Health Consultation

Forest Street Incinerator

Jacksonville, Duval County, Florida

CERCLIS # Unassigned

January 1997

Prepared by

Bureau of Environmental Toxicology
Division of Environmental Health
Florida Department of Health

Under a Cooperative Agreement With

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

Background and Statement of Issues

On November 8, 1996, the Environmental Protection Agency (EPA) requested the Agency for Toxic Substances and Disease Registry (ATSDR) to determine if a health threat exists at the Forest Street Incinerator site in Jacksonville, Florida. On November 21, ATSDR requested the Florida Department of Health make this determination. In this health consultation report we review the existing health and environmental data to determine if a health threat exists.

This five-acre site is in the City of Jacksonville, Duval County, Florida (Figures 1-3). It is two blocks north of the intersection of Interstate Highways 10 and 95, one mile west of downtown Jacksonville. It is bounded on the north by McCoy Creek Boulevard, on the south by Forest Street, on the east by Margaret Street, and on the west by Goodwin Street. A Head Start School occupies an area on the site along the western site boundary. A public playground occupies the southern half of the site. The northwest quadrant is used for parking by the Head Start School staff. The northeast quadrant of the site where the incinerator building used to be is now overgrown with weeds, fenced on three sides, and posted with hazardous waste warning signs. The areas south, east, and west of the site are residential. The area north of the site along McCoy Creek Boulevard is undeveloped [1].

The total population in the four census tracts within one mile of the site is about 11,952 (Figure 4). African-Americans make up about 59% of this population, Caucasians about 39%, and Hispanics about 2%. The median age is about 40 and the median annual family income is about $15,500 [2].

In the past, the City of Jacksonville operated a municipal incinerator on this site. The exact dates of operation are unknown. The City disposed of most of the incinerator ash off site, but buried some on site. In 1991, while investigating the site for use as a park, the City discovered high soil lead levels [3]. Additional investigations in 1994, 1995, and 1996 found incinerator ash, areas of high soil lead levels, and low levels of lead and chromium in the shallow aquifer ground water. These investigations also found elevated levels of lead in the soil northwest, north, and northeast of the site. There are no known wells within 0.5 mile of the site. Ground water flow in the shallow aquifer is northeast toward McCoy Creek [1,4,5,6].

Ash from municipal incinerators typically contains heavy metals (lead, arsenic, chromium, etc.) and complex organic chemicals such as polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs), and polychlorinated dibenzofurans (PCDFs) [7,8,9]. The City has not tested the soil for any of these complex organic chemicals.

In the following table we list the maximum soil contaminant concentrations found between 1991 and 1996:

Table 1. Maximum Soil Contaminant Concentrations
(0-1 foot below land surface)

Soil Contaminant	Number of Soil Samples	Maximum Soil Concentration (mg/kg)	ATSDR Soil Comparison Value (mg/kg)*
Arsenic	17	5	20
Barium	17	702	4,000
Cadmium	17	3	40
Selenium	17	10	100
Chromium	17	9	60
Lead	45	2,930	Not Established
Mercury	17	2	20
Silver	17	4	300

* Concentrations above the ATSDR comparison value are not necessarily a public health threat, but require further evaluation.
mg/kg = milligrams of contaminant per kilogram of soil
Sources: [1,4,5,6]

In 1995 or 1996 the City of Jacksonville removed lead-contaminated soil from the playground on the southern half of the site and replaced it with clean fill [10]. In February 1996, the Duval County Health Department screened children (four to six years old) at the Head Start School for blood lead levels [11]. Using the capillary method, they found that of 178 children screened, only three (2%) had a blood lead level of more than 15 μg/dL (micrograms of lead per deciliter of blood). The blood lead levels in the other children were mostly in the 3 to 7 μg/dL range. 15 μg/dL is the blood lead level the Centers for Disease Control and Prevention recommends education to reduce potential lead exposures and environmental investigations/intervention [12]. The blood lead levels for the three children with more than 15 μg/dL were 16, 17, and 19 μg/dL. The source of lead exposure for these three children is unknown. Approximately 9% of all the children screened in Duval County have more than 15 μg/dL [13].

