

Information on Commercial Disposal Facilities That May Have Received Offshore Drilling Wastes

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INTRODUCTION

The U.S. Environmental Protection Agency (EPA) is developing regulations that would establish requirements for discharging synthetic-based drill cuttings from offshore wells into the ocean. Justification for allowing discharges of these cuttings is that the environmental impacts from discharging drilling wastes into the ocean may be less harmful than the impacts from hauling them to shore for disposal. In the past, some onshore commercial facilities that disposed of these cuttings were improperly managed and operated and left behind environmental problems. This report provides background information on commercial waste disposal facilities in Texas, Louisiana, California, and Alaska that received or may have received offshore drilling wastes in the past and are now undergoing cleanup.

TEXAS SITES

Summary: Thirty four commercial disposal facilities in Texas that are known to have accepted wastes resulting from onshore and offshore oil and gas extraction and production (E&P) are currently undergoing or previously underwent State-funded cleanups. Of these, five have a realistic potential of containing offshore E&P drilling wastes. Information characterizing waste contamination and cleanup at these five sites was collected and is presented in the following sections.

Background: The Railroad Commission of Texas (RRC), Oil and Gas Division, is responsible for coordinating the cleanup of sites contaminated with E&P waste. It identified 34 commercial disposal facilities believed to have received E&P wastes:

36 th Street Reclamation Plant	Post Oak Site
Albany Tank Cleaning	Prestwick Company
B.C. Ventures	Red River Oilfield Service
Basin Wax	Reliable Services
Briggs Disposal	Roeling Vacuum
C&C Systems (Paul Mass SWD)	Runnels SWD
Chambers SWD	Stark's Steam Service
Complete SWD	Steve's Oilfield Service
Crude Processing	Terco Energy
Disposals, Inc. (Luska)	Texas Oil Conservation
Dixie SWD	Texas SW Injection
Driscoll SWD	Trio SW Injection
Fox Vacuum	Watex
K&D Associates	Winters Reclamation Plant
Lawn Tank Trucks	Young County Disposal
Mac SWD	Manvel SWD
Mandi-Injecto	Merkel SWD

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These sites were reviewed to identify any that might have received offshore drilling wastes. Sites

in counties located along the coast or in one county inland, within 75 miles of a offshore oil and gas port, were assumed to have a realistic potential for having received offshore drilling waste.

Seven of the 34 sites met these criteria. However, two of the seven received only saltwater and were excluded from additional analysis because they had not received solid wastes. The five sites with a realistic potential for having received offshore drilling waste are the Roeling Vacuum Site, the Fox Vacuum Site, the Vernon Briggs Site, the Manvel Saltwater Disposal Site, and the Steve's Oilfield Services Site. Of these sites:

- All have been abandoned and are inactive,
- All have been subjected to some cleanup or sampling by the RRC,
- All have been fenced to prevent unauthorized access and dumping,
- None appear to pose any immediate threat to public health, and
- Some may receive further cleanup.

Information on each site's location, owner/operator, disposal practices, waste types, and quantities, problems requiring cleanup, programs under which cleanup occurred, status of cleanup and cost and success of cleanup is presented in the following sections.

Roeling Vacuum Site (RRC Site Code 03-05216)

This site is located in Liberty County. Roeling Vacuum, Inc. was the operator. Roeling ended work and abandoned the site in 1988. Saltwater-based drilling wastes were probably disposed of at the site in the late 1970s. The disposal pit was closed in 1977 (RRC records). The site was then permitted for disposal of fresh water drilling fluids disposal between 1985 and 1990. It appears that fresh water drilling fluids were legally disposed of then. Saltwater was present in tanks and pits. The reason it was there is unclear. Saltwater-based waste may have been stored there temporarily before being transported to a disposal well; saltwater-based drilling fluids may have been disposed of there illegally; or saltwater-based waste may have been stored there before the permit period. In addition, unauthorized disposal of trash unrelated to oil and gas operations may have occurred.

