Health Assessment for

PICKETTVILLE ROAD LANDFILL SITE

DUVAL COUNTY, FLORIDA

AUGUST 4, 1988

Agency for Toxic Substances and Disease Registry
U.S. Public Health Service

SUMMARY

The Pickettville Road Landfill Site (PRLS) is located in Duval County approximately 5 miles northwest of downtown Jacksonville, Florida. The site lies adjacent to two other waste disposal facilities and residential areas where groundwater serves as the primary source of potable water. The major contaminants found in groundwater, surface water, soil, and sediment include arsenic, cadmium, lead, flouranthene and pyrene. The primary environmental pathways for contaminant migration include groundwater, surface water, soil, air, and bioaccumulation in consumable plants and animals. Potential pathways of human exposure include ingestion of contaminated soil, groundwater, or biota, inhalation of fugitive dusts or vapors, or dermal absorption of soil, sediment, or surface water contaminants. Because of the lack of and inconsistencies with, quality assurance/quality control (QA/QC) data, results of sampling programs were used for qualitative purposes only. As a result, the public health impact of the various pathways of human exposure to contaminants cannot be determined.

BACKGROUND

A. Site Description

The Pickettville Road Landfill is a National Priorities List (NPL) site located in semi-rural Duval County, Florida, northwest of Jacksonville. The site consists of 52.5 acres, located in a former borrow pit which has been backfilled with a wide variety of residential, commercial, and industrial wastes. The site was operated on a limited basis from the 1940's until 1967, at which time the City of Jacksonville began using the site for a municipal dump.

In 1971 the site was dedicated to the disposal of hazardous and solid wastes. Wastes deposited in the landfill included waste oil, liquid acid waste from batteries, battery casings, light terpine sludge, and polychlorinated biphenols (PCB's). All waste disposal at the site ceased in July, 1977 and the site was closed in November, 1977 after backfilling, regrading, and seeding of the site. On-site erosion and leachate drainage to Little Six Mile Creek continued after site closure until additional backfilling and regrading was completed in July, 1983.

B. Site Visit

A site visit was not conducted by ATSDR staff members. Available data were determined to provide an adequate description of the PRLS and surrounding areas.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS
Contaminant Levels for Qualitative Use Only

Groundwater

Contaminant	On-Site	Private and Residential Wells
Arsenic	810 ppb*	BDL
Barium	440 ppb"	1110 ppb#
Benzene	34 ppb*	BDL
Benzo (b) flouranthene	<20000 ppb"	BDL
Bis(2-ethylhexyl)phthate	509 ppb"	33000J ppb"
Cadmium	91 ppb"	46 ppb"
Chromium	130 ppb*	BDL
Cyanide	400 ppb*	NA
Flouranthene	<20000 ppb"	BDL
Lead	65 ppb*	8 ppb#
Pyrene	<20000 ppb"	BDL
Sodium	NA	32900 ppb^

*-Sample collected in 1981
#-Sample collected in 1982
^-Sample collected in 1983
"-Sample collected in 1986
J-Estimated Value
ppb-parts per billion
NA-Not Analyzed
BDL-Below Detection Limit

Off-Site Surface Leachate 1983

Flouranthene	35 ppm
Pyrene	18 ppm

ppm-parts per million
Leachate samples collected in 1983.

Soil 1986

Contaminant	On-Site	Off-Site
Arsenic	15 ppm	2 ppm
Cadmium	3 ppm	40 ppb
Flouranthene	310 ppm	BDL
Lead	1300 ppm	3 ppm
Mercury	71 ppm	23 ppm
PCB-1260	200 ppb	BDL

Soil 1986

Contaminant	On-Site	Off-Site
Phenanthrene	165 ppm	BDL
Pyrene	240 ppm	BDL
Selenium	2800 ppm	BDL

ppm-parts per million
ppb-parts per billion
BDL-Below Detection Limit

Sediments Off-Site

Contaminant	1981	1986
Arsenic	BDL	28 ppb
Chromium	12 ppm	30 ppb
Lead	35 ppm	92 ppb
Mercury	70 ppb	BDL

ppm-parts per million
ppb-parts per billion
BDL-Below Detection Limit

C. PHYSICAL HAZARDS

Available documentation briefly mentioned that during remedial investigations explosive vapors were encountered while obtaining soil borings and well installation. Methane, an explosive gas, is often generated by bacterial decomposition of landfill debris. Lateral migration of methane into nearby low areas, such as basements, may occur and result in potentially hazardous conditions for local residents.

DEMOGRAPHICS

The PRLS is located in an area of mixed uses including residences, commercial establishments, and light industry. A shipyard waste disposal area, demolition landfill, and a cemetery are located northwest of the site, and several residences are located around the periphery of the site. Based on a United States Geological Service topographic map, last updated in 1982, there are over 300 residences and two schools located within a one mile radius of the site. The site lies in an area which is not served by a public water supply; therefore, private groundwater wells serve as the major source of water for local residents and businesses.

