HRS DOCUMENTATION RECORD - REVIEW COVER SHEET

Name of Site: Jackson Ceramix

EPA ID No.: PAD001222025

Contact Persons:

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Pathways, Components, or Threats Not Evaluated

Based on available data, the ground water migration pathway, ground water to surface water migration component of the surface water migration pathway, air migration pathway, and soil exposure pathway were not evaluated because they are not expected to add significantly to the HRS site score due to limited number of targets identified for these pathways. Site-related contamination has been found in the shallow water-table ground water; however, there are no targets utilizing this ground water. Site-related contamination is not documented in the deeper bedrock aquifer.

HRS DOCUMENTATION RECORD

Name of Site:	Jackson Ceramix
EPA Region:	3 Date Revised: March 25, 2005
Street Address of Site*:	State Route 950, Falls Creek
County and State:	Jefferson County, Pennsylvania, 15840
General Location in the State:	Northwest (see Figure 1 in Appendix A)
Topographic Map:	7.5-Minute Series Topographic Map of Falls Creek, Pennsylvania, Quadrangle

Latitude: 41° 08' 21" North **Longitude:** 78° 48' 7" West
(**Site Reference Point:** Southwest corner of former Jackson Ceramix manufacturing building [Ref. 49].

Pathway Scores

Ground Water Pathway	Not Scored
Surface Water Pathway	60.43
Soil Exposure Pathway	Not Scored
Air Pathway	Not Scored
HRS SITE SCORE	**30.22**

** The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area where the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.*

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S^2
1.	Ground Water Migrations Pathway Score (S_{gw}) (from Table 3-1, line 13)	NS	NS
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	60.43	3651.78
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	NS	NS
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score	60.43	3651.78
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	NS	NS
4.	Air Migration Pathway Score (S_a)(from Table 6-1, line 12)	NS	NS
5.	Total of Sgw2 + Ssw2 + Ss2 + Sa2	60.43	3651.78
6.	HRS Site Score: Divide the value on line 5 by 4 and take the square root.		30.22

NS: Not scored

TABLE 4-1

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE SHEET

	LIKELIHOOD OF RELEASE	**MAXIMUM VALUE**	**VALUE ASSIGNED**
	DRINKING WATER THREAT		
1.	Observed Release	550	550
2.	Potential to Release by Overland Flow		
	2a. Containment	10	0
	2b. Runoff	25	0
	2c. Distance to Surface Water	25	0
	2d. Potential to Release by Overland Flow [lines 2a × (2b + 2c)]	500	0
3.	Potential to Release by Flood		
	3a. Containment (Flood)	10	0
	3b. Flood Frequency	50	0
	3c. Potential to Release by Flood (lines 3a × 3b)	500	0
4.	Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500	0
5.	Likelihood of Release (higher of lines 1 or 4)	550	550
	WASTE CHARACTERISTICS		
6.	Toxicity/Persistence	*	10,000
7.	Hazardous Waste Quantity	*	100
8.	Waste Characteristics	100	32
	TARGETS		
9.	Nearest Intake	50	0
10.	Population	**	0
	10a. Level I Concentrations	**	0
	10b. Level II Concentrations	**	0
	10c. Potential Contamination	**	0
	10d. Population (lines 10a + 10b + 10c)	**	0
11.	Resources	5	0
12.	Targets (lines 9 + 10d + 11)	**	0
	DRINKING WATER THREAT SCORE		
13.	Drinking Water Threat Score*** ([lines 5 × 8 × 12]/82,500, subject to a maximum of 100)	100	0

TABLE 4-1 (Continued)

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE SHEET

HUMAN FOOD CHAIN THREAT	MAXIMUM VALUE	VALUE ASSIGNED
LIKELIHOOD OF RELEASE		
14. Likelihood of Release (same value as line 5)	550	550
WASTE CHARACTERISTICS		
15. Toxicity/Persistence Bioaccumulation	*	5×10^4
16. Hazardous Waste Quantity	*	100
17. Waste Characteristics	1,000	32
TARGETS		
18. Food Chain Individual	50	2.0
19. Population		
19a. Level I Concentrations	**	0
19b. Level II Concentrations	**	0
19c. Potential Human Food Chain Contamination	**	0.0003
19d. Population (lines 19a + 19b +19c)	**	0.0003
20. Targets (lines 18 + 19d)	**	2.0003
HUMAN FOOD CHAIN THREAT SCORE		
21. Human Food Chain/Threat Score***	100	0.43
([lines 14 $\times$ 17 $\times$ 20]/82,500, subject to a maximum of 100)		

TABLE 4-1 (Continued)

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE SHEET

		Maximum Value	Assigned Value
	SENSITIVE ENVIRONMENTS		
	LIKELIHOOD OF RELEASE		
22.	Likelihood of Release (same value as line 5)	550	550
	WASTE CHARACTERISTICS		
	SENSITIVE ENVIRONMENT THREAT		
23.	Ecosystem Toxicity/Persistence/Bioaccumulation	*	5×10^7
24.	Hazardous Waste Quantity	*	100
25.	Waste Characteristics	1,000	180
	TARGETS		
26.	Sensitive Environments		
	26a. Level I Concentrations	**	0
	26b. Level II Concentrations	**	250
	26c. Potential Contamination	**	0
	26d. Sensitive Environments (lines 26a + 26b + 26c)	**	250
27.	Targets (value from line 26d)	**	250
	ENVIRONMENTAL THREAT SCORE		
28.	Environmental Threat Score*** ([line 22 × 25 ×27]/82,500, subject to a maximum of 60)	60	60.00
	SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED		
29.	Watershed Score*** (lines 13 + 21 + 28, subject to a maximum of 100)	100	60.43
	SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE		
30.	Components Score (S_{of})*** (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100	60.43

* Maximum value applies to waste characteristics category.

** Maximum value is not applicable.

*** Do not round to nearest integer.

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2.	EPA. Superfund Chemical Data Matrix. January 2004. 4 pages (including cover page and page BI-8). Reference is public document.
3.	Halliburton NUS Environmental Corporation (HNUS). Jackson Ceramix, Site Location Map. August 1992. 1 Page.
4.	Koob, Kevin, EPA, Region III. Federal On-Scene Coordinator's Report for Jackson Ceramix Lead Site (Restart). April 9 through October 26, 1990. 8 Pages (including title page and table of contents).
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6.	HNUS. Jackson Ceramix, Site Sketch. August 1992. 1 Page.
7.	Davis, Dale L., Lee-Simpson Associates, Incorporated, to Pat Donegan, PADER, Bureau of Water Quality Management. Correspondence. July 17, 1984. 4 Pages.
8.	Sterba, Robert S., Hydrogeologist, PADER, to Robert J. Rossi, Planning Engineer, PADER. Correspondence. November 27, 1979. 2 Pages.
9.	EPA, Region III Technical Assistance Team (TAT). Sample Location Map, Jackson Ceramics Lead Initiative Site. March 6, 1992. 1 Page (supplemental information added by NHUS).
10.	Himes, Floyd L., Water Quality Specialist, PADER, to File. Memorandum. October 11, 1985. 2 Pages.
11.	Gleeson, Robert H., Hydrogeologist, PADER, to Todd Carlson, Planning Engineer, PADER. Correspondence. June 4, 1984. 1 Page.
12.	HNUS, Field Investigation Team (FIT 3). Site Inspection of Jackson Ceramix. TDD No. F3-8703-15. March 11, 1988. 206 Pages (including title page and table of contents).

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14.	Sikdar, Hironmony, Technical Assistance Team Manager (TATM), Roy F. Weston, Incorporated (Weston), to Kevin Koob, On-Scene Coordinator, EPA, Region III, Western Response and Oil Enforcement Section. Memorandum. October 5, 1990. 53 Pages.
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16.	Downie, J. L., On-Scene Coordinator, EPA, to Ron Shick, Emergency Management Coordinator, Falls Creek Fire Department. Correspondence. February 9, 1989. 7 Pages.
17.	HNUS. Jackson Ceramix; Logbook No. 2652. TDD No. 9011-44, May 29 to June 3, 1991. 18 Pages (including cover page).
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19.	Wright Lab Services, Inc., Environmental Testing Laboratories. Jackson Ceramix Lead Initiative Site Analytical Data Summary and Sample Location Map. July 15 and 16, 1991. 91 Pages.
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25.	Tetra Tech EM Inc. (Tetra Tech). Record of Telephone Conversation Regarding Reporting Limits. Between Alicia Shultz, Environmental Scientist, and Norm Napierkowski, Chemist, Accutest Laboratories. November 6, 2002. 1 Page.
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28.	HNUS. Record of Telephone Conversation Regarding Surface Water Flow Rate. Between Jill Hartnell, Geologist, and Paul Hine, Hydrologist, U.S. Army Corps of Engineers. August 28 and 31, 1992. 1 Page.
29.	HNUS. Record of Telephone Conversation Regarding Surface Water Intakes. Between Timothy Ungrady, Geologist, and Eric Obert, Water Pollution Biologist, PADER. May 5, 1993. 1 Page.
30.	HNUS. Record of Telephone Conversation Regarding Fisheries. Between Jill Hartnell, Geologist, and Ron Lee, Pennsylvania Fish and Boat Commission. August 28, 1992. 1 Page.
31.	USGS. Reynoldsville Quadrangle Pennsylvania - Jefferson County 7.5-Minute Series. Topographic Map. 1966, Photorevised 1981. 1 Page (supplemental information added by HNUS ARCS III).

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39.	EPA, Environmental Monitoring Systems Laboratory, Las Vegas, Nevada. Site Analysis. Jackson Ceramix, Falls Creek, Pennsylvania. TS-PIC-90126, October 1990. 34 Pages.
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41.	Yost Associates, Incorporated, Engineers, DuBois, Pennsylvania. Jackson Vitrified China Company, Proposed Waste Treatment. File No. N.B. 600 P33-38. Circa 1971. 1 Page.
42.	Traveler's Map Company. Large Type Pennsylvania Road Map. 1991. 3 Pages (supplemental information added by HNUS).

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43.	Ogden Environmental and Energy Services Company, Inc. Final Baseline Ecological Risk Assessment Report, Addendum to Final Site Characterization Report. Jackson Ceramix Site, Falls Creek, Pennsylvania. March 24, 1999. 87 Pages.
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46.	EPA. Introduction to the Contract Laboratory Program. February 2000. 3 Pages.
47.	IT Corporation. Final Report. Prompt Interim Response, Jackson Ceramix Site, Falls Creek Borough, Jefferson County, Pennsylvania. Contract No. ME94999. Work Authorization No. IRSC-6-031. Prepared for the PADEP. February 2000. 122 Pages.
48.	AMEC Earth and Environmental, Inc. (AMEC). Final Pre-Design Investigation Report. Jackson Ceramix Site - Operable Unit 2, Borough of Falls Creek, Jefferson County, Pennsylvania. Prepared for PADEP. April 12, 2002. 153 Pages and Figures 1-1, 2-1, and 3-3.
49.	Tetra Tech. Latitude and Longitude Calculation Worksheet #1. LI Using Custom Ruler or Coordinator. October 22, 2002. 1 Page and Topographic Map.
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53.	PADEP. Statewide Health Standards. http://www.dep.state.pa.us/dep/deputate/airwaste/wm.landrecy/MSCs/MSCs.htm Accessed on November 24, 2001. 1 Page.
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ACRONYMS AND ABBREVATIONS

µg/kg	Micrograms per kilogram
µg/L	Micrograms per liter
AMEC	AMEC Earth and Environmental, Inc.
bgs	below ground surface
cis-1,2-DCE	cis-1,2-dichloroethene
CLP	Contract Laboratory Program
DOI	U.S. Department of the Interior
ERCS	Emergency Response Cleanup Services
EPA	U.S. Environmental Protection Agency
FIT	Field Investigation Team
HRS	Hazard Ranking System
HNUS	Halliburton NUS Environmental Corporation
ID	Identification
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
MW	Monitoring well
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NS	Not scored
OU	Operable unit
p.	Page
pp.	Pages
ppm	Parts per million
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Resources
PCE	Tetrachloroethene
PPE	Probably point of entry
Ref.	Reference
RCRA	Resource Conservation and Recovery Act
SQL	Sample Quantitation Limit
TAL	Target analyte list
TCL	Target compound list
TAT	Technical Assistance Team
TCLP	Toxicity characteristic leachate procedure

ACRONYMS AND ABBREVATIONS (Continued)

TCE	Trichloroethene
TDL	Target distance Limit
Tetra Tech	Tetra Tech EM Inc.
trans-1,2-DCE	trans-1,2-dichloroethene
USGS	U.S. Geological Survey
XRF	X-ray fluorescence
VOC	Volatile Organic Compounds

SITE SUMMARY

The Jackson Ceramix facility is located at the eastern perimeter of Falls Creek Borough in Jefferson County, Pennsylvania (see Figure 1 in Appendix A). The Jackson Ceramix facility manufactured china from 1917 until its closing in October 1985 (Refs. 4 [p. 7] and 5 [p. 1]).