The RRC closed the site in 1991 as a result of a complaint by a neighboring landowner about high chloride levels in well water and as a result of permit violations. (A washout pit that was permitted for storing wastewater left from washing out trailers used to haul spent drilling fluid had high chloride levels.) The RRC removed saltwater tanks and cleaned up the pit at a cost of \$30,000. The work was authorized in 1992 and completed in 1995.

In 1997, the RRC had the Texas Bureau of Economic Geography (BEG) conduct a site evaluation (final report 1999). BEG found buried spent drilling fluids in excavated pits. Most

waste areas were underlain by several feet of clay in the Beaumont formation. BEG estimated the total waste volume to be 17,500 yd³.

BEG found elevated levels of chlorides, metals, and petroleum hydrocarbons in the waste. The metals and petroleum hydrocarbon levels were below RRC action levels. No pesticides or PCB's were present. The wastes also exhibited low leaching potential for metals and organics according to the toxic characteristic leaching procedure (TCLP) methods for characterizing wastes for disposal.

The only confirmed finding related to groundwater quality was the presence of chlorides and salinity in some onsite and offsite monitoring wells in levels that exceeded EPA's secondary maximum contaminant levels (MCLs) for drinking water. No dissolved metals or organics were confirmed at concentrations above EPA's primary MCLs. The BEG recommended additional sampling of monitoring wells to address potential concerns about drinking water around the site. If remediation is later deemed necessary, evacuation of the soil contaminated with elevated levels of chloride from the central site would be recommended. The RRC has classified the site as being under consideration for further action.

Fox Vacuum Site (RRC Site No. 93-03-0019)

This site is located in Jasper County. Fox Vacuum, Inc., was the operator. The site was developed between 1958 and 1976. It is unclear exactly when Fox abandoned the site. The site was used for the disposal of drilling waste and as a washout yard for the vacuum truck service company. Drilling wastes were legally disposed of at the site. Sulfuric acid may have been illegally dumped there.

RRC inspectors visited the site in late 1993 after livestock were reportedly affected. They found a half acre of barren ground that extended from the yard into neighboring pasture. The neighboring land owner had curtailed use of the pasture by his horses. Soil samples taken in 1993 and 1994 showed the presence of sulfuric acid. The site was fenced off and placed on the RRC priority list for abandoned oil field sites as a candidate for cleanup.

The RRC had BEG conduct a site evaluation in 1995. BEG found the acid plume to be confined to the upper 10 ft of the surface soil, with most of the contamination occurring in the top 4 ft. The total volume of acid-contaminated soil (pH 1 to 4) was about 19,000 yd³. Approximately 3000 yd³ of drilling wastes contaminated with crude oil were present in the pits at the site. However, the concentrations of total petroleum hydrocarbons (TPH), metals, and chlorides in these wastes were below regulatory levels, and no cleanup of the pits was proposed.

The sulfuric acid may have resulted from an illegal discharge of sulfuric acid or from the slow oxidation of elemental sulfur to sulfuric acid. Sulfur scale obtained from treating sour gas might have been used as road material in the drive into the yard.

The BEG recommended that finely ground calcitic limestone be applied to the soil above the

sulfuric acid plume to neutralize it. The RRC took this action at a cost of \$13,000. Recovery is being monitored at this time.

Vernon Briggs Site (RRC Site No. 03-050218)

This site is located in Matagorda County. Vernon Briggs (deceased) owned and operated the site from 1981 through 1993. His estate now owns the property.

Briggs received a permit to maintain an unlined pit for the disposal of freshwater-based drilling wastes in 1981. Complaints from neighbors in 1993 prompted an RRC inspection. It appeared the site was uncontrolled at that time. Oil-stained soils were visible. Sludge samples contained high concentrations of TPH and barium. The site was described in RRC records as abandoned and a candidate for cleanup. RRC noted it was very accessible and could be used for illegal dumping. In July 1994 Mr. Briggs was directed to start cleanup, but none was performed. The site was listed for State-funded cleanup in December 1994.

