Halaco Engineering Company

Oxnard, California
EPA Facility ID: CAD009688052
Basin: Calleguas
HUC: 18070103

Executive Summary

The Halaco Engineering Company site is an active metal recycling plant in Oxnard, California. Non-ferrous scrap metal is produced into aluminum and magnesium ingots at the Halaco Engineering Company site. Wastewater from the smelting process is pumped into settling ponds to allow suspended solids to settle out. The primary contaminants of concern detected in environmental media at the site are aluminum, copper, lead, magnesium, and zinc. The NOAA trust habitats of concern are the surface waters of the Ormond Beach Lagoon and Ormond Beach Wetlands and the nearshore waters adjacent to Ormond Beach. NOAA trust resources including federally endangered Chinook salmon and nearshore marine species, use a variety of habitats near the site.

Site Background

The Halaco Engineering Company (Halaco) site is an inactive metal recycling plant in Oxnard, Ventura County, California (Figure 1). The site occupies approximately 17 hectares (43 acres) and is adjacent to the coastal sand dunes and estuarine wetlands of Ormond Beach, which includes Ormond Beach Lagoon (CRWQCB 2002a). The Oxnard Industrial Drain (OID) flows through the site and discharges into the Ormond Beach Lagoon southwest of the site. The OID was originally constructed as a flood control channel. The OID drains agricultural storm water runoff from fields and surrounding areas in the Oxnard Plain. The Oxnard plain is one of ten subbasins within the coastal valleys and plains of the Santa Clara-Calleguas basin in Ventura County. The OID divides the site into two sections: the smelting facility and the waste management unit (Figure 2). The waste management unit consists of three settling ponds and a waste disposal area. The ponds are surrounded by a berm constructed of solid wastes from periodic dredging of the ponds (CRWQCB 2002b).

The primary pathways for the migration of contaminants from the facility toward NOAA trust resources are groundwater and surface water. The near surface groundwater body beneath the facility is approximately 15 m (50 ft) thick and flows south toward the Pacific Ocean. The depth to groundwater has been measured at approximately three feet below ground surface and may be influenced by tidal fluctuations (Padre 2002). The site and the Ormond Beach Lagoon are situated immediately landward of a coastal sand dune (CRWQCB 2002b). During the winter, when storms create greater wave action, sand dunes are eroded (Scripps 2003). The winter erosion of the Ormond Beach sand dune likely leads to seasonal flow of lagoon water onto Ormond Beach and into the ocean.