The manufacturing process at the facility involved the production and painting of china. Lead and paint waste-contaminated wastewater was generated during the manufacturing process. This wastewater was generated during the wash-down of china glazing machines, during daily cleanup in the glaze spray area, and from the paint process line. The compound used during the glazing process contained lead. Paints contained oxides of aluminum, tin, chromium, manganese, lead, and copper (Refs. 5 [pp. 1, 2, 3, and 16], 6, and 7). Following an October 25, 1983 PADER inspection, Jackson Ceramix notified the U.S. Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Resources (PADER), currently known as the Pennsylvania Department of Environmental Protection (PADEP), that it was a generator of hazardous waste (Ref. 5 [p. 6]).

The wastewater generated during the glazing and paint processes was discharged to a drainage ditch that led to an unlined lagoon northeast of the Jackson Ceramix plant building (Refs. 5 [pp. 1, 2, and 16], 6, 7, 20 [p. 1-4], 39 [pp. 8, 14, 20 and 24] and 41). Paint wastes were discharged into the lagoon until 1984; glazing and clay wastes were discharged into the lagoon until the plant closed in 1985 (Ref. 5 [pp. 2 and 3]). From 1978 until the facility closed in 1985, sludge from the lagoon was periodically either partially removed from the lagoon for off-site disposal or recycled back into the manufacturing process (Ref. 5 [p. 2]). At the time of operations, drainage from the lagoon flowed to the east through a ditch that led to a 48-inch culvert that ran under railroad tracks that are located to the east of the facility. After directing the drainage from the lagoon under the railroad tracks, this culvert discharged into a wetland located to the east of the railroad tracks (Refs. 5 [p. 6], 9, 20 [pp. 1-2, 1-4], 24, 39 [pp. 8, 14, 20 and 24 and 47 [p. 3]).

During a November 1979 facility visit, PADER determined that effluent from the wastewater lagoon discharged to a ditch, approximately 100 feet in length, that led into a wetland area and eventually an unnamed tributary of Sandy Lick Creek (Ref. 8 [p. 1]). During this facility visit, PADER reported the presence of white, silty-clayey waste product in the wetlands located adjacent to the wastewater lagoon and in an unnamed tributary to Sandy Lick Creek that meanders through the wetland (Ref. 8 [p. 1]).

To address the wastewater discharges into the lagoon, PADER entered into a consent order and agreement with Jackson Ceramix on April 4, 1979. As part of this agreement, Jackson Ceramix proposed the construction and operation of an industrial wastewater treatment plant. In June 1980, a National Pollutant Discharge Elimination System (NPDES) Part 1 permit was issued to Jackson Ceramix that authorized the discharge of wastewater to the lagoon (Ref. 5 [p. 5]). PADER and Jackson Ceramix entered into a second consent order and agreement on March 7, 1983 (amended on July 9, 1984) that required construction of an industrial wastewater treatment unit (Refs. 5 [p. 5] and 10). A second NPDES permit was issued to Jackson Ceramix on September 27, 1984 (Ref. 5 [p. 5]). Jackson Ceramix failed to comply with the terms of the second consent order and agreement (Ref. 10 [p. 1]). During an inspection on May 23, 1984, PADER showed that conditions at the facility were similar to those found during the November 1979 visit (Ref. 11).

In March 1986, PADER collected samples of sludge from the lagoon and the wetland downstream of the lagoon. Analytical results revealed leachable lead concentrations of 27 and 100 milligrams per liter (mg/L) in the sludge collected from the lagoon and the wetland, respectively (Ref. 5 [pp. 37 to 38]).

On August 21, 1986, PADER visited the Jackson Ceramix facility again (Ref. 5 [pp. 3 and 8]). The manufacturing facility was abandoned and had been heavily vandalized (Ref. 5 [pp. 3 and 10]). Drums and other containers potentially holding hazardous materials were observed (Ref. 5 [p. 4]). Two broken china waste piles were located north and northwest of the plant building (Ref. 5 [p. 16]).

In April 1987, EPA Region 3's Field Investigation Team (FIT 3) conducted a site inspection of the Jackson Ceramix facility (Ref. 12 [p. 5-1]). Samples were collected from several areas of concern identified at the facility including drums, the drainage ditch located adjacent to the facility, and the wastewater lagoon (Ref. 12, [pp. 1-1, 1-2, 5-2 and 5-2A]. Samples obtained from the drums revealed chloroform, tetrachloroethene, 2-methyl naphthalene, naphthalene, xylenes, and diethyl phthalate, as well as significant concentrations of lead (up to 15,800 mg/kg) (Ref. 12 [pp. 5-2, 5-2A, 7-8A, 7-9A, and 7-10A]). Aqueous samples from the drainage ditch that received wastewater from the plant and discharged into the wastewater lagoon revealed the presence of trichloroethene (TCE), trans-1,2-dichloroethene (trans-1,2-DCE), and lead (Ref. 12 [pp. 7-3A and 7-6A and Figure 3]). Concentrations of lead, up to 242,000 milligrams per kilogram (mg/kg), were detected in samples collected of the sediment found in this drainage ditch (Ref. 12 [pp. 5-2, 7-6A, and Figure 3]). Auger samples of the lagoon showed the presence of toluene, trans-1,2-DCE, and lead concentrations of 10,500 mg/kg (Ref. 12 [p. 7-6A and Figure 3]). Sediment samples collected in the wetlands that received the effluent from the lagoon revealed several contaminants, including lead at 25,000 mg/kg (Ref. 12 [p. 7-6A and Figure 3]).

In July 1987, EPA Region 3's Technical Assistance Team (TAT) performed a removal assessment at the facility (Ref. 13 [p. 20]). Samples were collected from the drainage ditch that led to the lagoon. Analytical results revealed lead contamination as high as 66,500 mg/kg (Refs. 13 [p. 20] and 14 [pp. 1, 2, 6, and 15]).

In March 1988, TAT collected additional samples from the facility (Refs. 13 [p. 20] and 14 [p. 1]). Analytical results indicated elevated levels of lead in the drainage ditch (up to 125,000 mg/kg), the lagoon (up to 15,600 mg/kg), and the wetlands located east of the former manufacturing facility (up to 17,000 mg/kg) (Refs. 13 [p. 20] and 14 [pp. 1 to 4 and 7]).

In January 1989, an EPA Region 3's Emergency Response Cleanup Services (ERCS) contractor excavated and removed sludge from the lagoon area and contaminated material from the drainage ditch (Refs. 13 [pp. 21, 22], 14 [p. 1], and 15 [p. 1]). The excavated lagoon area was backfilled with clean material, and an 80-foot section of pipe was placed over the area to ensure proper drainage (Ref. 13 [p. 22]).

TAT and ERCS conducted a drum inventory and compatibility analysis at the facility in January 1989 (Refs. 13 [p. 22] and 15 [p. 1]). The inventory determined that drums located at the facility contained flammable liquid, PCE, acrylic lacquer thinner, denatured alcohol, xylol, combustible vapor, Engelhard-TD26318, flammable material, paint materials, TCE, and mineral spirits (Ref. 12 [pp. 5-3 to 5-6]). An EPA On-Scene Coordinator’s report indicated that 60 drums of flammable organic

solvents were present on the property (Ref. 12 [p. 8]). In 1989, all drums identified on the property were stored in a secured, contained area [Ref. 13 [p. 22]). In February 1989, miscellaneous materials and bags of Ceraflux were secured and contained (Refs. 13 [p. 22] and 16 [p. 1]). Ceraflux is a powder that contains high levels of lead (Refs. 14 [p. 5], 16 [p. 1], 38, 54 [p. 2], and 55 [pp. 1 and 8]). Ceraflux is used in pottery and wall-tile glaze (Refs. 54 [p. 1] and 55 [p. 1]). EPA's removal and stabilization activities were completed on February 10, 1989 (Ref. 13 [p. 22]).

On October 29, 1989, a fire destroyed approximately 75 percent of the former manufacturing facility (Ref. 4 [p. 7]). On October 31, 1989, in response to the fire, TAT returned to the facility and obtained samples of sludge, water, and glaze powders, along with wipe samples (Ref. 14 [p. 2]). Lead levels up to 38,500 mg/kg were detected in the drainage ditch that led from the facility building to the lagoon (Ref. 14 [pp. 4 and 6]).

In April 1990, an EPA Region 3 ERCS contractor conducted sampling for lead at eight locations on the facility (Ref. 14 [pp. 2, 5, and 6]). In September 1990, ERCS removed various hazardous materials from the facility (Ref. 14 [p. 2]). In May and June 1991, one off-site monitoring well (MW) and four on-site MWs were installed (Refs. 17 and 18).

In July 1991, TAT collected 25 soil, seven sediment, five aqueous, and four wipe samples from various areas on and near the facility (Ref. 19 [pp. 1 and 2]). A sample of the drainage ditch bed and a sediment sample of the lagoon showed lead levels of 14,000 and 15,000 mg/kg, respectively (Ref. 19 [pp. 1, 2, 51, and 54]). Five soil samples of the wetlands located east of the former manufacturing facility revealed lead at concentrations ranging from 2,900 to 14,000 mg/kg (Ref. 19 [pp. 1, 2, 18, 20, 21, 22, and 23]).

In January 1992, TAT conducted sampling of the wooded area north of the facility and the perimeter of the wetlands area located east of the facility (Refs. 9 and 34 [pp. 3 and 11]). Sample S14, located in a wetland about 2,000 feet south of the facility, showed a lead concentration of 1,760 mg/kg (Refs. 9 and 34 [p. 34]).

In February 1992, a representative of the U.S. Fish and Wildlife Service expressed concern over the potential threat posed to migratory birds by the lead-contaminated wetlands located near the Jackson Ceramix facility (Ref. 36). An expanded site inspection was conducted at the Jackson Ceramix facility in March and April 1992 (Ref. 20 [p. 2-1]). The five MWs installed in 1991 were sampled and analyzed for EPA's organic target compound list (TCL) and inorganic target analyte list (TAL) (Ref. 20 [p. 1-7 and Section 2.4]). In addition, filtered samples were obtained from each MW and analyzed for dissolved metals (Ref. 20 [p. 1-7 and Section 2.4]). Aqueous and sediment samples were obtained from the wetlands, Wolf Run, and Sandy Lick Creek (Ref. 20 [Section 2.4 and p. 2-6]). Six volatile organic compounds (VOC) (PCE; cis-1,2-DCE; vinyl chloride; TCE; trans-1,2-DCE; and toluene) were detected in shallow on-site MWs (Ref. 20 [Section 2.4 and p. 3-1B]). An elevated concentration of zinc, as compared to a background sample, was found in a filtered sample from one of the shallow on-site MWs (Ref. 20 [Section 2.4 and p. 3-3H]). Elevated levels of lead were detected in wetland aqueous (up to 3,730 micrograms per liter [μg/L]) and sediment samples (up to 24,800 mg/kg) (Ref. 20 [Section 2.4 and pp. 3-3F, 3-3G, and 3-5]).

A two-phased prompt interim response was conducted at the former manufacturing facility, under the direction of PADEP, during the periods of December 7, 1998 through February 5, 1999 and

April 21, 1999 through July 15, 1999. The prompt interim response included removal and off-site disposal of asbestos-containing material; excavation and on-site treatment and stabilization of contaminated sludge and soil from 16 sumps, the drainage ditch, and the lagoon; removal and off-site disposal or on-site treatment and stabilization of waste in pits and septic tanks, ceramic manufacturing process materials, construction debris, and stage materials; demolition of two buildings, two kilns, two railroad cars, a chimney stack, and various other structures; relocation of china waste and initial site grading; and construction and revegetation of a soil cap over about 12 acres of the property (Ref. 47 [p. 1]).

In August 2001, under the Pennsylvania Hazardous Sites Cleanup Act, a pre-design investigation was conducted in the wetland east of the lagoon (Ref. 48 [p. 1-1 and Figure 2-1]). The investigation was conducted to assist PADEP in implementing the remedial alternative selected from a feasibility study for the wetland area [Ref. 48 [p. 1-1]). The investigation included completion of 154 hand-augered soil borings in the wetland area (Ref. 48 [p. 2-1]). Based on the analytical results reported from these samples, it has been determined that approximately 13 to 24 acres of the wetland that received drainage from the Jackson Ceramix facility contain lead greater than 1,000 parts per million (ppm) (Ref. 48 [p. 5-2]).

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

Source Number: 1

Source Description: Lagoon

Source Type: Surface impoundment

Lead and paint waste-contaminated wastewater was generated during the china manufacturing process that occurred at the Jackson Ceramix facility. This wastewater was generated during the wash-down of china glazing machines, during daily cleanup in the glaze spray area, and from the paint process line. The compound used during the glazing process contained lead. Paints contained oxides of aluminum, tin, chromium, manganese, lead, and copper (Refs. 5 [pp. 1, 2, 3, and 16], 6, and 7). The wastewater generated during the glazing and paint processes was discharged to a drainage ditch that led to an unlined lagoon (Source No. 1) (Refs. 5 [pp.1, 2 and 16], 6, 7, 20 [p. 1-4], 39 [pp. 8, 14, 20, and 24], and 24).

