Kentucky Avenue Wellfield Superfund Site
Operable Unit 4-Koppers Pond
Chemung County, New York

July 2016

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered to address contamination at the Koppers Pond portion (herein, Operable Unit (OU) 4) of the Kentucky Avenue Wellfield Superfund Site (Site) in Village of Horseheads, Chemung County, New York, and identifies the preferred remedial alternative with the rationale for this preference.

This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA), the lead agency for the Site, in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, also known as Superfund), as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of contamination for OU4 at the Site and the remedial alternatives summarized in this Proposed Plan are described in the Remedial Investigation (RI) Report, dated July 6, 2012, and the Feasibility Study (FS) Report, dated July 18, 2016, as well as other documents in the Administrative Record file of this remedy. EPA encourages the public to review these documents to gain a more comprehensive understanding of the Site, the Superfund activities that have been conducted, and the remedial alternative that is being proposed.

The purpose of this Proposed Plan is to inform the public of EPA's preferred remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred remedy. The preferred remedy consists of the placement of a continuous six-inch thick soil and sand cap, including a geotextile membrane to act as a demarcation layer, over Koppers Pond. The preferred remedy includes long-term monitoring and institutional controls.

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

COMMUNITY ROLE IN SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, this Proposed Plan has been made available to the public for a public comment period which begins on July 23, 2016 and concludes on August 22, 2016.

A public meeting will be held during the public comment period at the Elmira College at Peterson Chapel in Elmira on August 4, 2016 at 7:00 p.m. to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred alternative, and to receive public comments.

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

Written comments on the Proposed Plan should be addressed to:

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INFORMATION REPOSITORIES

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

Horseheads Town Hall
Town Clerk Office
150 Wygant Road
Horseheads, New York
Telephone: (607) 739-8783
Hours of operation:
Mon. – Fri.: 8 AM – 4 PM

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

EPA's website for the Kentucky Avenue Wellfield Site:
www.epa.gov/superfund/kentucky-avenue

SCOPE AND ROLE OF ACTION

Site remediation activities are sometimes segregated into different phases, or operable units (OUs), so that remediation of different, discrete environmental media or geographic areas of a site can proceed separately, whether sequentially or concurrently. EPA has designated four OUs for the Kentucky Avenue Wellfield Site. OU1 addressed residences and commercial properties that had relied upon private drinking water wells for potable water in the area affected by groundwater contamination in the vicinity of the Kentucky Avenue Wellfield Site. OU2 addressed contamination in the public supply well known as the Kentucky Avenue Well (KAW), a source of public drinking water. OU3 addressed soil contamination at the former Westinghouse Electric Corporation's (Westinghouse's) Industrial and Governmental Tube Division facility (Facility) and sediment contamination in the industrial drainageway that runs south from the Facility. This Proposed Plan concerns OU4, the final planned phase of the response activities at the Site, and addresses soil and sediment contamination in an area referred to as Koppers Pond. Koppers Pond historically received water from various sources via the above-referenced industrial drainageway. Koppers Pond is located in the Village of Horseheads, Chemung County, New York and is situated on property owned by the Village of Horseheads, Hardinge, Inc. (Hardinge), and the Elmira Water Board (EWB). For purposes of this Proposed Plan, OU4's Koppers Pond is identified as a 12-acre area that is or was ponded, defined by a corresponding pond water elevation as discussed further below of approximately 887 to 888 feet above mean sea level (ft-amsl). While the size of the water body referred to as the Pond has reduced in recent years because of changes in the nature of discharges from the Facility, to the industrial drainageway, among other things, the full 12-acre area of the former Pond area is to be addressed in OU4. The 12 acres are generally bounded by the Old Horseheads Landfill (Landfill) to the north and northeast, the Norfolk Southern Corporation tracks to the west, and an area of the Kentucky Avenue Wellfield property to the south. Waters from Koppers Pond historically have discharged via two outlet streams to its south, which ultimately drain to Newtown Creek. (See Figure 2).

SITE BACKGROUND

Site Description

The Site is located within the Village of Horseheads and the Town of Horseheads in Chemung County, New York. The Site includes the KAW, the Facility, industrial drainageway, and the contaminated portion of the underlying aquifer, known locally as the Newtown Creek Aquifer. A Site location map is provided as Figure 1.

Westinghouse began operations at the Facility in 1952. The Facility developed and manufactured television picture tubes, vacuum switches, and similar electrical products. Beginning in 1988, Westinghouse sold off its business operations at the Facility by selling its Imaging and Sensing Technology Division to the Imaging and Sensing Technology Corporation, which continued operations until 2000. In 1989, Westinghouse sold its interest in the Toshiba-Westinghouse Electric Corporation to Toshiba Corporation. Toshiba Display Devices, Inc., and later MT Picture Display Corporation of America-New York, LLC continued to occupy a portion of the Facility until 2004. In 1994, Westinghouse sold its remaining operations to Cutler-Hammer, which continues operations at the Facility to the present. In April 2007, CBS Corporation, as the corporate successor to Westinghouse, sold the Facility to Silagi Development and Management, Inc.

The Facility is bounded by Interstate 86 on the north, State Route 14 on the east, a Conrail track to the south, and property of New York State Electric and Gas Company to the west. The Facility is characterized by areas of grass lawn, pavement and buildings. Surface runoff from precipitation is routed by shallow swales and captured by surface-water drains at various locations around the main plant building. A large portion of the runoff is routed through two plant outfall flumes and ultimately flows to the industrial drainageway. The main building at the Facility covers approximately 16 acres in the eastern portion of the property and includes two wastewater treatment plants. Treated wastewater (process and non-contact cooling water) had been discharged to the industrial drainageway via the two permitted outfalls at the Facility from the beginning of operations through 2014.

The industrial drainageway is a surface water channel that conveys surface water runoff when present from a 1,350-acre commercial and industrial watershed, and also historically received discharges from the Facility. The industrial drainageway begins at the outlet of an underground pipe (located at the Chemung Street outfall) approximately 1,500 feet southeast of the Facility. It is a seven to 10-foot wide open ditch which extends approximately 2,200 feet to the southeast where it discharges into Koppers Pond.

Historically, the water in Koppers Pond has been approximately three to six feet deep and, at its southern end, the pond discharges to two outlet streams, which then merge about 500 feet downstream to a single channel that flows past the Hardinge plant and into Halderman Hollow Creek. From there, the creek flows through mixed industrial, commercial, and residential areas and discharges into Newtown Creek approximately 1.5 miles south of Koppers Pond.

