United Metals, Inc.

Marianna, Florida

EPA Facility ID: FLD098924038

Basin: Chipola

HUC: 03130012

Executive Summary

The United Metals, Inc. site is in Marianna, Florida, a rural area of Jackson County. The property is approximately 72 hectares (180 acres) in area, of which approximately 9 hectares (23 acres) were used for processing and recycling lead-acid and nickel-cadmium batteries. During peak operations, the facility processed and recycled approximately 12,000 batteries per week. Until 1981, treated and untreated wastewater flowed into a settling basin, then into concrete basins, and then through a ditch to an unlined holding pond. Environmental investigations at the property found metals contamination in groundwater, soil, and sediment. The Chipola River, which is the NOAA trust habitat of primary concern, provides spawning, nursery, and adult habitat for many NOAA trust resources. Surface water runoff is the primary pathway for the migration of contaminants from the site to NOAA trust resources; groundwater and sediment transport are secondary pathways.

Site Background

The United Metals, Inc. site (United Metals) is in Marianna, Florida, a rural area of Jackson County. The property is approximately 72 hectares (180 acres) in area, of which approximately 9 hectares (23 acres) were used for processing and recycling batteries. The property is bordered to the north by a large agricultural wheat field and to the east, south, and west by wooded areas that in turn are bordered by forested wetlands. The United Metals site is approximately 2 km (1.25 mi) east of the Chipola River and 1 km (0.6 mi) south of Rocky Creek (Figure 1).

From 1979 to 1991, United Metals was operated as a battery reclamation facility where used lead-acid and nickel-cadmium batteries were recycled (CDM Federal 2002). Five buildings and two holding ponds remain at the site. The buildings include the battery recycling plant and materials storage area, the plastic storage and processing plant, the truck maintenance shop, the health center, and the office (Figure 2).

During peak operations, the facility processed and recycled approximately 12,000 batteries per week. Batteries were unloaded onto a conveyor belt in the northwest part of the battery recycling plant. The plastic battery casings, which were separated from the lead plates, were crushed and pelletized in the plastic storage and processing plant, then shipped to an off-site extruding facility. The lead components and lead oxide from the batteries were sent to an off-site lead smelter.

Prior to 1981, treated and untreated wastewater flowed into a settling basin, then into concrete basins, and then through a ditch to an unlined holding pond (USEPA 2003). In 1982, the wastewater system was modified so that wastewater could be neutralized in storage tanks and recycled back into plant operations, which eliminated wastewater discharges to the holding ponds. Around

