MAIN PLANT AREA (OU5)
BASIS OF DESIGN

CONTINENTAL STEEL SUPERFUND SITE
Kokomo, Indiana

Remedial Design

WA No. 222-RDRD-05BW/Contract No. 68-W6-0025

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C M-CACES Cost Estimate

Abbreviations and Acronyms

ACM	asbestos-containing material
ARAR	Applicable or Relevant and Appropriate Requirements
ALR	action leakage rate
BOD	Basis of Design
CAA	Clean Air Act
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
COC	contaminant of concern
CQAP	Construction Quality Assurance Plan
CSSS	Continental Steel Superfund Site
CWA	Clean Water Act
DCR	Design Criteria Report
DOT	Department of Transportation
FML	flexible membrane liner
GCL	geosynthetic clay liner
HDPE	high-density polyethylene
HGCL	hydraulic gradient control layer
HMTA	Hazardous Materials Transportation Act
HSWA	Hazardous and Solid Waste Amendments of 1984
HZE	Hub-Zone Enterprise
IAC	Indiana Administrative Code
IDEM	Indiana Department of Environmental Management
LBP	lead-based paint
LCL	leachate collection layer
LCS	leachate collection system
LDL	leak detection layer
LDR	Land Disposal Restriction
LDS	leak detection system
NCP	National Contingency Plan
NOI	Notice of Intent
O&M	operations and maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
OVA	organic vapor analyzer

PAH	polyaromatic hydrocarbon
PCB	polychlorinated biphenyl
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act of 1976
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SBE	Small Business Enterprise
SDBE	Small Disadvantaged Business Enterprise
SDWA	Safe Drinking Water Act
SMP	site management plan
SOW	Statement of Work
START	Superfund Technical Assistance Response Team
SVE	soil vapor extraction
SVOC	semivolatile organic compound
TBC	to be considered
TCL	target compound list
TSCA	Toxic Substances Control Act
UCL	upper confidence limit
USC	United States Code
USEPA	United States Environmental Protection Agency
UST	underground (storage) tank
UTS	Universal Treatment Standard
VOC	volatile organic compound
WOB	Women Owned Business
WWTP	wastewater treatment plant

Introduction

This Basis of Design (BOD) Report for the Continental Steel Superfund Site (CSSS) Main Plant Area (OU5) has been prepared for the United States Environmental Protection Agency (USEPA) by CH2M HILL under Contract No. 68-W6-0025 in accordance with the Statement of Work (SOW) in the Record of Decision[1] (ROD) issued in September 1998, and the Remedial Design/Remedial Action (RD/RA) Handbook issued in June 1995[2]. This BOD Report is divided into the following sections:

- Introduction
- Project Delivery Strategy
- Design Approach, Assumptions, and Parameters
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
- Construction Schedule
- Cost Estimate
- Biddability, Constructibility, and Operability Review
- Tables
- Figures
- Appendixes

The appendixes included in this BOD Report provide supplemental information integral to the design of the selected remedy. They consist of:

- Appendix A: Main Plant Data Evaluation Documentation—Technical memorandums discussing data evaluation, predesign investigation activities, and raw data.
- Appendix B: Heated Soil Vapor Extraction Information—Technology information pertaining to patented technology proposed for the volatile organic compound (VOC)-impacted soil within the Main Plant Area.
- Appendix C: M-CACES Cost Estimate—A cost estimate within an accuracy of +15 to -5 percent in M-CACES format.

The design specifications and drawings that accompany this report have been included as separate submittals. A Construction Quality Assurance Plan (CQAP) and a Draft Operations and Maintenance (O&M) Manual will be submitted at a later date. The separate design specification and drawing submittal includes all of the drawings cited in this report.

Site History

A detailed description of the history of Continental Steel can be found in the RI/FS and the ROD. Throughout its history, the facility produced nails, wire, and wire fence from scrap

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[1] USEPA/IDEM. *Record of Decision: Continental Steel Corporation Superfund Site.* Kokomo, Howard County, Indiana. September 1998.

[2] USEPA: *Remedial Design/Remedial Action Handbook (EPA 540/R-95/059).* June 1995.

metal. Operations included reheating, casting, rolling, drawing, pickling, annealing, hot-dip galvanizing, tinning, and oil tempering. The steel manufacturing operations included the use, handling, storage, and disposal of hazardous materials. For purposes of the RI/FS and the RD/RA, the site was divided into six operable units (OUs). The six OUs include:

- OU1—Sitewide Groundwater
- OU2—Lagoon Area
- OU3—Kokomo and Wildcat Creeks
- OU4—Markland Avenue Quarry
- OU5—Main Plant
- OU6—Slag Processing Area

Site Description

The CSSS is an uncontrolled hazardous waste site in Kokomo, Indiana. The Indiana Department of Environmental Management (IDEM) was the lead agency responsible for conducting the Remedial Investigation and Feasibility Study (RI/FS) at the site under a cooperative agreement with USEPA, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), commonly known as Superfund.

The CSSS is located on West Markland Avenue in the City of Kokomo, Township 23 North, Range 3 East, and Township 24 North, Range 3 East, of Howard County, Indiana (Figure 1). The 183-acre site consists of an abandoned steel manufacturing facility (Main Plant), pickle-liquor treatment lagoons (Lagoon Area), a former waste disposal area (Markland Avenue Quarry), and a former waste disposal and slag processing area (Slag Processing Area). The site is within a mixed residential, commercial, and industrial area zoned mainly for general use. Residential properties lie predominantly east and southeast, mixed residential and industrial areas, north and west, and industrial properties, south. The closest residences to the plant are within 100 feet east of the site, near the property fence line along South Leeds Street, and south of the Main Plant across Kokomo Creek. Highland Park, a public recreation area for local residents, lies south of the Main Plant just across Kokomo Creek and immediately adjacent to the CSSS property south of Kokomo Creek.

The Main Plant property consisted of three tracts of land comprising approximately 100 acres. The Superfund-designated area of the Main Plant consists of 94 acres bordered by West Markland Avenue to the north, Deffenbaugh Road and private property to the south, Leeds Street to the east, and Wildcat Creek to the west (Figure 2). The Main Plant contained most of the steel operations, and is deed restricted by the current no asset owner for commercial/industrial use. The industrial operations affected surface soil, resulting in contaminated soil west of the plant along Wildcat Creek.

The Main Plant included 127 structures, including more than 74 abandoned buildings, many with basements, underground sewers, and utility lines. The Main Plant buildings themselves were demolished under an Interim Record of Decision (IROD). The IROD included the decontamination and demolition of all 127 structures and buildings, disposal of solid and liquid hazardous and nonhazardous wastes, and asbestos surveying and abatement. This work began in 1999 and was completed in 2000.

Selected Remedy—Main Plant Area (OU5)

Record of Decision

The purpose of USEPA's ROD[3] was to select the final remedial action for the CSSS. The final remedy will control the sources of contamination and prevent the further migration of contaminants. The selected remedy for the Main Plant is to:

- Excavate polychlorinated biphenyl (PCB) solids along Kokomo Creek and dispose of the solids in the Corrective Action Management Unit (CAMU).
- Install common soil cover.
- Elevated VOC solids removal and disposal in the CAMU.
- Deed restrictions.

Description of the ROD-Selected Remedial Action

According to the ROD, the focus of the RA for the Main Plant Area is the elimination of direct contact risk, reduced stormwater infiltration, and limited soil removal to achieve the remediation goals (RGs) summarized in Table 1. It includes the installation of a common soil cover over the contaminated solids (incorporated National Remedy Review Board [NRRB] recommended modification), and the removal of VOC- and PCB-contaminated soil in two locations along the creeks. Other measures would include groundwater monitoring and deed restrictions.

The ROD states the cover will be constructed of common soils. A 2-ft soil cover, graded and seeded to promote runoff and reduce erosion and infiltration, will prevent direct contact. Prior to placement of the soil cover, the Main Plant property will be graded and a warning barrier (i.e., orange snow fencing) will be installed prior to placement of the final cover. This will provide a warning mechanism in the event of future excavation, signifying contact with contaminated materials.

