Health Consultation

Surface Soil and Groundwater

WEST FLORIDA SCRAP METAL

FORT WALTON BEACH, OKALOOSA COUNTY, FLORIDA

Prepared by the
Florida Department of Health

MAY 21, 2010

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

A health consultation is a verbal or written response from ATSDR or ATSDR's Cooperative Agreement Partners to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR or ATSDR's Cooperative Agreement Partner which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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Foreword

The Florida Department of Health (DOH) evaluates the public health threat of hazardous waste sites through a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR) in Atlanta, Georgia. This health consultation is part of an ongoing effort to evaluate health effects associated with surface soil and groundwater from the West Florida Scrap Metal hazardous waste site. The Florida DOH evaluates site-related public health issues through the following processes:

■ Evaluating exposure: Florida DOH scientists begin by reviewing available information about environmental conditions at the site. The first task is to find out how much contamination is present, where it is on the site, and how human exposures might occur. The Florida Department of Environmental Protection (DEP) provided the information for this assessment.

■ Evaluating health effects: If we find evidence that exposures to hazardous substances are occurring or might occur, Florida DOH scientists will determine whether that exposure could be harmful to human health. We focus this report on public health; that is, the health impact on the community as a whole, and base it on existing scientific information.

■ Developing recommendations: In this report, the Florida DOH outlines, in plain language, its conclusions regarding any potential health threat posed by surface soil and groundwater, and offers recommendations for reducing or eliminating human exposure to contaminants. The role of the Florida DOH in dealing with hazardous waste sites is primarily advisory. For that reason, the evaluation report will typically recommend actions for other agencies, including the US Environmental Protection Agency (EPA) and the Florida DEP. If, however, an immediate health threat exists or is imminent, the Florida DOH will issue a public health advisory warning people of the danger, and will work to resolve the problem.

■ Soliciting community input: The evaluation process is interactive. The Florida DOH starts by soliciting and evaluating information from various government agencies, individuals or organizations responsible for cleaning up the site, and those living in communities near the site. We share any conclusions about the site with the groups and organizations providing the information. Once we prepare an evaluation report, the Florida DOH seeks feedback from the public.

If you have questions or comments about this report, we encourage you to contact us.

Please write to: Bureau of Environmental Public Health Medicine
Florida Department Health
4052 Bald Cypress Way, Bin # A-08
Tallahassee, FL 32399-1712
Or call us at: 850 245-4299 or toll-free in Florida: 1-877-798-2772

Summary

INTRODUCTION	At the West Florida Scrap Metal hazardous waste site, the Florida Department of Health (DOH) serves the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent people from coming into contact with harmful toxic substances. Between 1973 and 2000, automobile salvaging and construction/demolition debris disposal contaminated soil and ground water at this site north of Fort Walton Beach.
CONCLUSION 1	Florida DOH concludes that incidentally ingesting (swallowing) very small amounts of contaminated surface soil from the West Florida Scrap Metal site is not likely to harm people's health.
BASIS FOR DECISION	For children and adults trespassing on the site, the likely dose due to incidental ingestion (swallowing) of surface soils for all of the contaminants of concern is less than the ATSDR minimal risk level or the EPA reference dose. Trespassers who incidentally ingest (swallow) very small amounts of surface soil contaminated with arsenic and BaP for a number of years are at "very low" to "extremely low" increased risk of cancer.
NEXT STEPS	In the summer of 2010, Florida DOH will distribute this report/summary to nearby residents. Florida DOH will review additional environmental data as they become available.
CONCLUSION 2	Testing has been inadequate for the Florida DOH to determine whether on-site subsurface soil and off-site soil and sediments in the ditches leading away from the site could harm people's health.
BASIS FOR DECISION	Florida DEP did not test any subsurface soil. Three off-site soil/sediment samples are too few to determine the extent of contamination.
NEXT STEPS	The Florida DEP is considering a state-funded site cleanup, including additional soil/sediment testing.

CONCLUSION 3	Testing performed so far has been inadequate to determine both the horizontal and vertical extent of offsite groundwater contamination from the site.
BASIS FOR DECISION	Florida DEP did not test any off-site groundwater.
NEXT STEPS	Florida DEP is considering a state-funded site cleanup, including additional groundwater testing.
FOR MORE INFORMATION	If you have concerns about your health or the health of your children, you should contact your health care provider. You may also call the Florida DOH toll-free at (877) 798-2772 and ask for information about the West Florida Scrap Metal hazardous waste site.

Background and Statement of Issues

The purpose of this health consultation report is to assess the public health threat from toxic chemicals in surface soil and groundwater at the West Florida Scrap Metal hazardous waste site. The Florida Department of Environmental Protection (DEP) requested this assessment. The Florida Department of Health (DOH) evaluates the public health threat of hazardous waste sites through a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR) in Atlanta, Georgia. This is the first assessment of the public health threat at this site by either the Florida DOH or ATSDR.

Site Description

The 13-acre West Florida Scrap Metal site is at 1906 Hi Tech Lane in Fort Walton Beach, Okaloosa County, Florida, 32547 (Figure 1). The site is bordered on the south by Hi Tech Lane, on the west by Percy Coleman Road, on the north by the City of Fort Walton Beach wastewater treatment plant, and on the east by a vegetated wastewater reclamation area (Figure 2).

Chain link fences divide the site into several parcels, some with one or two-story metal buildings housing various businesses. Some portions of the site, however, are readily accessible to trespassers. Most of the site is unpaved but sparsely vegetated. A 35-foot

high landfill covers the northwest quadrant of the site. Piles of wood waste, metal waste, and construction debris are scattered around the remainder of the site (Figure 2).

As early as 1973, the site was used for automobile salvaging, although operations may have begun before that time. In the early 1980s, the owner dug a 20 to 25 foot deep borrow pit in the northwest quadrant of the site. Starting in 1990, the owner began filling the borrow pit with land clearing and construction/demolition (C&D) debris. In the 1990s, the Florida DEP observed over 500 used tires, waste oil, 55-gallon drums, paint cans, auto parts, automobile batteries, and household waste on the site. As a result, surface soil is contaminated with arsenic and polychlorinated biphenyls (PCBs). In 2000, the owner covered the landfill with dirt to put out a fire. Routine landfill operations ceased about this time but neighbors report that sporadic dumping persists. In 2007, the Florida DEP observed leachate seeping from the south side of the landfill. Other than the soil cover to put out the fire, there has been no cleanup [Tetra Tech 2008]. Because there appears to be no financially viable responsible party, the Florida DEP is considering a state-funded cleanup of this site [DEP 2008].

On July 21, 2009, the Florida DOH and the Okaloosa County Health Department (CHD) staff visited the site. They observed one mobile home near the landfill mound. They also observed two mobile homes just inside the northwest site boundary (Figure 3). Although these mobile homes are on municipal water, it was not evident if they were occupied. Site access was unrestricted.

Demographics

Approximately 4,000 people live within one mile of the site, predominately in the Northern Pines neighborhood southeast of the site. Eighty percent (80%) are white, 9% are African-American, 5% are Hispanic origin, 4% are Asian/Pacific Islander, and 2% are other. Twenty-five percent (25%) are less than 18 years-old and 75% are older than 18. Forty percent (40%) have a high school diploma or less and 60% have at least two years of college. Ninety-four percent (94%) speak only English and 70% make less than $50,000 a year [EPA 2010].