Paint wastes were discharged into the lagoon (Source No. 1) until 1984; glazing and clay wastes were discharged into the lagoon until the plant closed in 1985 (Ref. 5 [pp. 2 and 3]). From 1978 until the facility closed in 1985, sludge from the lagoon was periodically either partially removed from the lagoon for off-site disposal or recycled back into the manufacturing process (Ref. 5 [p. 2]). From the time the plant closed in 1985 until 1989, when a removal action was completed in the lagoon, the lagoon was filled with sludge (Refs. 5 [p.3], 4 [p.7] and 12 [p.2-2].

At the time of operations, drainage from the lagoon flowed to the east through a ditch that led to a 48-inch culvert that ran under railroad tracks that are located to the east of the facility. After directing the drainage from the lagoon under the railroad tracks, this culvert discharged into a wetland located to the east of the railroad tracks (Refs. 5 [p. 6], 9, 20 [p. 1-4], 24, 39 [pp. 8, 14, 20 and 24 and 47 [p. 3]).

In 1983, facility representatives collected aqueous samples of wastewater and lagoon water, revealing concentrations of lead between 0.05 and 8.2 mg/L (Ref. 5 [pp. 3, 27, and 40]). In 1983, a sample of sludge from the lagoon was collected for TCLP analysis. The sample was characterized as hazardous due to leachable lead concentrations (59.40 mg/L of leachable lead) (Ref. 5 [pp. 22 and 23]). PADER collected samples from Source No. 1 in March 1986. Analytical results revealed leachable lead concentrations of 27 mg/L (Ref. 5 [pp. 37 to 38]).

In April 1987, a site inspection of the Jackson Ceramix facility was conducted by EPA Region 3's FIT (Ref. 12 [p. 5-1]). Analytical results of auger samples collected from the lagoon (Source No. 1) revealed lead at 10,500 mg/kg (Ref. 12 [p. 7-6A and Figure 3]).

In July 1987, EPA Region 3 conducted a removal action at the Jackson Ceramix facility. Samples were collected to determine the level of lead contamination at the facility (Ref. 13 [p. 20]). Analytical results indicated lead contamination (up to 8,740 mg/kg) throughout the lagoon (Refs. 13 [p. 20] and 14 [p. 2]).

In January 1989, sludge from the lagoon area was excavated and transported off site (Refs. 4 [p. 7] and 13 [pp. 21 and 22]). The size of the lagoon was estimated to be about 7,800 square feet, as measured on a survey plat of the Jackson Ceramix facility using a planimeter (Ref. 24). The exact amount of sludge removed from the lagoon (Source No. 1) cannot be determined because the amount of lead-contaminated material disposed off site includes material excavated from both the drainage ditch that led to the lagoon and the lagoon. The total amount of lead-contaminated material disposed off site is 1,900 cubic yards (Refs. 4 [p. 7] and 13 [pp. 21 and 22]). The excavated area was backfilled with clean material, and an 80-foot section of pipe was placed over the lagoon area to ensure proper drainage (Ref. 13 [p. 22]).

In 1991, samples were collected from the bank of the lagoon (S13) and the lagoon bed (S14), and sample analytical results revealed the presence of 9,400 and 15,000 mg/kg of lead, respectively (Ref. 19 [pp. 1, 2, 7, 53, and 54]).

Lagoon area remediation was performed under the direction of PADEP during the period of January 26 through February 2, 1999. The lagoon had been capped with a cover of soil during previous remedial activities (Ref. 47 [p. 40]). The cover of soil was removed prior to the 1999 remediation. The sludge in the lagoon consisted of a white-to-gray, clayey sludge and was easily visible during the 1999 excavation operations. The sludge was excavated from the lagoon until the white-to-gray colored sludge was no longer visible. No samples were collected to confirm that all contaminated sludge and sediment had been excavated from the lagoon. Subsequent toxicity characteristic leachate procedure (TCLP) analysis of the sludge and sediment excavated from the lagoon determined that the material was hazardous (Waste Code D008) due to the concentration of lead detected (Ref. 47 [p. 41]). The sludge and sediment were treated and stabilized onsite, forming a stockpile (Ref. 47 [pp. 41, 42, 43, 44, 45, and 46]). The treatment and stabilization process included excavating contaminated sludge and sediment and thoroughly mixing excavated material with Portland cement until a soil-like consistency was achieved (Ref. 47 [p. 27]). After the stockpile of treated material had been adequately treated and solidified, the material was transferred to a stockpile area. Composite samples were collected from the stockpiles for TCLP metals analysis to ensure that the process rendered the hazardous sludge and sediment nonhazardous (Ref. 47 [p. 43]).

The stockpiled nonhazardous materials were placed in successive lifts, approximately 1 foot thick, within the former basement and bisque kiln areas of the china manufacturing plant (Ref. 47 [p. 78]). A soil cap, consisting of a single, 2-foot-thick layer of cover soil, was placed over the backfilled basement and revegetated (Ref. 47 [pp. 94 and 98]).

Location of the source, with reference to a map of the site: The lagoon is located northeast of the Jackson Ceramix plant building, between two railroad lines (Refs. 5 [p. 16], 12 [Figure 2] and 24).

Containment:

Release to ground water: The ground water migration pathway was not scored.

Release via overland migration and/or flood: Drainage from the lagoon (Source No. 1) flowed to the east through a ditch that led to a 48-inch culvert that ran under the railroad tracks located to the east of the facility. After directing the drainage from the lagoon under the railroad tracks, this culvert discharged into a wetland located to the east of the railroad tracks (Refs. 5 [p. 6], 9, 20 [p. 1-4], 24, 39 [pp. 8, 14, 20 and 24] and 47 [p. 3]). Therefore, a functioning and maintained runoff management system was not present and a containment factor value of 10 is assigned to Source No. 1 (Ref. 1 [Table 4-2]).

Gas release to air: The air migration pathway was not scored.

Particulate release to air: The air migration pathway was not scored.

2.4 WASTE CHARACTERISTICS

2.4.1 Hazardous Substances

During the 1987 site inspection, a solid sample (MCE-547) was collected from Source No. 1, the lagoon (Ref. 12 [p. 5-1 and 5-2]). The sample was analyzed through EPA's Contract Laboratory Program (CLP) (Ref. 21 [pp. 7-2 and 7-7]). The sample is considered a waste sample because it was collected from the lagoon. As shown in Table 1, lead was detected in the waste sample at 10,500 mg/kg (Ref. 12 [pp. 5-2, 7-2A, 7-3A, 7-4A, 7-5A, 7-6A, 7-7A and Figure 3]).

During a removal action in 1987, sample S04 was collected from the lagoon bed and contained 8,740 mg/kg of lead [Ref. 14 [pp. 2, 6, and 12]). The sample is considered a waste sample because it was collected from the lagoon bed (Ref. 14 [pp. 2 and 6]). The sample was analyzed under EPA's CLP (Ref. 14 [p. 8]). The analytical results for this sample are summarized in Table 2.

During additional removal actions in 1991, a soil sample was collected from the bank of the lagoon (S13) and a sediment sample was collected from the bed of the lagoon (S14). The samples contained 9,400 and 15,000 mg/kg of lead, respectively (Ref. 19 [pp. 1, 2, 7, 53, and 54]). Although samples collected from sources such as surface impoundments generally are not compared to background samples, the lagoon samples are compared to background soil/sediment levels to demonstrate the significance of the lead levels present in the source. Background concentrations for lead also are provided in Table 3. The background soil and sediment samples include a soil sample (S-1) collected from a ballfield and a sediment sample (S-22) collected from Wolf Run, respectively. The depth of the source and background samples is not provided in the reference documentation (Ref. 19 [pp. 1 and 2]). See Reference 19, page 2, for the background sample locations.

The detection limits provided in Tables 1 and 2 are the contract required detection limit (CRDL). The Sample Quantitation Limits (SQLs) cannot be determined because the percent solids for every sample were not presented on the analytical data sheets. The detection limits for the release samples provided in Table 3 are the detection limits reported by the laboratory, as shown on the analytical data sheets.

TABLE 1

1987 SITE INSPECTION
LAGOON SLUDGE SAMPLE ANALYTICAL RESULTS
JACKSON CERAMIX

Hazardous Substance	Waste Sample	Date Collected	Concentration	CRDL	Reference
Solid					
Inorganic Compounds (mg/kg)					
Lead	MCE-547	4/21/1987	10,500	0.6	12 (p. 5-2, Section 7.1, p. 7-3A and Appendix D, pp. 65 and 73) and 46 (p. 2)

Notes:

CRDL Contract-required detection limit
mg/kg Milligrams per kilogram

TABLE 2

1987 REMOVAL ACTION
LAGOON SOIL SAMPLE ANALYTICAL RESULTS
JACKSON CERAMIX

Hazardous Substance	Waste Sample	Date Collected	Concentration	CRDL	Reference
Inorganic Compounds (mg/kg)					
Lead	S04	7/21/1987	8,740	0.6	14 (pp. 1, 2, 6, and 12) and 46 (p. 2)

Notes:

CRDL Contract-required detection limit
mg/kg Milligrams per kilogram
S Soil

TABLE 3

1991 REMOVAL ACTION
LAGOON SOIL SAMPLE ANALYTICAL RESULTS
JACKSON CERAMIX

Hazardous Substance	Release Sample	Date Collected	Release Concentration	Background Sample	Date Collected	Background Concentration	Detection Limit	Reference
Inorganic Compounds (mg/kg)								
Lead	S13	7/16/1991	9,400	S1	7/16/1991	25	15	19 (pp. 1, 2, 7, 47, and 53) and 46 (p. 2)
Lead	S14	7/16/1991	15,000	S22	7/16/1991	ND	15	19 (pp. 1, 2, 7, 9, 17, and 54) and 46 (p. 2)

Notes:

mg/kg Milligrams per kilogram
ND Not detected above the contract-required detection limit
S Soil

2.4.2 Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity

The information available is not sufficient to adequately support the evaluation of the hazardous constituent quantity for Source No. 1.

Sum (pounds): Unknown
Hazardous Constituent Quantity Value (C): NA

2.4.2.1.2 Hazardous Waste Stream Quantity

While wastes present in the lagoon were excavated in 1999 (Ref. 47 [p. 40]), effluent released from the lagoon to the nearby wetland has not been addressed. The wastewater generated during the glazing and paint processes was discharged into a drainage ditch that led to Source No. 1(Refs. 5 [pp. 1, 2, 3 and 16], 6, 7, 20 [p. 1-4], 24, 39 [pp. 8, 14, 20 and 24] and 41). Drainage from the lagoon flowed to the east through a ditch that led to a 48-inch culvert that ran under the railroad tracks located to the east of the facility. After directing the drainage from the lagoon under the railroad tracks, this culvert discharged into a wetland located to the east of the railroad tracks (Refs. 5 [p. 6], 9, 20 [p. 1-4], 24, 39 [pp. 8, 14, 20 and 24] and 47 [p. 3]). The wastewater sludge in the lagoon was described as a grayish-white clay (Ref. 47, [p. 41]). Grayish-white sludge was also observed within the wetlands (Refs. 5 [pp. 2 and 3], 12 [pp. 2-2 and 5-4] and 20 [pp. 2-1, Section 2.4, Figure 2.1 and Sample Log]). Records do not exist to determine the quantity of wastewater that was discharged into Source No. 1 or the amount that was released from Source No. 1 into the adjacent wetlands; therefore, the hazardous waste stream quantity value is assigned a value of unknown but greater than zero.

Sum (pounds): Unknown
Hazardous Waste Stream Quantity Value: >0, but unknown

2.4.2.1.3 Volume

The volume of the lagoon was not evaluated for the hazardous waste quantity because only the waste stream quantity released from the lagoon is being scored.

Dimension of source (yd^3 or gallons): Unknown
Volume Assigned Value: NA

2.4.2.1.4 Area

The area of the lagoon was not evaluated for the hazardous waste quantity because only the waste stream quantity released from the lagoon is being scored.

Area of Source (ft^2): unknown
Area Assigned Value: NA

2.4.2.1.5 Source Hazardous Waste Quantity Value

The hazardous waste quantity value for Source No. 1 is assigned the highest value assigned; therefore, the value for the hazardous waste quantity is unknown but greater than zero.

Source Hazardous Waste Quantity Value: >0, but unknown

TABLE 4

SUMMARY OF SOURCES EVALUATED
JACKSON CERAMIX

Source No.	Source Hazardous Waste Quantity Value	Ground Water	Surface Water	Air Gas	Air Particulate
1	>0, but unknown	Not scored	10	Not scored	Not scored

Total Source Hazardous Waste Quantity Value: >0, but unknown

Other Potential Sources:

-Drainage Ditch:

Several other potential sources exist at the Jackson Ceramix facility; however, adequate information is not available to sufficiently evaluate these other sources. One of these sources is the drainage ditch that received the lead and paint waste-contaminated wastewater was generated during the manufacturing process. This ditch originated on the southeastern section of the Jackson Ceramix facility and continued to the northeast, between the facility's main building and railroad tracks (Refs. 12 [Figure 2], 6, 9, 20 [p. 1-4]). In April 1987, during the site inspection completed at the Jackson Ceramix facility, aqueous samples collected from the drainage ditch revealed the presence of TCE, trans-1,2-DCE, and lead (Ref. 12 [pp. 5-1, 7-3A, 7-6A, and Figure 3]). Analysis of sediment samples collected from the drainage ditch during this site inspection detected concentrations of lead up to 242,000 mg/kg (Ref. 12 [p. 7-6A and Figure 3]). During removal activities completed at the facility in July 1987, lead was detected as high as 66,500 mg/kg in a sample collected from the drainage ditch and in March 1988, levels of lead as high as 125,000 ppm were detected in the drainage ditch (Ref. 14, pp. 1, 2, 7). In 1989, a removal action was initiated to remove some of the contaminated sludge from the drainage ditch; however, there was no delineation or mapping to record the exact areas that were excavated and removed (Refs. 13 [pp. 21 and 22], 15 [p. 1] and 20 [p. 1-5]).