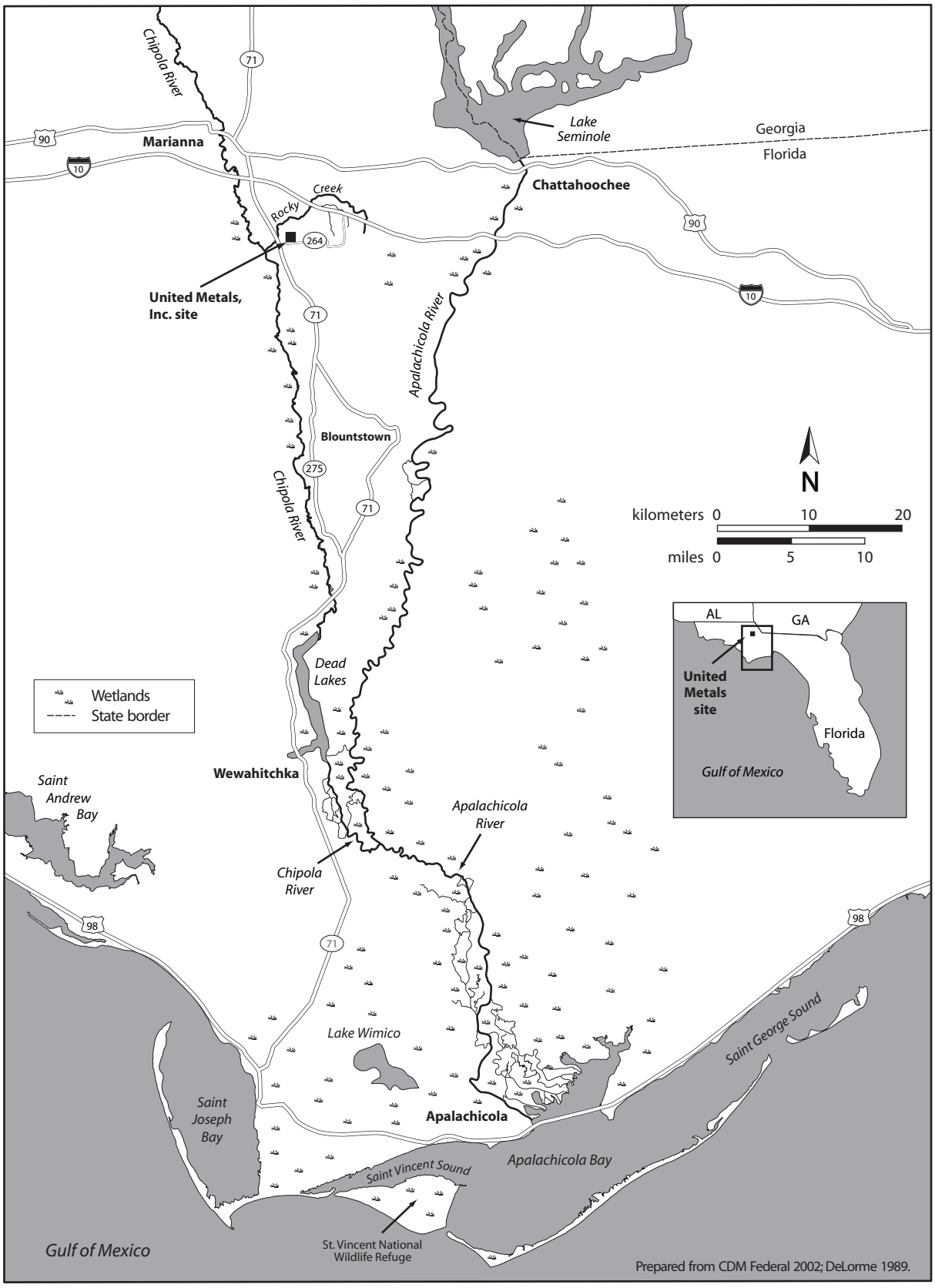

Figure 1. Location of United Metals, Inc. site, Marianna, Florida.