Land Use

Land use within 0.25 mile of the site is a mixture of residential, agricultural, and commercial. The Northern Pines neighborhood is southeast of the site. Forested US Air Force lands are to the south and west. A wastewater treatment plant is north of the site. East of the site is a vegetated wastewater spray field buffer zone (Figure 5).

Community Health Concerns

The Florida DEP reports phone calls from a few nearby residents asking if the site is a health threat. One distant resident is concerned that storm water runoff from the site is contaminating nearby creeks, bayous, and bays [DEP 2008a].

Discussion

Environmental Data

In April 2008, the Florida DEP and their consultant collected 19 surface soil samples (0-3 inches deep) on the West Florida Scrap Metal site. They collected one "background" surface soil sample just outside the fence in the northeast corner of the site (Figure 4). They did not collect any subsurface soil samples. They analyzed the surface soil samples for volatile organic chemicals (VOCs), semivolatile organic chemicals (SVOCs), metals, pesticides, and polychlorinated biphenyls (PCBs). The Florida DEP and their consultant also collected two off-site surface soil samples: one from a residential yard 1,100 feet south of the site and one from a drainage ditch about 1,200 feet south of the site (Figure 5). They analyzed these samples for dioxins in addition to the above chemicals [Tetra Tech 2008].

The Florida DEP and their consultant found arsenic and polycyclic aromatic hydrocarbons (including benzo(a)pyrene or BaP) in most on-site surface soil samples. They found PCBs (including Arochlor 1254), cadmium, and lead in some on-site surface soil samples (Table 1). They found very little contamination in the background sample and in the two off-site surface soil samples (Table 2) [Tetra Tech 2008].

For the purpose of this assessment, the Florida DEP has adequately characterized on-site surface soil quality. The quality of off-site surface soil, however, has not been adequately characterized. Three off-site soil/sediment samples are too few to determine the extent of contamination. Also the Florida DEP has not characterized on-site subsurface soil quality. Additional testing of on-site subsurface soil and surface soil in off-site ditches draining this site is necessary to determine the potential public health threat.

At the same time the Florida DEP and their consultant sampled surface soil, they also sampled groundwater. They collected samples from six shallow (10 to 25 feet deep) temporary monitor wells on the site. They collected samples from three off-site shallow (5 to 25 feet deep) temporary monitor wells adjacent to the east border of the site (hydraulically up-gradient). They found groundwater flow in the shallow aquifer was toward the southwest. They also collected a sample from an on-site drinking water well (depth unknown) (Figure 6). They analyzed these samples for VOCs, SVOCs, metals, pesticides, and PCBs but found very little contamination (Tables 3 & 4) [Tetra Tech 2008].

For the purpose of this assessment, Florida DEP has adequately characterized on-site groundwater quality. The quality of off-site groundwater, however, has not been adequately characterized. Additional testing of off-site groundwater south and west of the site is necessary to evaluate the potential public health threat.

Comparing the highest measured concentrations in soil and groundwater to ATSDR and US Environmental Protection Agency (EPA) screening guidelines, the Florida DOH

identified aluminum, Arochlor 1254, arsenic, BaP–TEQ, cadmium, chromium, lead, and manganese as contaminants of concern. Selecting these contaminants does not necessarily mean they pose a public health risk. Rather, the Florida DOH determined these contaminants need closer scrutiny. Concentrations of other contaminants were below screening guidelines and are not likely to cause illness, negating the need for further evaluation.

Pathway Analyses

Chemical contamination in the environment can harm your health but only if you have contact with those contaminants (exposure). Without contact or exposure, there is no harm to health. If there is contact or exposure, how much of the contaminants you contact (concentration), how often you contact them (frequency), for how long you contact them (duration), and the danger of the contaminant (toxicity) all determine the risk of harm.

Knowing or estimating the frequency with which people could have contact with hazardous substances is essential to assessing the public health importance of these contaminants. To decide if people can contact contaminants at or near a site, the Florida DOH looks at human exposure pathways. Exposure pathways have five parts. They are:

1. A source of contamination like a hazardous waste site,
2. An environmental medium like air, water, or soil that can hold or move the contamination,
3. A point where people come into contact with a contaminated medium like water at the tap or soil in the yard,
4. An exposure route like ingesting (contaminated soil or water) or breathing (contaminated air),
5. A population who could be exposed to contamination like nearby residents.

The Florida DOH eliminates an exposure pathway if at least one of the five parts referenced above is missing and will not occur in the future. Exposure pathways not eliminated are either completed or potential. For completed pathways, all five pathway parts exist and exposure to a contaminant has occurred, is occurring, or will occur. For potential pathways, at least one of the five parts is missing, but could exist. Also for potential pathways, exposure to a contaminant could have occurred, could be occurring, or could occur in the future.

Compared to ingestion (eating/drinking) and inhalation (breathing), the risk from dermal exposure (skin absorption) is usually insignificant. Therefore, human health risk assessments don’t typically quantify the risk from skin absorption.

This assessment first evaluates the long-term health threat for trespassers who incidentally ingest (swallow) very small amounts of contaminated surface soil. Ingesting very small amounts of soil can happen when adults don’t wash their hands after being

outside before eating or smoking. Ingesting very small amounts of soil is also common in children who put soiled fingers or toys in their mouth.

1. For this completed exposure pathway, on-site waste disposal is the source.
2. Surface soil (0-3 inches deep) is the environmental medium.
3. On the West Florida Scrap Metal site is the exposure point.
4. Ingestion (unintended swallowing of very small amounts of soil) is the exposure route.
5. Trespassers are the exposed population. Exposure may have been occurring as early as 1973, the first documented year of automotive salvage operations (Table 5).

This assessment then evaluates the long-term health threat for workers who drink from the on-site well.

1. For this complete pathway, on-site waste disposal is the source.
2. Groundwater is the environmental medium and
3. The on-site well is the exposure point.
4. Ingestion (drinking) is the exposure route.
5. Workers are the exposed population. This may have been occurring as early as 1973, the first year of documented automotive salvage operations (Table 5).

This assessment could not evaluate the health threat from two potential exposure pathways: off-site soil/sediments and off-site groundwater (Table 6). Storm water runoff from the site flows south along Ponderosa Road West to Northern Pine Road. Testing of off-site sediments has been inadequate to determine the extent of contamination. Additional sediment testing is necessary to assess the health threat. Also, there has been little off-site groundwater testing. Groundwater flow in the shallow aquifer is to the southwest. At this time there are no houses within 0.25 mile west, southwest, or south of the site. Houses southeast of the site are on municipal water. The nearest municipal water supply well is one mile southeast of the site. Off-site groundwater testing is necessary to delineate the extent of any groundwater contamination and assess the public health threat.

Public Health Implications

The Florida DOH evaluates exposures by estimating daily doses for children and adults. Karmin [1988] explains the concept of dose as follows:

> "…all chemicals, no matter what their characteristics, are toxic in large enough quantities. Thus, the amount of a chemical a person is exposed to is crucial in deciding the extent of toxicity that will occur. In attempting to place an exact number on the amount of a particular compound that is harmful, scientists recognize they must consider the size of an organism. It is unlikely, for example, that the same amount of a particular chemical that will cause toxic effects in a 1-pound rat will also cause toxicity in a 1-ton elephant.

> Thus instead of using the amount that is administered or to which an organism is exposed, it is more realistic to use the amount per weight of the organism. Thus, 1 ounce administered to a 1-pound rat is equivalent to 2,000 ounces to a 2,000-pound (1-ton) elephant. In each case, the amount per weight is the same; 1 ounce for each pound of animal."