Site History

The KAW is part of the EWB public-water supply system. It was constructed in 1962 and provided approximately 10 percent of the potable water produced by the EWB until its closure in 1980 following the discovery of elevated levels of trichloroethylene (TCE). TCE contamination was first detected in the KAW in May 1980 during an inventory of local wells initiated by the New York Department of Health (NYSDOH). In July 1980, the Chemung County Health Department conducted further groundwater sampling in the area and similarly found elevated levels of TCE in the KAW and several private residences and commercial facilities. As a result of these findings, the EWB closed the KAW in September 1980 and removed it from its other sources of potable water for its users. In 1983, the Site was placed on the federal National Priorities List of hazardous waste sites. Additional sampling conducted by local, state, and federal agencies through 1985 identified TCE contamination throughout the Newtown Creek Aquifer. In March 1985, EPA initiated a removal action for the purpose of providing alternate water supplies to impacted residences not connected to the public water distribution system. Residences whose private wells were found to be contaminated with TCE in excess of the NYSDOH drinking water standards for public water supplies were supplied with bottled water and ultimately connected to the public water supply.

As mentioned before, the EPA has divided the Site into four separate phases, or OUs, for remediation purposes.

OU1: In 1986, a remedial investigation and feasibility study (RI/FS) was conducted by NYSDEC and EPA to determine the nature and extent of the groundwater contamination at the Site. The results confirmed the presence of several volatile organic compounds (VOCs), including TCE at concentrations up to 340 parts per billion and inorganic chemicals at concentrations exceeding Federal maximum contaminant levels (MCLs) and New York State standards. Based on the 1986 RI/FS, EPA selected a remedy on September 26, 1986 in a ROD that addressed OU1. The OU1 ROD called for the connection of all residences on private wells within the study area to public water supplies and monitoring at, and upgradient of the EWB's nearby Sullivan Street supply well, which are further downgradient from the KAW. The OU1 ROD also called for a supplemental source control RI/FS to be conducted to further identify the source of contamination. In July 1989, NYSDEC completed the installation of the monitoring wells upgradient of the Sullivan Wellfield to monitor regional groundwater quality of the contaminant source areas. Groundwater samples collected from those wells in January 1990 revealed the presence of TCE in excess of the Federal MCLs and State standards. The public water supply at the Sullivan Street Wellfield was also found to be contaminated by TCE. In April 1990, EPA issued a document called an Explanation of Significant Difference (ESD) that modified the remedy selected in the 1986 ROD by announcing EPA's intention to design and construct a groundwater treatment facility for the Sullivan Street Well. This treatment facility was constructed and operational by mid-1994.

Pursuant to the OU1 ROD, EPA connected an additional 46 residences and three commercial properties to the public water supply that were using private drinking water wells in the affected area of groundwater contamination. Overall a total of 95 residences and three commercial properties were connected to the public water supplies between 1985 and 1994.

OU2: In February 1990, EPA completed a supplemental RI/FS. The supplemental RI concluded that the primary source of TCE contamination at and near the KAW was the Westinghouse Facility. Based on the 1990 RI/FS results, EPA selected a remedy on September 28, 1990, selecting an interim groundwater remedy that called for the following: restoration of the KAW as a public drinking water supply; prevention of the further spread of contaminated groundwater within the Newtown Creek Aquifer by pumping of the KAW and the yet-to-be installed recovery wells between the KAW and the Facility; construction of two groundwater treatment plants, one located near the KAW and the other located between the Facility and the KAW to the above-mentioned recovered groundwater; and a long-term monitoring program to monitor contaminant migration and evaluate the effectiveness of the remedy.

On June 28, 1991, EPA issued a unilateral administrative order to Westinghouse to implement the remedy selected in the 1990 ROD. Remedial construction activities began in September 1996 and were completed in June 30, 1999. On September 1995, EPA and Westinghouse entered an administrative order on consent requiring Westinghouse to perform a removal action at the Facility. The action consisted of the removal and off-Site disposal of buried drums containing magnesium chips and titanium turnings waste from the magnesium chip burial area and two calcium fluoride sludge disposal areas at the Facility. The removal action was completed in 1996.

Following the restoration of the KAW, EWB elected not to use the KAW. At this time, the KAW remains out of service. The second treatment system, which is located at the Facility and treats groundwater extracted from two barrier wells was in operation until April 2014, when the pumping of the extraction wells were temporarily suspended to evaluate groundwater quality conditions. As part of that evaluation, groundwater monitoring is ongoing.

VOC vapors released from groundwater contamination and/or soil have the potential to move through the soil and seep through cracks, utility penetrations, or other openings, into the indoor air of overlying buildings. This process is referred to as soil vapor intrusion. EPA investigates the soil vapor intrusion pathway at homes and buildings situated at Superfund sites when the potential for vapor intrusion exists. EPA’s approach for investigating, assessing and remediating vapor intrusion was developed after the issuance of the OU2 and OU3 RODs.

In October 2007, EPA conducted vapor intrusion sampling at six residences located near the Facility. Where permission was granted, EPA collected air samples from beneath, and in some cases within the buildings.

The analytical results of the October 2007 vapor intrusion sampling showed elevated TCE concentrations in the air beneath two of the six homes. As a result, sub-slab depressurization systems were installed at these two residences to mitigate the impacts of soil vapor intrusion by reducing or eliminating vapor entry into the buildings.

In addition to sampling residences for soil vapor intrusion, indoor areas in the occupied office spaces at the Facility were sampled in February 2015. VOCs were not detected above health-based levels in the four indoor air samples collected.

OU3: The OU2 ROD also called for an additional RI/FS to address source control at the Facility and to study the contaminated sediments present in the industrial drainageway and Koppers Pond. Based on the results of the additional RI/FS completed in 1996, EPA selected a remedy for OU3 on September 30, 1996. The OU3 ROD addressed soil contamination at the Facility and sediment contamination in the industrial drainageway. The major components of the selected remedy for OU3 included the excavation and off-Site disposal of contaminated soils and waste materials from the Facility, treatment of VOC-contaminated soils from the former Runoff Basin Area at the Facility using a soil vapor extraction (SVE) treatment system, and excavation and off-Site disposal of polychlorinated biphenyls (PCB)-contaminated sediments from the industrial drainageway. The OU3 ROD also required further investigations at Koppers Pond, identified as OU4, which is the subject of this Proposed Plan. In addition, in the OU3 ROD EPA determined that no further groundwater treatment beyond that specified in the OU2 interim remedy was necessary as a response action for OU3. In August 27, 2001, the OU3 remedial action began with the excavation and off-Site disposal of contaminated soils at the Facility, and this work was completed in August 23, 2005. Construction of the SVE system was completed in November 7, 2000 and operated until January 2011, at which time sampling revealed that the treatment system successfully remediated the VOC-contaminated soils. The remediation of the PCB-contaminated sediments in the industrial drainageway was completed in 2003.

OU4 - Koppers Pond: In September 2006, EPA and six potentially responsible parties entered an administrative order on consent for the performance of the RI/FS for Koppers Pond, identified as OU4. OU4 is the final planned phase of the response activities at the Site and the subject of this Proposed Plan.

