Delatte Metals

Ponchatoula, Tangipahoa Parish, Louisiana

EPA Facility ID: LAD052510344

Basin: Lake Maurepas

HUC: 08070204

Executive Summary

From the 1960s to the early 1990s, Delatte Metals operated battery recycling facilities adjacent to Selsers Creek, which flows to the Lake Pontchartrain estuary. Lead plating from used batteries was smelted into lead ingots at the property. Battery acid was stored in neutralization ponds and wastewaters discharged to drainage ditches that flow to Selsers Creek. Elevated concentrations of lead and other trace elements were observed in soils, groundwater, stream surface water, and stream sediment. The catadromous American eel uses Selsers Creek and numerous other estuarine species are present in the Lake Pontchartrain estuary, approximately 15 km (9 mi) south of the site. Recreational and commercial fisheries are present in Lake Pontchartrain and the federally protected Gulf sturgeon uses the estuary as a migratory corridor to natal streams.

Site Background

The Delatte Metals property is adjacent to Selsers Creek and occupies approximately 8 ha (19 acres) in Ponchatoula, Tangipahoa Parish, Louisiana (Tetra Tech 2000). From the property, Selsers Creek flows for about 3 km (1.8 mi) to an unnamed canal, which flows another 11.5 km (7 mi) to the Lake Ponchartrain estuary (Figure 1).

Two battery recycling facilities operated on the property from the 1960s to about 1992. Operations included demolition of spent batteries to remove lead plates and smelting of plates into lead ingots. Battery acid was stored in neutralization ponds (Figure 2). The former smelter consisted of a rotary furnace that chemically reduced lead compounds, melted the metallic lead, and oxidized the carbon in the battery fragments. The smelting process used coke, recycled slag, battery parts, lead oxide, arsenic, and antimony. Furnace washwater was collected in a concrete sump and discharged to a drainage ditch that drains to Selsers Creek (Figure 2; Tetra Tech 2000).

When the facilities closed, about 6 million empty battery casings and several surface impoundments with either very low (1) or very high pHs (12) were left behind (Tetra Tech 2000). Several removal actions have been undertaken on the property, including the removal of battery casings, closure of surface impoundments, and removal of lead contaminated soils. The U.S. Environmental Protection Agency listed the Delatte Metals property on the National Priorities List in January 1999. A remedial investigation (RI) was completed for the site in January 2000 (Tetra Tech 2000).

The principal pathway for contaminant migration off the property is via surface ditches that traverse the property and discharge to Selsers Creek. A fish kill in Selsers Creek, adjacent to the property, was documented in 1984. The pH of stream water at the time of the fish kill was 1.9. Contaminant migration through the groundwater may also occur; shallow groundwater is encountered from the ground surface to about 8.5 m (28 ft) below ground surface and flows north-north-