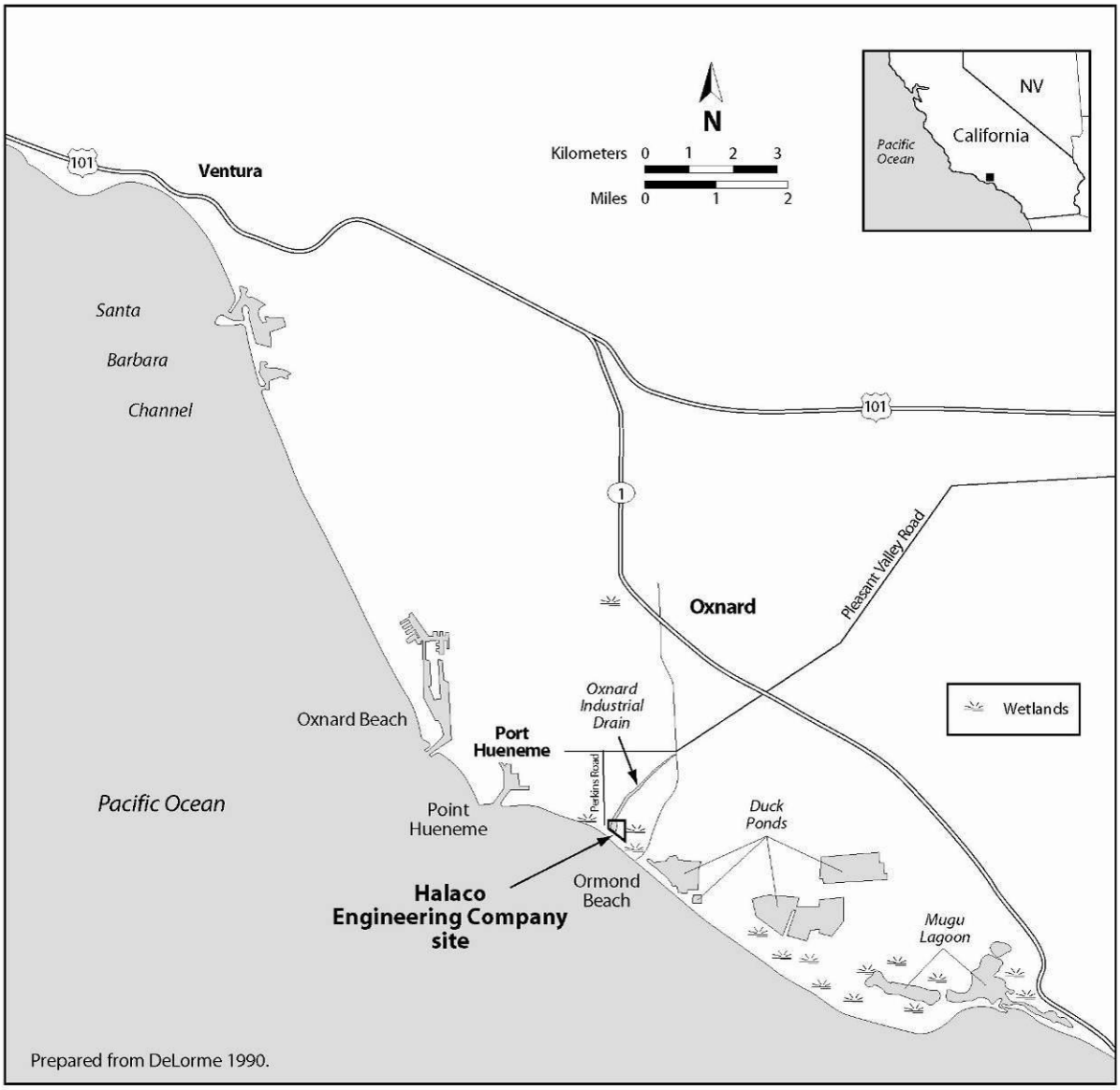

Figure 1. Location of the Halaco Engineering Company site, Oxnard, California.

Non-ferrous scrap metal was produced into aluminum and magnesium ingots at the Halaco smelting facility. When scrap metal was received at the site, it was washed with water from the OID to remove dirt and other impurities from the surface. The scrap metal was then smelted in a large furnace. Magnesium, sodium, and potassium chlorides were added to the scrap metal during the smelting process to separate the metals from metal oxides and other impurities. The slag, which was a byproduct of the smelting process, was then washed to recover additional aluminum and magnesium (CRWQCB 2002b).