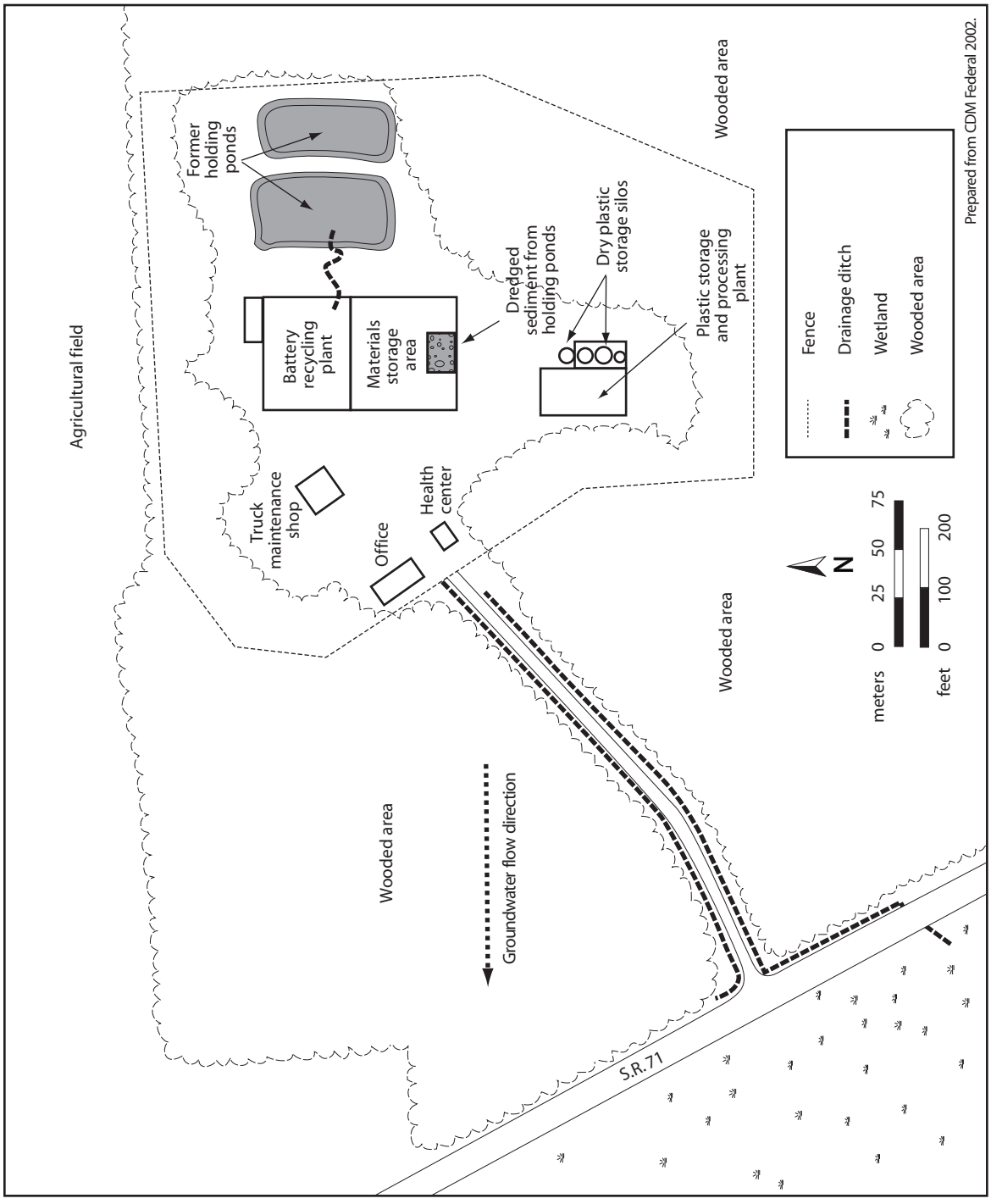

Figure 2. Detail of the United Metals, Inc. property, Marianna, Florida.

the same time, the holding ponds were abandoned, dredged, and backfilled. Dredged sediments from the holding ponds and drainage ditches are currently stockpiled in the materials storage area (USEPA 2003).

From 1981 to 1993, the Florida Department of Environmental Protection conducted numerous site investigations that found metals contamination in groundwater, soil, and sediment. In 1986, the U.S. Environmental Protection Agency (USEPA) conducted a Resource Conservation and Recovery Act (RCRA) program inspection and reported numerous RCRA violations. In 1991, the Florida Department of Environmental Protection ordered all site operations to cease because of numerous RCRA violations. In 1996, the USEPA conducted an emergency removal operation to remove six 210-liter (55-gallon) drums of hazardous materials, and several hundred gallons of sulfuric acid sludge from a tank in the battery recycling plant (CDM Federal 2002). The United Metals site was proposed for placement on the National Priorities List (NPL) on September 5, 2002, and was placed on the NPL on April 30, 2003.

Surface water runoff is the primary pathway for the migration of contaminants from the site to NOAA trust resources; groundwater and sediment transport are secondary pathways. Surface water runoff from the site generally flows to the west and south. Surface water that flows to the west drains into a ditch that borders the access road to the site. This ditch connects with the ditch that borders State Route 71, which then flows south into a culvert. The culvert drains to a forested wetland approximately 152 m (500 ft) south-southwest of the United Metals site (Figure 2). This wetland is hydraulically connected to an unnamed stream that flows to the Chipola River. Surface runoff that drains to the south enters an intermittent stream that discharges into a series of interconnected wetlands. The interconnected wetlands are hydraulically connected to another intermittent stream that then discharges into a sinkhole-pond approximately 0.2 km (0.1 mi) west of State Route 71. The exact location of the intermittent streams and the sinkhole pond could not be determined from the documents reviewed for this report.

