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Record of Decision

Lane Street Ground Water Contamination Site
Elkhart Township, Elkhart County, Indiana

EPA ID: INN000510229

United States Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

August 2016

Acronyms

µg/L	Microgram Per Liter
µg/m3	Microgram Per Cubic Meter
1,1-DCA	1,1-Dichloroethane
amsl	Above Mean Sea Level
ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substances Disease Registry
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
cis-1,2-DCE	cis-1,2-Dichloroethene
cm/s	Centimeter Per Second
CO2	Carbon Dioxide
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CSIA	Compound Specific Isotope Analysis
CSM	Conceptual Site Model
CVOC	Chlorinated Volatile Organic Compound
DCA	Dichloroethane
DCE	Dichloroethene
DHC	*Dehalococcoides Ethenogenes*
EA	Exposure Area
EA 1	Industrial Exposure Area
EA 2	Residential Exposure Area
EAD	Enhanced Anaerobic Dechlorination
ECHD	Elkhart County Health Department
ELCR	Excess Lifetime Cancer Risk
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
Flexsteel	Flexsteel Industries, Inc.
FS	Feasibility Study
ft	Feet
ft/day	Feet Per Day
ft^2/day	Square Feet Per Day
ft/s	Feet Per Second
GAC	Granular Activated Carbon

Geocel	Geocel Corporation
HHRA	Human Health Risk Assessment
HI	Hazard Index
HRS	Hazard Ranking System
IC	Institutional Control
ICIAP	Institutional Control Implementation and Assurance Plan
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
IRIS	Integrated Risk Information System
K	Hydraulic conductivity
LEL	Lower Explosive Limit
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
MW	Monitoring Well
NAVD	North American Vertical Datum
NCP	National Oil and Hazardous Substance Contingency Plan
NGVD	National Geodetic Vertical Datum
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
Pace	Pace Analytical Energy Services, LLC
PCE	Tetrachloroethene
POTW	Publicly-Owned Treatment Works
RAL	Remedial Action Level
RAO	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
RI/FS	Remedial Investigation and Feasibility Study
RISC	Risk Integrated System of Closure
RME	Reasonable Maximum Exposure
Roberts	Roberts Environmental Services, LLC
ROD	Record of Decision
RSL	Regional Screening Level
SARA	Superfund Amendments and Reauthorization Act
Site	Lane Street Ground Water Contamination Site
SLERA	Screening-Level Ecological Risk Assessment
SSL	Site Screening Level

START	Superfund Technical Assessment and Response Team
TCA	Trichloroethane
TCE	Trichloroethene
THM	Trihalomethane
U.S.	United States
USGS	United States Geological Survey
VAS	Vertical Aquifer Sampling
VI	Vapor Intrusion
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound
VRP	Voluntary Remediation Program
WESTON	Weston Solutions, Inc.
WQC	Water Quality Criteria

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APPENDICES

Part 1. Declaration

A. Site Name and Location

Lane Street Ground Water Contamination Superfund Site
Elkhart Township, Elkhart County, Indiana
CERCLIS ID# INN000510229

B. Statement of Basis and Purpose

This Record of Decision (ROD) presents the U.S. Environmental Protection Agency's (EPA) selected remedy of the Lane Street Ground Water Contamination Superfund Site (Lane Street Site or Site), which was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document addresses site contaminants in the groundwater aquifer and is the final remedy for the Lane Street Site.

This decision is based on the information contained in the Administrative Record for the Lane Street Site. The Administrative Record Index (see Appendix A) identifies each of the items comprising the Administrative Record upon which the selection of the remedial action is based. The Administrative Record file is available for review at the Elkhart Public Library in Elkhart, Indiana and at the EPA Region 5 Records Center in Chicago, Illinois. Information on the Site can also be accessed on-line through the Indiana Department of Environmental Management (IDEM) virtual file cabinet.

IDEM has indicated concurrence with the selected remedy on June 14, 2016. The state's concurrence letter is included in Appendix A.

C. Assessment of Site

EPA has determined that the response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

D. Description of Selected Remedy

EPA has selected **Alternative 3, In-Situ Groundwater Treatment through Enhanced Bioremediation**, to address the chlorinated volatile organic compound (VOC) contamination in the shallow (approximately 10-20 feet (ft) below ground surface (bgs)), intermediate (20-35 ft bgs), and deep (35 to approximately 50 ft bgs) groundwater zones of the aquifer at the Site. Because contamination is found at the Site at depths no greater than approximately 50 ft bgs, only limited investigative work was conducted to deeper depths. Alternative 3 is estimated to cost a total of $3.6 million to implement, including $2.5 million in capital costs and $1.1 million in present value operation and maintenance (O&M) costs.

The selected remedy consists of the following components:

1. In-Situ Groundwater Treatment through Enhanced Bioremediation

EPA will inject compounds (nutrients and an electron donor or energy source ["food"]) to create conditions favorable for bioremediation, potentially paired with appropriate microorganisms and feedstock, to reductively dechlorinate and potentially digest the chlorinated VOC contaminants in the shallow, intermediate, and deep groundwater zones of the aquifer. The process of reductive dechlorination relies on the combination of physical, chemical, and microbiological processes to create strong reducing conditions that result in the removal of chlorine atoms from the VOCs, which reduces them into harmless compounds (ethane and ethene). After the completion of this process, EPA expects that the contaminated groundwater aquifer will achieve remedial action objectives (RAOs) selected for the future commercial and residential reuse of the Site (as currently zoned) within 10 years.

As discussed in the Feasibility Study (FS), additional compounds may be used to prevent the accumulation of hazardous intermediate degradation products and/or provide additional control in portions of the plume. The potential use of these compounds will be considered during the remedial design (RD) phase of the work, and is subject to approval from EPA and IDEM.

2. Groundwater Monitoring

A groundwater monitoring and sampling program will be required to monitor the condition of the contaminated groundwater aquifer to determine if it is receding, stable, or expanding, and to ensure that the reductive dechlorination of the contaminants in Site groundwater is progressing as intended.

As part of the RD phase of the work, additional sampling, including potentially at some additional or new monitoring well locations would be performed. The data obtained during the pre-design investigation would be used to finalize the design of the remedy.

3. Institutional Controls

The need for additional institutional controls (ICs) in the future to prevent ingestion of contaminated groundwater will be evaluated during the RD and documented in an institutional control implementation and assurance plan (ICIAP). EPA will evaluate the need for a local ordinance to prohibit installation of any drinking water wells, including wells screened in the shallow, intermediate, and deep groundwater zones of the aquifer. It is unlikely that residents will be installing drinking water wells because in 2008, EPA connected 26 residents to the City of Elkhart municipal water supply system as part of the emergency cleanup action. One resident within the current Site boundary declined to be connected to municipal water, however is not currently exposed to drinking water contaminated above health-based levels. For the duration of the remedial action EPA will

periodically monitor and evaluate whether abandonment of this private well is appropriate or necessary.

ICs are needed to prohibit residential land use in the northeastern portion of the Site (identified as Exposure Area [EA] 1) in order to protect against potential vapor intrusion risk, which is presently used for industrial and commercial purposes. Future residents at EA 1 may be exposed to Site-related contaminants by inhalation of volatile contaminants that have migrated from groundwater through soil gas to indoor air via vapor intrusion. One soil vapor sample location (SV-01) within EA 1 had a concentration of PCE measured at 344 micrograms per cubic meter ($\mu g/m^3$), which is above EPA's Vapor Intrusion Screening Level (VISL) of 110 $\mu g/m^3$ for residents, but below the VISL of 470 $\mu g/m^3$ for industrial/commercial workers. Therefore, a potential vapor intrusion issue exists at this location in EA 1 if the area is redeveloped as a residential area. For the duration of the remedial action ICs would remain in effect until the RAOs have been achieved and EPA determines that they are no longer needed.

E. Statutory Determinations

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate requirements (ARARs) to the remedial action (unless justified by a waiver), is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

This remedy also satisfies the statutory preference for treatment as a principal element of the remedy in that the selected remedy uses treatment to reduce the toxicity, mobility, and/or volume of hazardous substances, pollutants, or contaminants.

This remedy addresses shallow, intermediate, and deep groundwater zones of the aquifer. Hazardous substances, pollutants, or contaminants will remain on-site above levels that allow for unlimited use and unrestricted exposure until remedial action objectives are achieved. A statutory review will be conducted every five years after initiation of remedial action, until remedial action objectives are achieved, to ensure that the remedy is, or will be, protective of human health and the environment.

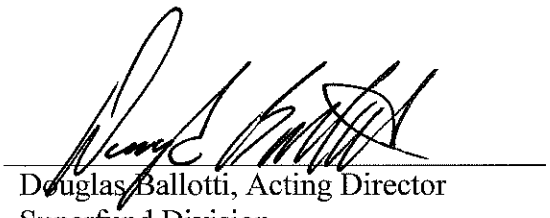
F. ROD Data Certification Checklist

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the site Administrative Record file.

- Chemicals of concern (COCs) and their respective concentrations (see Part 2.E.3.a - Identification of Chemicals of Concern);
- Baseline risk represented by the COCs (see Part 2.G.1 - Summary of the Human Health Risk Assessment);
- Remediation goals (i.e., cleanup goals) established for the COCs and the basis for the goals (see Part 2.H - Remedial Action Objectives);

- How source materials constituting principal threats are addressed (see Part 2.K - Principal Threat Wastes);
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of ground water used in the Human Health Risk Assessment and this ROD (see Part 2.F – Current and Future Site and Resource Uses);
- Potential land and groundwater use that will be available at the Site as a result of the Selected Remedy (see Part 2.F – Current and Future Site and Resource Uses and Part 2.H - Remedial Action Objectives);
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected (see Section J.7); and
- Key factor(s) that led to selecting the remedy (see Part 2.J - Comparative Analysis of Alternatives).

G. Authorizing Signature



Douglas Ballotti, Acting Director
Superfund Division
U.S. EPA - Region 5

Date 8/25/2016

IDEM, as the support agency for the Lane Street site, indicated concurrence with this ROD on June 14, 2016. The state's concurrence letter is included in Appendix A.

Part 2. Decision Summary

A. Site Name, Location, and Brief Description

The approximate 65-acre Lane Street Groundwater Contamination Superfund Site (INN000510229) is located near the intersection of Lane Street and County Road 106, in the northeast sector of Elkhart, Elkhart County, in north central Indiana about 15 miles east of South Bend, Indiana (see Figure 1). The geographic coordinates are approximately 41°43'00.65"N latitude and 85°55'15.62"W longitude.

The Site consists of a contaminated co-mingled groundwater plume underlying both active and inactive industrial, commercial, and residential properties. At present, except for one residence and five industrial locations, most of the residences and industrial facilities within the approximate Site boundary do not use private wells, as they are obtaining water from the City of Elkhart. None of the industrial facilities are using Site groundwater as a source of potable water. The depth to groundwater at the Site is approximately 6 to 12 feet below ground surface (bgs), and the aquifer consists of unconsolidated sand and gravel materials.

As presently defined, the Site is bounded by Barley Street on the south, the eastern property boundary of a private property on County Road 106 on the east, and an undeveloped property on the west. North of County Road 106, the eastern boundary widens to include the industrial/commercial area bounded by Marina Drive on the east, Ada Drive on the west, County Road 106 on the south, and Cooper Drive on the north. The northern boundary extends approximately 750 feet north of Cooper Drive to include some additional industrial properties in the northeast corner. Figure 1 shows the Lane Street Site boundaries.

Within the presently defined Site boundaries, there are approximately 29 residences along Lane Street and County Road 106, and 17 parcels in the industrial park area to the north of Lane Street, including both operating and vacant industrial and commercial buildings. There are no schools, parks, or churches within the Site boundaries. Within a one-mile radius from the intersection of Lane Street and County Road 106, there are four schools and one child daycare center. Of these four schools, the Cornerstone Christian Montessori School is the closest to the Site, located approximately 500 feet west of the Site. The City of Elkhart has verified that all four schools are served by City of Elkhart municipal water. City of Elkhart residents are supplied drinking water via a public water supply system from three main well fields—Northwest, North Main, and South Well Fields—and some residents within the City limits use private wells. The shallowest and closest downgradient municipal well from the site is within the North Main Street Well Field, approximately three miles to the southwest, and extends to a depth of 46 feet bgs. The deepest well is in the South Well Field and extends to a depth of 111 feet bgs.

To the east of Lane Street is a separate contaminated groundwater plume along Kershner Lane that is associated with the Geocel Corporation (Geocel) facility at 2502 Marina Drive in the industrial park. The Geocel plume originated from a tetrachloroethene (PCE) release. Sample results from monitoring wells between the Geocel facility and the Lane Street Site show that the Lane Street plume is separate and distinct from the Geocel plume and that the two plumes are

from separate sources. Geocel is currently addressing its plume under the IDEM Voluntary Remediation Program (VRP).

B. Site History and Enforcement Activities

B.1. Site History

Groundwater contamination around Lane Street was identified in 2007 through investigations at a nearby site remediation at the Geocel Corporation, conducted by Geocel with oversight by IDEM under the Indiana Voluntary Remediation Program. Upon discovering this contamination, Geocel contacted IDEM and the Elkhart County Health Department (ECHD) about possible groundwater contamination related to its operations.

In August 2007, a Lane Street resident, based on her concerns about the reported Geocel contamination, submitted well water samples to a private laboratory. The testing found trichloroethene (TCE) at 1,360 micrograms per liter (µg/L) and associated TCE breakdown products and other VOCs. The TCE concentration exceeded the federal Safe Drinking Water Act Maximum Contaminant Level (MCL), currently set at 5 µg/L. However, because of distinct contaminant profiles (e.g., mineral spirits with added ethylbenzene and xylenes were identified in Geocel contamination but not Lane Street contamination), IDEM determined that Geocel was not the source of the TCE associated with the resident's contaminated groundwater.

IDEM investigated well water in the area around the Lane Street Site in late August 2007 and found TCE exceeding drinking water standards in several wells. IDEM initially provided bottled water to about 13 homes, including all homes with wells with contaminant concentrations above drinking water standards, and contacted EPA to further investigate the issue. In September 2007 EPA confirmed elevated levels of TCE in several wells. On the basis of these findings, in November 2007 EPA's Superfund Removal Program installed water filtration systems to these 13 homes. Further testing in December 2007 showed that the filters were effective in removing TCE from the well water.

In December 2007 EPA sampled indoor air at two homes within the residential area (identified as Exposure Area [EA] 2) with elevated TCE concentrations in well water. This was to assess the possibility of vapor intrusion, in which VOCs evaporate from groundwater and travel up through cracks or other conduits to enter the indoor air of homes and buildings. No TCE-related vapor was detected in indoor air.

In November 2008 EPA's Superfund Removal Program connected 26 residences (23 on Lane Street, two on Barley Street, and one on County Road 106) to the City of Elkhart's municipal water supply system and abandoned the residential wells at those residences. Because the groundwater plume appears to flow in a south-southwesterly direction, several additional unaffected downgradient residences were connected to the City of Elkhart's municipal water supply system. Residences further south of Barley Street were already connected to municipal water. One resident within the current Site boundary declined to be connected to municipal water.

On September 14, 2009, EPA listed the Site on the National Priorities List (NPL). At that time EPA began the remedial investigation and feasibility study (RI/FS) to characterize the nature and extent of contamination and identify cleanup options.

In April and May 2011, EPA sampled groundwater and soil within the Lane Street Site to determine how far the contamination had moved over time, as well as to identify potential contamination sources. EPA collected and analyzed approximately 170 groundwater samples and 14 soil samples. This included two private groundwater well samples from a residential and a commercial property. Site-related contaminants were not found in any of the soil samples. The contaminants TCE, 1,1-dichloroethane (1,1-DCA), PCE, and cis-1,2-dichloroethene (cis-1,2-DCE), which is a breakdown product of TCE and PCE, were found in the groundwater samples at elevated levels. EPA and IDEM representatives discussed the groundwater results in detail during a public meeting at the Osolo Elementary School on May 22, 2013.

In late spring 2013, EPA collected groundwater, soil vapor, and an additional soil sample to further investigate the source and extent of groundwater contamination. During the 2013 sampling, EPA collected and analyzed approximately 135 groundwater samples, 11 soil vapor samples, and an additional soil sample for chemicals of concern. Groundwater samples were collected within the industrial and residential areas of the site at 12 boring locations and 44 monitoring wells (including 22 monitoring wells installed by Roberts Environmental Services, LLC ("Roberts") an environmental consultant for Flexsteel Industries, Inc. ("Flexsteel")). Soil vapor samples were collected from 11 different locations. Sample results again showed TCE, PCE, 1,1-DCA, and cis-1,2-DCE in the groundwater samples at elevated levels. No Site-related contaminants were found in any of the soil or soil vapor samples with the exception of PCE. PCE that was found in one soil vapor sample within the industrial/commercial area. Based on the combined results of the groundwater and soil vapor samples, vapor intrusion was evaluated and determined not a concern within the existing residential area as discussed in Section G of the "Summary of Site Risks" below.

EPA conducted another sampling event in August 2014 to advance a total of 10 additional boring locations in an effort to recreate the analytical data from the 2011 sampling event and to investigate the potential western boundary of contamination. The results of this sampling event were consistent with previous findings.

Prior to and during EPA's RI at the Site, Flexsteel conducted an independent environmental investigation in the area of three facilities at 2503 Marina Drive and 3507 Cooper Drive, both of which are former Flexsteel facilities, and at 2601 Marina Drive. Between March 2011 and November 2015, Flexsteel collected grab groundwater and soil samples and installed numerous groundwater monitoring wells on and surrounding its properties. Sample analyses included, but were not limited to, TCE, PCE, 1,1-DCA, and cis-1,2-DCE. The soil samples collected from 2.5 feet bgs to 4 feet bgs at each boring indicated no detectable concentrations of VOCs in the soil samples. However, the groundwater grab and groundwater monitoring well samples indicated elevated levels of TCE.

B.2. Enforcement Activities

In April 2008, and again in September 2008, IDEM visited facilities in the industrial park to the north of Lane Street and found at least three facilities that had stored or used hazardous substances. At that time there was insufficient information to evaluate whether releases of hazardous substances from these facilities had contributed to the Site groundwater plume. IDEM investigated eight other facilities in the Site study area to evaluate the potential impacts of their operations on the groundwater. A review of historical records indicate that many of these facilities contained septic systems prior to 2007.

In January 2014, EPA tasked a contractor with completing a detailed title search for current and past site ownership information for the Lane Street Site. In June 2014, EPA sent information requests, pursuant to Section 104(e) of CERCLA, to 17 current or past owners or operators at the properties connected to the contaminated groundwater plume. Consistent with EPA's "Final Policy Toward Owners of Property Containing Contaminated Aquifers", dated May 24, 1995, EPA does not consider owners or operators of property above a groundwater plume to be PRPs, absent evidence that the property owners or operator contributed to the Site contamination. Responses to the Section 104(e) information requests indicated that a total of three entities may have stored or used hazardous substances consistent with the TCE and PCE and during time periods when those contaminants could have contributed to the groundwater plume. On March 11, 2016, EPA sent a General Notice Letter of Potential Liability for the Lane Street Site to the three entities. Currently, there is an ongoing enforcement effort, and EPA anticipates issuing Special Notice Letters to initiate Remedial Design and Remedial Action negotiations with the potentially responsible parties after this ROD is issued.