From January 6 through 13, 1999, as part of the interim response that was completed at the Jackson Ceramix facility, remediation of the drainage ditch was performed. Accumulated sludge, sediment, and soil were excavated to an approximate depth of 1 foot across the cross-sectional width of the ditch. The average width of the drainage ditch excavation was 4 feet. Nearly 600 linear feet of the drainage ditch was remediated with about 750 tons of lead-contaminated waste being removed (Refs. 47 [pp. 36 and 37]). The material excavated from the drainage ditch was characterized under RCRA as hazardous for lead toxicity and carried the D008 waste code (Ref. 47 [p. 26]). The excavated material was treated, stabilized, and capped onsite (Ref. 47 [pp. 26, 27, and 40]). The treatment and stabilization process included excavating contaminated sludge and sediment and thoroughly mixing excavated material with Portland cement until a soil-like consistency was achieved (Ref. 47 [p. 27]). After the stockpile of treated material had been adequately treated and solidified, the treated and stabilized material was transferred to a stockpile

area. Composite samples were collected from the stockpiles and analyzed for TCLP metals analysis to ensure that the process rendered the hazardous sludge and sediment nonhazardous (Ref. 47 [p. 39]).

Confirmation samples were collected from the bottom of the drainage ditch excavation to determine if hazardous substances had been removed to the applicable Pennsylvania statewide human health and safety standards (standards promulgated pursuant to Pennsylvania's Land Recycling and Environmental Remediation Standards Act, Act 2 of 1995) (Refs. 47 [p. 37] and 53 [p. 1]). Based on these results, a second phase of remediation was conducted at the drainage ditch in April 1999. Additional material was excavated from the western embankment of the drainage ditch until white-to-gray, clayey material was no longer visible (Ref. 47 pp. 75 and 76]). During drainage ditch alignment, additional contaminated drainage ditch sediments were observed, excavated, treated, and stabilized onsite (Ref. 47 [p. 77]).

In addition to lead, analytical results from samples collected from the drainage ditch in 1999, prior to remediation, revealed the presence of 1,2-DCE; PCE; and TCE (Ref. 47 [Table 1]).

-Drum Storage Areas:

Other potential sources identified at the Jackson Ceramix facility include two drum storage areas that were sampled during the April 1987 site inspection. The first area consisted of a drum storage shed that was located on the western side of the facility and contained 21 drums, of which approximately 75 percent were labeled "Flammable Liquid". A second drum storage area was located in the production building. This area had a total of 17 drums, 3 of which were labeled "1,1,1-trichloroethylene"and 2 were labeled "perchloroethylene" (the remainder of the drums were not marked) (Ref. 12, p. 1-2). Samples obtained from the drums revealed chloroform, tetrachloroethene, 2-methyl naphthalene, naphthalene, xylenes, and diethyl phthalate. In addition, most of the samples collected from the drums revealed significant concentrations of lead (up to 15,800 mg/kg) (Ref. 12 [pp. 5-2, 5-2A, 7-8A, 7-9A, and 7-10A]). EPA's TAT and ERCS conducted a drum inventory and compatibility analysis at the facility in January 1989 (Refs. 13 [p. 22] and 15 [p. 1]). The inventory determined that drums located at the facility contained flammable liquid, PCE, acrylic lacquer thinner, denatured alcohol, xylol, combustible vapor, Engelhard-TD26318, flammable material, paint materials, TCE, and mineral spirits (Ref. 12 [pp. 5-3 to 5-6]). An EPA On-Scene Coordinator's report indicated that 60 drums of flammable organic solvents were present on the property (Ref. 13 [p. 8]). In 1989, all drums identified on the property were stored onsite in a secured, contained area [Refs. 13 [p. 22] and 16).

-Bags of Ceraflux:

During EPA's removal action completed at the Jackson Ceramix facility in 1989, broken bags of a material called Ceraflux were identified inside a building. Ceraflux is a powder that contains high levels of lead that is used in pottery and wall-tile glaze. EPA's TAT and ERCS secured and contained the broken bags of Ceraflux and staged them within the main steel building located at the facility (Refs. 13 [p. 22], 14 [p. 5], 16 [p. 1], 37, 38, 54 [pp. 1 and 2], and 55 [pp. 1 and 8]).

4.0 SURFACE WATER MIGRATION PATHWAY

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

4.1.1.1 DEFINITION OF HAZARDOUS SUBSTANCE MIGRATION PATH FOR OVERLAND/FLOOD COMPONENT

At the time the Jackson Ceramix plant was operating, lead- and paint-contaminated wastewater was discharged to a drainage ditch (Refs. 7 [pp. 1, 2, and 4], 13 [p. 8], and 41). The ditch ran to the northeast and parallel to the plant for about 380 feet before entering a 24-inch culvert that led to an unlined lagoon (Source No. 1) (Refs. 5 [p. 1], 6 [p. 3], 7 [p. 1], 20 [p. 1-4], 24 and 41). Drainage from the lagoon discharged to the east through a ditch that led to a 48-inch culvert that ran under the railroad tracks located to the east of the facility (Refs. 24 and 47 [p. 3]). After directing the drainage from the lagoon under the railroad tracks, this culvert discharged into a wetland located to the east of the railroad tracks (Refs. 5 [p. 6], 9, 20 [p. 1-4], 39 [pp. 8, 14, 20 and 24] and 47 [p. 3]). The probable point of entry (PPE) to surface water is the point at which the culvert that contained the flow from the lagoon discharged into the wetland.

From the PPE, the wetlands extend to the east for about 900 feet and to the south-southwest for about 3,200 feet (Refs. 9 and 48 [Figures 1-1 and 3-3]). Based on aerial photographs reviewed from between 1959 and 1988 as part of an EPA site analysis for Jackson Ceramix, the most apparent, consistently discernible flow of surface water within the wetland is towards the south, eventually discharging into an unnamed tributary of Sandy Lick Creek (Refs. 9 and 39 [pp.24 and 27]). This unnamed tributary to Sandy Lick Creek eventually discharges into Sandy Lick Creek. The remainder of the 15-mile downstream surface water migration pathway is along Sandy Lick Creek (Refs. 9 and 27). Table 5 summarizes the in-water segment of the surface water migration pathway.

TABLE 5

SURFACE WATER MIGRATION PATHWAY
JACKSON CERAMIX

Surface Water Segment	Length (miles)		Flow (cubic feet per second)	Dilution Weight (Ref. 1 [Table 4-13])	Reference
	Start	End			
Wetlands	0.00	0.45	0.96	1	9, 27, 32, and 56
Unnamed tributary to Sandy Lick Creek	0.45	0.59	0.96	1	9, 27, 32, and 56
Sandy Lick Creek	0.59	15.00	82	0.1	9, 27, 28, and 56

4.1.2.1 LIKELIHOOD OF RELEASE

4.1.2.1.1 OBSERVED RELEASE

Direct Observation

As described in Section 4.1.1.1, the lead- and paint-contaminated wastewater from the plant flowed into a lagoon and eventually into wetlands located to the east of the facility. The wastewater sludge in the lagoon was described as a grayish-white clay (Ref. 47, [p. 41]). Grayish-white sludge has been observed throughout the wetland that received the drainage from the lagoon (Refs. 5 [pp. 3, 18, and 29], 13 [p. 20], 20 [pp. 2-3, 2-4-2, 2-4-3, Figure 2-1], 39 [pp. 8 and 9] and 48 [pp. 3-5, 3-7 and 3-8, Figure 2-1 and Appendix 1, pp. 1 to 8]).

EPA completed an analysis of historical aerial photographs for the Jackson Ceramix facility. A light-toned effluent is visible originating from the lagoon, entering a channelized drainage and entering the wetlands area located east of the plant. Vegetation damage in the wetlands is also evident in these aerial photographs, most severe at the point of the lagoon effluent discharge into the wetland. The effluent extended from the Jackson Ceramix facility, approximately 2,600 feet, downstream to Sandy Lick Creek. (Ref. 39, [pp. 8, 14, 20, 24 and 26]).

Soil boring logs from hand augers completed in the wetland also visually document the presence of sludge (Ref. 48 [Figure 2-1, Appendix 1, pp. 1 to 8]). As documented in Section 2.2, Source Characterization for Source No. 1, the sludge contained lead. The sediment, sludge, soil, and other debris excavated from the lagoon were characterized as RCRA hazardous for lead toxicity and carried the D008 waste code (Ref. 47 [p. 26]). Therefore, the observation of sludge from the lagoon in the adjacent wetland and surrounding surface water document an observed release by direct observation of lead (sludge) into the wetland and surface water. Additionally, wastewater from the lagoon was discharged directly to the wetland (Refs. 5 [pp. 6, 12, 18, and 29] and 20 [p. 1-2]).

In 1999, a layer of thick sludge (up to 12 inches) was observed to cover 12 acres of the wetland (Ref. 43, pp. v, 1-1). Sludge was also observed in the oxbow lakes at the southwestern end of the wetland, which then flows into Sandy Lick Creek (Ref. 43 [p. 2-1 and Figure 2-1]).

- Basis for Direct Observation

Lead-contaminated sludge has been observed in the wetland as documented in the section above.

- Hazardous Substances in the Release

Analytical results from samples collected of the sludge indicate the presence of elevated levels of lead. In 1983, a sample of sludge from the lagoon was collected for TCLP analysis. The sample was characterized as hazardous due to leachable lead concentrations (59.40 mg/L leachable lead) (Ref. 5 [pp.22 and 23]). On March 15, 1986, PADER collected two samples of the sludge, one from the lagoon and one from the wetland. Analytical results revealed leachable lead at 27.0 mg/L in the lagoon sample and 100 mg/L in the wetland sample (Ref. 5, [pp. 36 to 38]). In January and April 1992, sediment samples were collected from the wetland that received runoff from Source No. 1. Descriptions of the sediment samples that were analyzed indicate that the samples consisted of a white/gray clay material that resembled the lead sludge in the drainage ditch that led to the lagoon. Analytical results revealed lead levels in these samples ranging from 3,790 mg/kg to 21,500 mg/kg (Ref. 20, pp. 2-3, 2-4-2, 2-4-3, Figure 2-1 and 3-3F).

Chemical Analysis

The background and release sampling locations and concentrations of lead detected in the background and release samples are summarized in the sections below.

- Background Sample Locations

In August 2001, 154 soil boring samples were collected from the wetland that received surface water runoff from the drainage ditch that led to the lagoon (Source No.1), formerly located on the Jackson Ceramix facility (Ref. 48 [pp. 2-1 and 3-3]). The soil samples were analyzed for total lead by EPA Method 6010B (Ref. 48, pp. 2-3 and 3-1). No background samples were collected during the investigation. To identify potential background wetland sampling locations for the 2001 sampling activity, the soil boring sampling location map (Figure 2-1 of Reference 48), the wetland delineation map (Figure 3-3 of Reference 48), and the concentrations of lead detected in the wetland soil samples (Reference 48, Table 3-1) were reviewed to identify potential background sampling locations.

The 2001 figures show a wetland located between the railroad on the Jackson Ceramix facility and an earthen berm (Ref. 48, Figure 3-3). For purposes of discussion, this wetland will be referred to as the east wetland. A second wetland is located on the west side of the earthen berm. For purposes of discussion this wetland will be referred to as the western wetland. Wetland soil samples collected from several locations in the east wetland revealed low concentrations of lead. These locations include SB-34G, SB-53L-I25, and SB-54L-I25 (Ref. 48 [Figure 2-1]). Other background wetland soil sampling locations identified on Figure 2-1 of Reference 48 include samples collected from the west wetland, approximately 2,400 feet south of the PPE to surface water (Ref. 48 [Figure 2-1]). Both the east and west background wetland soil sampling locations are selected as background locations for the 2001 sampling activity because they were collected within the same time frame, collected and analyzed using the same methods, are located within the same type of environment (wetland) as the observed release samples, and have the same composition (Refs. 48 [pp. 2-1, 2-2, 2-

3, and 3-1 and Appendix 1], 44, 58, and 59). Additionally, the concentrations of lead detected in the background samples (less than 1,000 ppm) indicate that the wetland soil sampling locations were not impacted by releases from the lagoon (Source No. 1) (Ref. 48 [Table 3-1]).

