,742	$6,075	$893,126
GROUND WATER			
No Action w/Monitoring	$6,380	$11,270	$146,230

*Discount rate of 7% was used in calculation of Present Worth Costs

8. State/Support Agency Acceptance

The Commonwealth of Pennsylvania's acceptance of the Preferred Alternatives will be evaluated after the public comment period and will be described in the Record of Decision.

9. Community Acceptance

Community acceptance of the Preferred Alternatives will be evaluated after the public comment period ends and will be described in the Record of Decision.

SUMMARY OF THE PROPOSED REMEDIAL DECISION FOR OU-1 AND OU-2

Operable Unit One – Residential Portion

EPA's preferred remedial decision is No Further Action for addressing interior and exterior residential contamination. On September 29, 2009, EPA issued an Interim ROD selecting interior decontamination and exterior yard remediation of residential properties while a more comprehensive RI/FS continued to define the full extent of the residential contamination. However, as this comprehensive RI progressed and additional properties were identified, these properties were incorporated into the ongoing remedial action. EPA cleaned up these additional residential properties, and no further action is necessary. The interim remedy selected in the 2009 Interim ROD may be considered the final remedy for OU-1. The risks associated with exposure to interior lead-contaminated dust and exterior soils has been addressed, and all ARARs associated with the remedy have been met. EPA will continue public education and outreach as specified in the 2009 Interim ROD. EPA has provided the Borough of Hamburg with a Registry which documents the cleanup status of individual properties. Because some residential property owners declined participation in the cleanup, EPA will perform Five Year Reviews of the OU-1 remedy to ensure continued protection to human health and the environment.

Operable Unit Two – Facility Portion

EPA has selected as its Preferred Alternative a combination of Soil Alternative S-4A and Sediment Alternative SD-3. In addition, EPA has proposed No Action with Monitoring for ground water.

Total Combined Present Worth Cost: $3,222,823

Soil: Alternative S-4A

The components of the preferred alternative are:

1. Excavate soils from the Main Parcel and the Warehouse Parcel that exceed the lowest calculated RAL (8,669 ppm) for lead in soil, including PTW soils, except to the extent that contaminated soil cannot be removed because of field conditions (i.e., physical constraints, maintaining safe excavation slopes, encountering ground water, etc.).

2. Concrete pavement, floor slabs, and foundations overlying the RAL and PTW soils will be segregated, cleaned to remove residual contamination (based on visual observations) pursuant to the requirements of RCRA, crushed, and stockpiled. Crushed material will be analyzed for inorganic constituents and the results compared against the PADEP Statewide Health Standards for non-residential soils (direct contact) prior to reuse as backfill.

3. Stabilize excavated soils on-site and transport to an off-site permitted facility or transport soils as hazardous waste for stabilization at an off-site permitted facility prior to disposal. Conduct TCLP testing of excavated soils and/or stabilized soils as necessary for proper disposal or to determine effectiveness of stabilization.

4. Perform post-excavation confirmation sampling of excavation floor and sidewalls to ensure RAL levels have been achieved. Recalculate the exposure point concentration (EPC) utilizing confirmation sample results collected after excavation.

5. Backfill resulting excavations with reclaimed crushed concrete and clean fill material to levels at or near existing grades except as coordinated with site redevelopment activities. Any crushed material used for backfilling will be overlain by imported clean fill. Reclaimed crushed concrete must meet backfill concentrations identified in the BHHRA for lead (<50 ppm), arsenic (< 100 ppm), and antimony (< 46 ppm). If reclaimed concrete exceeds 50 ppm lead (but is below the PADEP Statewide Health Standards for non-residential soils for direct contact of 1,000 ppm lead), the RAL must be recalculated utilizing the actual concentration for the proportion of backfilling completed using recycled concrete and additional soil remediation performed as appropriate to achieve the desired RBC. Clean soil must meet Pennsylvania Criteria for Management of Fill, or the backfill concentrations identified in the BHHRA, whichever is lower.

6. Stabilize Site surfaces using concrete, asphalt, buildings, and landscaping in a manner consistent with plans for Site redevelopment and suitable for preventing erosion of soils above residential remediation standards and as specified by erosion and sediment control requirements.

7. Implement institutional controls (ICs) to ensure the remedy provides an adequate measure of protection in light of current and anticipated future use. Such additional institutional controls would include notification to future property owners that contaminated soils remain in-place and that special handling of these soils would be required if these soils are disturbed during redevelopment construction activities. No residential use of the properties will be permitted. ICs will include activity and use restrictions enacted through proprietary (e.g., easements, covenants) and/or governmental (e.g., zoning requirements) controls to prevent use of the property that will pose an unacceptable risk to receptors. The exact type of IC implemented will be determined by EPA in consultation with PADEP and local government agencies. The restrictions in the current Declaration of Use and Deed Restriction will be incorporated into any new institutional controls.

Sediment: Alternative SD-3

1. Remove accumulated sediment from the gabion mattress, to the extent possible, using a vacuum truck or equivalent. Remove sediment from underground pipes and penetrations including, but not limited to, Pipes 1, 2, and 3. Grout any underground pipes, as necessary, to further prevent contaminated sediment within any pipes from entering Kaercher Creek.

2. Dispose of accumulated sediment off-site or use as backfill in on-site soil excavation areas if coordinated with soil remediation and sediment meets the same requirements for other soils under Alternative S-4A, above.

3. Grout gabion mattress to insure long-term stability of the Creek bed.

4. Perform annual inspections to confirm that the gabion mattress and channel walls remain stable and remove accumulated trash and debris to maintain the hydraulic capacity of the channel.

5. Implement institutional controls to prohibit removal of the gabion mattress or excavation of soils within or along the creek in conjunction with the IC requirements of Alternative S-4A.

