PROPOSED PLAN JUNE 2016
NEW JERSEY ZINC/MOBIL CHEMICAL - OPERABLE UNIT 4, OFF-SITE SOILS
DEPUE, BUREAU COUNTY, ILLINOIS

INTRODUCTION

The Illinois Environmental Protection Agency (Illinois EPA) is issuing this Proposed Plan to present Illinois EPA's preferred remedy for certain portions of Operable Unit 4, Off-Site Soils, of the New Jersey Zinc/Mobil Chemical Superfund Site in DePue, Illinois, and to solicit public review and comment on the alternatives considered. Illinois EPA is the lead agency for the Site and the United States Environmental Protection Agency (USEPA) is the support agency. Illinois EPA, in consultation with USEPA, will select a final remedy for the portions of Operable Unit 4 addressed by this Proposed Plan after reviewing and considering public comments submitted during the public comment period, from June 14 through July 14, 2016. The final plan will be announced in a **Record of Decision** (ROD). The public's comments will be considered and addressed in the Responsiveness Summary included in the ROD.

The Site has been organized into separate **Operable Units**. Operable Unit (OU) 4 is Off-Site Soils within the Village of DePue. Illinois EPA is proposing Alternative 2: Excavation and Management of Soils on the Former Plant Site Area to be the selected remedy to clean up contaminated soil in portions of OU4, specifically residential areas, public parks, alleys, the school, and miscellaneous properties throughout the village. Other areas of OU4, such as agricultural property and properties evaluated primarily for ecological concerns, will be addressed at a later date. Alternative 2 will be protective of human health and the environment, will meet **applicable or relevant and appropriate requirements** (ARARs), will be cost effective, will be effective in the long term, and will be consistent with a final remedy for OU4 and for the Site as a whole.

Illinois EPA is issuing this Proposed Plan to provide background information on the Site and OU4, and to solicit public comments on the preferred alternative and the other considered alternatives as the remedy for the portions of OU4 being addressed by this action. This Proposed Plan is issued to fulfill the public participation responsibilities under §117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act** (CERCLA) and §300.430(f)(2) of the **National Oil and Hazardous Substances Pollution Contingency Plan** (NCP). This Proposed Plan summarizes information that can be found in greater detail in the Pilot Study Sampling Report (ENVIRON 2015) and Scoping Document for Presumptive Remedy OU4: Off-site Soils (October 2015), and other documents contained in the Administrative Record for the Site.

The selected cleanup plan could differ from the preferred alternative described in this Proposed Plan depending on information or comments Illinois EPA receives during the public comment period. Therefore, Illinois EPA encourages the public to review and comment on this Proposed Plan. The public is also encouraged to attend and participate in an availability session to be held

on June 22, 2016 from 3:00 – 5:00 pm and 6:00 – 8:00 pm and a public meeting at the DePue School Gymnasium on June 29, 2016 from 6:00 – 8:00 pm.

Supporting documents that address the Site and OU4 can be found at:

Selby Township Library
101 Depot St.
DePue, IL 61322
815-447-2660
M, T, F noon – 5:00pm
W noon – 8:00 pm
Sa 8:00 am – noon

Illinois Environmental Protection Agency
1021 North Grand Ave. East
Springfield, IL 62702
217-557-4972
M-F 8:30 am – 5:00 pm
Call for appointment

Note: Words that appear in **bold font** are defined in the Glossary at the end of this document. A list of abbreviations used in this Proposed Plan can be found after the Glossary.

SITE BACKGROUND

The New Jersey Zinc/Mobil Chemical Site is a former primary and secondary zinc smelter. At various times, it also produced sulfuric acid, lithopone, and diammonium phosphate fertilizer. The Site is located within the Village of DePue in Bureau County, Illinois (Figure 1). The Site includes the smelter and fertilizer plant area and bluff, a phosphogypsum stack and associated features, bottomland areas including a drainage ditch and outfall area, Lake DePue, and portions of the floodplain associated with Lake DePue. The Site has been organized into separate OUs for investigation and remediation (Figure 2):

- OU1 is the South Ditch that received historic groundwater and surface water discharge from the plant area and conveyed this water to Lake DePue. As a result, sediments in the South Ditch are contaminated with metals associated with the operations of the plant. The potentially responsible parties (PRPs) performed an interim remedial action in the South Ditch in 2005 including dredging of contaminated sediment, stabilizing the sediment, and disposing the stabilized sediment on the plant site in a corrective action management unit (CAMU). A final remedial action for OU1 is anticipated to be included as part of the remedial action for OU5.

- OU2 is the phosphogypsum stack, an area of approximately 140 acres that includes phosphogypsum from the fertilizer production operation and several water control features.

- OU3 is the former plant site area (FPSA) and includes a 136-acre area enclosed by a fence where the former plant operations were conducted. OU3 also includes a 75-acre Bluff Area north of the plant, and a 25-acre area that includes a former solid waste dump beyond the plant's fence line, south of the main thoroughfare of the Village.

- OU4 includes soils impacted from Site operations beyond the plant's boundaries within the Village of DePue. The residential areas, public property, parks, alleys, the school, and miscellaneous properties within OU4 are the focus of this Proposed Plan. Other areas of OU4 will be addressed at a later time.

- OU5 is Lake DePue and its associated floodplain. The South Ditch and another outfall discharged to Lake DePue, resulting in metals-contaminated sediments concentrated in certain areas of the lake.

The Village of DePue is primarily residential, with an estimated population of 1,760 (US Census, May 2015). Commercial properties and a school are also present. 54.7% of the Village's population is Hispanic or Latino (US Census, 2010). 27% of the Village's population is less than 16 years old (US Census, 2010).

The plant is located in the north central part of the Village and surrounded by residential property to the west and east. Residential and commercial properties are located to the south. To the north of the plant is a large Bluff Area owned by the PRPs and the Site's phosphogypsum stack.

The contamination in OU4 is likely due to two sources: aerial deposition of contaminants emanating from the plant area as emissions from former operations or particulates transported by wind or water, and **site-related material** (SRM) taken directly from the Site and placed in yards, alleys, and other areas as fill material.

SITE HISTORY

Mineral Point Zinc began operations circa 1905 on what had been farmland. The primary smelter produced slab zinc, zinc dust, and sulfuric acid. A lithopone production plant was added to the smelter in 1923 and closed in 1956. In the late 1930s, New Jersey Zinc acquired Mineral Point Zinc and by the mid-1950s was operating the Site as New Jersey Zinc. In 1971, the primary smelter was closed. The zinc dust plant continued to operate. In the early 1980s, Horsehead Industries acquired certain assets of the New Jersey Zinc Company, later changing its name to Zinc Corporation of America. Zinc dust operations ceased in 1989 and Zinc Corporation of America completed the demolition of the majority of the remaining structures in 1990 and 1991.

In the mid-1960s, Gulf & Western purchased New Jersey Zinc and began operation of a diammonium phosphate fertilizer plant in 1967. The fertilizer and acid plants ceased operations in 1971. The plants were then leased to the phosphorous Division of the Minerals Group of Mobil Chemical Company, a division of Mobil Oil Corporation, in 1972. Mobil Chemical Company purchased the fertilizer and acid plants in 1975. Manufacturing operations ceased in 1978. Mobil Chemical Company transferred ownership to Mobil Mining and Minerals Company in 1985. Mobil then operated the plant as a fertilizer terminal until December 1990. The Mobil plant's structures were demolished in the early 1990s.

Through a series of name changes, acquisitions and mergers, the property eventually came to be owned by CBS Corporation and ExxonMobil Oil Corporation.

Currently, the main plant area is fenced. Two buildings are present on the property. One building, the former power plant, now houses the operating interim water treatment plant (IWTP), and the other building is used for equipment storage, office space, and as a base for field operations.

History of Remedial Activities

A Preliminary Assessment was performed by a USEPA Field Investigation Team contractor in December 1980, and was followed by two Screening Site Inspections in 1984 and 1987. Illinois EPA conducted an **Expanded Site Inspection** (ESI) in 1991 and 1992. The purpose of the ESI was to gather additional information needed to develop a CERCLA **Hazard Ranking System** (HRS) proposal. The ESI included collection and analysis of surface water samples and soil/sediment/waste samples from background locations and from the Site and Lake DePue. Soil samples were also taken from several residential yards within the Village.

USEPA took additional samples in 1993 from drums of spent vanadium pentoxide catalyst and Illinois EPA collected additional samples of sediment and water in the South Ditch.

In November 1995, the State of Illinois entered into an **Interim Consent Order** (ICO) with Horsehead Industries, Inc., Mobil Oil Corporation, and Viacom International, Inc. to conduct certain remedial activities, to determine the nature and extent of hazardous substances released from the Site and to identify and evaluate alternatives for remedial action. Several other interim measures and response actions were specified in the ICO. The Site is now being investigated and remediated by the PRPs, i.e., CBS Corporation and ExxonMobil Oil Corporation, collectively known as the DePue Group.

During the mid-1990s, the DePue Group installed and repaired fencing around the plant site and dump, vegetated the Site to control dust, conducted a dust monitoring program to determine if particulates and dust were leaving the Site, and removed vanadium pentoxide catalyst. During the mid to late-1990s, the DePue Group installed a storm water management system throughout the plant and Bluff Area to intercept surface water and storm water.

Construction of the IWTP occurred during the mid-1990s and it continues to operate. The IWTP and associated lift station receive storm water and contaminated groundwater from the slag pile and eastern portion of the plant site. The lift station routes collected water to the IWTP for treatment. Metals-contaminated water is treated at the IWTP by adjusting the pH which causes metals to precipitate out of the water. Treated water is discharged to the Illinois River and collected sludge is dewatered and stabilized before being sent off-site for disposal in a special waste landfill. Water samples are collected and analyzed before treatment and after treatment to ensure discharge standards to the Illinois River are met.

Based on information to support the HRS scoring package, the Site was proposed for the National Priorities List in April 1997 and the listing was finalized on May 10, 1999.

Pursuant to the ICO, CERCLA, and the NCP, the DePue Group undertook several investigations to determine the nature and extent of contamination. Investigations and results for each OU are briefly discussed below:

<u>OU1: South Ditch</u>

The South Ditch conveyed uncontrolled discharges of groundwater and surface water from the plant site to Lake DePue. Investigation of the South Ditch was initiated in November 1995 and concluded that approximately 8,000 cubic yards of metals-contaminated sediments contained elevated concentrations of arsenic, zinc, copper, cadmium, and lead. The ecological screening **risk assessment** portion of the **remedial investigation** (RI) indicated the sediments were acutely toxic to two different test species.

Illinois EPA signed an interim action ROD in October 2003 to address these risks and to address intermittent migration of contaminated sediment into Lake DePue. The USEPA concurred with the ROD. The DePue Group excavated contaminated sediments to a visual standard and dewatered the sediment. The sediments were then stabilized and disposed in a lined and covered containment cell (i.e., a CAMU) located on the plant facility, OU3.

The interim action is not the final action for the South Ditch, and a more permanent remedy for the South Ditch will be incorporated into a remedial action for OU5, Lake DePue.

OU2: Phosphogypsum Stack

The phosphogypsum stack serves as a permanent disposal area for phosphogypsum and is being closed consistent with the requirements of Illinois' landfill regulations, 35 Illinois Administrative Code (Ill. Adm. Code) 807. To meet this requirement, the DePue Group submitted a Closure Plan in 1996. Illinois EPA did not accept this plan and requested additional information regarding how the proposed closure activities would address protection of groundwater. A detailed hydrogeological study was conducted over the next several years to address these concerns. The long-term study identified contaminants of concern and delineated the extent of groundwater impacts. The DePue Group submitted a revised Closure Plan in December 2014 which has been reviewed by Illinois EPA. Resolution of outstanding issues is ongoing.

OU3: Former Plant Site Area

The FPSA includes the fenced area of plant operations, the Bluff Area to the north of the plant, and an area to the south of the plant, across Marquette Street, including the former dump and upland portion of the southeast area of the PRP's property.

The DePue Group completed Phase 1 of the RI in 2006, which focused primarily on delineating soil contamination, and completed Phase 2 in 2014, which focused primarily on groundwater contamination. Findings from the RI indicate that the slag pile near the southeast extent of the fenced area is estimated to include over 700,000 cubic yards of slag. About 69,000 cubic yards of lithopone is deposited in several ridges near the base of the Bluff. General fill includes slag and lithopone and, along with demolition debris, occurs throughout the plant area. The upland portion of the southeast area includes construction debris, demolition debris and slag.

The Phase 1 and Phase 2 RIs document metals contamination present in Site soils, sediment, and groundwater. Both the slag pile and lithopone ridges are contributing contamination to groundwater that occurs in an upper water bearing zone and a lower aquifer. The human health risk assessment was completed in February 2016. The human health assessment indicates that carcinogenic risks from arsenic and/or PAHs and non-carcinogenic hazards from metals, particularly arsenic and lead, are present to all receptors evaluated, though some risks and hazards are localized. The ecological risk assessment is ongoing.

OU5: Lake DePue, Floodplain Soils and Sediments

OU5 includes Lake DePue and associated floodplain soils and sediments below 450 feet mean sea level. Lake DePue is a large former oxbow connected at its western end to the Illinois River. The DePue Group conducted a comprehensive RI in 2006 and 2007 to determine the nature and extent of contamination within the lake associated with former plant operations. Information about the lake's physical characteristics such as a **bathymetry study**, sedimentation rates, and surface water inputs was gathered as well as contaminant concentrations in surface water, groundwater seeps, lowland soil, lake sediment, and various biota.

The RI concluded that in general, metals are present at elevated concentrations in surface water, seeps, lowland soils, and sediment. These concentrations tend to be higher in areas associated

with the South Ditch and Division Street Outfall. In the soil, concentrations of metals tend to be higher in the subsurface than in the surface. Sediment concentrations tend to increase with depth within the upper 6-10 feet, then decrease below 10 feet. Most metals concentrations tend to be higher at near-shore locations, though zinc and cadmium are more widespread (Arcadis 2009).

Twenty-six receptor-specific routes of exposure were evaluated in the human health risk assessment (HHRA). The HHRA concluded that **cancer risks** from soil, sediment, and surface water were generally lower than or within the CERCLA **target risk range** of 1×10^{-4} to 1×10^{-6}. The highest cancer risk was 7×10^{-5} for the lake-wide recreational child exposed to lake sediment and surface water under a swimming scenario. Non-cancer **hazards** for all scenarios and receptors were below the target **hazard index** of 1. An evaluation of risks from lead concluded that lead did not present a risk under any scenario based on a threshold of 5% probability of a blood lead level greater than 10 micrograms per deciliter (µg/dL, Arcadis 2014).

The baseline ecological risk assessment (BERA) is ongoing. Risks to plants, soil invertebrates, aquatic invertebrates, fish, reptiles/amphibians, birds, and mammals have been evaluated. Additional data will be collected in 2016 in an effort to determine with more certainty if there are significant risks within a formerly dredged area of the lake. Beyond the formerly dredged area, ecological risks appear to be more elevated within the South Ditch and Division Street Outfall area and an area along the shore of Lake Park for all receptor groups. Metals in soil and sediment are likely driving the risks, though additional evaluation will be conducted for risk to certain aquatic species.

<u>OU4: Off Site Soils</u>

This OU is the focus of this Proposed Plan and is discussed in detail below. Several previous investigations have been conducted by the DePue Group, Illinois EPA and the Illinois Department of Public Health (IDPH). These investigations include the following:

1992 Illinois EPA CERCLA Site Inspection

In 1992, the Illinois EPA conducted an ESI at the Site and surrounding areas. Surface water, soil, sediment, and waste material samples were collected from various areas associated with the Site, and 20 soil samples were collected from residential yards and public areas in the Village. Soil samples from the residential properties were collected from 1-2 inches deep and were analyzed for target analyte list (TAL) inorganics. The results of the Illinois EPA CERCLA site inspection were reported in the ESI Report (undated). The ESI categorized barium, cadmium, calcium, lead, magnesium, manganese, selenium, and zinc as significantly elevated compared to the background soil samples, and arsenic, copper, and silver results were qualified as estimates. Key findings from samples taken from residential properties were presented in the ESI and were based on HRS guidance in place at the time regarding "significant concentrations." Results considered "significant" from the residential sampling included detections of several metals, including barium, cadmium, lead, manganese, selenium, and zinc. The range of significant concentrations is provided in the following table:

	Range of Significant Concentrations from 1992 ESI **(mg/kg)**
Barium	736 -- 8,710
Cadmium	13.2 -- 98.1
Lead	371 -- 729
Manganese	1,180
Selenium	1.2 -- 1.3
Zinc	1,210 -- 6,580

1992–1994 IDPH Toxicology Investigation

IDPH collected soil, dust, and paint samples in December 1992, October 1993, and October 1994 to evaluate potential health impacts associated with these media. A total of 65 randomly selected and biased soil samples (approximately one inch below ground surface [bgs]) were collected from several residential and non-residential areas. Residential dust, paint, and garden soil samples were also collected. Samples were analyzed for cadmium, lead, and zinc. The results showed that these metals were sometimes present above comparison values used for children, adults, and children who exhibit pica behavior (the propensity to mouth or ingest non-food items, IDPH/ATSDR, 1999).

