PROPOSED PLAN

VELSICOL CHEMICAL SUPERFUND SITE

OPERABLE UNIT 3

ST. LOUIS, MICHIGAN

EPA SITE ID: MID000722439

PREPARED BY:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

JULY 2022

ACRYONYMS, ABBREVIATIONS, AND UNITS OF MEASURE

ANP	Adjacent and nearby properties
ARAR	Applicable or Relevant and Appropriate Requirement
BERA	Baseline Ecological Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
DDD	Dichlorodiphenyl dichloroethane
DDE	Dichlorodiphenyl dichloroethene
DDT	Dichlorodiphenyl trichloroethane
DDx	Represents the DDT, DDE and DDD concentrations
EGLE	Michigan Department of Environment, Great Lakes and Energy
EPA	United States Environmental Protection Agency
FPS	Former plant site
FS	Feasibility Study
GWCS	DNAPL/groundwater collection system
HBB	Hexabromobenzene
HHRA	Human Health Risk Assessment
HQ	Hazard Quotient
ISCO	In situ chemical oxidation
ISTT	In situ thermal treatment
LOAEL	Lowest observable adverse effects levels
MACT	Maximum allowable toxicant concentration
MCC	Michigan Chemical Corporation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL	No observable adverse effects levels
NPL	National Priorities List
NREPA	State of Michigan National Resources and Environmental Protection Act
O&M	Operation & Maintenance
OU	Operable Unit
PBB	Polybrominated biphenyls
POC	Point of compliance
PPM	Parts per million
PRG	Preliminary Remediation Goal
PRSCTF	Pine River Superfund Citizens Task Force
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
TBC	To-Be-Considered
TCRA	Time-critical removal action
TRIS	Tris(2,3-dibromopropyl) phosphate
Velsicol	Velsicol Chemical Corporation

A. INTRODUCTION

The United States Environmental Protection Agency (EPA) is issuing this Proposed Plan as part of its public participation requirements under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The objective of this Proposed Plan is to present EPA's Preferred Alternative for remedial action for Operable Unit 3 (OU3) at the Velsicol Chemical Superfund Site ("Site") in St. Louis, Gratiot County, Michigan. See Figure 1. EPA's Preferred Alternative is intended to address unacceptable risks to human health and the environment.

This Proposed Plan summarizes information gathered during the Remedial Investigation (RI) and Feasibility Study (FS) for the Site completed in February 2022. The main chemical of concern is dichlorodiphenyl trichloroethane (DDT) and its isomers dichlorodiphenyl dichloroethane (DDD) and dichlorodiphenyl dichloroethene (DDE) located in sediment, riverbank and floodplain soils. DDx represents the DDT, DDE and DDD concentrations. OU3 is located from the St. Louis, Michigan dam to approximately 1.5 miles downstream within the Pine River. In the OU3 stretch of the Pine River, unacceptable risk was determined to exist to both an adult and child recreational angler consuming bottom-feeding fish (common carp) due to total DDx contamination. Unacceptable ecological risk to bird and mammalian receptors was also present in OU3 due to DDx in floodplain soils.

EPA's Preferred Alternative for the Velsicol Chemical site is Alternative #2. This Alternative will address streambank and floodplain soils by excavation with off-site disposal in an approved landfill. The capital cost is $6.656 million. The annual Operation & Maintenance (O&M) cost is zero. The present value of the total cost is $6.656 million. The estimated timeframe for construction completion of the remedial action components is 12 months and the timeframe to remedial completion for OU3 is 12 months.

This document is issued by EPA, the lead agency. The Michigan Department of Environment, Great Lakes and Energy (EGLE), formerly the Michigan Department of Environmental Quality, is the support agency. EPA and EGLE are soliciting community involvement in the selection of the remedial action and invite the public to comment on all alternatives presented in the FS and summarized in this proposed plan. EPA, in consultation with EGLE, will select a remedial action for OU3 after considering relevant comments submitted during a public comment period. The public comment period runs for thirty (30) days from July 15, 2022 to August 13, 2022. Please review and comment on this Proposed Plan.

EPA will host a virtual public meeting on July 26, 2022. After a brief presentation, EPA will answer questions about the proposed plan. EPA will then take public comments and a court reporter will record the meeting and all comments.

The public meeting will be conducted via the Microsoft Teams web platform. You can join the Teams public meeting at any time during the event hours below.

Date: July 26, 2022
Time: 6 – 7:30 p.m.
Link to join: https://tinyurl.com/Velsicol-Meeting-Link
By phone: 872-813-0592

(You will be instructed to provide the Conference ID: 109 773 416#)

You can also join the meeting by going to www.epa.gov/superfund/velsicol-chemical-michigan and clicking on the posted link.

EPA will accept oral comments during the public availability session and written comments at any time during the public comment period.

EPA will issue its final decision on the selected remedial action in a decision document called a Record of Decision (ROD). The public will be notified of the ROD in a local newspaper notice and through EPA's website for the Site at VELSICOL CHEMICAL CORP. (MICHIGAN) | Superfund Site Profile | Superfund Site Information | US EPA . The ROD will include a responsiveness summary that summarizes EPA's responses to public comments on this Proposed Plan. Based on new information and/or public comments received during the public comment period, the selected remedy may differ in some details from the Preferred Alternative presented in this proposed plan.

EPA and EGLE encourage the public to review the documents in the Administrative Record to gain a more comprehensive understanding of the Site and the Superfund activities conducted at the Site to date. Supporting documents for the Site are available at the following locations:

T.A. Cutler Memorial Library
312 Michigan Avenue
St. Louis, Michigan 48880
(989) 681-5141
Mon-Fri: 10:00 am to 6:00 pm
Sat: 10:00 am to 2:00 pm

EPA Region 5 Records Center
77 W. Jackson Blvd. (SRC-7J)
Chicago, IL 60604
(312) 886-0900
Mon-Fri: 8:00 am to 4:00 pm
Call for appointment

And Online at: VELSICOL CHEMICAL CORP. (MICHIGAN) | Superfund Site Profile | Superfund Site Information | US EPA

B. SITE BACKGROUND

Site Description

The Velsicol Chemical Superfund Site is located in St. Louis, Gratiot County, Michigan. See Figure 1. The Site consists of four operable units (OUs). OU1 addresses the 52-acre former plant site (FPS) and is located at 500 Bankson Street. The Site is in a predominantly residential area and the Pine River flows along the western and northern boundary of the FPS into Mill Pond, where a hydroelectric dam is located (about ¼-mile east of the FPS). The cleanup of OU1 is underway. OU2 is complete and addressed contamination in sediments and fish in the lower and middle basins of the St. Louis impoundment of the Pine River. OU3 includes sediments and floodplain soils in the Pine River from the St. Louis dam to approximately 1.5 miles downstream in the Pine River. OU4 is located from the boundary of OU3 (1.5 miles downstream of the St. Louis dam) to the confluence of the Pine River and Chippewa River, near Midland, Michigan. Figure 2 shows the location of each OU.

History of Contamination

The 52-acre FPS was used for industrial operations since the mid-1800s, including a lumber mill, oil refinery, salt plant, and chemical plant. Michigan Chemical Corporation (MCC) purchased the facility in 1935 and operated a chemical manufacturing business until 1977, when MCC merged with Velsicol Chemical Corporation (Velsicol). From 1936 through 1977, the plant manufactured a variety of organic and inorganic chemicals including polybrominated biphenyls (PBB), hexabromobenzene (HBB), DDT, and tris(2,3-dibromopropyl) phosphate (TRIS).

In early 1973, both PBB (sold under the trade name FireMaster) and magnesium oxide (a cattle feed supplement sold under the trade name NutriMaster) were produced by MCC. A shortage of preprinted paper bag containers led to 10 to 20 fifty-pound bags of PBB accidentally being sent to Michigan Farm Bureau Services in place of NutriMaster. The accident was not recognized until long after the bags had been shipped to feed mills and used in the production of feed for dairy cattle. By the time the mix-up was discovered in April 1974, PBB had entered the food chain through milk and other dairy products, beef products, and contaminated swine, sheep, chickens, and eggs. As a result of this incident, over 500 contaminated Michigan farms were quarantined, and approximately 30,000 cattle, 4,500 swine, 1,500 sheep, and 1.5 million chickens were destroyed, along with over 800 tons of animal feed, 18,000 pounds of cheese, 2,500 pounds of butter, 5 million eggs, and 34,000 pounds of dried milk products. This resulted in the closure of the FPS in 1977 and decommissioning activities began in 1978. The aboveground site buildings were razed, and some structures were buried onsite, including storage tanks and process piping. Building and tank foundations were not removed, and a significant amount of debris remains buried at the FPS.

In 1982, the United States and the State of Michigan negotiated and entered into a consent judgment with Velsicol for the FPS. Pursuant to the consent judgment, Velsicol submitted the plans and specifications for the construction and installation of a containment system. The containment strategy consisted of a 2-foot-thick low-permeability slurry wall around the 52-acre FPS and the installation of a cap to control water infiltration. Velsicol was required to maintain groundwater levels inside the slurry wall and beneath the cap to a specified elevation (724.13 feet above mean sea level).

The Site was proposed for inclusion on the National Priority List (NPL) on December 30, 1982 and appeared on the final NPL on September 8, 1983.

EPA and EGLE provided oversight of the installation of the containment system. As part of the consent judgment, the containment system was to be tested for 3 years after installation to ensure the construction specifications were met. In 1984, Velsicol submitted a report documenting that the containment system components were installed according to the specifications described in the consent judgment.

The consent judgment did not require remediation of the contaminated sediments in the Pine River because the parties to the consent judgment concluded that the most appropriate alternative was to leave the contaminated sediments in place. The 1982 consent judgment gave Velsicol a release from any liability under CERCLA, Resource Conservation and Recovery Act (RCRA), and state environmental laws for the Site, with a limited reopener.

All the tasks in the consent judgment were completed by 1986. Also in 1986, in a complicated confidential buyout arrangement, Velsicol transferred ownership of the site to a Fruit of the Loom (FTL) subsidiary, NWI Land Management (NWI). FTL agreed to assume 100 percent of the liability for the Site previously owned by Velsicol in an Assumption and Indemnity Agreement. Velsicol continued to manage the site for FTL under a contract with NWI until FTL filed for bankruptcy in 1999, after which NWI took over management of the Site. Subsequent to the 1999 bankruptcy filing by FTL, EPA learned that FTL's subsidiary owned the site, not Velsicol. In 2002, a bankruptcy settlement vested title to the Site in a newly established Custodial Trust, which currently holds the title to the property. The Custodial Trust is in the process of being dissolved for the Velsicol Site and the State of Michigan Land Bank is expected to take over ownership of the Site by the summer of 2022.

In 1994, EGLE collected fish samples (carp and fillet, skin-off), and the results showed that DDT concentrations on average had more than doubled since 1989 (10.5 parts per million (ppm) in 1989 to 23.3 ppm in 1994). Based upon increasing DDT levels in fish tissue and the increasing water levels inside the containment system, both EPA and EGLE became concerned that additional loading of DDT into the Pine River could be occurring from the FPS.

Velsicol began a containment study on the FPS in 1996 and the report concluded that the cap was not functioning as designed and Velsicol was scheduled to repair the cap. Concurrently, additional sediment sampling occurred by EGLE in the Pine River and the St. Louis Impoundment near the St. Louis dam. Sampling results showed DDT concentrations as high as 32,000 ppm DDT and DDT on average of 34 ppm in fish tissue.

Based on the DDT levels in both the sediment and fish, EPA, with support from EGLE, implemented a time-critical removal action (TCRA) on June 8, 1998. The *Action Memorandum* called for the excavation of DDT-contaminated sediments greater than 3,000 ppm with offsite disposal. EPA used a dry excavation technique using sheet piles to dewater areas in the Pine River for excavation. Sediments were stabilized and transported offsite by trucks. The TCRA was completed in October 1999. Approximately 30,000 cubic yards of DDT-contaminated sediment was excavated and disposed of offsite in an approved landfill. Concurrently with the removal action, EPA, with support from EGLE, began a focused OU2 RI/FS to further characterize and evaluate the risk of the DDT-contaminated sediments in OU2. After presenting the results of the focused RI/FS for sediments in the Pine River to the Remedy Review Board, EPA signed a ROD on February 12, 1999. The selected remedy called for the excavation and offsite disposal of sediments contaminated with DDT greater than 5 ppm.

The OU2 sediment remedial design was started while the TCRA was under way, and the sediment remedial action (RA) began immediately after the TCRA was completed. As with the TCRA, the RA used a dry excavation technique and trucked stabilized sediments offsite for disposal at regulated landfills. Both the TCRA and OU2 RA were completed as fund-lead projects since the consent judgment gave Velsicol Chemical Corporation a release from liability for the site.

In the 2001 and 2002 sediment cleanup construction seasons, while the segment of river immediately adjacent to the FPS was dewatered, EPA discovered seeps of dense non-aqueous phase liquids (DNAPL) migrating into the Pine River. DNAPL is one of a group of organic chemicals that are relatively insoluble in water and are heavier than water. A DNAPL collection system was subsequently installed by EPA as an interim response action in 2002 to prevent recontamination of the Pine River by future migration of DNAPL and contaminated groundwater from the FPS.

Based on evidence from the report from Velsicol regarding the containment system and direct observation of DNAPL migrating from the FPS to the Pine River, EPA and EGLE determined that the existing containment system around the FPS was not protective of the Pine River and the sediment remedy. In July 2001, both EPA and EGLE signed correspondence requesting that Velsicol Chemical Corporation perform an RI/FS for OU1, but Velsicol refused. EGLE requested and was given the lead for the OU1 RI/FS.

In 2002, the United States and several states settled their bankruptcy claims against FTL and NWI in an agreement with FTL and Velsicol (based upon limited ability to pay). The settlement resolved the Superfund liability of FTL, NWI, and Velsicol for seven Superfund sites, formerly owned and operated by Velsicol, including the subject site in St. Louis, Michigan. The settlement agreement created a trust for each of the sites to receive and manage funds obtained from the settlement for cleanup of the sites. The State of Michigan Land Bank has taken over ownership of the FPS and other properties associated with the operation of the FPS.

EGLE completed the first phase of the OU1 Remedial Investigation in November 2006, and subsequently completed additional investigations and a second phase of OU1 Remedial Investigation (RI Addendum) was finalized in January 2009. EGLE completed the OU1 Feasibility Study in November 2011 and the OU1 Record of Decision was signed on June 22, 2012. The OU1 ROD included the following:

- Installation of a vertical barrier surrounding the FPS to decrease the potential for DNAPL and dissolved-phase contaminants to directly discharge to the Pine River from the shallow groundwater unit.
- Installation of a perimeter drain system to capture contaminated groundwater from the shallow unit for treatment and to maintain an inward hydraulic gradient.
- Continued operation of the existing DNAPL/groundwater collection system (GWCS) to capture DNAPL and contaminated groundwater migrating from the shallow unit and prevent recontamination of the Pine River and sediments.
- Installation of an additional (new) DNAPL/GWCS segment to address possible DNAPL and groundwater contamination from the MW-19 area.
- Implementation of in situ thermal treatment (ISTT) to address the two DNAPL-contaminated areas. The ISTT system would be operated until the maximum practical volume of DNAPL, defined as 95 percent of the theoretical volume, is achieved. The primary objective for ISTT implementation is to reduce the potential for mobile DNAPL within the FPS to recontaminate the sediments of the Pine River and prevent migration into the lower unit.
- Collection of DNAPL in the lower unit (100 feet below ground surface) near the WMW-48 well location through the use of a collection sump and transportation of collected fluids offsite for incineration.
- In situ chemical oxidation (ISCO), or excavation with offsite disposal, of up to four potential source areas (75,090 cubic yards). Two potential source areas will be excavated (42,939 cubic yards) to the soil saturation limit (Csat) concentration with subsequent offsite disposal. Two potential source areas (32,151 cubic yards) with groundwater contamination greater than respective water solubility concentrations will be treated by ISCO until the concentration of contaminants of concern (COCs) are below their respective water solubility concentrations.

- Installation of an engineered cap meeting the requirements of RCRA Subtitle C and Michigan Part 111 to eliminate the direct contact threat and prevent infiltration.
- Replacement of the City of St. Louis, Michigan, municipal water supply to avoid increased, non-cost-effective long-term groundwater extraction and treatment costs.
- Restoration of groundwater to drinking water standards outside the point of compliance (POC) and technical impracticability waiver zone, and containment within the POC through groundwater extraction and treatment.
- Excavation and offsite disposal of soils exceeding 5 parts per million (ppm) total DDT; 1.2 ppm PBB, and 4.4 ppm TRIS in the adjacent and nearby properties (ANP) to address risk to human health and the environment. Excavated properties will be backfilled with clean fill and restored.
- Monitoring well installation and groundwater monitoring program.
- Site restoration.
- Institutional controls such as a restrictive covenant, an ordinance restricting groundwater use near the Site, continuing fish advisories, and appropriate signage.

Beginning in 2003, EGLE began investigating the Pine River downstream of the St. Louis dam. Sampling consisted of floodplain and bank soils, sediment, surface water and biota which included benthic organisms, fish tissue, terrestrial invertebrates, small mammals, birds and plants. Sampling occurred from the St. Louis dam to approximately 15 miles downstream. In March 2011, EGLE submitted to EPA the Baseline Assessment Report and in November 2012 submitted an additional investigation report called the Baseline Addendum Report. These reports described the nature and extent of contamination and included both human health and ecological risk assessments. The baseline reports concluded the following:

- DDT and its isomers were the most prevalent site-related COCs in all media sampled. PBB, HBB, and TRIS were also frequently detected in many of the baseline assessment samples.
- Site-related COCs are present in stream sediment, floodplain soil, surface water, and biota samples collected downstream from the FPS.
- Concentrations of site-related COCs in floodplain soils and river sediments were generally higher closer to the FPS and decreased rapidly within the first 5 miles downstream of the FPS.
- The highest contaminant levels were present in the upper portions of the sediment and soil columns (i.e., approximately the top foot) in all downstream areas and decreased with depth.
- Surface water samples collected downstream of the FPS contained site-related COCs during several sampling events. The detections were determined to be attributable to storm events resulting in high levels of suspended sediments in the water column and/or associated with the ongoing sediment remediation activities in the St. Louis Impoundment.
- Biota data indicated that site-related COCs were prevalent in all the organisms sampled downstream from the FPS and that the lower trophic level organisms had lower concentrations of site-related contaminants than the higher trophic-level organisms, indicating that the COCs are bioaccumulating in biota that live in and adjacent to the Pine River near the FPS. DDT isomers were typically the COCs present at the highest concentration.

EPA reviewed the two Baseline Reports developed by EGLE and determined that data gaps existed and that a third operable unit was necessary. EPA became the lead Agency on OU3 and began a Remedial Investigation in 2013. The data from the two Baseline Reports were used to focus additional data gathering efforts. EPA in 2018 added a fourth OU and defined OU3 as from the St. Louis dam to approximately 1.5 miles downstream. OU4 was defined as from the end of OU3 to where the Pine River and Chippewa River intersect. See Figure 2. The RI report was completed in December 2021.

A large amount of public participation has occurred for the Velsicol Chemical site. Since 1998, EPA has provided a Technical Assistance Grant to the Pine River Superfund Citizens Task Force (PRSCTF). The PRSCTF meets monthly for public meetings and EPA and EGLE frequently participate in those meetings. The PRSCTF has been made aware of the OU3 Proposed Plan and EPA presented information to the public on the Remedial Investigation and Feasibility Study prior to release of the Proposed Plan.

Previous Response Actions

Several response actions have occurred at the Velsicol site after the implementation of the 1984 Velsicol containment remedy. The following response actions have occurred at the Site:

- In 1998, EPA began a TCRA for sediment cleanup in the Pine River and St. Louis impoundment. The sediment cleanup was transferred to the Remedial Program in 1999 and the OU2 sediment cleanup was completed in 2006. Over 750,000 tons of DDT contaminated sediment was removed and disposed of off-site.
- In 2012, EPA began the OU1 residential cleanup in the ANP in which DDT and PBB contaminated soils were excavated and disposed of off-site. Over 40,000 tons of contaminated soil was removed from 111 properties, which completed the cleanup in 2016.
- In 2012, the City of St. Louis began work on the replacement of the city drinking water supply through funding and oversight by EPA and EGLE. A joint water authority was formed between the City of St. Louis and Alma, Michigan and in 2015 the new drinking water supply was provided to St. Louis. The last drinking water production well will be complete in the fall of 2022.
- In 2015, EPA began a TCRA in the high school athletic fields, downstream from the St. Louis dam, in which 828 tons of DDT contaminated soils were excavated and disposed off-site. The cleanup was completed in 2016.
- In 2022, EPA completed the final phase of in-situ thermal treatment over approximately 4 acres on the FPS. The three phases of ISTT implemented recovered over 382,000 pounds of contaminants, including non-aqueous phase liquids.