Ground Water: No Action with Monitoring

No active cleanup measures would be taken for ground water at the Site.

1. Install new monitoring wells to the current monitoring well network after soil remediation is implemented. Redevelop or replace monitoring well BW-3 to address turbidity problems within the monitoring well.

2. Conduct quarterly ground water sampling. After eight consecutive quarters of monitoring, conduct a statistical evaluation to determine contaminant concentration trends and continue statistical analysis annually. Reevaluate need for continued monitoring at five year intervals.

In summary, the Preferred Alternative is believed to provide the best balance of trade-offs among all the alternatives evaluated with respect to the nine criteria above. Based on the information available at this time, EPA believes the Preferred Alternative would protect human health and the environment, would comply with ARARs, would be cost effective, and would utilize permanent solutions and alternative treatment technologies to the extent practicable. The Preferred Alternative would also meet the statutory preference for the selection of a remedy that includes treatment as a principal element.

The Preferred Alternative can change in response to public comment or new information.

COMMUNITY ROLE IN REMEDY SELECTION PROCESS

This Proposed Plan is being distributed to solicit public comment on the appropriate cleanup action for the Site. EPA relies on public input to ensure that the remedy selected for each Superfund Site considers the needs and concerns of the local community. EPA is providing a 30-day public comment period beginning on July 15, 2015, and ending on August 14, 2015, to encourage public participation in the selection process. **All written comments must be postmarked by August 14, 2015 and sent to:**

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Remedial Project Manager
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Larry Johnson (3HS52)
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EPA will conduct a Public Meeting on July 30, 2015 at 6:30 p.m. at the Hamburg Borough Municipal Building at 61 North Third Street in Hamburg, Pennsylvania, to present the Proposed Plan and supporting information, answer questions, and accept both oral and written comments from the public.

The Administrative Record file containing background documents regarding the Site, as well as copies of the Remedial Investigation and Feasibility Study Reports are available to the public at the following locations:

Hamburg Public Library
35 North Third Street
Hamburg, PA 19526
(610) 562-2843

and

U.S. Environmental Protection Agency, Region III
Administrative Record Room, 6th Floor
1650 Arch Street
Philadelphia, PA 19103

Please contact Paul Van Reed at (215) 814-3157 for an appointment.

Weekdays - 8:30 a.m. to 4:30 p.m.

The Administrative Record file can also be accessed on the web at www.epa.gov/arweb

EPA will summarize and respond to comments received at the public meeting and written comments post-marked by August 14, 2015 in the Responsiveness Summary in the Record of Decision, which will document EPA's selected remedy for the Site. To obtain additional information relating to this Proposed Plan, please contact one of the following EPA representatives:

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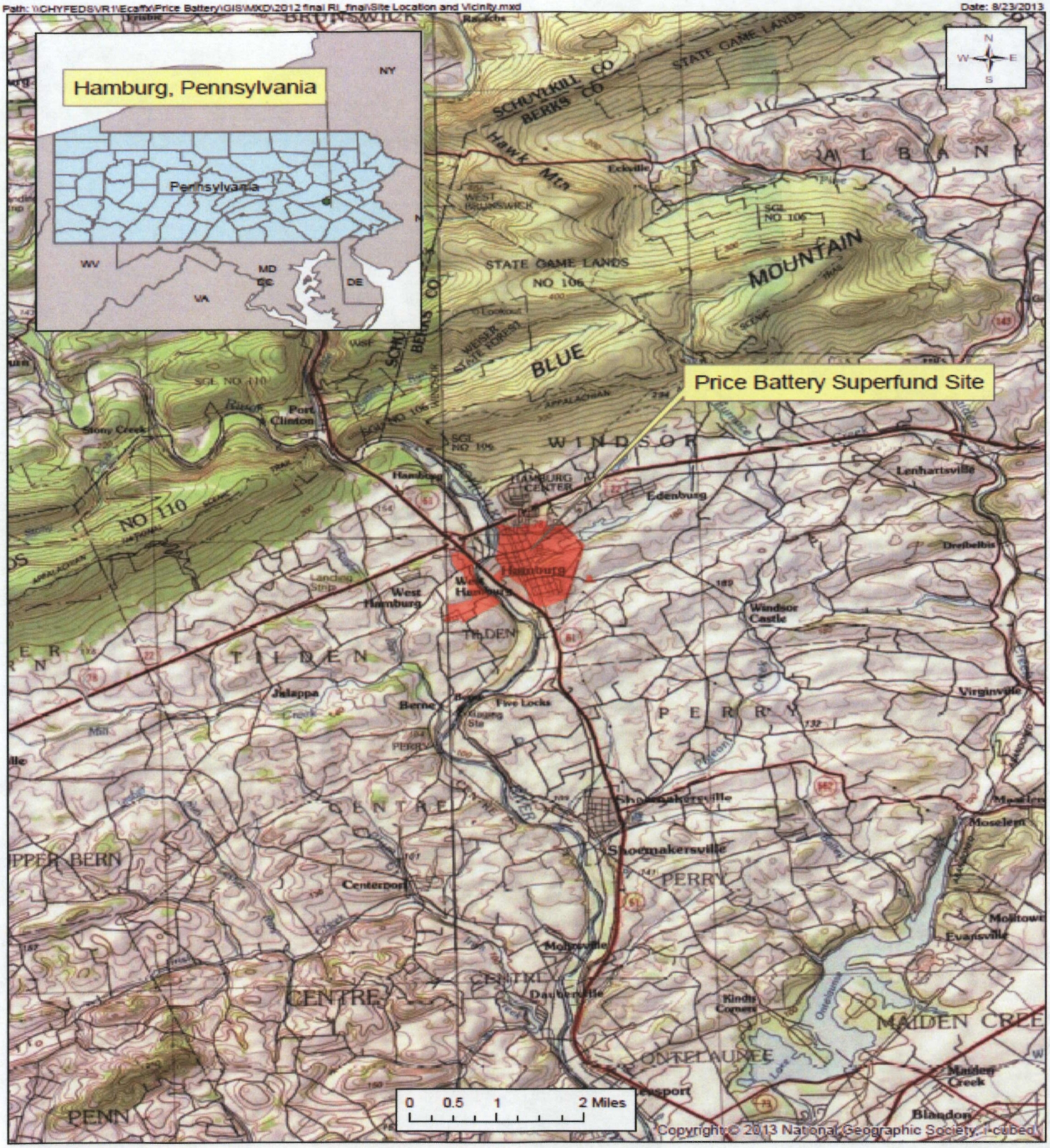
FIGURES