The ROD also states that VOC- and PCB-contaminated soil removal will be performed. VOC-contaminated solids along Wildcat Creek will be excavated from shallow (zero to 4 ft below grade) and deep (4 to 12 ft below grade) soil intervals and will be transported to the onsite landfill (i.e., CAMU) located in the Lagoon Area (OU2) for disposal. PCB-contaminated soils along Kokomo Creek will be excavated vertically and horizontally until cleanup goals are reached and transported to the onsite landfill. Excavated areas will be filled with clean soil.

CH2M HILL RD/RA Implementation Strategy

In 2000, CH2M HILL reviewed the proposed RA activities at the six OUs and formulated an RA strategy that, in general, segregates similar types of activities proposed for the various OUs and combines them into manageable contracts.[4] These contracts are as follows:

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[3] USEPA/IDEM. *Record of Decision: Continental Steel Corporation Superfund Site.* Kokomo, Howard County, Indiana. September 1998.

[4] CH2M HILL. *Technical Assistance Document—RD/RA Implementation Strategy: Continental Steel Corporation Superfund Site.* September 19, 2000.

- Contract 1—Lagoon Solids Excavation and Consolidation
- Contract 2—Kokomo and Wildcat Creeks Sediment Removal
- Contract 3—Markland Avenue Quarry Sediment Excavation
- Contract 4—Backfill and Capping/Covers
- Contract 5—Groundwater

Contract 4 for the Main Plant will be implemented as a state-led RA.

Contract 4—Backfill and Capping/Covers

As described in the *Technical Assistance Document*[5], all backfilling and capping/cover designs would be completed under Contract 4. This document specifically addresses the cover design for the Main Plant Area. In this document, CH2M HILL proposed to excavate the VOC and PCB hotspots within the Main Plant and place them in the CAMU, and to install the proposed cover for the Main Plant. This contract also includes the excavation and disposal of the asbestos-containing brick excavated and reburied under the interim RA of OU5.

Preliminary Design Investigation Activities

Field investigation activities were performed in June, July, and August 2001 to gather additional data to be used during the preliminary design. These activities included:

- Identifying and refining the volume estimate of PCB-contaminated soil to be remediated.
- Refining the volume estimate of VOC-contaminated soil along Wildcat Creek to be remediated.
- Refining the extent of potential buried drums and evaluating potential for impacts related to the crushed drums.
- Refining the estimate of the potential for impact to decontamination pad soil from demolition activities.
- Refining the estimate of the extent of oil-saturated soils.
- Refining the estimate of the extent of contaminated soil to be covered in the Main Plant Area.

The Technical Memorandum in Appendix A discusses the procedures, data, and data evaluation of the samples collected during the preliminary design investigation for the Main Plant Area.

Revised Remediation Goals

Based on potential future land use, USEPA requested that the shallow soil data also be compared to remediation goals based on a recreational-use exposure scenario. The development of the remediation goals for recreational-use criteria are provided in Attachment A-4 and summarized in Table 1 (see also Figure 4).

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[5] CH2M HILL. *Technical Assistance Document—RD/RA Implementation Strategy: Continental Steel Corporation Superfund Site.* September 19, 2000.

Kokomo Creek Floodway PCB-Contaminated Soil Findings

As stated above, one of the objectives for the preliminary design investigation activities for the Main Plant Area was to refine the extent of the "limits of elevated PCB soil removal" to estimate the volume of PCB-contaminated soil to be remediated along the north bank of Kokomo Creek adjacent to the Main Plant Area. Previous studies indicated that PCBs might be present at concentrations above the RGs for the Main Plant Area as presented in the ROD. However, the data evaluation found that none of the PCB concentrations from this area along Kokomo Creek contained individual or total PCB concentrations exceeding the RG as presented in the ROD. However, some sample locations exceed the RGs for PCBs based on the recreational-use exposure scenario, and are targeted for removal as described later in this document.

Instead, the Main Plant Area preliminary design investigation results indicate an area with elevated PAH and metals concentrations, specifically lead, that exceed the RGs for the Main Plant Area in the Kokomo Creek Floodway. The proposed remedial action for this area, as discussed in subsequent sections, will therefore focus on PAHs and metals, not PCBs.

Proposed Remedial Action

Based on the predesign investigation results, implementation of the Main Plant Area (OU5) RA will include the following components:

- Site preparation.
- Excavation and disposal of asbestos-containing brick excavated and reburied under the interim RA of OU5.
- Excavation and closure of six underground storage tanks (USTs), connected underground piping, ancillary equipment, and any containment systems.
- Excavation and onsite disposal of polyaromatic hydrocarbon- (PAH)/metals-contaminated soils.
- Installations of common soil cover.
- In situ treatment of onsite VOC-impacted soils.
- Deed restrictions.
- Institutional controls.
- Environmental monitoring and maintenance.
- 5-year site reviews.

Main Plant Area Redevelopment Plans

The City of Kokomo is interested in the redevelopment of the Main Plant Area. The City applied for and received a Brownfields grant to study potential redevelopment options and has retained the services of Strand Associates, Inc., of Madison, Wisconsin (Strand) to conduct a reuse study. Strand, in conjunction with the City, held a public meeting on March 5, 2002 to solicit public input on reuse options for the Main Plant Area.

On May 22, 2002, a meeting between CH2M HILL, IDEM, Strand, and the City of Kokomo was held at the Kokomo Wastewater Treatment Plant to discuss the findings of the public meeting and to discuss reuse options for the Main Plant. The redevelopment options were evaluated with respect to their compatibility with the proposed RA and presented a final cover construction plan that include storm water overflow/detention ponds. These overflow/retention ponds were later eliminated, and this current design reflects those changes.

Project Delivery Strategy

This section presents the project delivery strategy for the Main Plant Area RA. The contracting strategy and primary components of the RA are summarized below. Key project delivery strategies, relative to a specific RA component, are noted below in their respective sections.

Contracting Strategy

The contract documents for the Main Plant Area (OU5) are being prepared based on the understanding that the State of Indiana (State) is the Owner. CH2M HILL will prepare the specifications and drawings for the State to use as part of their Request for Bid documents. The State will provide the bidding process instructions and contract terms.

CH2M HILL has identified a vendor with a patented technology to treat the VOC soil within the Main Plant. The estimated cost of treating the soil in situ with the patented technology ($894,000) is similar to that of excavation and disposal in the CAMU ($650,000–$780,000). However, the cost of the latter option does not include the expected additional costs of shoring and bracing needed because of the numerous utilities located in the target area. Excavated VOC-impacted soil will also need to be treated ex situ to achieve the land disposal restriction (LDR) concentrations prior to placing the soil in the CAMU, which further increases the cost of this option.

Because of the comparable cost and the minimal disruption to the site associated with this option, heated soil vapor extraction (HSVE) treatment is viewed as a more viable option to address the contaminated soil than excavation and disposal in the CAMU. The proposed technology is described in greater detail later in this document.

Final Design

USEPA and IDEM have reviewed the preliminary design and their comments have been incorporated into the final design documents. Detailed design drawings and specifications are provided for the RA components. The draft CQAP and draft O&M Manual will be submitted separately.

The final design package will consist of the following:

- Basis of Design Report, which will include a cost estimate and the biddability, operability, and constructibility reviews.
- Specifications and Drawings.
- Construction Quality Assurance Plan.
- Operations and Maintenance Manual.

Detailed design drawings and specifications have been prepared for the RA components. However, the choice of most construction methods and the selection of some of the materials to be used will be based on performance specifications. Performance specifications

will allow the contractor flexibility during implementation while ensuring conformance with the specification requirements.

Remedial Action—Main Plant Area (OU5)

Descriptions of the primary components of the RA are presented below in their expected construction sequence. The design details and construction methods for each of these components are presented in the following section.

The State of Indiana will execute the Main Plant RA using the RD prepared by CH2M HILL. The primary components of the RA, as discussed in the preceding sections, are presented below in their expected construction sequence. Key project delivery strategies, relative to a specific RD component, are noted below in each respective section.

