

9

McCormick & Baxter Creosoting Company

Stockton, California

CERCLIS #CAD009106527

Site Exposure Potential

The 12-hectare McCormick & Baxter Creosoting Company site is in an industrial portion of the Port of Stockton, San Joaquin County, California (Figure 1). The site is bounded by Old Mormon Slough to the north, Washington Street and Interstate Highway 5 to the east, and a railroad spur to the south (Figure 2). In 1970, Mormon Slough was partially filled during construction of Interstate 5, which subsequently divided the slough into a western segment (Old Mormon Slough) and an eastern segment (New Mormon Slough). Both sloughs are tributaries to the San Joaquin River. Old Mormon Slough discharges to

the San Joaquin River about 500 m downstream of the site at the Turning Basin. The river flows into the Pacific Ocean 150 km further downstream.

From 1942 to 1990, the McCormick & Baxter Creosoting Company operated a wood preserving facility at the site. The main processing area covered the north-central portion of the site. Treated and untreated wood was stored throughout the south-central, east, and southeast portions of the site. Creosote and oil-borne solutions were the primary products used during wood treating operations. The contaminants associated

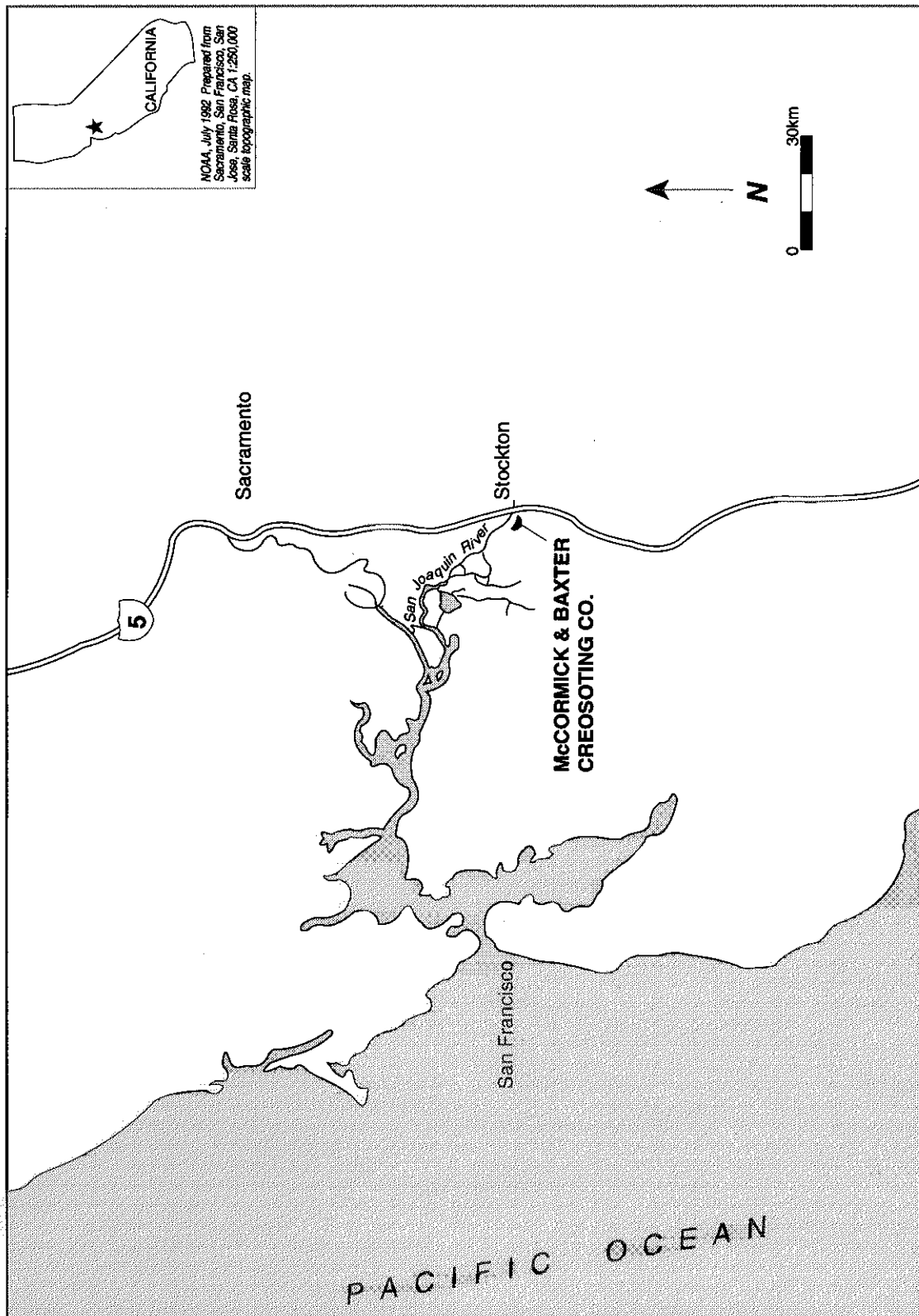


Figure 1. The McCormick & Baxter Creosoting site, Stockton, California.

