Health Assessment for

62ND STREET SITE

TAMPA, HILLSBOROUGH COUNTY, FLORIDA

CERLIS NO. FLD980728877

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

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HEALTH ASSESSMENT
62ND STREET SITE
TAMPA, HILLSBOROUGH COUNTY, FLORIDA

Prepared by:
State Health Office
Florida Department of Health and Rehabilitative Services

Prepared for:
Agency for Toxic Substances and Disease Registry (ATSDR)

SUMMARY

The 62nd Street National Priorities List (NPL) site is located in Tampa, Hillsborough County, Florida. Contaminants of concern found at the site are metals and volatile organic compounds (VOCs). This site is of potential public health concern because of the risk to human health from possible exposure to hazardous substances at levels that may result in adverse health effects over time. Human exposure to these contaminants may occur via ingestion and dermal absorption of contaminated ground water, surface water, sediments, and soils. A health effects study for this site is not recommended at this time.

BACKGROUND

A. SITE DESCRIPTION

The 62nd Street site is a five-acre abandoned industrial waste dump located north of Columbus Drive and west of 62nd Street in Hillsborough County, Florida. The site is bounded on the west by fish ponds and a marshy area, on the south by an automobile junk yard, on the east by private homes, and on the north by a densely wooded area.

The site was originally mined for sand. Site excavations were subsequently used by several companies in Tampa to dispose of various waste materials, including shredded automobile parts, batteries, waste cement, kiln dust, and kiln liners. Several ponds are present on site, and rainfall run-off at the site temporarily ponds in the southwest corner. Current site owners are able to move vehicles onto the site only after the area dries out after rainfall.

The site came to the attention of the Hillsborough County Environmental Protection Commission in 1976 when severe fish kills occurred in the Peninsular Fisheries breeding ponds on the western side of the dump. The site has been closed since 1976, but unauthorized dumping of household garbage persisted for several years after the site closed. Presently, fencing around the property prevents dumping.

A Final Remedial Investigation Report (RI) was issued in November 1986, and was revised in September 1987. Due to the expanded scope of feasibility studies, as required by the Superfund Amendment and Reauthorization Act (SARA), the Florida Department of Environmental Regulation (DER) decided to resolicit for a contractor. Field work for the feasibility study should begin in January 1989. The target date for finishing this study is September 1989.

. SITE VISIT

A site visit was conducted by staff from the HRS Health Office in November 1987. The densely vegetated site was surrounded by an eight foot chain-link fence on three sides and a barbed wire fence and dense vegetation on the west side. The road leading to the site was littered with debris and junked automobiles were observed south of the site. Most of the waste material on site had been buried, although the southern portion of the site is currently being used as a storage area for junked cars. The present owner of the site lives just south of the site, and the south gate to the site is not kept locked.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

A. ON-SITE CONTAMINATION

Surface water, ground water, and soil sampling were described in the RI report of November, 1986. Contaminants were also measured in the ground water and surface water field blanks; therefore, water sampling results from the RI are suspect. Post-RI sampling revealed the presence of contaminants that were not tested for in the RI study.

Data from the RI and post-RI sampling are included in Table 1. All monitoring points within approximately ten feet of the site boundaries were considered on site for the purposes of this Health Assessment. The ff-site sediment samples came from fish ponds which border the site.

B. OFF-SITE CONTAMINATION

Table 1 contains the results of off site testing of ground water, surface water, and sediments from the RI. As noted above, water sample results are suspect because ground water and surface water field blanks contained contaminants. These media should be retested because additional contaminants were found as a result of post-RI analyses.

C. PHYSICAL HAZARDS

The physical hazards posed by this site include partially buried debris and trash similar to those hazards normally associated with former waste disposal facilities. The present owner stores junked cars on the site. There were no other physical hazards identified on the site.