- **Establishment of Erosion Control Measures**—In order to minimize further erosion effects to the site because of existing conditions and/or scheduled construction activities, erosion control measures will be implemented immediately after mobilization of the contractor and before any additional site disturbance. Erosion control measures shall meet Indiana Department of Natural Resources (IDNR) requirements.
- **Site Preparation**—Select clearing and grubbing of vegetated areas will be completed in areas designated for soil excavation and removal. Efforts will be made to minimize impacts to existing vegetation.
- **Asbestos Brick Excavation**—Brick and mortar containing asbestos, left in place under the interim RA of OU5, will be excavated and disposed of in the CAMU or sent offsite to an approved asbestos disposal facility by a licensed asbestos abatement contractor.
- **UST Closure**—Six USTs, along with the associated piping located in OU5, will be excavated and properly disposed of offsite.
- **PAH/Metals Soil Excavation**—The area within the Kokomo Creek floodway will be partially excavated, as will a small isolated area of lead-contaminated soil near the site's north end . This soil will be used as berm material for the basins to be constructed and covered with 2 ft of clean soil. During the RA for the creeks (Contract 2), the banks will be stabilized to resist erosion during flood events. The combination of creek bank stabilization and the soil/vegetation cover is expected to withstand flood events and to prevent subsurface soils from eroding into the streambeds.
- **Cover Installation**—The areas within the Main Plant exceeding the remedial goals (RGs) for the site will be covered by 2 ft of clean imported fill.
- **VOC Soil Treatment**—The soils within the Main Plant exceeding the VOC RGs for the site (i.e., with VOC concentrations greater than 1,000 µg/kg) will be treated in situ using a patented technology, HSVE.
- **Institutional Controls**—IDEM will establish institutional control, in the form of a restrictive covenant on the property deed for the CSSS to limit site land and groundwater use. It is not anticipated that activities necessary to secure the institutional control will be performed as part of the remedial design.

- **Environmental Monitoring/Maintenance**—Environmental monitoring of the groundwater will be performed to determine the effectiveness of the remedy. The details of environmental monitoring will be established in the site O&M Manual.
- **5-Year Site Reviews**—Data collected under the monitoring program will be reviewed in 5-year intervals to determine whether human health and the environment continue to be protected and to determine whether additional remedial action is warranted. Alternate remedial technologies will be considered if it is determined that remedial objectives will not be obtained within 30 to 40 years from the start of the remedial action.

Design Approach, Assumptions, and Parameters

This section presents the technical details of the Main Plant Area RA design. Methods of construction for each RA component are described in this section, as are performance standards that must be met during construction. As described previously, the components of the Main Plant Area (OU5) RA consist of the following, presented in their expected project delivery sequence:

- Site preparation
- Excavation and disposal of asbestos-containing brick excavated and reburied under the interim RA of OU5
- Excavation and closure of six USTs
- Excavation and onsite disposal of PAH/metals-contaminated soils.
- Installation of common soil covers.
- In situ treatment of onsite VOC-contaminated soils
- Deed restrictions
- Institutional controls
- Environmental monitoring and maintenance
- 5-year site reviews

Site Preparation

Description of Site Preparation

Before any work on the Main Plant Area begins, site preparation activities will be performed. These activities, which will include clearing and grubbing, establishing physical construction limits at the site, identifying cover and excavation areas, and implementing erosion control measures for construction activities, are necessary to allow heavy equipment to access all portions of the site involved in this RA. Erosion control measures shall meet Indiana Department of Natural Resources (IDNR) requirements.

Areas Requiring Site Preparation

Erosion control measures will be installed along the site boundary with Kokomo Creek. Clearing and grubbing will be performed, as necessary, to implement the RA.

Construction Details Including Design and Construction Technical Factors

In preparation for construction activities, all required erosion control measures (e.g., straw bales, silt fence, diversion channels, etc.) shall be in place before soil is disturbed. Once erosion control measures are in place, remaining site preparation activities will commence.

Construction erosion control measures will follow standard erosion- and sediment-control best management practices and based on USEPA guidance[6]. Erosion control measures shall meet Indiana Department of Natural Resources (IDNR) requirements.

Before the start of construction, approval to perform work in a floodplain will be obtained and a Notice of Intent form for construction site activities will be sent to IDEM. A site management plan will be developed to address construction erosion and sediment control practices at the site. The plan will include instructions for evaluating the effectiveness of implemented erosion control measures and for implementing contingency measures, if required, to address observed erosion effects.

Standard erosion control measures, such as silt fencing, will be located at the downgradient side of excavation and fill areas to reduce the potential for erosion. Wood mulch (resulting from clearing and grubbing activities) or another cost-effective mulch will be spread over sloped, barren areas where construction activities have been completed to improve slope stability and for erosion protection. As the construction erosion control practices are implemented, they will be visually evaluated for effectiveness and adjusted as appropriate to limit the erosion potential at the site.

Asbestos Brick Excavation

Brick and mortar material containing asbestos excavated and reburied under the interim RA of OU5 will be reexcavated and disposed of in the CAMU or disposed of offsite by a licensed asbestos abatement contractor.

Area Requiring Excavation

The general location of the buried asbestos-containing material (ACM) designated for disposal is shown on Figure 2. A detailed sketch of the buried asbestos location shown on Figure 2 was provided to CH2M HILL by IDEM (Figure 3). This sketch indicates the estimated amount of ACM in the area to be approximately 676 yd^3.

Treatment Details Including Design and Construction Technical Factors

The ACM excavation area will be adequately wetted prior to excavation, and a licensed asbestos abatement contractor using conventional excavation equipment will excavate the ACM. The ACM will be placed in poly-lined, tri-axle dump trucks, properly sealed, and labeled for transportation to the CAMU or offsite to an approved asbestos disposal facility. The contractor will perform continuous air monitoring in the work area throughout the loading process.

The actual amount of asbestos previously excavated under the interim RA will not be determined until excavation of the ACM material begins. If additional ACM (i.e., volume of ACM greater than 676 yd^3) is encountered, it will also be excavated and transported to the CAMU or offsite to an approved asbestos disposal facility. IDEM personnel familiar with the previous demolition activities will observe the ACM excavation and advise the licensed asbestos abatement contractor when it is complete.

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[6] USEPA. *Summary Guidance Stormwater Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.* 1992.

Performance Standards

According to IDEM, approximately 676 yd^3 of ACM will require excavation and disposal in the CAMU. Only ACM rubble previously excavated during the interim RA of OU5 will be disposed of in the CAMU. ACM rubble will be identified based on visual observation using the information found on Figure 3.

UST Closure

Three USTs areas (containing a total of six USTs and associated piping) located within the Main Plant Area shall be excavated and disposed of offsite or abandoned in place according to Indiana UST requirements. The single UST located near former Building 125 is identified as UST Area 1; the three USTs near former Building 23 are identified as UST Area 2; and the two USTs near former Building 4 are identified as UST Area 3.

UST regulations (329 Indiana Administrative Code [IAC], Article 9) include requirements relating to UST closure, assessing sites at closure, and corrective actions. UST closure requires either removal or cleaning and filling of the tank with an inert material. These regulations are considered to be ARARs for the Main Plant Area.

UST Location

The locations of the three UST areas are shown on Figure 2.

Treatment Details Including Design and Construction Technical Factors

Due to previous site activities, one UST in UST Area 3 is substantially above grade. The exposed UST in UST Area 3 will be removed because it presents a physical health and safety hazard to site workers and the public. The remaining five USTs will also be emptied and excavated. Excavation of the remaining five tanks was selected over abandoning them in place because vendors familiar with UST excavation/abandonment have indicated that excavation is less costly. Over-excavation of grossly contaminated soils, if present, once the USTs have been removed may be required.

The petroleum-based liquids in the tanks will be sent for recycling or fuel blending, since they are not classified as a hazardous waste.

PAH/Metals Soil Excavation

Area Requiring Excavation

Figure 4 presents the extent of risk-based recreational remediation goal exceedences and visual observations of oil and tar for the Main Plant Area. Areas exceeding the RGs are shaded and identified by number on the figure. The portion of Area 4 shown on Figure 4 within the Kokomo Creek floodway and the small isolated area of lead-contaminated soil near the site's north end (Area 7), will be partially excavated and used as basin berm material.

Other areas within the Main Plant are targeted for excavation to obtain the surface elevations to construct the basins.