KOPPERS POND CHARACTERISTICS

Koppers Pond is surrounded by an area of vacant and active industrial and governmental properties. To the north and northeast is the Landfill, to the south is the KAW facility, to the southeast is the Hardinge plant, to the east is property owned by the Fairway Spring Company, and to the west is a Norfolk Southern Corporation railroad right-of-way with active tracks. Much of the northern bank of Koppers Pond is formed by the Landfill. The Landfill was operated from the 1940s until 1973 and reportedly received municipal, commercial, and some industrial solid waste. The Landfill was closed for waste disposal in 1975, but no engineered final cover system was constructed at the time of closure.

Geology

Koppers Pond is a shallow, flow-through pond. The pond receives most of its inflow from the industrial drainageway. Koppers Pond is situated in a previously low-lying, wet area that apparently began to fill with water with the onset of discharges from the Facility. Because the topography around the pond is relatively flat, changes in the pond water level significantly affect the open water area. The pond bottom is comprised of soft sediments that range in thickness up to 38 inches, with greater thicknesses associated with the upper western leg of the pond where the industrial drainageway discharges to the pond. In a portion of the eastern leg of the pond, the pond bottom beneath the loose sediments was identified as sand and gravel. The total volume of pond sediments is an estimated 21,400 cubic yards (CY), which is equivalent to an average sediment thickness of 1.5 feet (18 inches). A hard clay layer generally underlies the sediments throughout most of Koppers Pond, which would be expected from the pond's origin as a low-lying swampy area. Because of the low-permeability of this clay layer, the surface water in the pond does not significantly interact with local groundwater.

RESULTS OF THE KOPPERS POND REMEDIAL INVESTIGATION

In addition to evaluating the historical data collected in 1995 and 1998, the OU4 RI includes sediment and surface water results from sampling conducted in 2008, 2010, and 2013. Fish samples were collected in 2003 and 2008.

In 2007, during the initial RI activities, Koppers Pond covered approximately nine to 12 acres with typical water depths ranging from about 1.5 to five feet. Under these conditions, the volume of water in the pond was about six million gallons. During the sampling conducted in 2008, the open water area of the pond covered about 9 acres and water depths were approximately 1.5 to four feet. Following the suspension of the OU2 groundwater recovery and treatment operations at the Facility in April 2014, which had resulted in the discharge of approximately 2 million gallons of treated water a day, the pond surface elevation was lowered because the volume of water in the drainageway, which fed into Koppers Pond, had significantly reduced. By late 2015 and early 2016, the pond level had significantly receded with an estimated open water area, primarily in the former southwest corner, of about 2.5 to 3 acres. A July 2016 inspection of the pond revealed that the pond did not have any open water.

The FS identified three water level conditions as a means of identifying areas of the Pond based upon a range of hydrologic conditions (Figure 2):

- High Water Level (HWL) – Pond water elevation of approximately 887 to 888 feet ft-amsl, with water depths of 2.5 to 6 feet over a pond surface (open-water) area of about 10 to 12 acres;
- Average Water Level (AWL) – Pond water elevation of approximately 886 ft-amsl, with water depths of 1.5 to 4 feet over a pond surface (open-water) area of about at 8 to 10 acres; and
- Low Water Level (LWL) – Pond water elevation of approximately 883 to 884 ft-amsl, with water depths of 0.5 to 2 feet over a pond surface (open-water) area of about 2.5 to 3 acres.

The FS further defines the terms mudflats and exposed sediments/soils as follows: "mudflats" means the low-lying areas along the perimeter of the pond (particularly on the western side) that are inundated under HWL conditions but exposed under AWL conditions; "exposed sediments or soils" means the areas formerly submerged during the RI under AWL conditions and due to subsequent low water elevations are no longer submerged. These exposed sediments or soils are not considered mudflats. Based upon inspections of water elevations in the Pond, all sediments under AWL conditions, could potentially be exposed under certain hydrologic conditions.

<u>Summary of Sampling Results</u>

Sediments

Sampling revealed metals, PCBs, and polynuclear aromatic hydrocarbons (PAHs) in pond sediments. These contaminants were detected throughout the pond, although concentrations generally tended to be higher in the western leg of the pond as compared to the central portion and eastern leg of the pond. Vertical profiling sampling did not reveal consistent patterns of concentrations with the depth interval of the sediment.

A comparison of the sediment data collected between 1995 and 2013 generally reveals a marginal decreasing trend in concentrations of the metal contaminants detected. Table 1 provides a summary of the maximum concentrations for metals detected in surface sediment samples collected during the 2013 sampling event.

PCB concentrations tend to be higher in deeper sediments. The maximum concentration of PCBs detected in the sediment of Koppers Pond was detected at a depth between 25-29 inches at a concentration of 11 parts per million (ppm). The sampling results have shown a more significant decreasing trend with depth in the concentrations of PCBs. The most recent surface (0 – 6-inch) sediment sampling conducted in 2013 revealed total PCBs at concentrations less than 1 ppm for each of the samples collected.

PAH concentrations tend to be higher in the shallow (0 to 6 inch) sediments, and PAH concentrations are not markedly different in historical sediment data (1995 and 1998) from those observed in samples collected in 2008 and 2010. Benzo(a) anthracene and benzo(b)fluoranthene have been detected at a maximum concentration of 867 ppm and 1,099 ppm, respectively.

Table 1
Maximum Concentrations of Metals and PCBs in the Surface Sediments (top six inches)

Contaminant	Maximum Concentration (ppm)
Barium	694
Cadmium	430
Chromium	321
Copper	740
Iron	32,700
Lead	1,500
Mercury	0.90
Nickel	130
Selenium	2.2
Silver	29.3
Zinc	7,200
PCBs	0.64

Mudflat Soils

Surface soil samples were collected from periodically inundated low-lying areas around the pond in 2007. These areas are referred to as mudflats. Each of these samples showed metals concentrations lower than corresponding average values for pond sediments. PCB concentrations in mudflat soil ranged from non-detect to .04 ppm.

Surface Water

Historical data revealed elevated concentrations of certain contaminants in discharges to the industrial drainageway. Previously observed “floc” in the industrial drainageway is no longer present, and suspected accumulations of the floc in the aboveground piping leading to the Chemung Street outfall was not observed during any of the field studies conducted between 2008 and 2013. Data collected during the OU4 RI did not reveal exceedances of New York State surface water standards.

The proposed remedial alternatives for OU4 do not address groundwater. Hydrologic evaluations conducted as part of the RIs for OU2 and OU4 did not reveal significant communication between surface water in Koppers Pond and local groundwater, primarily due to the low-permeability of the clay layer below the pond. Groundwater is currently being addressed pursuant to the remedy selected in the OU2 ROD.

Fish

Metals and PCBs have been detected in fish samples collected in Koppers Pond and its outlet channels. Metals concentrations in fish samples collected in 2003 and 2008 show variable patterns with no overall trends in concentrations. Generally, metals were not detected at elevated concentrations in fish tissue samples. On a lipid-normalized basis, PCB concentrations in fish samples collected in 2003 and 2008 showed decreasing concentrations in the bottom-feeding species, but increases in the other species sampled at Koppers Pond, such as largemouth bass and black crappie. Overall, however, the highest concentration of PCBs detected in 2003 was 2.4 ppm, while the highest concentration detected in 2008 was slightly lower at 2.06 ppm.