RRC had BEG conduct a site evaluation during 1996 and 1997. BEG found that most waste material at the site was drilling fluid from oil production sources. The fluid was confined within berms and underlain by at least 5 ft of clay from the Beaumont formation. The volume of waste was estimated to be 39,000 yd³.

The waste contained elevated concentrations of petroleum hydrocarbons, metals, and chlorides. The organics and metals in the waste exhibited low TCLP potentials. The constituents at levels above regulatory guidelines in onsite groundwater were cadmium, lead and chloride. Offsite groundwater was not affected.

BEG recommended continued groundwater monitoring. If cleanup action is later deemed necessary, it was proposed to isolate the waste by capping. The waste would then be covered with a layer of clean soil, a geomembrane to restrict surface water percolation, and another layer of topsoil, seeded and fertilized. RRC has classified the site as being under consideration for further action.

Manvel Saltwater Disposal Site

This site is located within the city limits of Manvel in Brazoria County. The last operator of the site was the Manvel Salt Water Disposal Company. It operated the site from 1978 to 1986. The site accepted drilling wastes and associated crude oil. It stored saltwater in a concrete settling pit and two 500-gal tanks prior to injection in a disposal well.

RRC received several complaints about the site beginning in 1979 when crude oil overflowed. In 1988, the current landowner filed a complaint about an unplugged disposal well and unplugged oil well on the site. RRC plugged the wells in 1990. In 1993, crude oil seeped after a heavy rain. In 1994, RRC ordered Manvel Saltwater Disposal Company to begin cleanup. It is uncertain if Manvel SWD still exists.

RRC had BEG conduct a site evaluation in 1995. BEG found that saltwater, drilling wastes, and crude oil had been disposed of at the site. Several instances of pit overflow and levee rupture resulted in contamination of the surrounding area by oil and saltwater. BEG identified a shallow saltwater plume that had moved offsite and found wastes that were high in salinity and TPH in two of the pits. BEG estimated the drilling waste volume of concern to be approximately 10,000 yd³. Toxicity characterization of the metals and organics showed the drilling waste to be nonhazardous.

BEG recommended removing the highly saline wastes from the pits to eliminate the source of saltwater contamination and then monitoring the plume to make sure concentrations decreased over time. It recommended that the 10,000 yd³ of drilling wastes be land farmed. BEG estimated the total cost for cleanup to be \$273,000 to \$528,000. RRC has classified the site as being under consideration for further action.

Steve's Oilfield Services Site

Information on this site is limited. It is located near Kingsville in Kleberg County. Steve's Oilfield Services was the former operator. The site was permitted for disposal of freshwater-based mud at some unknown date. In 1992, oil and water spilled when a pit overflowed. The operator cleaned up most of the oil. In 1995, water and oil flowed from frac tanks into an adjacent cornfield. The operator was fined \$6,000. In 1996, the RRC emptied two leaking frac tanks at a cost of \$800.

The RRC has not had anyone conduct an extensive evaluation of this site. The reason is probably because the site does not appear to be as hazardous as many of the other sites with which the RRC deals.

LOUISIANA SITES

Summary: Three commercial disposal facilities in Louisiana that received drilling wastes were or are listed on the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) National Priority List (NPL). One site was cleaned up and removed from the list, another has been proposed for removal from the NPL, and the third is undergoing cleanup. In addition, three other sites that received drilling wastes were abandoned and are currently undergoing cleanup. Moreover, about 15 other abandoned sites are alleged to have received drilling wastes and are currently being investigated.

NPL Sites: In Louisiana, sites listed on the NPL are overseen by EPA and the Louisiana Department of Environmental Quality. Three commercial disposal sites in Louisiana that received drilling wastes were placed on the NPL: the PAB Oil & Chemical Service site, the D.L. Mud site, and the Gulf Coast Vacuum Services site. Information on each site's location, owner/operator, disposal practices, waste types and disposal quantity, problems requiring cleanup, programs under which the cleanup occurred, status of cleanup, and cost and success of cleanup is presented below.