Treatment Details Including Design and Construction Technical Factors

The area identified for excavation is located in Area 4 below the floodway fringe. It will be excavated to 1 ft below grade to reduce the risk of this material washing downstream during a flood event. This area and depth also include the sample locations exceeding the RGs for PCBs. The excavated material will be relocated within the Main Plant and covered with 2 ft of common soil. After the excavation has been completed, the area will be covered with 2 ft of common soil cover and seeded. During the RA for Kokokmo Creek (Contract 2), the banks in this area will be further stabilized to resist erosion during flood events. The combination of creek bank stabilization and the soil/vegetation cover is expected to withstand flood events and prevent subsurface soils from eroding into the streambeds.

The lead-contaminated area at the north end (Area 7) located behind a retaining wall will be excavated, relocated within the Main Plant, and covered with 2 ft of common soil. Concrete walls and foundations above the required grade lines will be removed and concrete walls and foundations below the required grade lines will be left in place. Any remaining soil will be leveled and graded, covered with 2 ft of common soil cover, and seeded. Caution shall be exercised during excavation in this area since the extent of the undisturbed tunnels constructed of ACM has not been documented.

The contractor will conduct air monitoring during the excavation of the PAH/metals soils. If necessary, dust control measures will be implemented to prevent dust from moving out of the excavation area.

The additional areas to be excavated are shown on Drawing C-3 of the design drawings.

Performance Standards

The performance standard for these areas is based on the depth of excavation and covering with common soil and not on the achievement of a specific concentration. Most of the contamination in the areas designated for excavation in Areas 4 and 7 is located between the ground surface to 1 ft in depth. To reduce the potential for this material to enter Kokomo Creek, 1 ft of material will be excavated, relocated within the Main Plant, and then covered with at least 2 ft of common soil.

Cover Installation

Area Requiring Cover

Areas within the Main Plant Area having residual constituents in soil exceeding the RGs for the site, as shown on Figure 4, will be covered by 2 ft of common soil cover, which will eliminate the potential for direct contact with existing site soils.

Treatment Details Including Design and Construction Technical Factors

Before the installation of the 2-ft-thick common soil cover, the Main Plant Area will be graded (Figure 5). The area to be graded will include the large construction debris piles near the south end of the site. This debris, as well as other excavated material, will be used not only as fill in low areas, but also as a means of positive drainage before covering these areas with clean fill, thereby preventing direct contact exposure. The designated areas shown on

Figure 4 will first be covered with orange safety fence to act as a warning barrier for future excavation activity. Then, a 2-foot-thick common soil cover will be placed over the safety fence. Additional clean fill will be imported as necessary to achieve the final grades.

Performance Standards

The areas exceeding the RGs require a 2-ft common soil cover. The primary performance standard for the common soil cover is to prevent direct contact with contaminated solids. The common soil cover will also allow the required grade to be achieved to minimize ponding and to promote positive runoff without causing erosion problems.

VOC Soil Treatment

Area Requiring Treatment

As an alternative to excavation for the VOC-contaminated soil, as specified in the ROD, the use of an in situ technology, HSVE, is proposed to treat the soils within the Main Plant Area that exceed the VOC RG for the site (i.e., with VOC concentrations greater than 1,000 µg/kg; see Figure 6). HSVE is a patented in situ technology offered by Jay Jaktar, Inc, of Naperville, Illinois.

A pretreatment soil investigation will be conducted for the soils up to 500 ft east of the current VOC target area shown on Figure 6 to better delineate the VOC target area. Soil samples will be collected from 20 locations (see Drawing C-2) and analyzed for VOCs. The target VOC area will be increased or decreased based on the results of the investigation.

Treatment Details Including Design and Construction Technical Factors

HSVE is a process that cleans contaminated soil by a thermally enhanced recovery method. The technology uses a closed loop system that is welded, pressure tested, and enclosed with outside barrier piping to prevent a release of the heated liquid to the surrounding environment. It circulates hot oil or water into the piping grid between the injection and extraction wells, thus transferring heat through conduction. Contaminants are removed using a soil vapor extraction system (SVE). The HSVE system offers minimal disruption to the contaminated area and is suitable for installation under existing structures or near utilities. Additional project-specific technical information is included in Appendix B.

Because of the location of the impacted area (i.e., adjacent to Park and Markland Avenues), HSVE is considered to be a viable alternative compared to excavation of the VOC-contaminated soil. Excavation in this area may be difficult because of the presence of buried utilities. In addition, once excavation is started, contamination may be found to continue underneath the streets. HSVE can be installed without impacting buried utilities and the treatment is capable of removing contaminants from underneath the streets. The estimated cost for HSVE is similar to excavation and disposal in the CAMU, but because of the minimal disruption to the site, it is viewed as a more practical alternative than excavation.

Jay Jaktar, Inc., proposes to divide the target area into five distinct sections (Figure 7) to reduce project costs; this is not expected to affect the amount of time needed for treatment. Construction of the HSVE system would begin with the installation of a series of heat wells

within the first section to be treated. The heat wells are typically constructed of a 6-inch pipe sealed at one end. After the heat wells are installed in the ground, a U-shaped pipe is installed in each heat well (Figure 8). This piping is eventually connected to the boiler and circulation pump to form a closed-loop heating system. The heat wells are filled with pea gravel to enhance thermal conduction with the subsurface soil. The heating of the subsurface soil is used to increase the rate of mass transfer during vacuum extraction of the mobilized compounds. The estimated radius of influence for the heat wells can be found in Appendix B.

Propylene glycol, a non-toxic, biodegradable liquid will be used as the heating fluid. As previously mentioned, the fluid is heated with a boiler, then pumped through piping to the heat wells. Due to the isolation of the heated fluid from the soil, no increase in contamination is caused by the heating technique.

Next, SVE wells are installed around the heat wells. A blower or vacuum pump draws contaminated vapors and air from the SVE wells. The vapor is condensed in a heat exchanger and collected in a receiver for disposal (approximately 10 gallons per day), while the air is passed through valves and discharged to an offgas treatment system, if necessary. The estimated VOC discharge rate is approximately 3 lbs/hr (Appendix B). The blower is sized using a series of proprietary equations developed by Jay Jaktar.

After the performance standard for a targeted area has been achieved, the heat and SVE wells will be removed and installed in the next target area. The holes in the previously treated area will be properly abandoned in accordance with 312 IAC Article 3-10.

Either natural gas (or propane) and electrical services (110 and 460 volt) are required to operate the system. The estimated time to complete the project, including mobilization, construction, operation, and demobilization of the HSVE system, is about 6 months.

Performance Standards

The performance standard is a reduction in the total concentration of VOCs below the RG of 1,000 μg/kg.

After the HSVE system has operated for the estimated period of time to achieve the RG for VOCs, soil samples will be collected from the same 20 locations shown on Drawing C-2, the analytical results from which will be used to evaluate the treatment and determine the number of verifications samples required to achieve closure.

The closure verification sampling will be based on the methodologies used by the State of Indiana[7]. Systematic sampling procedures will be used in each area. The soils will be sampled at regular intervals throughout the area of treatment to determine whether remedial goals have been obtained or additional soils should be treated. The initial systematic sample location is chosen randomly so that bias is minimized. Soils will also be sampled at regular intervals around the treatment area perimeter to determine whether additional soils require treatment beyond the horizontal limits of the VOC-impacted area. The number of samples to be obtained will be determined based on the Risk Integrated System of Closure Technical Guide, Table 6-2, and, for larger areas, equation 7-6, as follows:

[7] Indiana Department of Environmental Management. *Risk Integrated System of Closure (R.I.S.C.) User's Guidance.* February 15, 2001.

$$n = ((Z_a + Z_b)^2/(C_s - u_1)^2)\ v^2 + (Z_a^2/2)$$

where:

n = the required number of samples
Z_a = the "Z" value for a selected alpha
Z_b = the "Z" value for a selected beta
C_s = the contaminant of concern (COC) remedial goal
u_1 = the population mean at the site (estimated by the sample mean)
v^2 = the population variance (estimated by the sample variance)

A mobile laboratory supplied by USEPA will analyze samples for VOCs. Additional treatment will be performed if the upper 95-percent confidence limit of the mean of any COC exceeds the remedial goal. If the calculated upper confidence limit (UCL) marginally exceeds the remedial goal, additional soil samples will be analyzed and the UCL will be recalculated. When the UCL exceeds the remedial goal, the sample results will be evaluated to determine where additional soil should be treated. The area of treatment will be resampled following the additional treatment, and the UCL will be recalculated. Treatment will be determined to be complete when the UCL is less than the remediation goal.