1993 IDPH Community-Wide Blood and Urine Testing Program

IDPH conducted a community-wide blood and urine testing program in the Village in September 1993 to assess whether residents had been exposed to cadmium and/or lead. IDPH collected samples from volunteers. A total of 109 blood samples were analyzed for lead, and 106 blood samples and 33 urine samples were analyzed for cadmium. The results of the 1993 IDPH Community-Wide Blood and Urine Testing Program indicated one child had an elevated blood lead level (i.e., above the level of concern of 10 µg/dL), one adult had a slightly elevated blood level for cadmium (5.1 µg/L compared to the comparison standard of 5.0 µg/L), and one adult had an elevated urine level for cadmium above the national worker standard in place at the time of 3.0 µg cadmium per gram of creatinine. Further investigation identified workplace and residential metal sources for these three individuals (ATSDR, 1999). IDPH concluded that the biological testing did not show an immediate public health hazard.

1999 IDPH/ATSDR Public Health Assessment

In cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR), the IDPH evaluated the public health significance of the DePue Site based on available data from investigations completed prior to 1999. The purpose of the Public Health Assessment was to determine whether adverse health effects were possible and to recommend further actions to reduce or prevent possible health effects. The Public Health Assessment included pathways analyses which identified potentially complete exposure pathways for the DePue Site and off-site areas (i.e., surrounding residential areas). A toxicology evaluation was also conducted by the IDPH using the 1992 Illinois EPA and IDPH soils data to evaluate potential health effects. This evaluation involved comparing chemical concentrations to ATSDR Minimal Risk Levels and/or

USEPA Reference Doses. IDPH's overall conclusion was that the site was considered a public health hazard due to contamination in surface soils and sediments. The results of the study were presented in the Public Health Assessment for the DePue/New Jersey Zinc/Mobil Chemical Corporation, DePue, Bureau County, Illinois (ATSDR, 1999).

2000 Illinois EPA XRF Soil Study

The Illinois EPA collected x-ray fluorescence (**XRF**) soil screening data on publicly-owned property throughout the Village of DePue in August 2000. Illinois EPA collected a total of 101 soil samples at 52 discrete locations within the Village of DePue. XRF data were collected below sod (approximately 1 inch bgs) at the sample locations, and at 6 to 8 inches bgs at most locations. The XRF soil study screened for select metals, including: antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc. The XRF Soil Screening Study results were compared to remediation objectives from 35 Ill. Adm. Code Part 742, Tiered Approach to Corrective Action Objectives (TACO), current in 2000. Results indicated that arsenic, barium, cadmium, chromium, and lead concentrations in soils may be greater than screening values based on TACO at some of the locations. Excluding non-detections, the results indicated the following contaminant ranges:

	Range of Detected Concentrations that Exceed Screening Criteria from 2000 XRF Soil Screening Study (mg/kg)	Screening Criteria (mg/kg)
Arsenic	84.9	11.3
Barium	348 -- 11,897	5,500
Cadmium	109 -- 448	78
Chromium	720 -- 982	230
Lead	28 -- 1,180	400

RAL Assessment

As outlined in the Revised Removal Action Level (RAL)[1] Assessment Report (ENVIRON, 2011), in 2005, the DePue Group collected surface and subsurface soil samples from 17 off-site properties in the vicinity of the Site in the Village of DePue that were previously sampled by IDPH in 1992.

Samples were collected from front, side, and back yard areas, gardens (if present), and/or drip zones/downspouts. The samples were composite samples, including four depth intervals (i.e. 0-1 inch, 1-6 inches, 6-12 inches, and 12-18 inches). Select composite and discrete soil samples were analyzed by XRF methods and laboratory analytical methods. The composite sample data were evaluated in the field, and based on these results, discrete samples were selected for analysis by XRF and (as applicable) laboratory methods.

[1] Removal action levels (RALs) were established by USEPA to assist CERCLA On-Scene Coordinators in decision-making concerning removal actions at Superfund sites. USEPA's Superfund program calculates these values using the latest toxicity values and exposure assumptions. These values continue to be updated and are now known as Removal Management Levels (RMLs).

Arsenic and lead were the only metals detected in laboratory samples that exceeded their respective RALs. A summary of arsenic and lead laboratory detections above their respective RALs is provided in the table below. Two RALs for arsenic, one based on cancer risk and one based on non-cancer hazards, were used to evaluate the data. (ENVIRON, 2011).

	Number of Laboratory Samples Analyzed	RAL Screening Value (mg/kg)	Number of Laboratory Samples Exceeding RAL	Range of Concentrations Above the RAL in Laboratory Samples (mg/kg)
Composite Samples				
Arsenic	106	43 (cancer) 230 (non-cancer)	0 0	NA NA
Lead	62	1,200	4	1,350 – 2,420
Discrete Samples				
Arsenic	29	43 (cancer) 230 (non-cancer)	6 0	43.4 – 111 NA
Lead	8	1,200	0	NA

The RALs were exceeded in very few laboratory samples. The frequency of detections above the RAL did not indicate extensive contamination above RALs.

Off-site Soils Study Area Research and Reconnaissance

Research and reconnaissance for areas of potential SRM were conducted in 2005 within the off-site soils study area as part of the PRP's RAL Assessment. The objective of the research was to: 1) identify areas of potential SRM within the Village; 2) characterize the type and general extent of the potential SRM; and 3) provide a preliminary evaluation of potential exposure (based on land use, accessibility, cover, etc.). In addition, research was conducted to identify special use areas such as parks, playgrounds, schools, or other equivalent public recreation spaces.

The search for potential SRM included sending out a survey to DePue area residents inquiring about the suspected location of fill material, conducting interviews with past employees and people from the Village of DePue government, and a walking reconnaissance of areas within OU4 for potential SRM.

Residential Survey Forms: Of the 854 survey forms sent out in English and Spanish, 58 forms were returned. Of these, 15 respondents indicated that suspect SRM occurred on their property or elsewhere that they were aware of. Each of these properties were visually evaluated by the PRPs and Illinois EPA (from the street level) to identify the potential for the fill material to be site-related. In almost all instances, visual observation from the street level was inconclusive in the identification of potential fill materials on the properties evaluated.

Interviews: As part of the fill material research, several individuals were interviewed to discuss their knowledge about where fill material may be located within the off-site soils study area. Locations where the individuals previously encountered fill material (or suspected the presence of fill material) were identified on a map. These areas were also subsequently visited as part of the off-site soils study area reconnaissance.

Reconnaissance: The off-site soils study area reconnaissance was conducted in 2005 by walking the streets, alleys, and rail corridors within the study area and recording observations of possible

SRM. The reconnaissance was conducted by the PRPs with participation from Illinois EPA. Field notes were recorded where isolated pieces of SRM occurred as well as more substantial occurrences.

Background Study
The DePue Group conducted a study of soil background concentrations in 2006. The study included surface and subsurface soil samples (i.e., to 18 inches) collected from 30 locations in six areas throughout Bureau County. The six areas represented land uses and soil types similar to those in DePue. Land uses represented were developed (i.e., residential/commercial/ recreational), forested/woodland, and uncultivated/cultivated fields. Three depth intervals were sampled for developed and forested/woodland areas, and two depth intervals were evaluated for cultivated/uncultivated fields. Samples were analyzed for metals, pesticides, and polynuclear aromatic hydrocarbons. For purposes of the OU4 residential and residential-like properties, the dataset representing the 95% upper prediction limits for developed land was considered in the evaluation of screening criteria and preliminary remediation goals, as described later in this Proposed Plan.

Pilot Study
The Pilot Study conducted in November and December 2013 included the collection of over 1,000 composite soil samples and over 200 discrete garden soil samples from 41 properties. Included were three properties in the Northwest Subarea, 12 properties in the West Subarea, 14 in the South Subarea, and 12 in the East Subarea. These OU4 subareas are shown on Figure 3.

Soil samples were collected in accordance with the methodologies outlined in the Pilot Study Sampling Plan (ENVIRON, 2013) and USEPA's Superfund Lead-Contaminated Residential Sites Handbook (USEPA, 2003). Composite soil samples were collected from the yard areas from 0 to 1 inch, 1 to 6 inches, 6 to 12 inches, 12 to 18 inches, and 18 to 24 inches bgs from up to four quadrants of a yard (depending on property size), the drip zone, the downspout, play areas, and bare areas (if present). Discrete soil samples were obtained from garden areas from 0 to 6 inches, 6 to 12 inches, 12 to 18 inches, and 18 to 24 inches bgs. The soil samples were analyzed for the OU4 **human health contaminants of potential concern** (HCOPCs): antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, thallium, and zinc. The soil samples were analyzed at both a fixed-based laboratory and with a field portable bench-top XRF analyzer. The analytical results obtained using XRF were compared to the results from the fixed-base laboratory to determine the utility of using the XRF during future OU4 investigation and remedial activities.

In addition to the evaluation of soil samples from yard and garden areas, additional work was performed to evaluate the fine fraction of lead in soil, the speciation of total chromium in OU3 soil, and to evaluate the similarity of the 0 to 1 inch and 1 to 6 inch sampling intervals.

Results of the Pilot Study are described in the Nature and Extent of Contamination section later in this Proposed Plan.

OU4 CHARACTERISTICS

OU4 includes the residential areas of the Village of DePue. The Village is generally bounded to the south by Lake DePue, agricultural property, state-owned property managed for habitat, and the Illinois River, to the east and west by agricultural property and open space, and to the north by agricultural property. Detailed information on OU4 characteristics may be found in the Scoping Document for Presumptive Remedy, OU4: Off-Site Soils (Ramboll Environ 2015).

The portion of the OU that is the focus of this Proposed Plan is generally defined as the area between County Road 1300 North (State Rt. 29) to the north (but including Oakbrook Subdivision to the northwest), Negro Creek to the east, Lake DePue to the south, and Oakbrook Drive to the west. The boundaries are based on the corporate boundaries of the Village of DePue. Approximately 814 residential lots (including vacant lots) are included within the Village boundaries.

Beyond the residential areas are agricultural properties which will be investigated at a later time and are not addressed in this Proposed Plan. The future investigations will extend generally to County Road 1400 North to the north and possibly beyond. Figure 3 depicts the entirety of OU4 as it is currently understood. The developed areas within the West, Northwest, East, and South Subareas will be addressed as described in this Proposed Plan, as illustrated on Figure 3. The ecological areas and other open spaces of these Subareas and the Northeast Subarea will be addressed at a later time.

The OU4 subareas are described as follows (see Figure 3):

- West Subarea – Approximately 322 acres, the West Subarea is located west of the plant site and extends from the CSX Transportation, Inc. railroad tracks north to Route 29. The area is defined by the FPSA and Bluff Area boundary to the east and the agricultural fields to the west (up to a southern projection of Oakbrook Drive). This subarea includes single family residential homes that are located immediately adjacent to the FPSA (along East Street) and the western residential portion of the Village of DePue that is located north of the railroad tracks and south of Princeton Street.

- Northwest Subarea – Approximately 369 acres, the Northwest Subarea extends from the northern boundaries of the West Subarea and the OU3 Bluff Area north to 1400 Avenue North. It is bounded to the east by agricultural fields along the western boundary of the Northeast Subarea and by Oakbrook Drive and a northern projection of Oakbrook Drive to the west. The Northwest subarea contains a residential portion known as Oakbrook Terrace and an associated park. There are additional residences along East Street and the eastern boundary of the subarea.

- East Subarea – Approximately 385 acres, the East Subarea extends from approximately the 450-foot topographic contour interval along Lake DePue north to Highway 29. The

East Subarea is bounded by OU3 to the west and Negro Creek to the east. This subarea includes single family residential areas within the western, central, and northeastern portions of the subarea. The residential area within the western and central portions of the subarea is referred to as White City and includes White City Park.

- South Subarea – The South Subarea extends from approximately the 450-foot topographic contour interval along Lake DePue (the northern study boundary of OU5) north to the southern boundaries of OU3 and the West Subarea. The South Subarea is bordered by OU3 to the east and by the agricultural fields (up to a southern extension of Oakbrook Drive) to the west. The South Subarea includes approximately 221 acres. The eastern half of the subarea includes the central portion of the Village of DePue, and is bordered to the south by the Lake DePue lowlands. Commercial properties, single and multifamily homes, several churches, the DePue Unit School, and Lake Park are located in the South Subarea.

- Northeast Subarea – Approximately 1,056 acres, the Northeast Subarea extends north of the phosphogypsum stack to approximately County Road 1400 N, and possibly beyond. The Subarea is defined by Negro Creek to the east and the Northwest Subarea to the west. No reconnaissance of this area has occurred. This Subarea is not addressed by this Proposed Plan.

Surface Water Hydrology

Most of the surface water features in the DePue area are associated with the other OUs. These surface water features include the South Ditch, the Division Street outfall, the outfall for the Village of DePue Wastewater Treatment Plant (WWTP), the unnamed tributary south of the WWTP that includes the southwest sewer outlet, seeps, and sheet flow from storm water runoff along the banks of Lake DePue, and Lake DePue. Surface water in the Village generally flows to Lake DePue.

Within OU4, the nearest perennial stream is Negro Creek, which forms the eastern boundary of OU4. Small, likely intermittent, tributaries to Negro Creek are located in the Northeast and East subareas. In addition, a small intermittent stream is present along the western side of East Street, in the West and Northwest subareas. This unnamed tributary enters a culvert near the intersection of East Street and Princeton Street, and exits from a culvert west of High Street and north of Railroad Street where it joins the unnamed tributary south of the WWTP. Several small ponds and one large pond located southwest of the Village are also present within OU4.

Hydrogeology

The regional **hydrogeologic** system consists of recharge in the higher elevation plains areas north of OU4, with discharge to the Illinois River and its tributaries. On a more local scale, particularly in the unconsolidated deposits, flow is controlled by varying stratigraphy and lithology, and the presence of deep, incised valleys cut by tributaries to the Illinois River (e.g., Negro Creek). There are two notable hydrostratigraphic units monitored in OU3: the upper

water bearing zone (UWBZ) and the Lower Aquifer. Both units are described in detail in the OU3 RI report (ENVIRON 2014).

The UWBZ is a saturated zone within surficial alluvial soils and fill material that occurs above a peat layer and lower permeability silt and clay soils of the recent alluvium throughout the eastern portion of OU3. The UWBZ may extend south of the fence line along Marquette Street, but has not been identified in **monitoring wells** installed beyond the limits of the FPSA and upland portion of the southeast area and is not considered to be present within the boundaries of OU4.

The Lower Aquifer corresponds to the outwash deposits of the Henry Formation beneath the recent deposits and above the bedrock, and includes the contiguous outwash deposits of the Sankoty Sand Member beneath the Bluff Area, that may extend southward into OU3. The upper portion of this aquifer is sandy gravel or gravelly sand, while the lower portion is sand with little fine material or gravel. Clay is nearly absent from the unit. This is a relatively permeable unit, about 50 to 60 feet thick near the base of the Bluff, and thins to a thickness of approximately 10 to 30 feet in the southeast area. The entire thickness of the Lower Aquifer is saturated. The Lower Aquifer occurs in OU4 at least as far as Lake DePue and thins beneath Lake DePue. An upward vertical gradient is present beyond the boundary of OU3 and in the southern part of the Village such that groundwater from the Lower Aquifer surfaces through seeps and springs associated with the wetlands just north of Lake DePue and along the north shore of Lake DePue.

Other groundwater zones include thin, perched, saturated layers within the soils beneath the White City Area of OU4 and the Wedron Group tills in the Bluff Area. These saturated zones occur in permeable layers at elevations higher than the FPSA land surface and are truncated along the face of the Bluff Area and the western face of the unconsolidated deposits beneath White City.