TABLE 6

BACKGROUND SAMPLING LOCATIONS
JACKSON CERAMIX

Sample ID	Sampling Location	Depth (ft)	Date	Reference
SB-35G-1	East wetland, approximately 650 feet south of the probable point of entry to surface water	0-1	August 14, 2001	48 (Figure 2-1, Table 3-1, p. 6, Appendix 1, p. 9) and 50 (p. 10)
SB-35G-2	East wetland, approximately 650 feet south of the probable point of entry to surface water	0-2	August 14, 2001	48 (Figure 2-1, Table 3-1, p. 6, Appendix 1, p. 9) and 50 (p.10)
SB-53L-I25-1	East wetland, approximately 550 feet south of the probable point of entry to surface water	0-1	August 21, 2001	48 (Figure 2-1, Table 3-1, p. 4, Appendix 1, p. 10), and 50 (p.68)
SB-53L-I25-2	East wetland, approximately 550 feet south of the probable point of entry to surface water	0-2	August 21, 2001	48 (Figure 2-1, Table 3-1, p. 4, Appendix 1, p. 10) and 50 (pp. 68)
SB-54L-I25-1	East wetland, approximately 775 feet south of the probable point of entry to surface water	0-1	September 21, 2001	48 (Figure 2-1, Table 3-1, p. 4, Appendix 1, p. 11) and 50 (p. 71)
SB-54L-I25-2	East wetland, approximately 775 feet south of the probable point of entry to surface water	0-2	August 21, 2001	48 (Figure 2-1, Table 3-1, p. 4, Appendix 1, p. 11) and 50 (p. 71)
SB-31G-1	West wetland, approximately 2,400 feet south of the PPE	0-1	August 24, 2001	48 (Figure 2-1, Table 3-1, pp. 6, Appendix 1, p. 12) and 50 (p. 57)

TABLE 6 (Continued)

BACKGROUND SAMPLING LOCATIONS
JACKSON CERAMIX

Sample ID	Sampling Location	Depth (ft)	Date	Reference
SB-32G-1	West wetland, approximately 2,400 feet south of the PPE	0-1	August 24, 2001	48 (Figure 2-1, Table 3-1, p. 6, Appendix 1, p. 13) and 50 (p. 57)
SB-32G-2	West wetland, approximately 2,400 feet south of the PPE	0-2	August 24, 2001	48 (Figure 2-1, Table 3-1, p. 2, Appendix 1, p. 13) and 50 (p. 57)
SB-33L-1	West wetland, approximately 2,500 feet south of the PPE	0-1	August 24, 2001	48 (Figure 2-1, Table 3-1, p. 2, Appendix 1, p. 14) and 50 (p. 61)
SB-33L-2	West wetland, approximately 2,500 feet south of the PPE	0-2	August 24, 2001	48 (Figure 2-1, Table 3-1, p. 2, Appendix 1, p. 14) and 50 (p. 61)
SB-34L-1	West wetland, approximately 2,500 feet south of the PPE	0-1	August 24, 2001	48 (Figure 2-1, Table 3-1, p. 4, Appendix 1, p. 15) and 50 (p. 61)
SB-34L-2	West wetland, approximately 2,500 feet south of the PPE	0-2	August 24, 2001	48 (Figure 2-1, Table 3-1, p. 4, Appendix 1, p. 15) and 50 (p. 61)

Notes:
BS Background soil
ft Feet
PPE Probable point of entry
S Soil
SB Soil boring

- Background Concentration – Sediments

In 2001, 13 wetland soil samples were collected from the wetland east of the Jackson Ceramix facility (Table 6 documents the number of background wetland samples collected). Sediment samples show lead levels ranging from 14.7 to 270 mg/kg (see Table 7). These 13 samples are used to establish background levels of lead in area wetlands sediments. The highest concentration, 270 mg/kg, as documented in Table 7 below, is the concentration used to establish the background lead concentration for the wetlands east of the Jackson Ceramix facility for which an observed release is documented in the following sections. Using the highest concentration of lead detected in the background samples, regardless of when the sample was collected or what depth it was collected in, is a conservative approach.

TABLE 7

LEAD CONCENTRATIONS IN WETLAND BACKGROUND SEDIMENT SAMPLES JACKSON CERAMIX

Sample ID	Hazardous Substance	Concentration(s) (mg/kg)	Method Detection Limit	Reference
SB-35G-1	Lead	179	16	48 (Figure 2-1) and 50, p. 66; Ref. 25
SB-35G-2	Lead	33.5	15	48 (Figure 2-1) and 50, p. 67; Ref. 25
SB-53L-I25-1	Lead	104	0.81	48 (Figure 2-1) and 50, p. 69; Ref. 25
SB-53L-I25-2	Lead	61.7	0.74	48 (Figure 2-1) and 50, p. 70; Ref. 25
SB-54L-I25-1	Lead	270	0.90	48 (Figure 2-1) and 50, p. 72; Ref. 25
SB-54L-I25-2	Lead	30.8	0.71	48 (Figure 2-1) and 50, p. 73; Ref. 25
SB-31G-1	Lead	21.9	14	48 (Figure 2-1) and 50, p. 58; Ref. 25
SB-31G-2	Lead	14.7	13	48 (Figure 2-1) and 50, p. 59; Ref. 25
SB-32G-1	Lead	77.2	15	48 (Figure 2-1) and 50, p. 60; Ref. 25
SB-33L-1	Lead	140	13	48 (Figure 2-1) and 50, p. 62; Ref. 25
SB-33L-2	Lead	19.7	13	48 (Figure 2-1) and 50, p. 63; Ref. 25
SB-34L-1	Lead	107	16	48 (Figure 2-1) and 50,

TABLE 7 (Continued)

LEAD CONCENTRATIONS IN WETLAND BACKGROUND SEDIMENT SAMPLES JACKSON CERAMIX

Sample ID	Hazardous Substance	Concentration(s) (mg/kg)	Method Detection Limit	Reference
				p. 64; Ref. 25
SB-34L-2	Lead	15.6	13	48 (Figure 2-1), and 50, p. 65; Ref. 25

Notes:
ID Identification
mg/kg Milligrams per kilogram
SB Soil Boring
BS Background soil

- Release Samples

In August 2001, 154 soil boring samples were collected from the same wetland (Ref. 48 [pp. 2-1 and 3-3]). The figures in the 2001 investigative report depict the wetland on the eastern side of an old railroad right-of-way located on an elevated berm (Ref. 48 [Figure 2-1]). A wooded area and an area of higher elevation is located east of the railroad right-of-way that separates the wetland into east and west sections (Ref. 48 [Figures 2-1 and 3-3]). In Table 8, the sampling locations of the soil borings are described as being either in the eastern or western wetland. The wooded area and area of higher elevation were used to separate the two wetlands for purposes of describing the sampling locations. The two wetland areas are connected by a culvert that extend from the railroad right-of-way through the western wetland, the wooded area, and finally into the eastern wetland (Ref. 48 [Figure 2-1]).

The maximum concentration of lead detected in the background samples, as documented in Table 7 of this documentation record, is 270 mg/kg (sample SB-54L-25-1) (Ref. 48 [Figure 2-1 and 50 [p.72]). To be conservative, this concentration is used as background for all contaminated sediment samples collected from the wetland. Three times the background concentration is 810 mg/kg.

The August 2001 wetland soil boring samples were analyzed by a PADEP-approved laboratory and analyzed for total lead in accordance with EPA Method 6010B (Ref. 48 [p. 2-3]).

TABLE 8

LOCATION OF CONTAMINATED SAMPLES
JACKSON CERAMIX

Sample ID	Sampling Location	Depth (bgs)[a]	Date	Reference
2001 Final Pre-Design				
SB-1L-1[b]	Northern section of the eastern wetland, about 100 feet east of the railroad berm	0 – 1 feet*	08/17/2001	48 (p. 3-1, Figure 2-1, Table 3-1, p. 1, Appendix 1, p. 1, and Appendix 2, p. 9) and 50 (p. 14)
SB-1L-2[b]	Northern section of the eastern wetland, about 100 feet east of the railroad berm	1 - 2 feet*	08/17/2001	48 (Figure 2-1, Table 3-1, p. 1, Appendix 1 and Appendix 2, p. 9) and 50 (p. 14)
SB-37L-1	Southwestern section of the wetland along the western border, west of grid tick mark E1678600	1 - 2 feet*	08/23/2001	48 (Figure 2-1, Table 3-1, p. 2, Appendix 1, p. 17, and Appendix 2, p. 25) and 50 (p. 24)
SB-40L-1	In the southern portion of the middle section of the eastern wetland, along the western border	0 – 1 feet*	08/20/2001	48 (Figure 2-1, Table 3-1, p. 2, Appendix 1, p. 18, and Appendix 2, p. 13) and 50 (p. 5)

TABLE 8 (Continued)

LOCATION OF CONTAMINATED SAMPLES
JACKSON CERAMIX

Sample ID	Sampling Location	Depth (bgs)[a]	Date	Reference
SB-40L-O25-1	In the southern portion of the middle section of the eastern wetland, along the western border, 25 feet west of SB-40L-1	0 – 1 feet*	08/30/2001	48 (Figure 2-1, Table 3-1, p. 2, Appendix 19, p. 1, and Appendix 2, p. 33) and 50 (p. 74)
SB-41L-1	About 200 feet north of SB-40L, in the middle section of the eastern wetland	0 – 1 feet*	08/20/2001	48 (Figure 2-1, Table 3-1, p. 2, Appendix 1, p. 20, and Appendix 2, p. 13), and 50 (p. 5)
SB-41L–O25-1	25 feet west of SB-40L-1	0 – 1 feet*	08/30/2001	48 (Figure 2-1, Table 3-1, p. 2, Appendix 1, p. 21, and Appendix 2, p. 33) and 50 (p. 74)
SB-41L-O50-1	50 feet west of SB-40L-1	0 – 1 feet*	08/30/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 22, and Appendix 2, p. 35)
SB-44L-1	In the northern section of the middle section of eastern wetland	0 – 1 feet*	08/20/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 23, and Appendix 2, p. 12) and 50 (p. 4)
SB-45L-1	About 200 feet north of SB-44L	0 – 1 feet*	08/17/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 2, and Appendix 2, p. 9) and 50 (p. 14)
SB-46L-1	About 200 feet north of SB-45L	0 – 1 feet*	08/17/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 4, and Appendix 2, p. 9) and 50 (p. 14)
SB-46L-O25-1[c]	25 feet northwest of SB-46L-1	0 – 1 feet*	08/21/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 3, and Appendix 2, p. 19) and 50 (p. 35)
SB-47L-1	About 175 feet north of SB-46L	0 – 1 feet*	08/17/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 24, and Appendix 2, p. 10) and 50 (p. 14)
SB-47L-2	About 175 feet north of SB-46L	1 - 2 feet*	08/17/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 24, and Appendix 2, p. 10) and 50 (p. 14)

TABLE 8 (Continued)

LOCATION OF CONTAMINATED SAMPLES
JACKSON CERAMIX

Sample ID	Sampling Location	Depth (bgs)[a]	Date	Reference
SB-47L-3	About 175 feet north of SB-46L	2 - 3 feet*	08/30/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 24, and Appendix 2, p. 34) and 50 (p. 74)
SB-47L-O25-1	25 feet northwest of SB-47L-l	0 – 1 feet*	08/21/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 25, and Appendix 2, p. 17) and 50 (p. 76)
SB-47L-O25-2	25 feet northwest of SB-47L-l	1 - 2 feet*	08/21/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 25, and Appendix 2, p. 17) and 50 (p. 76)
SB-47L-O25-3	25 feet west of SB-47L-l	2 - 3 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p.25, and Appendix 2, p. 34) and 50 (p. 74)
SB-48L-I25-1	Northern section of the western wetland, southeast of SB-50L, near old railroad berm	0 – 1 feet*	8/16/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 5, and Appendix 2, p. 8) and 50 (p. 13)
SB-48L-I25-2	Northern section of the western wetland, southeast of SB-50L, near old railroad berm	1 - 2 feet*	08/16/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 5, and Appendix 2, p. 8) and 50 (p. 13)
SB-50L-1	Northern section of the western wetland, adjacent to the old railroad berm, and northeast of the culvert that underlies the railroad berm	0 - 1 feet*	08/14/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 6, and Appendix 2, p. 2) and 50 (p. 1)
SB-50L-2	Northern section of the western wetland, adjacent to the old railroad berm, and northeast of the culvert that underlies the railroad berm	1 - 2 feet*	08/14/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 6, and Appendix 2, p. 2) and 50 (p. 1)
SB-51L-2	Northern section of the western wetland, adjacent to the old railroad berm, southwest of the culvert that underlies the railroad berm and SB-50L	1 - 2 feet*	08/14/2001	48 (Figure 2-1, Table 3-1, p. 3, Appendix 1, p. 7, and Appendix 2, p. 1) and 50 (p. 50)

TABLE 8 (Continued)