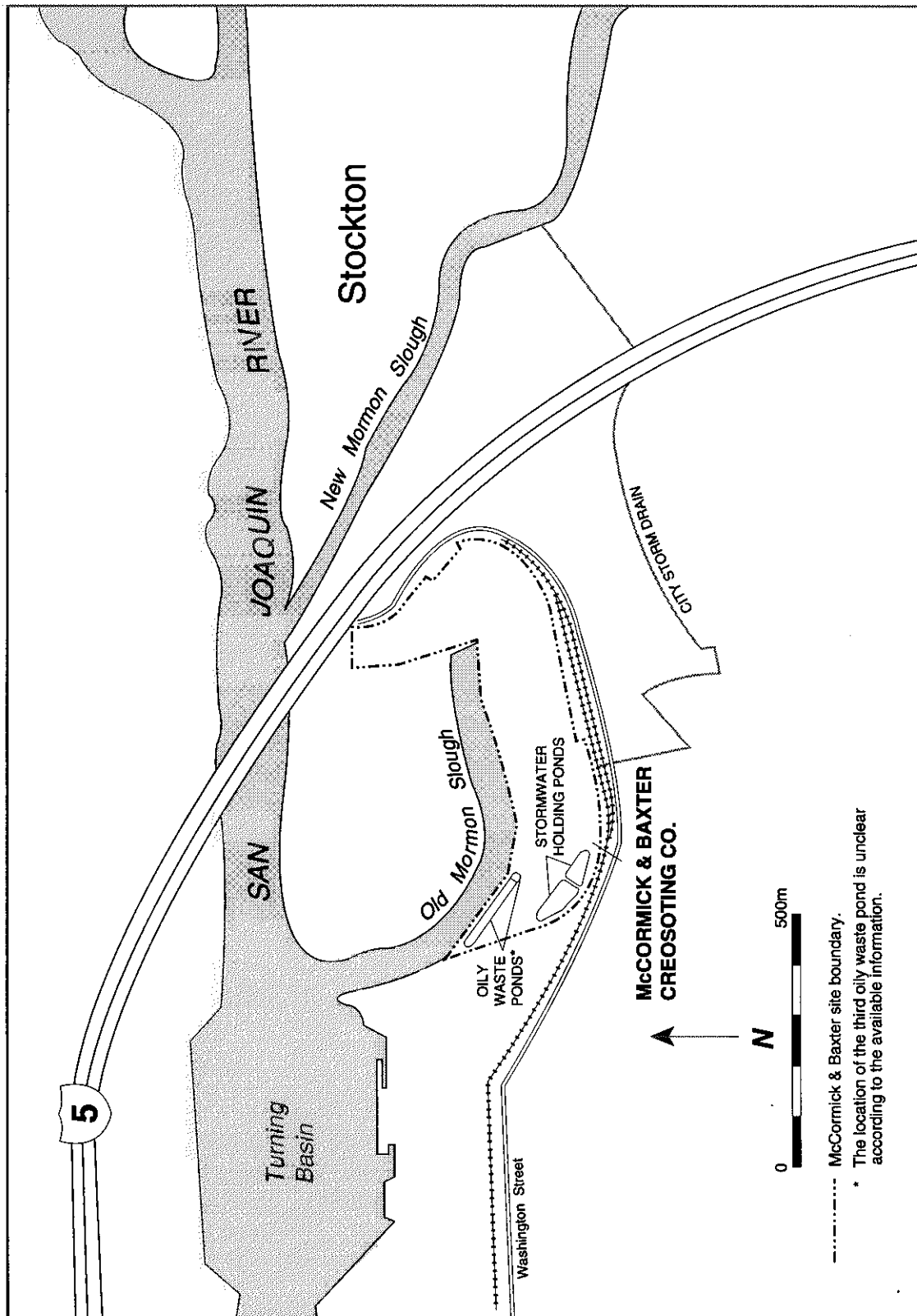


Figure 2. Features around the McCormick & Baxter site (USGS 1987; Ecology and Environment 1991).

with these products include PCP, butane, ether, ammoniacal copper arsenate, ammoniacal copper-zinc arsenate, diammonium phosphate, ammonium sulfate, boric acid, chromium, copper, arsenic, and zinc. Waste solutions from treatment processes and surface water runoff contained PAHs, PCP, and arsenic residues (Ecology and Environment 1991).

The mostly unpaved site has two clay-lined stormwater collection ponds in its southwest corner. In the past, there were also three contiguous oily waste ponds in the northwest corner. The oily waste ponds, which cover an area of 1,700 m² and are located less than 12 m from Old Mormon Slough, were used from the early 1940s until 1980 for storage of PCP or creosote-contaminated sludge. Oily wastes from these holding ponds were reportedly transferred to trucks for off-site disposal during site operations. In 1981, approximately 635,000 kg of contaminated soils were removed from the ponds, which were then covered with approximately one foot of clean fill (Ecology and Environment 1991).

The two stormwater collection ponds were built from 1977 to 1979; their combined volume is 8,300,000 l. Since 1979, stormwater runoff has reportedly been pumped from 17 underground rainwater and process wastewater sumps to the collection ponds, where it has been discharged to the Stockton Regional Wastewater Control Facility. A dike was also reportedly constructed around the site during the late 1970s to inhibit the off-site transport of stormwater runoff to Old Mormon Slough (Ecology and Environment 1991).

A fish kill in the New Mormon Slough in 1977 was probably caused by stormwater runoff from the site entering the slough via the City of Stockton storm sewer system. Limited data were available about the numbers and types of fish killed (Sanford personal communication 1992).