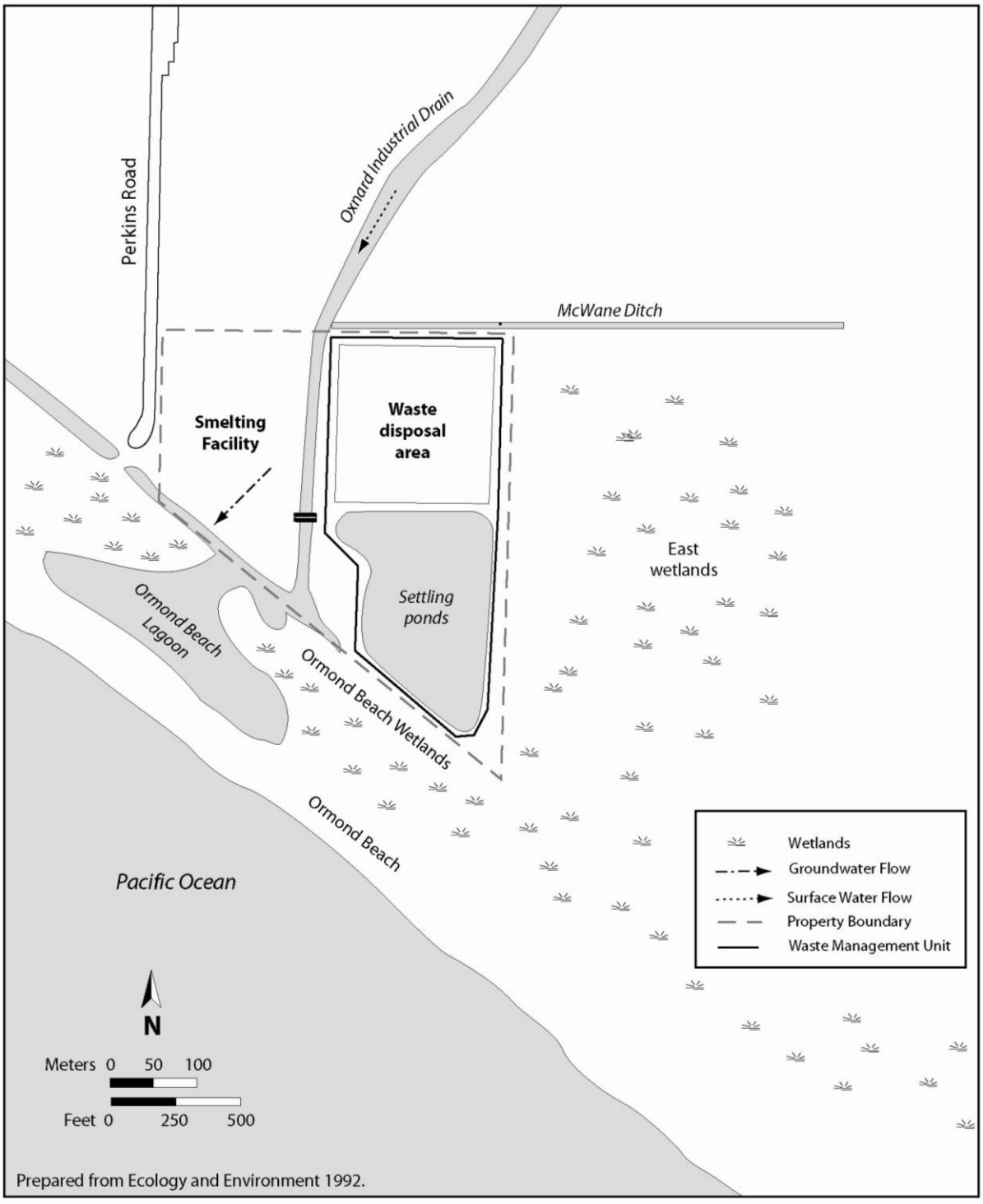

Figure 2. Detail of the Halaco Engineering Company site.

Approximately 1.8 million L (472,000 gal) of wastewater were produced at the site per month. Wastewater was generated when the scrap metal was rinsed, before and after the scrap metal was smelted, and when the system that controls air pollution at the smelting facility was cleaned. The wastewater, which contained metals, salts, ammonia, undissolved metal oxides, dirt, and other impurities, was pumped into the settling ponds to allow suspended solids to settle out. The solids were then periodically dredged from the settling ponds and placed in the waste disposal area and on the berms surrounding the settling ponds (CRWQCB 2002b). The California Regional Water Quality Control Board has estimated that the contaminated sediments in the waste disposal area are 6 to 12 m (20 to 40 ft) in thickness and 330,000 m^3 (430,000 yd^3) in volume (CRWQCB 2002b).