On December 2, 1996, Randy Merchant and Julie Smith of the Florida Department of Health visited the site. They were accompanied by representatives of the Duval County Health Department and the Florida Department of Environmental Protection. They observed the site and the adjacent area. They observed the following:

- Most of the nearby residents are African-American.
- The area around the site is predominately low-income and residential.
- Nearby residents were growing vegetables (corn, "greens," etc.) in an area northeast of the site. This area has elevated levels of lead in the soil. The City has not tested these vegetables for site-related contaminants.
- The northeast quadrant of the site, where the incinerator was, is fenced on three sides but is accessible on the west side by walking over a six-foot high earthen berm.
- Although the community has not been surveyed, there are no reports of community health concerns documented by the county health department.

Discussion

Air - Since there is no air monitoring data when the incinerator was in operation, we are unable to assess the public health threat from past inhalation exposures (breathing).

Ground Water - Since it is unlikely that anyone is using the contaminated ground water, we did not evaluate its potential public health threat.

Soil - To evaluate the potential health effects from contact with the contaminated soil, we estimated exposure from incidental or inadvertent soil ingestion. Inadvertent soil ingestion among children may occur through the mouthing of objects or hands. Mouthing behavior is considered to be a normal phase of childhood development. Adults may ingest soil particles that adhere to food, cigarettes, or their hands.

To estimate incidental soil ingestion for children, we assumed they were between one and six years old and weighed an average of 15 kilograms. We also assumed children ingested an average of 200 milligrams of soil (the weight of several grains of sand) per day for six years. To estimate incidental soil ingestion for adults, we assumed they weighed an average of 70 kilograms and ingested an average of 50 milligrams of soil (the weight of a few grains of sand) per day for 35 years. For both children and adults, we assumed they were exposed to soil with the highest lead concentration (2,930 mg/kg). This concentration was found in the partially fenced northeast quadrant of the site. The highest concentration found outside of the northeast quadrant was 1,180 mg/kg.

Long-term incidental ingestion of soil with lead at the highest measured concentration (2,930 mg/kg) could interfere with proper blood formation. Short-term (21 days) human studies with lead at concentrations similar to the maximum found at this site have shown decreases in an enzyme (ALAD) necessary for proper red blood cell formation (heme biosynthesis) [11]. Children and adults who trespass on the most contaminated

part of the site (northeast quadrant) may be exposed to lead at levels that may affect heme biosynthesis. Based on blood lead testing, the children at the Head Start School do not, however, appear to have been exposed to lead. Therefore, these children do not appear to be at risk.

Plants - Since there are no data on contaminant levels in plants, we were unable to evaluate the public health threat from eating vegetables grown in contaminated soil.

Conclusions

1. Based on the levels of lead in the soil, we consider this site a public health hazard. Long-term incidental soil ingestion by children or adult trespassers on the most contaminated part of this site (northeast quadrant) could interfere with proper blood formation. The concentrations of the other metals found in the soil are not a public health hazard. Although the northeast quadrant of the site is fenced on three sides, the six-foot earthen berm on the west side is inadequate to prevent access. Although we did not see any overt evidence of site trespass, site access should be restricted completely because of high soil lead levels.

2. The City of Jacksonville has not sampled the soil at this site for complex organic chemicals typical in incinerator ash such as polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs), and polychlorinated dibenzofurans (PCDFs).

3. Nearby residents may be exposed to site-related metals from eating vegetables grown in contaminated soil. There are no data on contaminant levels in plants.

Recommendations

1. Restrict access to the northeast quadrant of the site. The City of Jacksonville should completely restrict access to the northeast quadrant of the site where soil lead levels are the highest. Although the northeast quadrant is fenced on three sides, the six-foot high earthen berm on the west side is inadequate to restrict access.

2. Sample site surface soil for complex organic chemicals. The City of Jacksonville should sample site surface soil (0-3 inches deep) and analyze for complex organic chemical typically found in incinerator ash such as polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs), and polychlorinated dibenzofurans (PCDFs).

3. Test vegetables grown in contaminated soil. The City of Jacksonville should test vegetables grown in contaminated soil northeast of the intersection of McCoy Creek

Boulevard and Margaret Street. They should test the vegetables for metals and other site-related contaminants.