C. Community Participation

EPA informed the public of its activities at the Lane Street Site prior to and during the RI/FS process. In October 2008, EPA hosted a public information session to discuss the water hookups planned for homes with TCE contamination and to give residents an opportunity to ask questions about the Site. EPA sent a letter to residents on Lane Street informing them of their eligibility for connection, at no charge, to the City of Elkhart municipal water supply.

In May 2011, EPA held a public meeting to give an update on Site activities and to give residents an opportunity to ask questions. EPA also conducted interviews with local residents and city officials to gather information to better understand the concerns and information needs of the community.

EPA used several information sources, including research and information received from public meetings and community interviews, to develop a Community Involvement Plan (CIP), which EPA updated in December 2012. The CIP describes EPA's plan for addressing concerns and keeping residents informed and involved in the Site activities. It also provides information on the Superfund process, Site background information, and a profile of the city of Elkhart.

The Proposed Plan and other relevant and supporting documents for the Lane Street Site, including the RI and FS Reports, were made available to the public in April 2016. Copies of all

the documents supporting the remedy outlined in the Proposed Plan and contained in the Administrative Record file were made available to the public at the Elkhart Public Library, where EPA set up an information repository. Administrative Record files have also been made available on EPA's web page for the Lane Street Site. A notice of the availability of these documents was published in *The Elkhart Truth* on April 10, 2016. EPA held a 30-day public comment period on the Proposed Plan from April 11 to May 11, 2016. EPA also held a public meeting at the Eastwood Elementary School in Elkhart, Indiana on April 20, 2016, to present the Proposed Plan to community members. At this meeting, EPA representatives presented information and answered questions about the remedial alternatives and solicited community input on the proposed action. EPA also used this meeting to solicit community input on the reasonably anticipated future land use and potential beneficial groundwater uses at the Site. EPA's responses to the comments received during the public comment period are provided in the *Responsiveness Summary*, which is included as Part 3 of this ROD.

D. Scope and Role of Operable Unit or Response Action

In November 2008 EPA initiated emergency cleanup measures for the Lane Street Site through a removal action, which included connecting 26 residences to the City of Elkhart municipal water supply system and abandoned the residential wells at those residences.

This ROD addresses the VOC contaminant plumes in the shallow, intermediate, and deep groundwater zones of the aquifer, and will be the final remedial action for the Lane Street Site. The selected remedy will actively treat the VOCs in the aquifer with the goal of restoring to its beneficial use including potentially as a public water supply.

E. Site Characteristics

E.1. Environmental Setting

E.1.a. Regional Setting, Demography, and Land Use

According to the US Census bureau, Elkhart is the 15th largest city in Indiana with an estimated population of 53,060 people. In 2010, Elkhart's population was 50,949, of which 58 percent were white non-Hispanics, 22.5 percent were Hispanics, and 15.1 percent were African-Americans, with the remaining 4.4 percent consisting of two or more other races such as Asian, Native American, and Pacific Islander. The city spans a total area of 24.42 square miles and sits on the St. Joseph and Elkhart Rivers. The Elkhart River drains into the St. Joseph River at Island Park, just north of downtown Elkhart. Neither the Elkhart River nor the St. Joseph River are used as a public water supply by the City of Elkhart. The City of Elkhart obtains all of its drinking water (public supply) from groundwater. Additionally, some properties within the City limits of Elkhart are on private groundwater supply wells.

Elkhart's industry is home to the manufacturing of recreational vehicles, marine equipment, musical instruments, pharmaceuticals, and pre-fabricated houses, but the city is most known for two industries: recreational vehicles and musical instruments. Based on an inspection of historic aerial photographs, the Site's primary land use in the past consisted mostly of

farming/agricultural and residential uses; currently, the Site's primary land use is approximately 70 percent industrial/commercial and 30 percent residential. The Site is characterized by industrial buildings and facilities on the central and northern portion of the Site and residential properties on the south. Agricultural activities no longer occur within the Site boundaries.

E.1.b. Topography

The Site is relatively level at approximately 770 feet above mean sea level (amsl). The only known surface water body on the Site is a small drainage ditch between buildings on the industrial portion of the Site and can be seen on Figure 2. East Lake, located approximately 0.5 miles southwest of the Site, and the St. Joseph River are the only major surficial water bodies near the Site.

E.1.c. Geology

Regionally Elkhart, Indiana is part of the St. Joseph River basin, whose surficial geology is influenced predominantly by glacial and post-glacial activity. Quaternary glacial deposits in the St. Joseph River basin have been documented to be up to 450 feet thick. In the vicinity of the Site these deposits are reported to be approximately 170 feet thick (United States Geological Survey (USGS) 1989). A complex glacial history influences the St. Joseph River basin, including several glacial advancements and retreats that created layers of interbedded clayey till and outwash sand and gravels (Indiana Department of Natural Resources [IDNR] 1987). More detailed descriptions of the areas geology are found in the Remedial Investigation Report. EPA evaluated the Site-specific geology during the RI activities through the visual classification of subsurface soil using the unified soil classification system for logging soils. EPA confirmed the underlying geology is consistent with the unconsolidated Pleistocene glacial deposits, which primarily consist of unstratified, fine- to coarse-grained sand, and sand and gravel outwash with discrete or discontinuous silt and clay lenses to approximately 155 feet bgs (see Figure 3).

Grain size data from the Site, indicates three main stratigraphic zones of varying thickness:

- a poorly graded fine- to medium-grained sand-dominated zone from approximately one to 18 feet bgs;
- a well-graded zone dominated by fine to medium gravel with varying amounts of fines from approximately 20 to 32 feet bgs; and
- a fine- to coarse-grained sand-dominated zone from 32 to 50 feet bgs.

Because the contamination is found in the areas no greater than 50 feet bgs, only limited investigative work was conducted to deeper depths. As typical for sites of similar size, the geological conditions may vary at different Site locations. Figure 3 provides a geologic cross section (north to south) for the Site, approximately along the length of the groundwater plume.

E.1.d. Hydrogeology

The principal source of groundwater in Elkhart County is the unconsolidated outwash sand and gravel deposits known as the St. Joseph Aquifer overlying the Paleozoic bedrock. Groundwater contamination at the Lane Street site is located within the St. Joseph Aquifer. The City of Elkhart

obtains water from this aquifer and it is composed of fine- to medium-grained sand, with zones of coarse sand and gravel. Interspersed within these deposits are thin clay units of limited areal extent. The St. Joseph Aquifer generally thickens from south to north and varies from 20 feet thick near the southern boundary of the St. Joseph River Basin to approximately 400 feet thick over the buried bedrock valley at the western edge of Elkhart County. In the vicinity of the Site, the St. Joseph Aquifer is reported to extend to approximately 170 ft bgs. The estimated horizontal hydraulic conductivity (K value) of the upper portion of the St. Joseph Aquifer is approximately 170 feet per day (ft/day) or 6.0×10^{-2} centimeter per second (cm/s) within 1 mile of the St. Joseph River and approximately 370 ft/day or 1.3×10^{-1} cm/s at areas greater than 1 mile from the river. Transmissivity is estimated as high as 57,000 square feet per day (ft^2/day), with an average of 8,100 ft^2/day (USGS 1998).

Drinking water in the Site area is supplied both by the City of Elkhart's public water supply system three main well fields and by private wells. The shallowest well and closest downgradient municipal well fields are within the North Main Street Well Field (itself a Superfund site) and extends to a depth of 46 feet bgs. The deepest well is in the South Well Field and extends to a depth of 111 feet bgs (Malcolm Pirnie 2011). EPA conducted Site-specific hydraulic aquifer tests at the Site and estimated an average hydraulic conductivity in the intermediate and deep groundwater zones at the Lane Street Site of 140 ft/day or 5×10^{-2} cm/sec.

E.2. Climate

Elkhart, Indiana, is located in a temperate region of the United States with seasonal variations throughout the year. The average daily temperature plot for a year depicts a bell curve, with the hottest days in July and the coldest days in January. The mean monthly temperature in Elkhart varies from approximately 25 degrees Fahrenheit (°F) in January to 73 °F in July (City-Data 2012). The mean normal annual precipitation is approximately 38 inches. The total normal annual snowfall is approximately 67 inches. Lake-effect snow accounts for much of the snowfall in this region due to the effects of the moisture and relative warmth of Lake Michigan.

E.2.a. Ecology

The Site is located within the Southern Michigan/Northern Indiana Drift Plains ecoregion, specifically, the Elkhart Till Plains area. This region is composed primarily of glacial topography and is punctuated by end moraines, kames, and lacustrine flats. Kettle lakes may exist, but are much scarcer. Oak-hickory forests and beech and maple forests predominate, but currently, corn, soybean, and wheat farmlands are more extensive than woodland.

The Site is developed as an industrial and residential area with a small field to the southwest of the Site. No sensitive ecological habitats have been identified on the Site. The only known surface water body at or near the Site is a storm water drainage ditch, typically dry, located in the industrial/commercial area located just north of the 2503 Marina Drive, 3504 Henke Street, and 2503 Ada Drive properties (see Figure 2). Brads-Ko Engineering and Surveying, Inc (Brads-Ko), Roberts' surveyor, surveyed the storm drainage ditch and found the deepest portion of the drainage ditch near well R-MW-8 to have an elevation of approximately 761 feet amsl National Geodetic Vertical Datum (NGVD) 1929 which converts to 760.57 feet amsl North American

Vertical Datum (NAVD) 1998 (or approximately 0.5 feet bgs). The groundwater elevation near the drainage ditch during the fall sampling event (October 2013) was less than 760 feet amsl. The groundwater during this event and the winter sampling event (January 2014) did not appear to intersect the drainage ditch. However, it was noted that during the spring and summer sample events (April and July 2014) the groundwater elevations near the drainage ditch could potentially intersect the drainage ditch during periods with high groundwater.

E.3. Remedial Investigation Results

EPA investigated contamination at the Site through a RI/FS as discussed above in B.1. *Site History*.

In addition, in November 2015, Roberts, on behalf of Flexsteel, collected and submitted 11 samples to Pace Analytical laboratory for compound specific isotope analysis (CSIA) from an area that they identified as the centerline of the Lane Street plume (from one EPA well and 10 Flexsteel wells). The sample results are discussed in a response letter to EPA, titled "Public Comments to U.S. EPA August 2015 Final Remedial Investigation Report" dated December 28, 2015 and included in the Administrative Record. EPA, in consultation with IDEM, provided a response to the public comments letter on April 4, 2016, which is also included in the Administrative Record.

E.3.a. Chemicals of Concern (COCs)

The chemicals of concern (COCs) in the Site's groundwater include TCE, PCE, 1,1-DCA and cis-1,2-DCE. Both TCE and PCE are colorless liquids typically used in industrial processes as solvents to clean metal parts. 1,1-DCA is a colorless oily liquid most often found in solvents and chemical mixtures. TCE, PCE, and their breakdown products (such as cis-1,2-DCE), and 1,1-DCA, can pose potential health risks through ingestion of contaminated soil or contaminated water, through direct contact, or through breathing contaminated air. Short-term exposure to high levels of these VOCs may lead to headaches, lung irritation, dizziness, unconsciousness, and death. Long-term, low-level exposure could cause carcinogenic (cancer-causing) and/or non-carcinogenic health effects. EPA designated these compounds as COCs because they are persistent and present in the Site groundwater aquifer at concentrations above health-based levels.

The table below presents the COCs and maximum concentrations detected in groundwater during the RI.

COC	**Maximum Concentration**
TCE	320 micrograms per liter (µg/L)
PCE	120 µg/L
cis-1,2-DCE	600 µg/L
1,1-DCA	4.4 µg/L
Vinyl Chloride	No detections
Methane	No detections

Vinyl chloride and methane were not detected nor identified as COCs during the RI. However, as presented in Section H below, Remedial Action Levels (RALs) are being proposed for these compounds.

E.4. Conceptual Site Model

Based on both historical and the remedial investigations, along with the Flexsteel independent environmental investigation, EPA identified a co-mingled groundwater contaminant plume from multiple sources consisting primarily of PCE and TCE. The aerial extent of the groundwater plume exceeding cleanup levels is shown in Figure 4.

Contamination in groundwater generally migrates in the direction of groundwater flow. The groundwater at the Site flows from the northeast industrial/commercial portion of the Site to the southwest residential portion of the Site. EPA identified contamination in the shallow (10-20 ft bgs), intermediate (20-35 ft bgs), and deep (more than 35 ft bgs) groundwater zones. Limited contamination was found above the shallow groundwater zone (10-20 ft bgs). Generally, the water table lies at approximately 6 to 12 feet bgs, and groundwater flows toward the southwest. Vapor intrusion concerns are limited to the portion of the Site located north of County Road 106, and only for future potential residents (the area is presently industrial/commercial).

EPA developed a Conceptual Site Model (CSM) for the Site, which includes potential sources, release mechanisms, exposure pathways and migration routes, and potential receptors as seen on Figure 5. The CSM presents surface soil and groundwater as the primary affected media transporting contamination at the Site. The secondary affected medium is subsurface soil, due to sorption and diffusion within groundwater in low-permeability subsurface soil zones.

EPA evaluated the fate and transport of the groundwater COCs (TCE, PCE, 1,1-DCA, and cis-1,2-DCE) in the RI Report. These COCs are mobile in groundwater moving through the industrial/commercial area into the residential area. Human and ecological receptors could be exposed to these COCs primarily through direct ingestion of groundwater, dermal contact, and inhalation. Direct exposure to groundwater is a potential concern for properties using private water wells as a potable water source. Most, but not all, properties at the Site are on a municipal water supply. The "Summary of Site Risks" in Section G of this ROD discusses the human and ecological exposure routes and receptors.

F. Current and Potential Future Land and Resource Uses

F.1. Current and Potential Future Land Uses

Land use at the site is currently a mix of residential homes and commercial businesses. Within the presently defined Site boundaries, there are approximately 29 residences along Lane Street and County Road 106, and 17 parcels in the industrial park area to the north of Lane Street, including both operating and vacant industrial and commercial buildings. There are no schools, parks, or churches within the Site boundaries. However, within a one-mile radius from the intersection of Lane Street and County Road 106, there are four schools and one child daycare center. Of these four schools, the Cornerstone Christian Montessori School is the closest to the

Site, located at 23830 County Road 106, approximately 500 feet west of the Site. The land usage is anticipated to remain unchanged for the foreseeable future.

F.2. Current and Potential Future Groundwater Uses

Prior to EPA's 2008 connection of 26 residences to the City of Elkhart municipal water supply system, the residents in the Site area used the shallow, intermediate and/or deep groundwater zones of the aquifer as drinking water sources. A single residence currently uses a private groundwater well as a source of potable drinking water and no COCs were identified in the well water. Five industrial locations currently have private wells but do not use them as a source of potable drinking water. Future use of groundwater at the Site is assumed to include use as a drinking water source.

G. Summary of Site Risks

The following section establishes the basis for taking action at the Lane Street Site and briefly summarizes the relevant portions of the baseline Human Health Risk Assessment (HHRA) included as Appendix D of the 2015 RI Report.

G.1. Summary of the Human Health Risk Assessment

EPA conducted a baseline HHRA to estimate the risks and hazards to human health associated with current and potential future groundwater contaminant exposures. A baseline HHRA is an analysis of the potential adverse human health effects caused by exposure to hazardous substances in the absence of any actions taken to control or mitigate contaminants under both current and future resource use scenarios. If Site contaminants pose unacceptable health risks for current and/or future human receptors, EPA then makes a cleanup decision to reduce the risks to within the target range, based on current and/or reasonably anticipated future land use.

A four-step process was used for assessing Site-related cancer risks and non-cancer health hazards. The four-step process is comprised of: identification of chemicals of potential concern (COPCs); exposure assessment; toxicity assessment; and risk characterization.

EPA subdivided the Lane Street Site into two exposure areas: the EA 1-Industrial/Commercial Exposure Area and the EA 2-Residential Exposure Area. Currently, the EA 1 area is used exclusively for commercial and industrial purposes. Currently, EA 2 is used for residential purposes. The two exposure areas were delineated primarily according to the location and composition of soil and fill contamination and current and potential future land uses at and surrounding the Site (see Figure 6).

Identification of COPCs

EPA identified the Site-related VOC contaminants as COPCs in the shallow through deep groundwater zones that could cause adverse health effects in exposed populations under current and future land-use scenarios. COPCs in environmental media are identified through comparisons of maximum detected concentrations with conservative, risk-based screening levels.

Other contaminants, such as arsenic, manganese, and bis(2-ethylhexyl)phthalate were detected in groundwater above their Site Screening Level (SSL); however, they are not considered Site-related contaminants. Bromodichloromethane, chloroform, and dibromochloromethane are trihalomethanes (THM), a group of four chemicals that are formed when chlorine or other disinfectants react with naturally occurring organic and inorganic matter in water. EPA has established a MCL for THM of 80 µg/L and although these constituents were found in the groundwater, none had concentrations that were greater than this standard.

Table 1 presents the COPCs and exposure point concentrations for each of the COPCs detected in groundwater. The table includes the range of concentrations detected for each COPC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the Site), the exposure point concentration (EPC), and how the EPC was derived. The table indicates that TCE is the most frequently detected COPC in groundwater at the Site.

Exposure Assessment

Exposure assessment is the process of measuring or estimating the intensity, frequency, and duration of human exposure to a chemical in the environment. This section describes current and future land use assumptions, characterizes exposure factors for potential receptors, and discusses the mechanisms by which these receptors might come in contact with COPCs in environmental media. The following exposure pathways and populations were evaluated:

Current/Future Residents: There are no current residents in EA 1. A single residence in EA 2 currently uses a private groundwater well as a source of potable drinking water and no COPCs were identified in the well water. There is no direct exposure to contaminated groundwater to a current residential receptor in EA 1 and EA 2. Soil vapor concentrations measured in EA 2 for current residents were all less than residential vapor intrusion screening levels (VISLs)[1], therefore considered insignificant.

Future residents at both EA 1 and EA 2 may be exposed to Site-related contaminants via ingestion of and dermal contact with groundwater. Future residents at EA 1 may be exposed to Site-related contaminants by inhalation of volatile contaminants that have migrated from groundwater through soil gas to indoor air via vapor intrusion. One soil vapor sample location (SV-01) within EA 1 had a concentration of PCE measured at 344 micrograms per cubic meter (µg/m^3), which is above the VISL of 110 µg/m^3 for residents, but below the VISL of 470 µg/m^3 for industrial/commercial workers. Therefore, a potential vapor intrusion issue exists in EA 1 if the area is redeveloped as a residential area.

Current/Future Industrial/Commercial Workers: No current industrial/commercial workers in EA 1 or EA 2 are exposed to groundwater contaminants because Site groundwater is not currently a source of potable water. Soil vapor concentrations measured in EA 1 and EA 2 for current industrial/commercial workers were all less than industrial/commercial VISLs, and therefore considered insignificant. Future

[1] EPA. 2014. OSWER Vapor Intrusion Assessment, Vapor Intrusion Screening Level (VISL) Calculator, Version 3.3.1, May 2014 RSLs. On-Line Address: http://www.epa.gov/oswer/vaporintrusion/guidance.html.

industrial/commercial workers at both EA 1 and EA 2 may be exposed to Site-related contaminants via ingestion of and dermal contact with contaminants in groundwater.

Current/Future Construction and Utility Workers: Current and future construction and utility workers could be exposed to Site-related contaminants in groundwater during construction or utility maintenance activities. These workers may be exposed to shallow groundwater contaminants via dermal contact and inhalation as volatile contaminants migrate from groundwater into trench air.