This amount per weight is the *dose*. Toxicology uses dose to compare toxicity of different chemicals in different animals. We use the units of milligrams (mg) of contaminant per kilogram (kg) of body weight per day (mg/kg/day) to express doses in this assessment. A milligram is 1/1,000 of a gram; a kilogram is approximately 2 pounds.

To calculate the daily doses of each contaminant, the Florida DOH uses standard and other factors needed for dose calculation [ATSDR 2005; EPA 2002]. We assume that people are exposed daily to the maximum concentration measured. For trespassers, we assumed they were exposed to the mean surface soil concentration rather than the maximum. We also make the health protective assumption that 100% of the ingested chemical is absorbed into the body. The percent actually absorbed into the body is likely less. The general formula for estimating a dose is:

Dose = (soil concentration X soil ingestion rate) / body weight

ATSDR groups health effects by duration (length) of exposure. Acute exposures are those with duration of 14 days or less; intermediate exposures are those with duration of 15 – 364 days; and chronic exposures are those that occur for 365 days or more (or an equivalent period for animal exposures). ATSDR Toxicological Profiles also provide information on the environmental transport and regulatory status of contaminants.

To estimate exposure from the incidental ingestion (swallowing) of contaminated soil, the Florida DOH uses the following assumptions:

1) Children ingest (swallow) and average of 200 milligrams (mg) of soil per day (about the weight of a postage stamp),
2) Adults ingest an average of 100 mg of soil per day,
3) Children weigh and average of 10 kilograms (kg) or about 22 pounds,
4) Adults weigh and average of 70 kg, or about 155 pounds,
5) Children and adults trespassers ingest (swallow) contaminated surface soil at the mean concentration measured for each contaminant.

We estimated the dose for incidental ingestion (swallowing) of surface soil by trespassers using the following formula:

$$D = (C \times IR \times EF \times CF) / BW$$

D = exposure dose (milligrams per kilogram per day or mg/kg/day)
C = contaminant concentration (milligrams per kilogram or mg/kg)
IR = intake rate of contaminated sediment (milligrams per day or mg/day)

EF = exposure factor (unit less)
CF = conversion factor (10^{-6} kilograms per milligram or kg/mg)
BW = body weight (kilograms or kg)

$$EF = F \times ED / AT$$

EF = exposure factor (unit less)
F = frequency of exposure (days/year)
ED = exposure duration (years)
AT = averaging time (ED x 365 days/year)

We estimated an exposure factor for both children and adults of 0.27. Exposure to the on-site surface soil is likely less than the standard residential exposure of 365 days a year. For elementary school children (6 to 12 years old) and adults, we assumed they trespass on the site 2 day/week for 50 weeks/year for a total of about 100 days/year.

EF children = (100 days per year) (6 years) / (6 years x 365 days/year) = 0.27
EF adults = (100 days per year) (35 years) / (35 years x 365 days/year) = 0.27

For example, the estimated dose of arsenic for children from incidental ingestion (swallowing) of on-site surface soil is:

Dose = (9 mg As/kg soil) x (200 mg soil/day) x (0.27) x (10^{-6} mg/kg) / 10 kg
= 0.00005 mg/kg/day

For non-cancer illnesses, we first estimate the health risk for children. Because children are smaller and swallow more soil than adults, their exposure is higher. Therefore, if children are not at risk, then adults are not either. For cancer, we estimate the risk for adults from lifetime exposure.

Incidental Ingestion (Swallowing) of On-Site Surface Soil

For children and adults trespassing on the site, the Florida DOH estimated the likely dose due to incidental ingestion (swallowing) of surface soils (Table 7). For all of the contaminants of concern, the estimated dose is less than the ATSDR minimal risk level or the EPA reference dose. Therefore incidental ingestion (swallowing) of these contaminants in on-site surface soil is not likely to cause any non-cancer illness.

<u>Arochlor 1254</u> - PCBs are a family of chemicals that were manufactured in the United States (US) between about 1930 and 1977, predominantly for use as coolants and lubricants in electrical equipment such as capacitors, and transformers due to their general chemical inertness and heat stability. PCBs are complex mixtures of chlorinated biphenyls that vary in the degree of chlorination. For example, the commercial product Arochlor 1254 is a mixture of mono- through heptachlorinated biphenyl congeners with a chlorine content of approximately 54%. However, significant lot-to-lot differences in congeneric composition occurred among similar mixtures. The manufacture of PCBs in

the US was stopped due to evidence that they accumulated and persist in the environment and cause toxic effects [ATSDR 2000].

EPA classifies PCBs including Arochlor 1254 as a probable human carcinogen, based mainly on sufficient evidence of carcinogenicity in animals. EPA, however, has not established an oral cancer slope factor from which to quantify the risk. The cancer slope factor measures the potency of a cancer causing chemical. Therefore, the Florida DOH was unable to estimate a lifetime excess cancer risk for this exposure.

Arsenic - Arsenic is a naturally occurring metal widely distributed in soil. It is usually found combined with oxygen, chlorine, and sulfur. Most arsenic compounds have no smell or special taste. Arsenic, in combination with copper and chromium, was used to preserve wood [ATSDR 2007a].

EPA classifies inorganic arsenic as a known human carcinogen. Multiplying the estimated likely ingestion (swallowing) arsenic dose for adults trespassing on the site (0.000003 mg/kg/day) times the EPA oral cancer slope (potency) factor (1.5 mg/kg-day) yields a "very low" theoretical increased lifetime cancer risk (5 in 1,000,000 or 5×10^{-6}).

BaP-TEQ –BaP-TEQ is used to estimate the toxicity of a group of closely related chemicals called PAHs. PAHs are formed during the incomplete burning of coal, oil, gas, wood, garbage, or other organic substances. There are more than 100 different PAHs. They generally occur as complex mixtures, not as single compounds. PAHs occur naturally in crude oil, coal, coal tar pitch, creosote, roofing tar, and asphalt. Due to pollution they are found throughout the environment in air, water, and soil [ATSDR 1995].

EPA classifies BaP-TEQ as a probable human carcinogen. Human data specifically linking BaP-TEQ to a carcinogenic effect are lacking. There are, however, multiple animal studies in many species demonstrating BaP-TEQ to be carcinogenic following administration by numerous routes. Multiplying the estimated ingestion (swallowing) BaP-TEQ dose for adults trespassing on the site (0.0000003 mg/kg/day) times the EPA oral cancer slope (potency) factor (7.3 mg/kg-day) yields an "extremely low" maximum theoretical increased lifetime cancer risk (2 in 1,000,000 or $2 \text{ X } 10^{-6}$).

Cadmium – Cadmium is a naturally occurring metal used primarily in batteries. Cadmium is relatively insoluble in water but can be taken up by plants. For most people, food is the primary source of cadmium. Smoking, however, doubles the intake amount [ATSDR 2008].

EPA considers cadmium a probable human carcinogen based on limited evidence of carcinogenicity in humans. There is limited evidence of cadmium's ability to cause cancer from human occupational epidemiologic studies. There is sufficient evidence of cadmium's carcinogenicity in rats and mice by inhalation. Ingestion of cadmium in seven rat and mice studies, however, found no evidence of carcinogenicity. EPA has not established an oral cancer slope factor for ingestion of cadmium from which to quantify

the risk. Therefore, the Florida DOH was unable to estimate a lifetime excess cancer risk for this exposure.

Lead – Lead is a naturally occurring metal used in pipes, car batteries, weight, and ammunition. Lead was used in paints until the 1980s and as a gasoline additive until 1996. Lead is relatively insoluble in water and sticks to soil particles.