DEMOGRAPHICS

The population of the East Lake/Orient Park neighborhood, in which the site is located, is approximately 5,500 persons. The area east of the site is zoned institutional/residential and the area south of the site is zoned commercial/light industrial. In the commercial/light industrial area are restaurants, offices, a currently inactive fish farm, another inactive landfill (the Kassouf-Kimerling NPL site), a traffic sign storage area, and an automobile junk yard. The area immediately north of the site s uninhabited and is densely vegetated. Single family homes are located directly across a two-lane road east of the site.

otential receptors of contaminants transported in the air, the surficial aquifer or the Floridan aquifer include nearby residents, and fauna or flora on the site or in the immediate vicinity of the site. The RI report noted that it is extremely unlikely that anyone in the vicinity of the 62nd Street site uses shallow ground water for any type of water supply or for recreation. There were no discharge points noted from the shallow aquifer, other than the fish ponds. All the residents in the vicinity of the site use potable wells in the Floridan for their water supply. Some homes may use bottled water for drinking, but the majority use well water for drinking, cooking, bathing, and irrigation. There are nearly 300 wells in the area which are permitted for consumptive use.

EVALUATION

A. SITE CHARACTERIZATION (DATA NEEDS AND EVALUATION)

1. Environmental Media

Ground water contamination was not adequately characterized by information gathered during the RI or Post-RI testing. RI sampling included shallow monitoring wells and Floridan monitoring wells on site and ten private potable wells off site (both background and downgradient). However, the RI field blank was contaminated and the RI water sample results are suspect. Post-RI sampling only included the shallow and Floridan monitoring wells on site, but these test results (June 1987) indicated the presence of contaminants in the on-site ground water that were not analyzed for as part of the RI. For these reasons off-site surface water and ground water monitoring points should be resampled and their analyses should include a broader analytical suite.

Surface water samples were taken as part of the RI but field blanks were contaminated. Surface water was not sampled in post-RI testing, therefore, surface water contamination has not been adequately characterized. The reported surface water flow direction is to the southwest.

Nine soil borings and 12 test pits were sampled on site as part of the RI. Information gained from these samples were adequate for characterization of on-site soil contamination but a broader analytical suite may also reveal additional contaminants in soil. Sediments were sampled off site from two fish ponds. Because these pond sediments contained lead and polychlorinated biphenyls (PCBs) at levels which have health concerns (for ingestion of soil), other soil or sediment samples should be taken off site to adequately characterize the extent of soil contamination.

Air monitoring was not done.

2. Demographics and Land Use

The RI adequately discusses the demographics and land use of the area in the proximity of the site. If resampling of off-site potable wells detects a contamination plume in the Floridan Aquifer, a well survey with

ocations of the Floridan Aquifer wells would aid in the location and monitoring of wells that could be affected by the plume in the future.

3. Quality Assurance/Quality Control (QA/QC)

The Quality Assurance and Quality Control data that were included in the RI and post-RI samples consisted of the results for the analyses of several blank and duplicate samples. Cadmium and methylene chloride were detected in the RI ground water and surface water field blank, and reviewers of the data expressed concern over the validity of other water samples which contained these constituents. The post-RI water samples field blank contained no metals or compounds in excess of guidance levels. The conclusions presented in this health assessment are based on surface water, sediment and soil data from the RI, and on-site ground water data from post-RI analyses. The validity of these conclusions is, therefore, dependent on the quality of the data provided.

B. ENVIRONMENTAL PATHWAYS

The environmental pathways of greatest potential concern are those that allow movement of contaminants off the site, where greater numbers of people may be exposed. These pathways include: 1) rainfall run-off which may carry contaminated sediments and soils, 2) air movement of contaminated dust or vapors, and 3) ground water movement of contaminants.

The contaminants of soil and sediments on the site are arsenic, barium, lead, PCBs and polycyclic aromatic hydrocarbons (PAHs). The existence of contaminants in soil can serve as a reservoir for further ground water contamination because of the ability of contaminants to move as sediments or solvents in water. Rainfall run-off causes surface water and sediments to pond in the southwestern part of the site, which prevents the junk yard owner from moving vehicles onto the site. After this area dries, vehicle movement could cause contaminants to become airborne.

Piezometric tests have established the hydraulic connection between the fish ponds west of the site and on-site surficial ground water. The potentiometric data of the shallow aquifer from the RI shows a high point at the northeast corner of the site and a divide oriented in a southwest-northeast direction. Ground water flow on the west side of the divide is west, and on the east side of the divide is to the southeast.