LOCATION OF CONTAMINATED SAMPLES
JACKSON CERAMIX

Sample ID	Sampling Location	Depth (bgs)[a]	Date	Reference
SB-57L-I25-1	Southwestern section of the western wetland	0 – 1 feet*	08/17/2001	48 (Figure 2-1, Table 3-1, p. 4 and Appendix 2, p. 9 and Appendix 2, p. 9) and 50 (p. 13)
SB-61L-1	Southwestern section of the western wetland	0 – 1 feet*	08/15/2001	48 (Figure 2-1, Table 3-1, p. 4, Appendix 1, p. 26, and Appendix 2, p. 4) and 50 (p. 54)
SB-61L-2	Southwestern section of the western wetland	1 - 2 feet*	08/15/2001	48 (Figure 2-1, Table 3-1, p. 4, Appendix 1, p. 26, and Appendix 2, p. 4) and 50 (p. 54)
SB-61L-I25-1	25 feet west of SB-61L-1	0 – 1 feet*	08/21/2001	48 (Figure 2-1, Table 3-1, p. 4, Appendix 1, p. 27, and Appendix 2, p. 15) and 50 (p. 3)
SB-62L-I25-1	Middle section of the western wetland, on the western side	0 – 1 feet*	08/21/2001	48 (Figure 2-1, Table 3-1, p. 4, Appendix 1, p. 28, and Appendix 2, p. 15) and 50 (p. 3)
SB-63L-I25-1	Middle section of the western wetland on the western side, north of SB-62L-I25-1	0 – 1 feet*	08/30/2001	48 (Figure 2-1, Table 3-1, p. 5, Appendix 1, p. 29, and Appendix 2, p. 34) and 50 (p. 47)
SB-64L-I25-1	Northern section of the western wetland on the western side, north of SB-63L-I25	0 – 1 feet*	08/16/2001	48 (Figure 2-1, Table 3-1, p. 5, Appendix 1, p. 30, and Appendix 2, p. 7) and 50 (p. 12)
SB-65L-1	Northern section of the western wetland on the western side, north of SB-64L-I25	0 – 1 feet*	08/14/2001	48 (Figure 2-1, Table 3-1, p. 5, Appendix 1, p. 31, and Appendix 2, p. 1) and 50 (p. 50)
SB-65L-2	Northern section of the western wetland on the western side, north of SB-64L-I25	1 - 2 feet*	08/14/2001	48 (Figure 2-1, Table 3-1, p. 5, Appendix 1, p. 31, and Appendix 2, p. 1) and 50 (p. 50)

TABLE 8 (Continued)

LOCATION OF CONTAMINATED SAMPLES
JACKSON CERAMIX

Sample ID	Sampling Location	Depth (bgs)[a]	Date	Reference
SB-66L-125-1	Northern section of the eastern wetland, near old railroad berm, southeast of culvert that underlies the railroad berm and SB-51L	0 – 1 feet*	08/16/2001	48 (Figure 2-1, Table 3-1 p. 5, no soil boring log, and Appendix 2, p. 7) and 50 (p. 12)
SB-66L-125-2	Northern section of the eastern wetland, near old railroad berm, southeast of culvert that underlies the railroad berm and SB-51L	1 - 2 feet*	08/16/2001	48 (Figure 2-1, Table 3-1 p. 5, no soil boring log, and Appendix 2, p. 8) and 50 (p. 12)
SB-6G-1	Northern section of the eastern wetland, about 200 feet east of SB-1L and 300 feet east of the railroad berm	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 5, no soil boring log, and Appendix 2, p. 24) and 50 (p. 23)
SB-8G-1	Northern section of the eastern wetland, south of SB-6G	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 5, no soil boring log, and Appendix 2, p. 24) and 50 (p. 23)
SB-9G-1	Northern section of the eastern wetland, about 200 feet east of the culvert that underlies the railroad berm	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 5, no soil boring log, and Appendix 2, p. 21) and 50 (p. 37)
SB-9G-2	Northern section of the eastern wetland, about 200 feet east of the culvert that underlies the railroad berm	1 - 2 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 5, no soil boring log, and Appendix 2, p. 21) and 50 (p. 37)
SB-11G-1	Northwestern section of the eastern wetland, west of SB-8G	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 5, no soil boring log, and Appendix 2, p. 20) and 50 (p. 36)
SB-12G-1	Northwestern section of the eastern wetland, directly south of SB-11G	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 5, no soil boring log, and Appendix 2, p. 20) and 50 (p. 36)
SB-12G-2	Northwestern section of the eastern wetland, directly south of SB-11G	1 - 2 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 5, no soil boring log, and Appendix 2, p. 20) and 50 (p. 36)

TABLE 8 (Continued)

LOCATION OF CONTAMINATED SAMPLES
JACKSON CERAMIX

Sample ID	Sampling Location	Depth (bgs)[a]	Date	Reference
SB-14G-1	Middle section of the eastern wetland	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 5, no soil boring log, and Appendix 2, p. 21) and 50 (p. 36)
SB-15G-1	Middle section of the eastern wetland, west of SB-14G	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 6, no soil boring log, and Appendix 2, p. 20) and 50 (p. 35)
SB-15G-2	Middle section of the eastern wetland, west of SB-14G	1 - 2 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 6, no soil boring log, and Appendix 2, p. 20) and 50 (p. 36)
SB-17G-1	Middle section of the eastern wetland, south of SB-14G and SB015G	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 6, no soil boring log, and Appendix 2, p. 20) and 50 (p. 36)
SB-18G-1	Middle section of the eastern wetland, west of SB-14G	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 6, Appendix 1, p. 32, and Appendix 2, p. 21) and 50 (p. 36)
SB-25G-1	Southern section of the eastern wetland	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 6 and Appendix 2, p. 22) and 50 (p. 37)
SB-27G-1	Southern section of the eastern wetland, on the western side	0 – 1 feet*	08/22/2001	48 (Figure 2-1, Table 3-1, p. 6, Appendix 1, p. 33, and Appendix 2, p. 22) and 50 (p. 37)
SB-30G-1	Most southern section of the eastern wetland, 400 feet south of SB-27G	0 – 1 feet*	08/24/2001	48 (Figure 2-1, Table 3-1, p. 6, Appendix 1, p. 34, and Appendix 2, p. 29) and 50 (p. 75)
SB-36G-1	Middle section of the western wetland, near the railroad berm and about 500 feet southwest of the culvert that underlies the railroad berm	0 – 1 feet*	08/14/2001	48 (Figure 2-1, Table 3-1, p. 6, Appendix 1, p. 35, and Appendix 2, p. 3) and 50 (p. 10)

TABLE 8 (Continued)

LOCATION OF CONTAMINATED SAMPLES
JACKSON CERAMIX

Sample ID	Sampling Location	Depth (bgs)[a]	Date	Reference
SB-38G-1	Northern section of the western wetland adjacent to the old railroad berm, 100 feet south of the culvert that underlies the railroad berm	0 – 1 feet*	08/14/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 8, and Appendix 2, p. 1) and 50 (p. 50)
SB-38G-2	Northern section of the western wetland adjacent to the old railroad berm, 100 feet south of the culvert that underlies the railroad berm	1 - 2 feet*	08/14/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 8, and Appendix 2, p. 1) and 50 (p. 50)
SB-39G-1	Northern section of the western wetland, approximately 225 feet north of the culvert that underlies the railroad berm	0 – 1 feet*	08/14/2001	48 (Figure 2-1, Table 3-1, Appendix 1, p. 36, p. 7 and Appendix 2, p. 2) and 50 (p. 1)
SB-39G-2	Northern section of the western wetland, approximately 225 feet north of the culvert that underlies the railroad berm	1 - 2 feet*	08/14/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 36, and Appendix 2, p. 2) and 50 (p. 1)
SB-1R-1	Northern section of the eastern wetland, about 200 feet east of SB-1L and 300 feet east of the railroad berm	0 – 1 feet*	08/28/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 37, and Appendix 2, p. 30) and 50 (p. 28)
SB-1R-2	Northern section of the eastern wetland, about 200 feet east of SB-1L and 300 feet east of the railroad berm	1 - 2 feet*	08/28/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 37, and Appendix 2, p. 30) and 50 (p. 28)
SB-7R-1	Middle section of the eastern wetland, on the western side	0 – 1 feet*	08/28/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 38, and Appendix 2, p. 31) and 50 (p. 28)
SB-9R-1	Middle section of the eastern wetland, on the western side, 550 feet south of SB-7R, on the Jefferson County Falls Creek Borough Township line	0 – 1 feet*	08/28/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 39, and Appendix 2, p. 31) and 50 (p. 29)
SB-11R-1	Southernmost section of the eastern wetland, on the western side	0 – 1 feet*	08/29/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 40, and Appendix 2, p. 31) and 50 (p. 29)

TABLE 8 (Continued)

LOCATION OF CONTAMINATED SAMPLES
JACKSON CERAMIX

Sample ID	Sampling Location	Depth (bgs)[a]	Date	Reference
SB-12R-1	Southern section of the eastern wetland, on the western side	0 – 1 feet*	08/29/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 41, and Appendix 2, p. 31) and 50 (p. 29)
SB-15R-1	In the upper portion of the middle section of the eastern wetland, on the western side, 250 feet east if the railroad right of way	0 – 1 feet*	08/30/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 42, and Appendix 2, p. 35) and 50 (p. 47)
SB-16R-1	Middle section of the eastern wetland on the western side, 200 feet south of SB-15R	0 – 1 feet*	08/30/2001	48 (Figure 2-1, Table 3-1, p. 7, Appendix 1, p. 43, and Appendix 2, p. 35) and 50 (p. 47)

Notes:

* The 2001 Final Pre-Design Report indicates that one soil sample was collected from each 1-foot depth interval from every soil boring location; therefore, the depth is cited as a 1-foot range (Ref. 48 [pp. 2-3 and 3-2]).

[a] As shown in Table 3-1 of Reference 48, the samples collected from these soil boring locations were collected at the depth cited in the column sample depth and indicated as the last number in the soil boring identification column. For example, soil boring SB-1L is listed in the soil boring column as SB-1L-1, SB-1L-2, and SB-1L-3, indicating that the samples were collected at 1, 2, and 3 feet bgs at soil boring location SB-1L.

[b] Sample number SB-1L was misread or mislabeled at the laboratory and the results are labeled as SB-L-1 and SB-L-2 (Reference 48, Table 3-1, p. 8)

[c] Sample number SB-46L-O25-1 was misread or mislabeled at the laboratory and the results are labeled with an “I” instead of an “O.” (Reference 48, Table 3-1, p. 8).

bgs Below ground surface
ft Feet
ID Identification
PPE Probable point of entry (PPE) to the wetland, as shown in Reference 9 and Reference 48, Figures 1-2 and 3-3.

- Release Concentrations - Sediments

The concentrations of lead documenting an observed release to surface water sediments are summarized in Table 9. The sample IDs provided in Table 9 for the sediment samples collected during the 2001 pre-design investigation provide sampling locations, followed by the sample depth in feet. For example, Sample ID SB-37L-1 indicates that the sample was collected at Sampling Location SB-37L, at a depth of 1 foot below ground surface (bgs).

TABLE 9
CONCENTRATIONS OF LEAD DETECTED IN CONTAMINATED SEDIMENT SAMPLES
JACKSON CERAMIX

Sample ID	Hazardous Substance	Concentration (mg/kg)	SQLs* (mg/kg)	Reference
2001 Final Pre-design[a]				
SB-1L-1[b]	Lead	8,930	15	50 (p. 19) and 25
SB-1L-2[b]	Lead	1,420	15	50 (p. 90) and 25
SB-37L-1	Lead	1,330	17	50 (p. 27) and 25
SB-40L-1	Lead	1,440	1.0	50 (p. 9) and 25
SB-40L-025-1	Lead	1,690	15	50 (p. 82) and 25
SB-41L-1	Lead	4,550	0.77	50 (p. 8) and 25
SB-41L–O25-1	Lead	3,490	13	50 (p. 83) and 25
SB-41L-O50-1	Lead	2,600	16	50 (p. 91) and 25
SB-44L-1	Lead	7,310	1.1	50 (p. 7) and 25
SB-45L-1	Lead	10,000	13	50 (p. 20) and 25
SB-46L-1	Lead	29,400	130	50 (p. 21) and 25
SB-46L-025-1[c]	Lead	3,170	13	50 (p. 84) and 25
SB-47L-1	Lead	18,900	130	50 (p. 22) and 25
SB-47L-2	Lead	19,900	130	50 (p. 92) and 25
SB-47L-3	Lead	1,310	18	50 (p. 85) and 25
SB-47L-O25-1	Lead	17,800	0.58	50 (p. 86) and 25
SB-47L-O25-2	Lead	3,680	0.60	50 (p. 87) and 25
SB-47L-O25-3	Lead	1,030	26	50 (p. 88) and 25
SB-48L-I25-1	Lead	36,800	110	50 (p. 17) and 25
SB-48L-I25-2	Lead	8,540	13	50 (p. 93) and 25
SB-50L-1	Lead	13,100	16	50 (p. 2) and 25
SB-50L-2	Lead	3,610	20	50 (p. 94) and 25
SB-51L-2	Lead	6,030	18	50 (p. 52) and 25
SB-57-I25-1	Lead	3,640	17	50 (p. 18) and 25
SB-61L-1	Lead	2,430	12	50 (p. 55) and 25
SB-61L-2	Lead	1,070	12	50 (p. 95) and 25

