STATEMENT OF BASIS/FINAL DECISION AND RESPONSE TO COMMENTS SUMMARY

REGION VIII
ID# 0049

Flying J Petroleums, Inc.

Williston, North Dakota
November 1993

Facility/Unit Type:	**Petroleum refining and storage**
Contaminants:	**Benzo(a)anthracene, pyrene, lead, benzene, 1,2-dichloroethane**
Media:	**Ground water, soil**
Remedy:	**Institutional controls, excavation and disposal of lead-contaminated soils, soil vapor extraction, off-gas treatment, upper sand dewatering, free product recovery, dissolved hydrocarbon pump and treat, treatment and discharge of ground water.**

FACILITY DESCRIPTION

On February 1, 1993, the North Dakota State Department of Health and Consolidated Laboratories (Department) issued a RCRA Post-Closure/Corrective Action permit to Flying J and on May 4 of the same year, the facility submitted proposed revisions. The Department has proposed to incorporate some of the suggested revisions as well as propose remedies to meet the requirements of corrective action.

The Flying J Petroleums - Williston Refinery facility is a petroleum refinery and storage facility located in Williston, Williams County, North Dakota. The facility occupies approximately 41.6 acres owned by Flying J Petroleums, Inc. and includes at least 5.6 acres of property owned by the United States which are included in an easement granted by the Department of the Army Corps of Engineers (USACE), Omaha District to Flying J Petroleums, Inc. Nearby is the Little Muddy River which contains species such as the paddlefish (proposed for listing under the Endangered Species Act) and the pallid sturgeon (a federally-listed endangered species). The refinery was built in the early 1950s and was owned by several entities until April 1980, when it was acquired by Flying J. In October 1984, the process units were shut down and have not been operational since that time. All petroleum storage activities for resale ceased in 1986.

There are four regulated hazardous waste management units (HWMUs) onsite. These were unlined surface impoundments which were constructed in natural soil for the purpose of providing additional oil/water separation. Surface impoundments 1 and 2 are located on the property owned by Flying J, while 3 and 4 are on property owned by the United States.

A 1984 site characterization determined that there was facility-wide contamination. On July 25, 1986, the Department first contacted Flying J about the quality of their surface impoundments. The facility submitted a preliminary hazardous waste closure plan in May, 1986, and on June 26, 1987, a closure plan amendment was submitted. The surface impoundments were then closed pursuant to the approved closure plan in September, 1987. The RFA report dated March 1989 identified four hazardous waste management units, 64 solid waste management units, and 15 areas of concern at the site.

Flying J Petroleums has installed a system of four collection lateral underdrains: two at the north end of the facility, installed in 1989, and two at the southern end, installed in 1991. These intercept free phase product and contaminated ground water in upper sand/till. The facility has also installed a ground-water recovery well in the lower sand to recover hydrocarbons and contaminated ground water.

EXPOSURE PATHWAYS

The highest calculated risk levels for each exposure scenario from highest to lowest are for soil

CONTAMINATION DETECTED AND CLEANUP GOALS

Media	Estimated Volume (yd^3)	Contaminant	Maximum Concentration	Action Level	Cleanup Goals	Point of Compliance
soil	4,500	benzo(a)anthracene pyrene lead				
ground water		benzene 1,2-dichloroethane lead				

gas, recovered ground water, and ground water. Under the most probable soil exposure scenario, ingestion of contaminated soil does not yet pose a health threat but inhalation of undiluted soil gas does. In addition, benzene in unsaturated soils may be transferred to ground water where it may pose a significant health threat. The ground water's naturally high salinity may result in adverse health effects based on residential ingestion and refutes the use of drinking water cleanup levels. Because site access is currently restricted and future residential use of the site is highly improbable, only offsite exposure to soil gas and ground water may represent an unacceptable health risk. Institutional controls established for the site and impacted areas offsite are sufficient to control the potential for exposure.

SELECTED REMEDY

The selected remedy includes revegetation of the site; soil vapor extraction (SVE) and catalytic oxidation of extracted off-gas; excavation and offsite disposal of lead-contaminated soil; operation of a dewatering well to enhance SVE in the upper sand; continued operation of the existing collection laterals to recover free product in the upper sand/till; operation of the existing recovery well and three additional recovery wells to remove free product from the lower sand; capture of dissolved hydrocarbons in ground water by pumping of recovery systems; removal of dissolved hydrocarbons in recovered ground water with a diffused aeration tray unit; and discharge of treated ground water to the sanitary sewer. The cost of the selected remedy is $4.25 million over 20 years. This cost does not include post-closure costs, which are estimated at $630,000 over a period of 30 years.

INNOVATIVE TECHNOLOGIES CONSIDERED

Soil vapor extraction was selected as one of the treatment technologies for the Flying J site to reduce residual hydrocarbon concentrations in unsaturated soils and minimize their potential to serve as a long-term source of dissolved hydrocarbon contamination.

PUBLIC PARTICIPATION

The dates of the public comment period were from November 10, 1993 through January 11, 1994. The period included a public meeting on December 7, 1993 at the city hall of Williston, ND. Both Flying J Petroleums and EPA Region VIII commented on the Statement of Basis documents. Flying J Petroleums agreed with the terms and conditions of both the post-closure permit and the SB, and proposed changes to some of the language in the documents. The Department made most of the suggested revisions. On January 6, 1994, EPA Region VIII requested that the public comment period be extended to January 25, 1994. EPA's concern related to the ecological risk posed by leaving wastes in place in the "beak" of the Old Williston Landfill, at SWMU #59. Region VIII contended that an inadequate ecological risk assessment failed to account for the danger of high hydrocarbon concentrations to endangered fish species inhabiting the nearby Little Muddy River. The Department cited evidence that they had taken these possible releases into consideration and declared that the leachability of hydrocarbons to the ground water from the soil left in SWMU #59 was low. The

Department also argued that any releases could not be solely attributed to the Flying J site because these hydrocarbons are also found in coal and naturally occurring crude oil in the area of the Little Muddy River.

NEXT STEPS

The final Post-Closure/Corrective Action permit was issued on February 18, 1994. The final design for the in-situ land treatment must be submitted within 90 days of receipt of the permit.

KEYWORDS	CONTACT
Ground water, soil; direct contact, ingestion (gw), inhalation; organics (PAHs), VOCs (benzene, 1,2-DCA); dewatering, excavation, innovative technology, soil vapor extraction (selected), institutional controls, offsite discharge	Neil M. Knatterud, Director North Dakota State Department of Health and Consolidated Laboratories Division of Waste Management P.O. Box 5520 Bismarck, ND 58502-5520 (701) 221-5166