Neither ATSDR nor EPA has developed health guidelines for human exposure to lead. Therefore, we cannot use the usual approach of estimating a human dose and then comparing this dose to a health guideline. Instead, we evaluate exposure to lead by using a biological model that predicts a blood lead concentration that would result from exposure to environmental lead contamination. We then compare the modeled blood lead concentration to the level of concern for blood lead concentrations in children [ATSDR 2007b].

Using the mean on-site surface soil lead level (139 milligrams per kilogram), the EPA Integrated Exposure Uptake Biokinetic (IEUBK) model predicts a corresponding blood lead level of between 2 and 3 micrograms per deciliter (μg/dL) in children 2 to 6 years old [EPA 2007]. The Centers for Disease Control and Prevention (CDC) action level for children less than 7 years of age is 10 μg/dL.

Blood lead levels in the US have been decreasing over the past three decades as regulations regarding lead paint, leaded fuels, and lead-containing plumbing materials have reduced exposures. Blood lead levels measured in the National Health and Nutrition Examination Surveys (NHANES) indicate from 1976 to 1991 the mean blood level in the US dropped from 12.8 to 2.8 μg/dL. NHANES III, phase II (1991-1994) found the mean blood levels in children (1-5 years old) were 2.7 μg/dL. From 1999 to 2002, the level dropped further to 1.9 μg/dL [ATDR 2007b].

Although the evidence is not conclusive, the US Department of Health and Human Services has determined that lead can reasonably be anticipated to cause cancer in humans. Quantifying lead's cancer risk involves many uncertainties, some of which may be unique to lead. Age, health, nutritional state, body burden, and exposure duration influence the absorption, release, and excretion of lead. In addition, current knowledge of lead pharmacokinetics indicates that an estimate derived by standard procedures would not truly describe the potential risk. Therefore, EPA has not developed a cancer risk slope factor for lead. Although Florida DOH was unable to estimate a lifetime excess cancer risk for this exposure, the mean concentration of lead in on-site soil (139 mg/kg) is well below the EPA screening value (300 mg/kg).

Incidental Ingestion (Swallowing) of Off-Site Surface Soil

The quality of off-site surface soil has not been adequately characterized. The Florida DEP and their consultant only tested off-site surface soil quality in one background and two other locations. Although the levels of arsenic and BaP-TEQ were only slightly above screening guidelines, two samples are inadequate to generalize off-site surface soil

contamination. Additional testing of sediments in ditches draining away from this site is necessary to determine the potential public health threat.

Drinking from On-Site Drinking Water Well

The concentrations of all eight contaminants of concern in the on-site drinking water well were below comparison values and thus are not likely to cause harm.

Off-Site Ground Water

The quality of off-site groundwater has not been adequately tested or characterized. The Florida DEP and their consultant did not test any off-site groundwater. Testing of off-site groundwater is necessary to determine the potential public health threat.

Health Outcome Data

Florida DOH epidemiologists did not evaluate area cancer rates for two reasons. First, the lifetime maximum theoretical increased cancer risk for trespassers exposed to arsenic and BaP-TEQ in surface soil at this site is "very low" and "extremely low." This is the highest estimated increased cancer risk at this site. The actual increased cancer risk is likely lower and may be as low as zero. Second, because the potentially exposed population is very small (less than 100), it is unlikely that exposure to arsenic or BaP-TEQ in the soil at this site would result in any observable cases of cancer.

Children's Health Considerations

In communities faced with air, water, or food contamination, the many physical differences between children and adults demand special emphasis. Children could be at greater risk than are adults from certain kinds of exposure to hazardous substances. Children play outdoors and sometime engage in hand-to-mouth behaviors that increase their exposure potential. Children are shorter than are adults which means they breathe dust, soil and vapors close to the ground. A child's lower body weight and higher intake rate results in a greater dose of hazardous substance per unit of body weight. If toxic exposure levels are high enough during critical growth stages, the developing body system of children can sustain permanent damage. Finally, children are dependent on adults for access to housing, for access to medical care, and for risk identification. Thus, adults need as much information as possible to make informed decisions regarding their children's health.

This assessment takes into account the special vulnerabilities of children. It specifically estimates a dose from incidental ingestion (swallowing) for children trespassing on the site. The Florida DOH found that children exposed via incidental ingestion (swallowing) of on-site surface soil are not likely to suffer harm.

Community Health Concerns Evaluation

1. A few nearby residents are concerned the site may be a health threat.

   Adults and children who regularly trespass on the site for a number of years are not likely to be harmed. Testing of off-site soil and sediments in ditches that drain away from the site has been inadequate to determine the public health threat.

2. One distant resident is concerned that storm water runoff from the site is contaminating sediments in nearby creeks, bayous, and bays.

   Testing of off-site soil and sediment in ditches that drain away from the site has been inadequate to determine the extent of contamination.

Conclusions

- The Florida DOH concludes that incidentally ingesting (swallowing) very small amounts of contaminated surface soil on the West Florida Scrap Metal site is not likely to harm people's health. People who repeatedly trespass on the site and incidentally ingest (swallow) very small amounts of arsenic and BaP-TEQ contaminated surface soil for more than a year are at "very low" to "extremely low" increased risk of cancer.

- Testing performed so far has been inadequate to determine whether off-site soil and sediments in the ditches leading away from the site could harm people's health.

- Testing performed so far has been inadequate to determine if on-site subsurface soil could harm people's health.

- Testing performed so far has been inadequate to determine both the horizontal and vertical extent of offsite groundwater contamination from the site.

- Since EPA does not have cancer slope factors for Arochlor 1254, cadmium, and lead; the Florida DOH can not calculate a cancer risk. An increased risk of cancer from incidental ingestion (swallowing) of surface soil with these three contaminants is, however, very unlikely.

Recommendations

- The Florida DEP should determine how far any off-site surface soil contamination in the ditches leading away from the site may extend.

- The Florida DEP should determine the extent of contamination in subsurface soil on the site.

- The Florida DEP should delineate the vertical and horizontal extent of groundwater contamination coming from the site.

Public Health Action Plan

Actions Underway

The Florida DEP is considering a state-funded site cleanup, including off-site soil/ groundwater testing.

Actions Planned

In the summer of 2010, the Florida DOH will distribute this report or a summary to nearby residents.

Florida DOH will review additional environmental data as they become available.