Path: \\CHYFEDSVR1\Ecaffx\Price Battery\GIS\MXD\2012 final RI_final\Site Location and Vicinity.mxd Date: 8/23/2013



Price Battery Superfund Site
Berks County, Hamburg, PA

Figure 1-1
Site Location Map

FIGURE 1: PRICE BATTERY SITE LOCATION

AR307412

FIGURE 2: PRICE BATTERY OU-2
EXIDE-OWNED PROPERTIES

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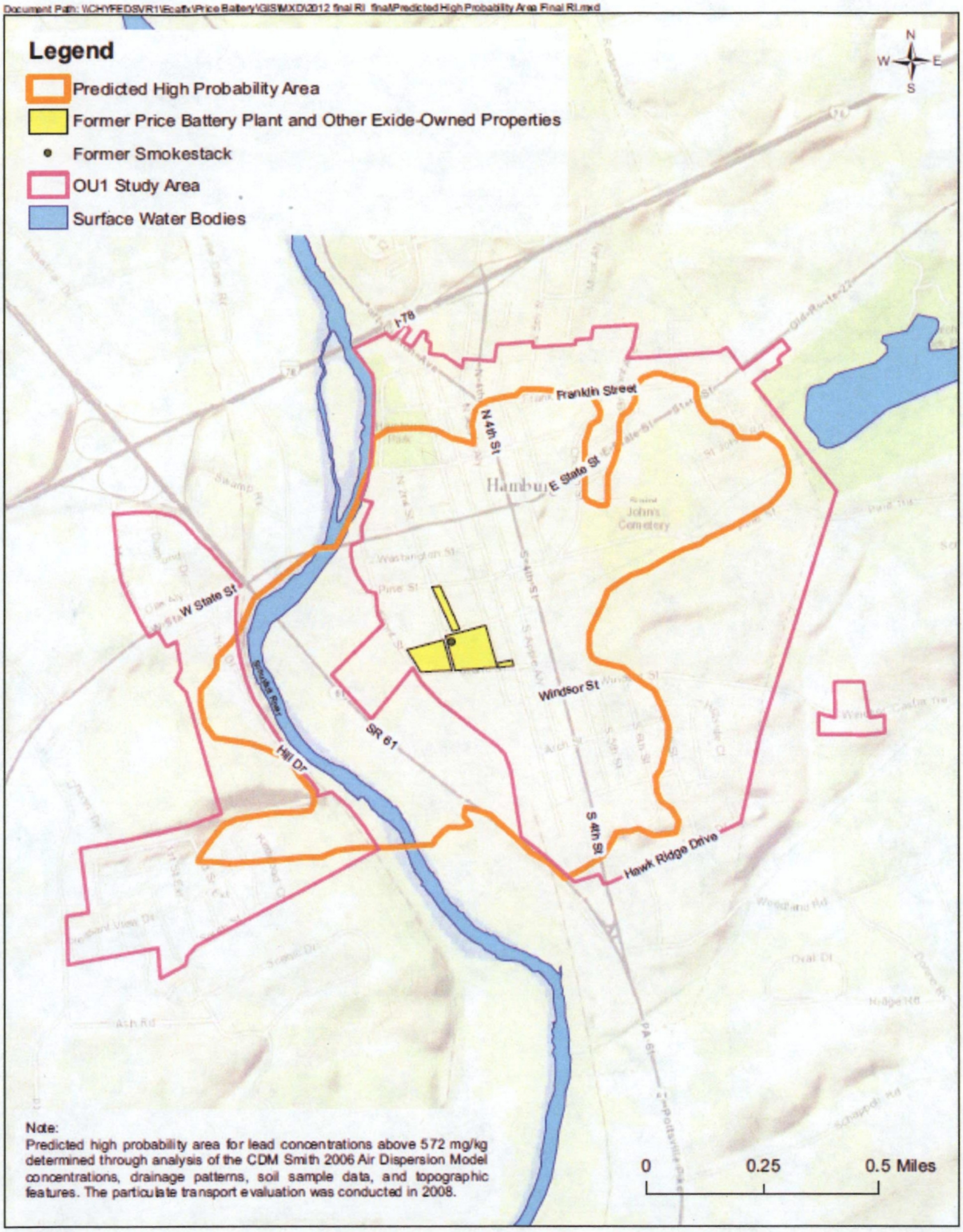

CDM Smith

Price Battery Superfund Site
Berks County, Hamburg, PA

Figure 2-3
Predicted High Probability Lead Area
Based on Particulate Transport Evaluation