The surficial deposits at the site are Pliocene and Quarternary-aged marine terrace sand deposits. These sands were excavated prior to waste disposal at the site and are no longer continuous across the site. The RI determined that the entire vertical column of sand had been excavated in some places, and the buried wastes now lie directly in contact with the Hawthorn Formation that underlies the sands. The surficial sands (and buried wastes) vary from 13 to 20 feet thick, and the ground water flow rate through these ranges from 62 to 193 feet per year.

he surficial layer is underlain by the marine Hawthorn Formation clayey sands and limestones which range from 7 to 12 feet thick. Portions of the

awthorn Formation are made up of low permeability clay lenses which locally confine the underlying Floridan Aquifer which is the main source of potable water in the area.

The upper portion of the Floridan Aquifer is locally comprised of the Tampa Limestone. Post-RI data indicate that metals have been detected at levels of health concern in the Floridan Aquifer on site. These contaminants include cadmium, chromium, manganese and nickel. Because these data did not establish background levels for the Floridan Aquifer, it is difficult to interpret what they mean, especially in light of the conflicting interpretations of the hydrogeologic characteristics of the local stratigraphy. According to the RI, there is a downward component of vertical water movement through the Hawthorn into the Floridan Aquifer, and recharge of the Floridan Aquifer takes place in the area that encompasses the site. On-site ground water flow in the Floridan Aquifer is to the south-southwest. However, in the RI, ground water levels measured in the Floridan Aquifer consistently varied only four inches or less lower in elevation than the shallow aquifer water levels. On one of the three RI sampling dates, one of the Floridan Aquifer wells had a higher ground water elevation than the corresponding shallow monitoring well.

These ground water levels indicate the presence of a low hydraulic head difference, or a reverse hydraulic head which may slow downward migration of ground water or may lead to migration of ground water upward from the loridan to the shallow aquifer. Artesian flow or lack of downward flow ay also initiate discharge of the surficial aquifer to surface water.

Factors which may increase the rate of ground water migration downward include improperly completed area wells, droughts, increases in waste mobility due to pH changes and ground water flow discontinuity. Air movement of contaminants at the site has not been addressed and may not be of great concern because most of the contaminants are buried.

C. HUMAN EXPOSURE PATHWAYS

Contamination of environmental media (above) constitute the following potential human exposure pathways.

1. Inadvertent ingestion and dermal absorption of contaminants from affected surface water and sediments may eventually be the human exposure pathways of greatest concern because geologic conditions cause shallow ground water to recharge the fish ponds. Fish are known to live in the 150 abandoned fish breeding ponds, however, food chain contamination via bioaccumulation has not been established or addressed for this site. Also, ponded surface water and sediments occur on the part of the site that is now used as junked car storage.

2. Incidental ingestion, inhalation and dermal absorption of contaminated soil may occur on site and off site. Site workers, trespassers or persons coming in contact with sediments from the abandoned fish ponds are at risk of exposure to arsenic, lead and

PCBs. In addition to these contaminants, barium and PAHs are also present in sediments on site.

3. Ingestion and dermal absorption of contaminated ground water is also a potential human exposure pathway. Post RI analyses confirm that both the shallow aquifer and the Floridan Aquifer show on-site contamination. Off-site analyses as part of the RI are suspect, and the RI was unable to make a connection between the site and water used in potable wells. For these reasons, even though 10 off-site potable Floridan wells were monitored as part of the RI, consumption of ground water as a health concern can only be partially addressed.

   The surficial aquifer is not used as a potable water source. Because of the small difference in the hydraulic head between the Floridan Aquifer and the surficial aquifer, contaminants should travel downward very slowly or may show artesian characteristics. If metal concentrations detected in the Floridan Aquifer represent background levels, use of this aquifer as a potable water source may not be appropriate. Altered geologic conditions, (that is a difference in potentiometric surfaces which would favor downward movement of contaminants) may result in future human exposure via use of potable wells in the area.

PUBLIC HEALTH IMPLICATIONS

The contaminants of concern, as listed in Table I, include metals, and a variety of VOCs and semi-VOCs. There is no documented human exposure to these compounds at the present time, but human contact may occur in the future.