Toxicity Assessment

The toxicity assessment describes the relationship between a dose of a chemical and the potential likelihood of an adverse health effect. The purpose of the toxicity assessment is to quantitatively estimate the inherent toxicity of COPCs for use in risk characterization. Potential effects of chemicals are separated into two categories: carcinogenic (cancer) and non-carcinogenic (non-cancer) effects. Toxicity values used in the HHRA are listed in Table 2 (cancer toxicity values) and Table 3 (non-cancer toxicity values).

Risk Characterization Summary

For carcinogens, risks are generally expressed as the incremental probability of an individual's developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk (ELCR) is calculated from the following equation:

Risk = CDI x SF

where: Risk = a unitless probability (e.g., 2×10^{-5}) of an individual's developing cancer
CDI = chronic daily intake averaged over 70 years (mg/kg-day)
SF = slope factor, expressed as (mg/kg-day)-1.

These risks are probabilities that usually are expressed in scientific notation (e.g., 1×10^{-6}). An ELCR of 1×10^{-6} indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual's developing cancer from all other causes has been estimated to be as high as one in three. EPA's generally acceptable risk range for site-related exposures is 10^{-4} to 10^{-6}.

The potential for non-carcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., lifetime) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ < 1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic non-carcinogenic effects from that chemical are unlikely. The Hazard Index (HI) is generated by adding the HQs for all chemicals of concern that affect the same target organ (e.g.,

liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI < 1 indicates that, based on the sum of all HQ's from different contaminants and exposure routes, toxic non-carcinogenic effects from all contaminants are unlikely. An HI > 1 indicates that site-related exposures may present a risk to human health. Generally, remedial action at a Site is warranted if cancer risks exceed 1E-04 and/or if non-cancer hazards exceed an HI of 1.

The HQ is calculated as follows:

Non-cancer HQ = CDI/RfD

where: CDI = Chronic daily intake
RfD = reference dose.

CDI and RfD are expressed in the same units and represent the same exposure period (i.e., chronic, sub-chronic, or short-term).

Risk calculations indicate that ELCRs for future residential use of the groundwater exceed 1×10^{-4} at EA 1 and EA 2, which is outside the target risk range. TCE drives the risk (cumulative risk of 6.6×10^{-4} [EA 1] and 1.8×10^{-4} [EA 2]). Total hazards for groundwater exposures exceed a Hazard Index of 1 for residential, industrial/commercial, and construction/utility worker receptors at both EA 1 and EA 2. See Tables 4 and 5.

Potentially significant VI-related risks are limited to future residents at EA 1 in the northeastern portion of the industrial/commercial area where PCE was found in a soil vapor sample as discussed under the *Exposure Assessment* above. Future VI-related cancer risk to industrial/commercial and construction worker receptors are within the EPA acceptable risk range (1×10^{-4} to 1×10^{-6}) for both EA 1 and EA 2. No potentially significant (greater than 1) non-cancer VI-related hazards were identified for any receptors in either EA 1 or EA 2.

EPA identified TCE, PCE, 1,1-DCA, and cis-1,2-DCE as COCs, as these compounds present the predominant risks at the Site.

Uncertainty Analysis

Uncertainties are inherent in the process of a risk assessment. Potentially significant sources of uncertainty for this risk assessment include the following:

- All future land use exposure assumptions. It is realistic to assume that current land uses (industrial/commercial at EA 1 and residential at EA 2) may continue in the future;
- Some receptor-exposure pathway combinations. For example, groundwater may be used for various non-potable uses by residents. Such uses may include car washing, irrigation of gardens, and filling of swimming pools (most often small "kiddie" pools). Also the potential for VOCs in groundwater to migrate via the VI pathway into overlying buildings (homes or businesses) is assumed to be limited primarily to the PCE Plume portion of EA 1. Because of uncertainties associated with the extent of a clean water layer which may limit or reduce VI potential, VI-related exposures were not estimated using

EPA's Johnson & Ettinger advanced models. Rather, receptor-specific risks and hazards were evaluated using EPA's VISL Calculator based on soil vapor concentrations measured at 11 locations (five [SV-01 through SV-05] in EA 1 and six [SV-06 through SV-08 and SV-10 through SV-12] in EA 2;

- The use and consideration of analytical data. Several compounds, such as arsenic, trihalomethanes, including chloroform, bromodichloromethane, and dibromochloromethane were identified as COPCs in groundwater but not considered to be site-related contaminants as discussed under *Identification of COPCs* above; and
- Uncertainty associated with estimates of exposure at the point of contact between the human receptor and constituents in environmental media. If any sampling was intentionally biased toward areas of contamination, the resulting EPC — an attempted quantification of average concentration across an area — could overestimate risks. Use of maximum detected concentrations as EPCs likely overestimated risks, whereas use of a 95 percent upper confidence limit as the EPC could underestimate or overestimate risks. However, this parameter is designed to overestimate the risk 95 percent of the time.

For more information regarding uncertainties, refer to Section 2.6, Appendix D of the Final RI Report.

G.2. Summary of Screening Level Ecological Risk Assessment

EPA did not complete a screening level ecological risk assessment to evaluate potential current ecological risks associated with ecological exposure to Site-related contaminants because there are no complete exposure pathways for ecological receptors, due to the subsurface nature of the contamination and the lack of groundwater discharging to surface water at or near the Site.

Basis for Taking Action

The response action selected in this Record of Decision is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

H. Remedial Action Objectives

Remedial action objectives (RAOs) provide a general description of what the cleanup will accomplish, and typically serve as the design basis for the remedial alternatives which will be presented in the following section. RAOs for the Site were developed based on COCs, pathways, receptors, and an acceptable constituent level (RBC, PRG, chemical-specific ARAR, or to-be-considered criteria) for each medium assuming future residential use of the site.

RAOs for the shallow, intermediate, and deep groundwater zones include:

- **RAO 1:** Protection of human health from chemical risks and hazards by preventing actual or potential direct exposure to, or potable use of, groundwater containing COCs at levels resulting in unacceptable risk for current and future Site users. Site users include current and future residents, current and future industrial/commercial workers, utility workers, and construction workers;

- **RAO 2:** Protection of human health from chemical risks and hazards posed by vapor intrusion associated with groundwater contamination for future Site users; and

- **RAO 3:** Restoration of the aquifer to its beneficial use (including potentially as a public water supply).

Groundwater cleanup levels, also known as Remedial Action Levels (RALs) for COCs are:

COC	Cleanup level	Source
TCE	5 micrograms per liter (µg/L)	MCL
PCE	5 µg/L	MCL
cis-1,2-DCE	70 µg/L	MCL
1,1-DCA	2.8 µg/L	RSL[2]
Vinyl Chloride	2 µg/L	MCL
Methane	5 percent	LEL[3]

Note: Vinyl chloride and methane were not identified as COCs during the RI. However, vinyl chloride is one of the degradation products and methane is a byproduct. Both compounds can be expected as an intermediate outcome during implementation of Alternative 3- Enhanced Bioremediation.

I. Description of Alternatives

EPA developed and evaluated the following cleanup alternatives for addressing the current and potential risks to human health or the environment.

Alternative 1 – *No Action*

Alternative 2 – *Monitored Natural Attenuation*

Alternative 3 – *In-Situ Groundwater Treatment: Enhanced Bioremediation*

Alternative 4 – *Ex-Situ Groundwater Treatment: Extraction, Treatment, and Discharge*

EPA evaluated the use of institutional controls (ICs) in conjunction with each of the above alternatives, with the exception of Alternative 1– No Action, to help prevent exposure to COCs until cleanup levels are achieved. A discussion of the types of ICs that could be implemented at the Site is included below.

[2] RSL, Regional Screening Level from EPA Summary Table November 2015 (Source: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2015/)

[3] The minimum concentration of a particular combustible gas or vapor necessary to support its combustion in air is defined as the Lower Explosive Limit (LEL) for that gas.

Common Elements of Alternatives 2, 3, and 4

Institutional controls are legal and administrative mechanisms that provide for land use and access restrictions to limit the exposure of current and future landowners or users of property to hazardous substances and to maintain the integrity of the response action. ICs are required on a property where contamination above levels that allow for unlimited use and unrestricted exposure remain on the property. ICs includes requirements for monitoring, inspections, and reporting to ensure compliance.

Legal mechanisms include proprietary controls such as restrictive covenants, negative easements, equitable servitudes, lease restrictions, and deed notices. Administrative mechanisms include notices, adopted local land use plans and ordinances, construction permitting, or other existing land use management systems intended to ensure compliance with land use restrictions. ICs are more effective if they are layered or implemented in series. Layering means using several ICs at the same time to enhance the protectiveness of the remedy. ICs may be implemented in series to enhance both the short- and long-term effectiveness of the remedy.

ICs would mitigate use of contaminated groundwater and mitigate potential future vapor intrusion hazards in a portion of the Site north of County Road 106.

Alternative 1 – *No Action*

Estimated Capital Cost: $0
Estimated Total O&M Cost: $0
Estimated Present Worth Cost: $0
Estimated Construction Timeframe: None

Under the No Action alternative EPA would take no further actions to mitigate risk. Any reduction in toxicity or volume of contaminants would occur only as a result of natural processes. The NCP requires the inclusion of the No Action alternative as a baseline for comparisons to the other groundwater alternatives. No monitoring of groundwater would occur and, therefore, no assessment of any reduction or potential expansion of groundwater contamination would occur. No Five-Year Reviews to assess protectiveness would be performed and no monitoring of ICs would occur. No cost is associated with this alternative because no action is taken.

Alternative 2 – *Minimal Action with Institutional Controls and Monitored Natural Attenuation*

Estimated Capital Cost: $294,000
Estimated Total O&M Cost: $995,000
Estimated Present Worth Cost: $1.3 million
Estimated Construction Timeframe: None

Alternative 2 requires minimal action, including the implementation of ICs and monitored natural attenuation (MNA), to mitigate the unacceptable Site risks. As part of the design phase,

some additional sampling would be performed and an ICIAP prepared. Potential ICs include groundwater and land use restrictions, obtained through local government ordinances or through recorded deed restrictions. Potable use of groundwater in areas of the Site where contamination is located would be restricted. EPA would implement ICs to: 1) limit groundwater use; and 2) prohibit residential land use in a portion of the Site north of County Road 106 to mitigate potential vapor intrusion hazards.

Monitored natural attenuation relies on natural processes to decrease or "attenuate" concentrations of contaminants within the Site groundwater plume. The natural processes can include: 1) transformation of contaminants into less toxic form through destructive processes such as biodegradation or abiotic transformations; 2) reduction of contaminant concentrations whereby exposure levels may be reduced, and 3) reduction of chemical mobility and bioavailability through sorption onto the soil or rock matrix.

EPA collected and analyzed groundwater samples for anaerobic biodegradation parameters, consistent with EPA Office of Solid Waste and Emergency Response (OSWER) guidance designed for that purpose, to assess the first of these attenuation processes. Anaerobic degradation means the breakdown of contaminants by microorganisms in the absence of oxygen. The analysis showed insufficient quantities of *Dehalococcoides ethenogenes* (DHC), a type of bacteria capable of fully degrading chlorinated solvents. The data also indicated the system would require the addition of organic source material to enhance biodegradation because of low organic carbon content in the soil.

EPA would conduct regular groundwater monitoring to ensure that MNA would work and that attenuation occurs at a rate that is consistent with cleanup goals for the Site. EPA would require five-year reviews, in accordance with CERCLA and the NCP, until RALs were reached for all COCs. The ICs, as well as the associated monitoring and reporting, would remain in place until the RALs were achieved.

MNA is easy to implement because it relies on natural biochemical and physical processes. However, MNA is more effective when combined with other alternative technologies--in this case, ICs, rather than as a stand-alone solution. The estimated present worth value of Alternative 2 is $1.3 million, including $294,000 in capital costs and $995,000 in present value O&M Costs. The time to reach cleanup levels is estimated at 30 years.

Alternative 3 – *In-Situ Groundwater Treatment: Enhanced Bioremediation (EPA's preferred alternative)*

Estimated Capital Cost: $2.5 million
Estimated Total O&M Cost: $1.1 million
Estimated Present Worth Cost: $3.6 million
Estimated Construction Timeframe: 6 months

Under Alternative 3 in-situ treatment using enhanced bioremediation would be combined with ICs to remediate the contaminated groundwater and control risks and hazards. The ICs and groundwater monitoring would be similar to those in Alternative 2, but would not need to remain

in place as long. As part of the design phase, additional sampling, including potentially at some additional or new monitoring well locations would be performed. The data obtained during the pre-design investigation would be used to finalize the design of the remedy. This remedy includes treatment of the groundwater using microorganisms to break down hazardous substances into less toxic or non-toxic substances. Microbes and a soluble substrate (nutrients and an electron donor or energy source ("food")) would be injected into the groundwater aquifer to create conditions favorable for bioremediation. As developed in the FS, these injections would occur in at least three locations within the industrial/commercial area of the Site, where the highest concentrations of contaminants are found, and would address contamination in the shallow, intermediate, and deep groundwater zones of the aquifer. It is expected that the ultimate implementation of this remedy may look different, based on the results of the pre-design investigation and the design/implementation strategy chosen and approved by EPA. Enhanced bioremediation would be the primary component of groundwater remediation; however, other strategies may be used in different portions of the plume, as needed, to address other concerns, such as vinyl chloride stall, discussed below. The neighboring Geocel facility is using a similar in-situ treatment remedy, with apparent success.

The complete reductive dechlorination of chlorinated ethenes (PCE and TCE) yields non-toxic ethene as a final degradation product. Absent the right bacteria and groundwater conditions, dichloroethene (DCE) or vinyl chloride, which precede ethene in the biological degradation of PCE and TCE, may still accumulate. Vinyl chloride is of particular concern because it is more toxic than both PCE, TCE, and DCE. Proper remedial design and implementation can minimize or prevent the risk of vinyl chloride accumulation. This mitigating measure would include adding oxygen to groundwater in the residential area as a means of preventing vinyl chloride accumulation. Vinyl chloride can also be managed by injecting other treatment compounds to stimulate its aerobic degradation. The final design would include measures to prevent the stall of the degradation process based on design studies conducted. While enhanced bioremediation would be used to remediate most of the plume area, other in-situ approaches, such as in-situ chemical oxidation or chemical reduction would potentially be used in limited areas to fully achieve the RAOs.

This alternative would include a sampling program to analyze for the COCs and the presence of indicator compounds, such as degradation daughter products. Sample results would be used to evaluate the condition of the plume to determine if it is receding, stable, or expanding. Routine sampling reports and five-year reviews would be required for the life of this alternative.

The estimated total cost of Alternative 3 is $3.6 million, including $2.5 million in capital costs and $1.1 million in present value O&M Costs. It would take about six months, including two applications, to fully apply the substrate and added microorganisms, and then an estimated 10 years of groundwater monitoring after the final application until RALs are met.

Alternative 4 – *Ex-Situ Groundwater Treatment: Extraction, Treatment, and Discharge*

Estimated Capital Cost: $4.6 million
Estimated Total O&M Cost: $6.8 million
Estimated Present Worth Cost: $11.4 million
Estimated Construction Timeframe: 1 year

Alternative 4 includes groundwater extraction, ex-situ treatment, and discharge to surface water (also referred to as "pump and treat"). ICs similar to Alternatives 2 and 3 would also be part of the remedy. As part of the design phase, additional sampling, including potentially at some additional or new monitoring well locations would be performed. The data obtained during the pre-design investigation would be used to finalize the design of the remedy. This alternative includes construction of extraction wells, a treatment plant, and the discharge line. The proposed system, as developed in the FS, would utilize an estimated 10 extraction wells and would be tailored to Site-specific conditions and remediation goals. Extraction wells would capture and remove contaminated ground water, prevent its migration, and ultimately restore the aquifer to its beneficial use. The exact number of extraction wells, their locations, and rate of extraction would be determined during system design.

The groundwater treatment technologies considered for the Site include air stripping and granular activated carbon (GAC) adsorption. Air stripping was considered as the primary treatment, followed by GAC adsorption as a polishing step, in a 'treatment train' to meet requirements for direct discharge to surface water. Two treatment trains are proposed. One train would treat groundwater extracted from the high COC concentration areas and the other would treat lower concentration groundwater extracted from the plume downstream.

The treated water would be discharged to Puterbaugh Creek, located approximately one mile east of the Site. The alternative includes construction of underground drainage piping from the treatment facility to the discharge location. A National Pollutant Discharge Elimination System (NPDES) permit, or equivalent, would be required to discharge the treated water and routine sampling of the discharged water required. This alternative would require routine reports for the life of this alternative and five year review reports.

The estimated total cost of Alternative 4 is $11.4 million, including $4.6 million in capital costs and $6.8 million in present value O&M Costs. Construction of Alternative 4 would take approximately one year. The time to reach cleanup levels is estimated at 20 years.

J. Comparative Analysis of Alternatives

Section 121(b)(1) of CERCLA presents several factors that EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP stipulates nine evaluation criteria to be used in assessing the individual remedial alternatives. The purpose of this evaluation is to promote consistent identification of the relative advantages and disadvantages of each alternative, thereby guiding selection of remedies offering the most effective and efficient means of achieving site cleanup goals. While all nine criteria are important, they are weighed differently in the decision-making process depending on whether they evaluate protection of human health and the environment or compliance with federal and state Applicable or Relevant and Appropriate Requirements (ARARs) (threshold criteria), consider technical or economic merits (primary balancing criteria), or involve the evaluation of non-EPA reviewers that may influence an EPA decision (modifying criteria). In order to be selected, an alternative has to meet the threshold criteria. These nine criteria are described below, followed by a discussion of how each alternative meets or does not meet each criterion.

Explanation of the Nine Evaluation Criteria

Threshold Criteria

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

2. ***Compliance with Applicable or Relevant and Appropriate Requirements*** addresses whether a remedy will meet the applicable or relevant and appropriate federal and state requirements, known as ARARs.

Primary Balancing Criteria

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

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

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

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

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

Modifying Criteria

8. ***State Agency Acceptance*** considers whether the state support agency supports the preferred alternative presented in the Proposed Plan and concurs with the selected remedy.

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

The following is a comparative analysis of the remedial alternatives other than the No Action Alternative.

J.1. Overall Protectiveness of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

Alternative 1 is not protective of human health and the environment because no action is taken to reduce COCs or prevent exposures of COCs to humans. Alternative 1 would allow contaminants greater than the RALs to remain at the Site.

Alternative 2 would be protective of human health and the environment because MNA could reduce the concentration and mobility of COCs in groundwater over a long period of time. ICs would help prevent the use of groundwater for drinking and prohibit residential land use in a portion of the Site north of County Road 106 until cleanup levels are met.

Alternative 3 would be protective of human health and the environment because enhanced bioremediation would reduce the concentration and mobility of COCs in groundwater. ICs would help prevent the use of groundwater for drinking and would prohibit residential land use in a portion of the Site north of County Road 106 to prevent VI exposures until cleanup levels are met.

Alternative 4 would be protective of human health and the environment because groundwater extraction and ex-situ treatment would prevent exposure to contaminants in groundwater upon reaching remedial action objectives. While groundwater extraction and treatment is taking place, ICs would help prevent the use of groundwater for drinking and would prohibit residential land use in a portion of the Site north of County Road 106 to prevent VI exposures.