C. SITE CHARACTERISTICS

Physical Characteristics and Land Use

OU3 for the Velsicol Chemical Superfund site includes a section of the Pine River and adjacent riverbank and floodplain soils approximately 1.5 miles downstream of the St. Louis hydroelectric dam. Four floodplains are part of this stretch of the Pine River and include floodplain 0.5, floodplain 1, floodplain 1.1 and the high school athletic fields, as shown on Figure 2. The athletic fields have markedly different habitat than the other three floodplains.

The land use in the vicinity of OU3 is a mixture of light industrial, residential and agricultural. Floodplains are predominantly located on residential or agricultural properties, except the high school athletic fields.

Site Geology and Hydrogeology

The Velsicol site is located in the Pine River Watershed. Many small creeks, streams, and agricultural and storm drainage ditches are present throughout the watershed and provide a significant source of surface water influx. The headwaters of the Pine River are in southeast Mecosta County; from there, the river flows southeast through southwest Isabella County and northeast Montcalm County before continuing through Gratiot County where it turns to the northeast, flowing through Alma and St. Louis. The Pine River flows to the northeast through Gratiot County and intersects the Chippewa River in Midland County (approximately 30 miles northeast of the FPS).

From the St. Louis dam downstream to the confluence with the Chippewa River, the Pine River is generally straight and free of sharp bends or meanders. The relatively straight river channel immediately downstream of the dam results in a relatively high-energy environment in the OU3 area. As a result, few soft sediment deposits have been observed downstream of the dam. The area immediately below the dam is mainly sand deposits with pockets of gravel, cobbles, and boulders. Soils in the OU3 area are generally classified as loamy sand, sandy loam, or loam.

The area surrounding OU3 encompasses a wide range of diverse habitats including farmland, wetlands, and floodplains. The bank and floodplain area surrounding OU3 consists of predominantly woodlands and is vegetated by scrub-shrub and deciduous trees. Terrestrial habitats include woodlands, riparian edge vegetation strips, shrub areas, grass and field areas, agricultural field areas, landscaped areas, and residential areas along the shores of the Pine River. Aquatic habitats include the water column and river bottom, wetlands along the river, riparian edge areas and shoreline, and floodplains where inundation is frequent or of long duration. The Pine River is a warmwater fishery supporting a wide range of fish species, including smallmouth bass, carp, suckers, and several species of minnows. Many species of mammal, birds, insects, and plants are also present with the Pine River ecosystem.

Site Contamination

During the operation of the Velsicol Chemical site, spills and direct discharges into the Pine River impacted sediment and surface soils. The Baseline Report, Baseline Addendum Report and sampling during the Remedial Investigation documented DDx along with HBB and PBB as the COCs. Other site-related contaminants were either not detected or were present at very low concentrations.

Contaminant fate and transport of DDx, PPB and HBB was a result of the COCs having a low solubility in water, having a high affinity for organic matter, and being expected to remain bound to soils, sediments and other particulate matter with minimal desorption into the water column. Transport of COCs in the Pine River and associated floodplains is primarily the result of physical transport of particulate matter (sediment, soils and organic matter) with sorbed site-related COCs. During periods of high precipitation when flooding occurs, sediment or bank soil sorbed contaminants are transported into the floodplain along the banks of the river. Once in the floodplains, the contaminated sediments become integrated into the floodplain soils. Due to the relatively thick vegetation in many floodplains, once sediment is deposited, it is unlikely to be resuspended and transported downstream. The riverbank soils may be susceptible to erosion and represent a potential secondary source of COCs to the river and downstream floodplains.

After receipt of the Baseline Report and Baseline Addendum Report, EPA began sampling in 2013 to fill data gaps. Floodplain, riverbank soils and sediments were sampled in both OU3 and OU4. Figure 3 shows the locations within OU3 where floodplain, riverbank and sediment sampling occurred along with the DDx concentration range. In OU3, sampling occurred at floodplain 0.5, floodplain 1.0 and floodplain 1.1. Also, the high school athletic fields which are within a floodplain were also sampled. Tables 1 and 2 summarize the historical floodplain sampling results and the following summarizes the DDx floodplain sampling results:

- FP 0.5 – Average DDx concentration 7.3 ppm, high 13.0 ppm.
- FP 1 – Average DDx concentration 9.0 ppm, high 23.5 ppm.
- FP 1.1 – Average DDx concentration 5.5 ppm, high 26.0 ppm
- Athletic Fields - total DDx concentrations >5 ppm were removed under TCRA.

Riverbank soils were also sampled within OU3 and 31 samples adjacent to the athletic fields showed concentrations of DDx greater than 5 ppm, with DDx contamination as much as 12 inches into the riverbank. Table 3 and Figures 4 and 5 show the sampling locations and range of DDx concentrations in the riverbanks. Downstream from the athletic fields to the end of OU3, DDx was only present in 2 samples greater than 5 ppm.

D. SCOPE AND ROLE OF RESPONSE ACTION

The Velsicol Chemical Superfund site consists of four OUs in different stages of completion. OU1 is the cleanup of the FPS, including the residential area adjacent to the site, and replacement of the City of St. Louis drinking water supply. The FPS remedy consists of several components. EPA has finished the cleanup of the residential properties, completed the replacement of the St. Louis drinking water supply except for one production well, and completed ISTT over approximately four acres. Over 382,000 pounds of principal threat waste classified as non-aqueous phase liquids (NAPL) were removed from soil and groundwater. Additional principal threat waste is scheduled to be removed from the FPS by excavation and off-site disposal of approximately 100,000 tons beginning in fall of 2022. Additional remedy components are in the remedial design phase and include ISCO, a vertical barrier wall and expanded DNAPL/GWCS.

OU2 is complete and included the excavation and off-site disposal of sediment contaminated with DDx greater than 5 ppm adjacent to the site within the Pine River and from within the St. Louis Impoundment located behind the St. Louis dam. Over 750,000 tons of contaminated sediment was removed and disposed off-site.

This Proposed Plan addresses OU3 and addresses DDx, HBB and PBB low-level contaminants in floodplains, riverbanks and sediments within the Pine River. A Remedial Investigation is underway within OU4 including evaluating the use of activated carbon amendments within floodplain soils as a pilot study.

E. SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline human health risk assessment (HHRA) to evaluate the current and future effects of contaminants on human health and a baseline ecological risk assessment (BERA) to assess the effects of the contaminants on ecological receptors. The land use in the vicinity of OU3 is a mixture of commercial, residential, rural, and agricultural. The floodplains included within the site are predominantly located on residential or agricultural properties, except the floodplains on the St. Louis High School athletic fields. Land use is expected to remain the same in the future.

Human Health Risks

The baseline HHRA focused on health effects for the following scenarios (both currently and in the future):

- Child and adult residents who may contact contaminated floodplain soil (e.g., through ingestion of soil while playing in residential yards);
- Child and adult recreational users who may contact floodplain soils, riverbank soils, surface water, and sediment in the Pine River (e.g., through ingestion of soil, surface water, and sediment while playing in or along the river);
- Students (adolescents) and coaches who may contact floodplain soil at the St. Louis High School athletic fields (e.g., through ingestion of soil while playing at the fields);
- Groundskeepers who may contact floodplain soil at the St. Louis High School athletic fields (e.g., through ingestion of soil while maintaining the fields); and
- Child and adult recreational anglers who may eat fish caught in the Pine River.

Potential risks associated with floodplain soils, riverbank soils, surface water, and sediment were within EPA's acceptable levels for human exposure.

EPA's statistical analysis of fish tissue sampling data indicates that potential exposure concentrations of 2,4'-DDD (0.25 mg/kg), 2,4'-DDE (0.16 mg/kg), 2,4'-DDT (0.08 mg/kg), 4,4'-DDD (0.66 mg/kg), 4,4'-DDE (2.1 mg/kg), and 4,4'-DDT (0.04 mg/kg) in bottom feeder fish tissue are associated with the following excess lifetime cancer risks (risks) and non-cancer hazard quotients (HQs) for recreational anglers due to ingestion of contaminated fish:

- 2,4'-DDD – risk = $1x10^{-5}$, HQ = 8
- 2,4'-DDE – risk = $9x10^{-6}$, HQ = 0.5
- 2,4'-DDT – risk = $4x10^{-6}$, HQ = 0.2
- 4,4'-DDD – risk = $3x10^{-5}$, HQ = 20
- 4,4'-DDE – risk = $1x10^{-4}$, HQ = 7
- 4,4'-DDT – risk = $2x10^{-6}$, HQ = 0.08

These risks and HQ levels indicate that there is significant potential risk to children and adults from ingesting bottom-feeding fish (common carp and forage fish). These risk estimates are based on current reasonable maximum exposure scenarios and were developed by taking into account various conservative assumptions about the frequency and duration of an individual's consumption of fish tissue, as well as the toxicity of DDD, DDE, and DDT.

Ecological Risks

The BERA focused on assessing community- and population-level risks in representative receptors, including plants and animals, associated with site-related contamination in:

- Sediment (aquatic/water-dependent receptors),
- Surface water (aquatic/water-dependent receptors), and
- Floodplain soil (terrestrial receptors).

The risks associated with exposure to sediment, surface water, and floodplain soil can be direct or indirect. Direct risks can include, for example, direct contact with and uptake of soil contaminants by terrestrial plants; direct contact with and ingestion of soil, sediment, or sediment contaminants by invertebrates; and direct contact with surface water by fish. Risks to upper trophic level receptors, which include animals that as part of their diet eat other animals, are considered indirect because the primary exposure is of contaminated food items (e.g., vegetation and prey). This exposure is the most important for the OU3 site-contaminants, Total DDT, HBB, and PBB.

Because of the wide variety and large number of organisms with potential to serve as representative receptors for OU3, several species or groups of organisms were selected in the BERA to serve as representative receptors for detailed evaluation of risks. Risks to the following aquatic/water-dependent receptors were evaluated in the BERA for exposure to sediment and surface water:

- Benthic macroinvertebrate community, which includes invertebrates such as freshwater mussels, mayflies, midge larvae, caddisflies, and crayfish that live in or on the sediment.
- Fish.
- Birds that eat insects like the marsh wren (insectivorous birds).
- Birds that eat fish like the great blue heron, belted kingfisher, and bald eagle (carnivorous birds).
- Mammals that eat fish like the mink (piscivorous mammals).

The following receptors were evaluated for exposure to floodplain soils:

- Plants.
- Invertebrates that live in soils such as earthworms.
- Birds that eat both plants and animals like the American robin (omnivorous birds).
- Birds that eat other animals like the American kestrel (carnivorous birds).
- Mammals that eat both plants and animals like the deer or white-footed mouse (omnivorous mammals).
- Mammals that eat primarily worms like the short-tailed shrew (vermivorous mammals).

The BERA used Total DDT, HBB, and PBB measurements in soil, sediment, surface water, and various plants and animals to estimate exposure in the selected receptors. That exposure was compared to concentrations known to harm the selected receptors to determine the potential for unacceptable risk. In addition, Michigan State University-Wildlife Toxicology Laboratory conducted a field study to directly measure DDT, PBB, and HBB in floodplain soils, plants and animals and compare those to simultaneously measured individual and population health metrics such as survival and reproductive health of key components of the ecosystem, including soil invertebrates, small mammals, and birds.

The BERA concluded that Total DDT in floodplain soils showed unacceptable risk to wildlife, as well as soil invertebrates and/or plants. HBB showed unacceptable risk to soil invertebrates and/or plants. Total DDT and PBB showed unacceptable risk for Pine River sediment, although minimal sediment is present within OU3 due to the scouring of the river bottom. For Gratiot County, special status species and habitats include nine birds, one mammal, six mussels, thirteen plants, one habitat, and one reptile. While there is no documentation of any special status species in OU3, if they are present, the Total DDT, HBB, and PBB in sediment and floodplain soil would pose unacceptable risks.

Basis for Taking Action

It is EPA's current judgment that the Preferred Alternative, or one of the other active measures, identified in this Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

F. REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives

Due to riverbank soils potentially providing an ongoing source of contamination to the ecosystem and downstream area along with unacceptable ecological risk associated with floodplain soils, the following are the Remedial Action Objectives (RAOs) to address contaminated floodplain and riverbank soils in OU3:

- Reduce risk associated with site-related COCs by reducing human and ecological receptors' exposure to COCs in floodplain and riverbank soils.
- Control the potential secondary sources of site-related COCs by limiting resuspension into the water column and downstream transport of floodplain and riverbank soils.

By achieving these RAOs, site-related COCs in fish tissue will reduce over time. Sediment is not a focus of OU3 because minimal sediment is present and fine sediment moves through the system over time and is diluted to lower concentrations.

Preliminary Remediation Goals

Preliminary Remediation Goals (PRGs) are preliminary estimated numeric values for chemical concentrations in environmental media above which the risk to receptors is unacceptable. PRGs can be based on risk-based concentrations at specific target risk or hazard levels, Federal or State Applicable or relevant and appropriate requirements (ARARs) and background levels.

A soil PRG was selected from a series of risk-based concentrations assumed to be protective of various exposure scenarios and ecological receptors common to the Pine River floodplain habitat. The overall goal is to select a soil PRG that provides reasonable protection of the communities present in the Pine River floodplain habitat. Concentrations in floodplain soil, riverbank soil and sediment did not produce unacceptable direct contact or inhalation human health risk. Fish tissue from bottom feeders showed unacceptable DDx risk to recreational anglers for ingestion of fish.

Risk-based concentrations were derived from the site-specific data generated by field studies that directly quantified DDx, PPB and HBB in floodplain soils and biota and compared those to simultaneously measured individual and population health metrics of key components of the ecosystem such as soil invertebrates, small mammals and birds. The use of site-specific data rather than modeled data is desirable since it directly measures adverse effects of either representatives of the community, such as birds, or the community as a whole for soil invertebrates.

Risk-based concentrations for ecological receptors in the floodplain were based on the following:

- No observable adverse effects levels (NOAELs).
- Lowest observable adverse effects levels (LOAELs).
- Maximum allowable toxicant concentration (MATC).

The MATC is the geometric mean of the NAOEL and LOAEL and represents the concentration where adverse effects might be seen. The NOAELs were set at the average soil concentration of total DDT where no adverse effects were seen and the LOAEL as the next highest average total DDT concentration where adverse effects were seen for the various receptors. The adverse effects included measure of survival, growth, and reproduction. Figure 6 shows the total DDx risk-based concentrations in soil that are protective of ecological resources.

Considering the habitats and ecological communities present and the uncertainty inherent in the site-specific data, EPA is proposing a PRG value of 1 part per million (ppm) total DDx. This PRG balances protectiveness of ecological communities against the uncertainty in the calculation of each risk-based concentration evaluated. The PRG will be protective against most birds, small mammals, and soil invertebrates that make up the floodplain community. In addition, the PRG of 1 ppm total DDx will reduce DDx levels in fish tissue.

PRG's were not developed for HBB or PBB since these constituents are co-located with DDx and samples show DDX more prevalent within samples compared to both HBB and PBB.

Applicable or Relevant and Appropriate Requirements

A listing and description of potential chemical-, location-, and action-specific ARARs and to-be-considered (TBC) criteria identified to address the contamination and potential exposure pathways at the Velsicol Chemical site are presented below.

Potential chemical-specific ARARs

Chemical-specific ARARs usually are either health- or risk-based numerical values or methodologies that establish the acceptable amount or concentration of a chemical that may remain in or be discharged to the environment. The major chemical-specific ARARs include the following:

- The State of Michigan National Resources and Environmental Protection Act (NREPA), Part 201, Environmental Remediation, Mich. Comp. Laws (MCL) §§ 324.20101 thru 324.20142

Potential action-specific ARARs

Action-specific ARARs usually are restrictions on the conduct of certain activities or the operation of certain technologies at a particular site. Regulations that dictate the design, construction, and operating characteristics of incinerators, air stripping units, or a landfill construction are examples of action-specific ARARs. The major action-specific ARARs include the following:

- Clean Water Act, Section 402, 33 United States Code (USC) 1251
- State of Michigan NREPA Part 115, Solid Waste Management (MCL 324.11501)
- Part 31, Water Resources Protection of the NREPA
- MCL 324.3101-3133
    - Part 4: Water Quality Standards
    - Part 8: Water Quality Based Effluent Limits
    - Part 13: Floodplains and Floodways
    - Part 17: Soil Erosion and Sedimentation Control
- Part 121 Liquid Industrial Wastes of NREPA
- MCL 324.12103 Generator Duties
- NREPA 451 Spillage of Oil and Polluting Materials
- Part 91 Soil Erosion and Sedimentation Control of the NREPA
    - R 323.1709 Erosion and Sediment Control
- Part 55 Air Pollution Control of the NREPA
    - R 336.1372(8)(b) Control of Fugitive Dust
- Part 201 Environmental Remediation, NREPA
    - MCL 324.20114c and 324.20121
    - Michigan Administrative Code R 299.1-299.50

Potential location-specific ARARs

Location-specific ARARs generally restrict certain activities or limit concentrations of hazardous substances solely because of geographical or land use concerns. Requirements addressing wetlands, historic places, floodplains, or sensitive ecosystems and habitats are potential location-specific ARARs. The major location-specific ARARs include the following:

- Migratory Bird Treaty Act of 1972
- 33 U.S.C. 1344; 33 CFR 323 Clean Water Act Section 404 Discharges of Dredged or Fill Material into Waters of the United States
- 33 USC 1341 State Certification of Water Qualtiy
- 40 CFR Parts 230
- 33 CFR Parts 320-330
- Fish and Wildlife Coordination Act 16 U.S.C. 661; 33 CFR 320-330; 33 U.S.C. 408
- Section 10 of the Rivers and Harbors Act of 1989 – 33 CFR 320-330; 22 U.S.C. 403
- Endangered Species Act 16 U.S.C. 1531; 50 CFR 402 – Threatened and Endangered Species
- NREPA Part 17 Michigan Environmental Protection Act
    - MCL 324.1706
- NREPA Part 305, Natural Rivers

    - MCL 324.30501-35111
- NREPA Part 365 Endangered Species Protection
    - MCL 324.36501-36507
    - MAC: R 229.1021-1028
- NREPA Part 401 Wildlife Conservation
    - MCL 324.40101-40120
- NREPA Part 411 Protection and Preservation of Fish, Game, and Birds
    - MCL 324.41101-41103
- NREPA Part 301 Inland Lakes and Streams
    - MCL 324.30301-324.30329
- NREPA Part 413 Invasive Species
    - MCL 3124.41301-324.41325

Potential TBC criteria includes

Many Federal and State environmental and public health agencies develop criteria, advisories, guidance, and proposed standards that are not legally enforceable but contain information that would be helpful in carrying out, or in determining the level of protectiveness of, selected remedies. In other words, "to be considered" (TBCs) criteria are meant to complement the use of ARARs, not to compete with or replace them. Because TBCs are not ARARs, their identification and use are not mandatory. The following are TBCs:

- Guidance on Use of Habitat Evaluation Procedures and Suitability Index Models for CERCLA, U.S. Department of the Interior. PB88-100151
- Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, 1997. EPA/540/R-97/006
- Ecological Risk Assessment for Contaminated Sites, Suter, G. W. II, R. A. Efroymson, B. E. Sample, and D. S. Jones. 2000
- Framework for Ecological Risk Assessment, 1992. EPA/630/R-92/001
- Wildlife Exposure Factors Handbook, 1993. EPA/600/R-93/187a
- Guidelines for Ecological Risk Assessment, 1998. EPA/630/R-95/002F
- U.S. EPA Region 5 RCRA Ecological Screening Levels, http://www.epa.gov/reg5rcra/ca/ESL.pdf. August 2003
- EPA Region 9 Use of Congener and Homologue Analysis in Ecological Risk Assessments, 1998

G. SUMMARY OF REMEDIAL ALTERNATIVES

EPA screened the proposed remedial alternatives based on effectiveness, implementability and cost. EPA initially evaluated several response actions including institutional controls, long-term monitoring, monitored natural recovery, enhanced natural recovery, containment, engineered bank stabilization, in-situ treatment, ex situ treatment, removal and transportation and disposal. EPA then developed alternatives from the most viable options, which included a containment alternative and an excavation and off-site disposal alternative. The three alternatives for screening included the following:

- Alternative 1 – No action
- Alternative 2 – Removal and Backfill/Cover and Riverbank Stabilization of OU3 Floodplain and

Riverbank Soils
- Alternative 3 – Containment of OU3 Floodplain and Riverbank Soils

Alternative 3 was eliminated from further consideration and not taken into detailed analysis for the following reasons:

- Containing the floodplain soils contaminated with DDx to prevent a continuing source to the Pine River would be difficult without a large amount of maintenance, monitoring and repair. In addition, increasing the elevation of the floodplains through capping would be required which could be difficult. Also, the costs associated with containment would be similar to Alternative 2.
- Considering the concentrations of DDx in the riverbanks, stabilizing the banks without removal is highly uncertain and would continue to provide a potential source of DDx into the Pine River.