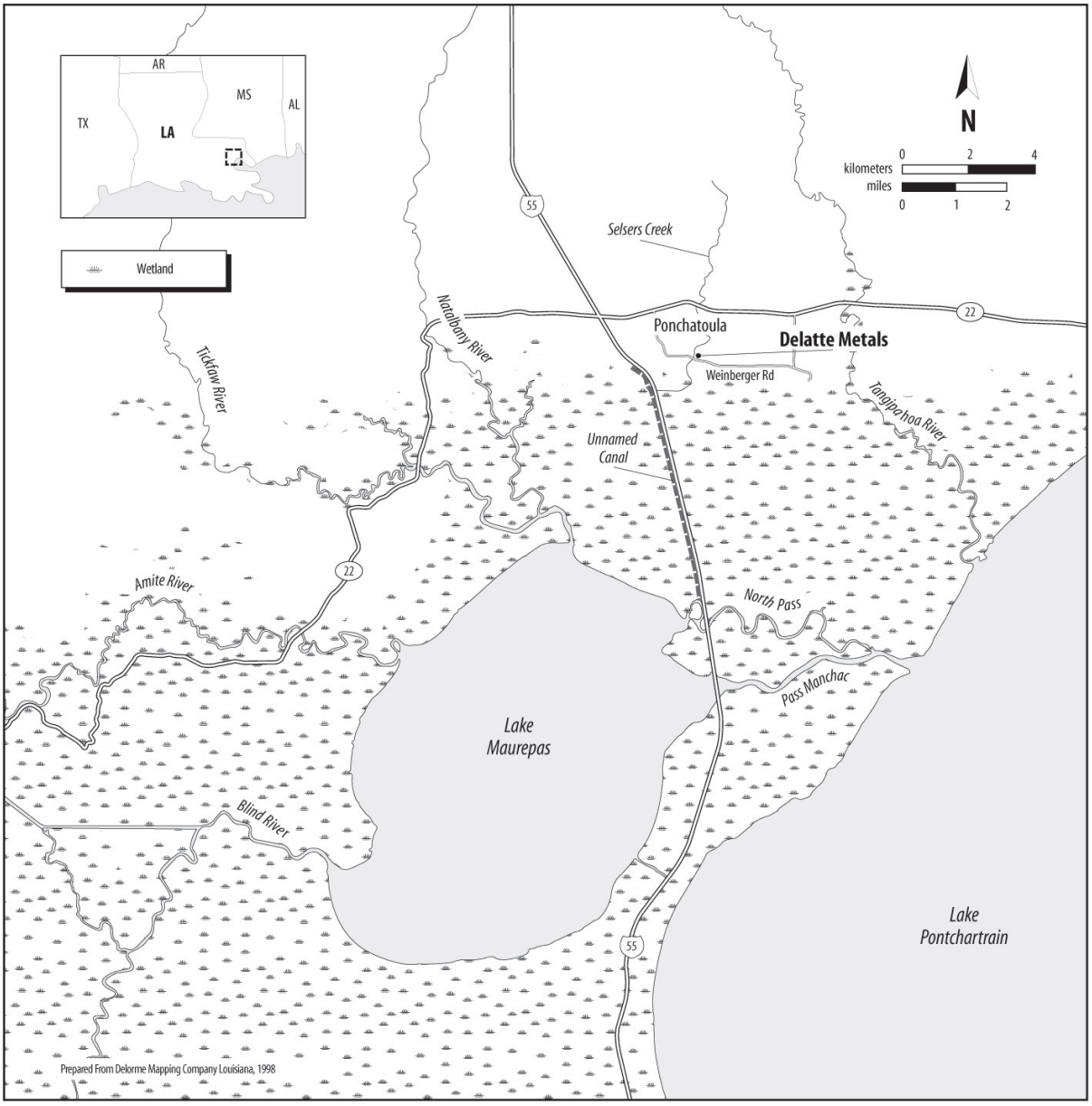

Figure 1. Location of the Delatte Metals property near Ponchatoula, Louisiana.

west toward Selsers Creek. Groundwater flow is estimated to be 0.4 m per day or 155 m per year (1.4 ft per day; 511 ft per year; Tetra Tech 2000).

NOAA Trust Resources

The NOAA trust habitats of concern are lower Selsers Creek, the unnamed canal, North Pass, Pass Manchac, and the Lake Pontchartrain estuary. Selsers Creek is a small, low-gradient freshwater stream that measures approximately 30 meters (100 ft) wide next to the site. The unnamed canal is 40 to 60 m wide (131 to 200 ft), running along Interstate 55 before discharging to North Pass and