The conclusions and recommendations in this report are based on the information reviewed. If additional information becomes available, we will evaluate it to determine what, if any, additional actions are necessary. The conclusions and recommendations in this report are site specific and are not necessarily applicable to other sites.

Health Consultation Author

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References

1. Preliminary Contamination Assessment Report, Forest Street Incinerator Site. RSDI Environmental, Inc. Project No. 94011.901. November 3, 1994.

2. 1990 Census Data Files, Bureau of Census, U.S. Department of Commerce, Washington, D.C.

3. Real Estate Site Assessment, Forest Street Incinerator Site. GWL Environmental, Inc. Project No. 1267.06SA. January 1992.

4. Contamination Assessment Report Summary, Forest Street Incinerator. Dominion Professional Environmental Geosciences. November 20, 1995.

5. Florida Department of Health and Rehabilitative Services. Letter to Ms. Mary Nogas, Florida Department of Environmental Protection from Mr. Todd Clark regarding six soil samples at the Forest Park Head Start School. February 15, 1996.

6. Dominion Professional Environmental Geosciences. Letter to Lary Perkins, Jacksonville Solid Waste Disposal Division from Paul D. Laymon regarding soil lead

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7. Agency for Toxic Substances and Disease Registry, Toxicological Profile for Selected PCBs (AROCLOR-1260, -1254, -1248, -1242, -1232, -1221, and -1016) (TP-88/21). Atlanta: ATSDR, June 1989.

8. United States Environmental Protection Agency. Estimating Exposure to Dioxin-Like Compounds, Volume I: Executive Summary, External Review Draft. EPA/600/6-88/005Ca. June 1994.

9. Agency for Toxic Substances and Disease Registry, Toxicological Profile for Polycyclic Aromatic Hydrocarbons (PAHS) (Update). Atlanta: ATSDR, August 1995.

10. Mary Nogas, Florida Department of Environmental Protection. Personal communication to Randy Merchant, Florida Department of Health. December 2, 1996.

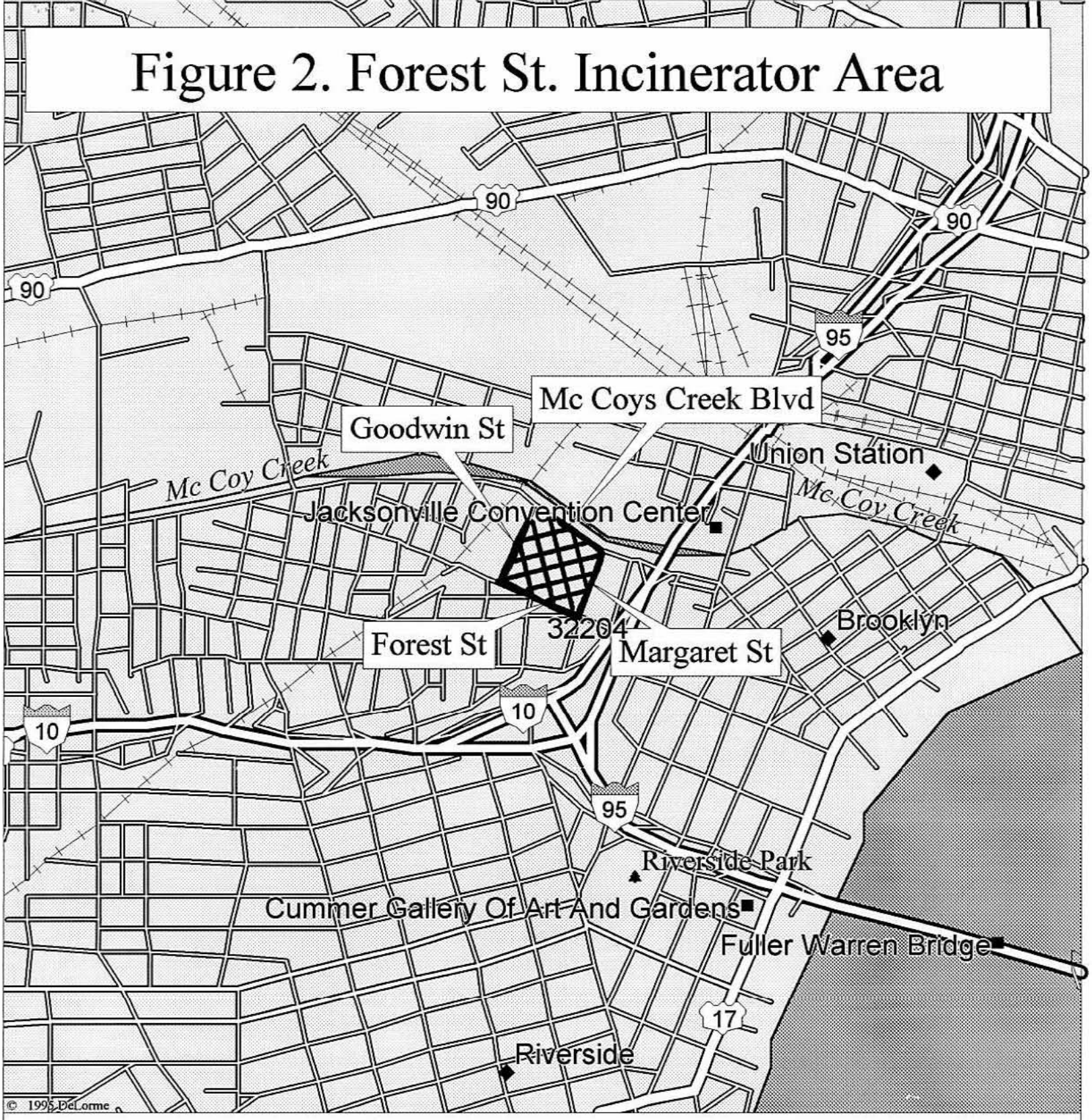
11. Duval County Health Department. February 1996 Lead Testing Files.