In 1992, consultants for the U.S. Environmental Protection Agency (USEPA) conducted an expanded site inspection (ESI) at the Halaco site. The results of the ESI indicated that hazardous substances were present in the Halaco waste management unit and were migrating to the wetlands east of the site (Ecology and Environment 1992) In 2002, the California Regional Water Quality Control Board issued a Cease and Desist Order (CDO) to the Halaco Engineering Company for violating waste discharge requirements (CRWQCB 2002b). In order to comply with the CDO, the Halaco Engineering Company was required to modify its waste management procedures and monitor contaminant levels in groundwater and surface water at the site. The waste management procedure modifications included operation of a filter press to dewater waste; discharge of the filter press wastewater to a local sanitary sewer; discontinued disposal of wastes to the waste management unit; recycling of the solids from the filter press; and eventual capping of the waste management unit (CRWQCB 2002b). Halaco Engineering Company filed bankruptcy in 2002, and ceased operating at the site in 2004. In 2006, the USEPA conducted an integrated assessment at the Halaco site to determine if it was eligible for placement on the USEPA's National Priorities List (NPL). The Halaco site was proposed to the NPL on March 7, 2007 (USEPA 2007).

NOAA Trust Resources

The NOAA trust habitats of concern are the surface waters of the Ormond Beach Lagoon and Ormond Beach Wetlands and the nearshore waters adjacent to Ormond Beach. Ormond Beach Lagoon and Ormond Beach Wetlands receive water from the OID, which drains agricultural, industrial, and storm water runoff from the Oxnard Plain. The OID flows into the Ormond Beach Lagoon, which is connected to the Ormond Beach Wetlands via a small drainage channel (CRWQCB 2002b).

In the 1800s, extensive estuarine wetlands extended from Mugu Lagoon to Port Hueneme (UCSB 2001). Since that time, upstream creeks have been dammed and diverted for agricultural and industrial development and infrastructure controls have been placed on the tidal flow of Mugu Lagoon. These changes have caused a loss of wetland acreage and reduced the connectivity of the wetland complex (UCSB 2001). Although the wetlands have been altered and no longer connect to Mugu Lagoon and Port Hueneme, they continue to provide habitat for many nearshore marine species.

In 1999, The California Coastal Conservancy purchased approximately 264 hectares (660 acres) of wetlands at the southern end of Ormond Beach for habitat restoration. This restoration may include hydrologic reconnection of Ormond Beach Lagoon and Mugu Lagoon (UCSB 2001).

The Ormond Beach Lagoon and Ormond Beach Wetlands provide critical spawning, nursery, and adult habitat for many marine species. These species include California killifish, deepbody anchovy, diamond turbot, jacksmelt, Pacific staghorn sculpin, threespine stickleback, and topsmelt. The tidewater goby, which is on the federal endangered species list, is present in the wetlands (Love 2003; Ono 2003; USFWS 2007).

The nearshore waters of Ormond Beach provide nursery and adult habitat for many marine species. Chinook salmon, a federally and state listed endangered species, migrate through the nearshore waters (CDFG 2003; USFWS 2007). The California grunion uses the high intertidal zone of Ormond Beach to deposit their eggs for incubation (Dugan 2000). Other species in the nearshore area include bass, California halibut, California lizardfish, flounder, sanddab, skate, smelt, and surfperch. Table 1 provides a summary of the NOAA trust resources found in the nearshore waters of Ormond Beach, Ormond Beach Lagoon, and the Ormond Beach Wetlands (Dugan 2000; Love 2003; Ono 2003).

Commercial fishing occurs in the nearshore waters of Ormond Beach. Commercially important fish species near the site are California halibut, Chinook salmon, California market squid, northern anchovy, Pacific barracuda, slender sole, white croaker, white seabass, and white seaperch. California market squid and northern anchovy are important bait fisheries in this area. The fish most often caught by recreational fishers include barred surfperch, California corbina, California grunion, California halibut, Chinook salmon, jacksmelt, and walleye surfperch (Ono 2003).

No fish consumption advisories were in effect for the nearshore waters of Ormond Beach at the time of this report (COEHHA 2003).

Table 1. NOAA trust resources present near the Halaco Engineering site (Dugan 2000, Love 2003, Ono 2003).