J.2. Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs", unless such ARARs are waived under CERCLA section 121(d)(4). Compliance with ARARs

addresses whether a remedy will meet all of the ARARs or provides a basis for invoking a waiver.

Alternative 1 would not comply with the Safe Drinking Water Act (SDWA) requirements because no measures would be taken to restore the groundwater to drinking water standards, or prevent exposure to unacceptable groundwater contamination.

Alternatives 2, 3, and 4 would meet all technology-specific ARARs and would meet the SDWA requirements to restore the aquifer to drinking water standards. The State of Indiana's air pollution control rules are considered ARARs for Alternative 4 for the air stripping treatment.

J.3. Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

Alternative 1 would not provide long-term protection of human health and the environment.

Alternative 2 would provide a long-term effective and permanent remedy by reducing concentrations of COCs in groundwater in approximately 30 years (compared to 10 and 20 years for Alternatives 3 and 4, respectively) under natural processes. The long-term adequacy and reliability of this alternative would depend on maintenance and enforcement of ICs until the groundwater achieved RAOs.

Alternative 3 would be effective in the long-term and permanent. Alternative 3 would use enhanced bioremediation, which has been successful at many Superfund sites and is expected to completely degrade the contaminants. In some situations, the degradation of PCE and TCE can stall at vinyl chloride. However, proper design and implementation would prevent the stall at vinyl chloride. This alternative would permanently remove contaminants from the groundwater.

Alternative 4 would be effective in the long-term and permanent. Alternative 4 would require 20 years to achieve RAOs through ex situ groundwater extraction and treatment. This alternative would permanently remove contaminants from the groundwater.

J.4. Reduction of Toxicity, Mobility, and Volume

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Alternatives 1 and 2 do not use treatment to reduce the toxicity, mobility, or volume of the VOC contaminants in the groundwater aquifers. Under Alternative 2 natural attenuation processes would be expected to break down contaminants in the groundwater to cleanup levels, reducing the toxicity, mobility and volume of groundwater contaminants.

Alternative 3 would use treatment to reduce the toxicity, mobility and volume of the VOCs in the groundwater. Alternative 4 would use treatment to reduce the mobility and volume of the VOCs in the groundwater. In each alternative, portions of the plume would be subject to natural attenuation processes as well, which would reduce the toxicity, mobility, and volume of residual COCs in the downgradient portions of the contaminant plume.

J.5. Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and achieve RAOs; and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Under Alternative 1 there would be no actions taken and there would be no short term risks to either workers or the community.

The Institutional Controls under Alternatives 2, 3, and 4 would not have short-term adverse impacts. Implementation of the ICs could occur in a few months. Alternative 2 would take an estimated 30 years to reach remedial action objectives. Alternative 3 would pose minimal risk to the community and Site workers during implementation. Following completion of the design, it would take approximately 6 months to construct the remedy, and remedial action objectives would be expected to be achieved in 10 years. Construction of the treatment plant and other remedy components in Alternative 4 would pose some risk to on-Site workers, but these risks would be controlled through implementation of a construction health and safety plan. Construction activities under Alternative 4 would be somewhat disruptive to the community and might result in some additional traffic at and near the Site. However, risks from increased traffic would be controlled through a traffic management plan. Following completion of the design, the construction of Alternative 4 would take approximately one year and it would take approximately 20 years to reach remedial action objectives.

J.6. Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Alternative 1 does not involve any construction or remedial activities, nor require approvals or coordination with regulatory agencies, and therefore is readily implementable.

The Institutional Controls associated with Alternatives 2, 3, and 4 would require the cooperation of the local community and possibly land owners, thus present some implementability concerns. No technical or administrative difficulties are anticipated with implementation of Alternatives 3 and 4. The technologies used for these alternatives are widely available and fairly common. Alternative 3 would require that access be obtained from landowners for both potential new monitoring points and to implement the remedy. Alternative 4 would require effort to obtain the access necessary to install the system components and permit-equivalent-requirements necessary to construct the treatment plant and the discharge line.

J.7. Cost

Alternative 1 would cost nothing.

Alternative 2 is the least expensive action alternative at an estimated $1.3 million.

Alternative 3 is projected to cost $3.6 million.

Alternative 4 is the most expensive alternative at an estimated $11.4 million.

Cost summaries can be found in Appendix A of the FS Report.

J.8. State Acceptance

IDEM has indicated concurrence with the selection of Alternative 3. The state concurrence letter is included in Appendix A.

J.9. Community Acceptance

During the public comment period, the community expressed its support of Alternative 3. A full response to public comments is included later in this ROD in Part 3 - Responsiveness Summary.

K. Principal Threat Wastes

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP §300.430(a)(1)(iii)(A)). Identifying principal threat wastes combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Conversely, non-principal threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied.

Wastes that generally will be considered to constitute principal threats include, but are not limited to, the following:

- **Liquid source material** - waste contained in drums, lagoons or tanks, free product in the subsurface (i.e., non-aqueous phase liquids) containing contaminants of concern (generally excluding groundwater).
- **Mobile source material** - surface soil or subsurface soil containing high concentrations of chemicals of concern that are (or potentially are) mobile due to wind entrainment, volatilization (e.g., volatile organic compounds), surface runoff, or subsurface transport.
- **Highly-toxic source material** - buried drummed non-liquid wastes, buried tanks containing non-liquid wastes, or soils containing significant concentrations of highly toxic materials.

Wastes that generally do not constitute principal threats include, but are not limited to, the following:

- **Non-mobile contaminated source material of low to moderate toxicity** - surface soil containing chemicals of concern that generally are relatively immobile in air or groundwater (i.e., non-liquid, low volatility, low leachability contaminants such as high molecular weight compounds) in the specific environmental setting.
- **Low toxicity source material** - soil and subsurface soil concentrations not greatly above reference dose levels or that present an excess cancer risk near the acceptable risk range were exposure to occur.

EPA does not consider the groundwater contaminant plume found at the Lane Street Site to be principal threat waste. EPA has not identified any materials at the Site that could be classified as principal threat wastes.

L. Selected Remedy

The Selected Remedy is **Alternative 3** – *In-Situ Groundwater Treatment through Enhanced Bioremediation*, to address the contamination in the groundwater aquifer at the Lane Street Site.

Institutional Controls

As part of the Selected Remedy, EPA will evaluate which ICs are necessary to prevent the consumption or accidental exposure to contaminated groundwater, or to protect the integrity of the remedial action until RAOs are achieved. Selected ICs also include those as necessary to protect against potential future exposures of residents in EA-1. The IC evaluation will be documented in the ICIAP.

ICs may include property use controls (such as environmental restrictive covenants) or governmental controls (including zoning ordinances and groundwater use restrictions). Where ICs are necessary, the ICIAP will identify parties responsible (i.e., federal agencies, the State of Indiana, Elkhart County, or other local authorities or private entities) for implementation, enforcement, and monitoring and long-term assurance of each IC, including costs (both short-term and long-term), and methods to fund the costs and responsibilities for each step.

The ICIAP will include maps describing the coordinates of the restricted areas on paper and provide shape files in an acceptable GIS format (i.e., NAD 83) to the parties responsible for implementation depicting all areas that do not allow unlimited use/unrestricted exposure and where groundwater use is restricted.

Description of the Selected Remedy

Alternative 3, *In-Situ Groundwater Treatment through Bioremediation*, is also referred to as enhanced anaerobic dechlorination (EAD) when applied to biodegradation of chlorinated VOCs (CVOCs) such as PCE, TCE, and cis-1,2-DCE. Anaerobic dechlorination occurs when bacteria utilize CVOCs for respiration as alternate electron acceptors under anaerobic conditions in place of oxygen, a process called halorespiration. The dechlorination process occurs naturally, if

anaerobic conditions are present in the subsurface, but the rate can be slow. The dechlorination rate can be increased or enhanced in the subsurface by placing biologically degradable substrates, such as molasses, corn syrup, lactate, whey, oil, or alcohol, into injection wells. The substrates act as electron donors, and biological degradation of these substrates requires electron acceptors. Electron acceptors typically are utilized sequentially based on the energy they yield to the microbe as follows: oxygen, nitrate, manganese, iron, sulfate, and carbon dioxide (CO2) until methanogenic conditions are established. Dechlorination typically occurs under sulfate reducing and methanogenic conditions, when other electron acceptors are scarce and the energy yielded by halorespiration of CVOCs is more favorable.

Applications of reducing compounds can be configured in several different ways, including grids, barriers, and excavations. The reducing compounds can be applied to the subsurface through direct-push injection, hollow-stem augers, existing wells, or re-injection wells. Injection of these mixtures into the saturated aquifer zones will allow the natural fate and transport process to treat the majority of the contamination source. The actual method will be determined in the remedial design.

EPA anticipates that two treatment applications will be required. The second treatment would be conducted approximately three years after initial treatment. Depending on the success of the first treatment application, the second application may cover a more limited area or require a reduced volume of product. At least four groundwater sampling events are proposed after the first treatment to determine its success and to modify the design of the second event accordingly. Additional groundwater sampling may be necessary to determine whether a second treatment is necessary.

Potential issues may include the accumulation of vinyl chloride, also called vinyl chloride stall. Vinyl chloride stall can be managed by several techniques, including verifying that the correct type of bacteria are present and injecting other treatment compounds to stimulate aerobic degradation of the vinyl chloride, or injecting other compounds which can capture and treat the vinyl chloride. A contingency plan for addressing potential vinyl chloride stall would be developed as part of the remedial design prior to the implementation of this remedial approach. Anaerobic conditions may produce methane and, therefore, the post-injection monitoring program would also include methane monitoring.

It is estimated that this alternative will take approximately 7 years (or 10 years total) after the final injection to reduce groundwater VOC concentrations to below cleanup levels. Once the material is injected, treatment is complete. The first 10 years of monitoring after the first and any necessary subsequent injection(s) will be considered long term response action (LTRA). O&M requirements will include any necessary monitoring after the 10-year LTRA phase of the cleanup. The remedial action cost estimate assumes that the RAOs would be successfully met after approximately 10 years. A total of ten years of LTRA monitoring is included in the cost estimate for confirmation sampling and monitoring.

Rationale for the Selected Remedy

The Selected Remedy was chosen based on EPA's belief that Alternative 3 provides the best balance of the evaluation criteria among all of the alternatives. Alternative 3 will be protective of human health and environment by reducing the concentration and mobility of COCs in groundwater through enhanced bioremediation. It will achieve the RAOs of meeting groundwater cleanup levels and restoring the aquifer to the highest beneficial use. Alternative 3 will also comply with chemical, location, and Site-specific ARARs identified in Appendix C.

Alternative 3 will achieve long-term effectiveness and permanence by reducing the concentration and mobility of COCs in the groundwater through enhanced bioremediation, and is expected to achieve the RAOs faster (10 years) than Alternative 4 (20 years) or Alternative 2 (30 years). The preferred alternative will be implementable because equipment and supplies are readily available for construction of the remedy. Alternative 3 will be effective in the short-term because construction time is short and workers and the community can be protected through standard safety measures.

Expected Outcomes of the Selected Remedy

The Selected Remedy will reduce the risks to human health and the environment to levels within EPA's acceptable risk range by preventing exposure to site contaminants of concern while treating the groundwater. Institutional controls will prevent exposure to nearby residents. Land and groundwater use at the site is not expected to change in the foreseeable future. It is expected that the RAOs that were established for the remedial action will be met after approximately 10 years.

Cost for the Selected Remedy

The cost to implement Alternative 3 is estimated to be approximately $3.6 million. This includes a capital cost of $2.5 million and a present worth LTRA cost of $1.1 million. Additional detail is provided in Table 6. The cost estimate summary table is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Differences, or a ROD Amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

ARARs for the Selected Remedy

The ARARs for the Selected Remedy are provided in Appendix C tables. This table includes not only requirements that are applicable or relevant and appropriate, but also guidance and criteria that are "to be considered" (TBC) during the remedial action. Appendix C tables identifies chemical-specific, location-specific, and action-specific ARARs and TBCs.

M. Statutory Determinations

Under CERCLA §121 and the NCP §300.430(f)(5)(ii), EPA must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as a principal element and a bias against offsite disposal of untreated wastes. The following sections discuss how the Selected Remedy meets these statutory requirements.

Protection of Human Health and the Environment

Alternative 3 will protect human health and the environment by preventing exposure to site chemicals while treating the contaminated shallow, intermediate, and deep groundwater zones of the aquifer. Institutional controls will prevent exposure to nearby residents.

The *in-situ* treatment will reduce concentrations of COCs in the groundwater to levels within the target risk range and below MCLs. While there is a risk of increasing concentrations of daughter products at the Site (particularly DCE and VC), complete reduction of PCE into ethene or ethane is believed to be the eventual result of the *in-situ* treatment with proper design and implementation.

Compliance with ARARs

The selected remedy will comply with all ARARs.

Cost-Effectiveness

Alternative 3 is cost effective because the remedy's costs are proportional to its overall effectiveness (see 40 CFR §300.430(f)(l)(ii)(D)). This determination is made by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (i.e., that are protective of human health and the environment, and comply with all federal and state ARARs, or as appropriate, waive ARARs). Overall effectiveness is evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). The overall effectiveness of each alternative is then compared to each alternative's costs to determine cost effectiveness. The relationship of the overall effectiveness of the Selected Remedial Action was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

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

EPA has determined that Alternative 3 represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the site. Of those

alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the Alternative 3 addresses site risks while also considering the statutory preference for treatment as a principal element, bias against offsite treatment and disposal, and considering state and community acceptance.

Alternative 3 will reduce contaminants in the contaminated groundwater aquifer at the Site. The Selected Remedy accomplishes this through treatment and will be permanent.

Preference for Treatment as a Principal Element

By treating the contaminated groundwater using enhanced bioremediation, Alternative 3 satisfies the statutory preference for remedies that employ treatment as a principal element.

Five-Year Review Requirements

CERCLA §121(c) and the NCP §300.430(f)(5)(iii)(C) provide the statutory and legal bases for conducting Five-Year Reviews. Because this remedy is expected to take at least five years to achieve the RAOs, it will result in hazardous substances remaining onsite in the groundwater above levels that allow for unlimited use and unrestricted exposure. A statutory review will be conducted every 5 years after initiation of the remedial action until RAOs are achieved to ensure that the remedy is, or will be, protective of human health and the environment.

N. Documentation of Significant Changes

The Proposed Plan for the Site was released for public comment on April 4, 2016. The Proposed Plan identified Alternative 3 as the Preferred Alternative. The Proposed Plan public comment period ran from April 11, 2016 through May 11, 2016. CERCLA Section 117(b) and NCP Section 300.430(f)(5)(iii) require an explanation of any significant changes from the remedy presented in the Proposed Plan that was published for public comment. Based upon its review of the written and oral comments submitted during the public comment period, EPA has determined that no significant changes to the remedy, as originally identified in the Proposed Plan, are necessary or appropriate.

Part 3. Responsiveness Summary

In accordance with CERCLA Section 117, 42 U.S.C. Section 9617, EPA released the Proposed Plan and Administrative Record on April 4, 2016, and the public comment period ran through May 11, 2016, to allow interested parties to comment on the Proposed Plan. EPA held a public meeting regarding the Proposed Plan on April 20, 2016, at the Eastwood Elementary School in Elkhart, Indiana. Approximately 30 people attended the public meeting. Representatives from EPA, IDEM, and the Elkhart County Department of Public Health were present at the public meeting.

This Responsiveness Summary provides both a summary of the public comments EPA received regarding the Proposed Plan and EPA's response to those comments. EPA received written comments (hand written and via regular and electronic mail) during the public comment period. There was also an opportunity to make verbal comments at the public meeting, although no one made verbal comments. In total, comments were received from four different people or organizations, including a concerned citizen, commercial landowners, and an environmental consultant. A copy of the comments received are included in the Administrative Record for the Site. The Administrative Record index is attached as Appendix 2 to this ROD.

EPA, in consultation with IDEM, carefully considered all of the information in the Administrative Record prior to selecting the remedy documented in this ROD. Complete copies of the Proposed Plan, Administrative Record, and other pertinent documents are available at the Elkhart Public Library, Reference Services, 300 S. Second Street, Elkhart, Indiana, as well as the EPA Region 5 Superfund Division Records Center, 77 West Jackson Boulevard, 7th floor, Chicago, Illinois.

A written transcript from the public meeting and the written comment received in entirety can be found in the Administrative Record.

Comments and Responses to Individual Comments

This Responsiveness Summary does not repeat verbatim each individual comment. The remainder of this Responsiveness Summary contains a summary of the comments received and EPA's responses to those comments, in consultation with IDEM. In some cases, similar comments which were received from more than one commenter have been combined into a single comment. This responsiveness summary summarizes all comments which relate to the Proposed Plan.

Comment 1: Health Concerns:
A current resident expressed specific health concerns related to the Lane Street Site.

Response:
In 2008 EPA switched almost all homes in the Lane Street area, and all homes with well water containing VOC levels above drinking water standards, to the City of Elkhart municipal water supply system. One or two homes in the area may still be using wells for drinking water, but these wells did not show VOC contamination above drinking water standards.

The Agency for Toxic Substances and Disease Registry (ATSDR) released a Public Health Assessment (PHA) report for public comment in March 2013. In the PHA report, ATSDR evaluated whether past exposure to chemicals in groundwater could have caused harm. ATSDR concluded that although potential exposures in the past could have been high enough in a few homes to result in health effects, ATSDR did not have information about how long the contamination was present or the actual exposure levels. Even if ATSDR knew the levels of past exposure, the number of potentially exposed people would be too small to allow them to detect statistical differences in disease rates.

For more information on the most frequently asked health questions regarding contaminants of concern at this Site, visit the ATSDR site: www.atsdr.cdc.gov/toxfaqs/index.asp.

Comment 2: Agreement with EPA's preferred option:
A current commercial landowner expressed agreement with EPA's preferred cleanup option, Alternative 3- In-Situ Treatment through Enhanced Bioremediation. The landowner expressed interest in the shorter cleanup timeframe and apparent success with this treatment at the neighboring Geocel facility.

Response:
EPA and IDEM appreciate and acknowledge this comment. As stated during the public meeting and in the ROD, EPA is performing the cleanup to allow the groundwater to potentially be used as a drinking water source in the future. Alternative 3 uses enhanced bioremediation, which has been successful at many Superfund sites and is expected to completely degrade the contaminants of concern. Alternative 3 is expected to achieve the Remedial Action Objectives (RAOs) faster (10 years) than Alternative 4 (20 years) or Alternative 2 (30 years).

Comment 3: Disagreement with Conceptual Model for EPA's preferred Cleanup Option:
A current commercial landowner expressed disagreement with the conceptual design for EPA's preferred cleanup option, Alternative 3- In-Situ Treatment through Enhanced Bioremediation. Specifically, the landowner states that there is no evidence of contamination at 2503 Marina Drive and only one source of contamination exists at 2601 Marina Drive and that all remediation efforts should be focused in that area.

Response:
EPA and IDEM agree that a contaminant source located north of Cooper Drive is a contributing source to the Lane Street groundwater contamination. However, in order for a source area north of Cooper Drive to be the sole source of groundwater contamination observed at the 2503 Marina Drive property, it would have been necessary for the center of mass of the contaminant plume to have migrated at least 1,000 feet from the source area. While this type of migration is possible and has been observed at other chlorinated VOC releases, it is EPA and IDEM's opinion that this theory cannot be conclusively proven or disproven based on the information to date. For instance, data from monitoring wells MW-14 and MW-15 (located near the southwestern corner of the 2503 Marina Drive facility) indicate that upgradient concentrations of TCE are lower and downgradient concentrations are higher than the data north of Cooper Drive. These findings are not inconsistent with the conceptual site model (CSM) in the RI Report, which indicates that

there are potential multiple sources of groundwater contamination. The final CSM presented by EPA in the RI Report includes potential sources, release mechanisms, exposure pathways, migration routes, and potential receptors. The interpretations and conclusions developed by EPA are scientifically sound and consistent with previous investigations performed at the Site by EPA and third-party consultants.