There are two aquifer systems in the vicinity of the site: a surficial aquifer system and the Floridian aquifer system. The surficial aquifer system consists of sand and clay and generally flows to the west. The Floridian aquifer system is approximately 18 m (60 ft) below the site; groundwater in the aquifer generally flows west, where it ultimately discharges into the Chipola River (CDM Federal 2002). Numerous sinkholes, a karst feature, are present at the site.

NOAA Trust Resources

The habitats of primary concern to NOAA are the surface water and sediments of the Chipola River and associated wetlands. The Chipola River is the largest tributary of the Apalachicola River and drains one-half of the Apalachicola watershed (American Rivers 2004). Near the United Metals site, the Chipola River ranges from 8 to 20 m (26 to 66 ft) in width and from 0.3 to more than 1 m (0.9 to 3 ft) in depth. The Chipola River is a spring-fed clearwater stream characterized by long runs, pools, rocks, and rapids. It has been designated a Florida state Wild and Scenic River and an Outstanding Florida Water (American Rivers 2004). Both designations attempt to protect water bodies from further pollution and degradation. The Chipola River joins the Apalachicola River approximately 72 km (45 mi) downstream of the site. From its confluence with the Chipola River, the Apalachicola River flows 40 km (25 mi) to Apalachicola Bay, which enters the Gulf of Mexico. The Apalachicola River provides habitat for the only known naturally reproducing population of Gulf Coast striped bass in the Gulf of Mexico (Parauka 2004).

NOAA trust resources in the Chipola River near the site include anadromous Alabama shad, Gulf Coast sturgeon (a local subspecies of Atlantic sturgeon), skipjack herring, and Gulf Coast striped bass and catadromous American eel (Hill 2003; Parauka 2004). These species use the Chipola River for spawning, nursery, and adult habitat (Table 1).

From 1962 to 1988, the Dead Lakes Dam blocked fish migration to the upper reaches of the Chipola River. In 1988, the dam was removed, which allowed fish passage for the first time in 20 years. Since the removal, striped bass have resumed summer migrations to the upper reaches of the Chipola River (Hill 2003). The Chipola River provides crucial cool-water habitat during the warm summer months for aestivating fish. Aestivation is the dormant or sluggish state that some animals enter to cope with periods of hot and dry conditions.

Table 1. NOAA trust resources in the Chipola River in the vicinity of the United Metals, Inc. site (Hill 2003 and Parauka 2004).

Species		**Habitat Use**			**Fisheries**	
Common Name	Scientific Name	Spawning Area	Nursery Area	Adult Habitat	Comm.	Rec.
CATADROMOUS FISH						
American eel	*Anguilla rostrata*			◆		◆
ANADROMOUS FISH						
Alabama shad	*Alosa alabamae*	◆	◆	◆		◆
Gulf Coast sturgeon[a]	*Acipenser oxyrhynchus desotoi*	◆	◆	◆		◆
Skipjack herring	*Alosa chrysochloris*	◆	◆	◆		◆
Gulf Coast striped bass	*Morone saxatilis*	◆	◆	◆		◆

a: Scientific name from Parauka 2004.

Gulf Coast striped bass are stocked periodically, by the Gulf States Marine Fisheries Commission, in the Chipola River and a number of other systems along the coast of the Gulf of Mexico (Parauka 2004). Gulf Coast striped bass migrate extensively throughout river systems, spending most of their life cycle in fresh water but in the winter months they migrate to coastal estuarine waters to forage. Gulf Coast striped bass enter coastal rivers and streams to spawn in mid-February, when saltwater temperatures start to rise. Gulf Coast striped bass deposit semi-buoyant eggs and sperm into the water column. The eggs normally hatch 36 to 42 hours after they are deposited. This is a critical time for striped bass, which require strong water currents and adequate river lengths to ensure their eggs and newly hatched young do not drop to the river bottom where they would be covered by silt. (USFWS 2003a).