Species		**Habitat Use**			**Fisheries**	
Common Name	Scientific Name	Spawning Area	Nursery Area	Adult Habitat	Comm.	Rec.
ANADROMOUS FISH						
Chinook salmon	*Oncorhynchus tshawytscha*			♦	♦	♦
MARINE/ESTUARINE FISH						
Bat ray	*Myliobatis californica*	♦	♦	♦	♦	♦
Barred sand bass	*Paralabrax nebulifer*	♦	♦	♦		♦
Barred surfperch	*Amphistichus argenteus*	♦	♦	♦		♦
Black perch	*Embiotoca jacksoni*	♦	♦	♦	♦	♦
Brown smoothhound	*Mustelus henlei*	♦	♦	♦	♦	♦
California corbina	*Menticirrhus undulatus*	♦	♦	♦		♦
California grunion	*Leuresthes tenuis*	♦	♦	♦		♦
California halibut	*Paralichthys californicus*	♦	♦	♦	♦	♦
California killifish	*Fundulus parvipinnis*	♦	♦	♦		
California lizardfish	*Synodus lucioceps*	♦	♦	♦	♦	♦
California tonguefish	*Symphurus atricauda*	♦	♦	♦	♦	
Chub (Pacific) mackerel	*Scomber japonicus*	♦	♦	♦	♦	♦
Deepbody anchovy	*Anchoa compressa*	♦	♦	♦		
Diamond turbot	*Hypsopsetta guttulata*	♦	♦	♦	♦	♦

Table 1 continued on next page.

Table 1, *cont.*

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Area	Nursery Area	Adult Habitat	Comm.	Rec.
Fantail sole	*Xystreurys liolepis*	♦	♦	♦	♦	♦
Giant sea bass	*Stereolepis gigas*		♦		♦	
Gray smoothhound	*Mustelus californicus*	♦	♦	♦	♦	♦
Jack mackerel	*Trachurus symmetricus*	♦	♦	♦	♦	♦
Jacksmelt	*Atherinopsis californiensis*	♦	♦	♦	♦	♦
Kelp bass	*Paralabrax clathratus*	♦	♦	♦		♦
Leopard shark	*Triakis semifasciata*	♦	♦	♦	♦	♦
Longfin sanddab	*Citharichthys xanthostigma*	♦	♦	♦	♦	♦
Longspine combfish	*Zaniolepis latipinnis*	♦	♦	♦	♦	
Northern anchovy	*Engraulis mordax*	♦	♦	♦	♦	♦
Pacific barracuda	*Sphyraena argentea*	♦	♦	♦	♦	♦
Pacific electric ray	*Torpedo californica*	♦	♦	♦	♦	
Pacific sanddab	*Citharichthys sordidus*	♦	♦	♦	♦	♦
Pacific sardine	*Sardinops sagax*	♦	♦	♦	♦	♦
Pacific staghorn sculpin	*Leptocottus armatus*	♦	♦	♦		♦
Plainfin midshipman	*Porichthys notatus*	♦	♦	♦	♦	
Queenfish	*Seriphus politus*	♦	♦	♦	♦	♦
Round stingray	*Urolophus halleri*	♦	♦	♦		♦
Shiner perch	*Cymatogaster aggregata*	♦	♦	♦		♦
Shovelnose guitarfish	*Rhinobatos productus*	♦	♦	♦	♦	♦
Slender sole	*Lyopsetta exilis*	♦	♦	♦	♦	
Speckled sanddab	*Citharichthys stigmaeus*	♦	♦	♦	♦	♦
Striped mullet	*Mugil cephalus*	♦	♦	♦		
Thornback skate	*Platyrhinoides triseriata*	♦	♦	♦		♦
Threespine stickleback	*Gasterosteus aculeatus*	♦	♦	♦		
Tidewater goby	*Eucyclogobius newberryi*	♦	♦	♦		
Topsmelt	*Atherinops affinis*	♦	♦	♦	♦	♦
Walleye surfperch	*Hyperprosopon argenteum*	♦	♦	♦	♦	♦
White croaker	*Genyonemus lineatus*	♦	♦	♦	♦	♦
White seabass	*Atractoscion nobilis*	♦	♦	♦	♦	♦
White seaperch	*Phanerodon furcatus*	♦	♦	♦	♦	♦
Yellowchin sculpin	*Icelinus quadriseriatus*	♦	♦	♦		
INVERTEBRATES						
California market squid	*Loligo opalescens*	♦	♦	♦	♦	♦
California sand star[a]	*Astropecten verrilli*	♦	♦	♦		
Gould beanclam	*Donax gouldii*	♦	♦	♦		♦
Gray sandstar[a]	*Luidia foliolata*	♦	♦	♦		
Pacific sand crab	*Emerita analoga*	♦	♦	♦	♦	♦
Pismo clam	*Tivela stultorum*	♦	♦	♦		♦
Ridgeback rock shrimp	*Sicyonia ingentis*	♦	♦	♦	♦	
Sand dollar[a]	*Dendraster excentricus*	♦	♦	♦		
Sea pansy[a]	*Renilla koellikeri*	♦	♦	♦		
Spiny mole crab	*Blepharipoda occidentalis*	♦	♦	♦		
Warty sea cucumber[a]	*Parastichopus parvimensis*	♦	♦	♦	♦	
White sand crab[a]	*Lepidopa myops*	♦	♦	♦		