The actual treatment/injection areas for the enhanced bioremediation preferred cleanup option was provided on a figure during the public meeting. It was noted at the time that the figure was a conceptual figure that was used in developing the cost estimate for Alternative 3 during the feasibility study (FS). The exact number of injection and recirculation wells and their locations would be determined during system design, based on current results of a pre-design investigation/sampling event. For more information, please refer to the Final FS Report.

Comment 4: Source area remediation should be implemented:
The commenter states that remediation must include elimination, reduction, or containment of the source at 2601 Marina Drive, and not merely the downgradient treatment of contaminants emanating from that source as currently proposed by the EPA.

Response:
Alternative 3, Enhanced Bioremediation includes a pre-design investigation. As part of the design phase, additional sampling, including potentially at some additional or new monitoring well locations will be performed. The data obtained during the pre-design investigation will be used to finalize the design of the remedy and the exact number of injection and recirculation wells or points and their locations. This will likely include remedial efforts at 2601 Marina Drive and other source area(s).

Focusing substantial remediation efforts in the immediate vicinity of 2601 Marina Drive would not be protective of this Site, as a significant portion of the contamination is presently located downgradient of 2601 Marina Drive, and concentrations from points near 2601 Marina Drive have been decreasing. EPA's preferred remedy focuses primarily on the most substantial portion of the contamination, which is located downgradient from 2601 Marina Drive.

Comment 5: Potential vapor intrusion risks at 2601 Marina Drive:
The commenter states that the FS does not describe any additional vapor intrusion (VI) sampling or VI mitigation within/underneath the building at 2601 Marina Drive. As discussed in Section IV of Roberts' Remedial Investigation Report Comments dated December 28, 2015, the data indicate potential VI risks to receptors working within this building.

Response:
Vapor intrusion risk was evaluated in the Human Health Risk Assessment (*see* Appendix D of the Final RI Report). Under the Reasonable Maximum Exposure (RME) scenario, risks from Vapor Intrusion associated with location SV-01 (located south of 2601 Marina Drive), were determined to be less than $1x10^{-6}$, which is the lower end of the risk management range. Therefore, no VI-related remedial action is required. However, the FS does consider institutional controls to address potential vapor intrusion issues and are included in the ROD. Additional VI

sampling and/or mitigation may be necessary only if residential use of the property was proposed in the future.

Comment 6: Injection wells versus grid-based injections:
The commenter states that the FS proposes fencerow-style permanent injection wells and extraction wells to emplace the enhanced bioremediation materials (EBMs) within the aquifer for Alternative 3. As recommended by IDEM in its October 2015 comments to EPA's FS, grid-based injections using direct-push technologies "similar to what has been done at the Geocel site" would result in better overall plume coverage and better control of vertical distribution of EBMs within the plume.

Response:
Comment noted. The FS presented a vision for how Alternative 3, In-Situ Groundwater Treatment through Bioremediation, would look. However, EPA recognizes that there is more than one way to implement the selected remedy. As discussed in the ROD, design flexibility is provided, such that the final design may use other approaches--including injections using grid-based injections or direct-push technologies--provided that enhanced bioremediation is the primary remedial mechanism.

Comment 7: Methane monitoring:
The commenter states that a methane monitoring plan per IDEM guidance will be needed if Alternative 3 is chosen. The injection of anaerobic EBMs often results in elevated levels of methane, which has been documented at sites across Indiana.

Response:
The FS assumes that periodic monitoring would be performed during the remedial period. The exact nature of the monitoring would be outlined in a future document, such as an Operations, Maintenance, and Monitoring Plan (OMMP), prepared once the design has been finalized, and would be subject to review and comment by EPA and IDEM. Such monitoring would certainly include methane, along with other appropriate parameters.

Comment 8: Oxygen injection wells to control vinyl chloride:
The commenter states that the FS proposes the use of oxygen injection wells south of County Road 106 within the Lane Street neighborhood in order to control the possible build-up of vinyl chloride. Oxygen enriching materials such as ORC® (Regenesis) should not be emplaced via permanent wells. Biofouling and a loss of hydraulic conductivity can occur at the well screen. Note that the ultimate location and need for any such injections or barriers to control VC should be based on upgradient post-EBM-injection data and not simply speculation.

Response:
Comment noted. The FS used ozone injection wells as one approach, but also outlined a number of different alternatives that could be used in the final design to address the possible build-up of vinyl chloride and potential vapor intrusion issues.

Comment 9: Accumulation of vinyl chloride:
The commenter expressed concerns regarding the conjecture that an accumulation or build-up of vinyl chloride (VC) will occur at the Lane Street Site. While "temporary" increases in cis-DCE and VC will occur within the treatment area, the VC is ultimately reduced to ethene. While it is true that vinyl chloride appears to be slightly increasing in some portions of the plume farther south of County Road 106 at the Geocel Site, this appears to be the result of natural attenuation/reductive dechlorination, not from the EBM injections.

Response:
EPA agrees with the commenter that vinyl chloride accumulation is not a certainty at this Site. The intent of the FS was to acknowledge the possibility that it may occur and recognize that there are a number of options available to address vinyl chloride stall, should it occur.

Figures

Approximate site boundary

Basemaps source: Esri

document path: D:\projects\Lane Street_EDI\EDR figure 1 Lane Street Site Location Map.mxd author: ASchubert

LANE STREET GROUND WATER CONTAMINATION SITE

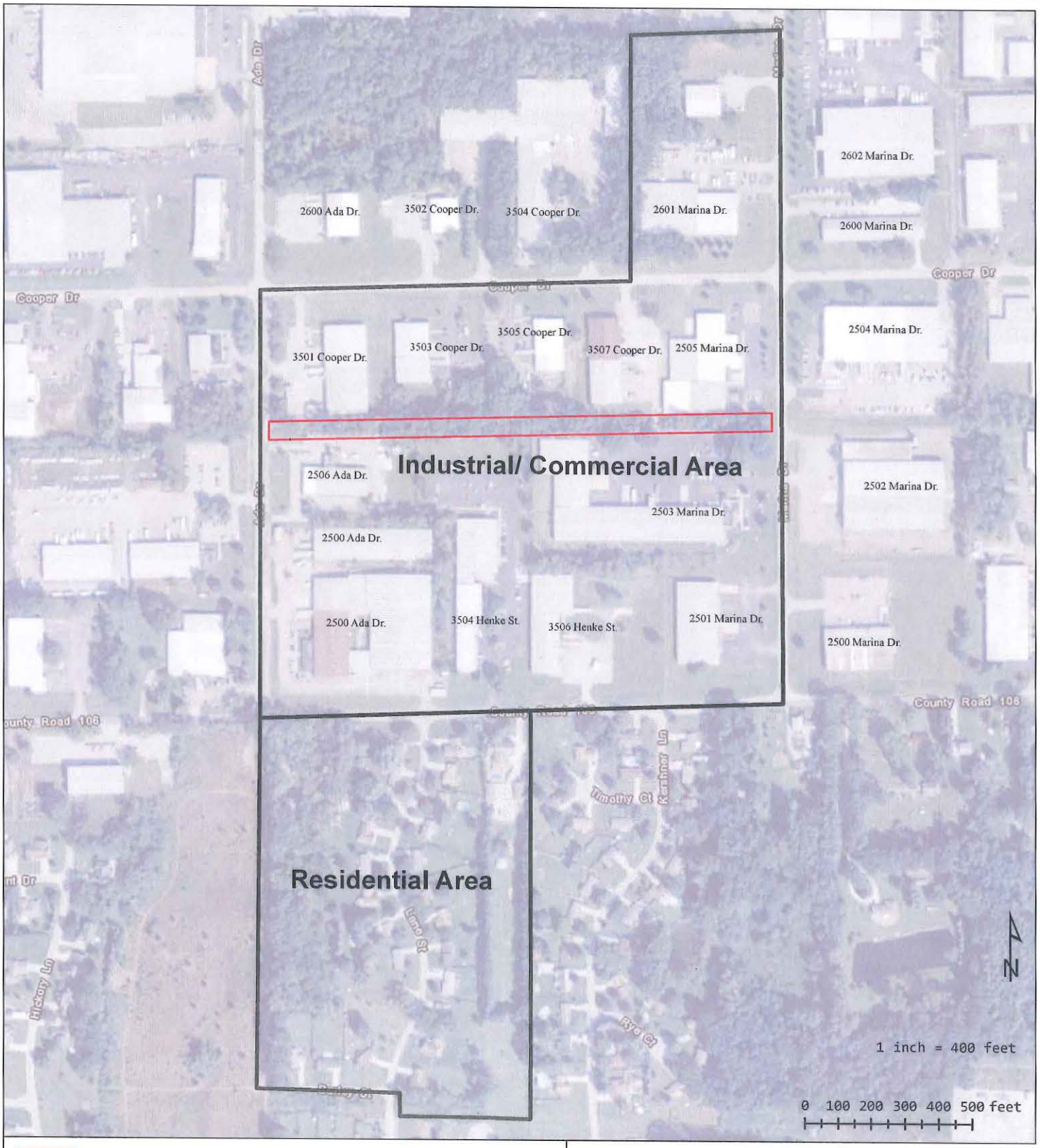
ELKHART, ELKHART COUNTY, INDIANA

RECORD OF DECISION

FIGURE 1

LANE STREET SITE LOCATION MAP

EPA REGION 5 RAC 2 | REVISION 1 | MAY 2016



Drainage ditch

Approximate Site Boundary

Basemap source: Esri

document path: D:\projects\Lane Street_ROD\ROD figure 2 Lane Street Site Detail.mxd author: ASchubert

LANE STREET GROUND WATER CONTAMINATION SITE

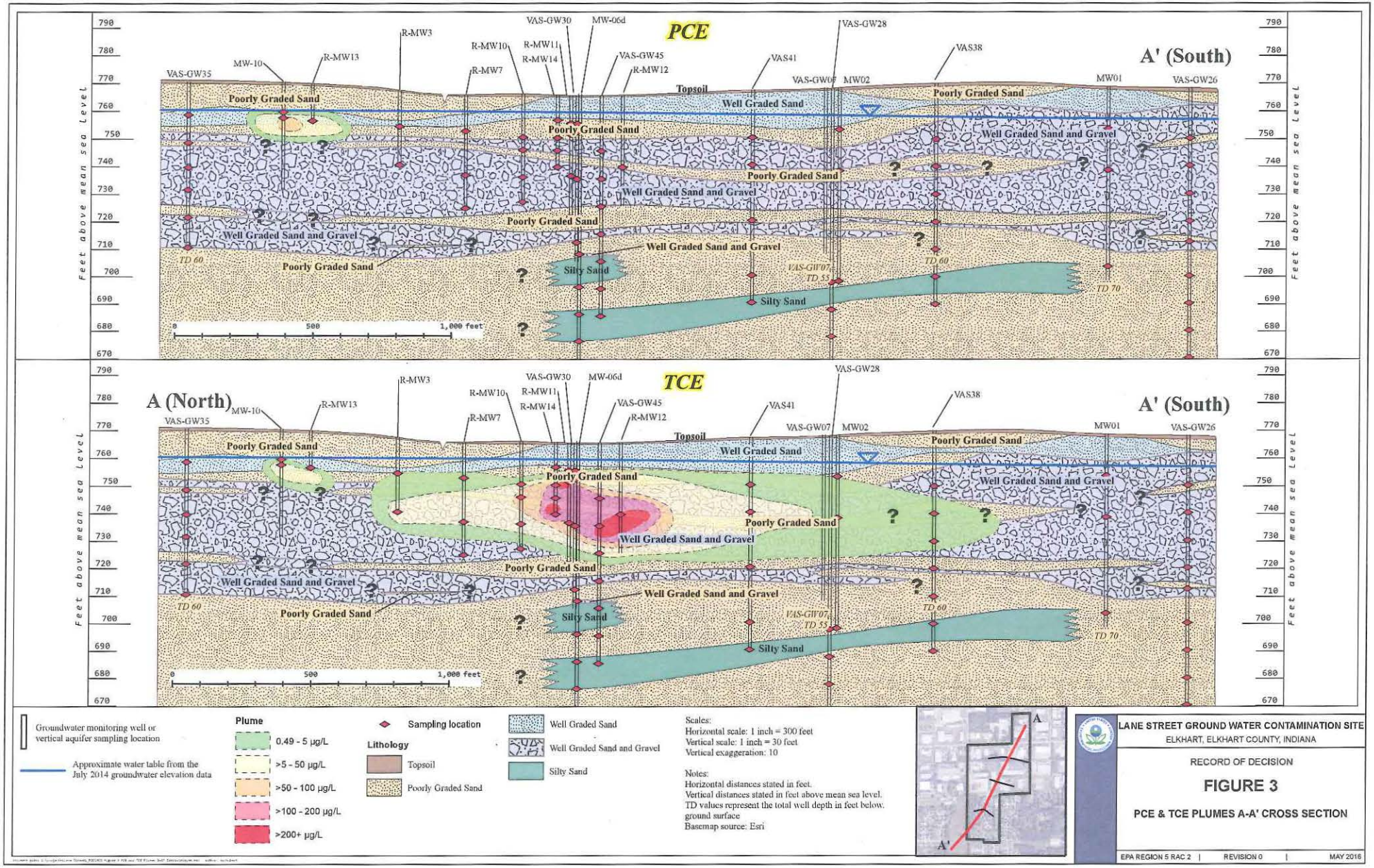
ELKHART, ELKHART COUNTY, INDIANA

RECORD OF DECISION

FIGURE 2

LANE STREET SITE DETAIL

EPA REGION 5 RAC 2 | REVISION 1 | MAY 2016


PCE
A (North)
A' (South)
TCE
A (North)
A' (South)
Feet above mean sea level
790
780
770
760
750
740
730
720
710
700
690
680
670
VAS-GW35
MW-10
R-MW13
R-MW3
R-MW10
R-MW7
R-MW11
R-MW14
VAS-GW30
MW-06d
VAS-GW45
R-MW12
VAS41
VAS-GW28
VAS-GW07
MW02
VAS38
MW01
VAS-GW26
Topsoil
Poorly Graded Sand
Well Graded Sand
Well Graded Sand and Gravel
Silty Sand
TD 60
TD 55
TD 70
0
500
1,000 feet
Groundwater monitoring well or vertical aquifer sampling location
Approximate water table from the July 2014 groundwater elevation data
Plume
0.49 - 5 µg/L
>5 - 50 µg/L
>50 - 100 µg/L
>100 - 200 µg/L
>200+ µg/L
Sampling location
Lithology
Topsoil
Poorly Graded Sand
Well Graded Sand
Well Graded Sand and Gravel
Silty Sand
Scales:
Horizontal scale: 1 inch = 300 feet
Vertical scale: 1 inch = 30 feet
Vertical exaggeration: 10
Notes:
Horizontal distances stated in feet.
Vertical distances stated in feet above mean sea level.
TD values represent the total well depth in feet below ground surface
Basemap source: Esri
A
A'
LANE STREET GROUND WATER CONTAMINATION SITE
ELKHART, ELKHART COUNTY, INDIANA
RECORD OF DECISION
FIGURE 3
PCE & TCE PLUMES A-A' CROSS SECTION
EPA REGION 5 RAC 2 | REVISION 0 | MAY 2016

- 2014 SulTRAC monitoring well network and VAS
- Approximate plume footprint
- Approximate site boundary

Notes:
Plume footprint based on RI data (SulTRAC 2015) and November 2015 Roberts' data (Roberts 2015).
Plume and descriptions based on exceedances of proposed RALs.

1,1 DCA = 1,1-dichloroethane
cis-1,2-DCE = cis-1,2-dichloroethene
PCE = tetrachloroethene
RAL = Remedial Action Level
RI = Remedial Investigation
TCE = trichloroethene
VAS = vertical aquifer sampling

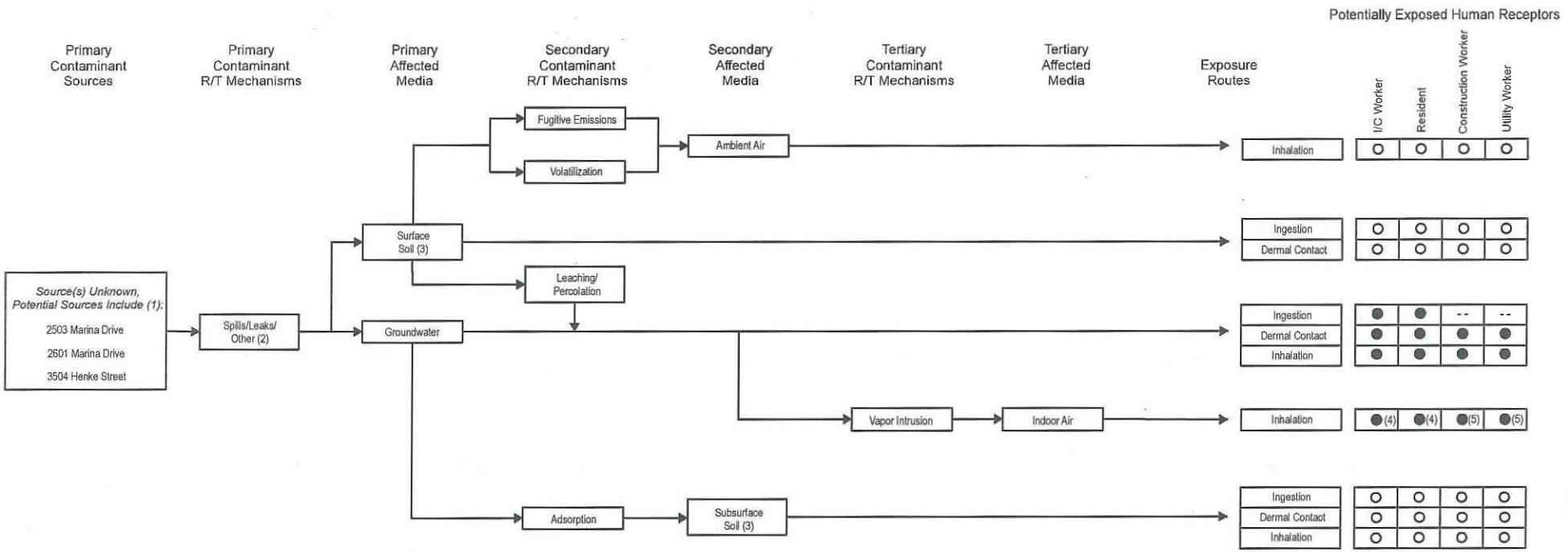
LANE STREET GROUND WATER CONTAMINATION SITE
ELKHART, ELKHART COUNTY, INDIANA

RECORD OF DECISION

FIGURE 4

AERIAL EXTENT OF CO-MINGLED GROUNDWATER PLUME

EPA REGION 5 RAC 2 | REVISION 1 | MAY 2016



Notes:

EPA = U.S. Environmental Protection Agency
EPC = Exposure Point Concentration
I/C = Industrial/Commercial
RI = Remedial Investigation
R/T = Release/transport
VISL = Vapor intrusion screening level
VOC = Volatile organic compound

● = Potentially complete exposure pathway; retained for quantitative analysis
○ = Potentially complete, but insignificant exposure pathway; was not retained
-- = Incomplete exposure pathway; was not retained

1. Potential sources all handle or handled hazardous substances.

2. "Other" includes releases to floor drains, dry wells, or septic systems.