The potential for groundwater contamination beneath OU4 has been investigated through a monitoring well network installed to support the investigation of OU3. In general, monitoring wells within the Village show little contamination. Isolated occurrences of arsenic have been detected in two monitoring wells within the Village, and manganese is elevated in all monitoring wells. Ammonia and sulfate also exceeded screening criteria in these monitoring wells (ENVIRON 2014). However, the contaminated soils throughout OU4 are not considered a significant contributor to this contamination. Based on the Pilot Study data, most OU4 contamination occurs within the upper 18 inches of soil, whereas the monitoring wells are monitoring groundwater that occurs at approximately 30 feet bgs, at the base of the Lower Aquifer. The extent of soil contamination is unlikely to extend to groundwater. There may be isolated properties, particularly in the southern part of the Village, where SRM, if present in significant volumes, could be contributing to groundwater contamination, but this is unlikely on a widespread basis. Regardless, any future groundwater remedial action that may be necessary will be addressed as part of OU3, not as part of OU4.

Soils

Based on the Bureau County Soil Survey (SCS, 1992), soils within OU4 are classified mainly as silty loam to clay loam. Most of the area south and west of the FPSA is classified as Jasper silt

loam (type = 440A), Mound Prairie silty clay loam (3480L), Orthents loam (802B), and Minneiska loam (8179A). Additional soil types within OU4 east of the FPSA are primarily Warsaw silt loam (290C2), Waukegan silt loam (564A), and Catlin silt loam (171C2).

Drinking Water Sources

The Village of DePue obtains its drinking water from a deep groundwater **aquifer** consisting of sandstone and limestone bedrock. The water is pumped from the aquifer by two wells. These wells are regulated as community water supply wells for the Village of DePue, and are designated Well #2 (also known as Village No. 4) and Well #3 (also known as Village No. 3). These two wells have depths of about 1,487 and 1,490 feet, respectively. The wells are located behind the Village Hall and old Public Works building. Water is pumped from the wells, monitored and treated by the Village as needed in a filter and ion exchange plant (e.g., chlorine is added as a disinfectant), pressurized, and distributed throughout the Village.

The aquifer utilized by the DePue community wells is overlain by more than 900 feet of bedrock of which over 300 feet is low permeability shale bedrock. The top of the bedrock surface is overlain by permeable sand and gravel river deposits. Illinois EPA considers the aquifer utilized by the Village of DePue as "confined." Due to its natural qualities (i.e., its depth and the geologic materials above it), the aquifer is isolated from contaminant sources and Illinois EPA does not consider the aquifer to be susceptible to contamination from the Site or from OU4 (Illinois EPA 2014).

Nature and Extent of Contamination

To assess the nature and extent of contamination within OU4, the Pilot Study made use of **screening criteria** for comparison of sample results. The screening criteria are presented in the table below and, with one exception, were selected from three primary sources: Illinois EPA's TACO, USEPA's Regional Screening Levels (RSLs), and USEPA's Soil Screening Levels (SSLs). Arsenic was the lone exception, with its screening criterion based on a site-specific background value of 11.6 mg/kg.

Screening criteria for carcinogens are generally based on a cancer risk of 1×10^{-6}. For arsenic, a screening criterion based on background was deemed appropriate in this case because a concentration representing 1×10^{-6} cancer risk (i.e., 0.68 mg/kg) is orders of magnitude below naturally-occurring background for Illinois (i.e, 11.3 mg/kg) and site-specific background (i.e, 11.6 mg/kg). Illinois EPA would not require remediation below the state or site-specific background value. The purpose of the Pilot Study and screening exercise was to learn more about the extent of contaminants above concentrations likely to be selected as remediation objectives.

Based on results of the 41 properties included in the Pilot Study, 36 properties exhibited concentrations of metals above screening criteria or exhibited SRM. Arsenic and lead were the only metals that demonstrated area-wide exceedances of screening criteria, with 29 properties exceeding the lead screening level, and 40 properties exceeding the arsenic screening level. Elevated levels of lead above 1,200 mg/kg were rare, occurring in only seven samples, with only

two of these samples at the surface. Cadmium was detected above screening criteria at 11 properties. Cobalt was detected above screening criteria in only two of the Pilot Study samples on two properties. Iron was detected above its screening criteria in eight samples from two properties. Manganese was detected above its screening criteria in 15 samples from 11 different properties, most of these in the East Subarea. The metals antimony, barium, chromium, copper, mercury, thallium, and zinc were not detected in soil from the Pilot Study properties greater than the OU4 screening criteria at any property.

Screening Criteria Used in Pilot Study

Chemical	CAS #	Residential Screening Level[1,2]	Garden Screening Level[1,2]
Antimony	7440-36-0	31	31
Arsenic	7440-38-2	11.6[e]	11.6[e]
Barium	7440-39-3	15,000	15,000
Cadmium	7440-43-9	70	24[b]
Total Chromium	16065-83-1	120,000[c]/230[d]	120,000[c]/230[d]
Cobalt	7440-48-4	23	23
Copper	7440-50-8	3,100	3,100
Iron	7439-89-6	55,000	55,000
Lead	7439-92-1	400	400
Manganese	7439-96-5	1,800	1,800
Mercury	7487-94-7	23	23
Thallium	7440-28-0	6.3[a]	6.3[a]
Zinc	7440-66-6	23,000	10,000[b]

Notes:
All concentrations in milligrams per kilogram (mg/kg)
1 = Lesser value of Residential and Construction Worker exposure scenarios.
2 = USEPA's Residential Regional Screening Level (November 2013) except where otherwise noted.
a = TACO Criteria
b = Part 5, Appendix G of the Soil Screening Guidance Technical Background Document (USEPA, 1996)
c = Chromium (III) screening levels used for Chromium (total)
d = Chromium (IV) TACO Criteria
e = Site-specific background (Arcadis, 2011)

Soil samples obtained from garden areas exceeded screening criteria for arsenic, cadmium, and lead. Of the 16 properties with gardens, 10 properties had garden soils with detections above screening criteria. Six gardens included samples that exceeded the lead screening level, three gardens included samples that exceeded the arsenic screening level, and eight gardens included samples that exceeded the cadmium screening level. A summary of the results for those metals that exceeded screening criteria is provided below:

Range of Concentrations for Metals that Exceeded Pilot Study Screening Criteria in Yards and Gardens

	Range of Detected Concentrations that Exceed Screening Criteria (mg/kg)	Screening Criteria (mg/kg)
Arsenic	11.8 -- 87.3	11.6
Cadmium	74.3 -- 113 24.1 -- 62.8	70 24 (gardens)
Cobalt	56.4 -- 40.1	23
Lead	403 -- 4,960	400
Manganese	1,810 -- 4,650	1,800

During the 2005 reconnaissance, in much of the south, east, and west areas, exposed potential SRM was limited to occasional pieces of potential clinker and retort within alleys and along roadways (Ramboll Environ 2015). Exposed potential SRM was noted in the athletic fields and parks, though none was noted on school property. More detailed location descriptions are included in the Scoping Document. During the Pilot Study, potential continuous SRM was noted in 7 of the 41 properties. The SRM was mostly found within the top 18 inches. In one property, fill material was observed up to depths of 72 inches bgs. In general, the greatest amount of potential SRM was noted in the South Subarea close to Lake DePue (ENVIRON 2015).

Groundwater was not evaluated during the Pilot Study or any of the other previous efforts that focused on OU4, because exposure to Site contaminants through groundwater is not a complete exposure pathway for OU4. Instead, groundwater contamination within the Village has been evaluated as part of the remedial investigation for OU3. Based on the Pilot Study data, most OU4 contamination occurs within the upper 18 inches of soil, whereas groundwater monitoring wells are monitoring groundwater that occurs at approximately 30 feet bgs, at the base of the Lower Aquifer. The extent of soil contamination is unlikely to extend to groundwater.

Other general findings from the Pilot Study were:

- Hexavalent chromium was determined to not be present. Based on the results of the total chromium evaluation, the total chromium detected in soil at the Site is primarily trivalent chromium, which has not been detected in OU4 soil at concentrations greater than the screening criteria.
- No significant difference in metal concentrations was present between the 0-1 inch and 1-6 inch depth intervals.
- Results from sieved samples used to determine whether or not the fine soil fraction was more highly contaminated than the total soil sample were inconclusive.
- Use of XRF as an appropriate analytical tool will continue to be explored.

Principal Threat Wastes

The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains **hazardous substances, pollutants or contaminants** that acts as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would represent a significant risk to human health or the environment should exposure occur. The NCP (300.430 (a)(1)(iii)(A)) indicates principal threat wastes are most likely to include liquids, areas contaminated with high concentrations of toxic compounds, and highly mobile materials.

Illinois EPA has not identified any principal threat wastes at OU4. Contaminant levels in soils tend to be below removal management levels, levels that are not expected to exhibit hazardous waste characteristics, or constitute wastes that can be reliably contained, are not highly mobile, and would present a relatively lower threat in the event of exposure. SRM, while generally expected to exhibit higher concentrations at levels that may exhibit hazardous waste characteristics, can be reliably contained and is not likely to be highly mobile.

Public Involvement

Public involvement in the Site has been active for many years, and particularly since 2010 when the **Community Advisory Group** (CAG) was re-established. The CAG currently meets approximately every six weeks, but had previously met monthly. Illinois EPA has attended almost every CAG meeting, either in person or via conference phone. Illinois EPA provides an update of the status and progress on each OU at CAG meetings, and answers community questions.

The scope of OU4 investigation and remediation activities has been included in Illinois EPA's OU updates to the CAG. Illinois EPA has also provided similar updates to the local Hispanic community on a less frequent basis, typically once or twice a year. The OU4 Pilot Study was discussed with the local Hispanic community on September 15, 2013 and August 24, 2014, and results of the sampling were presented on April 1, 2015.

An availability session with the community was held November 6, 2013 to discuss plans for the OU4 Pilot Study and to encourage community participation. Results of the Pilot Study were mailed to individual property owners in mid-September 2014, and an availability session was held October 1, 2014 to discuss those results with individual owners.

SCOPE AND ROLE OF THE ACTION

The response action described in this Proposed Plan will address metals-contaminated soil in portions of OU4, specifically the residential areas (including vacant lots), special use areas (i.e., athletic fields, parks, alleys, school), and certain miscellaneous (e.g., commercial) properties within the Village of DePue, as indicated on Figure 3. The action is not intended to be the final response action for OU4, since it does not address the entire OU, but it is intended to be the final

response action for those properties within OU4 where access is granted to conduct the work. Other areas of OU4, such as agricultural property and properties evaluated primarily for ecological concerns, will be addressed at a later time.

The proposed action does not address the other OUs. OU1, the South Ditch, was addressed by an interim action in 2005. The remaining contamination in OU1 will be addressed as part of the remedial action for OU5, Lake DePue, when that occurs. Separate investigations have been completed for OUs 3 and 5, and once the human health and ecological risk assessments are completed, Feasibility Studies will be conducted. Illinois EPA will develop separate or combined Proposed Plans for OUs 3 and 5 in the future. OU2, the phosphogypsum stack, is being closed pursuant to Illinois landfill regulations and is not expected to be the subject of a CERCLA Proposed Plan and ROD.

The actions undertaken at OU4 under the preferred remedy will result in contaminated soil and SRM from residential properties and Village properties being brought to the plant area where they will be consolidated with other plant-area wastes for final management and/or disposal when a final remedy is selected for OU3.

SUMMARY OF SITE RISKS

Human Health Risks

Contaminants of Concern: During the Pilot Study, soil samples were analyzed for antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, thallium, and zinc. Based on the approximately 1,300 samples analyzed during the Pilot Study, the only metals that exceeded screening criteria were arsenic, cadmium, cobalt, iron, lead, and manganese. Of these six metals, arsenic, cadmium, and lead are the principal risk drivers at the site, and these will be remediated generally wherever they are found to exceed the remedial goals.

Of the remaining three metals, iron has been eliminated from further consideration in OU4 sampling and remediation because it is not a CERCLA hazardous substance. Cobalt was detected above screening criteria in only two of the Pilot Study samples. In both of these cases cobalt would be remediated due to the presence of other HCOPCs above screening criteria. Manganese was detected above its screening criteria on 11 different properties, most of these in the East Subarea.

Manganese was co-located with other HCOPCs above screening criteria in four of the properties, and in other cases occurs either as the only HCOPC above its screening criteria or other HCOPCs are present on the same property that require remediation, but are not co-located with manganese. Manganese occurs above screening criteria typically at depths greater than six inches below the surface. While background levels of manganese in soil (i.e., 1,051 mg/kg) are higher than Illinois' state-background (630 mg/kg), the site-specific background is not higher than the manganese screening criterion and **preliminary remediation goal** (PRG) of 1,800 mg/kg. Because manganese was infrequently detected on residential properties sampled during the Pilot Study, more data is needed to determine the presence of manganese within the Village.

The metals analyzed in samples collected during the Pilot Study are the HCOPCs. The samples collected from the first 20 properties sampled during implementation of remedial activities at OU4 (i.e., approximately another 300 samples) will be analyzed for this same list of metals, and the final **contaminants of concern** (COC) list will be refined as warranted after evaluation of the additional data.

Conceptual Site Model: The human health **Conceptual Site Model** is presented in Figure 4. The portions of OU4 subject to this Proposed Plan are assumed to be residential in the future. Therefore, the exposed populations are children and adults who live within OU4 and construction workers.

The principal sources of contamination within the residential area are from direct placement of fill material and emissions and particulates from historical Site operations where air flow patterns may have resulted in deposition within yards. Such sources have contaminated the surface and shallow subsurface soils. In some cases, deeper soils may be affected by placement of fill material (Ramboll Environ 2015). From these sources, people can be exposed through ingestion and skin contact with surface and subsurface soils, from inhalation of particles suspended in air, and from ingestion of produce grown in contaminated soils.

As indicated previously, groundwater monitoring wells installed within the Village as part of the OU3 investigation do not indicate contamination of shallow groundwater, and Site contamination has not affected the Village's potable water supply. Exposure to Site contaminants through groundwater is not a complete exposure pathway for OU4.

Exposure to contaminated sediments and surface water from Lake DePue may occur, and the same people who live within OU4 may be exposed to additional sources of contamination within Lake DePue. These exposures, while not captured in the Conceptual Site Model for OU4, are included in the Conceptual Site Model for OU5 and were taken into consideration in developing the **preliminary remediation goals** (PRGs) for OU4 presented later in this document.

Human health risks were evaluated by comparing results from the Pilot Study to human health screening criteria. The comparison of OU4 sampling results to human health screening criteria serves as a human health baseline risk assessment and evaluated current and potential future risks to adults, children, and construction workers potentially exposed to soils in OU4. For metals other than arsenic and lead, the screening criteria represented non-cancer hazard indices of 1.0. For lead, a screening criterion of 400 mg/kg was used, as provided in Illinois regulation and based on the Integrated Exposure Uptake Biokinetic (IEUBK) model, using default inputs. For arsenic, the screening criterion was based on site-specific background of 11.6 mg/kg. The site-specific background concentration equates to a cancer risk of 3×10^{-5}, near the mid-point of the CERCLA cancer risk range of 1×10^{-4} to 1×10^{-6}. For comparison, Illinois' state-wide background value for arsenic is 11.3 mg/kg and represents the same level of cancer risk. The screening criteria used in the Pilot Study are presented above, in the Nature and Extent of Contamination section of this Proposed Plan. Exceedance of these screening criteria was used as an indication that unacceptable human health risks and hazards may be present and prompted development of site-specific PRGs.

Ecological Risks

Ecological risks were not evaluated for the residential area. Individual residences are maintained primarily for non-ecological habitat. The other residential-like properties that are the focus of this Proposed Plan (i.e., parks, alleys, and the school) are maintained in such a way as to discourage wildlife. The parks are recreational-oriented parks, with playground equipment and ball fields and without restored natural areas or areas set aside for nature. A screening level ecological risk assessment (SLERA) is planned for other ecological areas and open spaces of OU4, and a baseline ecological risk assessment (BERA) will be performed for those areas, as warranted, based on the results of the SLERA. For purposes of the SLERA, risks to soil invertebrates, plants, and terrestrial wildlife, including birds, mammals, reptiles, and amphibians, will be assessed. Relevant receptors and contaminants of concern will be further refined during the SLERA and BERA process consistent with USEPA ecological risk assessment guidance (Ramboll Environ 2015).

Risk Evaluation Conclusion

Illinois EPA has determined that, based on available data, the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are chemical-specific, medium-specific, or site-specific goals for protecting human health and the environment. RAOs are developed to address the contaminant levels and exposure pathways that present unacceptable current or potential future risk to human health and the environment. The RAOs specify the exposure routes, receptors, and acceptable risk concentrations for the HCOPCs.