Surface water runoff, direct discharge, and groundwater discharge are potential pathways of contaminant transport from the site to NOAA resources and associated habitats. Before construction of the stormwater holding ponds, surface water runoff from the site collected in on-site storm sewer drains and discharged directly into New Mormon Slough and the Stockton Regional Wastewater Control Facility. In 1971, the company obtained a NPDES permit to discharge some wastewater directly to Old Mormon Slough. However, some of the site-related storm drains that discharged to New Mormon Slough were excluded from the permit order. All on-site storm sewer drains were reportedly closed upon completion of the stormwater holding ponds (Ecology and Environment 1991).

Shallow groundwater near the site is less than 15 m below ground surface and generally flows to the east. Groundwater in the deep aquifer is about 18 to 43 m below ground surface and flows to the southeast. Groundwater in the shallow aquifer has a downward vertical gradient due to large withdrawals of water from industrial wells in the area (Ecology and Environment 1991).

NOAA Trust Habitats and Species

The primary habitats of concern to NOAA are the surface water and associated bottom substrates of the San Joaquin River and Mormon Slough. The slough is approximately 6 m deep and tidally influenced near the site. Excessive organic loading has caused a low dissolved oxygen problem in the slough (Proctor personal communication 1992). Salinities near the site are generally 3 ppt, but fluctuate throughout the year from rainfall, saltwater intrusion, and agricultural runoff. The Stockton shoreline has limited vegetation and is primarily composed of riprap, pier, and piling. Trust species migrate to habitats near the site and reside there for extended periods during sensitive life stages. No endangered or threatened species use habitats near the site (Kholhorst personal communication 1992).