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Appendices

Table 1. Surface Soil Contamination (0-3 inches deep) on the West Florida Scrap Metal Site

Contaminant	Concentration Range (mg/kg)	Mean Concentration (mg/kg) **	Background Concentration (mg/kg)	Screening Guidelines* (mg/kg)	Screening Guideline Source	Number of Samples Above Screening Guideline/Total Number of Samples
Aluminum	740 – 21,000	5,260	2,050	50,000	ATSDR chronic child EMEG	0/19
Arochlor 1254	BDL – 28	1.1	BDL	1	ATSDR CREG	3/19
Arsenic	BDL - 49	9	0.4	0.5	ATSDR CREG	14/19
BaP – TEQ	BDL – 2.4	0.9	0.2	0.1	ATSDR CREG	10/19
Cadmium	BDL – 14	2	BDL	5	ATSDR Chronic EMEG	2/19
Chromium	BDL - 48	16	2.5	50	ATSDR chronic child EMEG	0/19
Lead	BDL – 910	139	3	400	EPA Residential	3/19
Manganese	4.6 - 240	76	6	3,000	Child RMEG	0/19

BaP – TEQ = benzo(a)pyrene toxicity equivalent quotient
CREG = ATSDR cancer risk evaluation guide for 10^{-6} excess cancer risk
EMEG = ATSDR environmental media evaluation guide
BDL = below detection limit
mg/kg = milligrams per kilogram
* Screening guidelines used only to select chemicals for further scrutiny, not to the judge the risk of illness.
** In calculating the mean, we used one-half the detection limit for those values below the detection limit.
Source of data: Tetra Tech 2008

Table 2. Surface Soil Contamination (0-3 inches deep) near the West Florida Scrap Metal Site (Off Site)

Contaminant	Concentration Range (mg/kg)	Screening Guidelines* (mg/kg)	Screening Guideline Source	Number of Samples Above Screening Guideline/Total Number of Samples
Aluminum	3,000	50,000	ATSDR chronic child EMEG	0/1
Arochlor 1254	BDL	1	ATSDR CREG	0/2
Arsenic	0.4 - 0.8	0.5	ATSDR CREG	1/2
BaP – TEQ	BDL	0.1	ATSDR CREG	1/1
Cadmium	BDL - 0.6	5	ATSDR Chronic EMEG	0/2
Chromium	BDL - 3	50	ATSDR chronic child EMEG	0/2
Lead	1.6 - 3.3	400	EPA Residential	0/2
Manganese	2.6 – 8.8	3,000	Child RMEG	0/2

BaP – TEQ = benzo(a)pyrene toxicity equivalence
CREG = ATSDR cancer risk evaluation guide for 10^{-6} excess cancer risk
EMEG = ATSDR environmental media evaluation guide
BDL = below detection limit
mg/kg = milligrams per kilogram
* Screening guidelines only used to select chemicals for further scrutiny, not to the judge the risk of illness.
Source of data: Tetra Tech 2008

Table 3. Shallow (5 to 25 feet deep) Groundwater Contamination under the West Florida Scrap Metal Site§

Contaminant	Concentration Range (µg/L)	Screening Guidelines* (µg/L)	Screening Guideline Source	Number of Samples Above Screening Guideline/Total Number of Samples
Aluminum	BDL - 20,000	10,000	ATSDR chronic child EMEG	1/9
Arochlor 1254	BDL	0.2	ATSDR chronic child EMEG	0/9
Arsenic	BDL – 0.9	0.02	ATSDR CREG	1/9
BaP – TEQ	BDL	0.005	ATSDR CREG	0/9
Cadmium	BDL	1	ATSDR chronic child EMEG	0/9
Chromium	BDL - 20	10	ATSDR chronic child EMEG	2/9
Lead	BDL - 9	15	EPA MCL	0/9
Manganese	16 - 570	300	EPA LTHA	2/9

§ Includes three wells just outside of the east site boundary (hydraulically up-gradient)
LTHA = lifetime health advisory
BDL = below detection limits
BaP – TEQ = benzo(a)pyrene toxicity equivalent quotient
CREG = ATSDR cancer risk evaluation guide for 10^{-6} excess cancer risk
EMEG = ATSDR environmental media evaluation guide
µg/L = micrograms per liter
* Screening guidelines only used to select chemicals for further scrutiny, not to the judge the risk of illness.
Source of data: Tetra Tech 2008

Table 4. Contamination in the On-Site West Florida Scrap Metal Drinking Water Well §

Contaminant	Concentration (µg/L)	Screening Guidelines* (µg/L)	Screening Guideline Source	Number of Samples Above Screening Guideline/Total Number of Samples
Aluminum	330	10,000	ATSDR chronic child EMEG	0/1
Arochlor 1254	BDL	0.2	ATSDR chronic child EMEG	0/1
Arsenic	BDL	0.02	ATSDR CREG	0/1
BaP – TEQ	BDL	0.005	ATSDR CREG	0/1
Cadmium	BDL	1	ATSDR chronic child EMEG	0/1
Chromium	BDL	10	ATSDR chronic child EMEG	0/1
Lead	BDL	15	EPA MCL	0/1
Manganese	1.2	300	EPA LTHA	0/1

§ Depth of this well is unknown
MCL = maximum contaminant level
LTHA = lifetime health advisory
BaP – TEQ = benzo(a)pyrene toxicity equivalence
CREG = ATSDR cancer risk evaluation guide for 10^{-6} excess cancer risk
EMEG = ATSDR environmental media evaluation guide
µg/L = micrograms per liter BDL = below detection limit
* Screening guidelines only used to select chemicals for further scrutiny, not to the judge the risk of illness.
Source of data: Tetra Tech 2008

Table 5. Completed Human Exposure Pathways at the West Florida Scrap Metal Hazardous Waste Site

COMPLETED PATHWAY NAME	COMPLETED EXPOSURE PATHWAY ELEMENTS					TIME
	SOURCE	ENVIRONMENTAL MEDIA	POINT OF EXPOSURE	ROUTE OF EXPOSURE	EXPOSED POPULATION	
On-site surface soil	On-site waste disposal	Surface soil	On-site surface soil	Ingestion	Site trespassers	1973 to present
On-site drinking water well	On-site waste disposal	Groundwater	On-site well	Ingestion	On-site workers	1973 to present

Table 6. Potential Human Exposure Pathways at the West Florida Scrap Metal Hazardous Waste Site

POTENTIAL PATHWAY NAME	POTENTIAL EXPOSURE PATHWAY ELEMENTS					TIME
	SOURCE	ENVIRONMENTAL MEDIA	POINT OF EXPOSURE	ROUTE OF EXPOSURE	EXPOSED POPULATION	
Off-site storm water run-off sediments	On-site waste disposal	Sediments	Off-site ditches	Ingestion	Children playing in nearby ditches	1973 to present
Off-site groundwater	On-site waste disposal	Groundwater	Future nearby private drinking water wells	Ingestion	Future nearby residents	Future

Table 7. Estimated Maximum Dose and Increased Lifetime Cancer Risk from Incidental Ingestion (Swallowing) Very Small Amounts of Surface Soil by Trespassers on the West Florida Scrap Metal Site.

Contaminant	Mean Soil Concentration (mg/kg)	Estimated Adult Trespasser Dose (mg/kg/day)	Estimated Child Trespasser Dose (mg/kg/day)	ATSDR MRL or EPA RfD (mg/kg/day)	EPA Oral Cancer Slope Factor (mg/kg-day)	Theoretical Increased Adult Lifetime Cancer Risk
Aluminum	5,260	0.002	0.03	1	none	---
Arochlor 1254	1.1	0.0000004	0.000006	0.00002	none	---
Arsenic	9	0.000003	0.00005	0.0003	1.5	5×10^{-6}
BaP - TEQ	0.9	0.0000003	0.000005	none	7.3	2×10^{-6}
Cadmium	2	0.000001	0.00001	0.0001	none	---
Chromium	16	0.000006	0.0001	0.001	none	---
Lead	139	IEUBK	IEUBK	---	---	---
Manganese	76	0.00003	0.0004	0.05	none	---

mg/kg = milligrams per kilogram
mg/kg/day = milligrams per kilogram per day
IEUBK = EPA Intergraded Exposure Uptake Biokenetic model
MRL = ATSDR minimal risk level
RfD = EPA reference dose
IRIS = EPA Intergraded Risk Information System

Table 8. Estimated Maximum Dose and Increased Lifetime Cancer Risk from Incidental Ingestion (Swallowing) Very Small Amounts of Off-Site Surface Soil near the West Florida Scrap Metal Site