FIGURE 3: PRICE BATTERY OU-1 BOUNDARY AREA PREDICTED HIGH PROBABILITY DEPOSITIONAL AREA

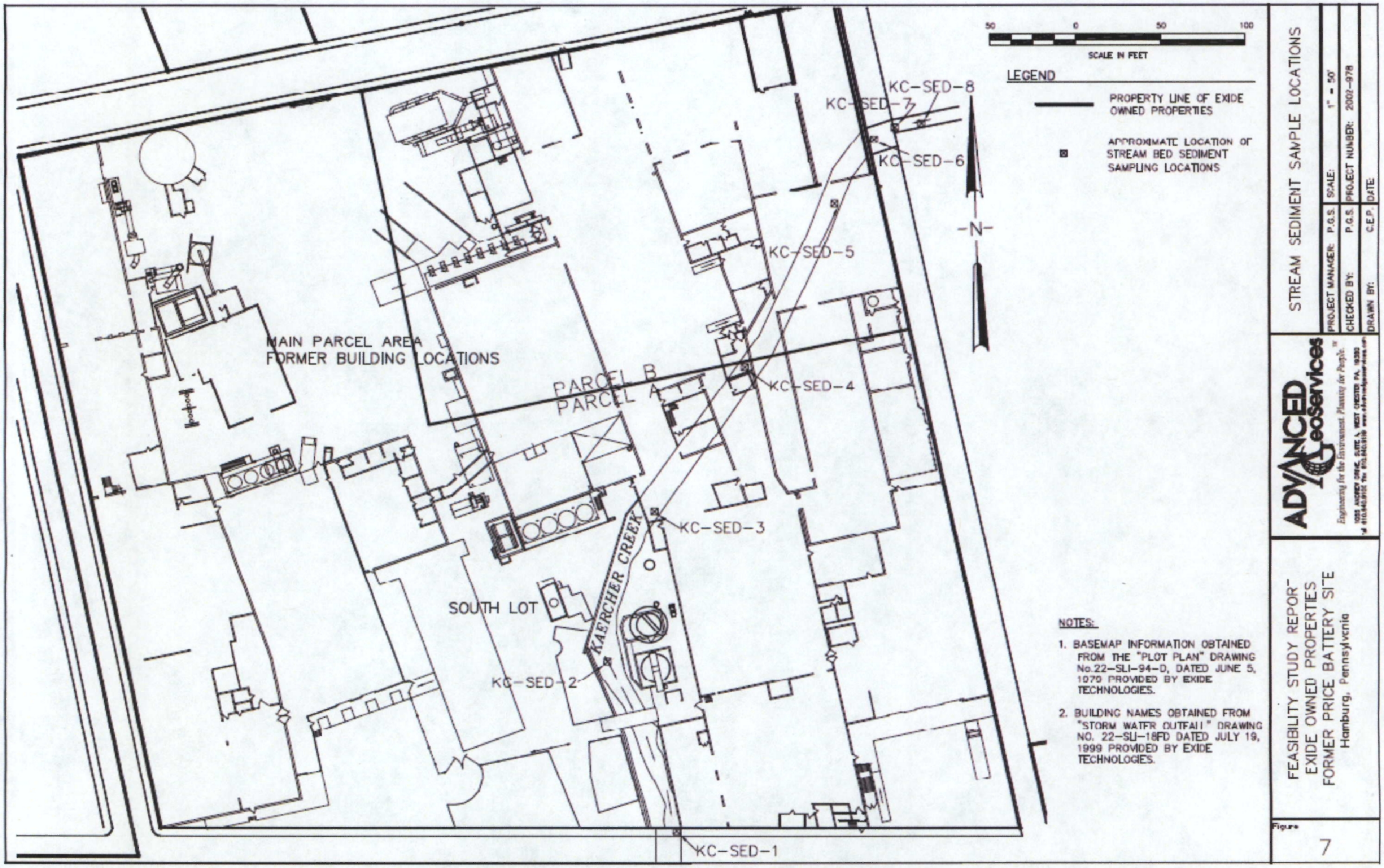

FIGURE 4: KAERCHER CREEK SEDIMENT SAMPLING LOCATIONS

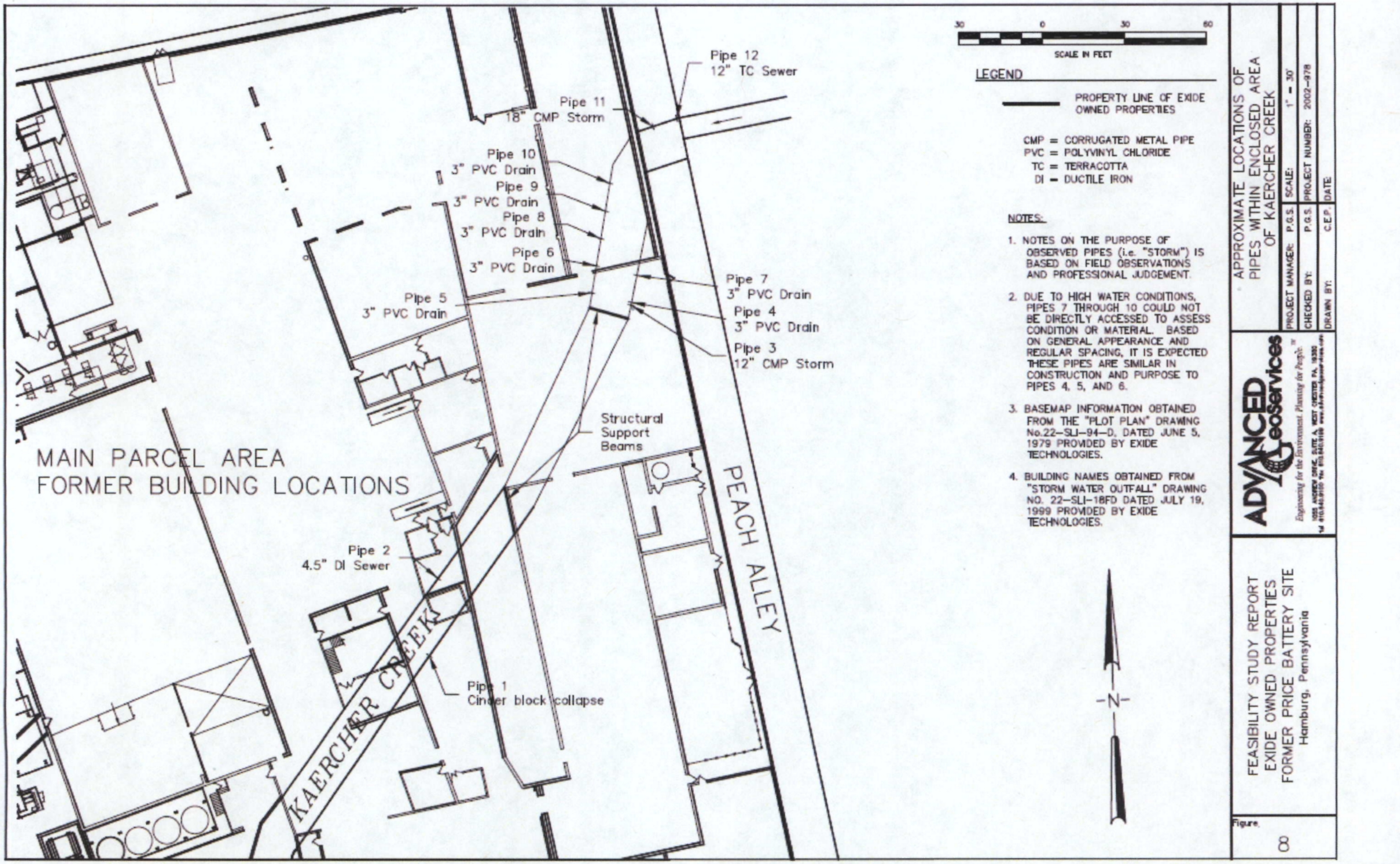