Surface water near the site provides spawning, nursery, and adult habitat for anadromous species (Table 1; Kholhorst personal communication 1992). Five species of anadromous fish use the

San Joaquin River for migratory and adult habitat. Striped bass are considered resident to the area. Even though surface water near the site is tidally influenced, salinities are higher upstream due to the input of agricultural-related organic salts. Striped bass and delta smelt use downstream locations for spawning because of lower salinities, generally migrating back to the area of the site as juveniles after one to two years (Kholhorst personal communication 1992). White sturgeon and, less commonly, American shad migrate through the area to reach spawning grounds about 30 km upstream of the site in the San Joaquin River. A small run of chinook salmon migrates past the site to reach upstream spawning areas. There are no invertebrate species of concern to NOAA near the site (Kholhorst personal communication 1992).

There is a small commercial bait fishery for threadfin shad near the site that is restricted to dip netting. There are no other commercial

Table 1. Fish species present in the San Joaquin River near the McCormick & Baxter Creosoting site.

Species		Habitat				Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Ground	Adult Forage	Migratory Route	Comm. Fishery	Recr. Fishery
ANADROMOUS SPECIES							
White sturgeon	<i>Acipenser transmontanus</i>		♦	♦	♦		♦
American shad	<i>Alosa sapidissima</i>		♦	♦	♦		♦
Delta smelt	<i>Hypomesus transpacificus</i>						
Striped bass	<i>Morone saxatilis</i>		♦	♦	♦		♦
Chinook salmon	<i>Oncorhynchus tshawytscha</i>		♦		♦		♦

fisheries in the San Joaquin River although there is an intense recreational striped bass fishery in the area. Largemouth bass and white catfish are also popular recreational fisheries; shore angling is popular near the site. There are no restrictions on these fisheries other than general regulations regarding take limit and minimum sizes (Kholhorst personal communication 1992).

Since 1972, a limited consumption health advisory has been in effect for white catfish, largemouth bass, and striped bass due to excessive levels of mercury contamination in the area (Kholhorst personal communication 1992).

Site-Related Contamination

The primary contaminants of concern to NOAA are trace elements, PCP, and PAHs. Dioxin is also a potential contaminant of concern since it frequently contaminates technical-grade PCP (Eisler 1989). Data from preliminary site investigations indicate that soil, groundwater, and surface water at the site contain elevated concentrations of site-related contaminants (Ecology and Environment 1991). Maximum concentrations of these inorganic substances and organic compounds are summarized in Table 2, along with applicable screening guidelines. Sediment

Table 2. Maximum concentrations of contaminants of concern at the site.

	Water (µg/l)				Soils (mg/kg)	
	Ground-water	Surface water runoff	Stormwater pond influent	AWQC ¹	Soil	Average U.S. ²
INORGANIC SUBSTANCES						
<u>Trace Elements</u>						
Arsenic	86	7,800	6,200	190	2,400	5
Copper	NR	2,100	7,000	12 ⁺	1,900	30
Chromium	2,470	NR	1,400	11	1,300	100
ORGANIC COMPOUNDS						
<u>SVOCs</u>						
PCP	67,000	46,000	29,000	13	5,100	NA
Total PAHs	11,000	2,300	2,000	NA	9,270	NA
1:	Ambient water quality criteria for the protection of aquatic organisms. Freshwater chronic criteria presented (U.S. EPA 1986).					
2:	Lindsay (1979).					
NR:	Data not reported; not clear in site documentation if constituent was analyzed for.					
NA:	No value available.					

samples were not collected from Old and New Mormon sloughs in October 1987.

Soil, groundwater, and surface water results were reported only for arsenic, chromium, copper, PCP, and PAHs. These were the only chemical constituents analyzed in soils, but it was not clear in the available site documentation whether groundwater or surface water samples were analyzed for other chemical constituents. Because only summarized chemical data were available for review, it was also not possible to evaluate the frequency and distribution of contaminants measured at concentrations exceeding screening guidelines for any medium.

Concentrations of arsenic, chromium, and copper measured in subsurface soil exceeded average U.S. soil concentrations for these elements. Highest concentrations were reportedly measured in the north-central area of the site and near the oily waste ponds. Of these trace elements, only chromium was measured in on-site groundwater at a concentration exceeding its freshwater chronic AWQC by a factor greater than ten. Concentrations of arsenic and copper detected in surface water runoff samples collected from unspecified locations at the site exceeded their screening criteria by up to two orders of magnitude. These inorganic substances and chromium were also measured in inflow from the stormwater holding ponds at concentrations greater than screening criteria.

