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**ATSDR** Agency for Toxic Substances & Disease Registry Public Health Assessments & Health Consultations

## PUBLIC HEALTH ASSESSMENT

HIGHWAY 71/72 REFINERY  
BOSSIER CITY, BOSSIER PARISH, LOUISIANA

### SUMMARY

The Highway 71/72 Refinery site is a former refinery that has been developed for residential and commercial use. The site has been classified as a public health hazard. A site is classified as a public health hazard 1) when evidence exists that exposures to site contaminants have occurred, are occurring or, are likely to occur in the future and 2) when exposure to contaminants occur at concentrations that upon long term exposure (greater than one year) can result in adverse health effects (noncancer or cancer). There are three reasons why the Highway 71/72 Refinery has been described as a public health hazard:

1. lead concentrations reported in soil would pose a future health risk to young children if they frequently come in contact with the lead contaminated soil.
2. benzene concentrations reported in indoor air (1990-1994) may pose a health threat if the short-term benzene measurements are representative of daily exposures.
3. methane concentrations measured indoors and in soil gas may pose a potential explosion hazard. As a precautionary measure, Apartment #501 of Building 5 of the Alexis Park Apartment complex has been closed under order of the state health department.

In certain areas of the site, surface soil (0-2 inches) is contaminated with lead. The areas of lead contamination with the highest lead concentrations have been covered with grass to reduce the likelihood that residents may come in contact with soil. Young children (6 months to 6 years) are the most sensitive population to lead exposure in soil and to the health effects of that exposure. In July 1995, the Louisiana Department of Health and Hospitals/Office of Public Health/Section of Environmental Epidemiology and Toxicology (LDHH/OPH/SEET) and the Agency for Toxic Substances and Disease Registry (ATSDR) conducted a voluntary blood lead screening to determine if children on site had elevated blood lead levels. Blood lead values were found to be in the normal range, below the levels requiring medical follow-up. Though the blood lead levels of children tested in the exposure investigation were below levels requiring follow-up, only 55 out of the approximate 300 children ages 6 months to 6 years who live on site, volunteered for testing. The children tested may not be representative of the larger population of children on site.

Even though indoor air has been tested several times between MAY 1990-1994, there are data gaps which make it difficult to assess the impact of site contaminants on indoor air quality. During the air investigations only a few contaminants were analyzed for consistently. Sampling was too infrequent and brief to accurately assess residents' exposure to contaminants. There was no concurrent monitoring of the soil gas and indoor air quality.

Investigations have been conducted to determine the origin of the indoor air contamination, but the results have not been conclusive. The source of the indoor air contaminants could be associated with a number of potential sources such as buried waste, soil gas, or groundwater contamination underneath the site. High levels of methane and benzene have been detected in soil gas samples.

Based on the data reviewed, SEET and ATSDR recommended that additional air sampling should be conducted to include analysis for refinery related chemicals. The indoor air sampling should be more frequent and longer in duration (24 hours). Contaminants in soil gas should be measured concurrently with indoor air measurements to determine if soil gas contaminants are contributing to indoor air contamination. Air sampling should be conducted during soil excavation to ensure that residents and workers are not exposed to volatile organic compounds. If volatile organic compounds are released, workers, residents, and others nearby could be exposed via inhalation to contaminants. Continue to cover (with vegetation or other barrier) areas where high levels of lead were detected in the soil to protect children.

## BACKGROUND

### A. Site Description and History

The 215-acre, Highway 71/72 Refinery site is located in Bossier City, Louisiana (see [Figures 1 and 2](#)). It was operated by Arkansas Fuel Oil for the production of home heating and fuel oils from 1923 to 1946. The layout of the facility may be seen in [Figure 3](#). The location of the processing facility, storage tanks, and [lagoons](#) are outlined. Following World War II, the processing area of the refinery was dismantled. The facility was then used as a petroleum product transportation and distribution center during the 1950's. Arkansas Fuel Oil then merged with Cities Service Company (CSC), who renamed the company OXY, Inc. in 1957, and the site was cleared for sale. At this time, a railroad terminal, pipeline terminal, and truck loading area were present on-site.