With the removal of Alternative 3 from further evaluation, the remedial action alternatives for OU3 at the Site are presented below. They are numbered to correspond with the FS and include the following:

- Alternative 1 - No Action
- Alternative 2 - Removal and Backfill/Cover with Riverbank Stabilization of OU3 Floodplain and Riverbank Soils

Alternative 1: No Further Action

The No Action alternative is required to be evaluated under the NCP as a baseline against which all other alternatives are compared. Under this alternative, no remedial actions would take place. There are no costs associated with Alternative 1.

Alternative 2: Removal and Backfill/Cover or Riverbank Stabilization of OU3 Floodplains and Riverbank Soils

Alternative 2 consists of excavating floodplain and riverbank soils with DDx concentrations greater than 1 ppm, the risk-based PRG. Excavated soil will be disposed of off-site at a RCRA Subtitle D landfill. The floodplains will be backfilled with clean soils to the existing grade and revegetated. The riverbank will be stablized using various methods (to be determined in design) to prevent further erosion.

The main components include the following:

- Additional surveying and sampling would be needed to completely delineate the footprint for riverbank soils (including the removal depth) and to confirm the removal depth in FP-0.5, FP-1, and FP-1.1 and the athletic fields.
- Assumptions include that the riverbank soils would require a removal thickness of approximately 2 feet, and the average bank height would be 5 feet along the entirety of the northern and southern banks. See Figure 7 for the proposed remediation footprint.
- The floodplain soils would be removed to an average depth of 1.5 feet. See Figure 7 for the proposed remediation footprint.

- Total contaminated soils excavated is estimated to be 20,350 cubic yards with 2,000 cubic yards requiring stabilization.
- The floodplains would need to be cleared of vegetation prior to excavation and disposed of off-site.
- Soil would be transported and disposed of at a permitted RCRA Subtitle D landfill and all soils would be characterized as RCRA non-hazardous.
- Floodplains would be backfilled with clean soil, graded, and plantings would be established.
- The riverbank would be stabilized using hardened shorelines, rootwads, grading, and vegetation.
- Access roads and staging areas would have equipment removed, would be regraded (as needed), and would be seeded to prevent soil erosion.

The estimated timeframe for construction completion is 12 months. The estimated capital cost associated with Alternative 2 is $6,656,781 and the annual O&M cost is $0. The total present worth cost of Alternative 2 is $6,656,781.

H. EVALUATION OF REMEDIAL ALTERNATIVES

The EPA uses nine CERCLA criteria to evaluate the alternatives and select remedial actions. This section summarizes the relative performance of each alternative against the nine criteria and each other. A detailed analysis of alternatives is provided in the FS.

The nine criteria consist of two threshold criteria, five balancing criteria, and two modifying criteria. The threshold criteria include overall protectiveness of human health and the environment and compliance with ARARs. These two criteria must be met by any remedial alternative for it to be considered a viable remedial action. The five balancing criteria include the following: long-term effectiveness and permanence; short-term effectiveness; reduction of toxicity, mobility, and volume through treatment; implementability; and cost. These are the primary criteria upon which the detailed analysis was based. The remaining two criteria include state acceptance and community acceptance. These modifying criteria are typically evaluated following a public comment period on the Proposed Plan and will be documented in the ROD.

CERCLA EVALUATION CRITERIA FOR REMEDIAL ALTERNATIVES
Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to human health and the environment through ICs, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative meets cleanup criteria, standards of control, or requirements of other environmental laws and regulations that pertain to the contamination, or whether a waiver is justified.
Long-Term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Short-Term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost includes estimated capital and annual O&M costs, and present-worth cost. Present-worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
State Agency Acceptance considers whether the state agrees with the EPA's analyses and recommendations, as described in the RI/FFS and Proposed Plan.
Community Acceptance considers whether the local community agrees with the EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Comparison of Remedial Alternatives

1. Overall Protection of Human Health and the Environment

Alternative 1 – No Action is not protective of human health and the environment since the RAOs would not be achieved, risks associated with contaminated soils would not be reduced or controlled, and potential secondary sources would not be controlled. These would provide a continuing source of contamination to the Pine River. No further analysis will be completed for the No Action alternative since it does not meet this threshold criterion.

Alternative 2 would meet overall protection of human health and the environment since the RAOs would be achieved through excavation with off-site disposal. Excavated soil would prevent the exposure to both human health and ecological receptors and will also prevent resuspension and downstream transport of contaminated floodplain and riverbank soils. It is expected that DDx concentrations of fish tissue will be reduced over time.

2. Compliance with ARARs

Alternative 2 will meet all ARARs described in the ARARs portion of this Proposed Plan. No waiver of ARARs will be required.

3. Long-Term Effectiveness and Permanence

Alternative 2 would provide a high level of effectiveness and permanence since DDx contaminated floodplain and riverbank soils would be removed to a concentration of 1 ppm. Clean fill would be placed over the excavated areas and riverbanks would be stabilized to prevent erosion. Unacceptable risk to ecological receptors would be removed through excavation, off-site disposal of contaminated soils and stabilization of the riverbanks. Any residual risk would be removed with the implementation of Alternative 2. In addition, climate resiliency would be part of Alternative 2 through the use of robust erosion control.

4. Reduction of Toxicology, Mobility, and/or Volume Through Treatment

Alternative 2 likely will not reduce the toxicity, mobility or volume through treatment since contaminated soils from floodplains and riverbanks would be removed and disposed off-site in an approved landfill without treatment. Based upon pre-design sampling, some excavated material may require stabilization prior to disposal in a non-hazardous landfill, which would reduce contaminant mobility. For cost estimating purposes, it was assumed 2,000 cubic yards of contaminated soils would require stabilization.

5. Short-Term Effectiveness

The low level DDx contamination should not pose a risk to the community or workers during the excavation but engineering controls will be put in place to ensure unacceptable risks are minimized. Construction equipment, dust, noise and the transport of excavated contaminated soils through the community could potentially pose a risk, and health and safety plans, including a transportation plan, will be required to minimize the risk. In addition, remedial activities would result in substantial environmental impacts to wetlands due to tree removal and clearing and grubbing activities. The riverbanks will also be impacted due to clearing and grubbing activities and it is unlikely that restoration activities will restore the riverbanks to their original condition considering the existing slopes are steep and vegetation in the remediation areas is mature. It is anticipated that the riverbanks will be restored with a more gradual slope and armored to prevent erosion.

6. Implementability

Soil excavation with off-site disposal is an established, field-proven technology. The equipment would need to be scaled accordingly to access the work areas and minimize impacts to private properties. Access constraints could be an issue for excavation, especially at the riverbanks. Additional challenges could be large trucks removing contaminated soil and clean backfill through private property. Restoration will likely be required for access points.

7. Cost

The cost for Alternative 2 is estimated to be $6,656,781 million dollars with an estimated accuracy of +50% to -30%. It is expected that one construction season will be needed to complete the work and no operation and maintenance costs will be required.

8. Support Agency Acceptance

The Michigan Department of Environment, Great Lakes and Energy supports the implementation of Alternative 2.

9. Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the ROD.

I. PREFERRED ALTERNATIVE

Alternative 2 is EPA's Preferred Alternative. The remediation footprint for Alternative 2 is shown in Figure 7 and consists of the following elements:

- Excavation and off-site disposal to an approved landfill floodplain and riverbank soils contaminated with DDx at concentrations greater than 1 ppm. Floodplains that will be addressed are FP-0.5, FP-1, FP-1.1 and the high school athletic fields. Depth of excavation is assumed to be 1.5 feet but additional pre-design sampling will be required to confirm sampling depths.
- Excavation and off-site disposal of riverbank soils at concentrations greater than 1 ppm DDx. Riverbank thickness of approximately 2 feet will be removed and the average bank height would be 5 feet along the entirety of the northern and southern banks as identified in Figure 7.
- The estimated volume of DDx contaminated soil to be excavated is 20,350 cubic yards with 2,000 cubic yards requiring stabilization.
- Additional surveying and sampling would be needed to completely delineate the footprint for riverbank soils (including the removal depth) and to confirm the removal depth in FP-0.5, FP-1, and FP-1.1 and the athletic fields.
- The floodplains would need to be cleared of vegetation prior to excavation and disposed of off-site.
- Soil would be transported and disposed of at a permitted RCRA Subtitle D landfill and all soils would be characterized as RCRA non-hazardous.
- Floodplains would be backfilled with clean soil, estimated to be 7,900 cubic yards, graded, topsoil addition, estimated to be 3,900 cubic yards, and habitat restoration. Figure 8 shows the proposed site layout at the FPS for stockpiled clean fill.
- The riverbank would be stabilized using hardened shorelines including geotextile, gravel rip rap bedding and rip rap armoring, rootwads, grading, and vegetation.
- Access roads and staging areas would have equipment removed, would be regraded (as needed), and would be seeded to prevent soil erosion. Figure 9 shows the proposed access road locations.

Summary of costs and timeframes for Alternative 2	
Capital Cost	$6,656,781
Annual O&M Cost	$0
Present Worth Cost	$6,656,781
Complete Construction	<12 months
Reach RAOs	12 months

Based on the information available now, EPA believes the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the alternatives evaluated with respect to the balancing and modifying criteria. EPA expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA §121(b): (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element or explain why the preference for treatment will not be met. The Preferred Alternative can change in response to public comment or new information.

Support Agency Coordination

EGLE has reviewed the FFS, concurred with the alternatives evaluated, and concurred with how the alternatives were screened and analyzed. EGLE will have an opportunity to review this Proposed Plan and provide their support, or lack thereof, of the Preferred Alternative. EGLE's response will be documented in a Responsiveness Summary, which will be included in the ROD.

J. COMMUNITY PARTICIPATION

The RI report, FS report, this Proposed Plan, and all supporting documents are available at the repositories listed above and online at VELSICOL CHEMICAL CORP. (MICHIGAN) | Superfund Site Profile | Superfund Site Information | US EPA and have been placed in the Administrative Record for the Velsicol Chemical Site. The public is encouraged to review and comment on all the alternatives presented in the Proposed Plan. The public comment period for the Proposed Plan begins July 15, 2022 and ends August 13, 2022.

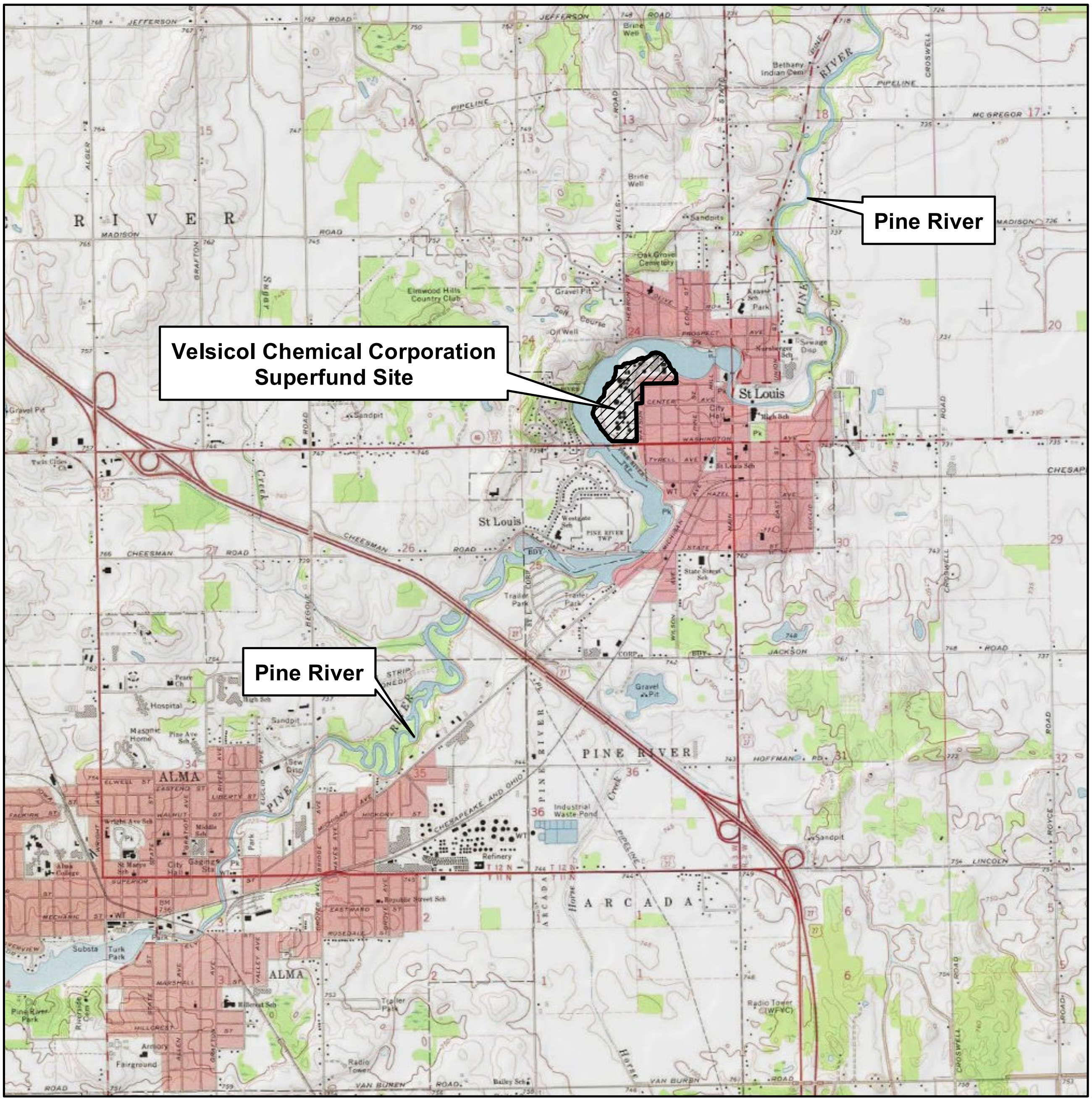
The public meeting will be conducted via the Microsoft Teams web platform. You can join the Teams public meeting at any time during the event hours below.
Date: July 26, 2022
Time: 6 – 7:30 p.m.
Link to join: https://tinyurl.com/Velsicol-Meeting-Link
By phone: 872-813-0592
(You will be instructed to provide the Conference ID: 109 773 416#)

You can also join the meeting by going to www.epa.gov/superfund/velsicol-chemical-michigan and clicking on the posted link.

EPA will accept oral comments during the public availability session and written comments at any time during the public comment period. A court recorder will be available to record verbal comments after the presentation. Written comments may be provided that evening or mailed before the close of the comment period to the address below:

Thomas Alcamo
U.S. Environmental Protection Agency
77 W. Jackson Blvd., SR-6J
Chicago, IL 60604-3590
Alcamo.thomas@epa.gov

The Preferred Alternative may change in response to public comment or new information acquired during the designated public comment period. Responses to comments received will be provided in the ROD, which will identify the selected interim remedial action to be implemented.



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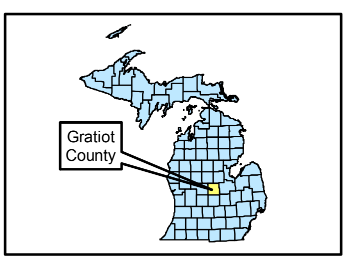

Legend

Former Main Plant Site

N

0 2,000 4,000 Feet

Figure: 1

Designed by: KRB	Drawn by: KRB	Checked by: RCD	Approved by: RCD

Michigan Department of Environmental Quality
Remediation and Redevelopment Division
Superfund Section

Weston Solutions of Michigan, Inc.
2501 Jolly Road, Suite 100
Okemos, Michigan

SITE LOCATION MAP
Pine River Baseline Assessment
2012 Addendum
Velsicol Chemical Corporation Superfund Site
St. Louis, Michigan

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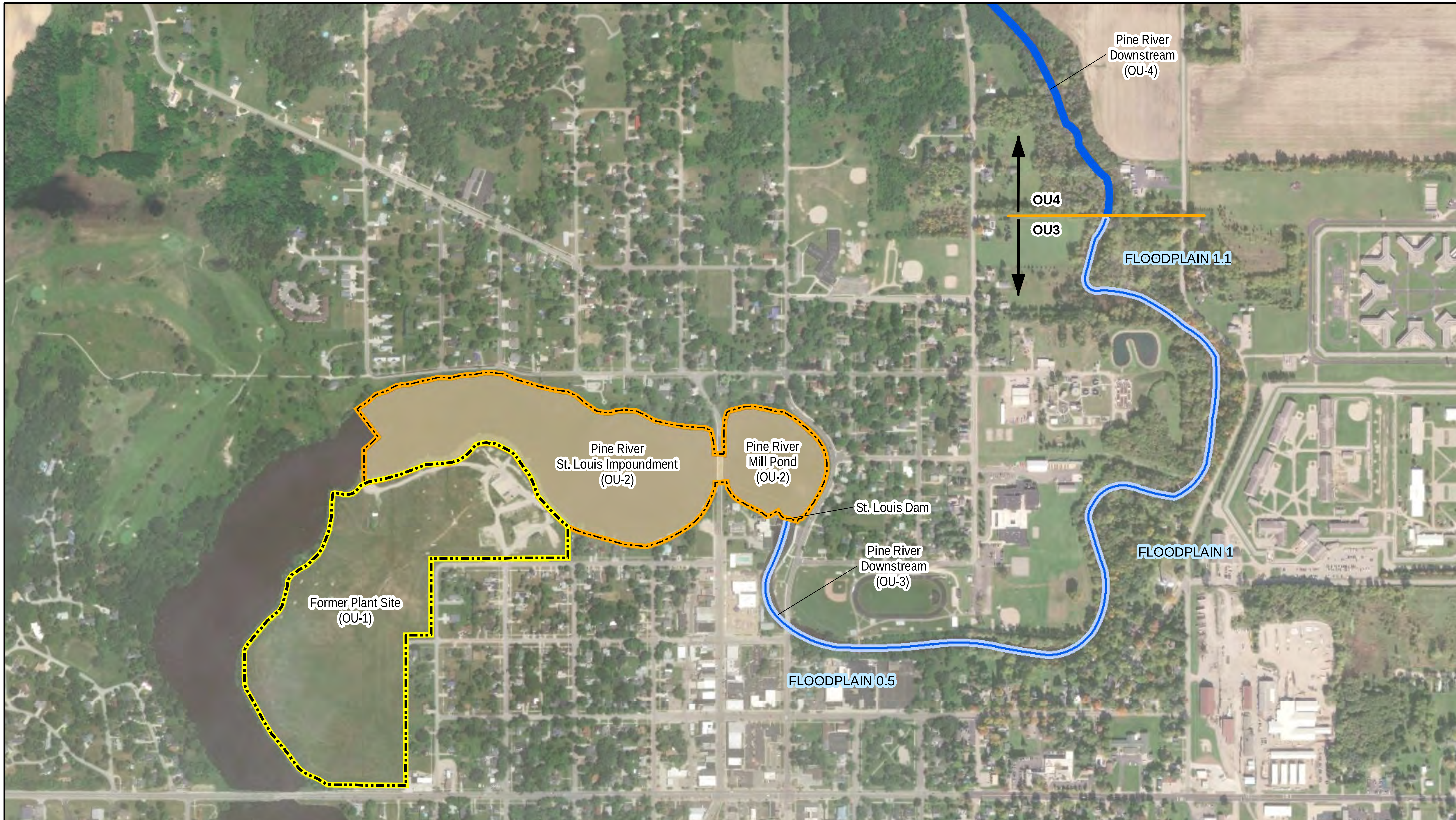


Legend

- Former Plant Site (OU-1)
- Pine River - St. Louis Impoundment (OU-2)
- Pine River (OU3)
- Pine River (OU4)

N

0 300 600
Feet

Figure 2
Study Areas and Operable Units
OU3 Focused Feasibility Study
Velsicol Chemical Corporation Superfund Site
St. Louis, Michigan

ch2m

Legend

Total DDT Concentration Ranges
- ND
- >70
- 70-400
- 400-1000
- 1000-2000
- 2000-5000
- >5000

Designated Sample Type
- BAR Sediment Sample
- BAR Floodplain Sample
- RI Sediment Sample
- RI River Bank Sample
- RI Floodplain Sample
- Pine River OU3
- Approximate OU2 Boundary
- Floodplain Extent