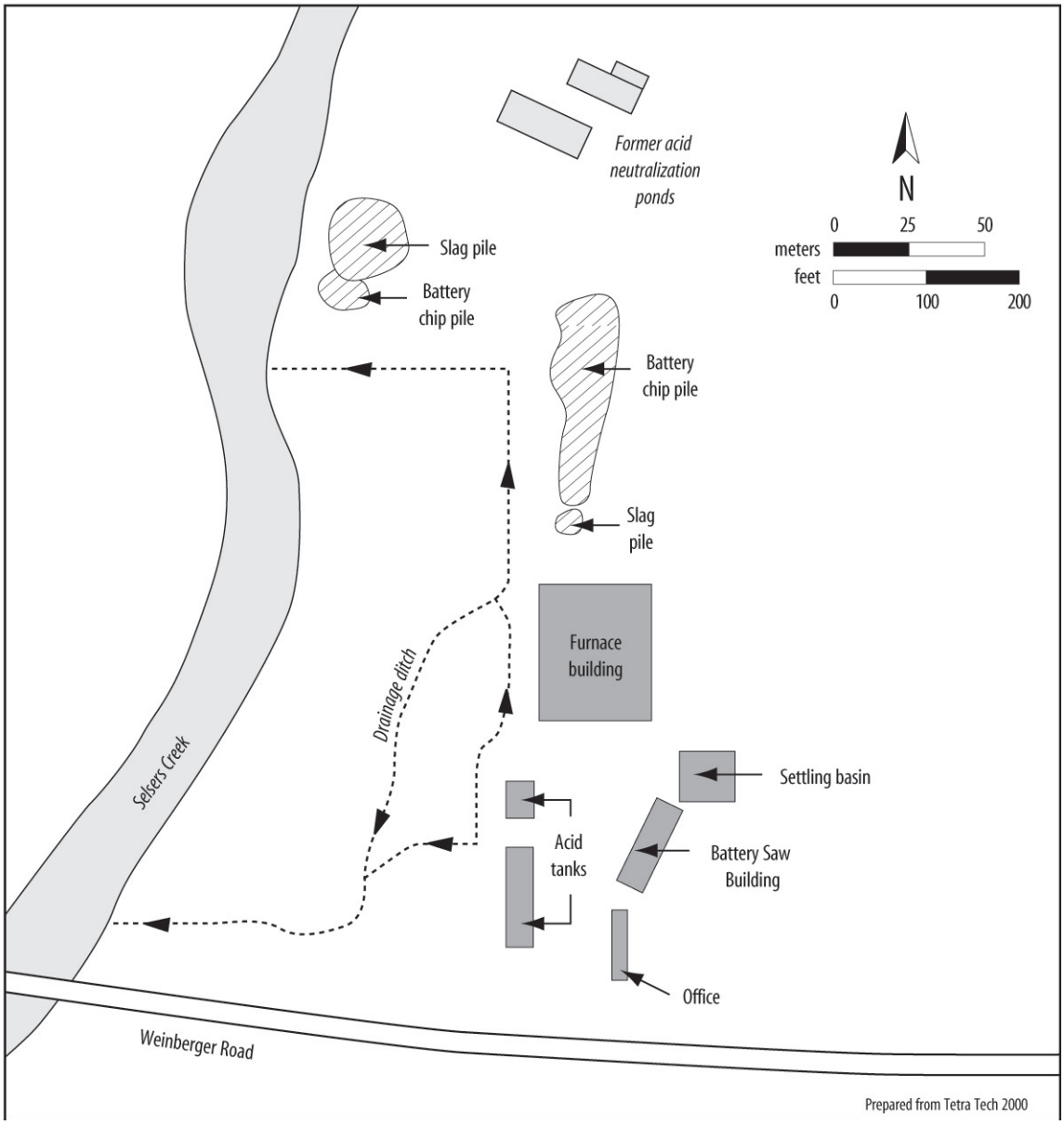

Figure 2. Detail of the Delatte Metals property.

Pass Manchac. North Pass and Pass Manchac are generally less than 50 m (165 ft) wide and are tidally influenced (USGS 1994; Rogilio 2000). These water bodies may receive some saltwater intrusion during the dry season, but salinities are generally less than 5 parts per thousand (ppt). Sediments in Selsers Creek and the canals range from fine sands to silts; water depths are not known (Rogilio 2000).

Lake Pontchartrain is a low-salinity estuary of the Gulf of Mexico. Depths are shallow, generally less than 5 m (16 ft) and sediments range from sands to silts (USGS 1983; Rogilio 2000). Salinities range from near-freshwater in the northwestern portions of the estuary to over 20 ppt in the southeastern portion nearest the entrance to the Gulf of Mexico. Lake Maurepas is tidal fresh water (Rogilio 2000). Depth and salinity for the lake were not available at the time of this review.

Vast freshwater emergent wetlands occupy areas north of Lake Pontchartrain and Lake Maurepas (Figure 1). Freshwater emergent species *Panicum hemitomon*, *Sagittaria falcate*, *Eleocharis spp*., and *Alternanthera philoxeroides* dominate much of these wetlands (Gosselink 1984). Cypress swamp wetlands are immediately south of the Delatte Metals property (Tetra Tech 2000).

The catadromous American eel, the only NOAA trust species present in Selsers Creek and the unnamed canal, uses the habitats for adult residence (Rogilio 2000). Numerous anadromous, estuarine, and marine fish, and invertebrate species are present in Lake Ponchartrain; selected species are presented in Table 1.

Gulf sturgeon and gizzard shad are anadromous species that use river basins draining to Lakes Ponchartrain and Maurepas. In 1991, the Gulf sturgeon was listed as threatened under the Endangered Species Act of 1972 (USFWS 2000). Gulf sturgeon spend the majority of their adult lives in large river basins, such as the Amite, Trickfaw, Natalbany, Blind, and Tangipahoa rivers (Figure 1). Spawning occurs in the spring with a seaward outmigration occurring during the late fall. Gulf sturgeon use Lake Pontchartrain as a migratory corridor during these time periods (Rogilio 2000; USFWS 2000). Shad spawn in freshwater sloughs, ponds, lakes, and rivers during the spring and juveniles rear in fresh water. Adults reside in Lake Ponchartrain and coastal areas, but generally remain in estuarine waters between 4 and 20 ppt (Pattillo et al. 1997).