The old refinery area has been developed since 1968. The demographics, land, and natural resource use of the site are provided in [Appendix A](#). Private residences, and commercial and light industry are situated on a large portion of the site. The northwest portion of the site contains single family homes, apartments, and commercial establishments. The northeastern portion of the site contains the largest area of undeveloped land and some commercial properties. The southern part of the site has several large apartment complexes, townhouses, and hotels.

In 1990, some residents of the site complained of odors in their apartments and homes. Sampling for indoor air contaminants was conducted, and volatile organics have been identified in indoor air samples. High concentrations of methane was found in some residences. Consequently, 47 families were evacuated from areas of the Alexis Park Apartment complex where concentrations in Building #5 were of particular concern. Apartment #501 of this building of the Alexis Park Apartment complex remains closed.

Residents have reported the appearance of black tarry material in their yards and driveways. The black tarry material has also been identified in the parking lot and recreational areas (volleyball court area) of the Sheraton Hotel, as well as other areas located around the Site.

The soil gas analysis of the site indicates methane levels at a maximum of 719,753 ppm and BTEX compounds (benzene, toluene, ethylbenzene, and xylene) at a maximum of 196 ppm. PAHs (chrysene, benzo(b)fluoranthene, benzo(k)anthracene, and benzo(a)pyrene) and metals (arsenic, mercury, and lead) have been identified in surface soil (0-2 inches) and subsurface soil (greater than 2 inches -2 feet).

Soil lead levels in some areas of the site were elevated. There was concern that children were being exposed to lead from the contaminated soil. In July 1995, SEET and ATSDR conducted a blood lead screening for children (6 months to 6 years) living on-site. None of the children tested had blood lead concentrations above levels requiring medical intervention (10 micrograms of lead per deciliter of blood).

Polycyclic aromatic hydrocarbons (PAHs) and volatile organics have been identified in the groundwater under the site.

## B. Site Visit

A site visit was conducted on June 28-29, 1995. Present were representatives with the Environmental Protection Agency (EPA), the Louisiana Department of Environmental Quality (LDEQ), SEET and ATSDR.

The site is divided into northern and southern sections by Old Minden Road. Both sections contain homes and apartment complexes. There are several hotels, restaurants, and other businesses on-site. One school is adjacent to the site.

A tar-like substance seeping from the ground was noted at several locations on-site. Tar seeps were seen in the parking lot, recreational area, and alongside a drainage ditch at the Sheraton Hotel; seeps were also seen in a grassy area of the Alexis Park Apartments; and in the yard of a townhouse adjacent to the Alexis Park Apartments.


In the northern part of the site at a private residence, a black tar-like substance was found oozing from a crack in the driveway. The resident reported that this material was also present in her backyard and prevented her from having a garden. She stated that additional soil was placed over her backyard but the tarry substance was soon found in the new fill. There were visible deep cracks in the soil of the yard but no tar was observed at this visit. The resident reported that the tar substance was oozing through the floor and carpet in her home. Tar-like material was seen on the surface of the carpet.

Building 5 of the Alexis Park Apartments was vacant. OPH/SEET ordered the building closed when methane levels recorded in 1990 were at the safety level of 10,000 ppm (20% of the lower explosion concentration for methane).

Due to lead concerns additionally, the equipment at the former Alexis Park playground has been removed. The playground area has been covered by grass. Old oil refinery concrete structures were present above ground near the former playground but did not pose a physical hazard. The old volleyball court was covered by thick grass. There were no indications that the volleyball court and playground areas were currently being used, but access to these areas was not restricted.

On February 14, 1990, staff from SEET once again visited the site. The playground at the Alexis Park Apartments was vegetated and the equipment was removed. Apartment #501 remained vacant. Tar seepages could still be seen on the ground in certain areas of the site.

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