One RAO was developed for OU4, based on the contaminant levels determined during the RAL effort and Pilot Study and to address the estimation of unacceptable risk to resident children, adults, and construction workers. The RAO was developed based on relevant site-specific exposure pathways, including ingestion of produce grown in contaminated soil that could result in unacceptable risk to human health.

The following RAO has been identified for OU4 residential soils:

- Prevent ingestion, inhalation, and dermal contact of OU4 soils contaminated with HCOPC concentrations above the designated Preliminary Remediation Goals (PRGs) for the resident child, adult and construction worker.

PRELIMINARY REMEDIATION GOALS

PRGs are risk-based or ARAR-based chemical-specific concentrations that help further define the RAOs. PRGs are considered "preliminary" remediation goals until a remedy is selected in the ROD. The ROD establishes the final remedial goals and/or cleanup levels. PRGs are used to define the extent of contaminated media requiring remedial action.

The preliminary HCOPCs for OU4 soils are antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, thallium, and zinc. PRGs have been developed for all HCOPCs and for the potential OU4 receptors, as summarized in the table below (Environ 2015). To respond to the Village of DePue concerns about eliminating some metals from the HCOPC list based on the Pilot Study effort, and to respond to the DePue Group's request for additional data to evaluate potential uses of XRF, Illinois EPA has agreed to carry the full list of HCOPCs from the Pilot Study through the start of full-scale implementation of the remedy, reserving the decision to retain or eliminate metals such as cobalt and manganese as COCs after additional data have been collected. Therefore, during remedy implementation, after the first 20 properties have been sampled, the results from those properties will be evaluated and a final decision made.

Any metal on the final COC list will meet the PRGs for that metal as listed in the table below. Based on the Pilot Study data, arsenic, cadmium, and lead, at a minimum, will be included in the list of final COCs.

Preliminary Remediation Goals

Chemical	CAS #	Residential[1]	Garden[1]	Construction Worker[2]	Proposed PRG[3]
Antimony	7440-36-0	31	31	140	31
Arsenic	7440-38-2	21[a]	21[a]	140[a]	21
Barium	7440-39-3	15,000	15,000	66,000	15,000
Cadmium	7440-43-9	70	24[b]	280	70 24 for gardens
Total Chromium	16065-83-1	120,000	120,000	510,000	120,000
Cobalt	7440-48-4	23	23	930	23
Copper	7440-50-8	3,100	3,100	14,000	3,100
Iron	7439-89-6	55,000	55,000	240,000	55,000
Lead	7439-92-1	400[c]	400[c]	940[e]	400[c]
Manganese	7439-96-5	1,800	1,800	6,200	1,800
Mercury	7487-94-7	23	23	680	23
Thallium	7440-28-0	6.3[d]	6.3[d]	160[d]	6.3[d]
Zinc	7440-66-6	23,000	10,000[b]	100,000	23,000 10,000 for gardens

Notes:
All concentrations in milligrams per kilogram (mg/kg)
1 = USEPA's Residential Regional Screening Levels (June 2015) used except where noted.
2 = To be used in determining acceptable management of excavated soil.
3 = Lesser value of Residential and Construction Worker exposure scenarios.
a = Based on site-specific derivation.
b = Part 5, Appendix G of the Soil Screening Guidance Technical Background Document (USEPA, 1996).
c = Based on Tiered Approach to Corrective Action Objectives, 35 Ill. Adm. Code Part 742 (TACO)
d = TACO Criteria
e = Based on Adult Lead Model and blood lead level of 10 µg/dL.

The PRGs for the combination adult/child receptor for carcinogenic chemicals and the PRGs for the child receptors for non-carcinogenic chemicals will be applicable to all areas addressed by this Proposed Plan. The PRGs are based on the USEPA Regional Screening Levels (RSLs, USEPA 2015), with the exceptions noted below:

- The PRGs for chromium and thallium are based on Illinois EPA's TACO.

- Arsenic: Arsenic is the only carcinogenic chemical identified through the direct soil contact pathway. For residential exposure, a PRG of 21 mg/kg for arsenic has been established for both residential soil and garden soil. The derivation of this PRG included exposure through direct contact with soil via incidental ingestion, dermal contact, and inhalation of particulates, as well as through the consumption of

vegetables and fruits grown in potentially-impacted soil. The derivation of the arsenic PRG also took into consideration exposure of a young child to sediment and surface water in Lake DePue using a lake-wide swimming scenario. 21 mg/kg represents an excess lifetime cancer risk of 5.77×10^{-5} and a hazard index of 0.98. This PRG is also protective of a child or adult resident in DePue that would not be exposed to Lake DePue.

- Lead: The PRG of 400 mg/kg is provided in Illinois' TACO regulations and is based on the resulting soil concentration using default inputs for the IEUBK model to achieve a threshold of no more than a 5% chance of a child's blood lead level exceeding 10 µg/dL. It is also the RSL default value.

- The PRGs for garden areas will also be the same as those for residential properties with the exception of cadmium and zinc. The PRGs for cadmium and zinc in gardens have been selected from Appendix G of the Soil Screening Guidance: Technical Background Document (USEPA, 1996).

The PRGs for the Construction Worker (adult) will be applicable to all areas addressed by this Proposed Plan. PRGs were calculated for the construction worker using standard USEPA and TACO inputs and the typical equations for the defined exposure pathways (i.e., ingestion, dermal contact, and inhalation), the exposure parameter values specific to the construction worker receptor (i.e., particulate emission factor, body weight, soil ingestion rate, exposed surface area, adherence factors, exposure frequency, exposure duration, averaging time), and the toxicity and chemical parameters specific to each HCOPC. The carcinogenic PRG (arsenic) was based on the same cancer risk level for residential receptors. The non-cancer PRGs were based on a HI of 1.

Carcinogenic and non-carcinogenic toxicity factors have not been developed for lead. Instead, lead was evaluated using the Adult Lead Model (ALM, USEPA, 2009) for the construction worker. The only modifications made to the model defaults were the soil ingestion rates and exposure frequencies that are specific to the potential off-site receptors.

Since the PRGs for the residential child and the residential child/adult combination are more stringent than the construction worker PRGs, the PRGs controlling the need for excavation will be based on the residential receptors. The construction worker PRG will be used in determining the acceptable management of excavated soil.

Based on the results of the Pilot Study, 36 of the 41 properties tested during the Pilot Study (or roughly 88%) may require some degree of remediation. Assuming the Pilot Study properties accurately represent other properties within the Village of DePue, approximately 716 residential properties could require remediation[2], in addition to alleys, parks, the school, and miscellaneous properties which have not yet been sampled.

[2] For planning purposes, a 90% rate of return on access agreements is assumed. Based on this rate of return, approximately 640 residential properties could require remediation.

SUMMARY OF REMEDIAL ALTERNATIVES

Since Superfund's inception in 1980, USEPA remedial and removal programs have found that certain categories of sites have similar characteristics, such as the types of contaminants present, sources of contamination, or types of disposal practices. Based on the information acquired from evaluating and cleaning up these sites, the Superfund program has developed presumptive remedies to accelerate cleanups at certain categories of sites with common characteristics. Presumptive remedies are preferred technologies or response actions for sites with similar characteristics. The selection of presumptive remedies is based on patterns of historical remedy selection practices, USEPA scientific and engineering evaluation of performance data on remedy implementation, and USEPA policies. Use of presumptive remedies streamlines the remedy selection process by narrowing the universe of alternatives considered in the **Feasibility Study**.

The presumptive remedies considered for OU4 are included in the USEPA Presumptive Remedy for Metals-in-Soil Sites directive (USEPA, 1999) and are consistent with the intention of the ICO. Consistent with this guidance and the Superfund Lead-Contaminated Residential Sites Handbook (USEPA, 2003), the presumptive remedy options considered are containment of soils on the Site and containment of soils in an off-site disposal facility.

The Scoping Document, which is the basis of this Proposed Plan, is the functional equivalent of the Feasibility Study and meets the ICO's requirement as an element of the Design Study for a Presumptive Remedy. The Scoping Document includes a detailed analysis of alternatives, a comparison of each alternative against the NCP's nine criteria for evaluation of remedial alternatives (addressed later in this document), a relative comparison of the alternatives to each other as required by the NCP, and also includes elements of remedial design.

Remedial alternatives for OU4 are discussed below. The alternatives are numbered to correspond with the numbers in the Scoping Document, and are further explained in that document. Three remedial alternatives (one of which has two scenarios) have been evaluated, and include:

- Alternative 1: No Action
- Alternative 2: Excavation and Management of Soils on the Former Plant Site Area (FPSA)
- Alternative 3A: Excavation and Off-Site Disposal (as non-hazardous waste)
- Alternative 3B: Excavation and Off-Site Disposal (as hazardous waste)

Illinois EPA recommends Alternative 2 as the selected remedy for OU4.

Common Elements

Components that are common to all the alternatives except the "no-action" alternative are presented here as a group in order to limit redundancy in the subsequent discussion of the individual alternatives. These common components are:

A. An access agreement with the current property owners will be obtained to allow for sampling and cleanup work;

B. Soil sampling will be conducted in general accordance with the Superfund Lead-Contaminated Residential Sites Handbook.
    a. It is anticipated that **composite samples** will be collected in six-inch increments as follows:
        i. For residential yards, samples will be collected at depths of 0-6 inches, 6-12 inches, 12-18 inches, and 18-24 inches, though the 18-24 inch sample may not be analyzed, depending on the results of the 12-18 inch sample; and
        ii. For parks and alleys, samples will be collected at depths of 0-6 inches, 6-12 inches, and 12-18 inches, though the 12-18 inch sample may not be analyzed, depending on the results of the 6-12 inch sample;
    b. For gardens, **discrete samples** will be collected and analyzed in six-inch increments to 24 inches;

    If the described sampling cannot be completed for any individual property, changes to the sampling plan can be accommodated on a case-by-case basis.

C. Contaminated soil will be removed by excavation. Excavation will generally occur to a maximum removal depth of 18 inches for residential properties, 24 inches for gardens, and 12 inches for parks and alleys. Deeper excavation may occur on a case-by-case basis, for instance if deeper excavation is determined to be more cost effective than implementing the measures described in Item F below;

D. Residential properties and parks will be restored using soil from an off-site source, and vegetated with grass seed or sod where excavation occurs (as determined on a case-by-case basis). A landscape contractor will maintain the yards until vegetation is established (one year). Landscaping removed or destroyed as part of the cleanup activities will be replaced with comparable landscaping, if requested by the owner. Backfill soils will be evaluated prior to implementation of the remedial action to verify the off-site backfill meets residential PRGs for the HCOPCs and TACO Tier 1 soil remediation objectives for non-COC chemicals;

E. Alleys will be restored using an Illinois Department of Transportation-approved coarse aggregate;

F. **Institutional controls** (ICs) and/or a visual barrier may be required at some properties. If soil with HCOPC concentrations greater than PRGs or if potential

continuous SRM are left in place below the applicable excavation depth, a permanent, permeable barrier will be installed to visually mark the maximum depth of the excavation and distinguish the impacted soil from the clean backfill soil. ICs will be placed on the private properties in these cases. The ICs will provide notification to the property owner and successive owners that soil with concentrations greater than PRGs is present at depth. If the marker barrier is encountered during future excavation work at a property, assistance will be provided to facilitate proper handling of the soil and placement into a repository to be constructed in OU3 as part of a Construction Support Program. **Environmental covenants** pursuant to Illinois' Uniform Environmental Covenants Act will be implemented on public properties and will incorporate the same ICs and Construction Support Program proposed for private properties;

G. As appropriate, contaminated soil and SRM will require characterization testing using the **toxicity characteristic leaching procedure** (TCLP) to determine whether the materials are characteristically hazardous before final disposition.

H. A soil repository will be constructed in OU3 to facilitate future property-specific handling of soil and/or SRM removed from below a marker barrier;

I. Certification letters from Illinois EPA will be provided to the property owners that include the data results and a description of the completed remedial actions;

J. Each property will be restored as close as practicable to its original conditions; and

K. Future land use for the off-site soils area is assumed to remain the same as the current property use.

Assumptions

Several assumptions were made to estimate soil volume, SRM volume, time required to conduct investigation and remediation activities, and associated costs. The Pilot Study provided the source of information for most estimates.

Laboratory soil sample data obtained during the Pilot Study were compared to PRGs. A conservative estimate of the soil volume potentially requiring removal for the Pilot Study properties was calculated by identifying areas at each of the properties where soil testing indicated the presence of one or more HCOPCs at concentrations greater than PRGs and/or the presence of a continuous layer of SRM, and a maximum depth of remediation of 18 inches bgs.

There are approximately 814 residential properties within the Village, including vacant properties. For the purposes of volume estimates, it is assumed that access will be granted to 90% of the properties. Based on visual observations, it is also assumed that approximately 50% of each property is covered by a residence, garage, sidewalk, driveway, or other barriers to soil exposure. Based on these assumptions, a total of 27,000 cubic yards of soil and SRM is

estimated to require removal from residential yard areas within OU4. The average remedial volume per property is estimated to be approximately 33 cubic yards[3].

In addition to the residential properties, there are approximately 22 acres of public parks and 16 acres of alleys within OU4. Since no analytical data has been obtained from these areas, the volume of soil to be removed from these areas was estimated by dividing the total acreage of parks and alleys into quarter-acre sections. Each quarter-acre section was considered similar to a residential yard area, and the average excavation volume determined per property was applied to these areas. Based on these assumptions, approximately 28,000 cubic yards of soil and SRM from the public park and alley areas is estimated to require remediation.

Other assumptions used to determine waste volumes, costs, and schedule include:

- Based on estimated maximum removal depths, an estimated 55,000 cubic yards of soil will be removed from residential properties and special use areas.
    - Of these 55,000 cubic yards, 39,000 cubic yards may exceed residential PRGs, but will be below construction worker PRGs and without SRM;
    - Of these 55,000 cubic yards, 16,000 cubic yards may exceed construction worker PRGs or include SRM;
        - Of these 16,000 cubic yards, 8,800 cubic yards may be SRM from yards, alleys, and parks;
        - Of these 16,000 cubic yards, 7,200 cubic yards may exceed construction worker PRGs.

- Excavation and restoration activities at the residential properties will be completed within two days per property;

- Investigative samples prior to excavation work will determine the extent of needed remediation. The need for the collection of additional confirmation samples may rarely occur. However, for cost estimating purposes, it is assumed that collection of confirmation samples will be required at 10% of the excavated properties to supplement the existing data; and

- The excavation and restoration activities to be performed on the residential properties, parks, and alleys addressed by this Proposed Plan will be accomplished in approximately 2.5 years.

A detailed description of each of the alternatives considered, with costs based on the assumptions described above, is presented below.

[3] The average of 33 cubic yards per property was arrived at through a Monte Carlo simulation (Ramboll Environ 2015).

Alternative 1: No Action

The NCP (40 CFR 300.430(e)(6))) requires that a No Action alternative be incorporated into the evaluation and selection of a remedial action. The No Action alternative serves as a point of comparison to the other alternatives under consideration at the Site. Under this alternative, no action would be taken at OU4 to prevent exposure to the contaminated soil. The No Action alternative would leave affected soils in place at OU4. Since the NCP requires five-year reviews as long as hazardous substances remain at the Site at concentrations that do not allow for unlimited use and unrestricted exposure, there would be periodic costs associated with five-year reviews for this alternative, but these costs would be minimal.

Estimated **Total Present Value** of Alternative: $0
Estimated **Capital Cost**: $0
Estimated Remedy Implementation Cost: $0
Estimated **Periodic Cost**: $0
Remedial Action Construction Timeframe: 0

Alternative 2: Excavation and Management of Soils on the Former Plant Site Area

Alternative 2 includes excavation of contaminated soil and SRM from residences, parks, and alleys in OU4, backfilling with clean soil, and revegetation of the disturbed areas. Soils with HCOPC concentrations exceeding construction worker PRGs or containing SRM would be temporarily stockpiled on the FPSA, adjacent to the Slag Pile along its north side (see Figure 5). Based on an extrapolation of the Pilot Study data, approximately 16,000 cubic yards of excavated soil (10,000 cubic yards of soil from the residential properties and 6,000 cubic yards from the public parks and alleys) will exceed one or more construction worker PRGs or contain SRM.

Soils with HCOPC concentrations exceeding residential PRGs but less than the construction worker PRGs would be temporarily stockpiled on the FPSA in the central portion of the Site (see Figure 5)[4]. Based on a comparison of the Pilot Study data to the PRGs and extrapolation to OU4, approximately 39,000 cubic yards could be stockpiled.