Performance Monitoring and Operations and Maintenance

The objective of the performance monitoring program for the HSVE operation is to assess the degree and effectiveness of VOC removal during this time. Activities associated with the O&M for the HSVE system will include:

- Operation of the HSVE system.
- Air sampling around the HSVE treatment areas.
- Soil sampling within the HSVE treatment areas.
- Offgas sampling, if necessary.
- Routine inspection of equipment.

Institutional Controls

Institutional controls will consist of land use restrictions for the areas where the common soil covers will be installed. Groundwater use restrictions for the Main Plant Area will be discussed in the RA design documents for sitewide groundwater (OU1). IDEM will implement the institutional controls until the property is transferred to a future owner. Deed restrictions in the form of an enforceable restrictive covenant will be used to specify:

1. The Main Plant Area property boundaries.
2. That the area is contaminated with VOCs, PAHs, PCBs, and metals.
3. That excavation within the site boundaries must comply with Occupational Safety and Health Administration (OSHA) requirements for health and safety protection.
4. That any excavated soils will be managed in accordance with all applicable laws.
5. The common soil cover must be maintained and inspected.
6. Land use restrictions will not allow residential use.

Environmental Monitoring/Maintenance

Environmental monitoring will be performed to determine the effectiveness of the remedy. The environmental monitoring details will be established in the site O&M Manual. Environmental monitoring will include an evaluation of cover integrity. Site inspection requirements will be specified along with the types of corrective measures necessary when problems, such as soil erosion, are encountered.

A groundwater-monitoring program will be developed later under Contract 5—Sitewide Groundwater (OU1) to include an evaluation of the integrity of the CAMU, as well as monitoring the existing groundwater contamination and the effectiveness of the groundwater collection system. Included will be the wells to be monitored, the frequency of sampling, analytical parameters, and the type of data evaluation to be performed.

5-Year Site Reviews

Data collected under the monitoring program will be reviewed at 5-year intervals to determine whether human health and the environment continue to be protected and to determine whether additional remedial action is warranted. Alternate remedial technologies will be considered if it is determined that remedial objectives are not being achieved.

Compliance with ARARs

The CSSS ROD summarized the following federal and state ARARs in Appendix G:

- CERCLA, including the Superfund Amendments and Reauthorization Act (SARA) of 1986 and subsequent amendments.
- RCRA, including the Hazardous and Solid Waste Act Amendments of 1984 (HSWA).
- The Toxic Substances Control Act (TSCA).
- The Clean Water Act (CWA) and Amendments.
- The Safe Drinking Water Act (SDWA).
- The Clean Air Act (CAA).
- The Protection of Wetlands/Floodplains Management Executive Order.
- The Hazardous Materials Transportation Act (HMTA).
- Indiana Water Quality Standards (Indiana Administrative Code [IAC] Title 327).
- Indiana Solid Waste Management Board Rules (IAC Title 329).
- Indiana Air Pollution Control Regulations (IAC Title 326).

The requirements of the CWA, SDWA, and the Indiana Water Quality Standards are not directly pertinent to the design of the Main Plant remedy and not discussed here. They will be addressed in the subsequent design of the groundwater collection system. However, the Main Plant design will be protective of groundwater and will thus meet the requirements of the CWA, SDWA, and the Indiana Water Quality Standards.

The remaining laws and regulations were discussed within the *Lagoon (OU2) Revised Design Criteria Report*, dated January 2002. Applicable laws and regulations, along with the unique aspects related to the design of the Main Plant remedy, are discussed below. In addition to the laws and regulations listed above, the National Emission Standards for Hazardous Air Pollutants (NESHAP) are discussed because these regulations have specific requirements that pertain to the disposal of asbestos-containing material, which has been found in the Main Plant Area. Table 2 presents specific requirements, the design components that address these requirements, and whether an ARAR waiver is necessary. IDEM will obtain ARAR waivers prior to the start of construction activities.

The Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA, as amended in October 1992, provides the USEPA Administrator the authority to respond to any past disposal of hazardous substances and any new uncontrolled releases of hazardous substances. Within CERCLA, a trust fund has been established for cleanup of abandoned past disposal sites and leaking underground storage facilities, as well as the authority to bring civil actions against violators. The National Contingency Plan (NCP), which guides cleanup actions at Superfund sites, was developed subject to this act.

SARA of 1986 extensively amends CERCLA. The major goals of SARA were to include more public participation, and to establish more consideration of state cleanup standards, with an emphasis on achieving remedies that permanently and significantly reduce the mobility, toxicity, or volume of wastes.

CERCLA requires the selected remedy to meet the substantive requirements of all environmental rules and regulations ARARs unless a specific waiver of the requirement is granted. Waiver of ARARs may be requested (per NCP 300.430[f][1][ii][C]) based on any of six circumstances. It is not anticipated that any ARAR waivers under CERCLA will be necessary, as discussed below.

The Resource Conservation and Recovery Act

RCRA regulates the management and land disposal of hazardous waste and solid waste material and the recovery of materials and energy resources from the waste stream. RCRA regulates the generation, transportation, treatment, storage, and disposal of hazardous wastes, as well as solid waste disposal facilities. RCRA applies to remedial actions selected that include disposal, treatment, storage, or transportation of regulated wastes. Remedies that include onsite disposal of hazardous wastes will be required to meet RCRA design, monitoring, performance, and closure standards. Offsite transportation of regulated wastes, whether as part of a remedial action or as generated during the investigation, will require use of the manifest system, a RCRA-licensed transporter, and proof of acceptance at a licensed facility approved for the particular wastes.

The HSWA of 1984 imposes new and more stringent requirements on hazardous waste generators, transporters, and owner/operators of treatment, storage, and disposal facilities. Land disposal restrictions, as described in 40 *Code of Federal Regulations* (CFR) 268, identify hazardous wastes that are restricted from land disposal, and define those limited circumstances under which an otherwise prohibited waste may continue to be land disposed.

The applicability or relevancy and appropriateness of RCRA is discussed first by summarizing the classification of wastes present in the Main Plant Area, and those that will remain and be covered in the Main Plant Area. The specific closure requirements are then presented for RCRA landfills because these are "to be considered" (TBC) requirements. The land disposal restrictions, although not ARARs because the wastes will be placed in a CAMU, are discussed because they are TBCs.

Classification of Wastes

Soils and Sediments

The first part of the RCRA applicability determination is to analyze whether or not the contaminated soil is a RCRA hazardous waste. The mixture rule within RCRA states that mixtures of hazardous waste and solid waste are to be considered hazardous waste. However, the mixture rule cannot apply to contaminated media such as soil and sediment, because the media have not been "discarded" and are, therefore, not solid waste.

To clarify how the mixture rule applies to contaminated environmental media, USEPA developed a "contained-in" policy, which specifies that environmental media that "contain" hazardous waste must be managed as hazardous waste. This policy applies to contaminated environmental media that exhibit a characteristic of a hazardous waste, such as toxicity, and to environmental media contaminated with a listed hazardous waste, such as F-listed solvents. To determine whether a contaminated environmental medium at a CERCLA site is a listed hazardous waste, the origin of the waste that contaminated the medium must be known. If is not known or without documentation, the medium can be assumed not to

contain a listed hazardous waste. The specific origin and potential hazardous waste classification of the wastes that are the source of the soil contamination at the Main Plant are not known. As a result, the soil is assumed not to contain a listed waste.

To determine if a contaminated environmental medium at a CERCLA site is a characteristic waste, the medium can be tested, or professional judgment can be used to determine whether testing is necessary. Under RCRA, a waste generator is not required to test its waste, but it can use knowledge of the waste constituents to make a characteristic determination. In general, the soil contamination of the Main Plant is at concentrations that will not result in classification as a characteristic waste. However, there may be some isolated areas of soil contamination that could fail the Toxicity Characteristic Leaching Procedure (TCLP) test and become classified as a hazardous waste.