Exposure to the levels of arsenic, barium, benzene, cadmium, chlorobenzene, chromium, lead, manganese, and nickel present in the on-site ground water may adversely affect public health. The closest domestic water supply well is within 100 feet down gradient of the site, but because of insufficient data, the potential for health concerns related to off-site consumption of water from the Florida aquifer cannot be addressed at this time. The following paragraphs are toxicologic summaries of the contaminants found in on-site shallow ground water and in the Florida Aquifer.

Arsenic valence was not indicated in the sample results but the relative toxicity is greater for arsenite 3^+ than arsenate 4^+. Arsenic exposure at relatively low levels may affect the liver causing portal hypertension, cirrhosis and cancer. Arsenic has been detected at levels of concern in the on-site shallow aquifer. Chronic arsenic exposure in children may lead to hearing loss and mental retardation. Skin abnormalities, lesions, cancer and contact dermatitus have also been related to low levels of arsenic exposure. Blackfoot disease, a vascular condition which may progress to gangrene of the extremities, is observed with endemic arsenism in Taiwan (Sittig, 1985).

Barium has been detected at levels of concern in the soil and ground water. Short term exposures are know to impact the heart,

gastrointestinal tract and the neuromuscular system. Much of the impact is from an increased excitability of muscle tissue. Inhalation exposures have resulted in benign pneumoconiosis (Clement Assoc., 1985) and pulmonary nodulation. Animal experimentation has shown a direct relationship between barium intake and high blood pressure, however, human epidemiological studies have failed to demonstrate this relationship.

Benzene has only been detected at levels of concern in the on-site shallow aquifer. Benzene is a know human carcinogen. Long term low level exposures may adversely affect the central nervous system and blood stream. Blood disorders linked to benzene exposure include anemia and bone marrow disturbances and occupational epidemiologic investigations have identified significant increases of leukemia in workers exposed to benzene via inhalation (IARC, 1982).

Cadmium has been detected on site in the shallow aquifer and in the Floridan Aquifer. Some metals are insoluable in water, but cadmium is relatively mobile in water. Toxic effects in humans attributed to cadmium exposure include chronic kidney dysfunction, anemia, pulmonary disease, possible effects on the endocrine system, defects in sensory functions and bone damage. Animal experiments have shown that cadmium is teratogenic but it is uncertain if it is carcinogenic in animals or humans exposed via ingestion (Clement Assoc., 1985).

Chlorobenzene has been detected on site at levels of concern in shallow ground water. Like many organic solvents, chlorobenzene is a central nervous system depressant to humans, but no chronic neurotoxic effects have been reported. Occupational studies suggest that chronic exposure to chlorobenzene vapors may cause blood poisoning, excess fat in the blood and heart disorders. Chlorobenzene has been linked to liver cancer in mice and has also caused liver damage and kidney damage in experimental animals (Clement Assoc., 1985).

Chromium has been detected at levels of concern in the shallow ground water and Floridan Aquifer on site. Chromium 6^{+} has been linked with liver and kidney damage, internal hemorrhage, dermatitis and respiratory damage (Clement Assoc, 1985). Injuries related to industrial exposure (inhalation exposure) include diseases of the nose and increased cancer risk.

Lead has been detected at levels of concern in on-site shallow ground water, on-site soils and in off-site soils and off-site surface water. Lead exposure at low levels may affect organ systems, and low blood levels have been associated with high blood pressure (no apparent threshold value). Increased risk of stroke, heart attack (and death) have also been reported at low levels of exposure (Hammond and Beliles, 1980). Children are especially susceptible to lead toxicity because they have greater sensitivity to lead, and they absorb greater relative amounts via the intestine. Repeated low doses may accumulate to toxic levels because lead is excreted very slowly (EPA, 1985a). Lead exposure may also adversely affect brain development and function in children (CDC, 1985a).

anganese has been detected at levels of concern in on-site shallow ground water and in the Floridan Aquifer. In humans, chronic exposure to manganese causes degenerative changes in the central nervous system in the form of uncontrollable tremors; liver damage also occurs. Acute exposure causes lung damage. No studies have shown carcinogenic, teratogenic or reproductive effects in humans (Clement Assoc., 1985).