Contaminated soil and SRM will require characterization testing using the **toxicity characteristic leaching procedure** (TCLP) to determine appropriate management consistent with a final remedy for OU3 when a final remedy is determined.

Best management practices will be used to control potential leaching, dust, and run-on/run-off from the stockpiles. Run-on and run-off controls such as silt fence or earthen berms will be utilized in conjunction with a cover system to control potential wind dispersal. The specifics will be provided in the Remedial Design Plan.

[4] Since a remedy for OU3, the former plant site, has not yet been determined, final disposition of the stockpiles has not yet been determined.

Estimated Total Present Value of Alternative: $13,132,000[5]
Estimated Capital Cost: $170,000
Estimated Remedy Implementation Cost: $12,662,000
Estimated Periodic Cost: $300,000
Estimated Remedial Action Construction Timeframe: 2.5 years

Alternative 3: Excavation and Off-Site Disposal

Alternative 3 includes excavation of contaminated soil and SRM from residences, parks, and alleys in OU4, disposal in an appropriate off-site landfill, backfilling with clean soil, and revegetation of the disturbed areas. Although the excavated soil is expected to be non-hazardous, the soils would require additional testing prior to disposal, using TCLP testing, before being accepted for disposal at a landfill. Since no TCLP analytical data has been obtained for OU4 soils, exact disposal volume estimates for hazardous and nonhazardous wastes cannot be made at this time. Therefore two scenarios are associated with this alternative to provide the potential range of Alternative 3 costs. For Alternative 3A, all of the excavated soil is assumed to pass TCLP testing and would be disposed of at an off-site municipal solid waste (RCRA Subtitle D) landfill. For Alternative 3B, all of the excavated soil is assumed to fail TCLP testing and require more expensive treatment and disposal at an off-site hazardous waste (RCRA Subtitle C) landfill. One waste pile area would be established in the FPSA to temporarily stockpile soils for approximately one week until the soils are removed and transported to an off-site disposal facility. It is possible that some of the excavated soil would pass TCLP testing and some of it would fail. The cost associated with that situation would fall somewhere between 3A and 3B.

<u>Alternative 3A</u>
Estimated Total Present Value of Alternative: $21,172,000
Estimated Capital Cost: $170,000
Estimated Remedy Implementation Cost: $20,702,000
Estimated Periodic Cost: $300,000
Estimated Remedial Action Construction Timeframe: 2.5 years

<u>Alternative 3B</u>
Estimated Total Present Value of Alternative: $30,582,000
Estimated Capital Cost: $170,000
Estimated Remedy Implementation Cost: $30,112,000
Estimated Periodic Cost: $300,000
Estimated Remedial Action Construction Timeframe: 2.5 years

[5] The costs, as presented, use terminology included in the Scoping Document. In general, the Capital Costs and Remedy Implementation Costs can be considered capital costs; periodic costs are costs associated with Operation and Maintenance after the remedy is completed. A discount rate of 1.4%, consistent with Office of Management and Budget Circular A-94, was used to calculate the Total Present Value of each alternative.

Summary

The alternatives described above, except No Action (Alternative 1), are proven and effective remedial alternatives for metals-in-soil sites that would meet ARARs and the RAO that was developed for OU4.

EVALUATION OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that the Illinois EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives (§300.430(e)(9)). The purpose of this evaluation is to promote consistent identification of the relative advantages and disadvantages of each alternative, thereby guiding selection of remedies offering the most effective and efficient means of achieving site cleanup goals. While all nine criteria are important, they are weighed differently in the decision-making process depending on whether they evaluate protection of human health and the environment or compliance with federal and state requirements, standards, criteria, and limitations (threshold criteria); consider technical or economic merits (primary balancing criteria); or involve the evaluation of non-Illinois EPA reviewers that may influence an Illinois EPA decision (modifying criteria).

The detailed analysis of alternatives consists of an assessment of individual alternatives against each of nine evaluation criteria, as well as a comparative analysis that focuses on the relative performance of each alternative against the other alternatives. Each of the nine evaluation criteria is described below, followed by a discussion of how each alternative meets or does not meet each criterion. More details regarding the evaluation and comparison of the cleanup alternatives against the nine criteria can be found in the Scoping Document for Presumptive Remedy OU4: Off-site Soils (October 2015). In addition, Table 1 provides a qualitative summary of how each cleanup alternative ranks against each of the nine criteria.

Explanation of the Nine Evaluation Criteria

<u>Threshold Criteria</u>
The two threshold criteria are statutory requirements that must be met. If either of the threshold criteria is not met by an alternative, that alternative cannot be selected as the remedy.

1. **Overall Protection of Human Health and the Environment** addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed by the site are eliminated, reduced, or controlled through treatment, engineering, or institutional controls.

2. **Compliance with Applicable or Relevant and Appropriate Requirements** addresses whether a remedy will meet the applicable or relevant and appropriate federal and state requirements, known as ARARs. Applicable requirements are those that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or

other circumstance found at the Site. Relevant and appropriate requirements are those that address problems or situations sufficiently similar to those encountered at the Site that their use is well suited to the situation or circumstances. Other advisories, criteria, or guidance may be identified as "to be considered" (TBC) for a particular situation.

Primary Balancing Criteria

The five primary balancing criteria weigh major tradeoffs among alternatives.

3. **Long-Term Effectiveness and Permanence** refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met.

4. **Reduction of Toxicity, Mobility, or Volume Through Treatment** addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as their principal element. This preference is satisfied when treatment is used to reduce the principal threats at the site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.

5. **Short-Term Effectiveness** addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and the environment during construction of the remedy until cleanup levels are achieved. This criterion also considers the effectiveness of mitigative measures and time until protection is achieved through attainment of the remedial action objectives.

6. **Implementability** addresses the technical and administrative feasibility of a remedy from design through construction, including the availability of services and materials needed to implement a particular option and coordination with other governmental entities.

7. **Cost** includes estimated capital costs, annual operating and maintenance (O&M) costs, and net present value of capital and O&M costs, including long-term monitoring.

Modifying Criteria

The two modifying criteria can be evaluated to the extent such information is available, but will be fully evaluated following the public comment period on this Proposed Plan and addressed in the ROD.

8. **Support Agency Acceptance** considers whether the support agency, in this case the USEPA, supports the preferred alternative presented in the Proposed Plan and concurs with the selected remedy.

9. **Community Acceptance** addresses the public's general response to the remedial alternatives and the preferred alternative presented in the Proposed Plan.

Each of the nine evaluation criteria are discussed below with respect to the alternatives under consideration for this remedial action.

COMPARISON OF ALTERNATIVES

1. Overall Protection of Human Health and the Environment

Alternative 1, No Action, would provide no improvement over current conditions, would provide no risk reduction, and would not be protective of human health or the environment. Thus, this alternative cannot be selected as the remedy and is not discussed further.

Alternatives 2 and 3 provide equal protection of human health and the environment within OU4. These alternatives would prevent direct contact exposure by removing soil containing metals at concentrations above PRGs to a maximum depth of 18 inches from residential properties, 24 inches from gardens, and 12 inches from parks and alleys, and by backfilling the excavated areas with clean soil. Excavated soils and SRM under Alternative 2 would be stockpiled on the FPSA, and the final disposition of the OU4 stockpiles would be determined as part of the final remedy for OU3 or in a separate effort. Excavated soils under Alternative 3 would be temporarily stockpiled on the FPSA prior to transport and disposal at an appropriate off-site facility.

Alternatives 2 and 3 are protective; however, if soil with HCOPC concentrations greater than PRGs or if potential continuous SRM is left in place below the applicable excavation depth, a permanent, permeable barrier would be installed to visually mark the maximum depth of the excavation and distinguish the impacted soil below from the clean backfill soil. This would occur under both alternatives. Environmental covenants and institutional controls would be placed on the remediated properties in these cases, and a Construction Support Program would be implemented for properties where a marker barrier is placed. If the marker barrier is encountered during future excavation work at a property, assistance will be provided to facilitate proper handling of the soil and placement into a repository to be constructed in OU3. Multiple **Five-Year Reviews** would also be conducted at these properties.

2. Compliance with ARARs

Alternatives 2 and 3 would be capable of meeting all potential ARARs. The potential chemical-, location-, and action-specific ARARs for these alternatives are identified in Tables 2, 3 and 4, respectively.

3. Long-term Effectiveness and Permanence

Since contaminated soils and SRM would be excavated and removed from OU4 and replaced with clean fill, the long-term effectiveness and permanence of Alternatives 2 and 3 would be equivalent for the properties addressed by the remedial action. For soils and SRM stockpiled at OU3, Alternatives 2 and 3 would be equivalent because soils and SRM would be managed to prevent further release, either as part of a permanent remedy for OU3 or by final disposition off-

site. For Alternative 3, it is assumed that the off-site disposal facility would dispose of the waste in a manner that prevents future migration of contaminants to the environment.

For Alternatives 2 and 3, if soil exceeding the PRGs is identified, left in place (e.g., below the applicable excavation depth), and identified with a marker barrier, then the long term-effectiveness would be dependent on the implementation and enforcement of the notification letters, the Construction Support Program, environmental covenants, institutional controls, property owner participation, and the soil repository to be constructed in OU3 to prevent future exposure to construction workers and residents.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Alternatives 2 and 3A would not decrease the toxicity, mobility, or volume of contaminated soil through treatment. For Alternative 3B, soils would be treated to reduce toxicity prior to being landfilled in accordance with the Land Disposal Restrictions of 35 Ill. Adm. Code 728. Alternatives 2 and 3A do not satisfy USEPA's statutory preference for remedial actions that employ treatment technologies as their principal element, but Alternative 3B (which assumes all of the soil is hazardous) would satisfy this statutory preference by employing treatment technologies before final soil disposal. However, it is unlikely that all of the OU4 excavated soil is hazardous. The soil contamination at OU4 is considered low-level threat material because the toxicity and mobility of the contaminants that are present pose a low potential risk. Low-level threat material does not lend itself to cost-effective treatment.

5. Short-term Effectiveness

Alternatives 2 and 3 would present short-term implementation risks over a 2.5-year period. However, the excavation portion of Alternatives 2 and 3 would not subject residents or construction workers to any unusual implementation risks as these remedies can be conducted using conventional construction techniques. Engineering controls, such as dust suppression, storm water controls, construction scheduling, and appropriate containment at the FSPA would be implemented to reduce potential short-term exposures. All workers would require training and medical monitoring in accordance with 29 CFR 1910.120. For these alternatives, construction workers could be required to utilize personnel protective equipment as established in a site-specific Health and Safety Plan, and operation controls (i.e., work zones, decontamination facilities, etc.) would be established to protect workers during the construction period. Exposure to these short-term risks under Alternatives 2 and 3 is further reduced due to the short estimated average length of time for individual property remediation (approximately two days), and the short travel distance to the FPSA stockpile areas (temporary stockpiling in the case of Alternative 3). Alternative 3 presents a greater degree of short-term implementation risk due to the additional handling required to remove the temporarily stockpiled soils from the FPSA and transport them to the off-site disposal facility. The double-handling and longer transport distances increase the risk of vehicle accidents and extend the risk of exposure to the environment and communities outside of the Village of DePue.

6. Implementability

Both Alternatives 2 and 3 are readily implementable assuming access is granted by the property owners, although Alternative 3 includes additional tasks associated with short-term storage, and possible treatment of soil before being moved off-site for final disposal. Excavation methods, backfilling, and revegetation are common remedial activities. For Alternative 2, a suitable area exists on the FPSA with sufficient capacity to handle the anticipated soil volumes with minimal advance preparation. For both scenarios of Alternative 3, materials would be transported to the FPSA, stockpiles would be constructed, and the soil handled a second time for transport and off-site disposal. Maintenance of the stockpile on the FPSA prior to off-site disposal would require additional waste management considerations, but is readily implementable. Landfills in the vicinity of the Site have capacity to handle the estimated soil quantities and assumed soil characteristics, so implementation of the off-site disposal scenarios is considered viable.

7. Cost

Of the two eligible alternatives, the total present value cost for Alternative 2 is significantly lower than the range of total present value costs for Alternative 3. The final cost estimates for the selected remedial action will be developed and refined during the remedial design process.

8. Support Agency Acceptance

USEPA will determine its support of the preferred alternative after the public comment period ends.

9. Community Acceptance

The local community's acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the OU4 ROD.

ILLINOIS EPA'S PREFERRED ALTERNATIVE

Illinois EPA is proposing Alternative 2: Excavation and Management of Soils on the Former Plant Site Area as the Preferred Alternative. This alternative will achieve substantial risk reduction by removing the source of exposures at impacted OU4 properties and consolidating wastes on the FPSA for efficient remediation of OU3. This alternative is preferred because it will achieve the remedial action objective of preventing ingestion, inhalation and dermal contact of OU4 soils contaminated with HCOPC concentrations above the designated PRGs for the resident child and adult and construction workers at a lower cost than Alternative 3 and with less risk to the community and workers during remedy implementation.

The main elements of Alternative 2 are:

A. Access agreement with the current property owners to allow for sampling and cleanup work;

B. Soil sampling will be conducted in general accordance with the Superfund Lead-Contaminated Residential Sites Handbook.
    a. It is anticipated that **composite samples** will be collected in six-inch increments as follows:
        i. For residential yards, samples will be collected at depths of 0-6 inches, 6-12 inches, 12-18 inches, and 18-24 inches, though the 18-24 inch sample may not be analyzed, depending on the results of the 12-18 inch sample; and
        ii. For parks and alleys, samples will be collected at depths of 0-6 inches, 6-12 inches, and 12-18 inches, though the 12-18 inch sample may not be analyzed, depending on the results of the 6-12 inch sample;
    b. For gardens, **discrete samples** will be collected and analyzed in six-inch increments to 24 inches;

    If the described sampling cannot be completed for any individual property, changes to the sampling plan can be accommodated on a case-by-case basis.

C. Some contaminated soil and SRM will require TCLP testing to determine whether the materials are characteristically hazardous;

D. Based on sample results, remediation will occur via excavation of affected soils with concentrations exceeding the PRGs, generally to a maximum depth of 18 inches on residential property, 24 inches for gardens, and 12 inches for parks and alleys. Affected soil below these depths may be excavated as determined on a case-by-case basis, for instance if deeper excavation is determined to be more cost effective than implementing the measures described in Item J below;

E. Compliance with PRGs will be demonstrated by results from investigative samples, adjacent samples, confirmatory sampling, or a combination of these samples;

F. Excavated soils and SRM will be transported to the FPSA for stockpiling and management. SRM and soils with concentrations above construction worker PRGs will be stockpiled on the north side of the slag pile. Soils with concentrations below construction worker PRGs and above residential PRGs will be stockpiled separately at OU3[6];

G. Best management practices will be established for the stockpiles to prevent leaching, run-on, run-off, wind dispersion, and direct contact of placed soils;

H. Residential properties and parks will be restored using soil from an off-site source and vegetated with grass seed appropriate for the climate zone; sod may be placed on a case-by-case basis. A landscape contractor will maintain the yards until vegetation is established (one year). Landscaping removed or destroyed as part of the cleanup activities will be replaced with comparable landscaping, if requested by the owner.

[6] Since a remedy for OU3, the former plant site, has not yet been determined, final disposition and/or use of the stockpiles has not yet been determined.

Backfill soils will be evaluated prior to implementation of the remedial action to verify this soil meets residential PRGs for the HCOPCs and TACO Tier 1 soil remediation objectives for non-COC chemicals (for off-site backfill sources);

I. Alleys will be restored using an Illinois Department of Transportation-approved coarse aggregate;

J. Institutional controls will be implemented as necessary. If soil with HCOPC concentrations greater than PRGs or if potential continuous SRM are left in place below the applicable excavation depth, a permanent, permeable barrier will be installed to visually mark the maximum depth of the excavation and distinguish the impacted soil from the clean backfill soil. ICs will be placed on the private properties in these cases. The ICs will provide notification to the property owner and successive owners that soil with concentrations greater than PRGs is present at depth. If the marker barrier is encountered during future excavation work at a property, assistance to facilitate proper handling of the soil and placement into a repository to be constructed in OU3 as part of a Construction Support Program will be provided. Environmental covenants pursuant to Illinois' Uniform Environmental Covenants Act will be implemented on public properties and will incorporate the same ICs and Construction Support Program proposed for private properties;

K. Certification letters from Illinois EPA will be provided to the property owners that include the data results and a description of the completed remedial actions;

L. Each property will be restored as close as practicable to its original conditions.

Summary of Rationale for the Preferred Alternative

Based on information currently available, Illinois 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 and modifying criteria. Illinois 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 5) satisfy the preference for treatment as a principal element, or explain why the preference for treatment will not be met.