a: Ono 2003.

Site-Related Contamination

The primary contaminants of concern to NOAA detected in environmental media at the site are metals. During the 1992 ESI, 52 waste samples (two water samples and four sediment samples from the settling ponds and 46 sediment samples from the waste disposal area), seven surface water samples, and 25 sediment samples were collected from the site and analyzed for metals, including selenium (Ecology and Environment 1992). In 1992, to comply with the Cease and Desist Order, consultants for the Halaco Engineering Company collected five surface water samples from the Ormond Beach Lagoon and the Oxnard Industrial Ditch. These samples were analyzed for metals, including selenium and thorium isotopes (Brash Industries 2002). In 1997, two sediment samples and two soil samples were collected from property adjacent to the Halaco site and analyzed for metals, including selenium (CRWQCB 2002b). In February 2003, two groundwater samples were collected by a consultant for the Halaco Engineering Company. During an integrated assessment conducted by USEPA in 2006, 118 soil, sediment, and slag samples; 10 surface water samples; and 14 groundwater samples were collected and analyzed for metals, volatile organic compounds (VOCs) and radioisotopes (Weston 2007).

Table 2 summarizes the maximum concentrations of contaminants of concern to NOAA detected during the site investigations and compares them to relevant screening guidelines. Site-specific or regionally specific screening guidelines are always used when available. In the absence of such guidance, the screening guidelines for groundwater and surface water are the ambient water quality criteria (AWQC) (USEPA 2006); the screening guidelines for sediment in a saltwater environment are the effects range-low (ERL) concentrations (Long et al. 1998); and the screening guidelines for soil are the Oak Ridge National Laboratory final preliminary remediation goals (ORNL-PRGs) (Efroymson et al. 1997) and the USEPA's ecological soil screening guidelines (USEPA 2008). Exceptions to these screening guidelines, if any, are noted in Table 2. Only maximum concentrations that exceeded relevant screening guidelines or for which there are no screening guidelines are discussed below. When known, the general sampling locations are also provided for maximum concentrations that exceeded screening guidelines or do not have screening guidelines.

Groundwater

Eleven metals were detected in groundwater from monitoring wells at the site. The maximum concentrations of aluminum, arsenic, chromium, copper, nickel, and silver were detected in a sample collected from the north end of the settling ponds. The maximum copper concentration exceeded the AWQC by four orders of magnitude. Nickel and silver concentrations exceeded the AWQC by two orders of magnitude and chromium concentrations exceeded by one order of magnitude. The maximum arsenic concentration was more than a factor of seven greater than the AWQC. Screening guidelines were not available for comparison to aluminum concentrations.

Maximum concentrations of cadmium, lead, magnesium, and zinc were detected in a sample collected from a monitoring well in the middle of the settling ponds. Zinc concentrations exceeded the AWQC by three orders of magnitude. Maximum concentrations of lead and cadmium exceeded the AWQC by two and one orders of magnitude, respectively. Screening guidelines were not available for comparison to magnesium concentrations.