Species such as hardhead catfish, sheepshead minnow, gulf killifish, silversides, bay anchovy, and gobies are small forage species that reside in Lake Pontchartrain year-round. Spotted seatrout are larger estuarine predators that also inhabit the estuary during all life stages (Pattillo et al. 1997).

The remainder of marine species spawn in coastal shelf areas with larval drift into Lake Ponchartrain, which is used as a juvenile nursery. Adults are also found in Lake Ponchartrain on a seasonal basis. Species such as gulf menhaden and crevalle jack use the estuary for juvenile rearing, but adults largely occupy coastal areas (Pattillo et al. 1997).

Several invertebrate species are common to abundant in Lake Pontchartrain. Shellfish such as rangia and oyster, as well as grass shrimp, spend all life stages in the estuary. Blue crab reside in Lake Pontchartrain as juveniles and adults. Mating has also been reported, although females usually move to coastal areas to hatch and release eggs. Crab larval stages are pelagic and coastal, drifting with the currents back to estuaries where they settle to the bottom and remain. Blue crab, particularly males and juveniles, will often occupy waters of very low salinity or fresh water and may be found in the canals. Brown and white shrimp generally occupy Lake Pontchartrain as juveniles, but adults are present seasonally. Spawning occurs in coastal waters. Bay squid occupy the higher-salinity zones of Lake Ponchartrain (< 17 ppt), moving to coastal areas during spawning periods and during the cooler months (Pattillo et al. 1997).

Recreational and commercial fisheries are present in Lake Pontchartrain for species such as blue crab, oyster, seatrout, sheepshead, and drum. Recreational fisheries in the canals primarily target freshwater species, such as largemouth bass and catfish (Rogilio 2000).

Site-Related Contamination

Environmental investigations on the Delatte Metals property have found soil, groundwater, and stream sediment contamination at concentrations exceeding screening guidelines (Table 2). The RI collected samples from over 150 soil borings, 29 monitoring wells, and 49 sediment and surface water stations on and downgradient of the property. Most samples were analyzed for volatile and

Table 1. Fish and invertebrate species commonly found in the Lake Ponchartrain estuary (Pattillo et al. 1997; Rogilio 2000).

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Ground	Adult Forage	Comm. Fishery	Recr. Fishery
ANADROMOUS/CATADROMOUS SPECIES						
American eel	*Anguilla rostrata*			◆		
Gizzard shad	*Dorosoma cepedianum*			◆		
Gulf sturgeon	*Acipenser oxyrhynchus desotoi*			◆		
MARINE/ESTUARINE FISH SPECIES						
Atlantic croaker	*Micropogonias undulatus*		◆	◆		◆
Bull shark	*Carcharhinus leucas*		◆	◆		
Bay anchovy	*Anchoa mitchilli*	◆	◆	◆		
Black drum	*Pogonias cromis*		◆	◆	◆	◆
Code goby	*Gobiosoma robustum*	◆	◆	◆		
Crevalle jack	*Caranx hippos*		◆			
Gulf killifish	*Fundulus grandis*	◆	◆	◆		
Gulf menhaden	*Brevoortia patronus*		◆			
Hardhead catfish	*Arius felis*	◆	◆	◆		
Pinfish	*Lagodon rhomboides*		◆	◆		
Red drum	*Sciaenops ocellatus*		◆	◆	◆	◆
Sand seatrout	*Cynoscion arenarius*		◆	◆		◆
Sheepshead	*Archosargus probatocephalus*		◆	◆	◆	◆
Sheepshead minnow	*Cyprinodon variegatus*	◆	◆	◆		
Silver perch	*Bairdiella chrysoura*		◆	◆		
Silversides	*Menidia spp.*	◆	◆	◆		
Southern flounder	*Paralichthys lethostigma*		◆	◆		◆
Spot	*Leiostomus xanthurus*		◆	◆		
Spotted seatrout	*Cynoscion nebulosus*	◆	◆	◆	◆	◆
Striped mullet	*Mugil cephalus*		◆	◆		
Tarpon	*Megalops atlanticus*		◆	◆		
INVERTEBRATE SPECIES						
Bay squid	*Lolliguncula brevis*		◆	◆		
Blue crab	*Callinectes sapidus*		◆	◆	◆	◆
Brown shrimp	*Farfante penaeus aztecus*[a]		◆	◆		
Common rangia	*Rangia cuneata*	◆	◆	◆		◆
Eastern oyster	*Crassostrea virginica*	◆	◆	◆	◆	
Grass shrimp	*Palaemonetes pugio*	◆	◆	◆		
White shrimp	*Litopenaeus setiferus*[b]		◆	◆		