FIGURE 5: APPROXIMATE LOCATION OF PIPES WITHIN ENCLOSED AREA OF KAERCHER CREEK

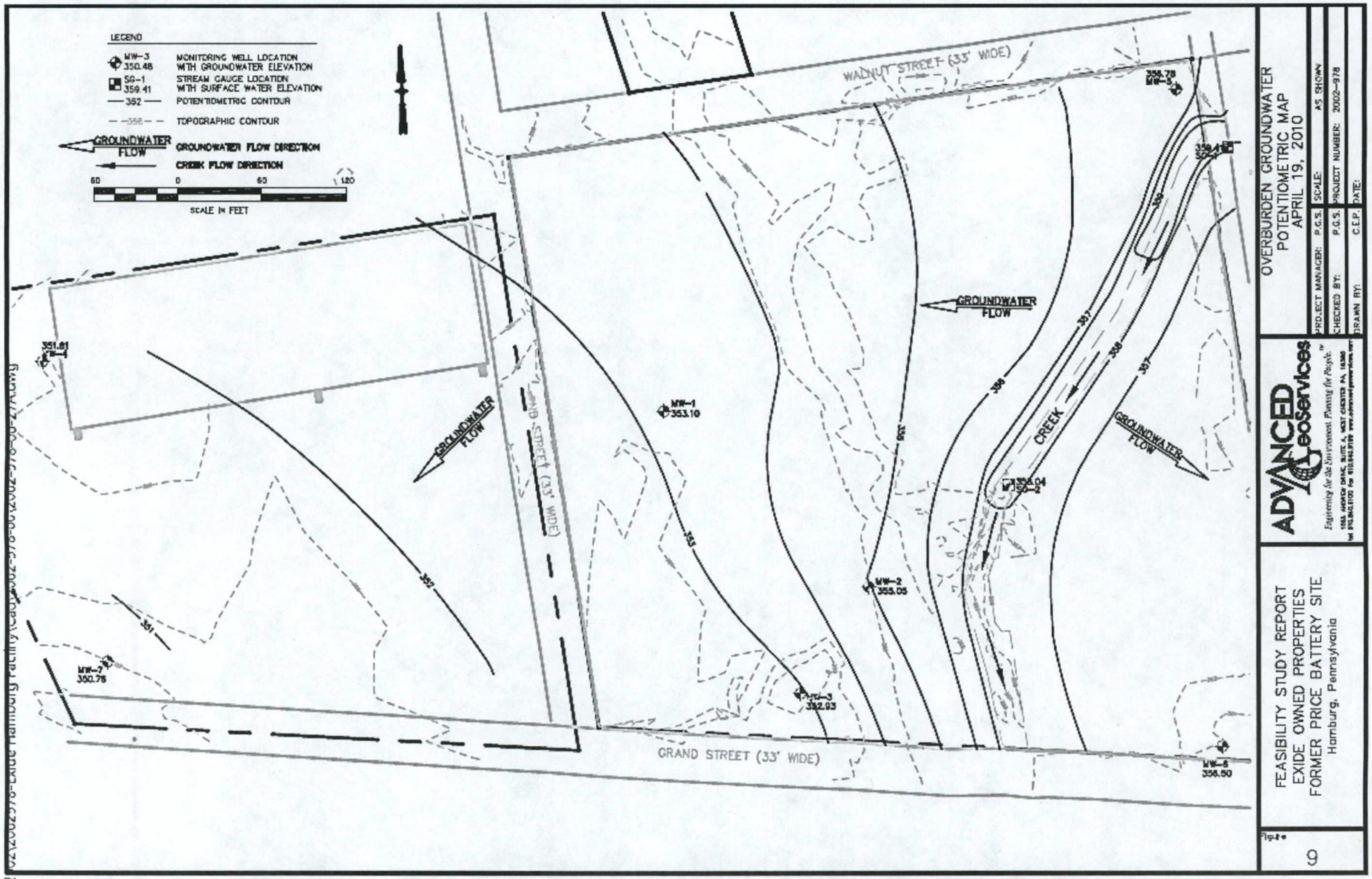

FIGURE 6: OVERBURDEN GROUND WATER POTENTIOMETRIC MAP