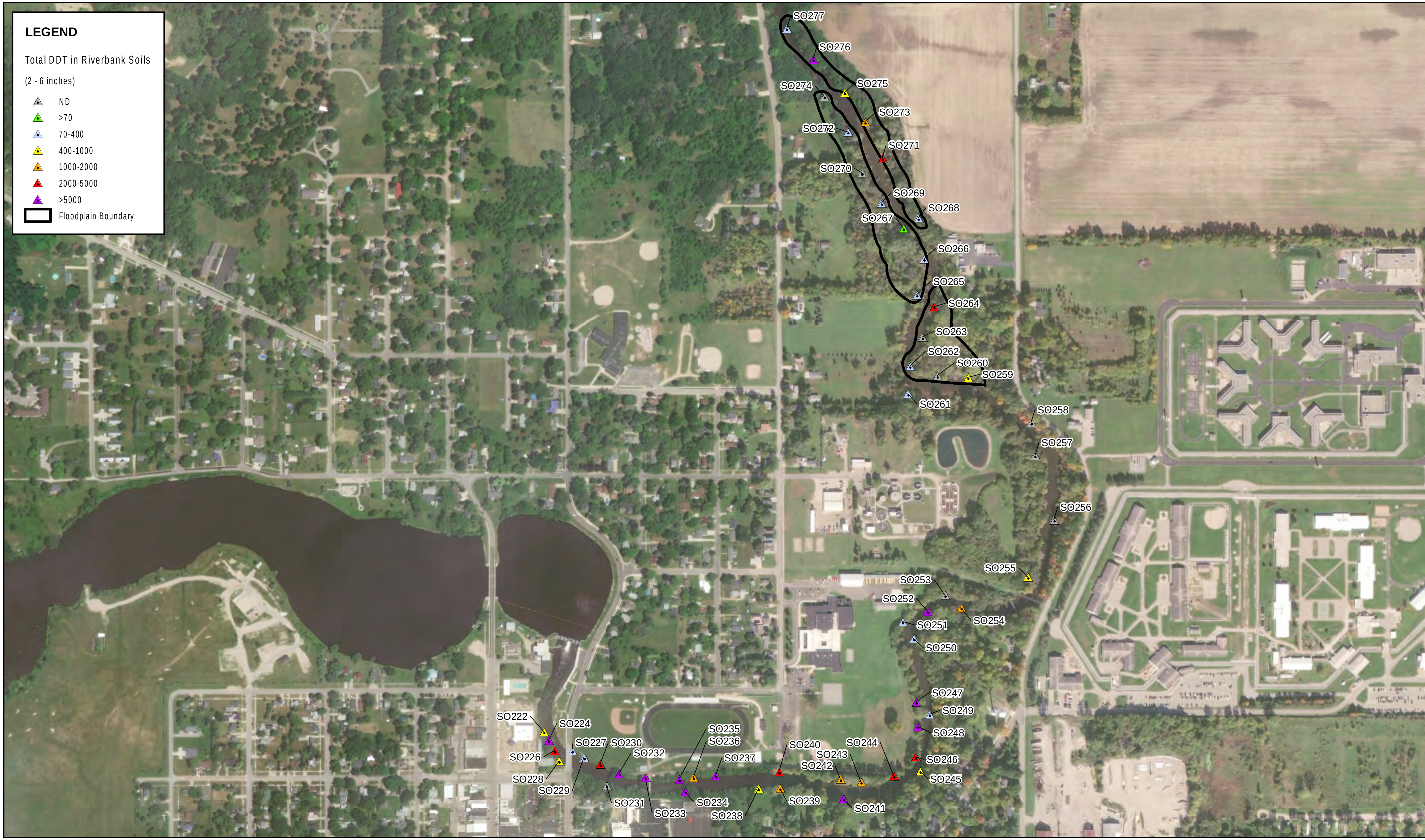
Note:
All results are in µg/kg

N

0 170 340 Feet

Figure 3
OU3 Area Surface Floodplain Soils, Riverbank Soils, and Sediment Total DDT Concentrations
OU3 Focused Feasibility Study
Velsicol Chemical Corporation Superfund Site
Saint Louis, Michigan

ch2m.



Note:
All results are in µg/kg

FIGURE 4
Total DDT in Riverbank Soils (2-6 inches)
OU3 Focused Feasibility Study
Velsicol Chemical Corporation Superfund Site
St. Louis, Michigan

ch2m

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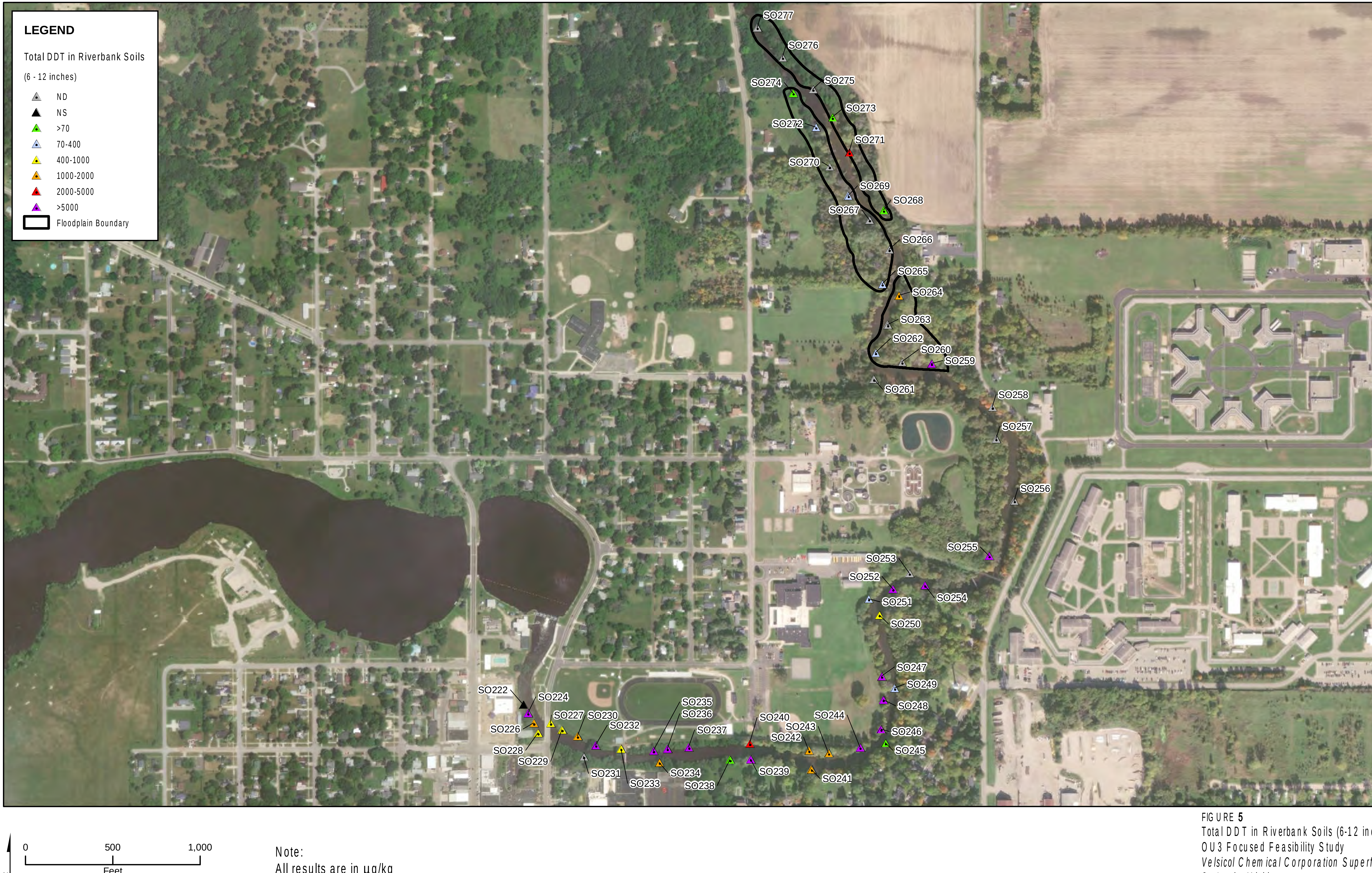

Note:
All results are in µg/kg

FIGURE 5
Total DDT in Riverbank Soils (6-12 inches)
OU3 Focused Feasibility Study
Velsicol Chemical Corporation Superfund Site
St. Louis, Michigan

ch2m

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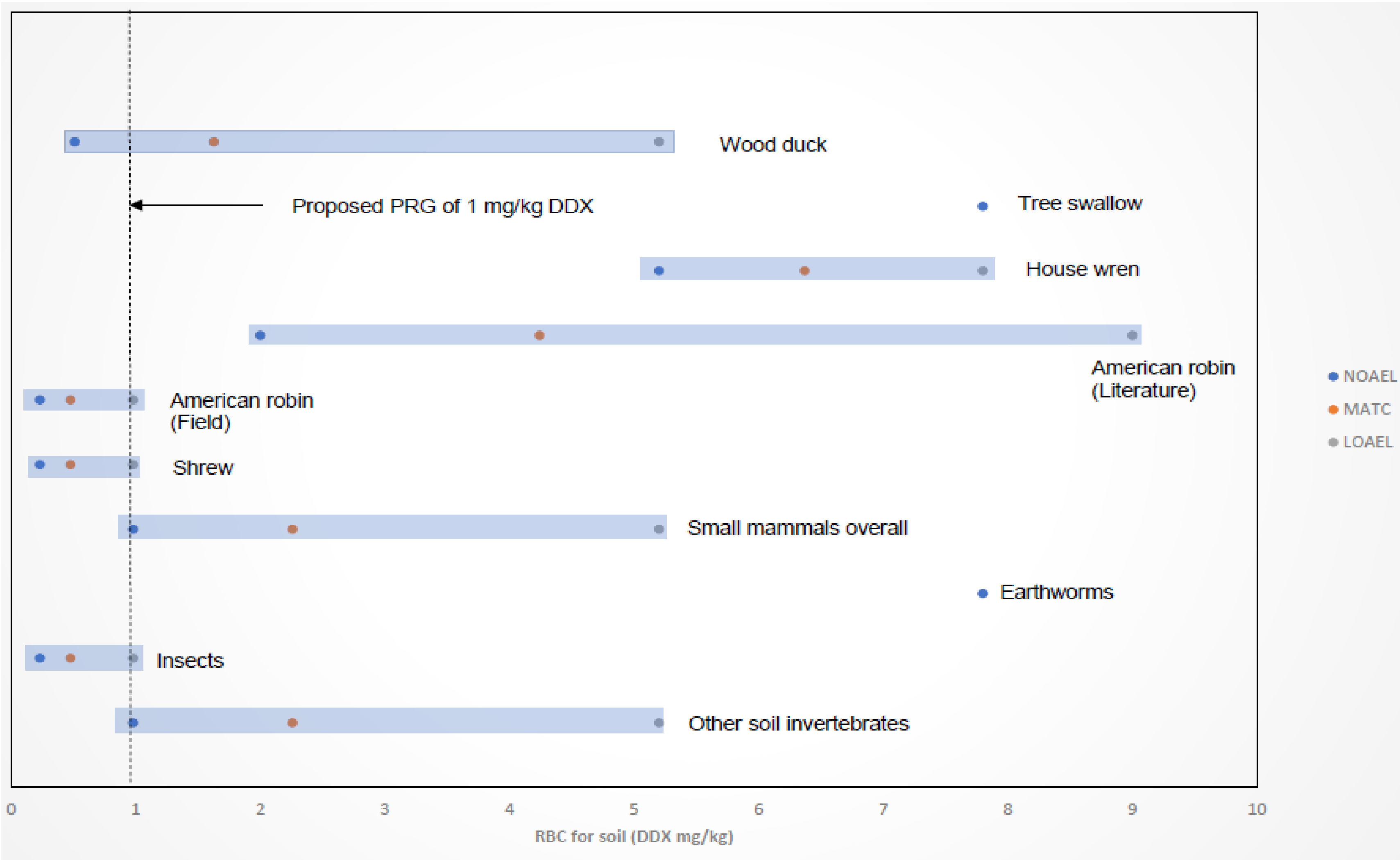


Notes:
mg/kg – milligram per kilogram DDX - sum of DDD, DDE and DDT isomers
LOAEC - lowest- observable-adverse-effects-concentration
NOAEC - no-observable-adverse-effects-concentration
MATC - maximum allowable toxicant concentration
PRG – preliminary remediation goal

Figure 6
Total DDX RBCs Protective of Ecological Resources
OU3 Focused Feasibility Study
Velsicol Chemical Corporation Superfund Site
St. Louis, Michigan

Legend

Total DDT Concentration Ranges
- ND
- >70
- 70-400
- 400-1000
- 1000-2000
- 2000-5000
- >5000

Designated Sample Type
- BAR Sediment Sample
- BAR Floodplain Sample
- RI Sediment Sample
- RI River Bank Sample
- RI Floodplain Sample
- Pine River OU3
- Approximate OU2 Boundary
- Floodplain Extent
- Remediated Floodplain Area

Notes:
1. See Figure 2-1 for Sample IDs.
2. Athletic Field Floodplain Area remediated as part of 2015 time-critical removal action and is not part of this footprint. Banks along this area are included in this remedial footprint.
3. All results are in µg/kg

N

0 170 340 Feet

Figure 7
Preliminary Remediation Footprint
OU3 Focused Feasibility Study
Velsicol Chemical Corporation Superfund Site
Saint Louis, Michigan

ch2m

\\lakefrontprojEPA\Velsicol_SuperfundSite\Reports\474507_VelsicolOU3_DownRiver\GIS\MXDs\New Sample Locations\St Louis DS-1 Sediment Data Evaluation.mxd mpetersh 6/1/2020 5:46:37 PM

Legend

Truck Routes to/from OU3 and FPS

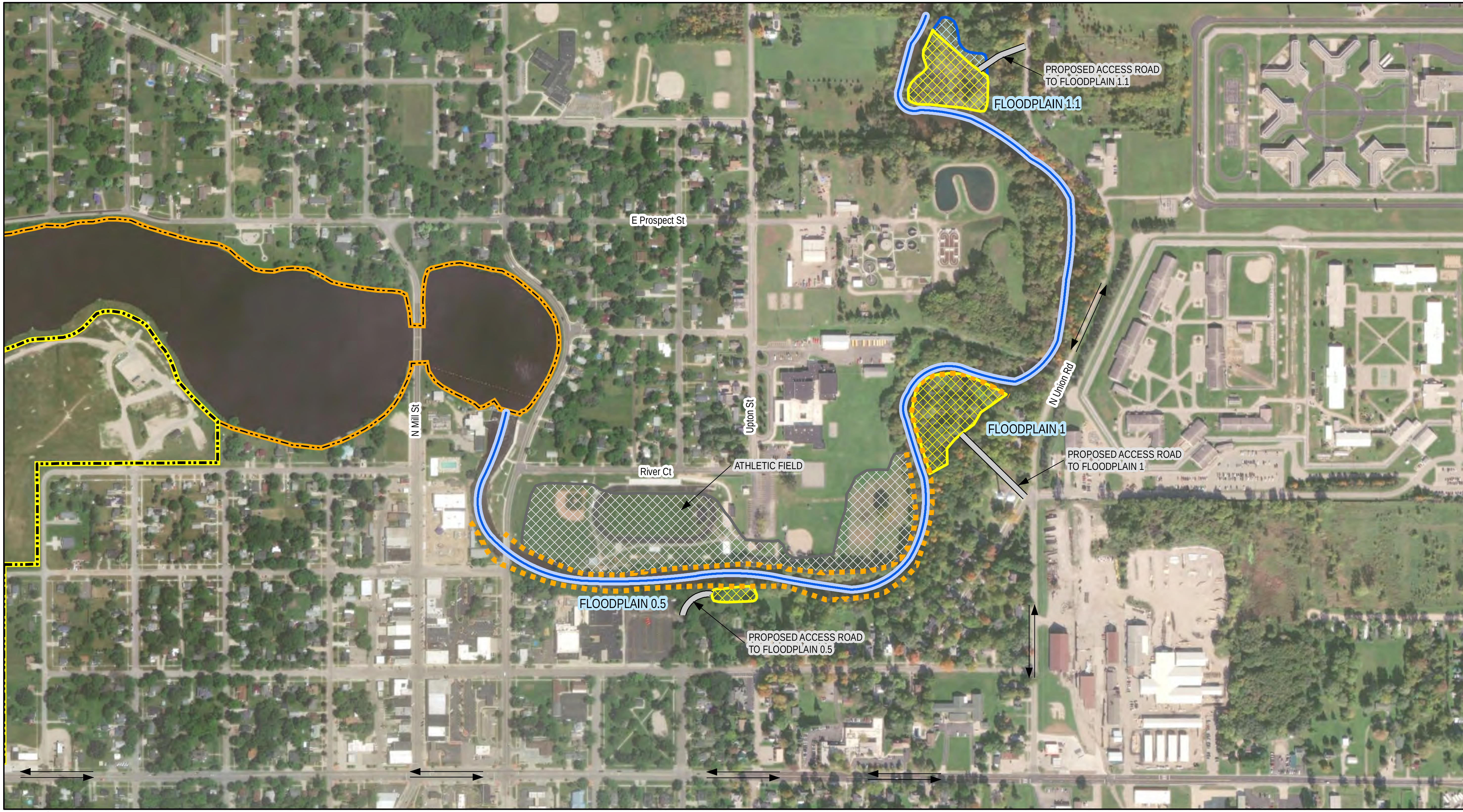
N

0 150 300 Feet

FIGURE 8
Proposed Site Layout
OU3 Focused Feasibility Study
Velsicol Chemical Corporation Superfund Site
St. Louis, Michigan

GIS Server: \\dc1vs01\GISProj\E\EPA\Velsicol_SuperfundSite\Reports\2020\OU3_Feasibility_Study\Maps\Report\06012020_Revisions\Figure 3-3_ProposedFPSStagingArea_rev.mxd, Date Saved: 6/1/2020 2:50:50 PM, User Name: mpetersh

ch2m



Legend

- Proposed Access Road
- Bank Soils Removal Area
- Pine River OU3
- Approximate OU1 Boundary
- Approximate OU2 Boundary
- Remediated Floodplain Area
- 2020 Floodplain Removal Area
- Floodplain Extent
- Truck Routes to/from OU3 and FPS

Note:
Athletic Field Floodplain Area remediated as part of 2015 time-critical removal action and is not part of this footprint. Banks along this area are included in this remedial footprint.