3. Only arsenic has been detected at a concentration greater than its EPA residential Regional Screening Level (RSL). However, as discussed in Sections 1.5.1 and 1.5.3 of the Final Lane Street RI Report, based on site history and comparison to county-specific and national background levels, arsenic was determined to not be site-related. Therefore, no soil chemicals of potential concern were identified and receptor-specific soil exposures were not evaluated in the risk assessment (SulTRAC 2015).

4. Exposures, risks, and hazards associated with vapor intrusion of VOCs from groundwater and soil gas are assessed qualitatively using EPAs VISL Calculator (EPA 2014).

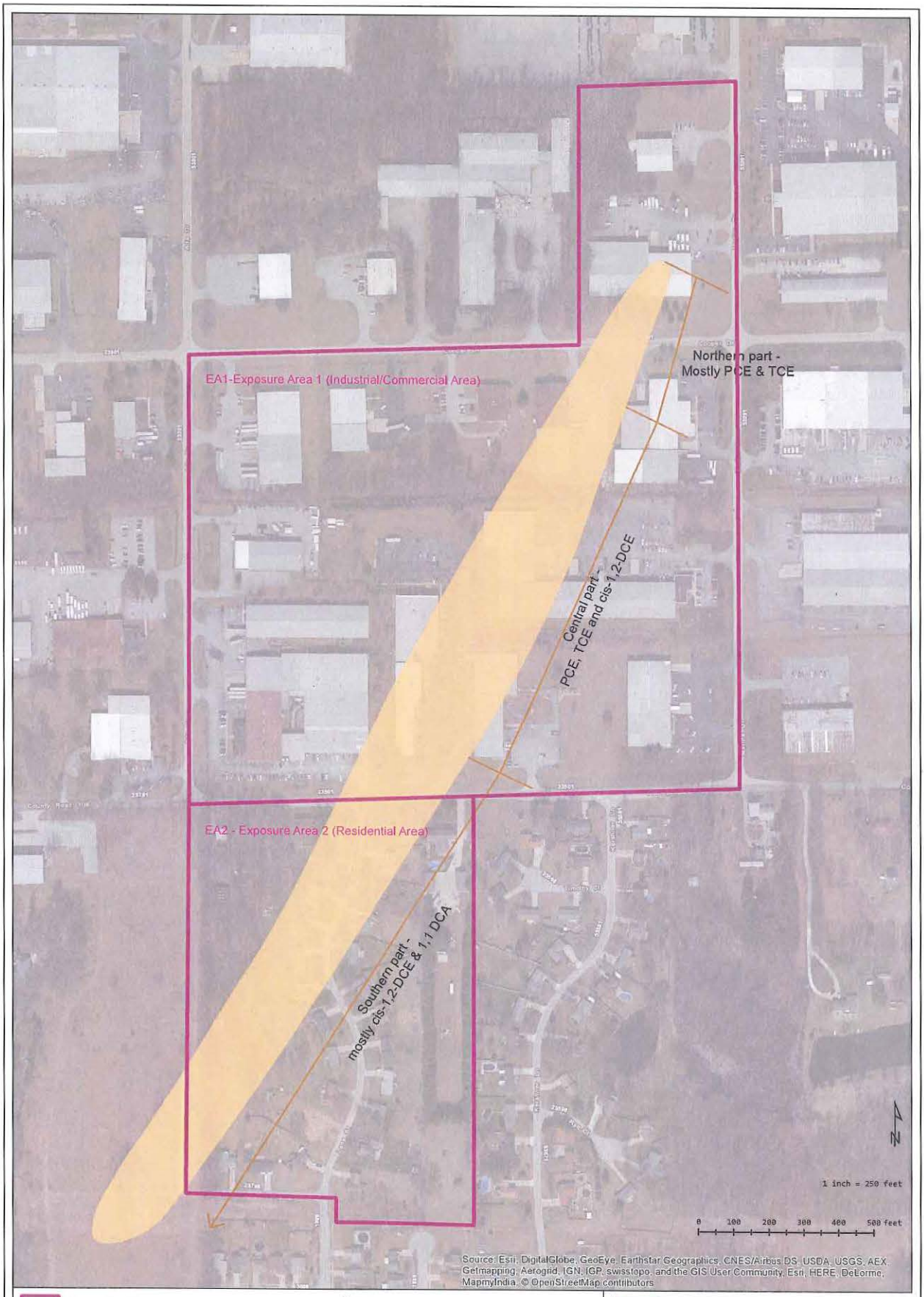
5. EPCs for air in a construction or utility trench will be calculated using the methodology presented in Virginia Department of Environmental Quality's Voluntary Remediation Program Risk Assessment Guidance dated August 2014.

LANE STREET GROUND WATER CONTAMINATION SITE
ELKHART, ELKHART COUNTY, INDIANA
RECORD OF DECISION

FIGURE 5

CONCEPTUAL SITE MODEL

EPA REGION 5 RAC 2 | REVISION 0 | MAY 2016



Human health exposure area

Approximate plume footprint

Notes:
Plume footprint based on RI data (SulTRAC 2015) and November 2015 Roberts' data (Roberts 2015).
Plume and descriptions based on exceedances of proposed RALs.

1,1 DCA = 1,1-dichloroethane
cis-1,2-DCE = cis-1,2-dichloroethene
PCE = tetrachloroethene
RAL = Remedial Action Level
RI = Remedial Investigation
TCE = trichloroethene
VAS = vertical aquifer sampling

LANE STREET GROUND WATER CONTAMINATION SITE

ELKHART, ELKHART COUNTY, INDIANA

RECORD OF DECISION

FIGURE 6

AERIAL EXTENT OF CO-MINGLED GROUNDWATER PLUME AND HUMAN HEALTH EXPOSURE AREAS

EPA REGION 5 RAC 2 | REVISION 1 | MAY 2016

Tables

TABLE 1: Summary of Chemicals of Potential Concern and Exposure Point Concentrations

HHRA for Lane Street Groundwater Contamination Site

Scenario Timeframe:	Current
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Point	Exposure Area	Analyte Class	Chemical of Potential Concern	Frequency of Detection	Units	Maximum Concentration (qualifier)		Exposure Point Concentration	
								Value	Statistical Measure
Groundwater	Exposure Area 1 (Combined Plume)	VOCs	--	--	--	--		--	--
	Exposure Area 2	VOCs	Cis-1,2-Dichloroethene	1/1	µg/L	31		31	Max

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Point	Exposure Area	Analyte Class	Chemical of Potential Concern	Frequency of Detection	Units	Maximum Concentration (qualifier)		Exposure Point Concentration	
								Value	Statistical Measure
Groundwater	Exposure Area 1 (Combined Plume)	VOCs	Bromodichloromethane	1/9	µg/L	1		1	Max
		VOCs	Chloroform	1/9	µg/L	8.5		8.5	Max
		VOCs	cis-1,2-Dichloroethene	8/9	µg/L	140		140	Max
		VOCs	Dibromochloromethane	1/9	µg/L	0.23		0.23	Max
		VOCs	Tetrachloroethene	5/5	µg/L	120		120	Max
		VOCs	Trichloroethene	9/9	µg/L	320		320	Max
	Exposure Area 2	VOCs	1,1-Dichloroethane	4/4	µg/L	4.4		4.4	Max
		VOCs	Bromodichloromethane	2/4	µg/L	1.9		1.9	Max
		VOCs	Chloroform	2/4	µg/L	4.3		4.3	Max
		VOCs	cis-1,2-Dichloroethene	4/4	µg/L	370		370	Max
		VOCs	Dibromochloromethane	2/4	µg/L	0.66		0.66	Max
		VOCs	Trichloroethene	4/4	µg/L	89		89	Max

Notes:

The maximum detected value was selected as the EPC unless the number of samples collected is ≥ 10 and the number of detections is ≥ 4. If these conditions are met, the EPC is calculated in accordance with EPA guidance (2002, 2013, 2014).

For nested monitoring well networks, and Vertical Aquifer Sampling (VAS) locations which have multiple co-located sampling locations, the highest concentration for each sampling event was chosen per sample location for inclusion of EPC calculation. The frequency of detection above is not depth dependent.

The Residential Exposure Area is represented by 1 nested monitoring well network MW-02 (d,i,s), and two VAS locations, VAS-GW38 and VAS-GW41. If available, and in accordance with EPA guidance, the two most recent sampling rounds of analytical data for each analyte class were used to calculate EPCs.

µg/L	micrograms per liter
--	Not applicable
EPA	U.S. Environmental Protection Agency
EPC	Exposure point concentration
J (+/- bias)	Concentration is estimated
Max	Maximum detected concentration
RAGS	Risk Assessment Guidance for Superfund
VAS	Vertical Aquifer Sampling

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, DC. December. Available on-line: www.epa.gov/oswer/riskassessment/pdf/ucl.pdf

EPA. 2013. "ProUCL Version 5.0 Technical Guide." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September. Available on-line: http://www.epa.gov/osp/hstl/tsc/software.htm

EPA 2014. "Determining Groundwater Exposure Point Concentrations". Office of Solid Waste and Emergency Response (OSWER). Directive 9283.1-42 Available on-line: http://www.epa.gov/oswer/riskassessment/pdf/superfund-hh-exposure/OSWER-Directive-9283-1-42-GWEPC-2014.pdf

TABLE 2: CANCER TOXICITY DATA SUMMARY

HHRA for Lane Street Groundwater Contamination Site, Elkhart, Elkhart County, Indiana

Pathway: Ingestion, Dermal

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal	Absorbed Cancer Slope Factor for Dermal		EPA Weight of Evidence/ Cancer Guideline Description	Oral Cancer Slope Factor	
	Value	Units		Value	Units		Source(s)	Date(s)
1,1-Dichloroethane	0.0057	$(mg/kg\text{-}day)^{-1}$	100%	0.0057	$(mg/kg\text{-}day)^{-1}$	Possible Carcinogen	Cal EPA	1/2015
Bromodichloromethane	0.062	$(mg/kg\text{-}day)^{-1}$	100%	0.062	$(mg/kg\text{-}day)^{-1}$	Probable Carcinogen	IRIS	1/2015
Chloroform	0.031	$(mg/kg\text{-}day)^{-1}$	100%	0.031	$(mg/kg\text{-}day)^{-1}$	Probable Carcinogen	Cal EPA	1/2015
cis-1,2-Dichloroethene	--	--	--	--	--	--	--	1/2015
Dibromochloromethane	0.084	$(mg/kg\text{-}day)^{-1}$	100%	0.084	$(mg/kg\text{-}day)^{-1}$	Possible Carcinogen	IRIS	1/2015
Tetrachloroethene	0.0021	$(mg/kg\text{-}day)^{-1}$	100%	0.0021	$(mg/kg\text{-}day)^{-1}$	Likely Carcinogen	IRIS	1/2015
Trichloroethene	0.046	$(mg/kg\text{-}day)^{-1}$	100%	0.046	$(mg/kg\text{-}day)^{-1}$	Possible Carcinogen	IRIS	1/2015

Pathway: Inhalation

Chemical of Potential Concern	Inhalation Unit Risk		EPA Weight of Evidence/Cancer Guideline Description	Unit Risk	
	Value	Units		Source(s)	Date(s)
1,1-Dichloroethane	0.0000016	(µg/m3)-1	Possible Carcinogen	Cal EPA	1/2015
Bromodichloromethane	0.000037	(µg/m3)-1	Possible Carcinogen	Cal EPA	1/2015
Chloroform	0.000023	(µg/m3)-1	Likely Carcinogen	IRIS	1/2015
cis-1,2-Dichloroethene	--	--	--	--	1/2015
Dibromochloromethane	0.000027	(µg/m3)-1	Possible Carcinogen	Cal EPA	1/2015
Tetrachloroethene	0.00000026	(µg/m3)-1	Likely Carcinogen	IRIS	1/2015
Trichloroethene	0.0000041	(µg/m3)-1	Carcinogen	IRIS	1/2015

Notes:

(1) All toxicity values were obtained from EPA 2015c.

Abbreviations:

Cal EPA	State of California Environmental Protection Agency
CAS	Chemical Abstract Service
EPA	U.S. Environmental Protection Agency
HHRA	Human Health Risk Assessment
IRIS	Integrated Risk Information System
mg/kg-day	Milligram per kilogram per day
RAGS	Risk Assessment Guidance for Superfund

References:

State of California Environmental Protection Agency (Cal EPA). 2015. Office of Environmental Health Hazard Assessment. Toxicity Criteria Database. Accessed January 27. Available on-line: http://oehha.ca.gov/risk/ChemicalDB/index.asp.

U.S. Environmental Protection Agency (EPA). 2015a. Integrated Risk Information System (IRIS). Online Database. Office of Research and Development, National Center for Environmental Assessment. Accessed January 27. Available on-line at: http://www.epa.gov/iris.

EPA. 2015c. Regional Screening Level (RSL) Summary Table (TR=1E-6, HQ=1) January. Available on-line: http://www.epa.gov/region9/superfund/prg/

TABLE 3: NON-CANCER TOXICITY DATA SUMMARY

HHRA for Lane Street Groundwater Contamination Site, Elkhart, Elkhart County, Indiana

Pathway: Ingestion, Dermal

Chemical of Potential Concern	Oral RfD		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/ Modifying Factors	Oral Reference Dose	
	Value	Units		Value	Units			Source(s)	Date(s)
1,1-Dichloroethane	0.20	mg/kg-day	100%	0.2	mg/kg-day	Kidney	3,000	PPRTV	1/2015
Bromodichloromethane	0.02	mg/kg-day	100%	0.02	mg/kg-day	Kidney	1,000	IRIS	1/2015
Chloroform	0.01	mg/kg-day	100%	0.01	mg/kg-day	Liver	100	IRIS	1/2015
cis-1,2-Dichloroethene	0.002	mg/kg-day	100%	0.002	mg/kg-day	Kidney	3,000	IRIS	1/2015
Dibromochloromethane	0.02	mg/kg-day	100%	0.02	mg/kg-day	Liver	1,000	IRIS	1/2015
Tetrachloroethene	0.006	mg/kg-day	100%	0.006	mg/kg-day	Neurological	1,000	IRIS	1/2015
Trichloroethene	0.0005	mg/kg-day	100%	0.0005	mg/kg-day	Immune System, Cardiovascular	10 - 1000	IRIS	1/2015

Pathway: Inhalation

Chemical of Potential Concern	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/ Modifying Factors	Inhalation Reference Concentration	
	Value	Units			Source(s)	Date(s)
1,1-Dichloroethane	--	--	--	--	--	1/2015
Bromodichloromethane	--	--	--	--	--	1/2015
Chloroform	0.098	mg/m^3	Cardiovascular, Developmental, Liver, Neurological, Kidneys, Reproductive	30	ATSDR	1/2015
cis-1,2-Dichloroethene	--	--	--	--	--	1/2015
Dibromochloromethane	--	--	--	--	--	1/2015
Tetrachloroethene	0.04	mg/m^3	Neurological	1,000	IRIS	1/2015
Trichloroethene	0.002	mg/m^3	Immune System, Cardiovascular	10 - 100	IRIS	1/2015

Notes:

(1) All toxicity values were obtained from EPA 2015c.

Abbreviations:

CAS	Chemical Abstract Service
EPA	U.S. Environmental Protection A
HHRA	Human Health Risk Assessmer
IRIS	Integrated Risk Information System
mg/kg-day	Milligram per kilogram per day
PPRTV	Provisional Peer Reviewed Toxicity Values
RAGS	Risk Assessment Guidance for Superfund
RfD	Reference Dose

References:

U.S. Environmental Protection Agency (EPA). 2015a. Integrated Risk Information System (IRIS). Online Database. Office of Research and Development, National Center for Accessed January 27, 2015.

EPA. 2015b. Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV). Accessed January 27. Available on-line: http://hhpprtv.ornl.gov/quickview/pprtv.php

EPA. 2015c. Regional Screening Level (RSL) Summary Table (TR=1E-6, HQ=1) January. Available on-line: http://www.epa.gov/region9/superfund/prg/

TABLE 4: RISK CHARACTERIZATION SUMMARY- EXPOSURE AREA 1

HHRA for Lane Street Groundwater Contamination Site, Elkhart, Elkhart County, Indiana

Receptor	RAGS D Tables	Total Risk	Risk Drivers	Total HI	HI Drivers
Future Industrial/ Commercial Worker	7.1.1.2.1 RME	1E-04 (GW)[1]	Bromodichloromethane (1.7E-06) Chloroform (9.0E-06) Tetrachloroethene (2.3E-06) Trichloroethene (1.1E-04)	27 (GW)[2]	Trichloroethene (25)
Future Industrial/ Commercial Worker (Property 1 : RV Washer/Parts Washer)	7.1.1.2.2 RME	1E-04 (GW)/1E-04 (GW)[1]	Bromodichloromethane (1.8E-06)/(1.7E-06) Chloroform (9.1E-06)/(9.0E-06) Tetrachloroethene (2.8E-06)/(2.4E-06) Trichloroethene (1.2E-04)/(1.1E-04)	28 (GW)/27 (GW)[2]	Trichloroethene (28)/(27)
Future Industrial/ Commercial Worker (Property 2)	7.1.1.2.3 RME	0.0E+00 [1]	NA	0.2 (GW)[2]	NA
Future Residents	7.1.2.2.1 RME	7E-04 (GW)[3]	Bromodichloromethane (7.5E-06) Chloroform (3.9E-05) Dibromochloromethane (1.4E-06) Tetrachloroethene (1.1E-05) Trichloroethene (6.6E-04)	121 (GW)[4]	cis-1,2-Dichloroethene (3.9) Tetrachloroethene (3.0) Trichloroethene (114)
Future Construction Workers	7.1.4.3.1 RME	5E-06 (GW)	Trichloroethene (4.0E-06)	135 (GW)	Tetrachloroethene (2.3) Trichloroethene (131)
Future Utility Workers	7.1.5.3.1 RME	4E-05 (GW)	Bromodichloromethane (4.6E-06) Chloroform (4.6E-06) Trichloroethene (3.0E-05)	10 (GW)	Trichloroethene (10)

Notes:

UNACCEPTABLE RISKS: Risk ≥ 1E-06 or HI > 1

EPA	U.S. Environmental Protection Agency
GW	Groundwater
MCL	Maximum contaminant level
NA	Not applicable
RME	Reasonable maximum exposure
VI	Vapor intrusion
VISL	Vapor intrusion screening level

1 Potential VI-related risks were evaluated qualitatively using EPA's VISL Calculator based on site-specific soil vapor concentrations (see Section 2.1.1 and Attachment D-4 of the HHRA). The qualitative risks are summarized below:

SV-01 (PCE Plume) -- risks are less than 1E-06 and considered insignificant.

SV-03 (TCE Plume) -- cumulative risk (3.6E-06), driven by chloroform (3.6E-06); chloroform concentration well below EPA's MCL for total trihalomethanes of 80 µg/L.

SV-04 (TCE Plume) -- risks are less than 1E-06 and considered insignificant.