Alternative 2 is the preferred alternative because it achieves the same level of risk reduction on individual properties at a lower cost than Alternative 3, and presents less short-term implementation risk because it does not include Alternative 3's additional handling and transportation of excavated contaminated materials. Under the Preferred Alternative, contaminated soil and SRM will be temporarily managed at the FPSA and permanent management will be addressed as part of the final remedy for OU3.

NEXT STEPS

Illinois EPA, in consultation with USEPA, will evaluate public reaction and public comments to the Preferred Alternative before selecting the final remedy for the portions of OU4 addressed by this Proposed Plan. Based on new information or public comments, Illinois EPA may modify its Preferred Alternative or choose another alternative. Illinois EPA encourages the public to review and comment on this Proposed Plan and the cleanup alternatives that were evaluated.

Illinois EPA will respond in writing to all significant comments in a Responsiveness Summary, which will be included with the ROD. Illinois EPA will announce the selected cleanup alternative in local newspapers and will place a copy of the ROD in the local information repository at the Selby Township Library.

COMMUNITY PARTICIPATION

The public is invited to provide comments on this Proposed Plan, the alternatives evaluated, and Illinois EPA's Preferred Alternative. The comment period will run from June 14 through July 14, 2016. During the comment period, an availability session will be held June 22 at the DePue School Gymnasium from 3:00 to 5:00 pm and from 6:00 to 8:00 pm, and a public meeting will be held June 29 at the DePue School Gymnasium from 6:00 to 8:00 pm during which Illinois EPA will discuss the Preferred Alternative, answer questions about this Proposed Plan, and accept written and verbal comments.

Public comments received on this Proposed Plan will be considered before selecting a final remedy and documentation of that remedy will occur in a ROD. The public's comments and Illinois EPA responses will be provided in a Responsiveness Summary included with the ROD.

The Preferred Alternative has been selected based on information presented in various other documents available to the public for review. Illinois EPA encourages the public to review the supporting technical documentation available at both the Selby Township Public Library in DePue, Illinois, and the Illinois EPA office in Springfield, Illinois.

For more information on the Site or this Proposed Plan, contact:

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Project Manager
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REFERENCES

Arcadis. 2009. DePue Lake Remedial Investigation Report, DePue Site, DePue, Illinois. July.

Arcadis. 2011. Final Background Soil Sampling Report. December.

Arcadis. 2014. OU5 Baseline Human Health Risk Assessment. September.

ATSDR. 1999. Public Health Assessment for the DePue/New Jersey Zinc/Mobil Chemical Corporation, DePue, Bureau County, Illinois. December 17.

ENVIRON. 2011. Removal Action Limit Assessment Report. Prepared for the DePue Group by Environ International Corporation, Chicago, Illinois.

ENVIRON. 2013. Pilot Study Sampling Plan OU4: Off-Site Soils. Prepared for the DePue Group by Environ International Corporation, Chicago, Illinois.

ENVIRON. 2014. Preliminary Phase II Remedial Investigation Report, OU3: On-Site Soils and Groundwater. Prepared for the DePue Group by Environ International Corporation, Chicago, Illinois.

ENVIRON. 2015. Pilot Study Sampling Report OU4: Off-Site Soils. Prepared for the DePue Group by Environ International Corporation, Chicago, Illinois.

Illinois EPA. 2014. Fact Sheet #16, August.

Ramboll Environ. 2015. Scoping Document for Presumptive Remedy, OU4: Off-Site Soils, DePue Site, DePue, Illinois. October.

Soil Conservation Service (SCS). 1992. Soil Survey of Bureau County, Illinois.

US Census Bureau. 2010.
http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk
Accessed November 4, 2015.

US Census Bureau, Population Division. May 2015.
http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF
Accessed November 4, 2015.

USEPA. 1996. Soil Screening Guidance: Technical Background Document. EPA/540/R-95/128. July.

USEPA. 1999. Presumptive Remedy for Metals-in-Soils Sites. EPA/540-R98-054.

USEPA. 2003. Superfund Lead-Contaminated Residential Sites Handbook. OSWER 9285.7-50.

USEPA. 2009. Adult Lead Model. Available at http://www.epa.gov/superfund/health/contaminants/lead/products.htm#alm.

USEPA. 2015. Regional Screening Levels (RSLs). June. http://www.epa.gov/region9/superfund/prg/

Proposed Plan for Operable Unit 4, Off-Site Soils
New Jersey Zinc/Mobil Chemical Superfund Site, DePue, Illinois

COMMENT FORM

Your input on the Proposed Plan for OU4 is important to Illinois EPA. Comments provided by the public are valuable in helping Illinois EPA select a final remedy for the portions of this operable unit addressed by the Proposed Plan.

You may use the space below to write your comments. All written comments must be postmarked no later than **July 14, 2016.**

Please send this form to:

Illinois Environmental Protection Agency
Mr. Jay Timm
1021 North Grand Ave. East
Springfield, IL 62702

You may also e-mail comments to:
Jay.timm@illinois.gov
Please include your name and address with your comments sent by e-mail.

Name: _____

Address: _____

Affiliation (optional):_____

Phone number (optional): _____

Comments: (Please feel free to attach additional sheets of paper.)

Your comments are considered public records and, if requested, may be subject to release.

GLOSSARY

Applicable or Relevant and Appropriate Requirements: Any Federal and State environmental laws or regulations that a selected remedy must meet. These requirements will vary among sites and alternatives.

Aquifer: a layer of porous rock saturated with water in which the water readily moves to wells and springs.

Background: chemical concentrations in the environment that are naturally occurring or as a result of human activity, but not specifically related to the Superfund site.

Bathymetry Study*:* A study conducted to determine the elevation of the lake floor to help develop contours of the lake and to determine the amount and rate of sedimentation in the lake.

CERCLA: The Comprehensive Environmental Response, Compensation, and Liability Act, also known as Superfund. A Federal law that addresses the removal or cleanup of hazardous substances at a hazardous waste site.

Cancer risks: a probability or chance of an individual developing cancer over a lifetime from exposure to chemicals at the site. This risk is in addition to risks individuals may already be subject to from smoking or other reasons. Cancer risks are expressed in scientific notation (e.g., a 1×10^{-5} cancer risk means there is a 1 in 100,000 chance that a person will develop cancer as a result of site-related exposures). Superfund guidance indicates that acceptable exposures may range from 1 in 10,000 (1×10^{-4}) to 1 in 1,000,000 (1×10^{-6}).

Capital Costs: Capital costs include those related to construction, labor, equipment and materials, professional and technical services, disposal, institutional controls, etc.

Community Advisory Group: also known as CAG, the CAG provides a public forum for community members to make their needs and concerns about the Superfund process and the decision-making process known to appropriate government representatives. The DePue CAG meets approximately every six weeks.

Composite Sample**:** a single sample made up from several other samples that are collected separately, then mixed or homogenized into one sample for analysis.

Conceptual Site Model: A graphic representation or flow diagram showing the source of contaminants and how people may ultimately be exposed to those contaminants, through what type of environmental media and who the receptors may be.

Discrete Samples: A single sample collected from a single location for analysis.

Environmental Covenants: The Illinois Uniform Environmental Covenants Act (UECA) (765 Illinois Compiled Statues (ILCS) 122 et seq.) creates an environmental covenant that is a specific recordable interest in real estate. It originates from an environmental response project that

imposes activity and use limitations on a property. The UECA instrument recites the property use controls and remediation requirements imposed upon the property.

Expanded Site Inspection: A study conducted to supplement initial sampling and gather additional information for the Hazard Ranking System proposal, also known as an ESI.

Feasibility Study: A study that evaluates several alternatives to address remediation of a contaminated site.

Five-Year Review: When remedies at Superfund sites leave contaminants in place that potentially pose unacceptable risk, CERCLA requires a review of the remedy and the site at least once every five years.

Hazard Ranking System: A numerically-based screening system that uses information from limited investigations to assess a site's potential human health or environmental threat.

Hazards: Non-cancer-causing adverse effects in the human body from exposure to contaminants.

Hazard Index: A hazard index greater than 1 indicates the potential for harmful non-cancer health effects.

Hazardous Substances, Pollutants, or Contaminants: These are defined in other federal laws, including CERCLA, the Clean Water Act, the Solid Waste Disposal Act, and the Toxic Substances Control Act.

Human Health Contaminants of Potential Concern: These are chemicals detected that are potentially site-related and may be contributing to levels of unacceptable risk.

Hydrogeologic: Hydrology is the study of groundwater and its movement in soil and rocks. The local hydrogeologic system describes the way groundwater moves and how it is distributed based on the local occurrence of aquifers.

Institutional Controls: Administrative and legal controls, such as deed restrictions and zoning, that can help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy.

Interim Consent Order: A Consent Order is an order of a court documenting a voluntary agreement between two or more parties to a dispute. An Interim Consent Order does not fully resolve the dispute, but will be followed by a Final Consent Order or by further litigation to conclude the law suit. It is an interim step pending further action.

mg/kg: milligram per kilogram, also known as "parts per million," used to describe the concentration of a chemical in soil. One ppm is one milligram of a chemical in one kilogram of soil.

Monitoring Wells: Wells installed to monitor groundwater which occurs beneath the earth's surface in the spaces between soil particles.

NCP: The National Oil and Hazardous Substances Pollution Contingency Plan, Code of Federal Regulations, Title 40, Volume 19, Part 300, also known as the NCP. A set of federal regulations that, in part, describes requirements for investigating and selecting remedies for Superfund sites, including requirements for public involvement.

Non-hazardous: Refers to a regulatory classification of waste or contaminated soil that does not meet the definition of "hazardous" as described in federal and state regulations.

Periodic Cost: Costs that occur once over a certain time period or costs that occur only once during the remedial action timeframe.

Preliminary Remediation Goals: Also known as PRGs. PRGs are initial cleanup goals that are based on the protection of human health. PRGs become final remedial goals in the ROD.

Record of Decision: Also known as a ROD. A ROD is a technical, legal, and public document that describes the selected remedial action and includes the facts, analyses of facts and site-specific policy determinations considered. The ROD will also include a response to public comments on the Proposed Plan.

Remedial Investigation: An investigation conducted to collect data used to characterize site conditions, determine the type of waste or contamination and where it is located, and assess risk to human health and the environment.

Resource Conservation and Recovery Act: Also known as RCRA. A Federal law that addresses the identification, storage, transportation, treatment, and disposal of hazardous and solid waste.

***Risk Assessment*:** An assessment of risks presented from contaminants at a site and potential exposures from the site to human and/or ecological receptors.

Operable Unit: Operable Units are designated to focus efforts on a discrete portion of the site.

Screening Criteria: Concentrations of contaminants below screening criteria are generally considered to be at levels for which no action is needed. Concentrations of contaminants above screening criteria generally require additional evaluation.

Site-related Material: Also known as SRM, this black granular material was likely taken from the former plant site and used as fill material in various locations in the Village and on private property.

Target Risk Range: The Superfund program addresses cancer risks between 1×10^{-6} and 1×10^{-4}, or between 1 in 1,000,000 and 1 in 10,000. For example, a 1×10^{-6} risk means that for every 1,000,000 people exposed, 1 extra case of cancer may occur from exposure to site chemicals.

Total Present Value: Cost amount to be set aside at an initial point in time when the remedial action starts to ensure funding will be available in the future to complete the action.

Toxicity Characteristic Leaching Procedure: an analytical procedure that measures the potential for contaminants to leach from one medium to another.

XRF: Also known as X-ray Fluoresence, a type of analytical instrument that can be used on-site at a specific location ("field-portable") or as a handheld device in the field that measures concentrations of metals in soils or other media.

ABBREVIATIONS

ALM	Adult Lead Model
ARARs	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
BERA	Baseline Ecological Risk Assessment
bgs	below ground surface
CAG	Community Advisory Group
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
ESI	Expanded Site Inspection
FPSA	Former Plant Site Area
HCOPCs	Human Contaminants of Potential Concern
HHRA	Human Health Risk Assessment
HRS	Hazard Ranking System
ICO	Interim Consent Order
IDPH	Illinois Department of Public Health
IEUBK	Integrated Exposure Uptake Biokinetic Model
Illinois EPA	Illinois Environmental Protection Agency
IWTP	Interim Water Treatment Plant
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OU	Operable Unit
PRGs	Preliminary Remediation Goals
PRPs	Potentially Responsible Parties
RAL	Removal Action Levels
RAO	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SLERA	Screening Level Ecological Risk Assessment
SRM	Site-Related Material
TACO	Tiered Approach to Corrective Action Objectives
TAL	Target Analyte List
TBC	To Be Considered
TCLP	Toxicity Characteristic Leaching Procedure
USEPA	United States Environmental Protection Agency
UWBZ	Upper Water Bearing Zone
WWTP	Waste Water Treatment Plant
XRF	X-ray Fluorescence

TABLE 1

Comparison Summary of Alternatives to the Nine Superfund Remedy Selection Criteria

Evaluation Criteria	Alternative 1 No Action	Alternative 2* Excavation and Management at the FPSA	Alternative 3 Excavation and Off-Site Disposal
Overall Protection of Human Health and the Environment	Not Protective	Protective	Protective
Compliance with ARARs	Not Compliant	Compliant	Compliant
Long-term Effectiveness and Permanence	N/A	Yes	Yes
Reduction of Toxicity, Mobility, or Volume Through Treatment	N/A	No	3A: No 3B: Yes
Short-term Effectiveness	N/A	Yes	Yes
Implementability	N/A	Yes	Yes
Cost	$0	$13.1 M	$21.1 to $30.5 M
Support Agency Acceptance	Will be evaluated after the public comment period		
Community Acceptance	Will be evaluated after the public comment period		

Note:
* Illinois EPA's preferred alternative

TABLE 2

Potential Chemical-Specific ARARs and Guidance To Be Considered

Standard, Requirement or Limitation	Citation	Description	Alternative 1 No Action	Alternative 2 Management on the FPSA	Alternative 3A Off-site Disposal (Non-hazardous)	Alternative 3B Off-site Disposal (Hazardous)
FEDERAL ARARs – None						
STATE ARARs – None						
FEDERAL TBCs[1]						
Superfund Lead- Contaminated Residential Sites Handbook	OSWER 9285.7-50	Developed by the USEPA to promote a nationally consistent decision-making process for assessing and managing risks associated with lead-contaminated residential sites.	--	X	X	X
Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities	OSWER 9355.4-12 OSWER 9200.4-27P	This interim directive establishes a streamlined approach for determining protective levels for lead in soil at CERCLA sites and RCRA facilities that are subject to corrective action under RCRA section 3004 (u) or 3008 (h).	--	X	X	X

Standard, Requirement or Limitation	Citation	Description	Alternative 1 No Action	Alternative 2 Management on the FPSA	Alternative 3A Off-site Disposal (Non-hazardous)	Alternative 3B Off-site Disposal (Hazardous)
USEPA Regional Screening Levels	United States Environmental Protection Agency Regions 3, 6, and 9. June 2015. Regional Screening Levels for Chemical Contaminants at Superfund Sites.	Risk-based concentrations based on exposure information assumptions and USEPA toxicity data that are considered by the USEPA to be protective for humans over a lifetime.	--	X	X	X
STATE TBCs[1]						
Illinois Environmental Protection, Title 35, Subtitle G, Waste Disposal, Chapter 1: Pollution Control Board, Subchapter f: Risk Based Cleanup Objectives	35 IAC Parts 742, Tiered Approach to Corrective Action Objectives, Appendices A and B	Illinois risk-based cleanup goals for soils and generic state background levels for metals.	--	X	X	X

Abbreviations and Acronyms:

ARAR	Applicable or Relevant and Appropriate Requirements
FPSA	Former Plant Site Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
IAC	Illinois Administrative Code
OSWER	Office of Solid Waste and Emergency Response
RCRA	Resource Conservation and Recovery Act
TBC	To Be Considered
USEPA	United States Environmental Protection Agency

Notes:

1 TBC guidance cited represents the minimum guidance applicable to Site conditions. Other guidance not listed may be used if applicable to the Site conditions

X = Requirement is ARAR or TBC for the indicated Alternative

-- = Requirement is NOT ARAR or TBC for the indicated Alternative. Note that Alternative 1, No Action, does not meet ARARs.