Contaminant	Maximum Soil Concentration (mg/kg)	Estimated Maximum Adult Dose (mg/kg/day)	Estimated Maximum Child Dose (mg/kg/day)	ATSDR MRL or EPA RfD (mg/kg/day)	EPA Oral Cancer Slope Factor (mg/kg-day)	Maximum Theoretical Increased Adult Lifetime Cancer
Aluminum	3,000	0.004	0.06	1	none	---
Arochlor 1254	BDL	---	---	---	---	---
Arsenic	0.8	0.000001	0.00002	0.0003	1.5	2×10^{-6}
BaP - TEQ	0.17	0.0000002	0.000003	none	7.3	1×10^{-6}
Cadmium	0.6	0.0000008	0.00001	0.0001	none	---
Chromium	3	0.000004	0.00006	0.001	none	---
Lead	3.3	IEUBK	IEUBK	---	---	---
Manganese	8.8	0.000003	0.00005	0.05	none	---

mg/kg = milligrams per kilogram
mg/kg/day = milligrams per kilogram per day
BDL = below detection limits
IEUBK = EPA Intergraded Exposure Uptake Biokenetic model used to estimated blood lead levels

Table 9. Estimated Maximum Dose and Increased Adult Lifetime Cancer Risk from Drinking Water out of the Existing West Florida Scrap Metal Drinking Water Well

Contaminant	Maximum Water Concentration (µg/L)	Estimated Maximum Dose (mg/kg/day)	ATSDR MRL or EPA RfD (mg/kg/day)	EPA Oral Cancer Slope Factor (mg/kg-day)	Theoretical Increased Lifetime Cancer
Aluminum	330	0.01	1	none	none
Arochlor 1254	BDL	---	---	---	---
Arsenic	BDL	---	---	---	---
BaP - TEQ	BDL	---	---	---	---
Cadmium	BDL	---	---	---	---
Chromium	BDL	---		---	---
Lead	BDL	---	---	---	---
Manganese	1.2	0.00003	0.05	none	none