Local regulations prohibit the future construction of any buildings on the site. Access to the site is generally unrestricted and the site continues to be used for dumping.

EVALUATION

A. SITE CHARACTERIZATION (DATA NEEDS AND EVALUATION)

1. Environmental Media

Groundwater in and around the PRLS has been monitored through a series of sampling rounds since 1975. Prior to 1981, groundwater sampling was limited to three on-site monitoring wells. Since May 1981, groundwater samples have been collected from off-site monitoring and private wells in addition to on-site wells.

Prior to 1986, five of the eight monitoring wells were located in or adjacent to the northeast corner of the site and were determined by ATSDR to be inadequate fully characterize groundwater contamination. During a field reconnaissance by contractor in 1983, it was noted that several of the off-site monitoring wells were incorrectly grouted and would allow surface runoff to contaminate the groundwater being monitored. Off-site monitoring wells also lacked locks to restrict unauthorized use or tampering. In 1986, nine additional groundwater monitoring wells were put into operation, two of these were upgradient, six downgradient, and one on-site.

Because of reported inconsistencies with QA/QC procedures and data, results of the groundwater monitoring program were determined by the contractor to be of qualitative use only. Results of groundwater sampling were useful in identifying groundwater contaminants; however, data were not sufficient to evaluate contaminant levels.

Soil samples were collected from the upper six inches of soil during Remedial Investigations conducted 1981 and 1986. There were only two soil samples collected in 1981, both of these from on-site areas. In 1986 seven of the eight samples were obtained from on-site areas of obvious or suspected contamination. As with other sampling data provided to ATSDR for review, contaminant levels found in soil were determined to be of qualitative use only.

Sediments were collected from Little Six Mile Creek in two sampling rounds conducted in 1981 and 1986. Sediment samples collected in 1981 were from two sampling points, one upstream and one downstream from the PRLS. In 1986 additional sediment samples were collected from four locations on Little Six Mile Creek, one upstream, one downstream, and two points adjacent to the site.

Surface water samples were collected from the Little Six Mile Creek which drains the site and also forms the site's eastern boundary. Flow in Little Six Mile Creek is generally to the northeast; however, surface drainage is tidal. Leachate samples have also been collected from the PRLS. A number of Hazardous Substance List chemicals have been found in leachate and surface water samples.

On-site air sampling has not been done at the site. During 1982-1983 on-site investigation's air monitoring performed with a flow ionization organic vapor analyzer detected levels of unknown volatile organic compounds (VOC's) in excess of 100 parts per million. Investigations conducted in 1986-1987 monitored on-site and off-site total ionizable constituents in the air with a Photovac TIP meter. No measurable VOC air emissions were detected in the breathing zone of on-site or off-site areas.

2. Demographics and Land Use

Limited demographic and land use data were available to ATSDR to complete the health assessment on the Pickettville Road Landfill Site. More detailed data, such as private well inventories, will allow ATSDR to more accurately assess the health impacts of the site.

3. Quality Control and Quality Assurance

Specific quality assurance and quality control (QA/QC) data were not available for sample collection, handling, and analysis during Remedial Investigations. Because of reported QA/QC discrepancies, results of groundwater, surface water, and soil sampling programs conducted in 1985 and 1986 were determined, by the firm contracted by the EPA to conduct site investigations, to be of qualitative utility only.

B. ENVIRONMENTAL PATHWAYS

Environmental pathways for the site include groundwater, soil, air, surface water, sediments, and bioaccumulation. A number of contaminants have been identified in on-site and off-site groundwater. Groundwater around the PRLS serves as the primary source of drinking water and as such serves as major pathway for human exposure to groundwater contaminants. There are over 300 residences located within a one mile radius of the site, most of which are located northeast of the site and downgradient to the flow of the surficial groundwater aquifer.

Contaminants were also identified in surface water and sediments found in Little Six Mile Creek, a small creek forming the eastern boundary of the site and flowing through several nearby waste disposal and industrial sites. Preliminary hydrologic data indicate that groundwater from the surficial aquifer may be discharging into the creek. If there is a flow connection, then contaminants leaching from the site would enter the

surface water system. Little Six Mile Creek has a shallow gradient, with flow rate and direction influenced by tidal cycles. As a result, contaminants found in the creek's sediments and surface water may be attributable to off-site sources.

The site lies in an urban fringe area which may support hunting, fishing, and agricultural activities. Use of contaminated surface water and groundwater as a water source for livestock, game animal, or crop or garden irrigation may result in the bioaccumulation of contaminants in plant or animal tissues. Contaminants in sediments and soil may also bioaccumulate in plants and animals. Biota were not sampled for determination of contaminant levels.

During soil disturbing activities contaminants may be released into the atmosphere through volatilization of VOCs or the generation of contaminant-bound fugitive dusts.