TABLE 3

Potential Location-Specific ARARs and Guidance To Be Considered

Standard, Requirement or Limitation	Citation	Description	Alternative 1 No Action	Alternative 2 Management on the FPSA	Alternative 3A: Off-site Disposal (Non-hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
FEDERAL ARARs						
Fish and Wildlife Coordination Act	16 USC Sections 661-666 40 CFR Part 6.302(g)	Requires federal agency or permitted entity to consult with the USFWS and appropriate state agency prior to modification of any stream or other water body. The intent of this requirement is to conserve, improve, or prevent the loss of wildlife habitat and resources. This act is applicable to any non-game fish or wildlife species that have been or may in the future be adversely affected by site-related contamination.	--	X	X	X
National Historic Preservation Act	16 USC Section 470	The National Historic Preservation Act requires that historically significant properties be protected. The National Register of Historic Places is a list of sites, buildings, or other resources identified as significant to United States history. An eligibility determination provides a site the same level of protection as a site listed on the National Register of Historic Places. The requirements of this federal law are potentially applicable based on a determination of whether such properties occur on the Site.	--	X	X	X

Standard, Requirement or Limitation	Citation	Description	Alternative 1 No Action	Alternative 2 Management on the FPSA	Alternative 3A: Off-site Disposal (Non-hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
Migratory Bird Treaty Act of 1972	16 USC Sections 703-712	Establishes federal responsibility for the protection of the international migratory bird resource and requires continued consultation with the USFWS during remedial design and remedial construction to ensure that the cleanup of the Site does not necessarily impact migratory birds.	--	X	X	X
Endangered Species Act	16 USC Sections 1531-1544, 50 CFR 200, 50 CFR 402	The purpose of this act is to conserve endangered, threatened, and rare species of wildlife and plants. This regulation prohibits federal agencies from jeopardizing habitat for endangered or threatened species. No endangered species have been documented at the Site but this would become an ARAR if any endangered species were to be encountered.	--	X	X	X
Clean Water Act Section 404	40 CFR Part 320 and 33 CFR Parts 320-330	These sections of the CWA and associated regulations prohibit discharge of dredge or fill material to United States' waters including wetlands as defined by the U.S. Army Corps of Engineers.	--	X	X	X

Standard, Requirement or Limitation	Citation	Description	Alternative 1 No Action	Alternative 2 Management on the FPSA	Alternative 3A: Off-site Disposal (Non-hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
STATE ARARs						
Title 17, Conservation, Chapter 1: Department of Natural Resources, Subchapter h: Water Resources	Part 3706, Regulation of Construction within Floodplains	Requires a permit for work in the floodplain. In order to obtain the permit, the construction must be shown not to have significant flood damage risk, nor increase flood damage risk to surrounding areas. Permittees must also assume full liability for flood damages caused by the existence of temporary fills, including soil staging areas.	--	X	X	X
Illinois Endangered Species Protection Act	520 ILCS 10/2	The purpose of this act is to conserve endangered, threatened, and rare species of wildlife and plants. This regulation prohibits state and local agencies from jeopardizing habitat for endangered or threatened species.	--	X	X	X
FEDERAL TBCs[1]						
Fish and Wildlife Conservation Act	16 USC Section 2901-2912	Requires Federal agencies to utilize their statutory and administrative authority to conserve and promote conservation of non-game fish and wildlife species. Not expected to be an ARAR based on ecological risk evaluations but will be considered, if necessary.	--	X	X	X
Executive Order on Protection of Wetlands	Executive Order No. 11990 40 CFR Part 6.302(a) and Appendix A	Requires Federal agencies to avoid, to the maximum extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid new construction in wetlands, if a practical alternative exists. Action in wetlands is possible and this citation will be met if wetlands are encountered.	--	X	X	X

Standard, Requirement or Limitation	Citation	Description	Alternative 1 No Action	Alternative 2 Management on the FPSA	Alternative 3A: Off-site Disposal (Non-hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
Executive Order on Floodplain Management	Executive Order No. 11988 40 CFR Part 6.302(b) and Appendix A	Requires Federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the maximum extent possible, the adverse impacts associated with direct and indirect development of a floodplain.	--	X	X	X
STATE TBCs[1] – None						

Abbreviations and Acronyms:

ARAR	Applicable or Relevant and Appropriate Requirements
CFR	Code of Federal Regulations
CWA	Clean Water Act
FPSA	Former Plant Site Area
IAC	Illinois Administrative Code
TBC	To Be Considered
USC	United States Code
USFWS	United States Fish and Wildlife Service

Notes:

1 TBC guidance cited represents the minimum guidance applicable to Site conditions. Other guidance not listed may be used if applicable to the Site conditions

X = Requirement is ARAR or TBC for the indicated Alternative

-- = Requirement is NOT ARAR or TBC for the indicated Alternative. Note that Alternative 1, No Action, does not meet ARARs.

TABLE 4

Potential Action-Specific ARARs and Guidance To Be Considered

Standard, Requirement or Limitation	Citation	Description	Alternative 1: No Action	Alternative 2: Management on the FPSA	Alternative 3A: Off-site Disposal (Non- hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
FEDERAL ARARs						
National Ambient Air Quality Standards	42 USC Sections 7401 et seq.; 40 CFR Part 250	These regulations establish ambient air quality for emissions of particulate matter. Remedial actions taken under any of the alternatives (except no action) could potentially result in release of contaminants in soil or particulate matter. Those regulations are applicable to "major sources" as defined under the Clean Air Act. Although remedial actions at the Site are not expected to result in major emission sources, these regulations would be relevant and appropriate.	--	X	X	X
RCRA: Subtitle C, Identification and Listing of Hazardous Wastes	RCRA 40 CFR Part 261, Identification and Listing of Hazardous Waste	Identifies solid wastes which may be subject to regulation as hazardous waste.	--	X	X	X

Standard, Requirement or Limitation	Citation	Description	Alternative 1: No Action	Alternative 2: Management on the FPSA	Alternative 3A: Off-site Disposal (Non- hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
RCRA	42 USC Sections 6941; 40 CFR Part 257 Criteria for Classification of Solid Waste Disposal Facilities and Practices	The regulations define solid waste which includes both smelter residues and the localized materials. They contain requirements related to solid waste cover designs and disposal. Among other things, those regulations require that facilities be maintained to prevent wash-out of solid wastes and that the public not be allowed uncontrolled access.	--	X	X	X
RCRA	40 CFR Part 268, Land Disposal Restrictions	These regulations prohibit certain hazardous wastes from being land disposed without meeting standards specified in the regulations. If wastes must be treated in order to meet the standards, these regulations specify the technology to be used.	--	--	--	X
Department of Transportation (DOT) Hazardous Materials Transportation Regulations	49 CFR Parts 107, 171-177	This section regulates transportation of hazardous materials and is only considered ARARs for materials deemed characteristically hazardous. If any materials are transported off-Site and are deemed characteristically hazardous, these substantive requirements will be met in order to protect the local community and public roads while the waste materials are being hauled.	--	X	--	X

Standard, Requirement or Limitation	Citation	Description	Alternative 1: No Action	Alternative 2: Management on the FPSA	Alternative 3A: Off-site Disposal (Non- hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
Federal Clean Water Act - National Pollutant Discharge Elimination System (NPDES)	40 CFR Part 122.26(b)(14)(n)	This section requires a Construction General Permit and Notice of Intent (NOI) associated with managing storm water discharges from large construction activities (more than 5 acres of land disturbance) and would be relevant and appropriate for remedial actions involving excavation, management and/or consolidating soil materials.	--	X	X	X
Occupational Safety and Health Administration (OSHA)	40 CFR Part 122.26(b)(15)(11)	Specifies minimum requirements to maintain worker health and safety for hazardous waste sites. Includes specific training, monitoring, respiratory protection and personal protective equipment (PPE) requirements based on site specific conditions.	--	X	X	X
National Oil and Hazardous Substances Pollution Contingency Plan: Off-site Rule	40 CFR Section 300.440	Establishes the requirements for planning and implementing off-site response actions for hazardous substances.	--	--	--	X
STATE ARARS						
Illinois Environmental Protection Agency, Division of Water Pollution Control	General NPDES Permit Number ILR10	Enforces the Federal CWA General Construction Permit program in Illinois and establishes specific requirements for Illinois sites	--	X	X	X

Standard, Requirement or Limitation	Citation	Description	Alternative 1: No Action	Alternative 2: Management on the FPSA	Alternative 3A: Off-site Disposal (Non- hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
Title 35: Environmental Protection, Subtitle G:Waste Disposal, Subchapter c: Hazardous Waste Operating Requirements	35 IAC Part 720 et seq.; Hazardous Waste Management System: General	The Illinois hazardous waste management regulations incorporate much of the federal RCRA regulations as incorporated by reference. These regulations provide definitions and references.	--	X	X	X
Title 35: Environmental Protection, Subtitle G:Waste Disposal, Subchapter c: Hazardous Waste Operating Requirements	35 IAC Part 721 et seq.; Identification and Listing of Hazardous Waste	These regulations identify solid wastes that are subject to regulation as hazardous wastes.	--	X	X	X
Title 35: Environmental Protection, Subtitle G:Waste Disposal, Subchapter c: Hazardous Waste Operating Requirements	35 IAC Part 722 et seq.; Standards Applicable to Generators of Hazardous Waste	A generator of solid waste must determine if that waste is hazardous per 35 IAC 722.111.	--	X	X	X

Standard, Requirement or Limitation	Citation	Description	Alternative 1: No Action	Alternative 2: Management on the FPSA	Alternative 3A: Off-site Disposal (Non- hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
Illinois Environmental Protection Act, Definition of Special Waste	Illinois Environmental Protection Act, Title I, Section 3.475	Defines special waste as used in Illinois Environmental Protection Act and throughout IAC (by reference). Under the definition, excavated soil would be considered special waste.	--	X	X	X
Illinois Environmental Protection Act, Certification of Non-special Waste	Illinois Environmental Protection Act, Title V, Section 22.48	Establishes the criteria under which a generator may certify a waste as non-special.	--	X	X	--
Title 35: Environmental Protection, Subtitle B: Air Pollution, Subchapter c: Emission Standards and Limitations for Stationary Sources	35 IAC Part 212, Visible and Particulate Matter Emissions, Section 212.301, Fugitive Particulate Matter	Prohibits the generation of visible fugitive particulate matter.	--	X	X	X

Standard, Requirement or Limitation	Citation	Description	Alternative 1: No Action	Alternative 2: Management on the FPSA	Alternative 3A: Off-site Disposal (Non- hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
Title 35: Environmental Protection, Subtitle G:Waste Disposal, Subchapter c: Hazardous Waste Operating Requirements, Part 724, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	35 IAC Section 724 Subpart S, Special Provisions for Cleanup	Establishes requirements for the design and operation of CAMUs, established requirements for design, maintenance of staging piles.	--	X	X	X
Title 35, Environmental Protection, Subtitle H: Noise	35 IAC Part 900-902	Sound emission standards and limitations that will be applicable or relevant and appropriate during implementation of the remedy. Construction activities as defined in 35 IAC Section 900.101 are exempt from 35 IAC Sections 901.102 through 901.106 under 35 IAC Section 901.107(d).	--	X	X	X
Illinois Environmental Protection, Title 35, Special Waste Hauling	35 IAC Part 809	State regulation governing off-site transportation of special wastes. Included as an ARAR for general hauling of non-special wastes.	--	--	--	X

Standard, Requirement or Limitation	Citation	Description	Alternative 1: No Action	Alternative 2: Management on the FPSA	Alternative 3A: Off-site Disposal (Non- hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
Title 35: Environmental Protection, Subtitle G:Waste Disposal, Chapter I: Pollution Control Board, Subchapter c: Hazardous Waste Operating Requirements	35 IAC Part 728, Land Disposal Restrictions	The Land Disposal Restrictions restricts certain hazardous wastes from land disposal and defines circumstances in which such wastes may be land disposed.	--	--	--	X
FEDERAL TBCs[1]						
Presumptive Remedy for Metals-in-Soil Sites	OSWER Directive No. 9355.0-72FS	This guidance clarifies the definition of high volume low-toxicity risk wastes as "contaminated source material of low to moderate toxicity that generally are relatively immobile to air or groundwater (i.e. non-liquid, low volatility, low leachability contaminants such as high molecular weight compounds) in the specific environmental setting; and low toxicity source materials, such as soil and subsurface soil contamination not greatly above reference dose levels or that present an excess cancer risk near the acceptable risk range.	--	X	X	X
STATE TBCs[1]						

Standard, Requirement or Limitation	Citation	Description	Alternative 1: No Action	Alternative 2: Management on the FPSA	Alternative 3A: Off-site Disposal (Non- hazardous)	Alternative 3B: Off-site Disposal (Hazardous)
Illinois Superfund Program	35 IAC Part 750	Establishes procedures for assessing and remediating Illinois State Superfund sites. While this is a CERCLA Superfund Site, these state-Superfund regulations may be considered.	--	X	X	X
Uniform Environmental Covenant Act	P.A. 095-0845	Outlines the terms and requirements for an environmental covenant arising from an environmental response project.	--	X	X	X

Abbreviations and Acronyms:

ARAR	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
DOT	Department of Transportation
IAC	Illinois Administrative Code
ILCS	Illinois Compliance Statutes
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupation Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
PA	Public Act
RCRA	Resource Conservation and Recovery Act
TBC	To Be Considered
USC	United States Code

Notes:

1 TBC guidance cited represents the minimum guidance applicable to Site conditions. Other guidance not listed may be used if applicable to the Site conditions

X = Requirement is ARAR or TBC for the indicated Alternative

-- = Requirement is NOT ARAR or TBC for the indicated Alternative. Note Alternative 1, No Action, does not meet ARARs.

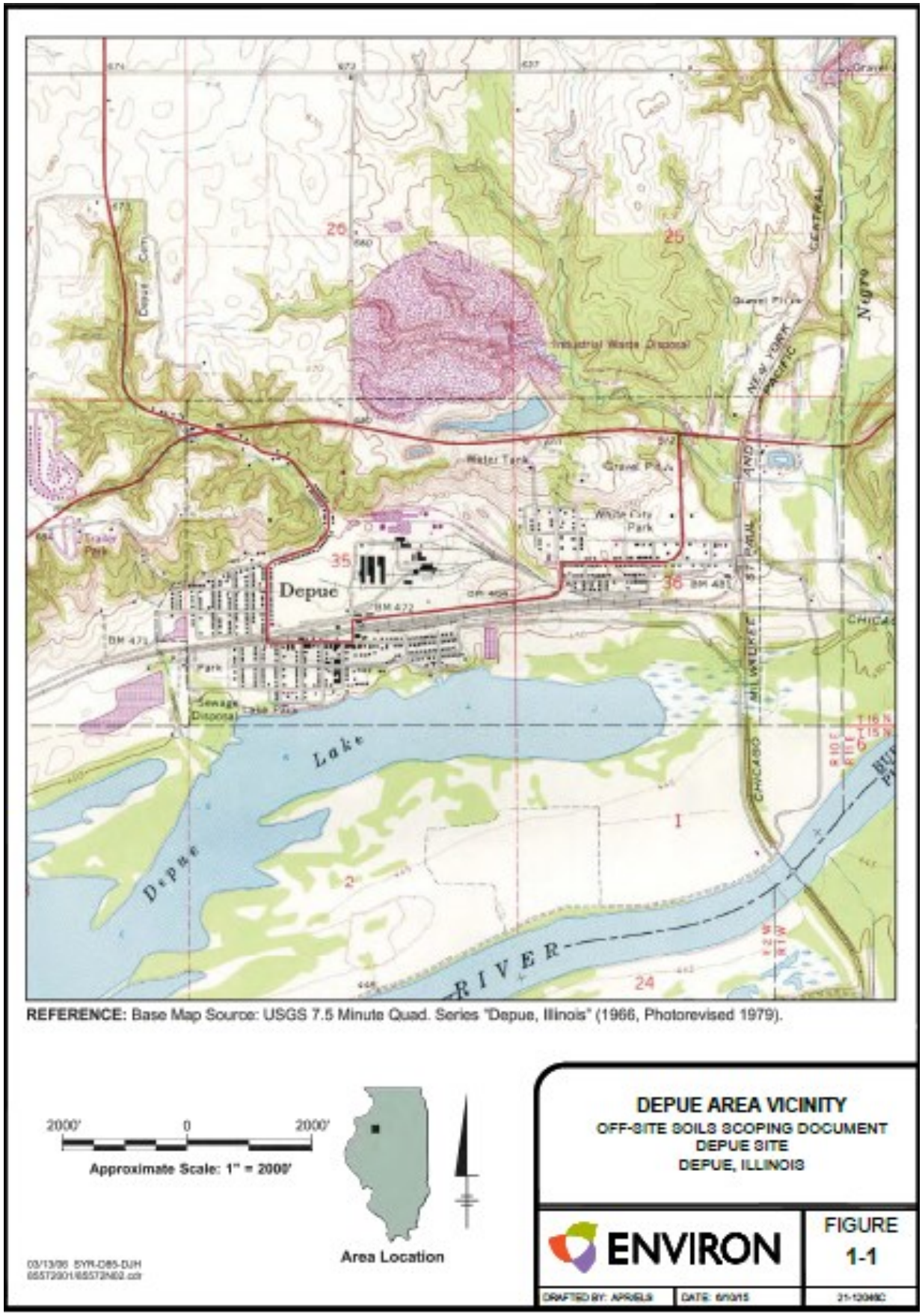


Figure 1. New Jersey Zinc/Mobil Chemical Site Location Map (Ramboll Environ 2015).