Nickel has been detected on site at levels of concern in the shallow ground water and the Floridan Aquifer. Several nickel compounds are mutagenic and can cause cell transformation. In humans, nickel and nickel compounds can cause sensitization dermatitus and occupational exposure has been linked to excess cancer of the lung and nasal cavity. The chronic toxicity of nickel to aquatic organisms is high (Clement Assoc., 1985).

PCBs have been detected at levels of concern on site and off site in soils and sediments, and off site in surface water. Both skin absorption and inhalation/ingestion exposures to PCBs may lead to liver toxicity and chloracne in humans. Other chemical symptoms of chronic exposure include dark spots on the skin, slowing of nerve impulses in the extremities, blindness, swelling due to water retention, nausea, vomiting and abdominal pain (Gosselin **et al**, 1984). PCBs are readily absorbed from the gastrointestinal tract and are stored in fats.

PAHs have been detected at levels of concern on site in soils and sediments. Like PCBs, PAHs are readily absorbed via the gastrointestinal ract, respiratory system and the skin. PAHs initially concentrate in the idney and liver and are stored in the fat. Animal experimentation has demonstrated the ability of PAHs to increase the incidence of cancer via ingestion, and PAHs have been implicated in the induction of lung cancers in cigarette smokers and tar-roofing workers. (Weisberger and Williams, 1980). Trihalomethanes have been detected at levels of concern in on-site, shallow ground water. There is suggestive evidence from epidemiological studies that exposure to chloroform and other trihalomethanes is associated with an increased incidence of bladder tumors in humans. Other toxic effects of chloroform include central nervous system depression: eye, skin, and gastrointestinal irritation; damage to the liver, heart and kidneys (Clement Assoc.,1985).

Potential human exposure pathways to on-site soil are ingestion, inhalation of suspended particles and dust, and direct dermal contact. Arsenic, barium, lead, PCBs and PAHs are present in the on-site sediments and soil at levels which may pose a potential health concern to trespassers, remediation workers and possibly the present owners of the site. Interactions between arsenic, barium and lead may increase the chemical specific toxicity of these metals, thereby leading to a potential increase in the overall toxicity and adverse health effects resulting from exposure to on-site soil. Current information on site conditions indicates that the owner of the junk yard that borders the site uses this area as part of the business, and that the gate to the fence in this area is not kept locked. A chain-link fence borders three sides of the site and the west side is bounded by dense vegetation and a barbed-wire fence. ite access could be restricted with the cooperation of the current owner,

owever current use of the site as part of a business facilitates human contact with on-site soil.

Because on-site soils contain barium, lead, PCBs and PAHs at levels of health concern, future off-site testing in the area of the site should address soils in areas of surface water soil deposition. Information on the topography of the site indicates that a berm exists on the west side of the southwestern portion of the site. Therefore contamination in the fish pond sediments is probably attributable to ground water which flows into these ponds and not sediment run-off.

Exposure to on-site or off-site contaminates via wind blown particles or airborne vapors have not been addressed.

Further testing is needed to confirm the suspect surface water on-site and off-site analytical results of the RI. Surface water sediments both on and off site contained arsenic, lead and PCBs. On-site sediments also contained barium and PAHs. There are no known receptors at present for on-site surface water or for sediments (on and off site). There is a possibility that contaminants could bioaccumulate in the off-site fish ponds but no biological studies or food chain studies have been carried out with respect to this site, and the RI did not report on whether these ponds could be or were used for fishing.

CONCLUSIONS AND RECOMMENDATIONS

his site is of potential public health concern because of the potential risk to human health resulting from possible exposure to hazardous substances at levels that may result in adverse health effects over time. As noted in the Human Exposure Pathways section, exposure to lead and PCBs may occur off site via ingestion or dermal absorption. Off-site ground water testing has not revealed contaminants at levels of concern (but RI ground water data may not adequately characterize the site). Therefore, ground water remains a potential pathway for human exposure. On-site contaminants at levels of concern include lead, PCBs and PAHs in sediments; lead and PCBs in surface water; lead and other metals, benzene, chlorobenzene and trihalomethanes in shallow ground water; and metals in the Floridan aquifer. The population at potential risk of exposure to sediments and surface water on the site includes the present owners of the site who use the southern half of the site as a storage area for junked cars, and trespassers. Remediation workers (if the site is remediated) will be at risk of exposure to contaminants in sediments, surface water and shallow ground water.