µg/L = micrograms per liter
mg/kg/day = milligrams per kilogram per day

Figure 1. Location of the West Florida Scrap Metal Site in Fort Walton

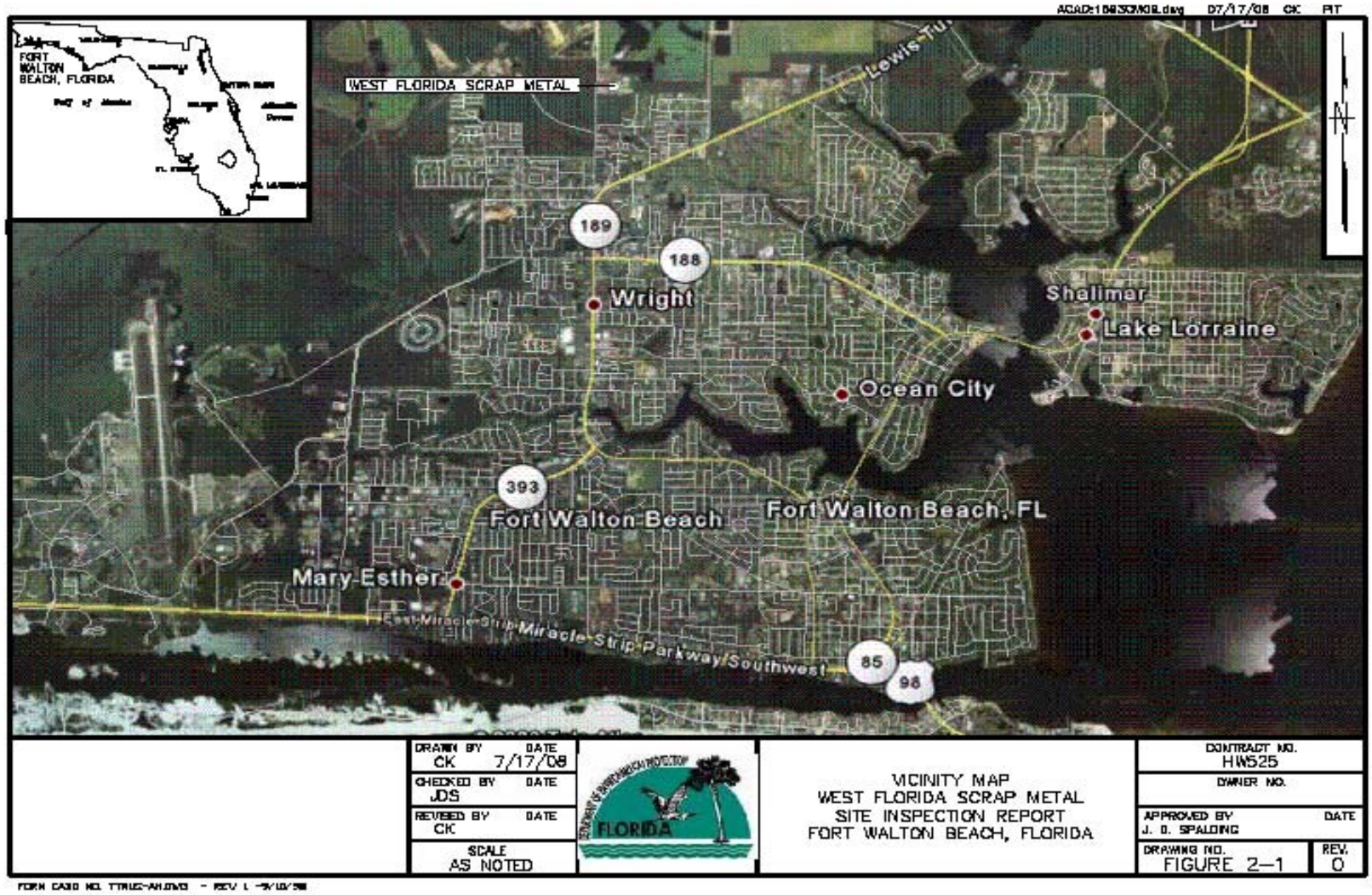


Figure 2. West Florida Scrap Metal Site Map

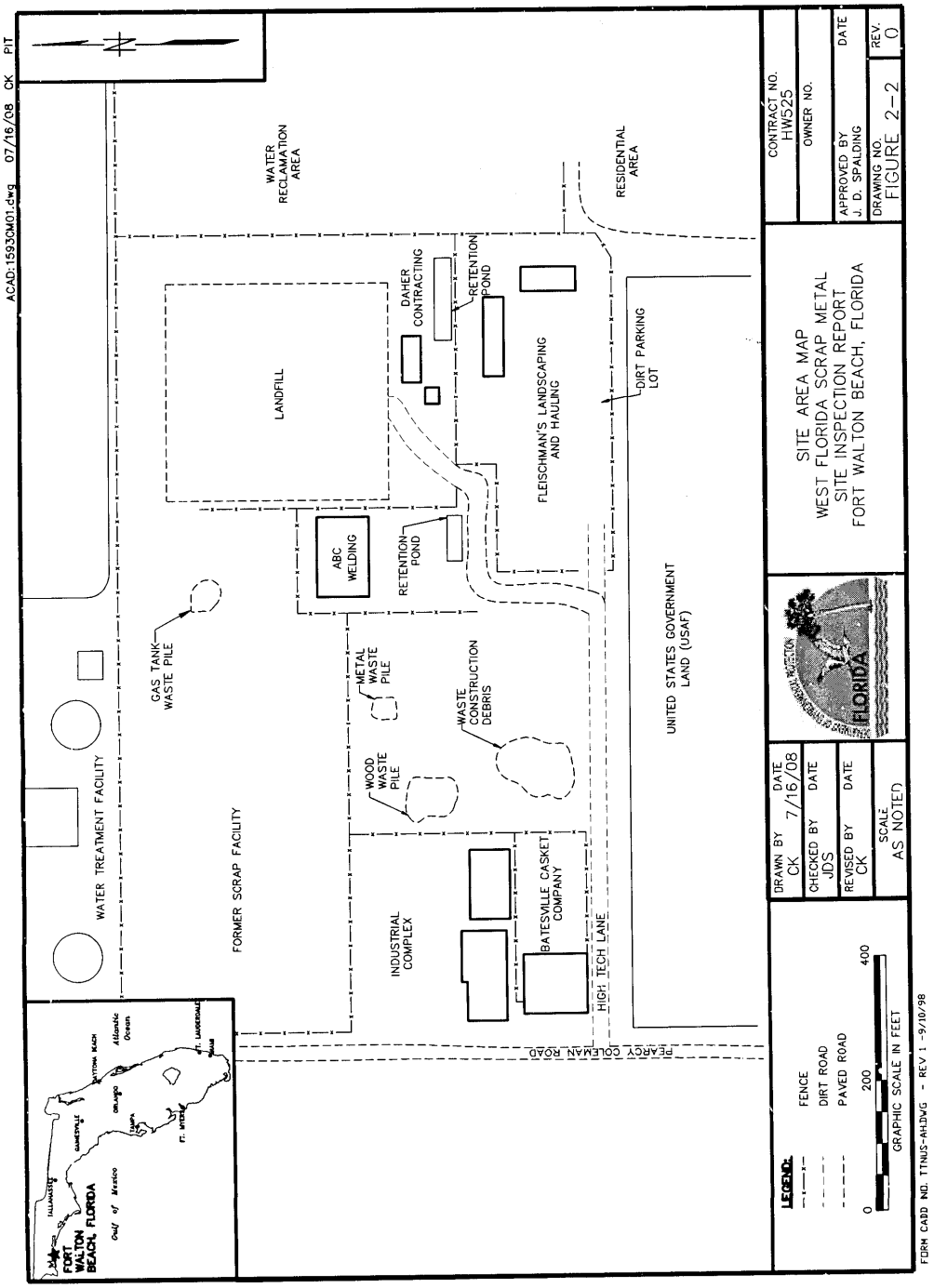


Figure 3. Two Mobile Homes in the Northwest Corner of the West Florida Scrap Metal Site. View from Percy Coleman Road Facing East. 7-21-2009.

Figure 4. West Florida Scrap Metal On-Site Surface Soil (0-3 inches deep) Sample Locations

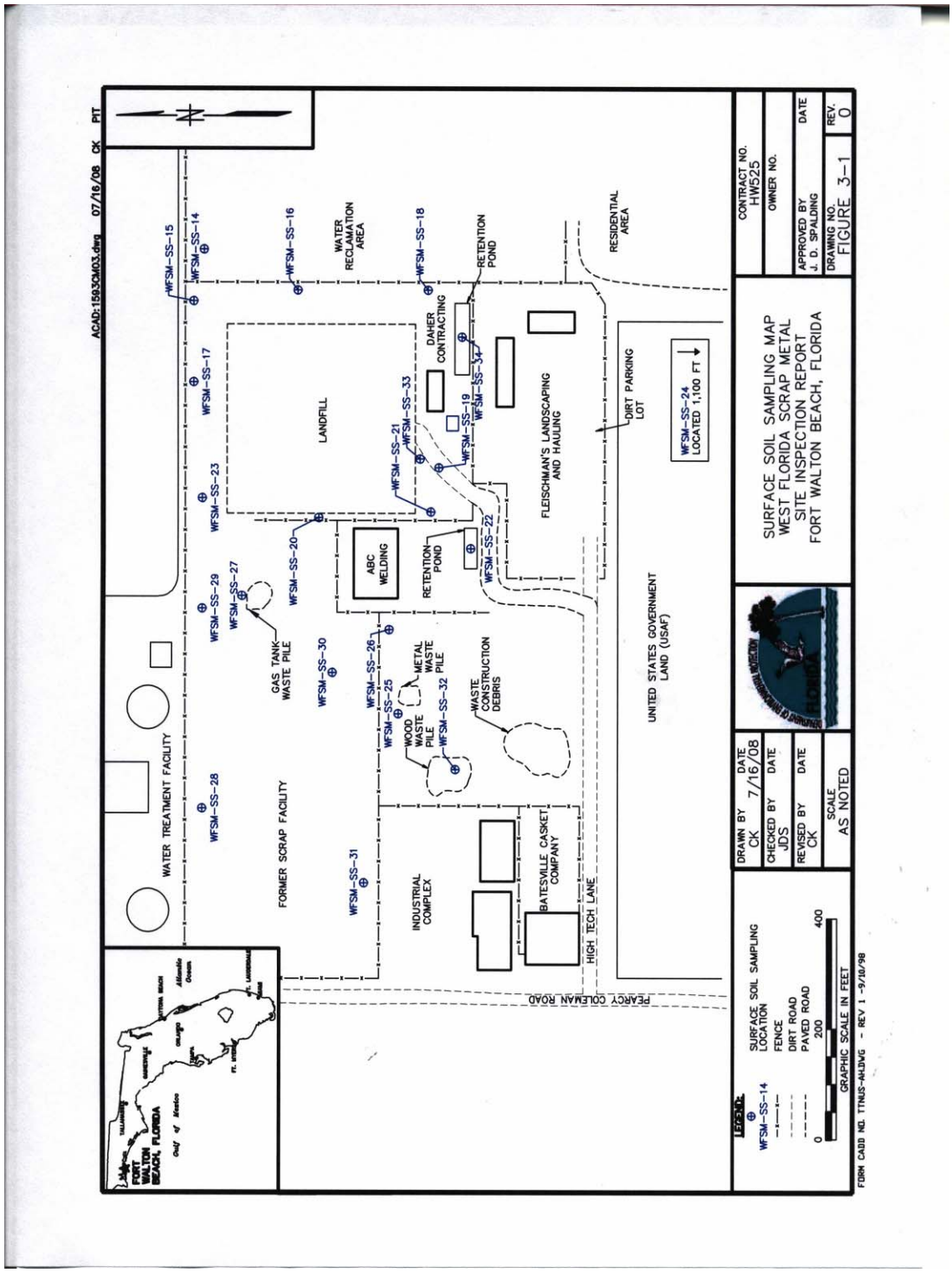


Figure 5. West Florida Scrap Metal Off-Site Surface Soil (0-3 inches deep) Sample Locations