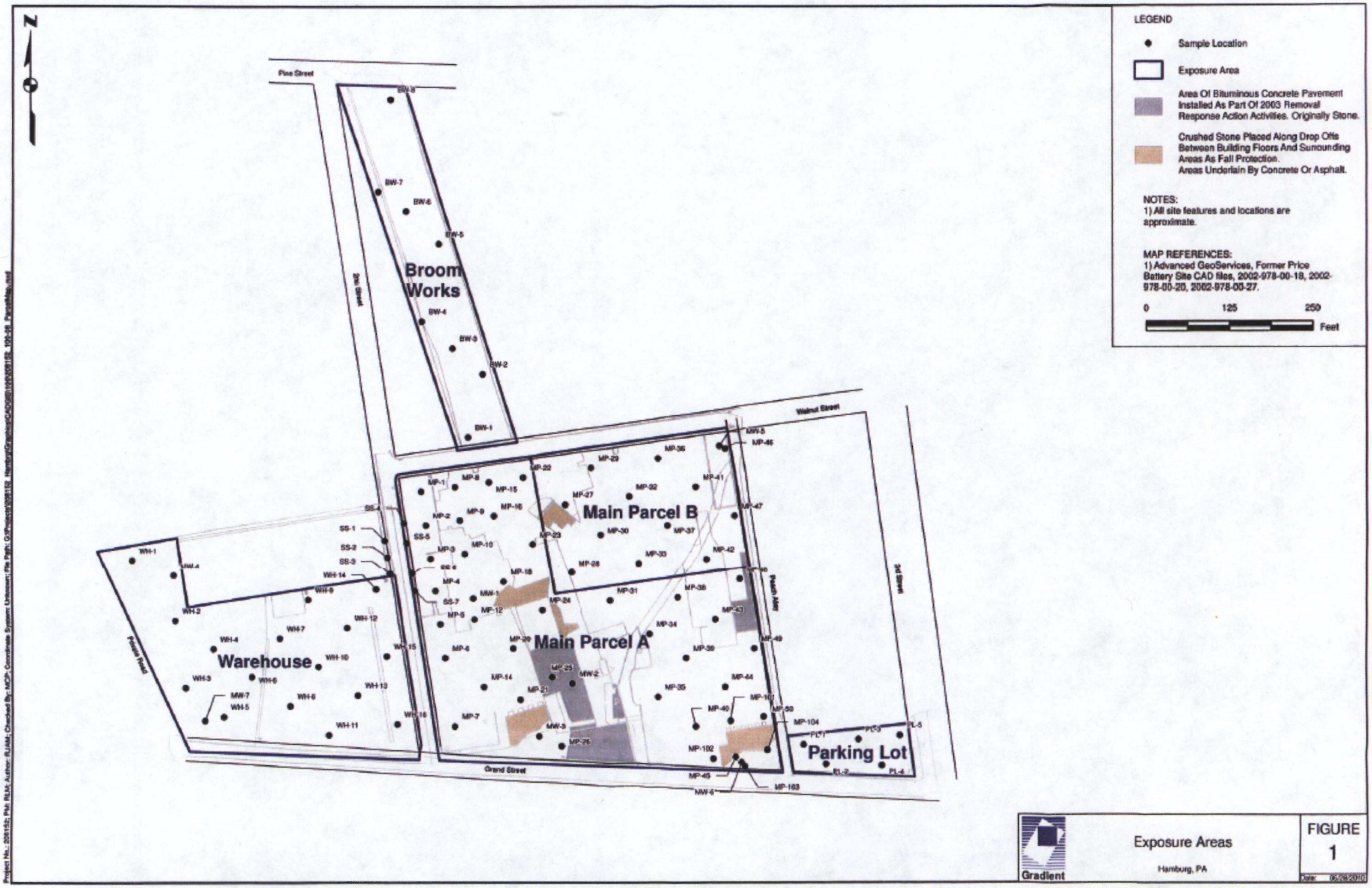

FIGURE 7: EXPOSURE AREAS

ARARS

Table 1

Action-Specific ARARs/TBCs are the substantive requirements included in the following citations Price Battery OU-2 Site, Hamburg, Pennsylvania