CAMUs

The CAMU requirements are presented in 40 CFR 264 Subpart S. Compliance with RCRA will be achieved by establishing a CAMU for consolidation and treatment of the contaminated sludge, soil, and sediment. The CAMU rule within RCRA (40 CFR 264 Subpart S [264.552]) and IAC 329 allows movement of contaminated material without triggering the requirements for "generated" hazardous waste. In essence, it allows consolidation of contaminated sludges, soils, and sediments containing listed or characteristic waste without triggering the land disposal restriction requirements. In addition, this consolidation does not constitute creation of a unit with minimum technology requirements. This concept is needed for alternatives involving consolidation followed by containment under a cover or, otherwise, the alternative would not comply with RCRA ARARs. The proposed CAMU meets the requirements for new RCRA hazardous waste landfills.

Land Disposal Restrictions (LDRs)

While CAMUs were developed to encourage treatment of remediation wastes, the requirement to meet LDRs was specifically excluded. However, LDRs may still be considered TBCs, particularly because of the ROD inclusion of the potential need for treatment of some of the soils and sediments.

The LDR treatment standards were originally developed to apply to RCRA "as generated" hazardous waste and not environmental media, such as soils and sediments contaminated with listed hazardous waste. However, USEPA recognized that remediation wastes presented different issues. As a result, USEPA published Alternative LDR treatment standards for contaminated soil in 40 CFR 268.49. The LDR requirement asserts that treatment must achieve the greater of 90-percent reduction in total constituent concentrations or 10 times the Universal Treatment Standard (UTS) for that constituent. The UTSs are identified in 40 CFR 268.48 (Table UTS). For example, the UTS for trichloroethene (TCE) is 6 mg/kg. Treatment of soil containing 500 mg/kg TCE would only be required to achieve 60 mg/kg (10 × UTS), rather than 50 mg/kg.

The LDR contaminated soil treatment standards for the VOCs that have historically leached and contaminated groundwater at the site will be used as the target performance standards for the SVE system. This is in conformance with the intent of the LDRs for contaminated soil.

Toxic Substances Control Act

TSCA regulates the remediation of soils contaminated with PCBs under 40 CFR 761.61 (a) *Self-implementing on-site cleanup and disposal of PCB remediation waste*. TSCA includes cleanup levels for PCB remediation waste under 40 CFR 761.61. These are presented in Table 2.

TSCA also requires soil contaminated with PCBs at concentrations of 50 mg/kg or greater to be disposed of at either a hazardous waste landfill permitted under RCRA or at a chemical waste landfill permitted under TSCA. Because the CAMU meets the requirements for hazardous waste landfills, soils contaminated at PCB concentrations greater than 50 mg/kg can be disposed in the CAMU. As a result, the chemical waste landfill requirements under 40 CFR 761.75 do not have to be met and are not ARARs.

TSCA storage requirements (40 FCR 761.65) for PCB materials with PCB concentrations of 50 mg/kg or greater before disposal are considered ARARs and are discussed in Table 2.

Clean Air Act

The CAA, with amendments through December 1991, was enacted to protect and enhance the quality of air resources to protect the public health and welfare. The CAA is intended to initiate and accelerate national research and development programs to achieve the prevention and control of air pollution. Under the CAA, the federal agencies are to provide technical and financial assistance to state and local governments for the development and execution of their air pollution programs. USEPA administers the CAA and has responsibility to meet the CAA objectives. The CAA establishes emission levels for certain hazardous air pollutants that result from treatment processes.

CAA requirements are potentially applicable to remedial actions that result in air emissions, such as excavation and treatment activities. Mitigative measures to reduce air emissions during excavation will be adhered to as part of the construction plan. An air discharge permit will be applied for to ensure that the HSVE system emissions will comply with regulations.

NESHAP (40 CFR Part 61) Subpart M—National Emission Standard for Asbestos includes requirements for removal of asbestos-containing materials. The Main Plant Area has brick mortar that may contain asbestos at regulated concentrations. As a result, the asbestos regulations are ARARs and the regulations will be followed for the removal and disposal of any asbestos-containing material.

Hazardous Materials Transportation Act (HMTA)

The HMTA of 1981, as amended, was enacted to regulate the shipping, marking, labeling, and placarding of hazardous materials that are transported on public roadways. Pursuant to the HMTA, the Department of Transportation (DOT) has promulgated regulations pertaining to transportation of hazardous materials. DOT also has jurisdiction over the packaging of hazardous materials prior to shipment.

Hazardous soils, residues, wastewaters, or wastes that are transported on public roadways from the CSSS will be handled according to HMTA and DOT regulations.

Indiana Solid Waste Management Board Rules (IAC Title 329)

These regulations specify requirements that apply to solid waste and hazardous waste facilities. These include Solid Waste Management Requirements, Hazardous Waste Management Permit Program and Related Hazardous Waste Management Requirements, PCB Waste Management Requirements and UST Requirements. The solid waste regulations include design and disposal regulations, as well as monitoring requirements and standards for groundwater protection applicable to solid wasteland disposal facilities. The hazardous waste regulations were developed pursuant to the requirements of RCRA and pertain to generators and transporters of hazardous waste and owners or operators of hazardous waste facilities.

The PCB waste management requirements were developed based on the requirements of the TSCA and pertain to the handling and disposal of PCB-containing wastes that exceed 50 parts per million (ppm), and in some cases, exceed 1 ppm.

In general, most of these requirements mirror the federal requirements discussed above. The main requirements are identical to the federal requirements as follows:

- RCRA Subpart S CAMUs—329 IAC 3.1-9-1
- RCRA Land Disposal Restrictions—329 IAC 3.1-12-1
- TSCA PCB Remediation Wastes—329 IAC 4

The UST regulations (329 IAC 9) include requirements relating to UST closure and assessing sites at closure and corrective actions. UST closure requires either removal of the tank or cleaning and filling of the tank with an inert material. These regulations are considered ARARs for the Main Plant Area.

Indiana Air Pollution Control Regulations (IAC Title 326)

The Indiana air pollution control regulations were developed pursuant to the Federal CAA. The regulations contain specific emission levels and requirements for monitoring emissions. They contain requirements for specific types of operations (such as burning) and for certain types of industry. There are also specific emissions standards for hazardous air pollutants.

Requirements of IAC Title 326 are potentially applicable to remedial actions that result in air emissions, such as excavation and treatment activities. Mitigative measures to reduce air emissions during excavation and HSVE treatment of the VOC-contaminated soil will be adhered to as part of the construction plan.

The federal regulations for asbestos control are referenced by Indiana in 329 IAC 14 Emission Standards for Sources of Asbestos.

OSHA Requirements

A health and safety plan for construction activities written in accordance with the OSHA requirements listed in 20 CFR 1910 and 20 CFR 1926 will be required.

Minimizing Environmental and Public Impacts

Environmental and public health and welfare impacts will be minimized through:

- Site access control
- Soil erosion control
- Air pollution control

Site Access Control

Access control to the site during remediation is necessary to prevent the exposure of trespassers to contaminated soil during excavation and stabilization activities. Access will be controlled by the fencing currently in place and by a locked gate. Some improvements to the current fencing and routine fence maintenance will be necessary for effective control of site access.

During working hours, gates No. 2 and No. 11 (Figure 1) will be unlocked but kept in the closed position. A sign will be posted at the entrance to notify visitors that they are required to sign in at the office trailer. Personnel in the office trailer area adjacent to the gate will monitor the gate area. After work hours, the gate will be locked.

Soil Erosion Control

Manholes to storm sewers and sanitary sewers shall be protected during construction. Silt fencing or hay bales will be placed along the edge of the Main Plant Area adjacent to Kokomo Creek following excavation until the area has been regraded and revegetated. Construction of embankments may also be needed to control erosion during remediation.

Groundwater Pollution Control

All groundwater associated with the CSSS site will be addressed later under a separate RD/RA contract.