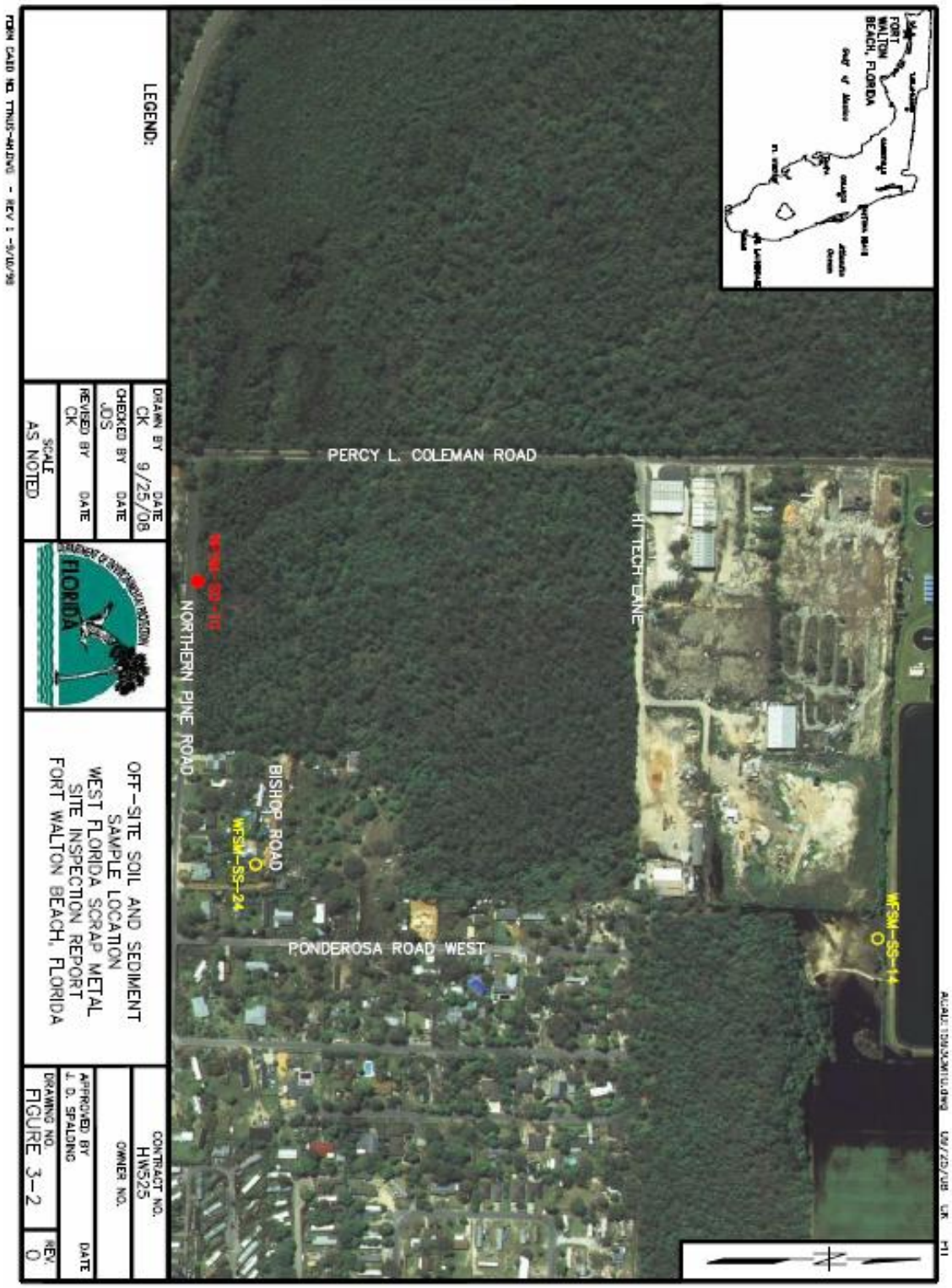
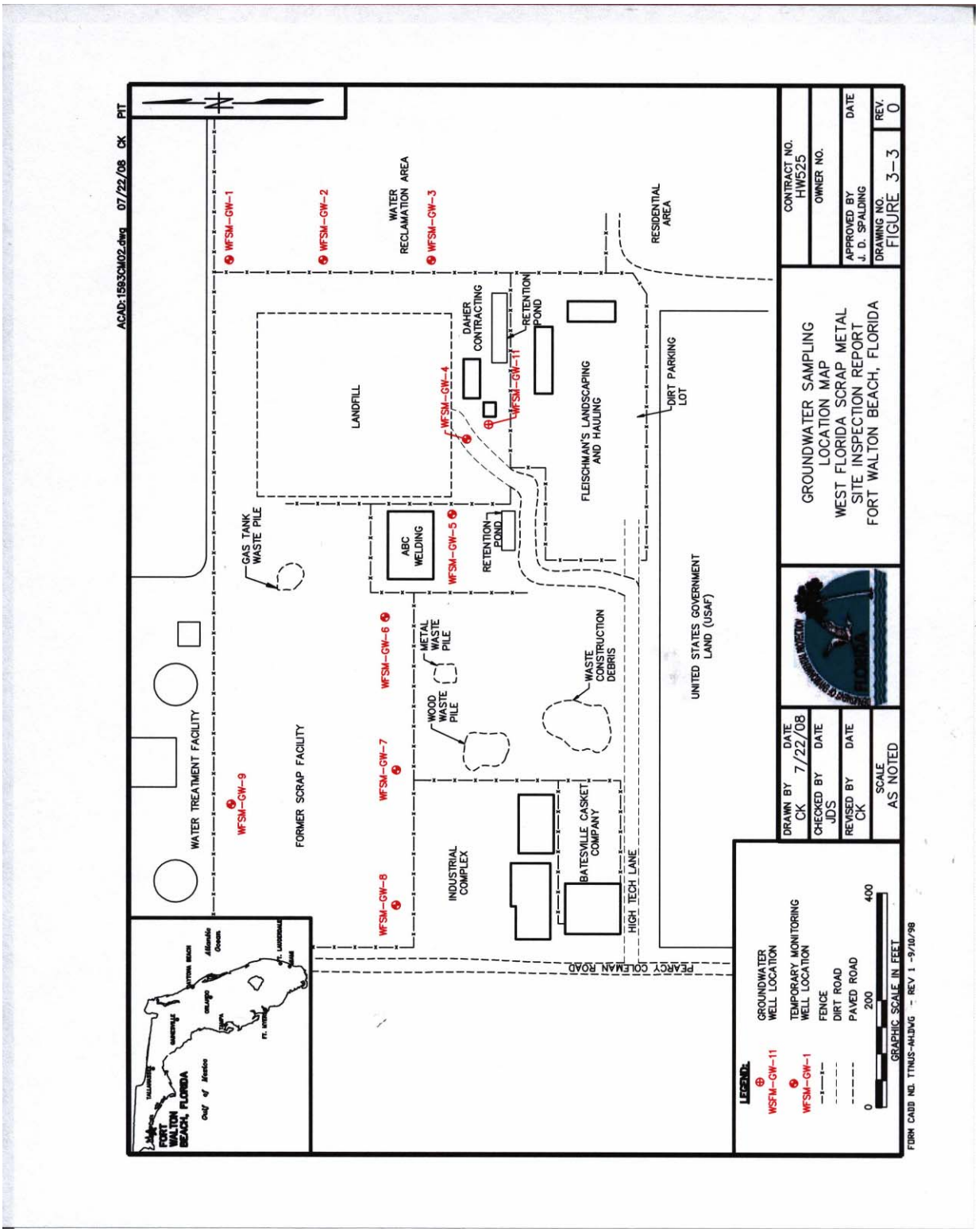


Figure 6. West Florida Scrap Metal Groundwater Sample Locations



Certification

The Florida Department of Health (DOH), Bureau of Environmental Public Health Medicine prepared this health consultation report under a cooperative agreement with the US Agency for Toxic Substances and Disease Registry. The Florida DOH followed approved methodologies and procedures existing at the time it began its assessment. The Florida DOH completed an editorial review of this document.

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

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