

MURPHY OIL SPILL

Health Consultation

Murphy Oil Spill

**2500 East St. Bernard Highway
Meraux, St. Bernard Parish, Louisiana
Record of Activity**

November 8, 2005



Prepared by

U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease
Registry

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Introduction

Murphy Oil USA, Inc. (Murphy) owns and operates the Meraux oil facility. The Meraux facility is located on 2500 East St. Bernard Highway in Meraux, St. Bernard Parish, Louisiana. The facility includes a dock facility for unloading and loading product, a truck terminal, and a 100,000 barrel-per-day refinery. Barrels of crude oil are off-loaded at the Mississippi River dock and transported to the Meraux facility via pipeline. Additional crude oil is transported to the facility through auxiliary pipelines. Normal facility throughput is approximately 630,000 gallons per day. The refinery uses the crude oil to produce gasoline, diesel fuel, kerosene, and no. 6 fuel oil. These products are then transported off-site via barge at the facility docks and via pipelines. Before Hurricane Katrina, the Meraux facility received and loaded oil from marine vessels 24 hours per day, 7 days a week.

Hurricane Katrina lifted and dislodged a 250,000 barrel aboveground storage tank (tank # 250-2) at the New Orleans Murphy Oil Refinery. At the time, the tank contained 65,000 barrels of mixed crude oil¹ and released approximately 25,110 barrels (1.05 million gallons). The released oil has affected approximately 1,700 homes in an adjacent residential neighborhood, an area of about 1 square mile. Several canals have also been affected: the 20 Arpent, the 40 Arpent, the Meraux, the Corinnes, the Delarond, and various unnamed interceptor canals.

On September 4, 2005, Murphy notified the U.S. Environmental Protection Agency (EPA) Region 6 Response and Prevention Branch (EPA-RPB) about an oil spill at the Murphy Meraux facility in Meraux, St. Bernard Parish, Louisiana and requested assistance. EPA and the U.S. Coast Guard (USCG) agreed to divide responsibility for the spill. EPA is overseeing Murphy's cleanup of oil in residential properties and properties accessible to the public (parks, school yards, roads, highway median strips, sidewalks, etc.). EPA is also assisting with the treatment and remediation of oil-impacted canals for clean-up levels that will be determined by key stakeholders and regulatory authorities.

Response Activities

EPA identified and characterized the extent of contamination in the area, provided written and photographic documentation of response activities, oversaw the removal activities, and collected split samples (10% of sediment samples) for quality assurance/quality control (QA/QC) from monitoring locations sampled by Murphy's contractors. Murphy collected sediment and air samples in areas identified by the EPA as contaminated. Between 15 and 30 summa canisters were placed in homes for 24-hour air sampling. EPA also oversaw Murphy's plan for cleaning up oil from public areas; roads, median strips, and sidewalks up to 1 foot of private properties, playgrounds, and parks. In addition, EPA reviewed the sampling plans of Murphy's contractors to correct inconsistencies with sampling procedures. Murphy subsequently required all sampling

¹ With a grade named, Arabian Medium APT 30.8

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teams to participate in training to assure consistency of the data. If samples were not collected according to the established procedures, the location was resampled.

Ongoing Activities

A meeting was held on October 21, 2005, to discuss clean-up action levels, debris removal, and transfer of federal on-scene coordinator (OSC) responsibility from USCG to EPA. Representatives from EPA, USCG, the Louisiana Department of Environmental Quality (LDEQ), ATSDR, Murphy, and the Governor's Office attended the meeting. The meeting established procedures for soil clean up in the public areas including the clean-up levels. Debris removal issues were listed for discussion with the joint field office and a preliminary plan was presented for transferring lead responsibility to EPA.

EPA has overseen sampling of public areas (school yards, parks, etc.) and now has approval to clean public areas. EPA documented Murphy's sampling activities and collected 10% splits of sediment samples. Murphy has collected 963 interior and exterior sediment samples from 563 residences.

Cleanup of public areas will include the removal of oil stained areas. Soil samples will then be taken to ensure action levels have been met. If the soil fails to meet action levels, additional excavation will occur and soil will be resampled until action levels are met. The action level is LDEQ risk evaluation/corrective action program (RECAP) residential soil standards for high public use areas:

Total petroleum hydrocarbon (TPH) oil range organics	1,800 mg/kg
Diesel range organics	650 mg/kg