Because of elevated PCB levels in fish found in the 1988 sampling, the NYSDOH issued a fish consumption advisory for Koppers Pond. The NYSDOH advisory, which is still in effect, recommends that women under 50 years and children under 15 years not eat any fish from Koppers Pond. For all others, the recommendation is to eat no more than one meal of carp from Koppers Pond per month and up to four meals per month of all other fish species from Koppers Pond.

RISK SUMMARY

As part of the RI, a baseline human health and ecological risk assessment was developed for OU4 to estimate the risks associated with current and future land use conditions. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects caused by hazardous substance releases at a site in the absence of any actions to control or mitigate exposures to these hazardous substances, including institutional controls (i.e., fish consumption advisories).

Human Health Risk Assessment

A baseline human health risk assessment (BHHRA) was conducted to estimate the cancer risks and noncancer health hazards associated with exposures to chemicals of potential concern (COPCs) present in surface water and sediment at Koppers Pond and its outlet channels, in addition to fish tissue at Koppers Pond. Consistent with

EPA policy and guidance, the human health risk assessment evaluates exposures under a reasonable maximum exposure (RME) scenario defined as highest exposure that is reasonably expected to occur at a site. The risks and hazards associated with the RME individual is the basis for decisions at Superfund sites. In addition, the assessment central tendency exposure (CTE) is an exposure that evaluates average exposures to the COPCs so as to provide additional exposure information, but the CTE is not the basis of the decision.

Human health risk assessment is a four-step process used for assessing site-related cancer risks and noncancer health hazards. The four-step process includes: hazard identification (data collection and evaluation); exposure assessment, toxicity assessment, and risk characterization (see "What Is Risk and How Is It Calculated" box on page 8).

The results of the BHHRA indicate that the cancer risk related to exposure to COPCs in sediments under current and future conditions does not exceed the cancer risk range established under the NCP of 10^{-4} to 10^{-6}, which means the probability of developing cancer is one in ten thousand to one in a million, respectively, as a result of exposure to sediments or surface water. The noncancer hazards from exposure to COPCs in sediments or surface water were below the goal of protection of a hazard quotient (HQ) for individual chemicals or a hazard index (HI) for multiple chemicals, less than or equal to one.

At the time of the BHHRA was competed in 2013, the document recognized the presence of litter and off-road vehicles tracks suggesting that periodic trespassing occurs in the area. Individuals have been observed fishing from the banks of the pond. As noted above, the OU2 groundwater recovery and treatment operations at the Facility were suspended in April 2014 in order to evaluate the effects of the cessation of pumping on groundwater quality. Since that time, the surface area and the depth of the pond have decreased significantly to the extent that Pond conditions in late 2015 and early 2016 would not support significant fish populations. However, resumption of the treatment system discharge or other significant discharges to the industrial drainageway could restore conditions that would once again support a fish population. The risk estimates below assume that fish populations return to the Pond in the future as a viable source for human consumption.

Exposure assumptions for the RME individual include a fish ingestion rate of 25 grams per day for the adult (or approximately 40 half pound meals/year); 8 grams per day for the young child (or approximately 13 half pound meals/year); and 16 grams per day for the 7 to 13 year old (or approximately 26 half pound meals/year) with an assumed total exposure period of 30 years for each.

Using these exposure assumptions, ingestion of fish results in a cancer risk of $3.1 \times 10^{-4,}$ or three in ten thousand, which exceeds the goal of protection of 1×10^{-6}. This carcinogenic risk represents the total risk by combining risks for a child (less than 6 years with a cancer risk of 7.3×10^{-5}), adolescent (ages 7 to 13 with a cancer risk of 7×10^{-5}) and an adult (13 years and older with a cancer risk of 1.6×10^{-4}). Noncancer HI values exceeding the goal of protection of an HI = 1 are: 21.1 for the young child; 20.3 for adolescent; and 15.6 for the adult. Both the cancer risks and noncancer hazards are from exposures to PCBs in the fish tissue.

The risks to the CTE or average individual through fish ingestion resulted in a total cancer risk of 2.6×10^{-5} with risks to the young child (9.1×10^{-6}), adolescent (8.8×10^{-6}) and adult (2.4×10^{-5}). The noncancer hazards for the CTE individual were 5.7 for the young child, 5.5 for the adolescent, and 4.0 for the adult where the HI remains above the goal of protection of an HI = 1. The main contributor to both the cancer risks and noncancer hazards was PCBs. The consumption rates used in this assessment were 8 grams/day for the adult or approximately 13 half pound meals/year, 3 grams/day for the young child or approximately 5 half pound meals/year, and 5 grams/day for the adolescent or approximately 8 half pound meals/year.

The BHHRA evaluated cancer risks and noncancer hazardous under current and future conditions. Since the BHHRA was completed in 2012, conditions at Koppers Pond have changed. Under the current low water conditions, the pond would not support a fish population that would make the pond a viable source of fish for human consumption, and the calculated risks as presented in the BHHRA would not occur under current conditions. The EPA Superfund program considers both current and future conditions to support remedy selection decisions. As such, the future conditions assumed in the BHHRA remain as a potential future condition at the pond as previously described. As discussed in the BHHRA, the cancer risk range and goal of the protection of an HI=1 were exceeded under potential future conditions. The main COPC was PCBs.

Ecological Risk Assessment

This section summarizes the results of the ecological risk assessment process and is based on the results of the supplemental baseline ecological risk assessment (sBERA). In the sBERA, EPA concludes that exposure to chemicals of potential ecological concern (COPECs) in the environmental media of Koppers Pond and its outlet channels do not pose an ecological concern for any of the evaluated receptors, except for exposure to cadmium by the muskrat. The risk to muskrats was initially based upon food chain modeling which included a literature-based bioaccumulation value for benthic macroinvertebrate. Food chain modeling subsequently conducted using site-specific fish tissue data did not result in the calculation of risk to the muskrat. The decrease in the Koppers Pond water depth has resulted in the conversion of sediments in the shallow portions of Koppers Pond to soils that allowed access to sediments that were previously inaccessible to certain potential receptors (e.g. wading birds). Under these low water level conditions, larger areas of exposed sediments or soils are present. In order to ensure that additional risk was not identified based upon exposed sediments under these conditions, food chain modeling was conducted for the muskrat and wading birds incorporating the exposed sediment and all shallow areas accessible to wading birds. The re-evaluation did not change the overall conclusions. In addition, the presence of forbs and grasses resulting from low water levels could be indicative of a terrestrial environment and the presence of additional terrestrial receptors that were not evaluated in the sBERA.