12. Centers for Disease Control. Preventing Lead Poisoning in Young Children. US Department of Health and Human Services, Public Health Service, October 1991.

13. EMCON. Health Evaluation, Mary McLeod Bethune Elementary School/Browns Dump Site [Jacksonville, Florida]. July 9, 1996.

14. Agency for Toxic Substances and Disease Registry, Toxicological Profile for Lead (TP-92/12). Atlanta: ATSDR, April 1993.

Figure 2. Forest St. Incinerator Area



Mag 14.00
Thu Jan 16 18:25 1997
Scale 1:15,625 (at center)
1000 Feet
500 Meters

- Secondary SR, Road, Hwy Ramp
- Major Connector
- US Highway
- Interstate/Limited Access
- Railroad
- Point of Interest
- Park or Reservation
- Locale
- Population Center
- Lake, Ocean, Large River
- River, Canal

MAP OF FLORIDA

SHOWING COUNTY OF INTEREST

Figure 1

RSDI Environmental, Inc.

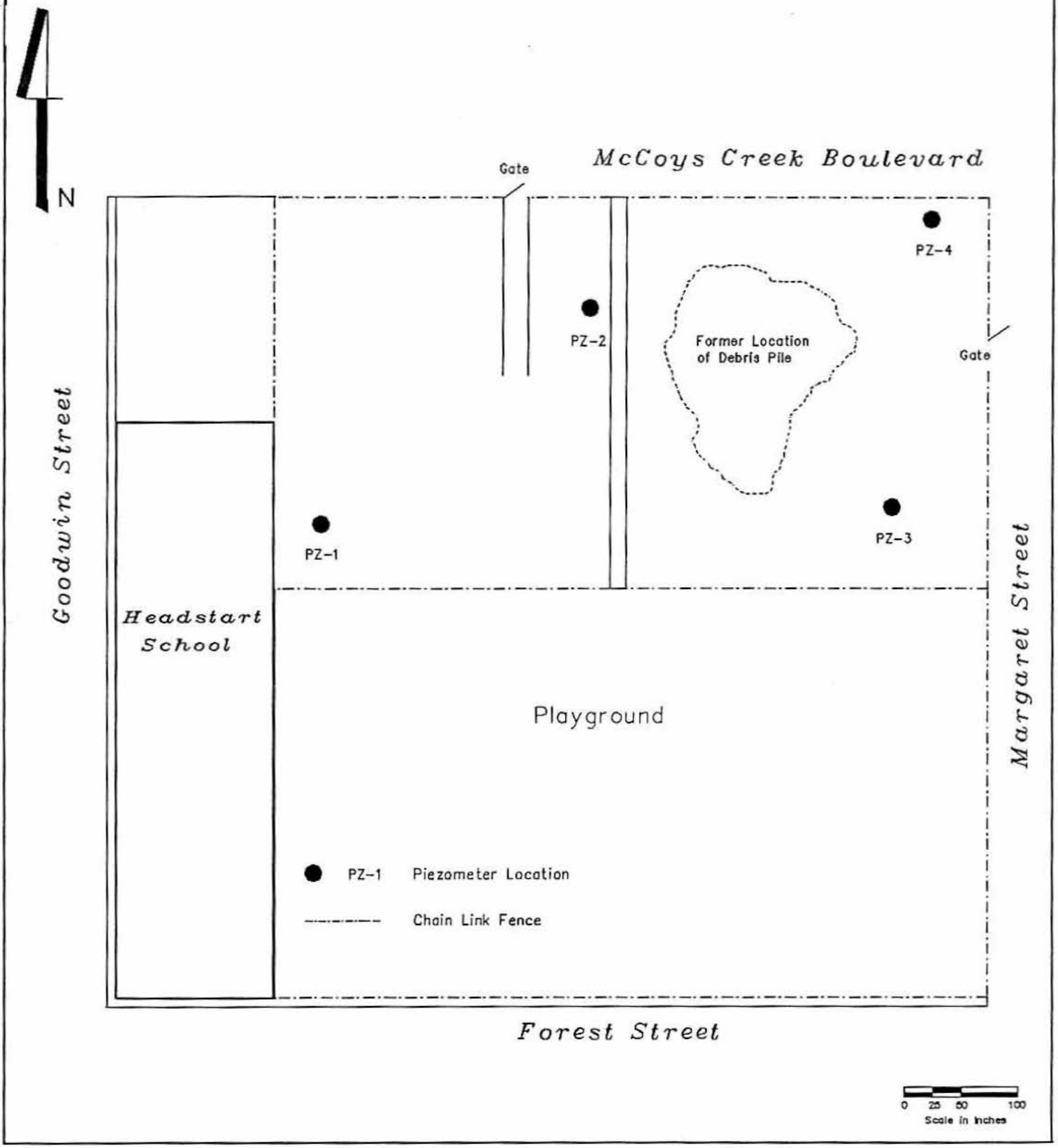
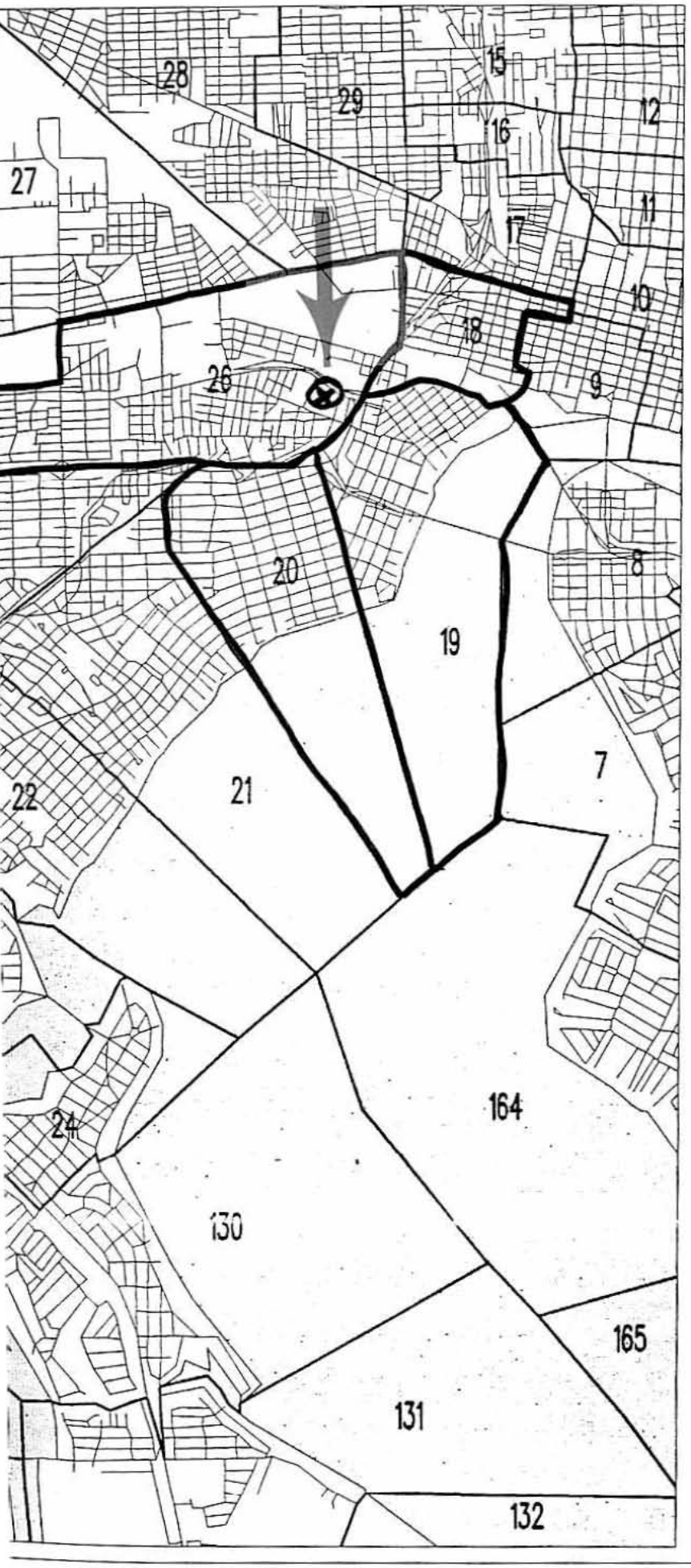