Gulf Coast sturgeon, and Alabama shad spawn in freshwater reaches of rivers and streams from January to April. These species spend the majority of their life cycles in coastal rivers seeking cool water, especially during hot summer months. Gulf Coast sturgeon enter coastal rivers and streams from February to April and return to saltwater habitats in October through November. They do not reach sexual maturity until nine to 12 years of age (USFWS 2003b). Alabama shad enter freshwater to spawn from January to April, when water temperatures reach 19 to 22 degrees C. Spawning occurs over sand, gravel, and rock substrates in a moderate current (NMFS 2004).

No commercial fishing occurs in the vicinity of the site. Alabama shad, American eel, skipjack herring, and striped bass are fished recreationally on the Chipola River (Hill 2003). A state-wide fish

consumption advisory is in effect for all fresh waters of Florida because of mercury contamination. The 2003 advisory recommends that adults consume no more than one meal per week of large-mouth bass, bowfin, gar, and other species and that women of child-bearing age and children limit their consumption of fish from the Chipola River system to one meal per month (FDOH 2003).

Site-Related Contamination

Sediment, groundwater, and soil samples have been collected for analysis from the United Metals site and adjacent properties during the course of several site investigations. The samples were analyzed for metals; semivolatile organic compounds, including polycyclic aromatic hydrocarbons (PAHs) and bis(2-ethylhexyl)phthalate (BEHP); pesticides; and polychlorinated biphenyls (PCBs). PCBs were not detected in any of the samples. Based on the results of these analyses, the primary contaminants of concern to NOAA are metals. Table 2 summarizes maximum contaminant concentrations detected during the site investigations and compares them to appropriate screening guidelines. Only maximum concentrations that exceeded relevant screening guidelines are discussed below. The screening guidelines are the threshold effects concentrations (TECs) for sediment (MacDonald et al. 2000) and the ambient water quality criteria (AWQC) for groundwater (USEPA 2002). For soil, the screening guidelines are the ecological screening values recommended by USEPA Region 4 (USEPA 2001). Any exceptions to the screening guidelines are noted in Table 2.

Sediment samples were taken from wetland areas adjacent to the site and on-site and off-site drainage ditches. Groundwater samples were taken from monitoring wells, on-site production wells, and private potable-water wells on properties adjacent to the site. Soil samples were taken throughout the site.

Sediment

Metals were detected in sediment samples taken both on and off site. Lead concentrations in sediment samples ranged from 24 to 16,000 mg/kg. The maximum concentration of lead was detected in a sample taken from the drainage ditch along the entrance driveway approximately 120 m (400 ft) southwest of the entrance gate. Lead was also detected at elevated concentrations in sediment samples taken from a wetland west of State Route 71. The maximum lead concentration exceeded the threshold effects concentration (TEC) by two orders of magnitude. Maximum concentrations of chromium, copper, mercury, nickel, and zinc detected in sediment did not exceed the TECs.

Groundwater

Metals and pesticides were detected in groundwater samples. Maximum concentrations of cadmium, chromium, copper, lead, and nickel were detected in samples taken from a monitoring well approximately 60 m (200 ft) north of the battery recycling plant. The maximum concentration of zinc was detected in a sample taken from a monitoring well approximately 30 m (100 ft) west of the battery recycling plant. The maximum concentration of cadmium exceeded the AWQC by three orders of magnitude. The maximum concentration of lead exceeded the AWQC by two orders of magnitude. The maximum concentrations of copper and chromium exceeded the AWQC by one order of magnitude. Nickel and zinc were detected at maximum concentrations that exceeded the AWQC by factors of approximately six and three, respectively. Arsenic and mercury were also detected, but at maximum concentrations that did not exceed the AWQC.