Soil and Sediment Studies

Soil and Sediment Sampling

According to the EPA OSC, St. Bernard Parish officials are requiring that the responsible party (RP) sample every property in the spill area before an assessment that the property can be reinhabited. The RP has started to take soil and sediment samples from the properties and has agreed to split 10% of the soil/sediment samples with EPA. EPA has contracted to have these samples analyzed at the same laboratory as the RP. The positive hits above the LDEQ Media-Specific Screening Level (MSSL) for the first round of splits are listed in the table below. As with other soil and sediment samples taken during the Katrina response, when results come in from the laboratory, they are validated by the Superfund Technical Assistance and Response Team (START) contractor in Dallas, Texas, and referred to the Region 6 Risk Assessment Group in the Environmental Unit. A risk assessment is performed and comparisons are made to appropriate standards and screening levels. The risk assessment is then forwarded to the Headquarters (HQ) Risk Assessment Group in the HQ Environmental Unit. The Region 6 risk evaluation is included in the "Screening Level Risk Evaluation" section below.

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Murphy Oil Sediment Results Exceeding MSSLs

<i>Sample ID</i>	<i>Analyte</i>	<i>Units</i>	<i>Result</i>	<i>MSSL</i>
T0629-051011-01-SS01-N	Diesel Range Organics	mg/kg	977	650
T0681-051011-01-SS01-N	Diesel Range Organics	mg/kg	1,270	650
T0496-051012-01-SS01-N	Diesel Range Organics	mg/kg	1,290 E	650
T0630-051012-01-SS01-N	Benzo(a)pyrene	mg/kg	0.125 J	0.062
	Dibenzo(a,h)anthracene	mg/kg	0.0881 J	0.062
T0681-051012-01-SS01-N	Diesel Range Organics	mg/kg	17,400 E	650
	Oil Range Organics	mg/kg	15,900	1,800
T0496-051014-01-SS01-N	Diesel Range Organics	mg/kg	1,760	650
	Oil Range Organics	mg/kg	2,570	1,800
T0630-051014-02-SS01-N	Diesel Range Organics	mg/kg	3,290	650
	Oil Range Organics	mg/kg	8,620	1,800
T0630-051009-01-SS03-N	Diesel Range Organics	mg/kg	1,210	650
	Oil Range Organics	mg/kg	4,240	1,800
T0629-051010-01-SS01-N	Diesel Range Organics	mg/kg	818	650

Chemicals in environmental media that exceeded EPA and DEQ standards ⁽¹⁾

Heavy Metals

Arsenic
Cadmium
Chromium

Semi-Volatile Organics

Benzo(a)anthracene
Benzo(b)fluoranthene
Indeno(1,2,3-c,d)pyrene
Benzo(a)pyrene
Dibenzo(a,h)anthracene
Gasoline and diesel range organics

Volatile Organic Chemicals

n-Butylbenzene
sec-Butylbenzene
Isopropyltoluene
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Isopropyltoluene
1,2,4-Trimethylbenzene

(1) These data were gathered by the Louisiana Bucket Brigade and were provided to ATSDR by the EPA. Results were consistent with EPA and RP data.

Oiled-Property Visual Survey

OSC and START contractor personnel have been gathering information regarding the oil

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spill, to provide written and photographic documentation of response activities, and to identify and characterize the extent of the spill in the surrounding residential area. START-2 personnel were assigned to identify the affected areas and to classify the level of contamination. A house-to-house visual survey was conducted from the street to roughly characterize the levels of oiling on the properties in the affected area. (Due to legal access questions, property areas not visible from the street or public sidewalk have yet to be surveyed.)

Three levels of oiling were established for this survey: heavy, moderate, light and /or "bathtub ring." Heavy was defined as a property where greater than 50% of the yard, sidewalks, and home were covered with product. Moderate was defined as a property where roughly 50% of the yard and sidewalks were covered in product. Light was defined as a property where a small percent of product was visible on horizontal surfaces or a "bathtub ring" of visible product band approximately 3 to 6 inches wide was seen on the residence, with no visible oil on the yard, sidewalks, and home. To date, 1,385 properties in the area of the Meraux facility have been determined to have been oiled by the spill. Of those residences, 985 homes were classified as light, 286 were classified as medium, and 114 were classified as heavy.

Site photographs indicate the staining caused by the oils on the exterior of homes and the oil deposits left in some homes.



Other photographs, such as the storm water ditch in the earlier photographs, indicate vegetation stress.

Overall Screening Evaluation of the Data

Sediment sample results collected from inside and outside properties located in the area affected by the Murphy oil spill were analyzed. The samples represent a subset of the total number of samples collected at the site, and do not include any indoor air samples.