Figure: 3	Site Map
Page:	Forest Street GAS Jacksonville, Duval County, Florida
Scale: 1" = 125'	



Census Tracts

Duval County

Inset 3

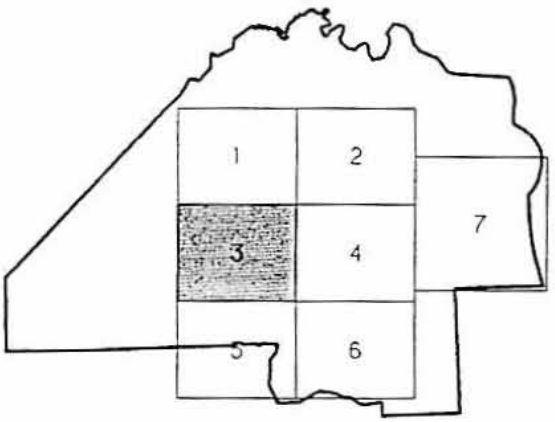
Water Features

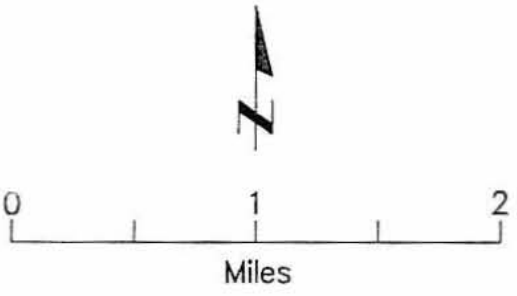
Tract Boundary

Road Features

123.01 Tract Number

Vessel Tract





The Florida Legislature

Source: U.S. Census Bureau's TIGER/Line Files.
Albers Equal-Area Projection
July, 1991

Figure 4

CERTIFICATION

This Health Consultation was prepared by the Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

Technical Project Officer
Superfund Site Assessment Branch (SSAB)
Division of Health Assessment and Consultation (DHAC)
ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation and concurs with its findings.

Chief, SPS, SSAB, DHAC, ATSDR