PAB Oil & Chemical Service

The 16.7-acre PAB Oil and Chemical Service site is located in Abbeville, Louisiana, in Vermilion Parish. Between 1979 and 1983, the site was used for disposal of oil and gas E&P wastes, including drilling muds. The site was remediated and removed from the NPL on January 3, 2000.

Remediation included stabilization and solidification of 25,000 yd³ of sludge. Sludge pits were graded, capped and vegetated. In addition, 6 million gallons of water was removed from an onsite pond, treated, and discharged. Moreover, 7,000 yd³ of sediment contaminated with arsenic, barium, and PAH, was removed from the pond and incorporated in the sludge pit remediation. The pond was then filled, graded, and vegetated.

Long-term groundwater monitoring and site operation and management activities continue at the site.

D.L. Mud

The D.L. Mud site was proposed for deletion from the NPL on January 7, 2000. This 12.8-acre site in Abbeville, Louisiana, 20 miles from the Gulf of Mexico, was used to store and formulate barium sulfate-based drilling mud. The site consisted of 16 vertical drilling mud storage tanks. Illegal disposal of waste was determined to have occurred at the site.

Remediation included the removal and incineration of tank contents and associated soils, decontamination and demolition of tanks, and removal and disposal of approximately 800 yd³ of contaminated soil.

Fencing of contaminated areas, deed restrictions, and groundwater monitoring activities continue at the site.

Gulf Coast Vacuum Services

This site is next to the D.L. Mud site. It handled waste oil and disposed of drilling wastes and saltwater in three earthen pits. This site has not been remediated.

Sites Not Listed on the NPL Being Cleaned: In addition to the NPL sites, three additional commercial E&P disposal sites are being cleaned up in Louisiana as of June 2000. The Louisiana Department of Natural Resources (DNR), Office of Conservation is responsible for abandoned oilfield waste sites not listed on the NPL. Thus, cleanups at these sites are occurring under the direction of the DNR.

MAR Services

This site near Cankton in Lafayette parish, was permitted to accept E&P wastes for disposal. The operator went bankrupt and abandoned the site. As of mid-May 2000, a Phase I cleanup had

been started at the site.

Big Diamond

This site near Grand Lake in Cameron Parish, was permitted to accept E&P wastes for disposal. The operator went bankrupt and abandoned the site. A preliminary site assessment was completed in 1998. As of May 2000, the DNR was reviewing a plan for a more detailed assessment and remediation of the site.

Castex

This site near Silverwood in Mermentau Parish was permitted to accept E&P wastes for disposal. The operator went bankrupt and abandoned the site. The Coast Guard felt that the site posed a threat to navigable waterways and began surface remediation. It is unclear what future remediation will be required here.

Sites Under Investigation: The DNR has also identified an additional 15 abandoned oilfield waste sites. These sites may include commercial disposal sites and are currently being investigated. They are listed below.

Abandoned Oilfield Waste Sites as of May 16, 2000

Site Name	Parish
Curtis Simon	Vermillion
Fork Island Shipyard	Vermillion
Guthrie Pits	Vermillion
Harpin Pits	Vermillion
John Nunez Injection Well	Vermillion
Old Larry Landry Dump	Vermillion
Leleux Disposal	Vermillion
Leo Fontenot Pit	Vermillion
N.R. Broussard Landfill	Vermillion
Sulphur Pit	Vermillion
Tower Pit	Vermillion
Pine Pit	Vermillion
Sam Carline Site	Terrebonne
Midland Site	Acadia
Jefferson Island Area Site	Ibaria

CALIFORNIA SITES

Summary: Twenty-two commercial hazardous waste sites were identified in California. Only one, the Casmalia Resources site, which began as a disposal site for wastes from drilling

operations and was expanded to include hazardous waste, is know to include E&P waste. The other sites may have received waste streams that included, but did not totally consist of E&P operation wastes. Most E&P wastes in California are disposed of at Class II (designated waste) facilities or Class III (brine disposal). No commercial California Class II or Class III facilities that required or had experienced remediation were identified.