a: Formerly *Penaeus aztecus*
b: Formerly *Penaeus setiferus*

semi-volatile organic compounds, polychlorinated biphenyls (PCBs)/pesticides, and trace elements (Tetra Tech 2000).

The contaminants of concern to NOAA are trace elements, particularly lead. Table 2 presents maximum concentrations of contaminants of concern, along with appropriate screening guideline

Table 2. Maximum concentrations of contaminants of concern in environmental media at the Delatte Metals property (Tetra Tech 2000).

	Soil (mg/kg)		Water (µg/L)			Sediment (mg/kg)	
Contaminant	Soil	U.S. Average Soils[a]	Ground water	Surface water	AWQC[b]	Sediment	TEL[c]
Arsenic	2,100	5.2	N/A	N/A	150	67	5.9
Cadmium	200	0.06	4,700	190	2.2	461	0.596
Chromium	630	37	N/A	N/A	11	164	37.3
Lead	22,000	16	2,300	3,100	2.5	55,000	35
Nickel	N/A	13	6,100	N/A	52	N/A	18
Silver	57	0.05	N/A	N/A	0.12	N/A	1.0d
Zinc	1,300	48	11,000	452	120	643	123.1
pH	3.1	NA	2.1	5.2	NA	3.7	NA

NA Screening guidelines not available
N/A Data not available
a Shacklette and Boerngen (1984), except for silver and cadmium which are average concentrations in the earth's crust as reported by Lindsay (1979).
b Ambient water quality criteria for the protection of aquatic organisms (USEPA 1999). Freshwater chronic criteria presented. Criterion expressed as a function of total hardness with the exception of arsenic and silver; concentrations shown correspond to hardness of 100 mg/L.
c TEL; Theshold Effects Level; freshwater sediment value. Concentrations below which adverse effects were rarely observed (geometric mean of the 15 percent concentration in the effects data set) as compiled by Smith et al. (1996).
d TEL not available; Effects Range-Low (ERL) value presented. The ERL represents the 10th percentile for the data set in which effects were observed or predicted in studies compiled by Long et al. (1995; 1998).

values. Several trace elements have been observed in soils, groundwater, surface water, and sediments at concentrations exceeding screening guidelines.

Elevated concentrations of lead were widespread in property soils. Maximum lead concentrations exceeded soil screening guidelines by over four orders of magnitude (Table 2). Nearly 40 surface and subsurface soil samples collected on the property exceeded 1,600 mg/kg, which is two orders of magnitude above the screening guideline. Maximum concentrations of cadmium, chromium, silver, and zinc also exceeded soil screening guidelines (Table 2).

Elevated concentrations of lead were also detected in the groundwater beneath the property. Maximum concentrations of lead in groundwater exceeded the AWQC of 2.5 µg/L by nearly three orders of magnitude (Table 2). Over 20 groundwater samples exceeded ambient water quality criteria (AWQC) by two orders of magnitude. Groundwater concentrations of cadmium, nickel, and zinc also exceeded AWQC guidelines (Table 2).

Low pH has been observed in the shallow groundwater beneath the site. Forty of the 51 groundwater samples collected in the shallowest water bearing zone were below a pH of 4.0. Low pH conditions can increase the mobility of trace elements in aquatic systems (Smith et al. 1995).

The trace elements have migrated to surface water pathways and habitats, elevating concentrations in surface water and sediment. The greatest concentrations were observed in the drainage ditches leading to Selsers Creek (Table 2). In both surface water and sediment from the drainage

ditches, lead and cadmium were found at the greatest concentrations relative to their screening guidelines, exceeding those guidelines by one to three orders of magnitude (Table 2). Other trace elements of concern in the drainage ditches based on a comparison to screening guidelines include arsenic, chromium, and zinc (Table 2). In Selsers Creek, concentrations of lead and cadmium in surface water and sediment exceeded their respective screening guidelines (Table 2).

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