The maximum concentration of barium was detected in a sample collected from a monitoring well in the south end of the smelter facility. Screening guidelines were not available for comparison to barium concentrations.

Four radioisotopes were detected in groundwater at the site. The maximum concentrations of potassium-40, thorium-228, thorium-230, and thorium-232 were all detected in monitoring wells in the south end of the smelter facility. Screening guidelines are not available for comparison to the radioisotope concentrations.

Surface Water

Maximum concentrations reported for aluminum, barium, cadmium, copper, silver, and zinc were found in surface water samples collected from the east wetland near the settling ponds. The maximum concentrations of copper and silver exceeded the AWQC by two orders of magnitude. Cadmium and zinc were detected at concentrations that exceeded the AWQC screening guidelines by one order of magnitude. AWQCs are not available for comparison to the reported concentrations of aluminum or barium.

The maximum concentration reported for magnesium in surface water was from the surf line of Ormond Beach. AWQCs are not available for comparison to the reported concentrations of magnesium.

Potassium-40, which was the only radioisotope detected in surface waters at the Halaco site, was detected in a sample collected from the wetlands adjacent to the south end of the settling ponds. A screening guideline is not available for comparison to detected concentrations of potassium-40.

Sediment

Metals, including selenium were detected at concentrations greater than the screening guidelines in sediment samples collected at the site. The maximum concentrations reported for aluminum, arsenic, barium, magnesium, and silver were detected in samples from the east wetland within 27 m (90 ft) of the berm surrounding the settling ponds. Barium and silver concentrations exceeded the screening guidelines by two and one orders of magnitude, respectively. The maximum concentration of arsenic exceeded the ERL by a factor of more than three. Screening guidelines are not available for comparison to the reported concentrations of aluminum and magnesium.

Maximum concentrations of cadmium, chromium, copper, lead, nickel, and zinc were detected in a sample collected from the wetlands near the southwest corner of the settling ponds. The maximum concentration of copper exceeded the ERL by two orders of magnitude. Concentrations of cadmium, lead, nickel, and zinc exceeded the ERL by one order of magnitude. The maximum chromium concentration was approximately six times greater than the ERL.

Selenium was detected at a maximum concentration in a sample from McWane Ditch located north of the waste disposal area; this concentration exceeded the apparent effects threshold (AET) by one order of magnitude.

Five radioisotopes were detected in sediment at the site. Maximum concentrations of cesium-137, thorium-228, and thorium-232 were detected in samples collected from Ormond Beach. The maximum concentration of potassium-40 was detected in sediment from the

wetlands adjacent to the south end of the settling ponds. The maximum concentration of thorium-230 was detected in a sediment sample from the OID near the Ormond Beach Lagoon. Screening guidelines are not available for comparison to the reported concentrations of radioisotopes.

Soil

Twelve metals were detected in soil at the site. Maximum concentrations of aluminum, chromium, copper, magnesium, nickel, and selenium were detected in samples collected from the Nature Conservancy Land to the east of the property. Chromium and selenium concentrations exceeded the ORNL-PRGs by two orders of magnitude. The maximum concentration of copper exceeded the ORNL-PRG by one order of magnitude. Nickel concentrations exceeded the ERL by a factor of more than six. No screening guidelines were available for comparison to reported concentrations of aluminum or magnesium.

Maximum concentrations of arsenic, cadmium, lead, silver, and zinc were detected in samples from the smelter facility. Zinc and lead concentrations exceeded the ORNL-PRG by three and two orders of magnitude, respectively. The maximum cadmium concentration exceeded the USEPA ecological soil screening guideline by one order of magnitude. Silver and arsenic concentrations exceeded the ORNL-PRG by a factor of seven and two, respectively.

The maximum barium concentration was detected in a sample northwest of the settling ponds. A screening guideline was not available for comparison to detected barium concentrations.