Surface water appears to be a primary environmental pathway for migration of contaminants off the site. However, data from the on-site Floridan aquifer monitoring wells suggest that some contamination from the site may have reached the Floridan aquifer. Viable data has not been obtained for off-site domestic (Floridan Aquifer) wells. Because of Quality Assurance problems with the RI sampling, it is only possible to partially address health concerns occurring from possible exposure to contaminants via otable water.

The following suggestions are recommended to protect public health from potential risks resulting from exposure to hazardous substances present at the 62nd Street site.

1. Regularly monitor off-site ground water. Periodically sample the domestic water supply wells to determine if off-site contaminant migration is occurring which may adversely affect the health of area residents.

2. Regularly monitor surface water on and off the site.

3. If surface and ground water monitoring reveals contaminants at levels of concern for health, then biological monitoring is also suggested to ensure that surface water contaminants, including those in the sediments, will not result in food chain contamination. Specifically, this should include a survey of the type of edible fauna (fish and amphibians) or flora in the area of the site, determination if these are actually consumed, and then samples of the portions of those organisms that are consumed should be tested.

4. Advise present owner of the site to keep the southern gate of the site locked to restrict site access.

5. Because the local source of potable water, the Floridan Aquifer, occurs 35 feet below land surface, consider recommending that no drinking water wells be installed on the site and in the path of the contamination plume (still to be delineated).

6. A well survey should be done so that if a ground water contamination plume is identified, provisions can be made to replace the drinking water of potable well users down gradient of the plume.

7. As part of the delineation of the contamination plume, additional testing needs to be done on and off site. On site, the surface water run-off patterns should be established along with the movement of soils by surficial run-off especially as they move off site. Off site, surface water soil and air samples should be monitored to enable adequate prediction of the possible exposure routes. All these additional analyses should be tested over broader analytical suites because post RI sampling revealed contaminants that were not tested for in the RI.

8. Although there is a potential for human exposure to on-site and off-site contaminants, there are no indications in the information and data reviewed for this Health Assessment that human exposure is presently occurring, or has occurred in the past. Therefore, this site is not currently being considered for follow-up health studies. If data becomes available that suggest human exposure is occurring or has occurred, ATSDR will re-evaluate this site for any indicated follow up.

PREPARERS OF REPORT

Environment and Health Effects Reviewer:	Connie Garrett, M.S. Environmental Specialist III Toxicology and Hazard Assessment
Health Implications Reviewer:	Andrew Reich, M.S., M.S.P.H. Biological Administrator III Toxicology and Hazard Assessment

REGIONAL REPRESENTATIVE

Regional Representative:	Casimer V. Pietrosewicz Senior Public Health Advisor Field Operations Branch Region VI