N

0 450 900 Feet

Figure 9
Proposed Access Road Locations
OU3 Focused Feasibility Study
Velsicol Chemical Corporation Superfund Site
Saint Louis, Michigan

ch2m:

Table 1. Floodplain 1 BAR Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Location ID	Field Sample ID	Sample Date	Depth	2,4-DDT (µg/kg)	4,4-DDD (µg/kg)	4,4-DDE (µg/kg)	4,4-DDT (µg/kg)	Total DDT (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)
Existing Site PRG (DDT, PBB) or Ecological Screening Value (HBB)								**5000**	**9170**	**1200**
Floodplain 1 Data										
F1-SL-001	F1-SL-001-0A	5/4/2003	0 - 0.5	70	R	R	R	*70*	130	18 J
	F1-SL-001-0B	5/4/2003	0.5 - 1	25	R	R	R	*25*	19 J	3 J
	F1-SL-001-0C	5/4/2003	1 - 2	3 J	R	R	R	*3*	1 J	3 J
	F1-SL-001-RS05-0A	8/29/2005	0 - 0.5	--	120	4,100	2,600	6,820	--	--
	F1-SL-001-RS05-0B	8/29/2005	0.5 - 1.5	--	9.3	560	200	769	--	--
	F1-SL-001-RS05-0C	8/29/2005	1.5 - 3.2	--	3.6 U	110	180	290	--	--
F1-SL-002	F1-SL-002-0A	5/5/2003	0 - 0.6	8,200	R	R	R	*8,200*	760	270 U
	F1-SL-002-0B	5/5/2003	0.6 - 1.2	1,500	R	R	R	*1,500*	100 U	100 U
	F1-SL-002-0C	5/5/2003	1.2 - 2	11 J	R	R	R	*11*	1 J	50 U
	F1-SL-002-RS05-0A	8/29/2005	0 - 0.5	--	260 J	7,900	6,000	14,160	--	--
	F1-SL-002-RS05-0B	8/29/2005	0.5 - 1	--	110	3,700	2,500	6,310	--	--
	F1-SL-002-RS05-0C	8/29/2005	1 - 2.33	--	7.2 J	210	130	347	--	--
F1-SL-003	F1-SL-003-0A	5/5/2003	0 - 0.5	1,500	R	R	R	*1,500*	380	53 U
	F1-SL-003-0B	5/5/2003	0.5 - 1	500	R	R	R	*500*	56 J	50 U
	F1-SL-003-0C	5/5/2003	1 - 2	24	R	R	R	*24*	100 U	50 U
	F1-SL-003-RS05-0A	8/29/2005	0 - 0.5	--	77 UJ	8,200	9,000	17,200	--	--
	F1-SL-003-RS05-0B	8/29/2005	0.5 - 1.5	--	18 U	1,800 U	1,700 J	1,700	--	--
	F1-SL-003-RS05-0C	8/29/2005	1.5 - 3	--	4.2 J	97	64	165	--	--
	F1-SL-003-RS05-0CDP	8/29/2005	1.5 - 3	--	6.6	120	110	237	--	--

Table 1. Floodplain 1 BAR Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Location ID	Field Sample ID	Sample Date	Depth	2,4-DDT (µg/kg)	4,4-DDD (µg/kg)	4,4-DDE (µg/kg)	4,4-DDT (µg/kg)	Total DDT (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)
Existing Site PRG (DDT, PBB) or Ecological Screening Value (HBB)								**5000**	**9170**	**1200**
F1-SL-004	F1-SL-004-0A	5/5/2003	0 - 0.5	4,600	R	R	R	*4,600*	1,400	600
	F1-SL-004-0B	5/5/2003	0.5 - 1.1	18,000	R	R	R	*18,000*	850	440 J
	F1-SL-004-0C	5/5/2003	1.1 - 1.8	29,000	R	R	R	*29,000*	1,200 U	1,200 U
	05-05-03-DUP-02	5/5/2003	1.1 - 1.8	43,000	R	R	R	*43,000*	2,400 U	2,400 U
	F1-SL-004-RS05-0A	8/29/2005	0 - 0.5	--	180 UJ	2,300 J	19,000	21,300	--	--
	F1-SL-004-RS05-0B	8/29/2005	0.5 - 1.5	--	1800 UJ	6,800 J	85,000	91,800	--	--
	F1-SL-004-RS05-0C	8/29/2005	1.5 - 2.5	--	170 UJ	1,200	5,400	6,600	--	--
	F1-SL-004-RS05-0D	8/29/2005	2.5 - 2.8	--	36	440	540	1,016	--	--
F1-SL-006	F1-SL-006-0A	5/5/2003	0 - 0.6	150	R	R	R	*150*	560	440
	F1-SL-006-0B	5/5/2003	0.6 - 1.2	1.6 J	R	R	R	*2*	100 U	2 J
	F1-SL-006-0C	5/5/2003	1.2 - 2.1	20 U	R	R	R	*20* U	100 U	50 U
	05-05-03-DUP-01	5/5/2003	1.2 - 2.1	20 U	R	R	R	*20* U	100 U	50 U
	F1-SL-006-RS05-0A	8/30/2005	0 - 1	--	250	1,100	4,700	6,050	--	--
F1-SL-007	F1-SL-007-0A	5/5/2003	0 - 0.5	1,300	R	R	R	*1,300*	210	75
	F1-SL-007-0B	5/5/2003	0.5 - 1	360	R	R	R	*360*	11 J	50 U
	F1-SL-007-0C	5/5/2003	1 - 1.8	2.1 J	R	R	R	*2*	2 J	50 U
	F1-SL-007-RS05-0A	8/30/2005	0 - 0.5	--	390	10,000	8,200	18,590	--	--
	F1-SL-007-RS05-0B	8/30/2005	0.5 - 1.2	--	96	3,100	1,800	4,996	--	--
	F1-SL-007-RS05-0C	8/30/2005	1.15 - 2	--	3.8	150	44	198	--	--
	F1-SL-007-RS05-0CDP	8/30/2005	1.15 - 2	--	3.6 J	140	41	185	--	--
F1-SL-008	F1-SL-008-0A	5/5/2003	0 - 0.5	1,900	R	R	R	*1,900*	1,300.0	1,000
	F1-SL-008-0B	5/5/2003	0.5 - 1.1	470	R	R	R	*470*	50.0 J	50 U
	F1-SL-008-0C	5/5/2003	1.1 - 2	1.9 J	R	R	R	*2*	100 U	50 U
	05-05-03-DUP-3B	5/5/2003	1.1 - 2	1.9 J	R	R	R	*2*	2.1 J	50 U
	F1-SL-008-RS05-0A	8/30/2005	0 - 0.5	--	200	7,600	5,700	13,500	--	--
	F1-SL-008-RS05-0B	8/30/2005	0.5 - 1.8	--	21	180	570	771	--	--
	F1-SL-008-RS05-0C	8/30/2005	1.8 - 2.4	--	4 U	17	7.5	25	--	--
F1-SL-009	F1-SL-009-0A	5/5/2003	0 - 0.5	130	R	R	R	*130*	52.0 J	50 U
	F1-SL-009-0B	5/5/2003	0.5 - 1	80	R	R	R	*80*	12.0 J	50 U
	F1-SL-009-0C	5/5/2003	1 - 2.2	20 U	R	R	R	*20*	100 U	50 U
	F1-SL-009-RS05-0A	8/29/2005	0 - 0.5	--	150	4,800	4,700	9,650	--	--
	F1-SL-009-RS05-0B	8/29/2005	0.5 - 1.9	--	2.6 J	140	35	178	--	--

Table 1. Floodplain 1 BAR Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Location ID	Field Sample ID	Sample Date	Depth	2,4-DDT (µg/kg)	4,4-DDD (µg/kg)	4,4-DDE (µg/kg)	4,4-DDT (µg/kg)	Total DDT (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)
Existing Site PRG (DDT, PBB) or Ecological Screening Value (HBB)								**5000**	**9170**	**1200**
F1-SL-010	F1-SL-010-0A	5/5/2003	0 - 0.5	740	R	R	R	*740*	430.0	220
	F1-SL-010-0B	5/5/2003	0.5 - 1.1	160	R	R	R	*160*	100 U	50 U
	F1-SL-010-0C	5/5/2003	1.1 - 2	34	R	R	R	*34*	17.0 J	66
	05-05-03-DUP-04	5/5/2003	1.1 - 2	8.4 J	R	R	R	*8*	100 U	50 U
	F1-SL-010-RS05-0A	8/29/2005	0 - 0.5	--	130 J	3,400	2,800	6,330	--	--
	F1-SL-010-RS05-0B	8/29/2005	0.5 - 1.75	--	3.6	100	59 J	163	--	--
	F1-SL-010-RS05-0C	8/29/2005	1.75 - 2.5	--	3.1 J	23	45	71	--	--
	F1-SL-010-RS05-0D	8/29/2005	2.5 - 3.25	--	3.4 U	1.4 J	3.4 U	1	--	--
	F1-SL-010-RS05-0DDP	8/29/2005	2.5 - 3.25	--	3.4 U	1.6 J	1.1 J	3	--	--
F1-SL-011	F1-SL-011-0A	5/5/2003	0 - 0.5	3,900	R	R	R	*3,900*	330.0	110 U
	F1-SL-011-0B	5/5/2003	0.5 - 1	1,000	R	R	R	*1,000*	51 U	51 U
	F1-SL-011-0C	5/5/2003	1 - 2	19 J	R	R	R	*19*	100 U	50 U
	F1-SL-011-RS05-0A	8/29/2005	0 - 0.5	--	190 UJ	7,100	17,000	24,100	--	--
	F1-SL-011-RS05-0B	8/29/2005	0.5 - 1.5	--	180 UJ	4,100	7,100	11,200	--	--
	F1-SL-011-RS05-0C	8/29/2005	1.5 - 2.2	--	14	470	310	794	--	--
F1-SL-013	F1-SL-013-0A	5/6/2003	0 - 0.5	20 U	R	R	R	*20 U*	21.0 JE	50 U
	F1-SL-013-0B	5/6/2003	0.5 - 1	20 U	R	R	R	*20 U*	100 U	50 U
	F1-SL-013-0C	5/6/2003	1 - 1.85	20 U	R	R	R	*20 U*	100 U	50 U
	05-06-03-DUP-01	5/6/2003	1 - 1.85	20 U	--	--	--	*20 U*	100 U	50 U
	F1-SL-013-RS05-0A	8/30/2005	0 - 0.5	--	4.5	220	64	289	--	--
	F1-SL-013-RS05-0B	8/30/2005	0.5 - 1.33	--	3.5 J	130	47	181	--	--
F1-SL-014	F1-SL-014-0A	5/6/2003	0 - 0.8	17 J	R	R	R	*17*	100 U	50 U
	F1-SL-014-0B	5/6/2003	0.8 - 1.6	20 U	R	R	R	*20 U*	100 U	50 U
	05-06-03-DUP-05	5/6/2003	1.6 - 2.6	20 U	--	--	--	*20 U*	100 U	50 U
	F1-SL-014-0C	5/6/2003	1.6 - 2.6	20 U	R	R	R	*20 U*	100 U	50 U
	F1-SL-014-RS05-0A	8/30/2005	0 - 0.5	--	23	1,400	370	1,793	--	--
	F1-SL-014-RS05-0B	8/30/2005	0.5 - 1.25	--	2.1 J	71	30	103	--	--
F1-SL-015	F1-SL-015-0A	5/6/2003	0 - 0.8	310	170	3,300	2,600	6,380	180.0	100
	05-06-03-DUP-06	5/6/2003	0 - 0.8	98	200	2,800	2,200	5,298	140.0	39 J
	F1-SL-015-0B	5/6/2003	0.8 - 1.45	2 J	1.8 J	56 J	41	101	3.5 J	50 U
F1-SL-016	F1-SL-016-0A	5/6/2003	0 - 0.7	580	650	8,400	8,900	18,530	120	56 U
	F1-SL-016-0B	5/6/2003	0.7 - 1.4	44	7.6	300	160	512	100 U	50 U
	F1-SL-016-0C	5/6/2003	1.4 - 2	18 J	5	210	120	353	100 U	50 U
F1-SL-017	F1-SL-017-0A	5/5/2003	0 - 0.5	460	R	R	R	*460*	310.0	50
	F1-SL-017-0B	5/5/2003	0.5 - 1	460	R	R	R	*460*	44.0 J	50 U
	F1-SL-017-0C	5/5/2003	1 - 1.8	3.2 J	R	R	R	*3*	100 U	50 U
	05-05-03-DUP-03	5/5/2003	1 - 1.8	3.8 J	R	R	R	*4*	1.7 J	50 U
	F1-SL-017-RS05-0A	8/31/2005	0 - 0.5	--	380	3,400	5,300	9,080	--	--
	F1-SL-017-RS05-0B	8/31/2005	0.5 - 1.25	--	22	470	310	802	--	--
	F1-SL-017-RS05-0C	8/31/2005	1.25 - 1.9	--	3 J	67	40 J	110	--	--

Table 1. Floodplain 1 BAR Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Location ID	Field Sample ID	Sample Date	Depth	2,4-DDT (µg/kg)	4,4-DDD (µg/kg)	4,4-DDE (µg/kg)	4,4-DDT (µg/kg)	Total DDT (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)
Existing Site PRG (DDT, PBB) or Ecological Screening Value (HBB)								**5000**	**9170**	**1200**
F1-SL-019	F1-SL-019-0A	5/6/2003	0 - 0.5	20 U	R	R	R	*20* U	100 U	50 U
	F1-SL-019-0B	5/6/2003	0.5 - 1.2	20 U	R	R	R	*20* U	100 U	50 U
	05-06-03-DUP-04	5/6/2003	0.5 - 1.2	20 U	--	--	--	*20* U	100 U	50 U
	F1-SL-019-0C	5/6/2003	1.2 - 1.8	20 U	R	R	R	*20* U	100 U	50 U
	F1-SL-019-RS05-0A	8/30/2005	0 - 0.5	--	3.6 U	11	8.1	19	--	--
	F1-SL-019-RS05-0B	8/30/2005	0.5 - 0.9	--	3.6 U	9.2	6.4	16	--	--
F1-SL-020	F1-SL-020-0A	5/6/2003	0 - 0.5	20 U	4.7	26 J	23	54	88 J	50 U
	F1-SL-020-0B	5/6/2003	0.5 - 1.2	20 U	4 U	8.4 J	5.2	14	100 U	50 U
	F1-SL-020-0C	5/6/2003	1.2 - 2.5	20 U	3.9 U	3.9 U	3.9 U	20 U	100 U	50 U
	05-06-03-DUP-07	5/6/2003	1.2 - 2.5	20 U	3.8 U	0.74 J	3.8 U	1	100 U	50 U
F1-SL-021	F1-SL-021-0A	5/5/2003	0 - 0.8	15 J	R	R	R	*15*	180	58
	F1-SL-021-0B	5/5/2003	0.8 - 1.4	20 U	R	R	R	*20 U*	100 U	50 U
	F1-SL-021-RS05-0A	8/30/2005	0 - 0.5	--	67	740	980	1,787	--	--
	F1-SL-021-RS05-0B	8/30/2005	0.5 - 1	--	10	490	150	650	--	--
	F1-SL-021-RS05-0C	8/30/2005	1 - 1.8	--	3.8 U	22	11	33	--	--
	F1-SL-021-RS05-0C-DP	8/30/2005	1 - 1.8	--	4.4	37	21	62	--	--
F1-SL-022	F1-SL-022-0A	5/5/2003	0 - 0.5	130	R	R	R	130	200	49 J
	F1-SL-022-0B	5/5/2003	0.5 - 1.4	37	R	R	R	37	100 U	50 U
	F1-SL-022-RS05-0A	8/30/2005	0 - 0.5	--	220	570	2,100	2,890	--	--
	F1-SL-022-RS05-0B	8/30/2005	0.5 - 1.5	--	19	90	110 J	219	--	--
F1-SL-023	F1-SL-023-0A	5/5/2003	0 - 0.5	500	R	R	R	*500*	680	190
	F1-SL-023-0B	5/5/2003	0.5 - 1	120	R	R	R	*120*	130	10 J
	F1-SL-023-0C	5/5/2003	1 - 2	20 U	R	R	R	*20 U*	100 U	50 U
	F1-SL-023-RS05-0A	8/30/2005	0 - 0.6	--	790	1,400	5,800	7,990	--	--
	F1-SL-023-RS05-0B	8/30/2005	0.6 - 1.8	--	220	610	1,600	2,430	--	--
	F1-SL-023-RS05-0C	8/30/2005	1.8 - 2.3	--	2 J	10	6	18	--	--
F1-SL-024	F1-SL-024-0A	5/6/2003	0 - 0.5	20 U	R	R	R	*20* U	22 J	50 U
	F1-SL-024-0B	5/6/2003	0.5 - 1.2	20 U	R	R	R	*20* U	100 U	50 U
	05-06-03-DUP-02	5/6/2003	0.5 - 1.2	20 U	--	--	--	*20* U	100 U	50 U
	F1-SL-024-0C	5/6/2003	1.2 - 1.8	20 U	R	R	R	*20* U	100 U	50 U
	F1-SL-024-RS05-0A	8/31/2005	0 - 0.5	--	5.9 J	120	58 J	184	--	--
	F1-SL-024-RS05-0B	8/31/2005	0.5 - 1.2	--	1.9 J	130	56	188	--	--
F1-SL-025	F1-SL-025-0A	5/5/2003	0 - 0.5	380	R	R	R	*380*	100 U	60 U
	F1-SL-025-0B	5/5/2003	0.5 - 1.5	20 U	R	R	R	*20 U*	100 U	50 U
	F1-SL-025-RS05-0A	8/31/2005	0 - 0.5	--	19	290	240	549	--	--
	F1-SL-025-RS05-0B	8/31/2005	0.5 - 1.5	--	15	290	110	415	--	--
	F1-SL-025-RS05-0B-DP	8/31/2005	0.5 - 1.5	--	20	390	240	650	--	--

Table 1. Floodplain 1 BAR Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Location ID	Field Sample ID	Sample Date	Depth	2,4-DDT (µg/kg)	4,4-DDD (µg/kg)	4,4-DDE (µg/kg)	4,4-DDT (µg/kg)	Total DDT (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)
Existing Site PRG (DDT, PBB) or Ecological Screening Value (HBB)								**5000**	**9170**	**1200**
F1-SL-026	F1-SL-026-0A	5/6/2003	0 - 0.6	20 U	R	R	R	*20 U*	6 J	50 U
	F1-SL-026-0B	5/6/2003	0.6 - 1.2	20 U	R	R	R	*20 U*	100 U	50 U
	F1-SL-026-0C	5/6/2003	1.2 - 1.9	20 U	R	R	R	*20 U*	100 U	50 U
	05-06-03-DUP-03	5/6/2003	1.2 - 1.9	20 U	--	--	--	*20 U*	100 U	50 U
	F1-SL-026-RS05-0A	8/31/2005	0 - 0.5	--	4 U	120	46	166	--	--
F1-SL-001	F1-SL-001-2010	9/16/2010	0.0 - 0.5	1,800	180 J	8100	6400	16,480	390 J	64 J
F1-SL-002	F1-SL-002-2010	9/16/2010	0.0 - 0.5	870	340 J	6900	5200	13,310	400 J	52 J
F1-SL-003	F1-SL-003-2010	9/16/2010	0.0 - 0.5	2,100	300 J	9600	6900	18,900	740 J	77 J
F1-SL-004	F1-SL-004-2010	9/16/2010	0.0 - 0.5	3,800	1,500	4200	14000	23,500	770 J	96 J
F1-SL-006	F1-SL-006-2010	9/16/2010	0.0 - 0.5	78	41	1300	840	2,259	540 J	120 J
F1-SL-007	F1-SL-007-2010	9/16/2010	0.0 - 0.5	3,200	310 J	9700	7800	21,010	830 J	200 J
F1-SL-008	F1-SL-008-2010	9/16/2010	0.0 - 0.5	1,100	270 J	7400	6700	15,470	680 J	200 J
F1-SL-009	F1-SL-009-2010	9/16/2010	0.0 - 0.5	1,100	94	8400	3600	13,194	170	26 J
F1-SL-010	F1-SL-010-2010	9/16/2010	0.0 - 0.5	1,400	430 J	5500	10000	17,330	1,200 J	230 J
F1-SL-011	F1-SL-011-2010	9/16/2010	0.0 - 0.5	900	600	4200	7000	12,700	1,200 J	490 J
F1-SL-013	F1-SL-013-2010	9/16/2010	0.0 - 0.5	25 U	25 U	98	55	153	120 J	310 UJ
F1-SL-014	F1-SL-014-2010	9/16/2010	0.0 - 0.5	150	34	2500	520	3,204	59 J	310 UJ
F1-SL-015	F1-SL-015-2010	9/16/2010	0.0 - 0.5	290	230	2000	6400	8,920	780 J	130 J
F1-SL-016	F1-SL-016-2010	9/16/2010	0.0 - 0.5	2,300	220 J	11000	4900	18,420	580 J	68 J
F1-SL-017	F1-SL-017-2010	9/16/2010	0.0 - 0.5	1,400	260 J	3600	6600	11,860	420 J	140 J
F1-SL-019	F1-SL-019-2010	9/17/2010	0.0 - 0.5	23 U	23 U	13 J	10 J	23	120 U	290 UJ
F1-SL-020	F1-SL-020-2010	9/17/2010	0.0 - 0.5	26 U	26 U	26	170	196	160	320 UJ
F1-SL-021	F1-SL-021-2010	9/17/2010	0.0 - 0.5	120	140	1400	3000	4,660	1,300 J	100 J
F1-SL-022	F1-SL-022-2010	9/17/2010	0.0 - 0.5	690	260	890	5300	7,140	950 J	150 J
F1-SL-023	F1-SL-023-2010	9/17/2010	0.0 - 0.5	380 J	380 J	2000	3100	5,860	1,000 J	160 J
	DUP-05	9/17/2010	0.0 - 0.5	300 J	440 J	1900	4900	7,540	960 J	180 J
F1-SL-024	F1-SL-024-2010	9/17/2010	0.0 - 0.5	26 U	26 U	71	54	125	31 J	320 UJ
F1-SL-025	F1-SL-025-2010	9/17/2010	0.0 - 0.5	57	81	1300	260 J	1,698	170	27 J
F1-SL-026	F1-SL-026-2010	9/17/2010	0.0 - 0.5	23 U	23 U	160	110	270	25 J	290 UJ
WFP03-02c	WFP03-02C-2010	9/16/2010	0.0 - 0.5	1,200 J	280	350	4100	5,930	110 U	23 J
	DUP-04	9/16/2010	0.0 - 0.5	140 J	130	330	1100	1,700	95 J	24 J
WFP03-02d	WFP03-02D-2010	9/16/2010	0.0 - 0.5	960	750	2200	6000	9,910	950 J	130 J
WFP03-02e	WFP03-02E-2010	9/17/2010	0.0 - 0.5	65	130	1000	940	2,135	680 J	98 J

Table 1. Floodplain 1 BAR Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Location ID	Field Sample ID	Sample Date	Depth	2,4-DDT (µg/kg)	4,4-DDD (µg/kg)	4,4-DDE (µg/kg)	4,4-DDT (µg/kg)	Total DDT (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)
Existing Site PRG (DDT, PBB) or Ecological Screening Value (HBB)								**5000**	**9170**	**1200**

Notes:

Detected result greater Site PRG or screening value

Sample located in OU3

Italicized total DDT results are based on only one reported isomer and value likely have a low bias.