Five radioisotopes were detected in soil at the Halaco site. The maximum concentrations of cesium-137, potassium-40, thorium-228, thorium-230, and thorium-232 were detected in samples collected from the smelter facility. Screening guidelines are not available for comparison to the detected concentrations of radioisotopes.

Waste Samples

Elevated concentrations of metals, including selenium were detected in waste samples collected from the settling ponds and the waste disposal area. The maximum concentrations reported for aluminum, copper, and magnesium were found in the middle of the settling ponds; arsenic, barium, lead, selenium, and zinc concentrations were found in the northwest corner of the settling ponds. The maximum concentrations of cadmium, chromium, nickel, and silver were found in the southeast corner of the waste disposal area. No screening guidelines are available for comparison to the metals detected in the waste samples.

Five radioisotopes were detected in waste samples collected at the site. The maximum concentration of cesium-137 and potassium-40 were found in the northwest and northeast section of the settling ponds, respectively. The maximum concentrations of thorium-228, 230, and 232 were detected in the southeast corner of the waste disposal area. Screening guidelines are not available for comparison to the detected concentrations of radioisotopes.

Table 2. Maximum concentrations of contaminants of concern to NOAA at the Halaco Engineering Company site (Ecology and Environment 1992; CRWQCB 2002b; Brash Industries 2002; Weston 2007). Contaminant values in bold exceed or are equal to screening guidelines.

	Waste Samples (mg/kg)		**Soil (mg/kg)**		**Water (µg/L)**			**Sediment (mg/kg)**	
Contaminant	Waste Disposal Area	Settling Ponds	Soil	ORNL-PRG[a]	Ground-water	Surface Water	AWQC[b]	Sediment	ERL[c]
METALS/ INORGANICS									
Aluminum	140,000	290,000	170,000	NA	2,900,000	23,000	NA	120,000	NA
Arsenic	11	28	**20**	9.9	**270**	6.9	36	**30**	8.2
Barium	1,200	22,000	6,900	NA	1,600,000	1,200	NA	**6,300**	48[d]
Cadmium	26	15	**15**	0.36[e]	**400**	**720**	8.8	**17**	1.2
Chromium	1,700	770	**360**	0.4	**3,800**	ND	50[f]	**500**	81
Copper	3,100	8,700	**3,800**	60	**78,000**	**1,400**	3.1	**6,000**	34
Lead	300	1,100	**7,300**	40.5	**4,400**	ND	8.1	**740**	46.7
Magnesium	140,000	240,000	110,000	NA	11,000,000	2,200,000	NA	110,000	NA
Nickel	610	570	**200**	30	**1,600**	ND	8.2	**240**	20.9
Selenium	20	24	**42**	0.21	ND	ND	71	**54**	1.0[d]
Silver	62	28	**14**	2	**570**	**210**	1.9[g]	**13**	1
Zinc	2,500	6,800	**23,000**	8.5	**90,000**	**1,100**	81	**5,200**	150
RADIOISOTOPES									
Cesium-137	ND	0.079	0.25	NA	ND	ND	NA	0.092	NA
Potassium-40	9.0	55	24	NA	20,000	260	NA	37	NA
Thorium-228	19	4.5	12	NA	110	ND	NA	2.7	NA
Thorium-230	8.7	5.2	24	NA	1.0	ND	NA	2.4	NA
Thorium-232	20	4.8	12	NA	0.87	ND	NA	3.7	NA

a: Oak Ridge National Laboratory (ORNL) final preliminary remediation goals (PRG) for ecological endpoints (Efroymson et al. 1997).

b: Ambient water quality criteria for the protection of aquatic organisms (USEPA 2006). Marine chronic criteria presented.

c: Effects range-low represents the 10th percentile for the dataset in which effects were observed or predicted in studies compiled by Long et al. (1998).

d: Marine apparent effects threshold (AET) for amphipod bioassay. The AET represents the concentration above which adverse biological impacts would be expected.

e: Ecological soil screening guidelines (USEPA 2008).

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

g: Chronic criterion not available; acute criterion presented.

NA: Screening guidelines not available.

ND: Not detected.

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