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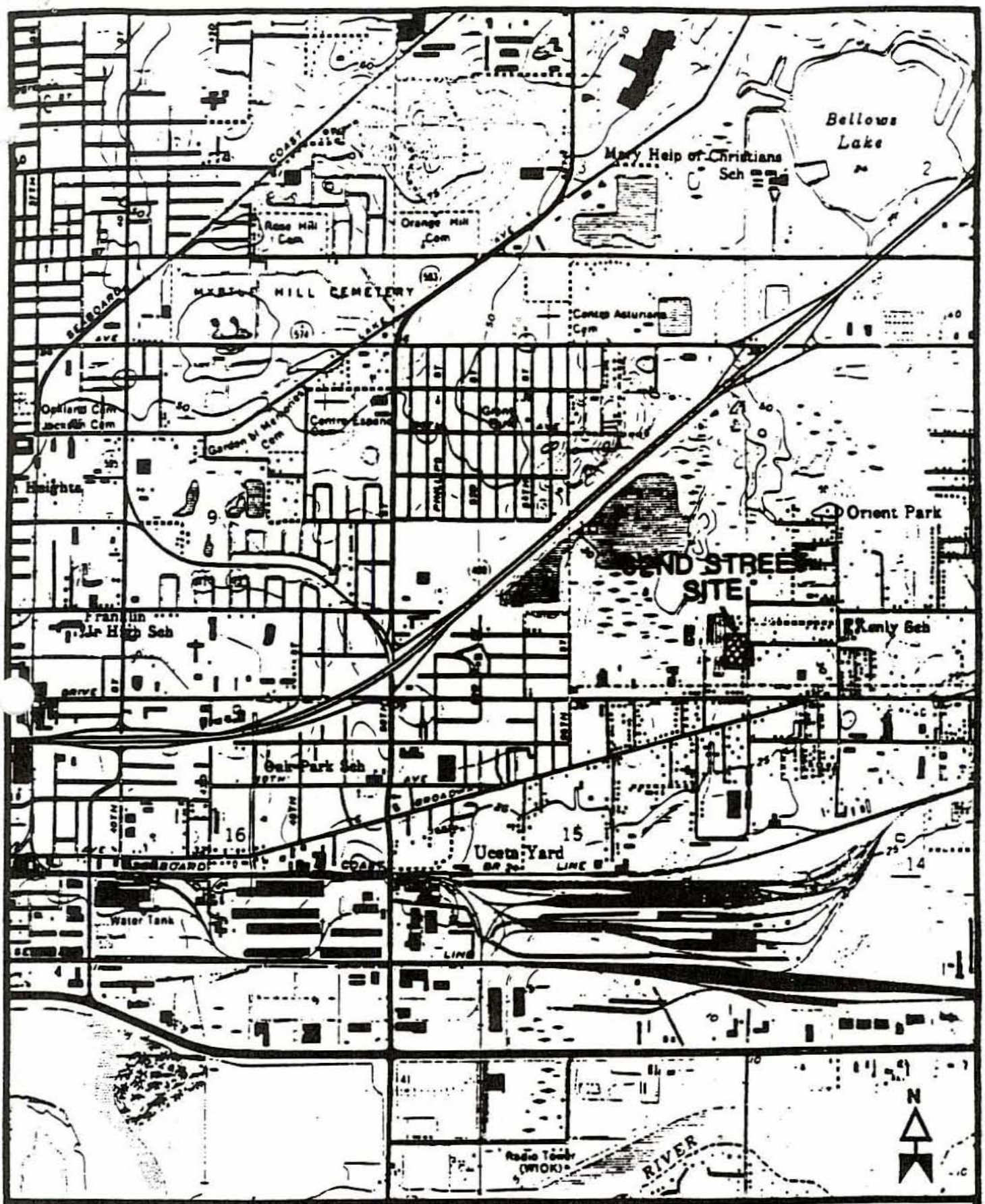

FIGURE 2-1.

SITE LOCATION MAP
62ND STREET SITE

FRED C. HART ASSOCIATES, INC.

	Data from RI (MS & E for Fred C. Hart and Associates) Suspect because field Blank is contaminated. (micrograms/liter)				Combined Data from FDER by MS & E and EPA) (micrograms/liter)		Data From RI (MS &E for Fred C. Hart and Associate (milligrams/kilogram)		
	Ground Water		Ground Water		Ground Water		Soils		
	On-Site		Off-Site		On-Site	On-Site	Off-Site	On-Site	Off-Site
AMINANTS:	Shallow Aquifer	Floridian Aquifer	Floridian Aquifer	Field Blank	Shallow Aquifer	Floridian Aquifer	Surface Water	Sediments & Soils	Sediments
enic					15-290				
ium	ND-1600				7-2100			11-1,240 PPM	
zene					1.6				
mium	12-75	14-28	10-15	20	3-2640	4-25			
orobenzene					<6.0-1500				
omium	56-150				11-268	8-650			
d					11-3570		960-2600 PPb	59 54-2300 PPM	2.2-2900 PPM
ganese					4-880	110-2600			
el					24-940	41-180			
ychlorinated henyls							ND-.011 PPM	90-2900 PPb	76-460 PPb
nuclear Aromatic rocarbons								831-1,028	
halomethanes*					total 2930				

CHRYSENE - 170 PPb