Based upon the results of the BHHRA and sBERA, EPA has determined that actual or threatened releases of hazardous substances at Koppers Pond, if not addressed by the preferred remedy or one of the other active measures considered, will present a current or potential threat to human health or the environment. It is EPA's current judgment that the Preferred Alternative identified in this Proposed Plan is necessary to protect human health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

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

The followings RAOs have been established for Koppers Pond:

- Minimize ecological receptors' exposure to contamination in exposed sediments or soils; and
- Reduce the future health risks and hazards associated with future consumption of fish from Koppers Pond by reducing the concentration of contaminants in fish.

WHAT IS HUMAN HEALTH RISK AND HOW IS IT CALCULATED

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

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

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

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

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

Table 1 presents the highest levels of COCs and COPECs present in the surface sediments/soils at the pond. As noted above, concentrations of PCBs in fish tissue indicate unacceptable risks to human health under the fish consumption assumptions identified in the BHHRA. Furthermore, numerous metals exceeded their respective soil cleanup objectives for the protection of ecological resources identified in York State's 6 NYCRR Part 375-6.6. While PCBs were detected, metals were generally widespread and co-located, with cadmium as the metal that exceeded its ecological SCO frequently and to the greatest order of magnitude, with one sample being found at two orders of magnitude above its ecological SCO. Because the fluctuating water levels in the pond result in varying amounts of sediments being exposed, flexibility needs to be incorporated into remedial efforts intended to achieve the RAOs. The alternatives developed below are designed to provide the flexibility to address sediments that may be either exposed or inundated, depending upon variations of climate, season, or local (e.g., human-derived) conditions. The ecological SCOs for cadmium, chromium, and copper of 4 ppm, 41 ppm, and 50 ppm, respectively, have been selected as the PRGs. Given that cadmium contamination is generally widespread and co-located with other metals, it is expected that addressing cadmium in the soft sediments/soils would also address other metals. Furthermore, the fish consumption exposure route defined in the BHHRA would expect that PCB concentrations in fish tissue would need to be below 0.07 ppm; addressing sediment concentrations that exceed the PRGs would also adequately address the general widespread low level PCB contamination present in the soft sediment/soils, thereby addressing the fish consumption RAO.

SUMMARY OF REMEDIAL ALTERNATIVES

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

Detailed descriptions of the remedial alternatives for addressing the contamination associated with this site can be found in the FS Report, dated July 2016.

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

Remediation Area

As mentioned previously, water elevations in the pond have decreased considerably since the OU4 RI commenced. These variations in water level are predominately due to climatic and hydrologic conditions, such as prolonged dry periods, the cessation of permitted discharges from the Facility to the industrial drainageway, and the suspension of the discharge of the treated water to the industrial drainageway from the groundwater treatment plant. Variability in water elevations in the pond is expected over time. The FS identified three water level conditions as a means of identifying areas of the Pond based upon a range of hydrologic conditions (Figure 2):

- High Water Level (HWL) – Pond water elevation of approximately 887 to 888 feet ft-amsl, with water depths of 2.5 to 6 feet over a pond surface (open-water) area of about 10 to 12 acres;
- Average Water Level (AWL) – Pond water elevation of approximately 886 ft-amsl, with water depths of 1.5 to 4 feet over a pond surface (open-water) area of about at 8 to 10 acres; and
- Low Water Level (LWL) – Pond water elevation of approximately 883 to 884 ft-amsl, with water depths of 0.5 to 2 feet over a pond surface (open-water) area of about 2.5 to 3 acres.

The development of remedial alternatives for OU4 considered the potential for variability in water level elevations. As a result, each of the alternatives for evaluation address the entire approximately nine acres encompassing the AWL for both sediments and exposed soils. Under the July 2016 conditions at Koppers Pond, no fishery is present due to limited open water area and water depth. The return of a fishery could be possible if higher water levels are sustained for a sufficient period of time to allow for fish populations to rebound or possibly recolonize the pond. While the specific height of water required to support such a situation has not been established, the FS assumed that water levels would need to meet or exceed the AWL condition. Under such a scenario, fish consumption from Koppers Pond could be possible in the future.

The remedial design would take into consideration measures to maintain the function of the pond to the extent practicable, considering the expected variability in water elevations over time.

Alternative 1: No Action

The NCP requires that a "No Action" alternative be developed as a baseline for comparing other remedial alternatives. Under this alternative, there would be no physical remedial measures to address the contamination at Koppers Pond. This alternative does not include any monitoring or institutional controls.

Because this alternative would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, additional response actions may be implemented.

Capital Cost:	*$0*
Annual Operation &Maintenance (O&M) Costs:	*$0*
Present-Worth Cost:	*$0*
Construction Time:	*Not Applicable*

Alternative 2: Monitored Natural Recovery, Access Restrictions, and Institutional Controls

The monitored natural recovery (MNR) alternative relies on naturally occurring processes to reduce the toxicity, mobility, and volume of contaminants at Koppers Pond. The dominant natural recovery process at Koppers Pond is burial by cleaner material. Long-term monitoring of sediment and fish, including sediment toxicity testing, pore water testing, and acid volatile sulfide/simultaneously extracted metals testing of sediments to monitor contaminant bioavailability would be included in this alternative to confirm that contaminant reduction is occurring and that the reduction is achieving the remedial action objectives. A fishery management program to provide chemical monitoring and other assessments of the fish population, including the potential for periodic harvesting and restocking of fish would be evaluated.

Chain-link security fencing would be installed around the perimeter of Koppers Pond to supplement the existing fencing. Institutional controls, such as fish consumption advisories and restrictions on activities in Koppers Pond that could cause or contribute to the spread of contaminants through the use of deed notices and environmental restrictive covenants would be implemented as long-term control measures as part of Alternative 2. A review of Site conditions would be conducted no less often than once every five years until cleanup levels are achieved.

Capital Cost:	*$ 270,000*
Annual O&M Costs:	*$ 640,000*
Present-Worth Cost:	*$ 910,000*
Construction Time:	*3 months*

Alternative 3: Capping, Access Restrictions, and Institutional Controls

This alternative would include the placement of a geotextile membrane and six-inch thick soil and sand cap over the pond to provide a uniform and continuous bottom surface, which equates to approximately nine acres of sediments and exposed soils. This alternative includes sediment consolidation/grading within the footprint of Koppers Pond to accommodate the placement of capping material. As part of the remedial design, pre-design investigations would be undertaken to evaluate the need for modifications of the pond outlets structure to help maintain the design pond surface water elevation. During the remedial design, the necessary capacity for flood management would be evaluated and the necessary mitigation measures would be developed, as determined to be appropriate. A restoration plan may be required to address impacts to wetlands. Chain-link security fencing would be installed around the perimeter of Koppers Pond to supplement the existing fencing. After construction of the cap is completed, the remedy would be monitored over the long term. Long-term monitoring of sediment and fish, to the extent necessary, would be conducted to confirm that contaminant reduction is occurring and that the reduction is achieving the remedial action objectives. A fishery management program to provide chemical monitoring and other assessments of the fish population, including the potential for periodic harvesting and restocking of fish would be evaluated.