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However, the available data are sufficient to define a few public health hazards. The analytical data confirm the widespread impact of oil substances on properties located within the Murphy oil spill site. Levels of diesel and oil-related organic chemicals in sediment samples exceeded several health based comparison values (including the LDEQ levels for residential exposures). Exceeding the health based screening level may not pose a health hazard as exposure is not certain. These health screening levels are established to protect people from touching or accidentally ingesting soils. Therefore, the levels measured indicate that soils should not be routinely touched or accidentally ingested. Children's behaviors, such as hand to mouth behavior, increase their exposure to contaminants in soil. Pets increase pet owner's exposures to soil. Therefore children and pet access to contaminated areas should be restricted or controlled.

A complete assessment of exposures requires a clear understanding of the locations where samples were collected as well as an understanding of the frequency of human contact with those soils and the extent to which people would contact those soils. At this time much of this data is unavailable.

Additionally, indoor air sample results were unavailable at the time this report was written. Because petroleum products are known to volatilize, some volatiles are expected in air, but none have been reported so far. Because the more toxic airborne pollutants tend to be more volatile, and there have been many warm days since the oil was spilled, most of the harmful pollutants have volatilized. Therefore, the outdoor levels of volatiles are expected to be low. Some volatiles may be trapped inside homes or other buildings. These airborne levels should drop over time.

Environmental Data

Field sampling staff reported that soil and sediment samples collected before October 16, 2005, represent outdoor samples and those after October 16, 2005, were indoor sediment samples. A review of raw data provided by EPA in a spreadsheet revealed elevated levels indoors as well as outdoors. Some chemicals exceed health comparison guidance values.

Health Effects of Exposure to Oil Substances

The Netherlands Institute of Public Health and Environment conducted a human health risk assessment after 30 tons of oil washed onto Brittany Beach (France). They found the greatest risks were reversible skin dermatitis and a small increase in the risk of skin cancer. In this study, risks were limited to people who had bare skin contact with soil.²

Behaviors of children and pets are such that they may touch contaminated surfaces more frequently than adults. Should pets be exposed, they may pass contaminants on to owners.

² Bert-Jan Baars, "The wreckage of the oil tanker Erika—human health risk assessment of beach cleaning, sunbathing, and swimming." Elsevier, Toxicology Letters, 128 (2002), S0378-4274(01)00533-1. National Institute of Public health and the Environment, Center for Substances and Risk Assessment, The Netherlands.

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Contact with oil and petroleum residues can cause skin rashes in people. Subsequent exposure to sunlight increases the effect.

The photograph to the right shows a common rash (contact dermatitis) that may develop—even after immediate washing—if a sensitive person touches petroleum products. Children who spend longer periods outdoor in the sunlight may have more severe rashes. Children have been known to develop face rashes after touching petroleum residue with their hands and transferring some residue to the skin on their face.



Public Health Conclusions

ATSDR categorizes areas affected by visible oil contamination from the Murphy Oil Spill as a public health hazard for normal residential use due to the potential for skin contact and accidental ingestion of oil residues.

ATSDR categorizes the affected area as an indeterminate public health hazard for air contamination due to the lack of air quality data. In the absence of air data, it is not possible to assess inhalation exposures to airborne volatiles that have evaporated from the petroleum product and remain trapped inside buildings.

Recommendations

- Reinhabiting homes with visible oil contamination is not recommended because of the potential for skin exposure to oil substances. If people choose to reenter the affected area before remediation, they should take precautions to avoid contact with oil substances. Sensitive individuals, including children and people with recently healed or open wounds, should avoid all exposure to oil substances.
- Because children are more likely to be exposed to contaminated soil, local officials should consider restricting children from entering areas containing oil-related waste.
- Residents may be exposed to soil contaminants from contact with their pets; therefore, local officials should consider restricting pets from entering oil-contaminated areas.
- ATSDR endorses Louisiana's guidance to protect people from exposure to oil substances who choose to reenter properties before clean-up and remediation activities are completed. This protective guidance recommends the following:
 - Protect your skin from contacting oil.

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- Use oil resistant gloves. (Oil may dissolve latex gloves. Use another type of glove.)
 - Keep arms and legs covered.
 - Wear coveralls or clothing that can be left at the oil-contaminated residence.
 - If you get oil on skin, (immediately) wash with soap and water.
 - Wear boot covers or leave work boots at the oil-contaminated residence.
 - Open doors and windows to ventilate the oil-contaminated residence.
 - Do not transport oil contaminated items from the oil-contaminated residence to noncontaminated locations.
- ATSDR recommends workers cleaning up oil-contaminated property should wear appropriate protective clothing. Petroleum products can degrade some synthetic materials and fabrics, so oil-resistant protective footwear, gloves, and clothing should be used.

Public Health Action Plan

ATSDR will coordinate the distribution in St. Bernard Parish of fliers that provide the Louisiana protective guidance listed above.

ATSDR will evaluate additional environmental and indoor air sample results, if provided by Murphy Oil Company, and will provide findings to the public.