C. HUMAN EXPOSURE PATHWAYS

There are a number of potential exposure routes by which humans may be exposed to contaminants from the PRLS. Although sampling data has been determined to be of qualitative use, preliminary sampling data has revealed a number of contaminants which may impact the public health of local residents. Groundwater, soil, and surface water should be resampled to determine if contaminant values are sufficiently high to impact human health. Agricultural products, livestock, fish, or native plants may bioaccumulate contaminants and adversely affect the health those consuming these foodchain entities.

Groundwater samples collected from residential wells and on-site and off-site monitoring wells indicate a number of contaminants. The site lies in an area where groundwater serves as the primary potable water source. Groundwater contaminants could impact on the health of local residents using groundwater for domestic or agricultural purposes. Access to the site is unrestricted; therefore, children living in adjacent residential areas may use the site. Preliminary surface soil sampling data revealed a number of contaminants which may, through dermal absorption, ingestion, or inhalation, affect human health.

Bioaccumulation of contaminants from groundwater used for irrigation, surface water, and sediments may result in another pathway for human exposure. The site lies in an area of substantial rainfall; however, residential gardeners may irrigate home gardens with local well water. Cadmium was detected in off-site groundwater and may bioaccumulate in vegetables and fruits grown in irrigated gardens. Fish and other aquatic biota found in the Little Six Mile Creek may bioaccumulate contaminants from sediments, surface water, and other media.

Inhalation of VOCs and fugitive dusts from the site may pose a public health threat. Air monitoring conducted in 1986-1987 indicate that levels

of volatilized VOCs were not detectable in on-site or off-site area breathing zones. On-site excavation may release contaminant vapors or generate contaminated dusts which could affect the health of nearby residents, site workers, and others, especially children, entering the site.

PUBLIC HEALTH IMPLICATIONS

Groundwater at the Pickettville Road Landfill Site is contaminated with a number of contaminants including arsenic, barium, cadmium, chromium, and lead. Use of local groundwater for potable and household uses may result in human exposure to groundwater contaminants. The site lies in an area not served by a municipal water system and local residents therefore rely on groundwater as the primary water source for potable and household uses. Historically, sampling data has detected a number of site related compounds in private wells located near the site; however, data are insufficient to evaluate contaminant levels and the extent of the contaminant plume.

Based on available information, we are unable to assess the public health implications, if any, that may be attributable to the Pickettville Road Landfill Site. Sampling data reveal a number of contaminants in on-site groundwater, and air, while samples collected from off-site areas reveal contaminants in groundwater, surface water, soil, and sediments.

CONCLUSIONS AND RECOMMENDATIONS

Groundwater, surface water, soil, sediment, and air sampling data indicated a number of contaminants were present; however, specific levels of contaminants could not be determined. Based on available information we cannot conclude whether or not the Pickettville Road Landfill site may affect the public health of local residents. This site is of potential health concern because of the risk to human health resulting from the possible exposure to hazardous substances at concentrations that may result in adverse health effects. As noted in Human Exposure Pathways Section above, human exposure to site contaminants may be occurring via groundwater, surface water, soil, sediments, air, and foodchain entities.

In accordance with CERCLA as amended, the Pickettville Road Landfill, Duval County, Jacksonville, Florida, has been evaluated for appropriate follow-up with respect to health effects studies. Since environmental sampling has some quality assurance limitations, the site still requires additional characterization. This site is not being considered for follow-up health studies at this time because no active pathway of human exposure can be defined. The site will be reevaluated following additional environmental sampling.

We make the following recommendations to protect the public health of local residents pending further site investigations:

1. Restrict public access to the PRLS to prevent unauthorized entry.

2. Determine contaminant type and levels in the environmental media, including on-site and off-site groundwater, surface water, soil, sediments, and air.

3. As further data on site contaminants become available, submit them to ATSDR for review and comments.

4. Perform monitoring to evaluate the extent of methane generation and migration into areas surrounding the PRLS.

5. During all remedial actions, workers should follow all applicable OSHA and NIOSH recommendations, guidelines, and regulations. Optimal dust control should be employed. For protection of nearby residents, real-time monitoring should be carried out at the worksite periphery during working hours for appropriate action levels.

PREPARERS OF REPORT

Environmental and Health Effects Reviewer:	Richard Earl Gillig, M.C.P. Environmental Health Scientist Environmental Engineering Branch
Regional Representative:	Casimer V. Pietrosewicz Senior Public Health Advisor Field Operations Branch
Typist:	Lorraine Adams Branch Secretary Environmental Engineering Branch

REFERENCES

Bowen, H.J.M., "Environmental Chemistry of the Elements," Academic Press, New York, 1979.

Sittig, Marshall, "Handbook of Toxic and Hazardous Chemicals and Carcinogens," 2nd Edition, Noyes Publications, 1985.

"Remedial Action Master Plan-Pickettville Road Site, Duval County, Jacksonville, Florida," NUS Corp., November 1983.

"Remedial Investigation Report-Pickettville Road Landfill, Jacksonville, Florida," Geraghty and Miller Inc., July 1987.

"Work Plan-Additional Site Characterization, Pickettville Road Landfill, Jacksonville, Florida," Geraghty and Miller Inc., August 1987.