Standard, Requirement, Criterion, Or Limitation	Citation Or Reference	Description	Status	Comments
FEDERAL*				
Manifesting and Recordkeeping Requirements	25 PA Code §§ 262a.10 (incorporating by reference 40 CFR Part 262, but limited to Subparts A - C, 262a.11, 262a.12, 262a.21, and 262a.34)	Standards for recordkeeping of the management actions for hazardous wastes.	Applicable	Applicable if remedial activities include the off-site transport of hazardous waste. Does not apply to transport of material within an AOC.
Hazardous Waste Management	25 PA Code §§ 261a.1 (incorporating by reference 40 CFR Part 261, but limited to Subparts A - E, 261a.2-8, 262a.32, and 262a.39)	Waste characterization	Applicable	Applicable for characterizing contaminated soil or sediment determined to be sent off-site for disposal.
Land Disposal Restrictions	25 PA Code § 268a.1(incorporating by reference 40 CFR Part 268, Subparts A- E)	Restricts disposal of hazardous waste that could trigger land disposal regulations	Applicable	Not triggered for materials that are managed within an Area of Contamination. Applicable to off-site disposal only.
Storage Requirements Preparedness and Prevention	25 PA Code § 264a.1 (incorporating by reference 40 CFR Part 264, but limited to substantive parts of Subparts B - G and I – M)	Standards for the storage of hazardous wastes. Requirements for spill response planning and control	Relevant and Appropriate	Includes requirements if remedial activities include the storage of hazardous waste greater than 90 days. Materials on-site are not regulated as hazardous waste when consolidated in same Area of Contamination
Off-Site Transport of Hazardous Waste	EPA OSWER Directive 9834.11	Establishes technical guidelines for the off-site transport of hazardous wastes.	TBC	TBC if remedial activities include the off-site transport and management of hazardous waste.
National Ambient Air Quality Standards	40 CFR § 50.6	Requirements for fugitive dust and particulate matter, lead in air, and carbon monoxide.	Applicable	NAAQS for particulates and lead may be applicable to earth-moving activities as well as to treatment processes that may include mixing or other processes that result in potential releases of particulates.
Standards for Owners and Operators of TSD	25 PA Code § 264a Subpart N	Requirement for landfills, including design and operating requirements, monitoring and inspection, response actions, surveying, closure and post-closure care.	TBC	Materials on-site are not regulated as hazardous waste when consolidated in same Area of Contamination

*Pennsylvania has an authorized hazardous waste program; therefore the Pennsylvania hazardous waste regulations are identified here as the applicable Federal hazardous waste standards.

Table 1 (Continued)

Action-Specific ARARs/TBCs are the substantive requirements included in the following citations Price Battery OU-2 Site, Hamburg, Pennsylvania

Standard, Requirement, Criterion, Or Limitation	Citation Or Reference	Description	Status	Comments
PENNSYLVANIA				
Hazardous Waste:				
PA Hazardous Waste Landfill	25 PA Code 264a.1(incorporating by reference 40 CFR Part 264 Subpart N)	Requirements that cap systems for hazardous waste landfills have a lower permeability than their bottom liner	TBC	Materials on-site are not regulated as hazardous waste when consolidated in same Area of Contamination
Soil:				
Administration of Land Recycling Program (Act 2)	25 PA Code § 250.407(c) Subpart D Site-Specific Standard	For attainment of site-specific soil standards in residential areas, the point of compliance for ingestion and inhalation exposure is up to 15 feet below the existing surface unless bedrock or physical structures are encountered which prevent safe continued remediation.	Applicable	Applicable to soil remediation activities.
PA Residual Waste and Municipal Waste Regulations, Chemical Analysis of Waste	25 PA Code §§ 287.54, 271.611	Chemical Analysis Requirements	Applicable	Applicable to consider capping standards for on-site disposal. Applicable to off-site disposal.
Administration of Land Recycling Program (Act 2)	25 PA Code § 250.308	Standards for protection of ground water using default soil to ground water standards or site-specific soil to ground water modeling.	Applicable	Applicable to soil remediation and capping requirements.
Residual Waste:				
Final Cover and Grading	25 PA Code § 288.234, 288.423, 288.523 and 288.623	Standards for cap design for on-site consolidation area	Relevant and Appropriate	Siting and other design requirements for on-site consolidation area. Requirements regarding the type of waste that may be disposed in the consolidation area."
General Provisions	25 PA Code § 287	General provisions for residual waste management	Relevant and Appropriate	Residual waste provisions are not applicable when consolidating contaminated materials within an Area of Contamination
Storage and Transportation	25 PA Code § 299 Subpart A	Storage and transportation of residual waste	Relevant and Appropriate	Not applicable when consolidating materials within an Area of Contamination

Table 1 (Continued)

Action-Specific ARARs/TBCs are the substantive requirements included in the following citations Price Battery OU-2 Site, Hamburg, Pennsylvania

Standard, Requirement, Criterion, Or Limitation	Citation Or Reference	Description	Status	Comments
PENNSYLVANIA (CON'T)				
Other				
Pennsylvania's Land Recycling Program Technical Guidance Manual	253-0300-100	Establishes recommendations and guidance for attainment of site specific standards in soil at voluntary state cleanup Sites for land reuse.	TBC	TBC for remedial activities involving soil.
Department of Environmental Protection Bureau of Land Recycling and Waste Management: Management of Fill	258-2182-773	Establishes clean fill requirements.	TBC	TBC for soils used as clean fill at excavated areas at the site.
Fugitive Dust Control	25 PA Code §§ 123.1-123.2	Requires that the remedial action take all reasonable actions to prevent particulate matter from becoming airborne.	Applicable	Applicable to earth-moving activities as well as to treatment processes that may include mixing or other processes that result in potential releases of particulates.
Air Pollution Control	25 PA Code Chapters 121.1 -.3, 127, 139 (excluding Subchapter I)	Requires prevention of air emissions at remedial sites and that ambient air quality will be maintained in areas where air quality is better than applicable air quality standards and improved in areas where air quality is worse than applicable air quality standards.	Applicable	Applicable to earth-moving activities as well as to treatment processes that may include mixing or other processes that result in potential releases of particulates.
Erosion and Sedimentation Control	35 PS § 691.1 et. seq. Chapter 102, 25 PA Code §§ 102.4, 102.11, and 102.22	Regulates erosion and sedimentation control measures.	Applicable	Applicable to grading and excavation activities conducted as part of site remediation. Implemented by Berks County.
Storm Water Management Act of 1978, as amended	32 P.S. § 680.13	Provides storm water runoff control requirements during construction activities.	Applicable	Applicable to grading and excavation activities conducted as part of site remediation.
Dam Safety and Waterway Management	25 PA Code 105, Subchapters A-K	Applies to work performed within, along, and across waterways. Channel changes and dredging	Applicable	Chapter 105 implementation delegated to BCCD.