Background: In California, state or federal authorities can oversee waste disposal facilities. Within the California Environmental Protection Agency, these authorities include the Regional Water Quality Control Board, which is responsible for groundwater basin planning; Department of Toxic Substances Control (DTSC), Planning Permitting Division (Permitting), which implements corrective actions; and, DTSC, Site Mitigation Program (SMP), which administers the state CERCLA program. Within the federal government, these authorities include the EPA's Resource Conservation and Recovery Act (RCRA) and CERCLA program offices.

Twenty-two commercial hazardous waste facilities have been identified in California. These facilities, their locations, and oversight agencies are listed in the table below. Only one of these sites, Casmalia Resources in Santa Barbara County, is known to include E&P wastes. This facility was originally developed to dispose of wastes generated as part of local oil and gas drilling operations. Subsequently in 1976, it was permitted accept hazardous waste. While it operated, 4.5 billion pounds of hazardous wastes were disposed of at the site. It is currently being remediated under CERCLA.

California hazardous waste disposal facilities report on wastes by category. No category is unique to E&P operations. As a result, although E&P wastes may have been disposed of at other commercial hazardous waste facilities, it was not possible to determine if these included E&P wastes.

Most E&P wastes in California are disposed of at Class II (designated wastes) or Class III (brine disposal) facilities. No commercial Class II or Class III facilities that required or had experienced remediation were identified.

California Commercial Hazardous Waste Disposal Facilities

<u>Facility</u>	<u>Location</u>	<u>Oversight Agency(ies)*</u>
Acme Fill Corp	Martinez	DTSC Permitting, RWQCB
Aerochem Inc.	El Mirage	DTSC Permitting
Big Blue Hills Disposal Site	Coalinga	DTSC Permitting
BKK Landfill	West Covina	EPA
Casmalia Resources	Casmalia	EPA
Chemical Waste Management Bakersfield	Bakersfield	DTSC Permitting
Chemical Waste Management Inc.	Kettleman City	DTSC Permitting
Del Norte County Dept. of Agriculture	Crescent City	DTSC Permitting

Environpur West Corp.
Epc Eastside Disposal Farm
Forward Disposal Site
Gibson Environmental

It Corp. Bensen Ridge
It Corp. Montezuma Facility
It Corp. Panoche
John Smith Solid Waste
Rio Bravo Disposal Facility
Safety Kleen Inc.
Safety Kleen Westmorland
West County Landfill Inc.
Westside Disposal Facility

Signal Hill	DTSC Permitting
Bakersfield	DTSC SMP
Manteca	DTSC Permitting
Bakersfield	DTSC Permitting, DTSC SMP
Kelseyville	DTSC Permitting
Colinsville	DTSC Permitting
Benicia	DTSC Permitting
Hollister	DTSC Permitting
Shafter	DTSC Permitting
Buttonwillow	DTSC Permitting
Westmorland	DTSC Permitting
Richmond	DTSC Permitting
Fellows	DTSC Permitting, RWQCB

*DTSC Permitting = Department of Toxic Substances Control, Planning Permitting Division
DTSC SMP = Department of Toxic Substances Control, Site Mitigation Program
RWQCB = Regional Water Quality Control Board
USEPA = U.S. Environmental Protection Agency

ALASKA SITES

Summary: As of January 31, 2000, 322 of 572 inactive E&P waste disposal sites in Alaska had been remediated and closed. Of the remaining sites, 142 had not been characterized. Closure plans for the remaining sites do not have to be submitted until 2002. Information on the number of commercial disposal sites included in this group was not available.

Background: The Alaska Department of Environmental Conservation, Division of Environmental Health, Solid Waste Program, oversees the disposal of oil and gas E&P waste. The Solid Waste Program is managing more than 250 ongoing cleanups. Most of the less complex sites have already been closed, and most of the more complex sites are still active. Information available from the State was sparse because the Alaska Solid Waste Program's resources are limited.