Along with the engineered control, namely the fencing around the perimeter of the Pond, institutional controls would be implemented, such as fish consumption advisories and restrictions on activities in Koppers Pond that could cause or contribute to the spread of contaminants such as through deed restrictions as long-term control measures as part of this alternative. Also, pursuant to Section 121 (c) of CERCLA, a review of Site conditions would be conducted no less often than once every five years until cleanup levels are achieved.

Capital Cost:	*$ 1,659,000*
Annual O&M Costs:	*$ 262,000*
Present-Worth Cost:	*$ 1,921,000*
Construction Time:	*6 months to 1 year*

Alternative 4: Excavation, On-Site Containment, and Institutional Controls

This alternative would involve the removal through excavation of the sediments in either the western or eastern portion of the pond and the placement of the excavated material in the non-excavated portion of the pond, thereby replacing the existing aquatic habitat with a combination of wetland and upland habitat. Under the conceptual design, the elevation of the two outlet channels would be lowered to allow the pond to drain. Temporary earthen dams would be constructed at the upper western end of the pond (i.e. at the mouth of the industrial drainageway) and across the pond to separate the eastern and western portion. A temporary bypass and piping system would be constructed and operated to divert the flow of the industrial drainageway around the pond, discharging downstream of the western outlet channel. Sediments from the excavated portion of the pond would be dried and relocated into the non-excavated portion. A drainage ditch would be constructed connecting the industrial drainageway to the western outlet channel and eliminating the eastern outlet channel. Two feet of clean soil cover would be installed over the consolidated sediments and that portion of the pond would be restored as upland habitat. The excavated portion of the pond would be restored as a low-lying wetland area. During the remedial design, the capacity need for flood management would be evaluated and the necessary mitigation measures would be developed, as determined appropriate. A restoration plan may be required to address impacts to wetlands. A fishery management program to provide chemical monitoring and other assessments of the fish population, including the potential for periodic harvesting and restocking of fish would be evaluated.

Institutional controls would be implemented, in the form of deed restrictions as part of this alternative to ensure the long-term integrity of the waste containment area.

Also, pursuant to Section 121 (c) of CERCLA, a review of Site conditions would be conducted no less often than once every five years.

Alternative 4A: Excavation of the Western Portion and Consolidation to the Eastern Portion

Capital Cost:	*$ 3,203,000*
Annual O&M Costs:	*$ 195,000*
Present-Worth Cost:	*$ 3,398,000*
Construction Time:	*6 months to 1 year*

Alternative 4B: Excavation of the Eastern Portion and Consolidation to the Western Portion

Capital Cost:	*$ 2,929,000*
Annual O&M Costs:	*$ 195,000*
Present-Worth Cost:	*$ 3,124,000*
Construction Time:	*6 months to 1 year*

Alternative 5: Excavation and Off-Site Disposal

This alternative involves the complete removal through excavation of all sediments and exposed soils, an estimated 28,600 cubic yards, from Koppers Pond. Temporary dams in the upper western end of the pond and across the entrances of the two outlet channels would be constructed and bypass piping and a pumping system would be installed to divert the flow of the industrial drainageway around the pond, discharging downstream of the temporary dams of the outlet channels. Handling of the excavated material would include the management of the excavated sediments and exposed soils at the Site, including allowing the sediments to dry and treating them using stabilization agents, as necessary, and transporting them to an approved off-Site facility for disposal. Restoration activities would include revegetation in the impacted areas. After construction is completed, no institutional or engineering controls would be required for this alternative.

Capital Cost:	*$ 4,824,000*
Present-Worth Cost:	*$ 4,824,000*
Construction Time:	*6 months to 1 year*

EVALUATION OF ALTERNATIVES

In evaluating the remedial alternatives, each alternative is assessed against nine evaluation criteria set forth in federal regulation, namely, overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance. Refer to the table on the page 12 for a more detailed description of the evaluation criteria.

This section of the Proposed Plan evaluates the relative performance of each alternative against the nine criteria, noting how each compares to the other options under consideration. A detailed analysis of alternatives can be found in the FS Report.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

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

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the Site, or whether a waiver is justified.

Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

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

Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods 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.

State/Support Agency Acceptance considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Overall Protection of Human Health and the Environment

A threshold requirement of CERCLA is that the selected remedial action be protective of human health and the environment. An alternative is protective if it reduces current and potential future risk associated with each exposure pathway at a site to acceptable levels.

Overall protection of human health and the environment at Koppers Pond would be achieved by reducing PCB concentrations in fish and minimizing exposure to contaminated soils or sediments. Each of the alternatives presented except Alternative 1 (No Action) and Alternative 2 (MNR), would provide adequate protection of human health and the environment through active remediation. Alternative 2 relies on natural processes, such as sedimentation, to cover the surface sediment with cleaner sediment to reduce the concentrations of contaminants at the sediment surface. However, Alternative 2 would not address the exposed soils. Alternative 3 relies on capping to isolate soil and sediment contamination in place, while Alternatives 4a and 4b rely on a combination of excavation and capping to achieve protectiveness. Alternatives 2, 3, 4a, and 4b also rely on monitoring for the protection of human health and the environment. Alternative 5 relies on excavation of all affected soils and sediments to address risks.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Compliance with ARARs is the other threshold requirement for remedy selection under CERCLA regulations. There are currently no federal or state promulgated standards for contaminant levels in sediments. EPA has identified New York State's 6 NYCRR Part 375 as a "to-be-considered", or an 'other guidance' that EPA considers in determining how to address contaminated sediments. Furthermore, the sediments have been or have the potential to be characterized as contaminated, exposed soils as a result of the fluctuations in water elevations at Koppers Pond. Because the contaminated, exposed soils and sediments would not be actively addressed under Alternatives 1 and 2, cleanup levels would not be achieved under these alternatives. Alternatives 3, 4a, 4b, and 5 would either cap or remove, or a combination thereof, the sediments and exposed soils in the approximately nine acre area with a corresponding elevation of approximately 886 feet-amsl.

Alternatives 3, 4a, 4b, and 5, which include the placement of material within Koppers Pond, would need to be implemented in compliance with the Clean Water Act.

Long-Term Effectiveness and Permanence

Alternative 1 would involve no active remedial measures and, therefore, would not be effective in eliminating the potential exposure to contaminants. Alternative 2 would not address contaminated soils and, as such, would not be effective in the long term. Alternative 3, 4a, and 4b would be effective in the long term by isolating contaminated soils and sediments under a cap. Alternative 4a and 4b eliminate the pond in its current configuration, consolidate impacted sediments/soils into an on-site containment area, and replace the aquatic habitat with a combination of wetlands and upland habitat. Under Alternatives 4a and 4b, the replacement of aquatic habitat with wetlands and uplands habitat would be permanent. Alternative 5 would be effective in the long term and would provide permanent remediation by removing contaminated soils and sediments and securely disposing of them in an approved off-Site facility. Alternatives 3, 4a, and 4b would require O&M to ensure the long-term integrity of the cap and fence. The fishery management program under Alternatives 2, 3, 4a, and 4b would require that an evaluation be performed to determine if some reduction in residual risk could be attained by harvesting older adult fish, including the bottom-feeding carp, and restocking the pond with juvenile fish. The fish consumption advisory would continue to provide some measure of protection of human health until PCB concentrations in fish are reduced to the point where the fish consumption advisories can be relaxed or lifted. For Alternatives 2 through 4, institutional controls would be required to restrict activities that could compromise the integrity of the cap.