2 Potential VI-related hazards were evaluated using EPA's VISL Calculator. All hazards are less than 1 and considered insignificant.

3 Potential VI-related risks were evaluated qualitatively using EPA's VISL Calculator based on site-specific soil vapor concentrations. The qualitative risks are summarized below:

SV-01 (PCE Plume) -- cumulative risk (3.7E-06), driven by PCE (3.2E-06).

SV-03 (TCE Plume) -- cumulative risk (1.6E-05), driven by chloroform (1.6E-05); chloroform concentration well below EPA's MCL for total trihalomethanes of 80 µg/L.

SV-04 (TCE Plume) -- risks are less than 1E-06 and considered insignificant.

4 Potential VI-related hazards were evaluated using EPA's VISL Calculator based on site-specific soil vapor concentrations. The qualitative hazards are summarized below:

SV-01 (PCE Plume) -- hazards are less than 1 and considered insignificant. SV-03 (TCE Plume) -- hazards are less than 1 and considered insignificant.

SV-04 (TCE Plume) -- cumulative hazard (2.), driven by dichlorodifluoromethane (2.0). Dichlorodifluoromethane (Freon 12) is a common refrigerant, detection is considered anomalous and not related to Lane Street plumes.

TABLE 5: RISK CHARACTERIZATION SUMMARY- EXPOSURE AREA 2

HHRA for Lane Street Groundwater Contamination Site, Elkhart, Elkhart County, Indiana

Receptor	RAGS D Tables	Total Risk	Risk Drivers	Total HI	HI Drivers
Future Industrial/ Commercial Worker	7.2.1.2.1 RME	4E-05 (GW)[1]	Bromodichloromethane (3.4E-06) Chloroform (4.6E-06) Trichloroethene (3.1E-05)	9.0 (GW)[1]	cis-1,2-Dichloroethene (2.0) Trichloroethene (7.0)
Future Residents	7.2.2.2 RME	2E-04 (GW)[1]	1,1-Dichloroethane (1.6E-06) Bromodichloromethane (1.5E-05) Chloroform (2.0E-05) Dibromochloromethane (4.0E-06) **Trichloroethene (1.8E-04)**	42 (GW)[1]	cis-1,2-Dichloroethene (10) Trichloroethene (32)
Future Construction Workers	7.2.4.3.1 RME	2E-06 (GW)	Trichloroethene (1.1E-06)	37 (GW)	Trichloroethene (37)
Future Utility Workers	7.2.5.3.1 RME	1E-05 (GW)	1,1-Dichloroethane (1.4E-06) Bromodichloromethane (1.4E-06) Chloroform (2.3E-06) Trichloroethene (8.4E-06)	3.0 (GW)	Trichloroethene (2.8)

Notes:

	Risk ≥ 1E-06 or HI > 1
EPA	U.S. Environmental Protection Agency
GW	Groundwater
MCL	Maximum contaminant level
NA	Not applicable
RME	Reasonable maximum exposure
VI	Vapor intrusion
VISL	Vapor intrusion screening level
1	Potential VI-related risks and hazards were evaluated qualitatively using EPA's VISL Calculator based on site-specific soil vapor concentrations (see Section 2.1.1 and Attachment D-4 of the HHRA). Risks are less than 1E-06 and considered insignificant; similarly, hazards are less than 1 and considered insignificant.

TABLE 6: Cost Estimate Summary for the Selected Remedy

Lane Street Groundwater Contamination Site
ELKHART, ELKHART COUNTY, INDIANA

Capital Costs for Alternative 3

ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	COST	SUBTOTAL
Mobilization/Demobilization					
Equipment/Personnel Mobilization/Demobilization	1	ls	$66,000	$66,000	
Survey	1	ls	$5,000	$5,000	
					$71,000
Site Work					
Site clearing and grubbing	1	ls	$5,000	$5,000	
Injection wells	12	each	$15,000	$180,000	
Extraction well	12	each	$15,000	$180,000	
Bio barrier system	2	each	$120,000	$240,000	
Amendments	2	each	$200,000	$400,000	
Oxygen injection wells	10	each	$15,000	$150,000	
Oxygen injection	1	ls	$60,000	$60,000	
					$1,215,000
Monitoring wells					
10- 2" dia wells	10	each	$10,000	$100,000	
				$0	
					$100,000
				SUBTOTAL	***$1,386,000***
				BONDS AND INSURANCE (@ 2 percent)	*$27,720*
				PERMITTING (@ 1 percent)	*$13,860*
				CONSTRUCTION SUBTOTAL	***$1,427,580***
				Scope Contingency (@ 25 Percent)	*$356,895*
				Bid Contingency (@ 15 Percent)	*$214,137*
				SUBTOTAL	***$1,999,000***
				Project Management (@ 5 percent)	*$99,950*
				Design (@ 10 percent)	*$199,900*
				Construction Management and inspection (@ 10 percent)	*$199,900*
				TOTAL CAPITAL COST FOR ALTERNATIVE 3	***$2,500,000***

TABLE 6: Cost Estimate Summary for the Selected Remedy

Lane Street Groundwater Contamination Site

ELKHART, ELKHART COUNTY, INDIANA

Annual Operation and Maintenance Costs for Alternative 3

ITEM DESCRIPTION	QTY	UNITS	UNIT PRICE	COST	SUBTOTAL
O&M Cost					
Follow up application	1	ls	$ 100,000.00	$100,000.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				SUBTOTAL OF ADDITIONAL TREATMENT	$100,000
				ONE TIME FOLLOW UP APPLICATION	**$100,000**
Monitoring Cost					
Quarterly sampling	4	each	$ 20,000.00	$80,000.00	
Shipping cost	4	each	$ 1,500.00	$6,000.00	
Consumables	1	ls	$ 3,000.00	$3,000.00	
Sampling equipment	4	each	$ 1,200.00	$4,800.00	
Quarterly report	4	each	$ 10,000.00	$40,000.00	
				$0.00	
				SUBTOTAL ANNUAL MONITORING COST	$133,800
				Total Annual O&M Cost	**$134,000**

Summary of Present Worth Analysis

Year	Capital Cost	Annual O&M Cost	Remedy Review	Total Cost	Discount Factor (7%)	Present Worth
0	$2,500,000			$2,500,000	1.000	$2,500,000
1		$134,000		$134,000	0.935	$125,290
2		$134,000		$134,000	0.873	$116,982
3		$134,000		$134,000	0.816	$109,344
4		$134,000		$134,000	0.763	$102,242
5		$134,000	$24,000	$158,000	0.713	$112,654
6		$134,000		$134,000	0.666	$89,244
7		$134,000		$134,000	0.623	$83,482
8		$134,000		$134,000	0.582	$77,988
9		$134,000		$134,000	0.544	$72,896
10		$134,000	$24,000	$158,000	0.508	$80,264
TOTALS	$2,500,000	$1,340,000		$3,888,000		$3,470,386
Total Present Worth Cost						$3,470,386

Notes

O&M Costs are reported as present worth estimates given a 7% discount rate for a 10 year duration.

Cost estimates are within +50 to -30% accuracy expectation.

Appendix A – Indiana Department of Environmental Management Concurrence Letter

Indiana Department of Environmental Management
We Protect Hoosiers and Our Environment.
100 N. Senate Avenue · Indianapolis, IN 46204
(800) 451-6027 · (317) 232-8603 · www.idem.IN.gov

Michael R. Pence
Governor

Carol S. Comer
Commissioner

June 14, 2016

Mr. Robert Kaplan
Acting Regional Administrator
U.S. EPA, Region V
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Dear Mr. Kaplan:

Re: Draft Record of Decision (ROD)
Lane Street Groundwater Contamination
Superfund Site
Elkhart, Indiana

The Indiana Department of Environmental Management (IDEM) has reviewed the U.S. Environmental Protection Agency's draft Record of Decision (ROD) document for the Lane Street Groundwater Contamination Superfund site in Elkhart, Indiana. IDEM is in full concurrence with the major components of the selected remedy outlined in the document which include the following:

- Injection of reducing compounds, potentially paired with appropriate microorganisms and feedstock, to reductively dechlorinate and potentially digest the chlorinated volatile organic compound (VOC) contaminants in the shallow, intermediate, and deep groundwater zones of the site aquifer.

- Implementation of a sampling program to monitor the condition of the groundwater plume to determine if it is receding, stable, or expanding, and to ensure that the reductive dechlorination of the contaminants in site groundwater is progressing as intended.

- Implementation of institutional controls (ICs) as necessary to prevent exposure to site contaminants.

IDEM staff agree that the selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. IDEM staff have been working closely with EPA Region V staff in the selection of an appropriate remedy and are satisfied with the selected alternative.

Please be assured that IDEM is committed to accomplish cleanup at all Indiana sites on the National Priorities List and intends to fulfill all obligations required by law to achieve that goal. We look forward to the beginning of remediation work on this project.

Sincerely,

Bruce H Palin
Assistant Commissioner
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Appendix B – Administrative Record Index

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION

ADMINISTRATIVE RECORD
FOR
LANE STREET GROUNDWATER CONTAMINATION SITE
ELKHART, ELKHART COUNTY, INDIANA

ORIGINAL
MARCH 25, 2008
(SDMS ID: 286278)

EPA Region 5 Records Ctr.
286278

NO.	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	09/05/07	U.S. EPA	File	Lane Street Site Assessment Residential Well Sampling Results for September 2007 (SDMS ID: 286276)	14
2	09/13/07	Jaworski, M., IDEM	Theisen, K., U.S. EPA	E-Mail Transmission re: IDEM Residential Well Sampling Results for the Lane Street Groundwater Contamination Site (SDMS ID: 286277)	2
3	03/19/08	Rauh, J., Weston Solutions, Inc.	Theisen, K., U.S. EPA	Site Assessment Letter Report for the Lane Street Groundwater Contamination Site (SDMS ID: 286238)	35
4	03/25/08	Theisen, K., U.S. EPA	El-Zein, J., U.S. EPA	Action Memorandum: Request for an Emergency Removal Action at the Lane Street Groundwater Contamination Site (PORTIONS OF THIS DOCUMENT HAVE BEEN REDACTED, SDMS ID: 286275)	12

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR THE
LANE STREET GROUND WATER CONTAMINATION SITE
ELKHART, ELKHART COUNTY, INDIANA

UPDATE 2
APRIL 6, 2016
SEMS ID: 924234

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	418011	10/19/95	Elkhart County	File	Inspection Form - Flexsteel Industries Inc	2
2	418008	12/5/96	Elkhart County	File	Inspection Form - Goshen Cushion	3
3	455171	6/13/06	Elkhart County	File	Elkhart County Building Department Records	170
4	325082	10/20/06	Roberts Environmental Services LLC	Geocel Corp.	Phase I Environmental Site Assessment	201
5	325097	8/23/07	IDEM	File	Sample Field Sheets for Groundwater Plume	10
6	325098	8/23/07	IDEM	File	Sample Field Sheets for Groundwater Contamination	39
7	300592	10/5/07	Jaworski, M., IDEM	Ripley, L., U.S. EPA	Preliminary Assessment Report	64
8	325110	11/1/07	Jaworski, M., IDEM	File	Expanded Site Inspection Work Plan	31
9	325077	2/8/08	Roberman, A., U.S. EPA	Ripley, L., U.S. EPA	Memo re: Conditional Approval of First Revision of QAPP for Site Investigation	4
10	325134	4/28/08	IDEM	File	Sample Locations	4
11	325130	8/13/08	Koon, K., Riverside Tool Corp.	Jaworski, M., IDEM	Letter re: List of Products Used (Material Safety Data Sheets Attached)	7

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12	325119	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for Alliance Plastics	9
13	325120	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for Engineered Packaging Systems of Indiana	14
14	325121	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for Cameo Industries	47
15	325122	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for Kelmark Corp.	11
16	325123	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for Vinyl Solutions	13
17	325124	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for Kasa Supply	15
18	325125	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for Environmental Test Systems	20
19	325126	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for R E Jackson & Vahala Foam	38
20	325127	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for Dygert Seating	11
21	325128	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for Stiles Inc.	16
22	325129	8/14/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for Sherry Designs	11
23	924247	9/5/08	IDEM	File	Site Inspection Report - Volume 1 (Redacted)	290
24	325059	9/5/08	IDEM	File	Site Inspection Report - Volume 2	480
25	325060	9/5/08	IDEM	File	Site Inspection Report - Volume 3	275
26	325081	9/8/08	Hill, Michael IDEM	Jaworski, M., IDEM	Memo re: Wellhead Protection Search Determination	1

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27	325086	9/9/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Letter re: List of Inhabitants in Elkhart, IN (Redacted)	2
28	923374	9/9/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Letter re: Resident Concerns on Drinking Water (Redacted)	4
29	923373	9/10/08	Esserman, Suzanne IDEM	Jaworski, M., IDEM	Memo re: Residential Water Sampling Using Carbon Filter Systems (Redacted)	6
30	325094	9/18/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Email re: Lanes Wells	2
31	325105	10/1/08	Ropski, Carol, G U.S. EPA	Jaworski, M., IDEM	Email re: Interviews	4
32	325131	10/22/08	Elkhart Metals Corp.	File	Material Safety Data Sheet	50
33	325062	12/1/08	IDEM	File	Geologic Assessment	476
34	325113	12/3/08	Jaworski, M., IDEM	File	Affidavit of Mark Jaworski, Summary of Site Investigation Activities	4
35	325117	12/3/08	Jaworski, M., IDEM	File	Affidavit of Mark Jaworski, Ground Water Contamination Project Information	7
36	325118	12/4/08	Jaworski, M., IDEM	File	Review of Elkhart County Health Dept. Inspection Reports	4
37	325135	12/8/08	Hulewicz, J., Elkhart County Health Department	Jaworski, M., IDEM	Inspection Information for R E Jackson	32
38	417999	1/28/09	Alt & Witzig Engineering Inc	File	Subsurface Investigation, CQC Inc - 3507 Cooper Drive, Elkhart, IN	36
39	325054	3/1/09	U.S. EPA	File	Hazard Ranking System (HRS) Documentation Record	61
40	505063	3/31/09	GRB Environmental Services Inc.	Dababneh, F., U.S. EPA	Copy of Lane Street Groundwater Contamination Site Report	1457

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
41	923887	10/14/10	Byvik, R., U.S. EPA	Schorle, B., U.S. EPA	Memo re: Approval for the First Revision of the Quality Assurance Project Plan (QAPP) for Remedial Investigation/Feasibility Study (RI/FS)	6
42	923889	2/18/11	Gorman, C., SULTRAC	U.S. EPA	Quality Assurance Project Plan (Revision 1)	332
43	923888	4/22/11	Schorle, B., U.S. EPA	Gorman, C., SULTRAC	Email re: Approval of Sampling and Analysis Plan with Field Sampling Plan and QAPP; Data Management Plan; Site Management Plan; and Health and Safety Plan	1
44	920932	11/30/12	Petroff, D., IDEM	Blake, L., U.S. EPA	Letter re: Site Investigation Data	3
45	919951	12/1/12	U.S. EPA	File	Community Involvement Plan	26
46	920935	12/20/12	Jeffers, D., Roberts Environmental Services LLC	Petroff, D., IDEM	Letter re: Response To IDEM Letter Dated Nov. 30, 2012	155
47	920933	2/7/13	Petroff, D., IDEM	Blake, L., U.S. EPA	Letter re: Site Investigation Data	4
48	920934	2/7/13	Petroff, D., IDEM	Jeffers, D., Roberts Environmental Services LLC	Letter re: Roberts Letter Dated Dec 20, 2012	6
49	919965	3/14/13	U.S. ATSDR	Public	News Release - ATSDR Invites Public Comment on the Revised Draft Lane Street Ground Water Contamination Report	2
50	919966	3/14/13	U.S. ATSDR	Public	News Release - Public Health Assessment (for Public Comment)	48
51	505062	5/29/13	Elkhart County Health Department and City of Elkhart Building Department	File	Regulatory Documents from the Elkhart County Health Department and the City of Elkhart Building Department	239
52	919963	6/1/13	SULTRAC	U.S. EPA	Data Validation Summary Report Phase I Soil and Groundwater Sample Results	14

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
53	919964	7/17/13	U.S. ATSDR	Public	Media Announcement - ATSDR Releases Final Public Health Assessment for Lane Street Ground Water Contamination	2
54	919967	7/17/13	U.S. ATSDR	Public	News Release - Public Health Assessment	50
55	923890	8/22/13	Gorman, Cheyrl SULTRAC	U.S. EPA	Quality Assurance Project Plan (Revision 3) (w/Response to Agency Comments)	190
56	923886	9/11/13	Roberman, A., U.S. EPA	Blake, L., U.S. EPA and Hansen, S., U.S. EPA	Memo re: Approval for the Third Revision of the Quality Assurance Project Plan with Field Sampling Plan and Sampling and Analysis Plan - Remedial Investigation/Feasibility Study (RI/FS)	1
57	915934	6/30/14	Bennett, S., Voyager Inc.	Blake, L., U.S. EPA	104(E) Response - Voyager Products (Voyager Inc) (Redacted)	4
58	915937	6/30/14	Woodsmall, J., Warrick & Boyn	Blake, L., U.S. EPA	104(E) Response - Ludwig Investments Inc (Redacted)	12
59	477916	7/1/14	Fisher, K., Phoenix USA Inc.	Blake, L., U.S. EPA	104(E) Response - Phoenix USA Inc	64
60	915936	7/7/14	Woodsmall, J., Warrick & Boyn	Blake, L., U.S. EPA	104(E) Response - Marcott Family Partners LLC (Redacted)	3
61	477908	7/8/14	Migedt, R., RJM Enterprises LLC	Blake, L., U.S. EPA	104(E) Response - Riverside Tool Corp	4
62	915939	7/8/14	Migedt, R., RJM Enterprises LLC	Blake, L., U.S. EPA	104(E) Response - Riverside Tool Corp (Redacted)	629
63	915938	7/9/14	Michael, R., Taft Law	Blake, L., U.S. EPA	104(E) Response - Fred Lands (Redacted)	12
64	921920	7/9/14	Bennett, S., Voyager Inc.	Blake, L., U.S. EPA	104(E) Response - Steve Bennett	4
65	478520	7/16/14	Hartzler, K. Barnes & Thornburg	Blake, L., U.S. EPA	104(E) Response - Flexsteel Industries Inc	17
66	915940	7/16/14	Balks, J., Hadley Products Corp.	Blake, L., U.S. EPA	104(E) Response - Hadley Products Corp (Redacted)	297