Table 2

Location-Specific ARARs/TBCs are the substantive requirements included in the following citations Price Battery OU-2 Site, Hamburg, Pennsylvania

Standard, Requirement, Criterion, Or Limitation	Citation Or Reference	Description	Status	Comments
FEDERAL				
National Historic Preservation Act Archeological Resources Protection Act	16 U.S.C. § 470; et. Seq.; 36 CFR Part 800 16 U.S.C. 469a-1	Minimizes impact of actions on historic properties and landmarks. Provides protection from actions that may cause irreparable harm, loss, or destruction of artifacts	Applicable	Applicable to actions at historic properties or landmarks, or properties at the site that contain historical and archeological data.
Clean Water Act (Dredge and Fill Requirements)	33 U.S.C. §§ 1251-1376; 40 CFR Parts 230	Provides protection to waters in and around the site.	Relevant and Appropriate	Relevant and appropriate to actions involving capping, berm construction and/or onsite disposal of contaminated soil that may impact local water bodies.
PENNSYLVANIA				
Clean Streams Law	35 P.S. § 619.1; 25 PA Code §§ 93.4, 93.7, 93.8 (b)(c), 93.9, 25 PA Code Chapter 16 and Chapter 105 Subchapters A-K	Provides protection to waters in and around the site.	Relevant and Appropriate	Requires that any remedial actions taken at the site not contribute to pollution of state waters.
PA Floodplain Management Act	32 P.S. 679.101-60; 25 PA Code §106.31	Standards for construction in 100 year floodplain, wetlands and regulated waters.	Relevant and Appropriate	Applicable to remediation in Kaercher Creek and realignment of the Creek.

Table 3

Chemical-Specific ARARs/TBCs are the substantive requirements included in the following citations Price Battery OU-2 Site, Hamburg, Pennsylvania

Standard, Requirement, Criterion, Or Limitation	Citation Or Reference	Description	Status	Comments
FEDERAL				
Soil: EPA Soil Screening Guidance	EPA/540/R-96/018 July 1996	Provides methodology for calculating risk-based, site-specific soil screening levels.	TBC	Used to standardize and accelerate site cleanup.
Hazardous Waste: Identification and Listing of Hazardous Waste	25 PA Code §§ 261a.2-261a.39 (incorporating by reference 40 CFR §§ 261.2 - 261.35)	Defines those solid wastes which are subject to regulations as hazardous wastes.	Applicable	Applicable to determining whether wastes are considered hazardous under RCRA for off-site disposal.
Ground Water: Federal MCLs	40 CFR §§ 141.23 -.24, 141.51, 141.61, 141.62	National drinking water standards	Relevant and Appropriate	Applicable through the PADEP Act 2 requirements
Guidelines for Ground Water Classification under the EPA Ground Water Protection Strategy	EPA/813R88001 June 1988	Provides site-specific ground water classification guidelines, procedures, and data requirements	TBC	Applicable when classification has not been determined by Pennsylvania
Other: EPA Region III Risk-Based Concentration Table	www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/	Establishes chemical screening guidelines for use during risk assessment.	TBC	May be useful in development of cleanup goals.
National Ambient Air Quality Standards	40 CFR §§ 50.6, 50.12	Provides acceptable ambient air quality levels for particulate matter and lead.	Applicable	Applicable to earth-moving activities as well as to treatment processes that may include mixing or other processes that result in potential releases of particulates or lead.
Risk Assessment Guidance for Superfund, Volume 1, Part A	EPA/540/1-89/002	Defines Preliminary Remediation Goals and Remedial Action Levels for soil	TBC	Applicable when evaluating the adequacy of soil remediation activities.

Table 3 (Continued)

Chemical-Specific ARARs/TBCs are the substantive requirements included in the following citations Price Battery OU-2 Site, Hamburg, Pennsylvania

Standard, Requirement, Criterion, Or Limitation	Citation Or Reference	Description	Status	Comments
FEDERAL				
Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities	OSWER Directive 9355.4-12 August 1994	Establishes a streamlined approach for determining protective levels of lead in soil at CERCLA sites and RCRA facilities	TBC	Recommends screening levels for lead in soils for residential land use of 400 ppm; describes how to develop PRGs for residential land use; and describes a plan for soil lead cleanup at sites that have multiple sources of lead.
Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities	OSWER Directive 99200.4-27P August 1998 EPA/540/F-98/030 PB98-963244	Clarifies the Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities	TBC	Clarifies OSWER policy on using the IEUBK model and blood lead studies; determines geographic area to use in evaluating human exposure to lead contamination; addresses multimedia lead contamination; and determines appropriate response actions at lead sites.
PENNSYLVANIA				
Soil and Ground Water Remediation Levels	25 PA Code 250, Subpart 250.401	Protocol for developing site remediation standards	Applicable	Allows the use of site-specific standards
Water Quality Standards	25 PA Code 93	Defines water quality criteria, anti-degradation requirements, and designated water uses for surface water	Applicable	Implementation of the Clean Streams Law by PA. Applicable if on-site treatment and discharge of surface water occurs.
Water Quality Criteria	25 PA Code §§ 16.11-16.52, 16.101-16.102, Appendix A	Guidelines for development of water quality criteria for surface water	Applicable	Implementation of the Clean Streams Law by PA. Applicable if on-site treatment and discharge of surface water occurs.
Pennsylvania Guidance Manual for Ground Water Monitoring December 2001	www.dep.state.us	Guidance for ground water monitoring	TBC	Establishes guidelines for ground water monitoring
Air Resources – Variance and Alternate Standards	25 PA Code § 141.1	Criteria for implementation of alternate standards related to ambient air quality	Applicable	Applicable if imposed by PADEP