Because contaminants would remain at the Site under Alternatives 1 through 4, statutorily mandated five-year reviews would be required pursuant to Section 121 (c) of CERCLA.

Reduction of Toxicity, Mobility, or Volume

Alternative 1 would provide no reduction in toxicity, mobility, or volume. Alternative 2 relies on naturally occurring processes (*e.g.*, sedimentation) to reduce the toxicity or mobility of contaminants in sediments. Although mobility is not typically reduced by MNR, the sediments in Koppers Pond are not prone to erosional conditions. In addition, these processes would provide no reduction in toxicity, mobility, or volume of soils. Under Alternative 3, and 4a and 4b, the mobility of contaminants would be eliminated via capping but the mobility of the contaminants would be eliminated via excavation with off-Site disposal, or on-Site consolidation and capping, respectively. In addition to reducing mobility, Alternative 5 would also reduce the toxicity and volume of contaminants through excavation and off-site disposal.

Short-Term Effectiveness

Alternatives 1 (No Action) and 2 (MNR) do not involve any capping, excavation, or dredging activities that could present a risk to workers or the public. Alternatives 3 through 5 would each have similar risks to remediation/construction workers, including the potential for exposure to contaminants, working on or around heavy equipment, working in water/wet environments, and increased construction-related traffic. It is estimated that Alternative 2 would require 3 months to install fencing and Alternatives 3, 4a and 4b, and 5 would require 6 months to 1 year to complete the capping and/or excavation. In all cases, it is anticipated that these potential risks could be mitigated through the use of engineering controls, safe work practices, and personal protective equipment.

Excavation and capping activities would likely increase concentrations of contaminants in the water column and fish tissue during the dredging period and for a short period of time after dredging. Alternatives 3 through 5 all result in varying levels of impacts to the aquatic habitat in the pond, including complete elimination of the aquatic habitat associated with the pond and replacing this habitat with a combination of wetlands and uplands habitat under Alternative 4. Alternatives 3 and 5 rely on natural processes to restore the impacted aquatic habitat impacts. Under Alternative 4, the replacement of aquatic habitat with wetlands and uplands habitat would be permanent.

Alternative 4 would result in the loss of open water and adjacent wetlands. The pond and surrounding area provide water storage during flood events that can lessen the impacts of downstream flooding. Eliminating the pond and adjacent wetlands would increase potential downstream flooding.

Implementability

Alternative 1 would be the easiest alternative to implement, as there are no construction activities to implement. There are no implementability issues for Alternative 2 because it does not involve any active remediation. Alternatives 3, 4, and 5 would employ technologies known to be reliable and that can be readily implemented. Alternative 3 (capping) would be easier to implement than Alternatives 4 and 5 because it involves the placement of a six-inch cap rather than the removal of sediments and soils from Koppers Pond. The volume of fill added to the pond by capping is not expected to affect the pond level or increase the potential to downstream flooding because of the resulting consolidation of underlying soft sediments.

Under Alternatives 2, 3, 4, and 5, the implementation of institutional controls would be feasible to implement.

Cost

The estimated capital cost, operation and maintenance (O&M), and present worth cost are discussed in detail in the FS Report. The cost estimates are based on the best available information. Alternative S1 (No Action) has no cost because no activities are implemented. The present worth cost for Alternatives 2 through 5 are provided below. The estimated capital, O&M, and present-worth costs for each of the alternatives are as follows:

Alternative	Capital Cost	Annual O&M Cost	Present Worth
1	$0	$0	$0
2	$270,000	$640,000	$910,000
3	$1,659,000	$262,000	$1,921,000
4a	$3,203,000	$195,000	$3,398,000
4b	$2,929,000	$195,000	$3,124,000
5	$4,824,000	$0	$4,824,000

State/Support Agency Acceptance

NYSDEC concurs with the preferred alternative.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the Responsiveness Summary section of the Record of Decision for this OU. The Record of Decision is the document that formalizes the selection of the remedy for an OU.

PREFERRED REMEDY AND BASIS FOR PREFERENCE

Based upon an evaluation of the remedial alternatives, EPA, with the concurrence of NYSDEC, proposes Alternative 3, Capping, Access Restrictions, and Institutional Controls as the Preferred Alternative. Alternative 3 consists of the placement of a geotextile membrane and six-inch thick soil and sand cap over the pond to provide a uniform and continuous bottom surface, which equates to approximately nine acres of sediments and exposed soils. This alternative includes sediment consolidation/grading within the footprint of Koppers Pond to accommodate the placement of capping material.

As part of the remedial design, pre-design investigations would be undertaken to evaluate the need for modifications of the pond outlet structure to help maintain the designed pond surface water elevation. During the remedial design, the necessary capacity for flood management would be evaluated and the necessary mitigation measures would be developed, as determined to be appropriate. A restoration plan may be required to address impacts to wetlands. A fishery management program to provide chemical monitoring and other assessments of the fish population, including the potential for periodic harvesting and restocking of fish would be evaluated under this alternative.

Chain-link security fencing would be installed around the perimeter of Koppers Pond to supplement the existing fencing. Long-term monitoring of sediment and fish, to the extent necessary, would be conducted to confirm that contaminant reduction is occurring and that the reduction is achieving the remedial action objectives.

Under this alternative, institutional controls, such as fish consumption advisories and restrictions on activities in Koppers Pond which could cause or contribute to the spread of contaminants, will be implemented through the use of deed restrictions that will serve as long-term control measures. The estimated present-worth costs of the preferred alternative is $1,921,000.

The environmental benefits of the preferred alternative may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with the EPA Region 2's Clean and Green Energy Policy[1] and NYSDEC's Green Remediation Policy. This would include consideration of green remediation technologies and practices. Because the remedy would result in contaminants remaining on Site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, additional remedial actions may be implemented to remove, treat, or contain the contaminants. The site review would include evaluation of data collected from the long-term monitoring, a site-wide visual inspection, and a report prepared by EPA.