TABLE 9 (Continued)

CONCENTRATIONS OF LEAD DETECTED IN CONTAMINATED SEDIMENT SAMPLES JACKSON CERAMIX

Sample ID	Hazardous Substance	Concentration (mg/kg)	SQLs* (mg/kg)	Reference
SB-61L-I25-1	Lead	1,890	0.83	50 (p. 89) and 25
SB-61L-I25-2	Lead	1,400	1.1	50 (p. 96) and 25
SB-62L-I25-1	Lead	2,030	0.64	50 (p. 6) and 25
SB-63L-I25-1	Lead	1,380	16	50 (p. 56) and 25
SB-64L-I25-1	Lead	5,050	13	50 (p. 15) and 25
SB-65L-1	Lead	1,240	10	50 (p. 53) and 25
SB-65L-2	Lead	1,040	12	50 (p. 97) and 25
SB-66L-125-1	Lead	4,310	11	50 (p. 16) and 25
SB-66L-125-2	Lead	1,760	14	50 (p. 98) and 25
SB-6G-1	Lead	16,100	17	50 (p. 25) and 25
SB-8G-1	Lead	3,590	17	50 (p. 26) and 25
SB-9G-1	Lead	9,390	14	50 (p. 44) and 25
SB-9G-2	Lead	9,800	13	50 (p. 99) and 25
SB-11G-1	Lead	12,200	22	50 (p. 40) and 25
SB-12G-1	Lead	20,500	26	50 (p. 39) and 25
SB-12G-2	Lead	22,300	27	50 (p. 100) and 25
SB-14G-1	Lead	19,800	35	50 (p. 43) and 25
SB-15G-1	Lead	22,300	24	50 (p. 38) and 25
SB-15G-2	Lead	12,500	13	50 (p. 101) and 25
SB-17G-1	Lead	2,700	18	50 (p. 41) and 25
SB-18G-1	Lead	20,800	26	50 (p. 42) and 25
SB-25G-1	Lead	3,480	23	50 (p. 46) and 25
SB-27G-1	Lead	7,010	13	50 (p. 45) and 25
SB-36G-1	Lead	2,820	16	50 (p. 11) and 25
SB-38G-1	Lead	5,160	12	50 (p. 51) and 25
SB-38G-2	Lead	6,640	15	50 (p. 79) and 25
SB-39G-1	Lead	8,040	43	50 (p. 81) and 25
SB-39G-2	Lead	1,780	34	50 (p. 80) and 25
SB-1R-1	Lead	31,500	35	50 (p. 30) and 25
SB-1R-2	Lead	5,290	25	50 (p. 102) and 25
SB-7R-1	Lead	8,360	18	50 (p. 31) and 25
SB-9R-1	Lead	3,600	16	50 (p. 32) and 25
SB-11R-1	Lead	4,880	20	50 (p. 33) and 25
SB-12R-1	Lead	3,190	16	50 (p. 34) and 25

TABLE 9 (Continued)

CONCENTRATIONS OF LEAD DETECTED IN CONTAMINATED SEDIMENT SAMPLES JACKSON CERAMIX

Sample ID	Hazardous Substance	Concentration (mg/kg)	SQLs* (mg/kg)	Reference
SB-15R-1	Lead	5,300	15	50 (p. 48) and 25
SB-16R-1	Lead	4,230	12	50 (p. 49) and 25

Notes:

* Reporting Limits (RLs) cited for 2001 data. The RLs are analogous to SQLs, see Reference 25.

[a] The first set of letters and numbers of the sample ID provide the location of the soil boring and the last number in the sample ID indicates the depth in feet at which the sample was collected.

[b] Sample number SB-1L was misread or mislabeled at the laboratory and the results are labeled as "SB-L-1 and SB-L-2." (Reference 48, Table 3-1, p. 8).

[c] Sample number SB-46L-O25-1 was misread or mislabeled at the laboratory and the results are labeled with an "I" instead of an "O." (Reference 48, Table 3-1, p. 8).

ID Identification
mg/kg Milligrams per kilogram
SB Soil boring
SD Sediment
SQL Sample quantitation limits

Attribution:

Lead has been found throughout the Jackson Ceramix facility. As documented in Section 2.2 of this hazard ranking system (HRS) documentation record, lead is documented to have been a constituent of the glaze used in the ceramic glazing process, the paints used in manufacturing the pottery and in wastewater generated during the manufacturing process (Refs. 5 [pp. 1, 2, 3, and 16] and 47 [p. 4]). The presence of lead has been documented onsite in products used in the manufacturing process, drums, and bags of Ceraflux (Refs. 12 [pp. 5-2, 7-9A, Appendix D, pp. 82, 84, 85, and 86], 14 [p. 5], 6 [pp. 2, 3, 4]), 21 [pp. 3 to 7, 11, 12, and 14 to 17], 37, 38, and 47 [p. 48]). Lead has been detected in samples collected from the drainage ditch (Refs. 6, 7, 12 [pp. 5-2, 7-4A, 69, 71, and 72], 13 [pp. 12 and 20], 14 [pp. 1, 2, 3, 4, and 7], and 19 [pp. 1 and 2]) and the lagoon (Source No. 1) (Refs. 12 [pp. 5-27-6a, and Appendix D, p. 65), 13 [p. 20], 14 [pp. 1, 2 and 12], 19 [pp. 1, 2, 53 and 54], and 47 [p. 41]). The drainage ditch and the lagoon (Source No. 1) received surface water runoff and wastewater discharged from the facility (Refs. 12 [pp. 5-4, 7-6A, Appendix D, pp. 72 and 75], 13 [pp. 8, 20], 14 [pp. 1, 2, 3, 4, 6, 8, 7, 15, 17, and 19], 15 [p. 1], 47 [p. 36], 7 [pp. 1 and 2], and 5 [pp. 1 and 2]).

Further evidence of attributing the lead contamination detected in the wetlands to the Jackson Ceramix facility is the visual observation of the grayish-white sludge described in the drainage ditch and lagoon throughout the wetland that ultimately received the sludge drainage from the facility (Refs. 4 [p. 1], 5 [pp. 1, 2, 3, 7, 18, and 29], 7 [p. 1], 8 [p. 1], 12 [p. 5-4], 13 [pp. 4 and 20], 20 [pp. 2-3, 2-4-2, 2-4-3, Figure 2.1], 32 [pp. 8 and 9], 26, [pp. 8 and 9], 47 [pp. 4 and 41] and 48 [pp. 3-5, 3-7 and 3-8, Figure 2-1 and Appendix 1, pp. 1 to 8]). As documented in Section 2.2, Source Characterization for Source No. 1, the sludge contained lead (Refs. 5 [pp.22 and 23] and 47 [pp. 14, 42, 44, and 46). Analytical results reported from sediment samples collected in the wetlands that were described as consisting of a “white-gray” material resembling the lead sludge in the drainage ditch also revealed lead levels ranging from 3,790 mg/kg to 21,500 mg/kg (Ref. 20, pp. 2-3, 2-4-2, 2-4-3, Figure 2-1 and 3-3F).

Effluent from the lagoon entering the wetlands is also documented in historical aerial photographs of the Jackson Ceramix facility. In these photographs, during the operational history of the Jackson Ceramix facility, a light-toned effluent is visible originating from the lagoon, entering a channelized drainage and entering the wetlands area located east of the plant. The effluent extended from the Jackson Ceramix facility, approximately 2,600 feet, downstream to Sandy Lick Creek. (Ref. 39, [pp. 8, 14, 20, 24 and 26]). In 1999, a layer of thick sludge (up to 12 inches) was observed to cover 12 acres of the wetland (Ref. 43, pp. v, 1-1). Sludge was also observed in the oxbow lakes at the southwestern end of the wetland, which then flows into Sandy Lick Creek (Ref. 43 [p. 2-1 and Figure 2-1]).

As documented in Section 4.1.1.1, there is no surface water runoff containment at the facility. All surface water runoff from sources on the facility eventually flows into the wetlands located to the east (Refs. 27 and 32). Therefore, the lead contamination detected in the wetlands is at least partially attributable to the Jackson Ceramix facility.

The U.S. Geological Survey topographic maps for the Jackson Ceramix facility and the surrounding area indicate the area surrounding the facility was used for strip mining and is industrial in nature (Ref. 27). Strip mining, industrial activities, and numerous other human activities are other potential sources of lead contamination and may have partially contributed to the elevated lead concentrations detected in the wetlands (Ref. 47 [pp. 4, 6, 5, 377, 378, 382, 383, 384, 386, and 387]).

Hazardous Substances Released:

Lead

Surface Water Observed Release Factor Value: 550

4.1.2.2 WASTE CHARACTERISTICS

4.1.2.2.1 Toxicity/Persistence

For each hazardous substance detected at a source and in the observed release with a containment value of greater than zero, a toxicity factor value, a persistence factor value, and a combined toxicity/persistence factor value are assigned and presented below (Ref. 1 [Section 4.1.2.2.1]).

TABLE 10

TOXICITY/PERSISTENCE FACTOR VALUES
JACKSON CERAMIX

Hazardous Substance	Source Number	Toxicity Factor Value (Ref. 2, p. BI-8)	Persistence Factor Value (Ref. 2, p. BI-8)	Toxicity/Persistence Factor Value (Ref. 1 [Table 4-12])
Lead	1	10,000	1	10,000

Toxicity/Persistence Factor Value: 10,000
(Ref. 1 [Table 4-12])

4.1.2.2.2 Hazardous Waste Quantity

The source HWQ values are summarized below.

TABLE 11

SOURCE HAZARDOUS WASTE QUANTITY VALUES
JACKSON CERAMIX

Source Number	Source Hazardous Waste Quantity Value (Section 2.4.2.1.5)	Is source hazardous constituent quantity data complete ? (yes/no)
1	>0, but unknown	No
	Sum of value: >0	
Hazardous Waste Quantity Factor Value: 100*		

* As documented in Section 4.1.4.3, wetlands subject to Level II concentrations of hazardous substances have been documented; therefore, a default value of 100 is assigned for the hazardous waste quantity value (Ref. 1 [Table 2-6]).

Hazardous Waste Quantity Factor Value = 100

4.1.2.2.3 Waste Characteristics Factor Category Value

The waste characteristics factor value is determined from the product of the toxicity/persistence and HWQ factor values, subject to a maximum product of 1×10^8 (Ref. 1 [Table 2-7]).

$$10{,}000 \times 100 = 1 \times 10^6$$

Toxicity/persistence factor value: 10,000
Hazardous Waste Quantity Factor Value: 100

Waste Characteristics Factor Category Value: 32
(Ref. 1 [Table 2-7])

4.1.2.3 DRINKING WATER THREAT - TARGETS

No drinking water intakes have been identified within the 15-mile downstream target distance limit (TDL) (Ref. 5 [pp. 6 and 7]).

4.1.2.3.3 Resources

No resources have been identified within the 15-mile downstream target distance limit (TDL).

Resource Factor Value: 0 (Ref. 1 (Section 4.1.2.3.3])

4.1.3.2 WASTE CHARACTERISTICS

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

The toxicity, persistence, and bioaccumulation factor values associated with hazardous substances detected in the sources and documented in the observed release to surface water at the Jackson Ceramix facility are summarized in Tables 12 and 13.

TABLE 12

TOXICITY/PERSISTENCE FACTOR VALUES
JACKSON CERAMIX

Hazardous Substance	Source Number	Toxicity Value (Ref. 2, p. BI-8)	Persistence Value (Ref 2, p. BI-8)	Toxicity/Persistence Factor Value (Ref. 1 [Table 4-12]
Lead	1	10,000	1	10,000

TABLE 13

TOXICITY/PERSISTENCE/BIOACCUMULATION
FACTOR VALUES
JACKSON CERAMIX

Hazardous Substance	Source Number	Toxicity/ Persistence Factor Value (Ref. 1 [Table 4-12]	Human Food Chain Bioaccumulation Value* (Ref. 2, p. BI-8)	Toxicity/Persistence/ Bioaccumulation Factor Value (Ref. 1 [Table 4-16])
Lead	1	10,000	5.0	5×10^4

* Fresh-water bioaccumulation values are assigned.

Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^4
(Ref. 1 (Table 4-16])

4.1.3.2.2 Hazardous Waste Quantity

The source HWQ values are summarized below.

Source Number	Source Hazardous Waste Quantity Value (Section 2.4.2.1.5)	Is source hazardous constituent quantity data complete? (yes/no)
1	>0, but unknown	no
	Sum of values: >0 **Hazardous Waste Quantity Assigned Value:** 100*	

* As documented in Section 4.1.4.3, wetlands subject to Level II concentrations of hazardous substances have been documented; therefore, a default value of 100 is assigned for the hazardous waste quantity value (Ref. 1 (Table 2-6]).

Hazardous Waste Quantity Factor Value = 100

4.1.3.2.3 Waste Characteristics Factor Category Value

The waste characteristics factor value is the product of the highest toxicity/persistence factor value and HWQ value, multiplied by the highest bioaccumulation factor value (Ref. 1 [Section 4.1.3.2.3]).