µg/kg = microgram(s) per kilogram

DDD = dichlorodiphenyldichloroethane

DDT = dichlorodiphenyltrichloroethane

HBB = hexabromobiphenyl

J = estimated value

PBB = polybrominated biphenyl

PRG = preliminary remediation goal

R = data rejected during validation, not reported

U = result not detected above reporting limit shown

Table 2. Floodplain RI Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Station ID	Floodplain Identifier	Depth Interval	Date	Sampling Event	2,4'-DDD (µg/kg)	2,4'-DDE (µg/kg)	2,4'-DDT (µg/kg)	4,4'-DDD (µg/kg)	4,4'-DDE (µg/kg)	4,4'-DDT (µg/kg)	DDT Total (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)	Solids (percent)
Existing Site PRG (DDT, PBB) or Ecological Screening Value (HBB)											**5,000**	**9,170**	**1,200**	
VCS-OU3-SO019/0-0.5	1.1	0 - 0.5	12/7/2013	2013	20 U	20 U	20 U	23 J	25 J	40 J	88	290	170 U	70.8
VCS-OU3-SO019/0.5-1	1.1	0.5 - 1	12/7/2013	2013	16 U	16 U	16 U	16 U	21 U	19 U	21 U	9 U	140 U	84.6
VCS-OU3-SO020/0-0.5	1.1	0 - 0.5	12/7/2013	2013	60 J	33 J	100 J	110	1,200	290	1,800	510	160 U	73.0
VCS-OU3-SO020/0-0.5-FD	1.1	0 - 0.5	12/7/2013	2013	54 J	32 J	56 J	99	1,300	260	1,800	520	160 U	74.7
VCS-OU3-SO020/0.5-1	1.1	0.5 - 1	12/7/2013	2013	17 U	17 U	17 U	17 U	80	33 J	110	10 U	140 U	84.6
VCS-OU3-SO021/0-0.5	1.1	0 - 0.5	12/7/2013	2013	180	87	290	510	800	1,500	3,400	840	190 U	64.3
VCS-OU3-SO021/0.5-0.8	1.1	0.5 - 0.8	12/7/2013	2013	42 J	18 U	18 U	63	82	77	260	32 J	160 U	75.2
VCS-OU3-SO022/0-0.5	1.1	0 - 0.5	12/7/2013	2013	130 J	88 J	140 J	340	1,100	2,300	4,100	1,100	160 U	74.2
VCS-OU3-SO022/0.5-1	1.1	0.5 - 1	12/7/2013	2013	49 J	36 J	160	110	500	900	1,800	220	160 U	77.3
VCS-OU3-SO022/1-1.4	1.1	1 - 1.4	12/7/2013	2013	19 U	19 U	19 U	19 U	48 J	38 J	86	11 UJ	160 U	74.6
VCS-OU3-SO023/0-0.5	1.1	0 - 0.5	12/4/2013	2013	440 J	170 U	2,000	540 J	1,800	9,400	14,000	930	390 J	81.3
VCS-OU3-SO023/0.5-1-FD	1.1	0.5 - 1	12/4/2013	2013	670	160 U	1,600 J	490 J	1,500	6,300 J	11,000 J	390 J	300 J	85.9
VCS-OU3-SO023/0.5-1	1.1	0.5 - 1	12/4/2013	2013	590 J	410 U	3,500 J	760 J	1,300 J	20,000 J	26,000 J	570 J	260 J	85.4
VCS-OU3-SO023/1-1.75	1.1	1 - 1.75	12/4/2013	2013	82	37 J	160 J	60	310	650	1,300	30 J	150 U	79.4
VCS-OU3-SO024/0-0.5	1.1	0 - 0.5	12/5/2013	2013	1,500 J	370 J	49 UJ	1,500 J	700 J	560 J	4,600 J	530	170 U	70.4
VCS-OU3-SO024/0-0.5-FD	1.1	0 - 0.5	12/5/2013	2013	1,800	370 J	2,000	1,600	660 J	6,000 J	12,000 J	650	170 U	69.2
VCS-OU3-SO024/0.5-1	1.1	0.5 - 1	12/5/2013	2013	1,200	230 J	830	880	160 J	3,600	6,900	88	160 U	74.4
VCS-OU3-SO024/1-1.4	1.1	1 - 1.4	12/5/2013	2013	84	20 U	81	150	29 J	330	670	12 U	170 U	68.8
VCS-OU3-SO025/0-0.5	1.1	0 - 0.5	12/4/2013	2013	120 J	52 UJ	52 UJ	260 J	540 J	1,000 J	1,900 J	740	180 U	67.1
VCS-OU3-SO025/0.5-1-FD	1.1	0.5 - 1	12/4/2013	2013	17 U	17 U	17 U	17 U	21 U	19 U	21 U	10 U	140 U	83.6
VCS-OU3-SO025/0.5-1	1.1	0.5 - 1	12/4/2013	2013	17 J	17 U	100	35 J	24 J	390	570	33	140 U	83.9
VCS-OU3-SO026/0-0.5	1.1	0 - 0.5	12/4/2013	2013	63 J	20 U	20 U	89	300	66 J	520	1,100	170 U	69.6
VCS-OU3-SO026/0.5-1	1.1	0.5 - 1	12/4/2013	2013	16 U	16 U	16 U	16 U	21 U	19 U	21 U	9 U	140 U	84.4
VCS-OU3-SO027/0-0.5	1.1	0 - 0.5	12/5/2013	2013	910	460	50 U	1,400	1,700	57 U	4,500	720	270 J	69.4
VCS-OU3-SO027/0.5-1	1.1	0.5 - 1	12/5/2013	2013	160	140	20 U	170	390	23 U	860	82	170 U	70.5
VCS-OU3-SO028/0-0.5	1.1	0 - 0.5	12/4/2013	2013	23 U	23 U	23 U	32 J	71 J	26 U	100	350	190 U	61.7
VCS-OU3-SO028/0.5-1	1.1	0.5 - 1	12/4/2013	2013	89	19 U	24 J	100	150	400	760	450	160 U	73.4
VCS-OU3-SO028/1-1.5	1.1	1 - 1.5	12/4/2013	2013	19 J	17 U	17 U	17 J	22 U	19 U	36 J	10 U	150 U	82.3
VCS-OU3-SO079/0-0.5-FD	Athletic Fields	0 - 0.5	8/12/2014	2014	19 U	19 U	19 U	19 U	250	59 J	310	54	160 U	74.6
VCS-OU3-SO079/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	18 U	18 U	18 U	18 U	250	65 J	320	60	160 U	76.3
VCS-OU3-SO080/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	20 U	20 U	20 U	20 U	390	200	590	250	180 U	68.7
VCS-OU3-SO081/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	96 J	45 J	57 J	270	880	1,800	3,100	1,300	170 U	70.3
VCS-OU3-SO082/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	41 UJ	76 J	400 J	99 J	2,500 J	2,100 J	5,200 J	280	160 J	85.7
VCS-OU3-SO083/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	17 U	29 J	56	39 J	710	170	1,000	140	150 U	81.9
VCS-OU3-SO084/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 U	24 J	29 J	360	370	780	42	130 U	90.4
VCS-OU3-SO085/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 U	15 U	15 U	75	26 J	100	17 J	130 U	92.7
VCS-OU3-SO086/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	16 U	16 U	16 U	16 U	250	76	330	20 J	130 U	88.9
VCS-OU3-SO087/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	18 U	18 U	18 U	18 U	23 U	21 U	23 U	10 U	160 U	76.3
VCS-OU3-SO088/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	18 U	18 U	18 U	18 U	83	21 U	83	190	160 U	77.0
VCS-OU3-SO089/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 U	33 J	15 U	450	80	560	43	130 U	91.6
VCS-OU3-SO090/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	18 U	18 U	18 U	18 U	580	69	650	38	190 J	79.1
VCS-OU3-SO091/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	17 U	17 U	42 J	17 U	800	190	1,000	82	280 J	79.9
VCS-OU3-SO092/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	18 J	50	15 U	840	260	1,200	230	130 U	91.0
VCS-OU3-SO093/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	31 U	31 U	120	31 U	1,900	700	2,700	250	130 U	88.5
VCS-OU3-SO094/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	16 U	16 U	94	38 J	970	560	1,700	160	130 U	89.2
VCS-OU3-SO095/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	160 U	160 U	970	160 U	8,000	3,200	12,000	220	140 U	86.7
VCS-OU3-SO095/0-0.5-FD	Athletic Fields	0 - 0.5	8/12/2014	2014	160 U	160 U	1,100	160 U	9,100	3,300	14,000	190	140 U	86.7

Table 2 Floodplain RI Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Station ID	Floodplain Identifier	Depth Interval	Date	Sampling Event	2,4'-DDD (µg/kg)	2,4'-DDE (µg/kg)	2,4'-DDT (µg/kg)	4,4'-DDD (µg/kg)	4,4'-DDE (µg/kg)	4,4'-DDT (µg/kg)	DDT Total (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)	Solids (percent)
VCS-OU3-SO096/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	290 J	290 J	1,600	310 J	9,100	4,300	16,000	130	370 J	76.7
VCS-OU3-SO097/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	37 U	37 U	190	37 U	1,700	830	2,700	39	160 U	75.8
VCS-OU3-SO098/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	33 U	47 J	200	74 J	1,900	1,100	3,300	280	140 U	85.9
VCS-OU3-SO099/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	79 U	150 J	900	150 J	5,300	3,300	9,800	88	130 U	88.9
VCS-OU3-SO100/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	450 U	450 U	7,300	1,100 J	3,800	27,000	39,000	26 J	150 U	77.0
VCS-OU3-SO101/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	33 U	33 U	95 J	33 U	1,300	630	2,000	340	140 U	83.2
VCS-OU3-SO102/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	16 U	16 U	16 U	16 U	550	100	650	12 J	140 U	85.7
VCS-OU3-SO103/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	39 U	39 U	110 J	230	1,700	640	2,700	200	170 U	72.3
VCS-OU3-SO104/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 U	15 U	15 U	37 J	18 U	37 J	9 U	130 U	91.0
VCS-OU3-SO105/0-0.5	Athletic Fields	0 - 0.5	8/13/2014	2014	16 U	16 U	26 J	16 U	570	470	1,100	54	140 U	84.9
VCS-OU3-SO106/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	37 J	41 J	80 J	37 J	750	230	1,200	90	140 U	86.3
VCS-OU3-SO107/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 U	15 U	15 U	20 U	17 U	20 U	9 U	130 U	91.9
VCS-OU3-SO108/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	31 J	33 J	130	16 U	1,300	340	1,800	27 J	130 U	89.5
VCS-OU3-SO109/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	94 J	36 U	240	100 J	1,900	1,400	3,700	110	160 U	76.3
VCS-OU3-SO109/0-0.5-FD	Athletic Fields	0 - 0.5	8/12/2014	2014	90 J	37 U	270	110 J	2,100	1,700	4,300	98	160 U	75.9
VCS-OU3-SO110/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	30 U	30 U	130 J	120 J	1,600	710	2,600	150	130 J	92.3
VCS-OU3-SO111/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	34 U	43 J	140	34 U	1,400	720	2,300	360	140 U	82.4
VCS-OU3-SO111/0-0.5-FD	Athletic Fields	0 - 0.5	8/12/2014	2014	57 J	48 J	140	86 J	1,400	890	2,600	390	140 U	83.1
VCS-OU3-SO112/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	43 J	26 J	86	84	610	1,100	1,900	450	140 J	83.8
VCS-OU3-SO113/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	27 J	16 J	34 J	34 J	210	240	560	640	140 U	86.6
VCS-OU3-SO114/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 J	37 J	15 U	570	170	790	470	130 U	93.1
VCS-OU3-SO115/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	220 J	82 U	390	260 J	3,000	1,800	5,700	570	160 J	85.1
VCS-OU3-SO116/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	88 J	44 J	83 J	93 J	960 J	750 J	2,000 J	700	150 U	81.6
VCS-OU3-SO117/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	670 J	430 U	980 J	1,000 J	1,800 J	23,000	27,000	1,500	440 J	80.8
VCS-OU3-SO118/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	40 J	23 J	65	73	540	430	1,200	310	150 U	78.9
VCS-OU3-SO119/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	900 U	900 U	7,900	900 U	2,700 J	29,000	40,000	450	150 U	77.5
VCS-OU3-SO120/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	83 U	83 U	290	230 J	2,100	4,900	7,500	440	140 U	83.3
VCS-OU3-SO121/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	82 U	82 U	390	82 U	3,800	1,300	5,500	310	140 U	85.2
VCS-OU3-SO122/0-0.5-FD	Athletic Fields	0 - 0.5	8/12/2014	2014	30 U	30 U	70 J	30 U	1,200	580 J	1,900	250	130 U	92.0
VCS-OU3-SO122/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	31 U	31 U	92 J	57 J	1,500	840 J	2,500	300	130 J	90.1
VCS-OU3-SO123/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	33 U	33 U	150	33 U	1,300	530	2,000	310	140 U	84.6
VCS-OU3-SO124/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 U	38 J	200	410	700	1,300	150	130 U	94.1
VCS-OU3-SO125/0-0.5-FD	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 U	15 U	15 U	19 U	17 U	19 U	58	130 U	92.7
VCS-OU3-SO125/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 U	15 U	15 U	20 U	17 U	20 U	78	130 U	92.0
VCS-OU3-SO126/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	16 U	16 U	16 U	16 U	150	18 J	170	220	130 U	90.0
VCS-OU3-SO127/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 U	15 U	15 U	330	24 J	350	270	130 U	90.3
VCS-OU3-SO128/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	32 J	17 U	17 U	42 J	390	240	700	410	150 U	80.4
VCS-OU3-SO129/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	16 U	16 U	42 J	16 U	460	200	700	230	130 U	89.3
VCS-OU3-SO130/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	57 J	17 U	32 J	45 J	940	130	1,200	380	150 U	80.1
VCS-OU3-SO131/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	72 J	33 U	33 U	33 U	1,100	120 J	1,300	250	140 U	83.1
VCS-OU3-SO132/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	50 J	18 U	110	38 J	1,000	290	1,500	220	150 U	79.2
VCS-OU3-SO133/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	65	17 U	160	43 J	1,100	320	1,700	340	140 U	83.4
VCS-OU3-SO134/0-0.5	Athletic Fields	0 - 0.5	8/12/2014	2014	15 U	15 U	15 U	15 U	81	17 U	81	9 U	130 U	93.1
VCS-OU3-SO135/0-0.5	0.5	0 - 0.5	8/13/2014	2014	160 U	160 U	500 J	1,000	4,500	2,600	8,600	270	280 J	86.8
VCS-OU3-SO135/0.5-0.8	0.5	0.5 - 0.8	8/13/2014	2014	160 U	160 U	390 J	160 U	3,400	1,600	5,400	110	200 J	86.9
VCS-OU3-SO136/0-0.5	0.5	0 - 0.5	8/13/2014	2014	33 U	38 J	150 J	33 U	1,700 J	550 J	2,400 J	490	210 J	84.6
VCS-OU3-SO136/0.5-1	0.5	0.5 - 1	8/13/2014	2014	32 U	32 U	32 U	32 U	570	110 J	680	32	140 U	87.8
VCS-OU3-SO136/1-1.3	0.5	1 - 1.3	8/13/2014	2014	16 U	16 U	16 U	16 U	57 J	18 U	57	9 U	140 U	88.1
VCS-OU3-SO137/0-0.5	0.5	0 - 0.5	8/13/2014	2014	84 U	84 U	84 U	84 U	2,700	1,200	3,900	330	250 J	83.4

Table 2 Floodplain RI Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Station ID	Floodplain Identifier	Depth Interval	Date	Sampling Event	2,4'-DDD (µg/kg)	2,4'-DDE (µg/kg)	2,4'-DDT (µg/kg)	4,4'-DDD (µg/kg)	4,4'-DDE (µg/kg)	4,4'-DDT (µg/kg)	DDT Total (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)	Solids (percent)
VCS-OU3-SO137/0.5-1	0.5	0.5 - 1	8/13/2014	2014	31 U	31 U	83 J	31 U	1,800 J	300 J	2,200 J	94	180 J	90.7
VCS-OU3-SO137/1-1.65	0.5	1 - 1.65	8/13/2014	2014	17 U	17 U	17 U	17 U	410	58 J	470	10 U	140 U	82.3
VCS-OU3-SO138/0-0.5	0.5	0 - 0.5	8/13/2014	2014	150 U	240 J	1,200	150 U	8,800	3,100	13,000	210	240 J	92.8
VCS-OU3-SO138/0.5-1	0.5	0.5 - 1	8/13/2014	2014	160 U	250 J	1,100	160 U	6,700	2,900	11,000	92	190 J	87.7
VCS-OU3-SO138/1-1.7	0.5	1 - 1.7	8/13/2014	2014	82 U	82 U	130 J	82 U	1,600	400	2,100	30 J	140 U	85.7
VCS-OU3-SO139/0-0.5	0.5	0 - 0.5	8/13/2014	2014	170 U	170 U	170 U	170 U	2,800	640	3,400	280	220 J	84.0
VCS-OU3-SO139/0.5-1	0.5	0.5 - 1	8/13/2014	2014	40 UJ	40 UJ	150 J	40 UJ	1,700 J	340 J	2,200 J	62	140 U	87.8
VCS-OU3-SO139/1-1.2	0.5	1 - 1.2	8/13/2014	2014	31 U	31 U	31 U	31 U	480	66 J	550	9 U	130 U	90.6
VCS-OU3-SO140/0-0.5-FD	0.5	0 - 0.5	8/13/2014	2014	410 U	410 U	1,200 J	410 U	6,600	3,200	11,000	240	230 J	85.2
VCS-OU3-SO140/0-0.5	0.5	0 - 0.5	8/13/2014	2014	410 U	410 U	1,200 J	410 U	7,500	3,600	12,000	280	240 J	85.3
VCS-OU3-SO140/0.5-1	0.5	0.5 - 1	8/13/2014	2014	400 U	400 U	1,700	400 U	7,000	3,800	13,000	120	190 J	87.5
VCS-OU3-SO140/1-1.3	0.5	1 - 1.3	8/13/2014	2014	42 U	90 J	330	42 U	2,400	590	3,400	14 J	140 U	83.9
VCS-OU3-SO-172/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	190 U	190 U	2,500	370 J	5,700	11,000	20,000	190 J	300 J	75.3
VCS-OU3-SO-172/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	180 J	160 U	2,900	270 J	3,900	10,000	17,000	120	140 U	87.7
VCS-OU3-SO-172/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	30 U	43 J	380	34 J	1,400	690	2,500	9 U	130 U	92.4
VCS-OU3-SO-172/2 - 2.9	Athletic Fields	2 - 2.9	1/26/2015	2015	17 U	17 U	79 J	17 U	590 J	130 J	800	10 UJ	150 U	81.4
VCS-OU3-SO-173/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	92 U	92 U	360	92 U	3,200	1,500	5,100	350	160 U	75.6
VCS-OU3-SO-173/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	17 U	26 J	120	17 U	1,000 J	300 J	1,400	9.6 UJ	140 U	83.7
VCS-OU3-SO-173/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	15 U	15 U	15 U	15 U	180	26 J	210	9 U	130 U	90.9
VCS-OU3-SO-174/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	73 U	73 J	590	84 J	4,400	1,700	6,800	55	160 U	76.1
VCS-OU3-SO-174/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	30 U	30 U	190	30 U	1,400	410	2,000	8.5 U	130 U	94.0
VCS-OU3-SO-174/1 - 2-FD	Athletic Fields	1 - 2	1/26/2015	2015	15 U	15 U	39 J	15 U	400	50 J	490 J	9 U	130 U	91.8
VCS-OU3-SO-174/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	15 U	15 U	62 J	15 U	540	91 J	690 J	9 U	130 U	90.0
VCS-OU3-SO-175/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	560 J	200 U	5,500	1,200	8,600	12,000	28,000	120	360 J	71.6
VCS-OU3-SO-175/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	400 U	400 U	9,900	740 J	4,000	26,000	41,000	71	230 J	87.2
VCS-OU3-SO-175/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	30 U	30 J	620	51 J	880	1,900	3,500	9 U	130 U	93.0
VCS-OU3-SO-175/2 - 2.6	Athletic Fields	2 - 2.6	1/26/2015	2015	16 U	16 U	16 U	16 U	29 J	18 U	29 J	9 U	130 U	89.1
VCS-OU3-SO-176/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	190 U	190 U	1,900	210 J	9,900	5,300	17,000	130	220 J	74.5
VCS-OU3-SO-176/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	240 J	290 J	3,100	270 J	9,600	7,200	21,000	170	300 J	83.2
VCS-OU3-SO-176-FD	Athletic Fields	0.5 - 1	1/26/2015	2015	320 J	320 J	3,800	2,900 J	9,800	9,000	26,000	180	500 J	82.7
VCS-OU3-SO-176/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	79 U	140 J	1,400	140 J	4,300	5,200	11,000	59	230 J	88.8
VCS-OU3-SO-176/2 - 2.56	Athletic Fields	2 - 2.56	1/26/2015	2015	16 U	16 U	16 U	16 U	21 U	18 U	21 U	9 U	140 U	86.7
VCS-OU3-SO-177/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	97 U	97 U	440	97 U	4,200	1,500	6,100	25 J	170 J	72.7
VCS-OU3-SO-177/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	32 U	41 J	330	50 J	2,000	870	3,300	9 U	140 U	88.7
VCS-OU3-SO-177/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	16 U	16 U	16 J	16 U	180	44 J	240	9 U	140 U	85.7
VCS-OU3-SO-178/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	360 UJ	360 UJ	8,300	670 J	5,300	19,000	33,000	73 J	160 J	77.0
VCS-OU3-SO-178/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	170 U	170 U	1,700	270 J	3,500	10,000	15,000	9.9 U	150 U	80.8
VCS-OU3-SO-178/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	33 U	33 U	310	43 J	1,600	900	2,900	9 U	140 U	85.0
VCS-OU3-SO-178/2 - 3	Athletic Fields	2 - 3	1/26/2015	2015	18 U	18 U	45 J	18 U	310	79	430	10 U	160 U	75.8
VCS-OU3-SO-179/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	18 U	18 U	43 J	18 U	320	190	550	10 U	150 U	78.4
VCS-OU3-SO-179/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	16 U	16 U	96	19 J	540	320	980	9 U	140 U	85.8
VCS-OU3-SO-179/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	28 J	24 J	180 J	35 J	980	330 J	1,600 J	9 U	130 U	92.3
VCS-OU3-SO-179/1 - 2-FD	Athletic Fields	1 - 2	1/26/2015	2015	50 J	33 J	280 J	63 J	1,200	960 J	2,600 J	9 U	130 U	92.0
VCS-OU3-SO-179/2 - 3	Athletic Fields	2 - 3	1/26/2015	2015	16 U	16 U	20 J	16 U	200	38 J	260	9 U	130 U	89.1
VCS-OU3-SO-180/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	18 U	18 U	18 U	18 U	50 J	29 J	79 J	10 U	160 U	77.0
VCS-OU3-SO-180/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	16 U	16 U	16 U	16 U	21 U	19 U	21 U	9 U	140 U	85.6
VCS-OU3-SO-180/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	15 U	15 U	15 U	15 U	20 U	18 U	20 U	9 U	130 U	91.7
VCS-OU3-SO-181/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	560 J	360 U	5,500	560 J	13,000	19,000	39,000	190 J	150 U	78.9
VCS-OU3-SO-181/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	330 U	380 J	5,900	570 J	8,000	23,000	38,000	31 J	140 U	84.7