[1] See http://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy and http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf

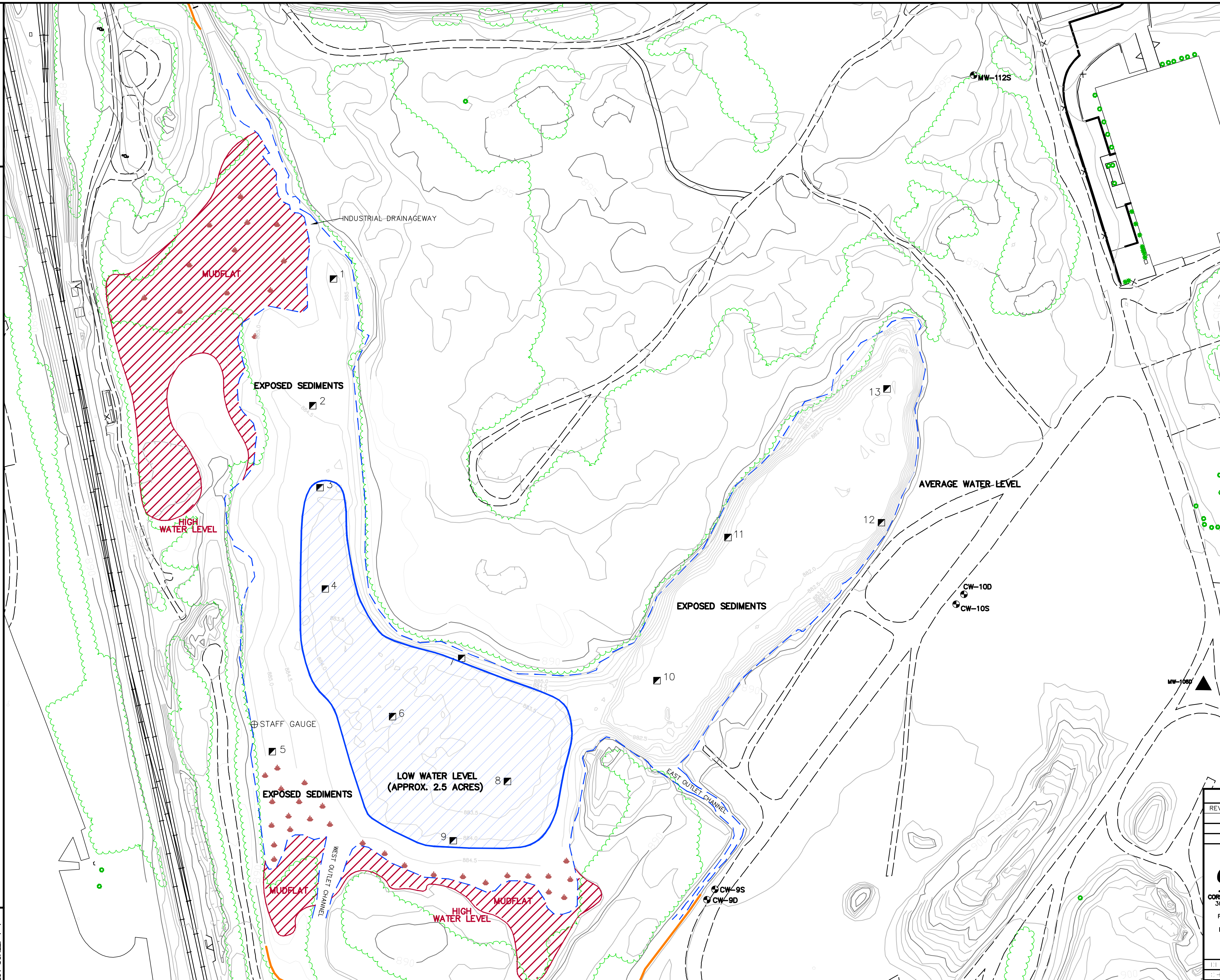
Basis for the Remedy Preference

Alternatives 3, 4a, 4b, and 5 would effectively achieve the remedial action objects. Alternative 3 is protective because it would reduce the PCB concentrations in fish and meet the ecological soil cleanup objectives. Given the future uncertainty of water level conditions in Koppers Pond, Alternative 3 provides the flexibility to make adjustments to the design of the cover system. The cap, providing a uniform and continuous bottom surface, ensures effective remediation over an area comprised of a combination of exposed soils and sediments. The estimated present-worth cost of the preferred alternative is $1,921,000.

Alternative 3 is preferred because it will achieve RAOs and PRGs in a short period of time while providing flexibility to adapt to fluctuations in the water conditions of the Pond. Given the future uncertainty of water level conditions in the Pond, Alternative 3 provides the flexibility to make adjustments to the design of the cover system. The cap, providing a uniform and continuous bottom surface, ensures effective remediation over an area comprised of a combination of exposed soils and sediments. Based upon the information currently available, EPA believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. EPA expects the preferred alternative to satisfy the following statutory requirements of CERCLA §121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The preferred alternative would not satisfy the preference for treatment as a principal element because contaminants would remain underneath the cap; however long-term monitoring and five-year reviews would be performed to assure the effectiveness of the remedy. With respect to the two modifying criteria of the comparative analysis state acceptance and community acceptance: NYSDEC concurs with the preferred alternative; community acceptance will be evaluated upon the close of the public comment period.

FIGURE 1
SITE LOCATION MAP
KENTUCKY AVE. WELLFIELD SITE - OU4
HORSEHEADS, NEW YORK
Prepared For:
KOPPERS POND RI/FS GROUP

CUMMINGS RITER CONSULTANTS INC.



LEGEND

MW-112S	MONITORING WELL LOCATION
886	EXISTING ELEVATION CONTOUR
885.0	SEDIMENT ELEVATION CONTOUR
	UTILITY POLE
	TYPICAL LOW WATER CONDITIONS
	TYPICAL AVERAGE WATER CONDITIONS
	TYPICAL HIGH WATER CONDITIONS
12	SEDIMENT SAMPLE LOCATION
	STAFF GAUGE

NOTE

1. CONTOUR ELEVATIONS IN THE POND ARE BASED ON WATER ELEVATION OF 885.75', SURVEYED ON MAY 6, 2008.

REFERENCE:

1. MAPPING COMPLETED BY STEREOPHOTO GRAMMETRIC METHODS BY WEILER ASSOCIATES FROM 1:4800 SCALE AERIAL FLOWN 11-09-91.

SCALE

70 0 70 140 FEET

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED

CUMMINGS RITER CONSULTANTS, INC.
CORPORATE HEADQUARTERS
300 Penn Center Blvd.
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Pittsburgh, PA 15235
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FIGURE 2
WATER LEVEL CONDITIONS

KENTUCKY AVENUE WELLFIELD SITE – OU4
HORSEHEADS, NEW YORK

PREPARED FOR
KOPPERS POND RI/FS GROUP

SIZE E | SCALE: 1" = 50' | REV. –

DRAWING NUMBER 07502E3

DRAWN BY: D.J. Martino DATE: 04-01-16
CHECKED BY: B.R. Maurer DATE: 04-01-16
APPROVED BY: B.R. Maurer DATE: 04-01-16

DRAWING NUMBER 07502E3

PLOT SCALE: 1=1