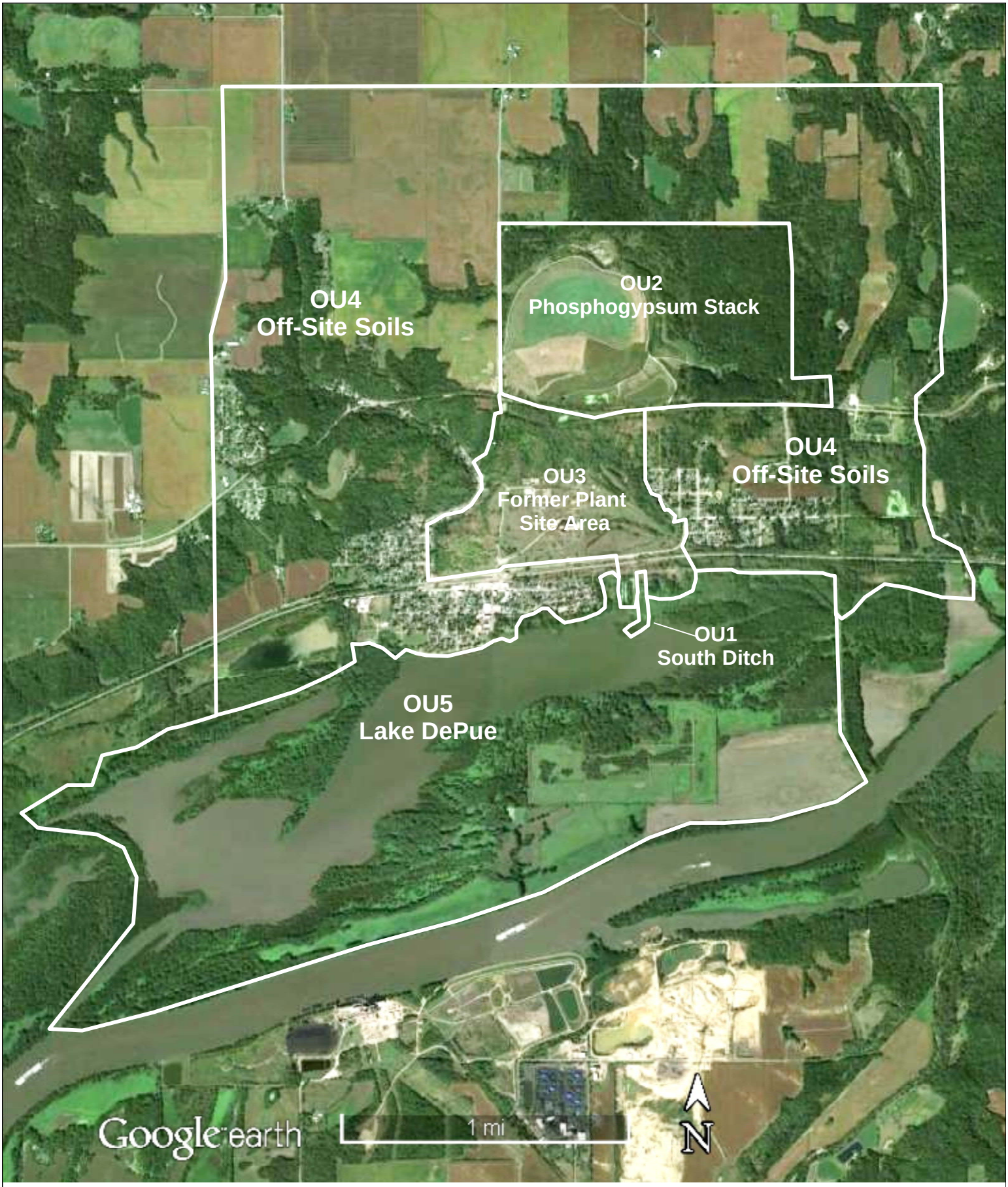
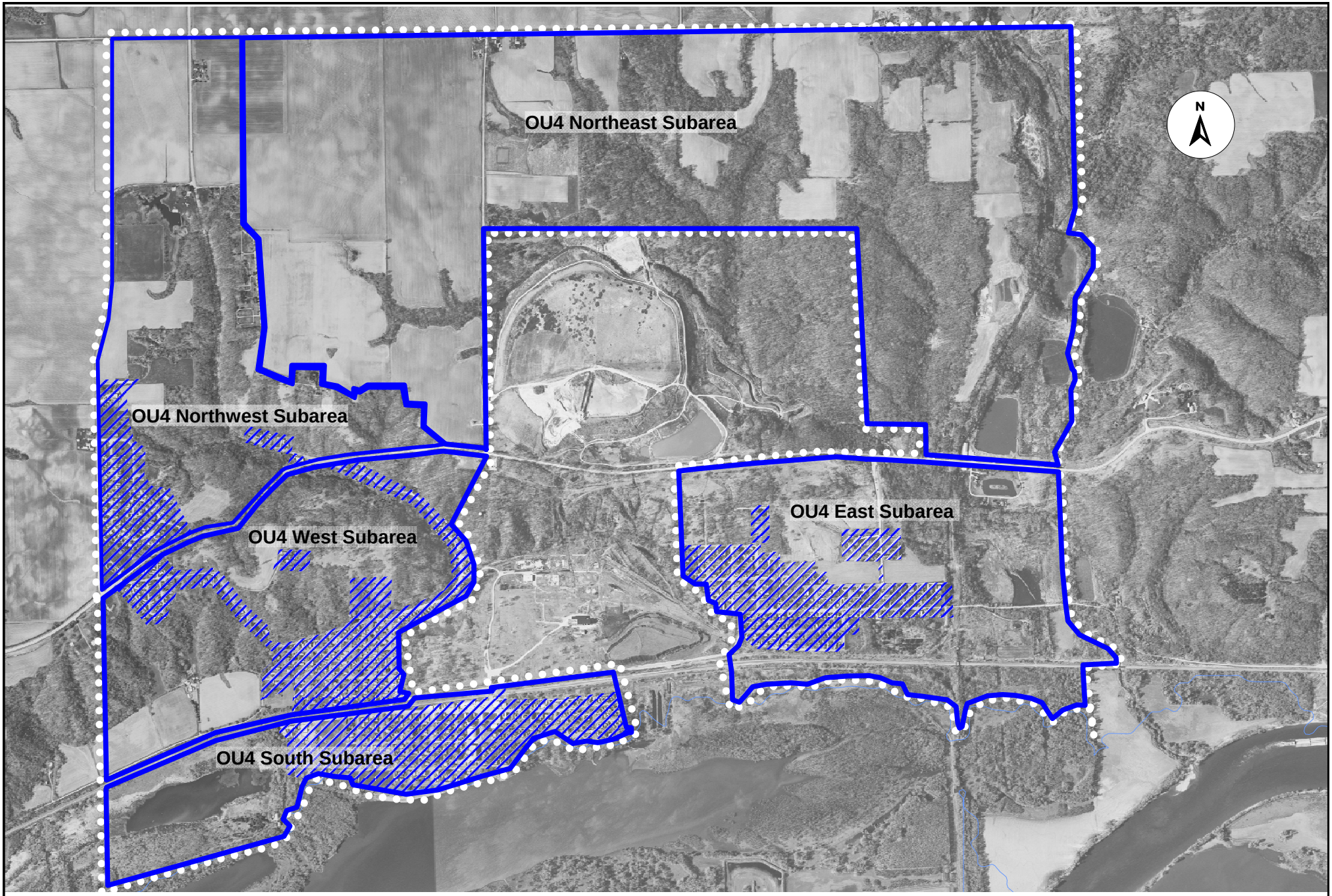


Figure 2.
Operable Units (OU's) within NPL Site

NJ Zinc/Mobil Chemical Site
DePue, Illinois



Legend

OU4 boundary, NJ Zinc/Mobil Chemical Site

OU4 residential, park, school, and alley properties addressed in this Proposed Plan.
Agricultural and ecological areas (ponds, woodlands) will be addressed at a later date.

Figure 3.
OU4 Residential and Other Areas Addressed in this Proposed Plan

NJ Zinc/Mobil Chemical Site
DePue, Illinois

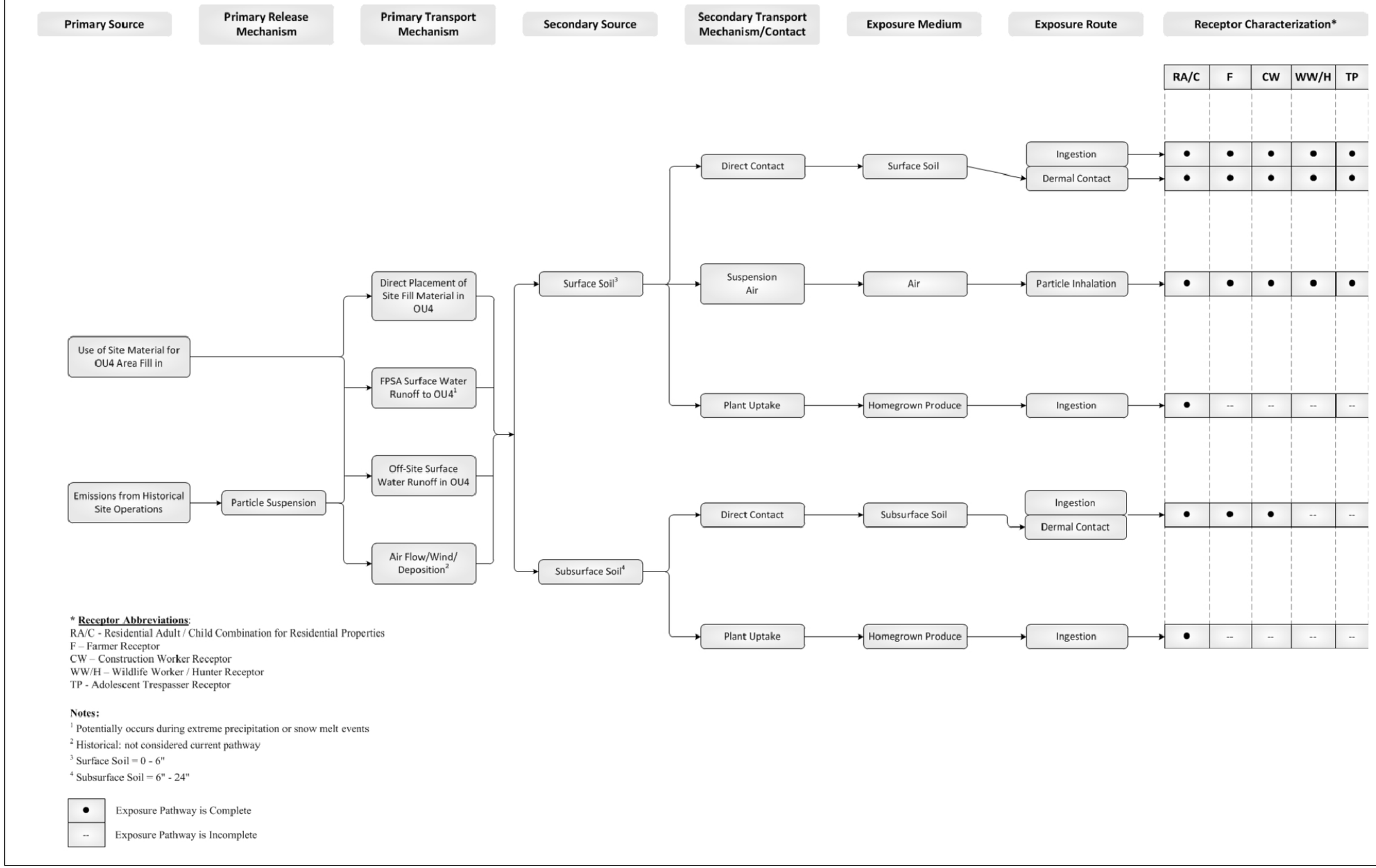


Figure 4 Human Health Exposure Pathway Conceptual Site Model for OU4 (Ramboll Environ 2015)

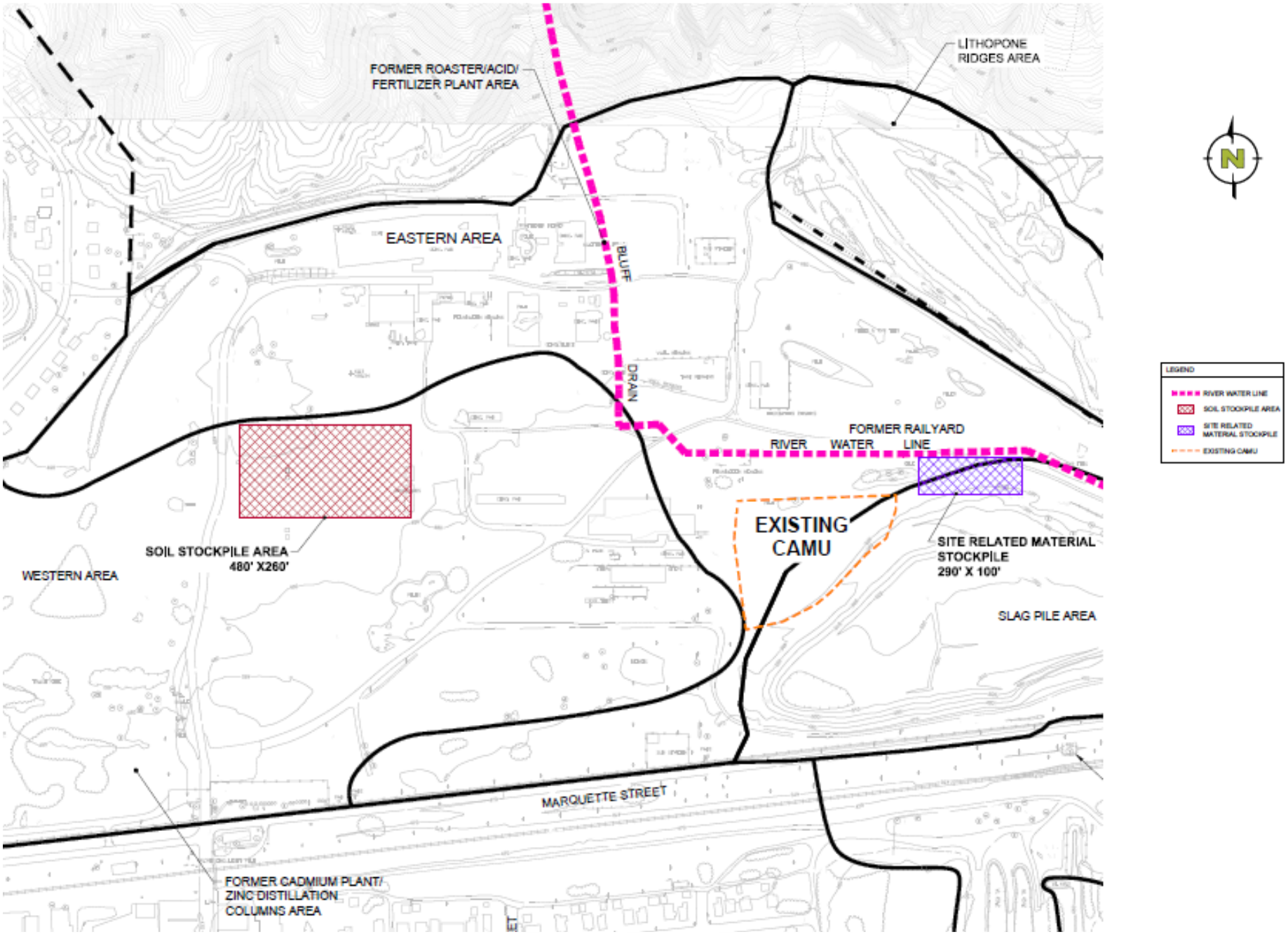


Figure 5. Conceptual Location of Soil Stockpiles (Ramboll Environmental 2015)