$10{,}000 \times 100 = 1 \times 10^6$

Toxicity/persistence factor value
X hazardous waste quantity factor value: 1×10^6

$1 \times 10^6 \times 5.0 = 5 \times 10^6$

(Toxicity/persistence X hazardous waste quantity)
X bioaccumulation potential factor value: 5×10^6

Waste Characteristics Factor Category Value: 32
(Ref. 1 [Table 2-7])

4.1.3.3 HUMAN FOOD CHAIN THREAT - TARGETS

Actual Human Food Chain Contamination

Surface Water and Sediment Samples

Sample ID	Distance from Probable Point of Entry	Hazardous Substance	Bioaccumulation Potential Factor Value

Although aqueous and sediment samples document an observed release to the surface water pathway, actual food chain contamination is not scored, because lead has a food chain bioaccumulation factor value of less than 500 (Refs. 1 [Section 4.1.3.3], 2, and Documentation Record [Section 4.1.3.2.1]).

Closed Fisheries

Identity of Fishery	Hazardous Substance
NA	

Sample ID	Distance from Probable Point of Entry	Hazardous Substance
NA		

4.1.3.3.1 Food Chain Individual

As documented in Section 4.1.2.1.1 of this HRS documentation record, an observed release of lead to surface water has been documented from the Jackson Ceramix facility. As documented in Section 4.1.1.1 of this documentation record, Sandy Lick Creek is located within the 15-mile downstream target distance limit. Within the TDL, Sandy Lick Creek is a stocked with trout for fishing (Refs. 30 and 35 [p. 93.107]). When an observed release to surface water of a hazardous substance having a bioaccumulation factor value of less than 500 is documented and there is a fishery anywhere within the 15-mile downstream TDL, the food chain individual factor is assigned by multiplying 20 by the highest dilution weight applicable to the fisheries (Ref. 1 [Section 4.1.3.3.1]). Therefore, the food chain individual factor value for the site is $0.1 \times 20 = 2.0$ (Refs. 27, 28, 1 [Table 4-13]).

TABLE 14
FOOD CHAIN INDIVIDUAL

Identity of Fishery	Type of Surface Water Body	Dilution Weight (Ref. 1 [Table 4-13])	Reference
Sandy Lick Creek	small to moderate stream	0.1	1 (Table 4-13 and Section 4.1.3.3.1)

Food Chain Individual Factor Value: 2
(Ref. 1 [Section 4.1.3.3.1])

4.1.3.3.2.3 Potential Human Food Chain Contamination

Production information for Sandy Lick Creek is not available for the portion of the creek within the 15-mile downstream target distance limit (Refs. 27, 30, and 40). However, because the creek is a fishery, an annual production value of greater than 0 is assigned, which results in a population value of 0.03 (Ref. 1, Table 4-18).

TABLE 15
POTENTIAL HUMAN FOOD CHAIN CONTAMINATION

Identity of Fishery	**Annual Production (pounds)**	**Annual Flow (cfs)**	**Refs.**	**Population Value (P_i)(Table 4-18)**	**Dilution Weight (D_i)(Table 4-13)**	**P_i x D_i**
Sandy Lick Creek	>0	82	9, 27, 28, and 56	0.03	0.1	0.003

Sum of P_i x D_i: 0.003
(Sum of P_i x D_i)/10: 0.0003

Potential Human Food Chain Contamination Factor Value: 0.0003
(Ref. 1 [Section 4.1.3.3.2.3])

4.1.4 ENVIRONMENTAL THREAT

4.1.4.2 Waste Characteristics

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

The ecosystem toxicity/persistence/bioaccumulation factor values for hazardous substances detected in sources and the observed release with a containment value greater than zero are summarized in Tables 16 and 17.

TABLE 16

ECOSYSTEM TOCIXITY/PERSISTENCE FACTOR VALUES JACKSON CERAMIX

Hazardous Substance	Source Number	Ecosystem Toxicity Value (Ref. 2, p. BI-8)	Persistence Value (Ref. 2, p. BI-8)	Ecosystem Toxicity/Persistence Factor Value (Ref. 1 [Table 4-20])
Lead	1	1,000	1.0	1,000

TABLE 17

ECOSYSTEM TOXICITY/PERSISTENCE AND BIOACCUMULATION FACTOR VALUES JACKSON CERAMIX

Hazardous Substance	Ecosystem/Toxicity/ Persistence Factor Value (Ref. 2, p. BI-8)	Ecosystem Bioaccumulation Value* (Section 4.1.3.2.1.3) (Ref. 2, p. BI-8)	Ecosystem Toxicity/ Persistence/Bioaccumulation Value (Ref. 1 [Table 4-21])
Lead	1,000	50,000	5×10^7

* Freshwater value is assigned.

Ecosystem Toxicity/Persistence/Bioaccumulation Potential Factor Value: 5×10^7
(Ref. 1 [Section 4.1.4.2.1.4])

4.1.4.2.2 Hazardous Waste Quantity

The source HWQ values are summarized below.

Source Number	Source Hazardous Waste Quantity Value (Section 2.4.2.1.5)	Is source hazardous constituent quantity data complete? (yes/no)
1	>0, but unknown	no
	Sum of values: >0 **Hazardous Waste Quantity Assigned Value:** 100*	

* As documented in Section 4.1.4.3, wetlands subject to Level II concentrations of hazardous substances have been documented; therefore, a default value of 100 is assigned for the hazardous waste quantity value (Ref. 1 (Table 2-6]).

Hazardous Waste Quantity Factor Value =100

4.1.4.2.3 Waste Characteristics Factor Category Value

The waste characteristics factor category value is determined by taking the product of the highest ecosystem toxicity/persistence factor value and the HWQ value and multiplying the product by the highest ecosystem bioaccumulation factor value (Ref. 1 [Section 4.1.4.2.3]).

$1{,}000 \times 100 = 1 \times 10^5$

Ecosystem toxicity/persistence factor value
× Hazardous waste quantity factor value: 1×10^5

1×10^5 x $50{,}000 = 5 \times 10^9$

(Ecosystem toxicity/persistence X hazardous waste quantity)
× ecosystem bioaccumulation potential factor value: 5×10^9

Waste Characteristics Factor Category Value: 180
(Ref. 1 [Table 2-7])

4.1.4.3 ENVIRONMENTAL THREAT - TARGETS

Level I Concentrations

Actual environmental contamination has been documented in the wetland east of the Jackson Ceramix facility, as documented in Section 4.1.1.1 of this documentation record. No Level I releases have been documented.

Most Distant Level I Sample

None

Most Distant Level II Sample

Sample ID: SB-11R-1 (sediment sample) (see Tables 10 and 11 of this HRS documentation record)
Distance from the probable point of entry: About 2,400 feet
Reference: 48 (Figures 2-1 and 3-3, Table 3-1, p. 7, Appendix 1, p. 40 and Appendix 2, p. 31), 50 (p. 33).

4.1.4.3.1 Sensitive Environments

4.1.4.3.1.1 Level II Concentrations

Sensitive Environments

No Level II concentrations documented in sensitive environments other than wetlands.

Wetlands

Wetland	Wetland Frontage	Reference
Palustrine wetlands	8.37 miles (44,200 feet) *	48 (pp. 3-5 through 3-8, Figures 2-1 and 3-3) and 32

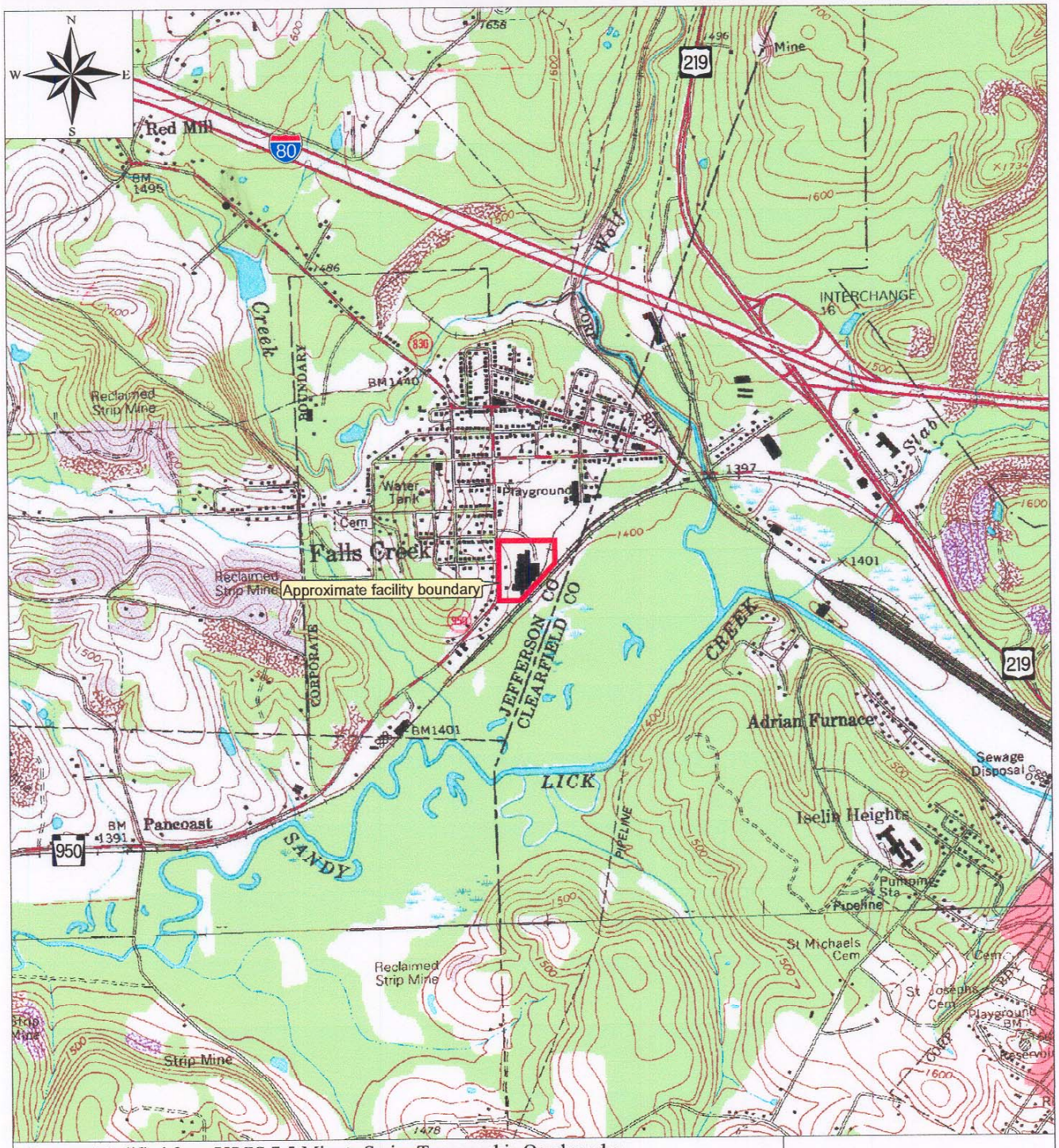
Total Wetland Frontage: 8.37 miles

* When the PPE is in a wetland, the wetland frontage subject to Level II contamination is calculated by drawing an arc from the PPE through the most distant sample (SB-11R-1) having Level II concentrations and measuring the perimeter of the Level II arc (Refs. 1 [Section 4.1.4.3] and 48 [Figure 2-1 and 3-3]). The area of the wetland is shown on both Figures 2-1 and 3-3 of Reference 48. An arc was drawn on Figure 3-3 of Reference 48 from the PPE to sample SB-11R-1. The arc goes outside the area of the Figure 3-3, the area of the paper, and the area delineated as wetlands. However, using Figure 3-3 to determine the perimeter of wetlands subject to Level II contamination is the most accurate method of delineating the area. The edges of the map were included in the perimeter of the wetland in the one location where the arc goes outside the area of Figure 3-3. The length of the perimeter was determined by using a map wheel.

Wetland Value: 250 (Ref. 1 [Table 4-24])
Level II Concentrations Factor Value: 250 (Ref. 1 [Section 4.1.4.3.1.2])

4.1.4.3.1.3 Potential Contamination

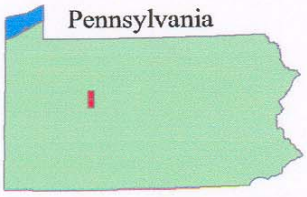
The potential environmental contamination factor value for the site is not evaluated because the maximum value for the environmental threat score is achieved using only the Level II contamination factor value. Evaluation of the potential contamination factor value will not change the site score. Potential environmental targets include wetlands and state game lands (Refs. 31 and 32).



Source: Modified from USGS 7.5-Minute Series Topographic Quadrangles,
Du Bois, Pennsylvania, 1966, Revised 1994
Falls Creek, Pennsylvania, 1966, Revised 1994

0 0.25 0.5 Miles

Quadrangle Location = ■



Jackson Ceramix Site
Falls Creek, Jefferson County, Pennsylvania

Figure 1
Site Location Map

TDD No. SE3-04-10-001
EPA Contract No. 68-S3-00-02

Map created on December 22, 2004
by D. Call, TTEMI START

Tetra Tech EM Inc.