Air Pollution Control

Earthwork during remediation will generate dust. Impacts on workers will be minimized through implementation of a worker health and safety plan specifying a photoionization detector and a dust monitor. These instruments will be used to monitor the air along the site boundaries to determine whether excessive emissions are occurring to offsite areas. Dust suppression measures shall be implemented when the concentration of dust in the air, as measured at the property boundary, is greater than 1.0 mg/m^3. Dust suppression shall be accomplished by wetting the haul roads and stockpiles with water.

Compliance with Permitting Requirements

CERCLA response actions do not need to comply with the administrative requirements, such as permitting, of applicable or relevant and appropriate environmental laws and regulations. The substantive requirements, however, must be met.

The substantive requirements for impacts to wetlands required under Section 404 of the CWA will be followed. The requirements of the CWA for minimizing impacts and restoration will be followed.

Substantive requirements for an IDEM Storm Water Discharges Associated with Construction Activities Permit will be followed for construction at the site, as will the requirements for an air-discharge permit during treatment of the VOC-contaminated soil.

Construction Schedule

A draft construction schedule follows this page.

Cost Estimate

The estimated cost for this remedial action, based on the final design, was calculated to be approximately $6.4 million. The estimated cost in the M-CACES Gold format is attached (Appendix C).

Biddability, Constructibility, and Operability Review

CH2M HILL's affiliate, CH2M HILL Constructors, Inc. (CCI), has reviewed the draft BOD and plans and specifications with an emphasis on biddability and constructibility. Comments from the review have been incorporated into this document and the accompanying plans and specifications.

In addition, the project review team reviewed the draft BOD report and draft plans and specifications, and their comments were incorporated as appropriate.

Tables

TABLE 1
Remediation Goals for Soil at the Main Plant
Basis of Design Report
Continental Steel Superfund Site

Chemical	FS Remediation Goal[a] (µg/kg)	Final Remediation Goal[c] (µg/kg)
Lead	1,096,000	400,000
Benzo(a)anthracene	26,703	13,260
Benzo(a)pyrene	2,670	1,330
Benzo(b&k)fluoranthene	26,703	13,260
Dibenz(a,h)anthracene	2,670	1,330
Indeno(1,2,3-cd)pyrene	26,703	13,260
Aroclor-1242	25,000	4,640
Aroclor-1248	25,000	4,640
Aroclor-1254	25,000	2,650
Aroclor-1260	25,000	4,640
Total VOCs	1,000[b]	1,000[b]

[a]From Table 4-2 in the *Final Feasibility Study* (Camp Dresser & McKee, February 28, 1997).
[b]From Record of Decision.
[c]Remediation goals based on recreational exposure for soil at the Main Plant (see Attachment A).

TABLE 2
Evaluation of ARARs
Basis of Design Report
Continental Steel Superfund Site

ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
40 CFR Part 61—National Emission Standards for Hazardous Air Pollutants (NESHAP) **Subpart M—National Emission Standard for Asbestos**		
40 CFR 61.145—Standard for Demolition and Renovation Regulations are specific to the type of ACM. Regulated asbestos containing material (RACM) must be removed using special methods, such as wetting, to minimize emissions to the air. RACM must be placed in leak-tight containers or wrapping. Friable RACM (material that contains more than 1 percent asbestos and, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure) must be processed into nonfriable form before transport and disposal.	The mortar of some bricks remaining onsite may contain asbestos at concentrations > 1 percent. If so, the Subpart M regulations are applicable. A licensed asbestos removal contractor familiar with the applicable federal and state requirements will be used for excavation of asbestos material onsite. All requirements for the specific type of asbestos found will be implemented.	No
40 CFR 61.154—Standard for Active Waste Disposal Sites Warning signs or fencing must be installed around an asbestos disposal site. No visible emissions to the outside air are allowed at the waste disposal site or, in lieu of this requirement, the ACM is covered each day with either 6 inches of nonasbestos-containing material or a dust suppression agent.	Asbestos will be disposed of in the CAMU and covered each day with at least 6 inches of nonasbestos material or dust suppressant. A fence will encircle the entire CAMU.	No
40 CFR 763—Appendix D to Subpart E—Transport and Disposal of Asbestos Waste This appendix to the rules for remediation of asbestos in elementary and secondary school buildings contains recommendations for disposal of asbestos wastes that augment the 40 CFR 61.154 regulations. Recommendations include designating a separate area of the landfill for asbestos waste, using a separate trench in which to place the asbestos waste, providing an additional 30 inches of compacted nonasbestos material, and including fencing and warning signs around the landfill perimeter.	Recommendations are TBCs. These recommendations will be followed in the design of the asbestos disposal portion of the landfill.	No
Identification and Listing of Hazardous Waste 40 CFR Part 261 Defines those solid wastes that are subject to regulation as hazardous wastes under 40 CFR Parts 262-265 and Parts 270, 271, and 124.	The CAMU rule allows movement of contaminated soils, such as those of the Main Plant, without triggering the requirements for "generated" hazardous waste. As a result, the designation of the soils as listed or characteristic does not affect requirements once they are excavated, provided they are disposed of in the CAMU.	No

TABLE 2
Evaluation of ARARs
Basis of Design Report
Continental Steel Superfund Site

ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
Standards Applicable to Generators of Hazardous Waste 40 CFR Part 262 Establishes standards for generators of hazardous waste.	Excavated soils to be disposed of in the CAMU are not considered "generated." Therefore, these standards are not ARARs.	No
40 CFR 268.49—Alternative Land Disposal Restriction Treatment Standards for Contaminated Soil		
Achieve the greater of a 90 percent reduction in total constituent concentrations or ten times the UTS for that constituent.	The LDRs are not ARARs because the soil is being disposed of in a CAMU. However, these requirements are TBCs, and will be used as target performance standards for the leachable VOC constituents treated with the SVE system. An example performance standard for TCE would be the greater of a 90 percent reduction in concentration or 60 mg/kg (10 × the UTS of 6 mg/kg). Note that these TBC requirements are essentially identical to the treatment standards for principal hazardous constituents under the new CAMU requirements promulgated December 21, 2001. (Also note that the new CAMU requirements are not applicable to the CSSS CAMU because they were promulgated after the CAMU was approved by USEPA.)	No
40 CFR Part 280—Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (USTs)		
40 CFR 280.64—Free-product Removal Requires free-product to be removed to the maximum extent practicable with the minimum objective to prevent the further migration of free-product.	Oily soils have been observed in the Main Plant area, although free-product is not known to be present at the water table. The minimum objective of preventing further migration is believed to be met because the free-product contamination is limited to unsaturated zone soils; it is not present at the water table or within the groundwater. Free product is present in the pit southwest of UST Area 2. Removal of the free product to the maximum extent practicable prior to installation of the cover material shall occur.	No
40 CFR 280.66—Corrective Action Plan Requires submittal of a corrective action plan to the implementing agency that provides for adequate protection of human health and the environment, given the site-specific conditions.	The requirement for a corrective action plan is met by the feasibility study of corrective actions and the ROD for the Main Plant.	No

TABLE 2
Evaluation of ARARs
Basis of Design Report
Continental Steel Superfund Site

ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
Toxic Substances Control Act (TSCA) (40 CFR 761.61) PCB Remediation Wastes		
Specifies requirements for self-implementing onsite cleanup of PCB remediation waste. Requirements are not binding on CERCLA sites (761.61 [a][1][ii]).	No PCB-contaminated soil above the remedial goals was found in the Main Plant Area.	No
Cleanup levels (761.61[a][4]) specified as follows: High Occupancy Areas (people present > 6.7 hrs/wk)—PCBs < 1 ppm; cap required for PCBs > 1 ppm and < 10 ppm. Low Occupancy Areas (people present < 6.7 hrs/wk)—PCBs < 25 ppm; fencing and signs for PCBs > 25 ppm and < 100 ppm; capping for PCBs >25 and <100 ppm. Cleanup levels are also specified for porous and nonporous surfaces. Neither are currently anticipated at the CSSS Main Plant Area.	Soils with PCBs at or greater than 25 mg/kg will be excavated and disposed of in the CAMU. Porous and nonporous media contaminated with PCBs are not known to be present in the remediation area. However, if media such as concrete are encountered that may be contaminated, the TSCA requirements in 761.61(a)(4) will be used.	No
Site Cleanup (761[a][5]) specified as: Bulk PCB remediation wastes, such as soils, with PCBs < 50 ppm may be disposed of in Subtitle D Municipal Landfills. Bulk PCB remediation wastes, such as soils, with PCBs > 50 ppm must be disposed of in hazardous waste landfills permitted under RCRA or a TSCA landfill (40 CFR 761.61 [a][5][i][B][2][iii]).	No PCB-contaminated soil above the remedial goals was found in the Main Plant Area.	No
Cap requirements (761.61[7]) specified as: Concrete or asphalt minimum thickness of 6 inches. Compacted soil cap minimum thickness of 10 inches.	The design includes excavation and disposal in the CAMU or capping of areas with PCBs greater than 25 mg/kg with a 2-foot-thick soil cap, thus meeting this requirement.	No
For areas where PCBs remain onsite with caps, fences, and low occupancy areas as part of site cleanup, record a notation on the deed (761.61[9]) that: 1) the land has been used for PCB remediation waste disposal and is restricted for low occupancy use, 2) a cap or fence is present and must be maintained, and 3) specifies the PCB concentrations remaining onsite.	Deed restrictions consistent with this requirement will be recorded on the Main Plant property deed.	No

TABLE 2
Evaluation of ARARs
Basis of Design Report
Continental Steel Superfund Site

ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
Sampling requirements for verification of PCB remediation (761.130[c]) require detection of areas of contamination as small as 2 feet, but limit the maximum number of samples to 40. A recommendation is included to use the method *Verification of PCB Spill Cleanup by Sampling and Analysis* included in the Midwest Research Institute report *Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup.* The sampling scheme and the guidance document are available from the Director, Environmental Assistance Division (7408), Office of Pollution Prevention and Toxics, U.S. Environmental Protection Agency, Room E-543B, 1200 Pennsylvania Ave. NW, Washington, DC 20460. Telephone: (202) 554-1404, TDD: (202) 544-0551.	The requirement for detecting contamination in excess of cleanup levels in areas of 2 feet or more will be considered in the development of the specific approach. However, it is likely that this will not be achievable for such a large remediation area. An ARAR waiver is not needed, because soil verification guidance consistent with CERCLA will be followed, and the TSCA requirements are not binding on CERCLA sites (40 CFR 761.61 [a][1][ii]).	No
Toxic Substances Control Act (TSCA) (40 CFR 761.65) Storage for Disposal		
Bulk PCB remediation waste containing > 50 mg/kg PCBs may be stored onsite for up to 180 days provided that controls are in place to prevent dispersal by wind or generation of leachate. Storage site requirements include a foundation below the liner, a liner, a cover, and a run-on control system.	Storage piles for soils, sludge, or sediment with PCBs > 50 mg/kg will be designed to meet these requirements. An extension on the 180-day storage limit could be obtained if needed through a notification to USEPA per 40 CFR 761.65 (a).	No
Endangered Species Act 16 USC Sec. 1531-1543; 40 CFR 6-302(h), 50 CFR Part 200, 50 CFR Part 402. Requires that Federal agencies ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify critical habitat.	No endangered species known to be present that would be affected by excavation activities.	No
Executive Order 11990		
Requires actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.	Destruction of wetlands will be minimized during sludge, soil, and sediment excavation.	No

TABLE 2
Evaluation of ARARs
Basis of Design Report
Continental Steel Superfund Site

ARARs and TBCs	Design Components Addressing Requirement	Waivers Needed?
Executive Order 11988		
40 CFR Sec. 6.302(B) and Appendix A.		
Requires actions to reduce the risk of flood loss; to minimize the impact of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains.	The soil excavation along the banks of the creeks will not affect flooding. The banks will be restored to their original conditions following soil excavation.	No
Indiana Air Pollution Control Board Rules 326 IAC 2		No
Indiana rules specify requirements for air emissions, such as particulates, sulfur dioxide, VOCs, hazardous air pollutants, and asbestos. Rules generally parallel federal Clean Air Act Requirements.	See federal CAA ARARs.	
326 IAC 2—Permit Review Rules	Discusses the registrations, permits, modification approval, or operating permit revisions required and the sources or emissions unit(s) required to obtain a registration, permit, modification approval, or operating permit revision.	
Indiana Solid Waste Rules 329 IAC 4—Requirements for Disposal of Waste Containing PCBs		No
Incorporates the federal TSCA requirements by reference. See TSCA ARARs.		
Indiana Solid Waste Rules 329 IAC 9—Underground Storage Tanks.		
The UST requirements are considered ARARs for the main plant because six USTs are present and samples showed diesel fuel and oils present. 329 IAC 9-1-49—"UST system" or "tank system" means the following: (1) Underground storage tank. (2) Connected underground piping. (3) Underground ancillary equipment. (4) Containment system, if any.	Oily soils have been observed in the Main Plant area. The minimum objective of preventing further migration is believed to be met because the free-product contamination is limited to unsaturated zone soils; it is not present at the water table or within the groundwater. USTs identified in the Main Plant Area include the connected underground piping, ancillary equipment, and any containment systems.	No
329 IAC 9-5-3.1—Free-Product Removal Requires free-product to be removed to the maximum extent practicable with the minimum objective to prevent further migration of free-product.	Free-product is present in the pit southwest of UST Area 2. Removal of the free-product to the maximum extent practicable prior to installation of the cover material shall occur.	No

TABLE 2
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329 IAC 9-5-7—Corrective Action Plan Requires submittal of a corrective action plan that provides for adequate protection of human health and the environment, given the site-specific conditions.	The requirement for a corrective action plan is met by the feasibility study of corrective actions and the ROD for the Main Plant.	No
329 IAC 9-6-1—Permanent Closure and Change-in-Service Before a change-in-service, the underground tank must be emptied and cleaned to remove all liquid and sludge. To permanently close a tank, the tank must either be removed from the ground or filled with an inert material after the tank is cleaned of all liquids and accumulated sludge.	The tanks will be cleaned and either removed or filled with an inert material in accordance with these UST requirements.	No
329 IAC 9-6-2—Assessing the Site at Closure or Change-In-Service Clean closure may include removal of 1 foot of soil from around the sidewalls and bottom of the UST excavation. Two or three samples (depending on tank size) must be collected from the bottom of the excavation, and one sidewall sample must be collected for each 20 feet around the perimeter of the excavation, with a minimum of at least four samples (one for each sidewall) collected (329 IAC 9-6-2 [f][1][A]). Analytical results of samples of native soil and groundwater for COCs must be below detection limits specified in 329 IAC 9-6-2 (a)(3) (e.g. TPH < 1,000 ppb, individual BTEX < 5 ppb). Modified closure may include removal of up to 1,000 yd^3 of soil from around the sidewalls and bottom of the UST excavation. Samples must be collected as above for clean closure and also for each 50 yd^3 of excavated soil. Analytical results of samples of native soil and groundwater for chemicals of concern (COCs) must be below risk-based levels pursuant to 329 IAC 9-1-29.1 (which, in turn, references IC 13-12-3-2, which, in turn, references IC 13-25-5-8.5). Site investigation and corrective action are required when: Onsite soil > 100 ppm TPH or offsite soil > 20 ppm TPH, and clean closure or modified closure standards cannot be met, or Groundwater has a COC > specified detection limits, or Free-product is present. Detailed site inspection requirements for soil borings, soil sampling, and groundwater sampling are provided.	Soil sampling will be consistent with UST closure requirements. Closure will be consistent either with clean closure or modified closure requirements.	No

TABLE 2
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Indiana Solid Waste Rules 329 IAC 10	Disposal of hazardous waste is specifically excluded from these requirements and must meet the requirements of 329 IAC 3.1. As a result, these requirements are not applicable, but individual requirements may be relevant and appropriate.	No
Indiana Solid Waste Rules 329 IAC 14—Emission Standards for Sources of Asbestos Incorporates the federal air emission requirements (40 CFR 61, Subpart M) by reference. See NESHAP ARARs.	See discussion of Federal requirements under 40 CFR 61.	No

ARAR – applicable or relevant and appropriate requirements
TBC – to be considered

Figures