Table 2 Floodplain RI Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Station ID	Floodplain Identifier	Depth Interval	Date	Sampling Event	2,4'-DDD (µg/kg)	2,4'-DDE (µg/kg)	2,4'-DDT (µg/kg)	4,4'-DDD (µg/kg)	4,4'-DDE (µg/kg)	4,4'-DDT (µg/kg)	DDT Total (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)	Solids (percent)
VCS-OU3-SO-181/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	16 U	21 J	140	16 U	850	210	1,200	9 U	140 U	87.7
VCS-OU3-SO-182/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	920 U	920 U	17,000	1,400 J	16,000	48,000	82,000	470 J	290 J	75.9
VCS-OU3-SO-182/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	170 J	190 J	2,100 J	140 J	5,500 J	5,400 J	14,000 J	21 J	140 U	84.2
VCS-OU3-SO-182/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	15 U	24 J	210	17 J	900	400	1,600	9 U	130 U	91.5
VCS-OU3-SO-182/2 - 2.7	Athletic Fields	2 - 2.7	1/26/2015	2015	15 U	15 U	22 J	15 U	140	51 J	210	9 U	130 U	90.6
VCS-OU3-SO-183/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	91 UJ	91 UJ	540 J	91 UJ	6,300 J	1,900 J	8,700 J	200	160 U	77.6
VCS-OU3-SO-183/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	40 U	40 U	230	40 U	2,500	620	3,400	37 J	140 U	86.7
VCS-OU3-SO-183/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	16 U	16 U	41 J	16 U	690	150	880	9 U	140 U	88.8
VCS-OU3-SO-184/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	280 J	170 J	1,100 J	220 J	7,700 J	2,600 J	12,000 J	250 J	170 U	70.9
VCS-OU3-SO-184/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	50 J	62 J	480 J	56 J	2,000 J	1,500 J	4,100 J	9 U	130 U	89.3
VCS-OU3-SO-184/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	16 U	16 U	21 J	16 U	220	51 J	290	9 U	140 U	86.1
VCS-OU3-SO-185/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	49 U	49 U	49 U	140 J	2,900	84 J	3,100	210	270 J	71.4
VCS-OU3-SO-185/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	39 UJ	39 UJ	120 J	39 UJ	1,400 J	380 J	1,900 J	11 J	130 U	88.5
VCS-OU3-SO-185/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	16 U	16 U	16 U	16 U	150	32 J	180	9 U	140 U	87.6
VCS-OU3-SO-186/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	120 J	96 UJ	440 J	120 J	6,600 J	1,900 J	9,200 J	240	360 J	72.4
VCS-OU3-SO-186/0.5 - 1-FD	Athletic Fields	0.5 - 1	1/26/2015	2015	83 UJ	83 UJ	450 J	83 UJ	5,300 J	1,300 J	7,100 J	50 J	180 J	83.2
VCS-OU3-SO-186/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	86 UJ	86 UJ	520 J	86 UJ	6,000 J	1,800 J	8,300 J	140 J	200 J	81.5
VCS-OU3-SO-186/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	15 U	15 U	29 J	15 U	440	90 J	560	9 UJ	130 U	91.1
VCS-OU3-SO-187/0 - 0.5	Athletic Fields	0 - 0.5	1/27/2015	2015	18 U	18 U	18 U	18 U	69 J	48 J	120	74	150 U	78.6
VCS-OU3-SO-187/0.5 - 1	Athletic Fields	0.5 - 1	1/27/2015	2015	17 U	17 U	17 U	17 U	65 J	31 J	96	12 J	140 U	83.3
VCS-OU3-SO-187/1 - 2	Athletic Fields	1 - 2	1/27/2015	2015	17 U	17 U	17 U	17 U	58 J	24 J	82	10 U	140 U	82.4
VCS-OU3-SO-188/0 - 0.5	Athletic Fields	0 - 0.5	1/27/2015	2015	62	54 J	170	62	860	580	1,800	570	380 J	77.4
VCS-OU3-SO-188/0.5 - 1	Athletic Fields	0.5 - 1	1/27/2015	2015	16 U	16 U	20 J	16 U	140	110	270	180	140 U	88.8
VCS-OU3-SO-188/1 - 2	Athletic Fields	1 - 2	1/27/2015	2015	17 U	17 U	17 U	17 U	51 J	27 J	78	12 J	150 U	81.4
VCS-OU3-SO-189/0 - 0.5	Athletic Fields	0 - 0.5	1/27/2015	2015	200	61 J	230	230	840	2,000	3,600	1,300	710	73.3
VCS-OU3-SO-189/0.5 - 1	Athletic Fields	0.5 - 1	1/27/2015	2015	290	37 J	78	240	220	800	1,700	1,100	710	81.2
VCS-OU3-SO-189/1 - 2	Athletic Fields	1 - 2	1/27/2015	2015	18 U	18 U	18 J	26 J	240	99	380	10 U	160 U	76.6
VCS-OU3-SO-190/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	130 J	48 J	180 J	170	1,200	1,700	3,400	1,100	570 J	72.6
VCS-OU3-SO-190/0 - 0.5-FD	Athletic Fields	0 - 0.5	1/26/2015	2015	140 J	54 J	250 J	180	1,300	1,800	3,700	1,000	440 J	73.8
VCS-OU3-SO-190/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	24 J	16 U	45 J	33 J	370	360	830	120	140 U	84.4
VCS-OU3-SO-190/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	97	45 J	100	66 J	1,200	440	1,900	12 U	180 U	66.4
VCS-OU3-SO-191/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	20 U	20 J	20 U	40 J	610	23 U	670	120	190 J	70.7
VCS-OU3-SO-191/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	21 J	16 U	30 J	34 J	510	170	770	55	140 U	86.7
VCS-OU3-SO-191/1 - 2-FD	Athletic Fields	1 - 2	1/26/2015	2015	32 J	18 U	26 J	42 J	420 J	110 J	630 J	11 U	160 U	75.4
VCS-OU3-SO-191/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	49 J	19 U	78 J	67 J	600 J	580 J	1,400 J	11 U	160 U	73.7
VCS-OU3-SO-192/0 - 0.5	Athletic Fields	0 - 0.5	1/26/2015	2015	4,100	1,300 J	1,700	14,000	5,900	6,300	33,000	710	860	74.2
VCS-OU3-SO-192/0.5 - 1-FD	Athletic Fields	0.5 - 1	1/26/2015	2015	190	86 J	400 J	130 J	2,300	1,500 J	4,600	340 J	260 J	80.4
VCS-OU3-SO-192/0.5 - 1	Athletic Fields	0.5 - 1	1/26/2015	2015	240	93 J	550 J	160	2,300	2,400 J	5,700	600 J	300 J	80.8
VCS-OU3-SO-192/1 - 2	Athletic Fields	1 - 2	1/26/2015	2015	560	170 J	1,200	300	2,300	3,500	8,000	46 J	150 U	81.8
VCS-OU3-SO-192/2 - 3	Athletic Fields	2 - 3	1/26/2015	2015	16 U	16 U	16 U	16 U	46 J	21 J	67 J	9 U	140 U	86.2
VCS-OU3-SO-193/0 - 0.5-FD	Athletic Fields	0 - 0.5	1/27/2015	2015	90 U	90 U	240 J	90 U	3,400	900	4,500	260	300 J	77.9
VCS-OU3-SO-193/0 - 0.5	Athletic Fields	0 - 0.5	1/27/2015	2015	89 UJ	89 UJ	290 J	89 J	4,200 J	1,000 J	5,600 J	310	350 J	78.9
VCS-OU3-SO-193/0.5 - 1	Athletic Fields	0.5 - 1	1/27/2015	2015	210 J	240 J	1,600	160 U	7,200	4,800	14,000	57	270 J	84.3
VCS-OU3-SO-193/1 - 2	Athletic Fields	1 - 2	1/27/2015	2015	15 U	24 J	100	15 U	920	100	1,100	9 U	130 U	91.3
VCS-OU3-SO-194/0 - 0.5	Athletic Fields	0 - 0.5	1/27/2015	2015	100 J	91 U	320	140 J	2,400	1,700	4,700	440	420 J	76.4
VCS-OU3-SO-194/0.5 - 1	Athletic Fields	0.5 - 1	1/27/2015	2015	210 J	170 J	530 J	130 J	4,500 J	1,100 J	6,600 J	34 J	150 U	81.0
VCS-OU3-SO-194/1 - 2	Athletic Fields	1 - 2	1/27/2015	2015	31 J	33 J	72	31 J	1,100	260	1,500	10 U	140 U	83.2
VCS-OU3-SO-195/0 - 0.5	Athletic Fields	0 - 0.5	1/27/2015	2015	120	54 J	200	140	1,500	1,300	3,300	600 J	170 U	70.2
VCS-OU3-SO-195/0.5 - 1	Athletic Fields	0.5 - 1	1/27/2015	2015	210	83	140	98	1,300	1,000	2,800	150 J	150 U	79.4

Table 2 Floodplain RI Sample Results Summary - DDT, PBB, and HBB
Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Station ID	Floodplain Identifier	Depth Interval	Date	Sampling Event	2,4'-DDD (µg/kg)	2,4'-DDE (µg/kg)	2,4'-DDT (µg/kg)	4,4'-DDD (µg/kg)	4,4'-DDE (µg/kg)	4,4'-DDT (µg/kg)	DDT Total (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)	Solids (percent)
VCS-OU3-SO-195/1 - 2	Athletic Fields	1 - 2	1/27/2015	2015	980 J	230 J	420 J	320 J	3,000 J	1,500 J	6,500 J	17 J	150 U	81.1
VCS-OU3-SO-195/2 - 3	Athletic Fields	2 - 3	1/27/2015	2015	23 J	18 U	18 U	18 U	75 J	60 J	160	10 U	150 U	79.3
VCS-OU3-SO-196/0 - 0.5	Athletic Fields	0 - 0.5	1/27/2015	2015	130	49 J	76	260	1,300	540	2,400	760	360 J	65.5
VCS-OU3-SO-196/0.5 - 1	Athletic Fields	0.5 - 1	1/27/2015	2015	100	37 J	130	110	730	920	2,000	740	180 J	75.8
VCS-OU3-SO-196/1 - 2	Athletic Fields	1 - 2	1/27/2015	2015	160	63	61	82	540	310	1,200	11 U	160 U	75.4
VCS-OU3-SO-197/0 - 0.5	Athletic Fields	0 - 0.5	1/27/2015	2015	63	26 J	130	97	770	830	1,900	540	240 J	75.6
VCS-OU3-SO-197/0.5 - 1	Athletic Fields	0.5 - 1	1/27/2015	2015	450 J	99 J	450 J	360 J	1,200 J	1,800 J	4,400 J	2,900 J	820	75.2
VCS-OU3-SO-197/1 - 2	Athletic Fields	1 - 2	1/27/2015	2015	120	41 J	27 J	63	340	260	850	39 J	150 U	82.1
VCS-OU3-SO-198/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	35 J	19 U	70	59 J	430	610	1,200	420	160 U	74.3
VCS-OU3-SO-198/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	250 J	68 J	290 J	340 J	1,200 J	2,400 J	4,500 J	1,500 J	1,100	72.7
VCS-OU3-SO-198/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	200	46 J	81 J	370 J	490	1,000	2,200	1,100 J	260 J	74.1
VCS-OU3-SO-199/0 - 0.5	Athletic Fields	0 - 0.5	1/27/2015	2015	120	49 J	110	180	820	1,600	2,900	840	270 J	65.6
VCS-OU3-SO-199/0.5 - 1	Athletic Fields	0.5 - 1	1/27/2015	2015	40 J	18 U	38 J	53 J	250	150	530	140	150 U	79.1
VCS-OU3-SO-199/1 - 2	Athletic Fields	1 - 2	1/27/2015	2015	620	90	28 J	140	150	230	1,300	11 U	170 U	70.9
VCS-OU3-SO-200/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	150	53 J	260	160	1,600	2,100	4,300	640	160 U	74.8
VCS-OU3-SO-200/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	490	170	320	270	2,000	2,000	5,300	620	160 U	76.7
VCS-OU3-SO-200/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	50 J	25 J	17 U	37 J	210	67	390	10 U	150 U	80.6
VCS-OU3-SO-201/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	87 J	38 U	110 J	140 J	810 J	1,500 J	2,600 J	950	160 U	73.7
VCS-OU3-SO-201/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	360 J	180 U	420 J	440 J	910	5,000	7,100	2,300 J	340 J	76.6
VCS-OU3-SO-201/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	34 J	18 U	18 U	34 J	150	150	370	130	150 U	77.9
VCS-OU3-SO-202/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	62 J	22 J	64 J	120 J	740 J	910 J	1,900 J	1,200	170 U	71.2
VCS-OU3-SO-202/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	130	17 U	49 J	220	310	450	1,200	610	430 J	81.6
VCS-OU3-SO-202/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	180 J	85	18 U	110	270	170 J	820	10 U	150 U	77.3
VCS-OU3-SO-203/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	49 J	24 J	82	54 J	1,200	590	2,000	480	160 U	73.2
VCS-OU3-SO-203/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	150 J	110 J	280 J	120 J	2,500 J	1,100 J	4,300 J	680	150 U	76.9
VCS-OU3-SO-203/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	44 J	34 J	63	29 J	660	130	960	51	150 U	81.8
VCS-OU3-SO-204/0 - 0.5-FD	Athletic Fields	0 - 0.5	1/28/2015	2015	60 J	33 J	110	79	1,100	870	2,300	390	160 U	72.7
VCS-OU3-SO-204/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	72	35 J	120	94	1,200	1,100	2,600	400	160 U	74.2
VCS-OU3-SO-204/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	140 J	86 U	320 J	170 J	1,300 J	3,400 J	5,300 J	630	150 U	80.4
VCS-OU3-SO-204/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	71	34 J	44 J	42 J	630	140	960	34	150 U	81.5
VCS-OU3-SO-205/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	36 U	36 U	130	36 U	1,000	1,000	2,100	290	2,500	78.4
VCS-OU3-SO-205/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	33 U	33 U	67 J	33 U	890	250	1,200	88	140 U	83.9
VCS-OU3-SO-205/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	16 U	21 J	81	16 U	1,000	180	1,300	9 U	140 U	87.0
VCS-OU3-SO-206/0 - 0.5	Athletic Fields	0 - 0.5	1/27/2015	2015	18 U	18 U	50 J	25 J	730	430	1,200	210	230 J	79.1
VCS-OU3-SO-206/0.5 - 1	Athletic Fields	0.5 - 1	1/27/2015	2015	16 U	16 U	16 U	16 U	180	28 J	210	9 U	140 U	85.3
VCS-OU3-SO-206/1 - 2	Athletic Fields	1 - 2	1/27/2015	2015	15 U	15 U	15 U	15 U	71	23 J	94	8 U	130 U	96.0
VCS-OU3-SO-207/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	17 U	17 U	29 J	17 U	470	290	790	280	140 U	82.9
VCS-OU3-SO-207/0.5 - 1-FD	Athletic Fields	0.5 - 1	1/28/2015	2015	16 U	16 U	16 U	16 U	80 J	18 U	80 J	9 U	140 U	87.2
VCS-OU3-SO-207/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	16 U	16 U	16 U	16 U	110 J	23 J	130 J	11 J	140 U	86.8
VCS-OU3-SO-207/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	16 U	16 U	16 U	16 U	36 J	18 U	36 J	9 U	140 U	88.0
VCS-OU3-SO-208/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	51 J	36 U	87 J	72 J	1,400 J	630 J	2,200 J	690	190 J	77.6
VCS-OU3-SO-208/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	43 J	33 U	240 J	33 U	1,700 J	1,000 J	3,000 J	200	140 U	83.1
VCS-OU3-SO-208/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	15 U	15 U	15 U	15 U	100	20 J	120	9 U	130 U	90.8
VCS-OU3-SO-208/1 - 2-FD	Athletic Fields	1 - 2	1/28/2015	2015	16 U	16 U	16 U	16 U	110	18 J	130	9 U	130 U	89.8
VCS-OU3-SO-209/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	37 J	18 J	120 J	76 J	1,100 J	780 J	2,100 J	600	160 U	76.3
VCS-OU3-SO-209/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	16 U	16 U	33 J	16 U	580 J	150 J	760 J	180	140 U	84.9
VCS-OU3-SO-209/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	16 U	16 U	16 U	16 U	69	18 U	69	9 UJ	130 U	88.8
VCS-OU3-SO-210/0 - 0.5-FD	Athletic Fields	0 - 0.5	1/28/2015	2015	81 J	47 U	200 J	990 J	2,500 J	1,700 J	5,500 J	460	160 U	74.1
VCS-OU3-SO-210/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	190 U	190 U	320 J	190 U	2,700 J	9,400 J	12,000 J	520	290 J	74.9

Table 2 Floodplain RI Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Unit 3 (Downstream)