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67	915942	7/16/14	Hartzler, K., Barnes & Thornburg	Blake, L., U.S. EPA	104(E) Response (Attachments) - Flexsteel Industries Inc	1
68	472549	7/30/14	U.S. EPA	Martin, J.	104(E) Letter - John K Martin - Returned to Sender	1
69	915935	8/12/14	Woodsmall, J., Warrick & Boyn	Blake, L., U.S. EPA	104(E) Response - Voyager Acquisition (Redacted)	417
70	915941	9/3/14	Olson, J., Seyfarth Shaw Fairweather & Geraldson	Blake, L., U.S. EPA	104(E) Response - Hach Co (Redacted)	286
71	478972	6/1/15	SULTRAC	U.S. EPA	Appendix D: Final Risk Assessment	120
72	478973	8/1/15	SULTRAC	U.S. EPA	Final Remedial Investigation Report	449
73	498242	8/25/15	Petroff, D., IDEM	Blake, L., U.S. EPA	Letter re: Applicable or Relevant & Appropriate Requirements (ARARs)	3
74	498245	10/29/15	Petroff, D., IDEM	Blake, L., U.S. EPA	Letter re: Comments on Draft Feasibility Study Report	2
75	924658	12/14/15	Dynamic Metals	U.S. EPA	104(E) Response - Dynamic Metals (Redacted)	203
76	922971	12/28/15	Jeffers, D., Roberts Environmental Services LLC	Blake, L., U.S. EPA	Public Comments to U.S. EPA August 2015 Final Remedial Investigation Report (w/ Exibits A & B)	1
77	922973	1/13/16	Petroff, D., IDEM	Blake, L., U.S. EPA	Letter re: Comments on Draft Proposed Plan	2
78	923754	2/11/16	Blake, L., U.S. EPA	Petroff, D., IDEM	Memo re: Comments on Pace Analytical's Compound Specific Isotope Analysis (CSIA) Report Prepared for Roberts Environmental	4
79	924025	2/29/16	Roberts Environmental Services	U.S. EPA	Summary of Public Comments to U.S. EPA, August 2015	5
80	924740	3/8/16	Petroff, D., IDEM	Blake, L., U.S. EPA	Letter re: Roberts Environmental Submittals	4

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
81	924106	3/11/16	Tanaka, J., U.S. EPA	Miller Canfield	General Notice Letter - Dynamic Metals	13
82	924107	3/11/16	Tanaka, J., U.S. EPA	Nystrom, D., Dynamic Metals LLC	General Notice Letter - Dynamic Metals	13
83	924108	3/11/16	Tanaka, J., U.S. EPA	Czanderna, K., Flexsteel Industries Inc.	General Notice Letter - Flexsteel Industries Inc	13
84	924109	3/11/16	Tanaka, J., U.S. EPA	Hartzler, K. Barnes & Thornburg	General Notice Letter - Flexsteel Industries Inc	13
85	924110	3/11/16	Tanaka, J., U.S. EPA	Reisman, L., Hach Co.	General Notice Letter - Hach Co	13
86	924111	3/11/16	Tanaka, J., U.S. EPA	Olson, J., Seyfarth Shaw Fairweather & Geraldson	General Notice Letter - Hach Co	13
87	924883	3/31/16	SULTRAC	U.S. EPA	Final Feasibilty Study Report	99
88	925118	4/4/16	Blake, L., U.S. EPA	Jeffers, D., Roberts Environmental Services LLC	Letter re: Public Comments to Final Remeidal Invesitgation Report - U.S. EPA Reponse Letter	26
89	925119	4/4/16	U.S. EPA	Public	Fact Sheet: EPA Proposes Cleanup Plan for Groundwater Pollutiion	8
90	925120	4/4/16	U.S. EPA	Public	Proposed Plan	26

Appendix C – ARAR Tables

Table C-1. Chemical Specific ARARs

Potential ARARs	Requirements	Status	Description
Federal Chemical-Specific			
Clean Air Act (42 USC §§ 7401 through 7462)			
National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50)	Establishes primary and secondary standards for ambient air quality to protect public health and welfare.	Possible ARAR	Not likely to be applicable at the site because air stripping is not the selected remedial action.
National Emissions Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61)	Establishes emissions standards for hazardous air pollutants for which no ambient air quality standards exist but that cause or contribute to air pollution that may result in an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness.	Possible ARAR	Not likely to be applicable at the site because air stripping is not the selected remedial action.
Clean Water Act (33 USC §§ 1251 through 1376)			
Section 401 Water Quality Certifications	Establishes requirements for activities that may result in any discharge to waters of the state.	Possible ARAR	Considered an ARAR if discharges to waters of the state are necessary; however, discharges to surface water will be unlikely. If relevant, substantive requirements will be completed.
Water Quality Criteria (WQC) (40 CFR Part 131, Quality Criteria for Water, 1976, 1980, 1986)	Sets criteria for water quality based on toxicity to aquatic organisms and human health. These federal water quality criteria are non-enforceable guidelines used by the state to set water quality standards for surface water.	TBC	After in-situ treatment, groundwater concentrations are anticipated to decrease to below standards.
Safe Drinking Water Act (40 USC § 300)			
National Primary Drinking Water Standards (40 CFR Part 141)	Establishes health-based standards for public water systems (MCLs).	ARAR	After in-situ treatment, groundwater concentrations are anticipated to decrease to below standards.
Maximum Contaminant Level Goals (MCLG) (40 CFR 141.50, 141.51, 141.52)	Establishes drinking water quality goals set at levels of no known or anticipated adverse health effects, with an adequate margin of safety.	ARAR	After in-situ treatment, groundwater concentrations are anticipated to decrease to below standards.
National Secondary Drinking Water Standards (40 CFR Part 143)	Non-enforceable limits intended as guidelines for use by states in regulating water supplies. Secondary MCLs are related to aesthetic concerns and are not health-related.	TBC	Treatment of groundwater is not expected to improve aesthetic concerns.
EPA Risk Screening Levels			
EPA Regional Screening Levels (RSLs)	EPA Regional Screening Levels (RSLs) and associated guidance are risk-based tools for evaluating and cleaning up contaminated sites. The RSLs represent Agency guidelines and are not legally enforceable standards.	TBC	EPA RSLs are being used to assess if concentrations are protective where MCLs are not available.

Potential ARARs	Requirements	Status	Description
Integrated Risk Information System (IRIS)	Risk reference doses (RfDs) are estimates of daily exposure levels that are unlikely to cause significant adverse non-carcinogenic health effects over a lifetime. Cancer Slope Factors (CSFs) are used to compute the incremental cancer risk from exposure to site contaminants and represent the most up-to-date information on cancer risk from EPA's Carcinogen Assessment Group.	TBC	IRIS is a source of risk-related information which is used in the risk assessment process. IRIS is updated from time to time. Information within IRIS can be used both for evaluating potential risks, and evaluating the potential effectiveness of remedies.
State Chemical-Specific			
Indiana Drinking Water Standards (327 IAC 2-11, 327 IAC 8)	These rules establish MCLs in accordance with the SDWA (40 CFR 141.11), as well as groundwater classification methods and associated standards.	ARAR	Applicable to drinking water within the State of Indiana, and applicable to groundwater outside of established groundwater management zones. The Site is not located within a designated groundwater management zone.
Groundwater Quality Standards (327 IAC 2-11-2(e))	These regulations provide the standards for groundwater quality in Indiana. Provides that no person shall cause the groundwater in a drinking water supply well to have a contaminant concentration that results in an exceedance of numeric criteria contained within the rule for drinking water class groundwater, creates a condition that is injurious to human health, creates an exceedance of specific indicator criteria levels contained within the rule, or renders the well unusable for normal domestic use.	ARAR	After in-situ treatment, intermediate and deep groundwater concentrations are anticipated to decrease to below standards.
Indiana NPDES Permit regulations (327 IAC 5 and 327 IAC 2)	Regulations for NPDES discharges and applicable permits. This is the Indiana implementation of the Federal NPDES permit program.	Possible ARAR	Substantive requirements are considered an ARAR if discharges to waters of the state are necessary; however, it is unlikely that discharges would occur to waters of the state. Necessary pre-treatment would occur prior to any discharge.
Remediation Closure Guidance (RCG)	The RCG outlines IDEM's method for developing remediation objectives (risk-based and site-specific) for contaminated soil and groundwater. These remediation objectives protect human health and take into account Site conditions and land use. This is a non-rule policy document.	TBC	The RCG document provides a methodology for establishing remedial goals and determining that remediation has been achieved.

Table C-2. Location Specific ARARs

Potential ARARs	Requirements	Status	Description
Federal Location-Specific			
Floodplain Management (40 CFR Part 6, Appendix A)	Establishes agency policy and guidance for carrying out the provisions of Executive Order 11988, "Floodplain Management."	ARAR	Determined by proximity to St. Joseph River floodplain.
Protection of Wetlands (40 CFR Part 6, Appendix A)	Requires minimization of destruction, loss, or degradation of wetlands to carry out the provisions of Executive Order 11990.	TBC	Determined by location of wetlands, if any, along the surface water bodies. No wetlands currently exist along the Site boundaries.
Endangered Species Act of 1973 (16 USC § 1531 et Seq.)	Establishes requirements to protect species threatened by extinction and habitats critical to their survival.	Not ARAR	No habitats critical to survival of endangered species located on site.
National Historic Preservation Act of 1966 (USC § 470 et seq.)	Establishes requirements to protect historically significant facilities.	Not ARAR	No historically significant facilities located on site.
Fish and Wildlife Coordination Act (16 USC §§ 661 through 666; 40 CFR § 6.302 [g])	Requires consultation when a federal department or Agency proposes or authorizes any modification of any stream or other water body; requires adequate provisions for protection of fish and wildlife resources; also establishes policy for Executive Order 11990, "protection of wetlands."	Not ARAR	No modification of water bodies are included as part of the remedy
Archaeological Resources Protection Act of 1979; Public Law 96-95	Provides for the protection of archaeological resources on federal and native American lands.	Not ARAR	Site not owned by the government or tribe.
State Location-Specific			
Indiana Wellhead Protection Program (327 IAC 8-4.1)	This rule establishes MCLs (40 CFR 141 and 327 IAC 8) as cleanup standards for impacted groundwater within established wellhead protection areas.	Not ARAR	Site is not located within a wellhead protection area.

Table C-3. Action Specific ARARs

Potential ARARs	Requirements	Status	Description
Federal Action-Specific			
Occupational Safety and Health Administration (OSHA) Regulations (29 USC § 651)			
29 CFR Part 1910.120	Establishes limits for worker exposures during Response action at CERCLA sites.	ARAR	Appropriate health and safety procedures would be implemented during construction.
Federal Water Pollution Control Act as Amended by the Clean Water Act of 1977			
Section 208(b)	Proposed action must be consistent with regional water quality management plans as developed under Section 208 of the Clean Water Act.	Possible ARAR	Considered an ARAR if discharges to waters of the state are necessary; however, discharges to surface water will be unlikely. If needed, will be compliant with water quality management plans.
EPA NPDES Permit Regulations			
40 CFR Part 122	Administrative requirements for discharge to off-site waters.	Possible ARAR	Considered an ARAR if discharges to waters of the state are necessary, however, discharges to surface water will be unlikely. If relevant, substantive requirements will be complied with.
40 CFR Part 125.100	Site operator shall develop a best management Practice (BMP) program and shall incorporate it into the operations plan or the NPDES permit Application if required.	Possible ARAR	Considered an ARAR if discharges to waters of the state are necessary, however, discharges to surface water will be unlikely. If relevant, substantive requirements will be complied with.
Clean Water Act (33 USC §§ 1251 through 1376)			
40 CFR Part 131	States granted enforcement jurisdiction over direct discharges and may adopt reasonable standards to protect or enhance uses and qualities of surface water bodies in the states.	Possible ARAR	Considered an ARAR if discharges to waters of the state are necessary, however, discharges to surface water will be unlikely. If relevant, substantive requirements will be complied with.
RCRA (42 USC § 6901)			
40 CFR Parts 260 through 270	Identifies wastes subject to regulation as hazardous wastes.	ARAR	Investigation-derived waste generated during investigation activities will be sampled and analyzed to determine whether it is a hazardous waste, and appropriate waste storage and disposal practices will be followed.
40 CFR Part 261, Subpart B	Requires that hazardous waste must be manifested as such for transport to a permitted treatment, storage, or disposal facility (TSDF) in accordance with 40 CFR 262, Subpart B (329 IAC 3.1-7 and 329 IAC 3.1-8)	Possible ARAR	If hazardous waste is generated as part of remedial action, substantive requirements will be complied with.

Potential ARARs	Requirements	Status	Description
40 CFR Part 261.3(d)	For all hazardous waste related equipment, remove or decontaminate all hazardous waste residues, contaminated containment components, contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste unless 40 CFR 261.3(d) applies.	Possible ARAR	If hazardous waste is generated as part of remedial action, substantive requirements will be complied with.
Hazardous Waste Determination (40 CFR 262.11) and (329 IAC 3.1-6)	Requires that a proper hazardous waste determination must be made on all wastes generated from remedial actions including soil cuttings, spent activated carbon, and extracted groundwater.	Possible ARAR	If hazardous waste is generated as part of remedial action.
EPA Identification Numbers (40 CFR 262.12) and (329 IAC 3.1-6)	Requires a generator of hazardous waste to obtain an EPA identification number before treatment, storage, disposal, or offering for transport.	Possible ARAR	If hazardous waste is generated as part of remedial action, substantive requirements will be completed.
Packaging (40 CFR 262.30, 262.31, 262.32, and 262.33) (329 IAC 3.1-7 and 329 IAC 3.1-8)	All hazardous waste must be properly packaged, with labels, markings and placards, prior to transport	Possible ARAR	If hazardous waste is generated as part of remedial action.
Transportation of Hazardous Waste (40 CFR Part 263)	Requires transporters to be licensed hazardous Waste haulers; in case of a discharge during transportation, transporter must take immediate action to protect human health and the environment and clean up the discharge so that it no longer presents a hazard.	Possible ARAR	If hazardous waste is generated as part of remedial action, substantive requirements will be completed.
Containers (40 CFR Parts 264.171 through 264.178) and (329 IAC 3.1-10)	Regulations cited under Subpart I concern permanent on-site storage of hazardous wastes or temporary storage phases used during various cleanup actions such as removal or incineration.	Possible ARAR	If hazardous waste is generated as part of remedial action, substantive storage requirements prior to treatment or disposal shall be complied with.
Tanks (40 CFR Parts 264.191 through 264.198)	Regulations under Subpart J apply to tank storage of hazardous materials.	Possible ARAR	For hazardous waste generated as part of remedial action, tanks used for storage prior to treatment or disposal shall be compliant.
Waste Piles (40 CFR Part 264, Subpart L)	Regulations under Subpart L apply to waste piles. Any excavated soil or cuttings determined to be hazardous must not be placed back on the ground so as to create a waste pile as defined in 40 CFR 264, Subpart L. Covered roll-offs may be used.	Possible ARAR	If hazardous waste is generated as part of remedial action, substantive requirements will be complied with.
Miscellaneous Treatment Units (40 CFR Part 264, Subpart X)	Standards for environmental performance of miscellaneous treatment units.	Possible ARAR	If hazardous waste is generated as part of remedial action and treatment is necessary prior to disposal, substantive standards will be complied with.
Land Disposal Restrictions (LDR) (40 CFR Part 268)	Requires any waste placed in land-disposal units to comply with LDRs by either attaining specific performance- or technology-based standards.	Not ARAR	Land disposal on site of any waste is unlikely.
State Action-Specific			
Water Well Driller Licensing Requirements (Indiana Code (IC) 25-39-3 and 312 IAC 13)	This regulation provides for licensing of water well drillers.	Possible ARAR	Installation of water wells (such as extraction or monitoring wells) may be required.
Regulation of Water Well Drilling (IC 25-39-4 and 312 IAC 13)	This regulation outlines the requirements for construction and abandonment of groundwater wells for non-personal use in Indiana.	Possible ARAR	Installation of water wells (such as extraction or monitoring wells) may be required.

Potential ARARs	Requirements	Status	Description
Indiana Air Pollution Opacity Regulations (326 IAC 5-1-3)	Except as provided in 326 IAC 5-1-3, opacity shall meet the following: (a) Opacity shall not exceed an average of forty percent for any one six-minute averaging period as determined in 326 IAC 5-1-4. (b) Opacity shall not exceed sixty percent for more than a cumulative total of fifteen minutes (60 readings) in a six-hour period as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen one-minute non-overlapping integrated averages for a continuous opacity monitor in a six-hour period.	Not ARAR	Not likely to be applicable at the site since air stripping is not the selected remedial action.
Indiana Air Pollution Volatile Organic Compound Rules (326 IAC 8)	The Volatile Organic Compound (VOC) requirements contained within 326 IAC 8 generally apply to any facility that has emissions greater than fifteen pounds per day of VOCs.	Not ARAR	Not likely to be applicable at the site since air stripping is not the selected remedial action.
Indiana Environmental Restrictive Covenants (Indiana Code 13-25-4-24)	If the remedial action will result in leaving contamination in place such that unrestricted land use is not permitted (i.e., residential land use remediation objectives are not achieved), an Environmental Restrictive Covenant (ERC) should be recorded for the property per Indiana Code.	Possible ARAR	Considered an ARAR if land use remains unrestricted.
Damage to Underground Utilities (IC 8-1 Chapter 26)	This is the underground utility location law. It requires that a notice via the Indiana one-call system be made seeking utility locations prior to excavation.	Possible ARAR	Considered an ARAR if any excavation activities are involved.
Elkhart County and City of Elkhart			
Elkhart County Groundwater Protection Ordinance No. 09-172	The purpose of this Ordinance is to enhance and preserve the public health, safety, and welfare of persons and property in Elkhart County by protecting the groundwater of Elkhart County from degradation resulting from the spills of toxic or hazardous substances. Applies to facilities that use, store, or generate toxic or hazardous substances.	Possible ARAR	Considered an ARAR if land use remains unrestricted. Use and/or storage of hazardous materials may be required.
City of Elkhart Drilling Permits	The City of Elkhart requires that all excavations along city rights-of-way be permitted. Additional permits may be required for drilling.	Possible ARAR	Substantive requirements would be an ARAR if any excavation activities in the city right-of-way are involved.

Appendix D – Selected References

EPA. 2009. "HRS Documentation Record for the Lane Street Ground Water Contamination Site, Elkhart, Elkhart County, Indiana." March 1.

EPA. 2016. "Proposed Plan – April 2016, Lane Street Groundwater Contamination Site, Elkhart, Indiana." April 4.

EPA. 2016. "Public Comments to Final Remedial Investigation Report–U.S. EPA Response Letter, Lane Street Groundwater Contamination Site, Elkhart County, Elkhart, Indiana". April 4.

IDEM 2007. "Preliminary Assessment Report for Lane Street Ground Water Contamination, Elkhart, Indiana, Elkhart County." October 5.

IDEM 2007. "Expanded Site Inspection Work Plan for Lane Street Ground Water Contamination". November 1.

IDEM 2007. "IDEM Site Inspection Work Plan for Lane Street Ground Water Contamination". December 21.

IDEM 2008. "Site Inspection Report for Lane Street Ground Water Contamination, Elkhart, Indiana, Elkhart County." September 5.

IDEM 2016. "Roberts Environmental Submittals, Lane Street Groundwater Contamination Site, Elkhart, Indiana". March 8.

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Roberts 2015. "Public Comments to U.S. EPA August 2015 Final Remedial Investigation Report Lane Street Groundwater Contamination Site Elkhart, Indiana, EPA I.D. #INN000510229". December 28.

Roberts 2016. "Public Comments to U.S. EPA March 2016 Proposed Plan & Final Feasibility Study Report, Lane Street Groundwater Contamination Site Elkhart, Indiana, EPA I.D. #INN000510229". May 9.

SulTRAC. 2015. "Final Remedial Investigation Report, Lane Street Ground Water Contamination Site, Elkhart, Elkhart County, Indiana." August 1.

SulTRAC. 2016. "Feasibility Study Report, Lane Street Ground Water Contamination Site, Elkhart, Elkhart County, Indiana." March 31.

Weston Solutions, Inc. 2008. "Lane Street Groundwater Site, Elkhart, Elkhart County, Indiana, Technical Direction Document Number: S05-0002-0708-025, Document Control Number: 279-2A-ABOY." (Redacted) March 19.