PCP was measured in on-site soils at high ppm concentrations; because there are no screening guidelines for PCP in soils no conclusions can be

drawn about these concentrations. PCP was detected in on-site groundwater at a concentration exceeding its AWQC by three orders of magnitude. This organic compound was also measured in the surface water runoff on site and in the surface water runoff entering the stormwater holding ponds (referred to as “influent samples”) at high concentrations. In 1977, a fish kill in the New Mormon Slough was attributed to stormwater runoff from the site entering the slough via the City of Stockton storm sewer system. An estimated 50 to 100 catfish were killed, along with less than 25 striped bass (Fransen personal communication 1992). Subsequent sampling of the New and Old Mormon sloughs indicated that PCP concentrations in the surface water ranged from 0.2 to 3,900 $\mu\text{g}/\text{l}$ and exceeded its screening criterion. In addition, PCP was detected at a concentration of 6.2 million $\mu\text{g}/\text{l}$ in an on-site storm drain sampled as part of the fish kill investigation.

No conclusions can be drawn about the high ppm concentrations measured of total PAHs in on-site soils because there are no screening guidelines for PAHs in soils. In groundwater, naphthalene (9,300 $\mu\text{g}/\text{l}$) exceeded its screening criterion (620 $\mu\text{g}/\text{l}$) by a factor greater than ten. Phenanthrene (2,100 $\mu\text{g}/\text{l}$) was also detected in groundwater but there is no screening criterion for this compound. Individual PAHs were not detected in the surface water runoff or influent samples from the site at concentrations exceeding available AWQC. However, total PAHs were detected in these samples at high ppb concentrations.

Summary

Trace elements, PCP, and PAHs were detected above screening criteria in soil, groundwater, and surface water. NOAA is concerned about the possible presence of dioxin in environmental media. The San Joaquin River near the site provides spawning, nursery, and adult habitat for anadromous species. Striped bass are resident in the area. A bioassessment in habitats of concern to NOAA is needed to determine the effects of site-related contamination.

References

- Ecology and Environment. 1991. Site inspection report for McCormick and Baxter Creosoting Company, Stockton, California. San Francisco: U.S. Environmental Protection Agency.
- Eisler, R. 1989. *Pentachlorophenol hazards to fish, wildlife, and invertebrates: a synoptic review*. Biological Report 85(1.17). Laurel, Maryland: Patuxent Wildlife Research Center, U.S. Fish and Wildlife Service.
- Fransen, H., Environmental Scientist, California Department of Fish and Game, Division of Fish and Wildlife, Water Pollution Control Laboratory, Rancho Cordova, personal communication, August 25, 1992.
- Kholhorst, D., Assoc. Fisheries Biologist, Bay Delta Fisheries Program, California Department of Fish and Game, Stockton, personal communication, June 5, 1992.
- Lindsay, W.L. 1979. *Chemical Equilibria in Soils*. New York: John Wiley & Sons. 449 p.
- Proctor, H., State of California Water Resources Control Board, Sacramento, personal communication, July 17, 1992.
- Sanford, B., Regional Patrol Chief, California Department of Fish and Game, Division of Wildlife Protection, Enforcement Branch, Region 2 Headquarters Office, Rancho Cordova, personal communication, August 25, 1992.
- U.S. EPA. 1986. *Quality criteria for water*. EPA 440/5-87-001. Washington, D.C.: Office of Water Regulations and Standards, Criteria and Standards Division, U.S. Environmental Protection Agency.
- USGS. 1969. San Jose, California. Washington, D.C.: U.S. Government Printing Office. 1:250,000 scale series.
- USGS. 1970. Sacramento, California. Washington, D.C.: U.S. Government Printing Office. 1:250,000 scale series.
- USGS. 1980. San Francisco, California. Washington, D.C.: U.S. Government Printing Office. 1:250,000 scale series.

USGS. 1980. Santa Rosa, California. Washington, D.C.: U.S. Government Printing Office. 1:250,000 scale series.

USGS. 1987. Stockton West, California. Washington, D.C.: U.S. Government Printing Office. 7.5 minute series quadrangle.