Station ID	Floodplain Identifier	Depth Interval	Date	Sampling Event	2,4'-DDD (µg/kg)	2,4'-DDE (µg/kg)	2,4'-DDT (µg/kg)	4,4'-DDD (µg/kg)	4,4'-DDE (µg/kg)	4,4'-DDT (µg/kg)	DDT Total (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)	Solids (percent)
VCS-OU3-SO-210/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	45 U	45 U	150	45 U	2,300	1,300	3,800	260	150 U	77.7
VCS-OU3-SO-210/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	17 U	17 U	19 J	17 U	340 J	87 J	450 J	17 J	140 U	84.1
VCS-OU3-SO-211/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	120 J	38 U	100 J	210 J	2,000 J	1,600 J	4,000 J	760	160 U	73.8
VCS-OU3-SO-211/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	25 J	20 J	46 J	33 J	1,200	220	1,500	170	150 U	78.4
VCS-OU3-SO-211/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	17 U	17 U	17 U	17 U	84	19 U	84	10 U	140 U	82.8
VCS-OU3-SO-212/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	69	25 J	33 J	66	800	290	1,300	1,100	170 U	72.8
VCS-OU3-SO-212/0 - 0.5-FD	Athletic Fields	0 - 0.5	1/28/2015	2015	72	25 J	33 J	72	850	300	1,400	1,000	170 U	71.9
VCS-OU3-SO-212/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	440	130 J	190 J	190	2,100	250 J	3,300	300	150 U	77.8
VCS-OU3-SO-212/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	250	70	38 J	120	930	170	1,600	27 J	160 U	73.9
VCS-OU3-SO-213/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	230 J	180 U	410 J	1,000 J	3,200 J	14,000 J	19,000 J	480	150 U	78.0
VCS-OU3-SO-213/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	180	150	170 J	250	2,300	710 J	3,800	170	150 U	78.7
VCS-OU3-SO-213/0.5 - 1-FD	Athletic Fields	0.5 - 1	1/28/2015	2015	180 J	160 J	890 J	260 J	2,300 J	3,100 J	6,900 J	130	160 U	76.9
VCS-OU3-SO-213/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	18 U	18 U	18 U	18 U	110	21 U	110	10 U	160 U	76.9
VCS-OU3-SO-214/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	87 J	53 J	310 J	150 J	2,700 J	1,600 J	4,900 J	470	160 U	75.2
VCS-OU3-SO-214/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	80 J	87 J	280 J	62 J	2,700 J	570 J	3,800 J	110	150 U	81.1
VCS-OU3-SO-214/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	17 U	17 U	20 J	17 U	370 J	51 J	440 J	10 U	150 U	81.1
VCS-OU3-SO-215/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	46 UJ	46 UJ	86 J	110 J	2,000 J	390 J	2,600 J	300 J	160 U	75.9
VCS-OU3-SO-215/0 - 0.5-FD	Athletic Fields	0 - 0.5	1/28/2015	2015	100 J	45 UJ	130 J	150 J	2,300 J	540 J	3,200 J	440 J	270 J	77.0
VCS-OU3-SO-215/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	16 U	16 U	40 J	16 U	720	130	890	35	140 U	84.3
VCS-OU3-SO-215/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	15 U	15 U	15 U	15 U	59 J	17 U	59 J	9 UJ	130 U	91.1
VCS-OU3-SO-216/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	89 UJ	89 UJ	170 J	89 UJ	3,500 J	840 J	4,500 J	330	150 U	78.8
VCS-OU3-SO-216/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	120 J	130 J	520 J	84 UJ	4,800 J	1,000 J	6,600 J	46	140 U	83.2
VCS-OU3-SO-216/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	85 J	110 J	450 J	85 U	2,800 J	780 J	4,200 J	10 J	150 U	81.8
VCS-OU3-SO-217/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	86 J	48 J	70 J	150	1,700	390	2,400	740	160 U	74.8
VCS-OU3-SO-217/0 - 0.5-FD	Athletic Fields	0 - 0.5	1/28/2015	2015	97 J	59 J	70 J	150 J	1,700 J	400 J	2,500 J	770	160 U	74.3
VCS-OU3-SO-217/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	190 U	190 U	610 J	190 U	2,700 J	6,000 J	9,300 J	450	160 U	75.6
VCS-OU3-SO-217/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	19 U	27 J	38 J	27 J	820	110	1,000	49	160 U	72.9
VCS-OU3-SO-218/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	29 J	19 U	24 J	40 J	530	160	780	140	160 U	74.3
VCS-OU3-SO-218/0.5 - 1-FD	Athletic Fields	0.5 - 1	1/28/2015	2015	61	42 J	57 J	49 J	860	240	1,300	110	150 U	81.3
VCS-OU3-SO-218/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	72	47 J	94 J	62	960	300	1,500	140	150 U	80.9
VCS-OU3-SO-218/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	17 U	17 U	17 U	17 U	34 J	20 U	34 J	10 U	150 U	80.8
VCS-OU3-SO-219/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	18 U	18 U	18 U	18 U	50 J	31 J	81	63	160 UJ	76.3
VCS-OU3-SO-219/0 - 0.5-FD	Athletic Fields	0 - 0.5	1/28/2015	2015	18 U	18 U	18 U	18 U	57 J	39 J	96	65	160 U	76.2
VCS-OU3-SO-219/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	16 U	16 U	16 U	16 U	43 J	27 J	70	14 J	140 U	88.0
VCS-OU3-SO-219/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	22 J	17 U	17 U	17 U	59 J	27 J	110	10 U	150 U	80.7
VCS-OU3-SO-220/0 - 0.5-FD	Athletic Fields	0 - 0.5	1/28/2015	2015	16 U	16 U	16 U	16 U	21 U	19 U	21 U	28 J	140 U	85.4
VCS-OU3-SO-220/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	20 U	20 U	20 U	20 U	25 U	23 U	25 U	130 J	170 U	70.9
VCS-OU3-SO-220/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	17 U	17 U	17 U	17 U	22 U	19 U	22 U	14 J	140 U	82.4
VCS-OU3-SO-220/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	17 U	17 U	17 U	17 U	49 J	27 J	76	10 U	150 U	81.1
VCS-OU3-SO-221/0 - 0.5	Athletic Fields	0 - 0.5	1/28/2015	2015	19 U	19 U	19 U	19 U	24 U	21 U	24 U	11 U	160 U	74.6
VCS-OU3-SO-221/0.5 - 1-FD	Athletic Fields	0.5 - 1	1/28/2015	2015	17 U	17 U	17 U	17 U	21 U	19 U	21 U	10 U	140 U	83.8
VCS-OU3-SO-221/0.5 - 1	Athletic Fields	0.5 - 1	1/28/2015	2015	17 U	17 U	17 U	17 U	22 U	19 U	22 U	10 U	150 U	82.2
VCS-OU3-SO-221/1 - 2	Athletic Fields	1 - 2	1/28/2015	2015	16 U	16 U	16 U	16 U	30 J	20 J	50 J	9 U	140 U	87.9

Table 3. Riverbank Soils Sample Results Summary - DDT, PBB, and HBB

Velsicol Chemical/Pine River Superfund Site - Operable Units 3 and 4 (Downstream)

Sample Name	Location	Top of sample (inches)	Bottom of sample (inches)	Depth Interval (feet)	Date	2,4'-DDD (µg/kg)	2,4'-DDE (µg/kg)	2,4'-DDT (µg/kg)	4,4'-DDD (µg/kg)	4,4'-DDE (µg/kg)	4,4'-DDT (µg/kg)	DDT Total (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)	Solids (percent)	TOC (mg/kg)
VCS-OU3-SO229/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/26/2018	380 U	380 U	125 J	297 J	407 J	4800	5,600	--	--	63.7	--
VCS-OU3-SO229/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/26/2018	73.4	63 U	28.8 J	65.5	44.5 J	89.1	300	--	--	75.5	--
VCS-OU3-SO229/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/26/2018	64.7	25.1 J	56.4	115	251	311	820	--	--	92	--
VCS-OU3-SO230/0-2-11181	Athletic Fields/School	0	2	0 - 0.2	11/26/2018	103	24.6 J	78.6	226	580	776	1,800	--	--	81.2	--
VCS-OU3-SO230/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/26/2018	85.2	34.1 J	124	202	833	770	2,000	--	--	81.3	--
VCS-OU3-SO230/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/26/2018	249	92.1 J	62.2	193	419	223	1,200	--	--	86.1	--
VCS-OU3-SO231/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/26/2018	52 U	52 U	50 U	52 U	52 J	32.5 J	85	--	--	90.1	--
VCS-OU3-SO231/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/26/2018	52 U	52 U	49 U	52 U	67 J	58 U	67 U	--	--	92.6	2330
VCS-OU3-SO231/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/26/2018	57 U	57 U	55 U	57 U	74 U	64 U	74 U	--	--	83.7	--
VCS-OU3-SO232/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/26/2018	706	128 J	770	1,210	1,780	3,710	8,300	--	--	77.9	--
VCS-OU3-SO232/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/26/2018	300	100 J	1,380	750	1,340	5,410	9,300	--	--	78.5	--
VCS-OU3-SO232/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/26/2018	320	83 J	830	593	1,060	4,230	7,100	--	--	83.6	--
VCS-OU3-SO233/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	290 U	290 U	134 J	255 J	534	3,140 J	4,100	--	--	81.3	--
VCS-OU3-SO233/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	112 J	300 U	275 J	250 J	1100	3650	5,400	--	--	79.4	--
VCS-OU3-SO233/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	62 U	62 U	25.7 J	36 J	208	147	420	--	--	77.1	--
VCS-OU3-SO234/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	38.3 J	61 U	61.3	128	503	434	1,200	--	--	76	--
VCS-OU3-SO234/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	630 U	630 U	3,460	498 J	367 J	10,700	15,000	--	--	75.7	--
VCS-OU3-SO234/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	53.9 J	59 U	76	115	42 J	835	1,100	--	--	80.7	38100
VCS-OU3-SO235/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	393	114 J	571 J	1,310	1,990	5,360 J	9,700	--	--	77.7	--
VCS-OU3-SO235/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	148 J	270 U	1,100	331	662	2,730	5,000	--	--	86.4	--
VCS-OU3-SO235/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	444 J	590 U	6,700	838	1,380	9,120	18,000	--	--	78.4	--
VCS-OU3-SO236/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	251	85.4 J	322	849	1,930	2,590	6,000	--	--	78.6	--
VCS-OU3-SO236/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	185	40.6 J	118	215	262	349	1,200	--	--	97.1	--
VCS-OU3-SO236/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	2400 J	3000 U	10,900	3,420	3,900 U	58,000	75,000	--	--	78	--
VCS-OU3-SO237/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	258 J	310 U	413	723	1,340	3,600	6,300	--	--	75.5	--
VCS-OU3-SO237/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	352	117 J	742	768	1,980	4,940	8,900	--	--	76.1	--
VCS-OU3-SO237/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	250 J	87.3 J	499	711	1,520	4,720	7,800	--	--	80	--
VCS-OU3-SO238/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	425 J	107 J	89.6 J	356 J	619 J	575 J	2,200 J	--	--	79.2	7930
VCS-OU3-SO238/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	143 J	43.3 J	59 U	94.2 J	199 J	81.4 J	560 J	--	--	77.5	--
VCS-OU3-SO238/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	61 U	61 U	58 U	61 U	43 J	68 U	43 J	--	--	74.1	--
VCS-OU3-SO239/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	32 J	70 U	26.2 J	55.2 J	416 J	142 J	670 J	--	--	65.9	--
VCS-OU3-SO239/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	113 J	43.5 J	46.4 J	157 J	638 J	626 J	1,600 J	--	--	66.8	--
VCS-OU3-SO239/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	1330 J	406 J	80.4 J	1,030 J	1,430 J	1,620 J	5,900 J	--	--	54.3	--
VCS-OU3-SO240/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	51.9 J	62 U	23.3 J	80.4 J	210 J	166 J	530 J	--	--	74	--
VCS-OU3-SO240/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	228	57.1 J	266	328	457	2,660	4,000	--	--	83.5	--
VCS-OU3-SO240/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	448	85.7 J	210	509	305	1,690	3,200	--	--	81.8	--
VCS-OU3-SO241/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	1,740 J	461 J	117 J	1,050 J	1,510 J	950 J	5,800 J	--	--	63	--
VCS-OU3-SO241/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	2,960	541	229	1,850	1,650	2,810	10,000	--	--	67.5	--
VCS-OU3-SO241/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	374 J	105 J	28.4 J	179 J	388 J	130 J	1,200 J	--	--	69.5	--
VCS-OU3-SO242/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	31.3 J	63 U	60 U	52.2 J	203 J	80.9 J	370 J	--	--	75.4	--
VCS-OU3-SO242/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	34.6 J	64 U	349 J	117 J	264 J	889 J	1,700 J	--	--	74.3	--
VCS-OU3-SO242/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	40.9 J	58 U	24.1 J	64.9 J	52.9 J	904 J	1,100 J	--	--	80.1	--
VCS-OU3-SO243/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	108 J	140 U	90.2 J	301	313	2,020	2,800	--	--	66.1	--
VCS-OU3-SO243/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	67.5	65 U	86.4	203	243	1,080	1,700	--	--	74	--
VCS-OU3-SO243/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	94.3 J	22.2 J	25 J	144 J	122 J	607 J	1,000 J	--	--	69.2	--
VCS-OU3-SO244/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	179 J	310 U	332	460	1,110	2,350	4,400	--	--	76.3	--
VCS-OU3-SO244/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	632	109 J	255 J	523	365 J	2,770	4,700	--	--	82.2	--
VCS-OU3-SO244/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	1410 J	3100 U	11100	2810 J	4,000 U	66,600	82,000	--	--	77.2	11800
VCS-OU3-SO245/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	30.3 J	61 U	98.6	73.3	157	726	1,100	--	--	78.8	--
VCS-OU3-SO245/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	58.6 J	22 J	31.7 J	95.2	195	278	680	--	--	81.6	--
VCS-OU3-SO245/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	20.2 J	54 U	52 U	22.4 J	70 U	61 U	43 J	--	--	86	--
VCS-OU3-SO246/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	167	130 U	357	374	697	2,040 J	3,600 J	--	--	69.4	--
VCS-OU3-SO246/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	534	98.4	98.4	655	692	1,020	3,100	--	--	74.9	--
VCS-OU3-SO246/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	1310	1300 U	682 J	1310	1,600 U	8,440	12,000	--	--	75	--
VCS-OU3-SO247/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	437	150 J	714	414	3,250	3,680	8,600	--	--	86.7	--
VCS-OU3-SO247/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	879 J	1000 U	5190	1050	963 J	17,700	26,000	--	--	94.9	--
VCS-OU3-SO247/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	2240 J	2800 U	6240	2710 J	3,600 U	48,700	60,000	--	--	82.6	--
VCS-OU3-SO248/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	2900 U	2900 U	5270 J	1590 J	1,100 J	32,000 J	40,000	--	--	80	27700
VCS-OU3-SO248/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	600 J	270 U	611	522	511 J	3,610 J	5,900 J	--	--	89.8	--
VCS-OU3-SO248/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	678	580 U	1160	895	266 J	12,600	16,000	--	--	80	--
VCS-OU3-SO249/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	56 U	56 U	53 U	25.5 J	62.5 J	104	190	--	--	83.8	--

Table 3. Riverbank Soils Sample Results Summary - DDT, PBB, and HBB
Velsicol Chemical/Pine River Superfund Site - Operable Units 3 and 4 (Downstream)

Sample Name	Location	Top of sample (inches)	Bottom of sample (inches)	Depth Interval (feet)	Date	2,4'-DDD (µg/kg)	2,4'-DDE (µg/kg)	2,4'-DDT (µg/kg)	4,4'-DDD (µg/kg)	4,4'-DDE (µg/kg)	4,4'-DDT (µg/kg)	DDT Total (µg/kg)	HBB (µg/kg)	PBB (BP-6) (µg/kg)	Solids (percent)	TOC (mg/kg)
VCS-OU3-SO249/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	56 U	56 U	53 U	25.5 J	109	71.7	210	--	--	83.9	--
VCS-OU3-SO249/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	54 U	54 U	52 U	54 U	67.8 J	38.4 J	110	--	--	85.8	--
VCS-OU3-SO250/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	64 U	64 U	61 U	39.8 J	101	106	250	--	--	75	--
VCS-OU3-SO250/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	27.2 J	59 U	57 U	51.9 J	128	93.9	300	--	--	79.2	--
VCS-OU3-SO250/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	83.2	57 U	55 U	119	107	235	540	--	--	81.7	--
VCS-OU3-SO251/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	61 U	61 U	22.8 J	35.5 J	122	160	340	--	--	77.6	--
VCS-OU3-SO251/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	60 U	60 U	57 U	20 J	115	72.4	210	--	--	77.6	21600
VCS-OU3-SO251/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	58 U	58 U	56 U	58 U	50.7 J	36.2 J	87	--	--	80.5	--
VCS-OU3-SO252/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	165	120 U	414	341	352	1,400	2,700	--	--	74.6	--
VCS-OU3-SO252/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	659 J	1,200 U	3,700	1,370	1,270 J	13,600	21,000	--	--	75.9	--
VCS-OU3-SO252/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	1,720 J	3,200 U	9,110	3,960	2,640 J	52,500	70,000	--	--	73.9	--
VCS-OU3-SO253/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	55 U	55 U	53 U	55 U	71 U	75.3	75	--	--	85.3	--
VCS-OU3-SO253/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	54 U	54 U	52 U	54 U	70 U	61 U	70 U	--	--	87.4	--
VCS-OU3-SO253/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	52 U	52 U	50 U	52 U	67 U	58 U	67 U	--	--	90.1	--
VCS-OU3-SO254/0-2-1118	Athletic Fields/School	0	2	0 - 0.2	11/27/2018	114 J	70 U	117 J	275	666	1,050	2,200	--	--	67.5	25100
VCS-OU3-SO254/2-6-1118	Athletic Fields/School	2	6	0.2 - 0.5	11/27/2018	58.7 J	120 U	68.5 J	103 J	343	1,150 J	1,700	--	--	79.2	--
VCS-OU3-SO254/6-12-1118	Athletic Fields/School	6	12	0.5 - 1	11/27/2018	600 U	600 U	853 J	600 U	780 U	4,640	5,500 J	--	--	78.4	--
VCS-OU3-SO259/0-2-0719	adjacent to FP-1.1	0	2	0 - 0.2	07/09/2019	62 U	62 U	60 U	41.5 J	106	41.5 J	190	39 J	540 U	75.6	6740
VCS-OU3-SO259/2-6-0719	adjacent to FP-1.1	2	6	0.2 - 0.5	07/09/2019	170	41.1 J	59 U	123	139	128	600	139	540 U	75.8	10200
VCS-OU3-SO259/6-12-0719	adjacent to FP-1.1	6	12	0.5 - 1	07/09/2019	1,800	426 J	300 U	1,280	465	3,020	7,000	57 J	540 U	77.3	--
VCS-OU3-SO260/0-2-0719	adjacent to FP-1.1	0	2	0 - 0.2	07/09/2019	58 U	58 U	56 U	58 U	75 U	66 U	75 U	32 U	510 U	81.3	--
VCS-OU3-SO260/2-6-0719	adjacent to FP-1.1	2	6	0.2 - 0.5	07/09/2019	57 U	57 U	54 U	57 U	73 U	64 U	73 U	31 U	500 U	80.5	--
VCS-OU3-SO260/6-12-0719	adjacent to FP-1.1	6	12	0.5 - 1	07/09/2019	59 U	59 U	57 U	59 U	77 U	67 U	77 U	32 U	520 U	78.4	--
VCS-OU3-SO261/0-2-0719	adjacent to FP-1.1	0	2	0 - 0.2	07/09/2019	78.1	59 U	56 U	24.4 J	41.5 J	66 U	140	42 J	510 U	79.3	--
VCS-OU3-SO261/2-6-0719	adjacent to FP-1.1	2	6	0.2 - 0.5	07/09/2019	100	59 U	56 U	36.6 J	43.9 J	66 U	180	32 U	510 U	78.2	3790
VCS-OU3-SO261/6-12-0719	adjacent to FP-1.1	6	12	0.5 - 1	07/09/2019	63 U	63 U	61 U	63 U	82 U	71 U	82 U	34 U	550 U	73.4	--
VCS-OU3-SO262/0-2-0719	adjacent to FP-1.1	0	2	0 - 0.2	07/09/2019	58 U	58 U	56 U	33.9 J	70.2 J	29 J	130	31 U	510 U	77.1	--
VCS-OU3-SO262/2-6-0719	adjacent to FP-1.1	2	6	0.2 - 0.5	07/09/2019	22.7 J	61 U	58 U	50.5 J	55.5 J	189	320	33 U	530 U	75.2	--
VCS-OU3-SO262/6-12-0719	adjacent to FP-1.1	6	12	0.5 - 1	07/09/2019	36.3 J	62 U	60 U	44.1 J	41.5 J	44.1 J	170	34 U	550 U	73.8	--
VCS-OU3-SO263/0-2-0719	adjacent to FP-1.1	0	2	0 - 0.2	07/09/2019	61 U	61 U	59 U	61 U	79 U	69 U	79 U	33 U	540 U	75.6	--
VCS-OU3-SO263/2-6-0719	adjacent to FP-1.1	2	6	0.2 - 0.5	07/09/2019	60 U	60 U	58 U	60 U	78 U	68 U	78 U	33 U	530 U	76.8	--
VCS-OU3-SO263/6-12-0719	adjacent to FP-1.1	6	12	0.5 - 1	07/09/2019	84 U	84 U	81 U	84 U	110 U	95 U	110 U	46 U	740 U	55.8	29300
VCS-OU3-SO264/0-2-0719	adjacent to FP-1.1	0	2	0 - 0.2	07/09/2019	37.1 J	68 U	114	117	148	402	820	322	710	69.9	--
VCS-OU3-SO264/2-6-0719	adjacent to FP-1.1	2	6	0.2 - 0.5	07/09/2019	62.9 J	140 U	74.4 J	229	349	2530	3,200	918	412 J	65.1	--
VCS-OU3-SO264/6-12-0719	adjacent to FP-1.1	6	12	0.5 - 1	07/09/2019	118	42 J	64 U	252	252	576	1,200	1,510	607	69.6	--