The pesticides, dieldrin and heptachlor were detected in groundwater samples taken from monitoring wells approximately 22 m (72 ft) southwest of the battery recycling plant and approximately 30 m (100 ft) west of the battery recycling plant, respectively, at maximum concentrations that exceeded the AWQC by one order of magnitude. Heptachlor epoxide was detected in a sample

taken from a production well approximately 30 m (100 ft) southeast of the plastic storage and processing plant at a maximum concentration that exceeded the AWQC by a factor of four. Aldrin was also detected, but at a maximum concentration that did not exceed the AWQC.

Table 2. Maximum concentrations of contaminants of concern to NOAA detected in samples collected at the United Metals, Inc. site (CDM Federal 2002). Contaminant values in bold exceeded screening guidelines.

	Soil (mg/kg)		Water (µg/L)		Sediment (mg/kg)	
Contaminant	Soil	USEPA Region 4[a]	Ground-water	AWQC[b]	Sediment	TEC[c]
METALS/INORGANICS						
Arsenic	**670**	10	40	150	ND	9.79
Cadmium	ND	0.38[d]	**500**	0.25[e]	ND	0.99
Chromium[f]	**24**	0.4	**110**	11	25	43.4
Copper	40	40	**390**	9[e]	18	31.6
Lead	**260,000**	50	**520**	2.5[e]	**16,000**	35.8
Mercury	0.038	0.1	0.26	0.77[g]	0.14	0.18
Nickel	10	30	**320**	52[e]	14	22.7
Zinc	**97**	50	**400**	120[e]	41	121
PAHs						
Benz(a)pyrene	0.63	0.1	ND	NA	ND	0.15
Benzo(b)fluoranthene	0.92	NA	ND	NA	ND	NA
Bis(2-ethylhexyl)phthalate	45	NA	ND	NA	ND	NA
PESTICIDES/PCBs						
Aldrin	ND	0.0025	0.93	3.0[h]	ND	0.040[i]
Dieldrin	ND	0.00028[d]	**0.79**	0.056	ND	0.0019
Heptachlor	ND	NA	**0.067**	0.0038	ND	0.040[i]
Heptachlor Epoxide	ND	NA	**0.016**	0.0038	ND	0.00247
Total PCBs	ND	0.02	ND	0.014	ND	0.0598

a: USEPA Region 4 recommended ecological screening values (USEPA 2001).

b: Ambient water quality criteria for the protection of aquatic organisms (USEPA 2002). Freshwater chronic criteria presented.

c: Threshold Effects Concentration (TEC). Concentration below which harmful effects are unlikely to be observed (MacDonald et al. 2000).

d: Ecological soil screening guidelines (USEPA 2004).

e: Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of 100 mg/L $CaCO_3$.

f: Screening guidelines represent concentrations for $Cr.^{+6}$

g: Criterion expressed as total recoverable metal.

h: Chronic criterion not available; acute criterion presented.

i: Freshwater upper effects threshold (UET) for bioassays. The UET represents the concentration above which adverse biological impacts would be expected.

NA: Screening guidelines not available.

ND: Not detected.

Soil

Metals, PAHs, and BEHP were detected in soil samples taken on-site and adjacent to the United Metals site. Lead and arsenic were detected in samples taken adjacent to the southwest corner of the battery recycling plant at maximum concentrations that exceeded the USEPA Region 4 values by three orders of magnitude and one order of magnitude, respectively (Table 2). Zinc was detected in samples taken approximately 60 m (200 ft) east of the battery recycling plant at maximum concentrations that exceeded the Region 4 values by a factor of two. Chromium was detected in samples taken from the drainage ditch along the entrance driveway and State Route 71. Maximum concentrations of chromium exceeded the Region 4 values by one order of magnitude. Maximum concentrations of BEHP and two PAHs, benz(a)pyrene and benzo(b)fluoranthene, were detected in soil samples taken adjacent to the southwest corner of the battery plant. There are no USEPA soil screening guidelines available for comparison to the maximum concentrations of BEHP and one of the PAHs in soil.

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