ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Public Health Assessment for

CORONET INDUSTRIES, INCORPORATED
(a/k/a BORDEN FEED PHOSPHATE COMPLEX)
PLANT CITY, HILLSBOROUGH COUNTY, FLORIDA
EPA FACILITY ID: FLD001704741
JANUARY 18, 2007

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Agency for Toxic Substances and Disease Registry

THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This Public Health Assessment was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6)), and in accordance with our implementing regulations (42 C.F.R. Part 90). In preparing this document, ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate.

In addition, this document has previously been provided to EPA and the affected states in an initial release, as required by CERCLA section 104 (i)(6)(H) for their information and review. The revised document was released for a 30-day public comment period. Subsequent to the public comment period, ATSDR addressed all public comments and revised or appended the document as appropriate. The public health assessment has now been reissued. This concludes the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the agency's opinion, indicates a need to revise or append the conclusions previously issued.

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PUBLIC HEALTH ASSESSMENT

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PLANT CITY, HILLSBOROUGH COUNTY, FLORIDA

EPA FACILITY ID: FLD001704741

Prepared by:

Florida Department of Health
Bureau of Community Environmental Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

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FOREWORD

Congress established the Agency for Toxic Substances and Disease Registry (ATSDR) in 1980 under the Comprehensive Environmental Response, Compensation, and Liability Act, also known as the Superfund law. This law set up a fund to identify and cleanup our country's hazardous waste sites. The Environmental protection Agency (EPA) and the individual states regulate the investigation and cleanup of the sites.

Since 1986, Congress has required ATSDR to conduct a public health assessment at each of the sites on the EPA National Priorities List. The aim of these evaluations is to find out if people are being exposed to hazardous substances and, if so, whether that exposure is harmful and should be stopped or reduced. If appropriate, ATSDR also conducts public health assessments when petitioned by concerned individuals. Environmental and health scientists from ATSDR and from the states with which ATSDR has cooperative agreements conduct public health assessments.

The public health assessment program allows the scientists flexibility in the format or structure of their response to the public health assessment issues at hazardous waste sites. For example, a public health assessment could be one document or it could be a compilation of several health consultations. Nevertheless, the public health assessment process is not considered complete until the public health issues at the site are addressed.

The Florida Department of Health (DOH) evaluated available environmental data collected in areas surrounding the Coronet Industries Site in Plant City, Florida to determine if releases of hazardous chemicals to soil, air, or water could have possibly caused illness. Area residents are concerned that their cancer and other illnesses may be due to chemicals from the Coronet site.

Evaluating exposure: Florida DOH scientists begin by reviewing available information about environmental conditions surrounding the site. These data add to our understanding of how much contamination is present, where it is found near the site, and how people might be exposed to it. Usually, Florida DOH does not collect its own environmental sampling data. We rely on information provided by the Florida Department of Environmental Protection (DEP), the U.S. Environmental Protection Agency (EPA), and other government agencies, private businesses, and the public.

Evaluating health effects: If there is evidence that exposures to hazardous substances are currently occurring or are likely to occur, Florida DOH scientists will determine whether that exposure could be harmful to human health. Our report focuses on public health; that is, the health impact on the community as a whole, and existing scientific information is its basis.

Developing recommendations: In this health consultation, Florida DOH outlines its conclusions regarding potential health threats posed by a site, 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 to be taken by other agencies, including the Florida DEP. However, if a health threat exists or is imminent, 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. 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. Florida DOH shares any conclusions about the site with the groups and organizations providing the information. Once an evaluation report has been prepared, Florida DOH seeks feedback from the public.

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SUMMARY

This report assesses the public health threat of exposure to wastewater discharged to English Creek and addresses community health concerns for the Coronet Industries contaminated former phosphate mining and processing facility near Plant City, Florida. It also incorporates seven previous Florida DOH/ATSDR reports regarding nearby private drinking water wells, off-site soil, fish, air, urine testing, and area cancer rates. Florida DOH/ATSDR prepared these reports in response to a petition from a nearby resident.

Coronet mined the site for phosphate starting in 1906 and operated a phosphate processing plant since 1945. Coronet disposed of wastewater into 10 unlined ponds spanning 332 acres. During heavy rainfall, Coronet discharged wastewater to ditches leading to English Creek. In 1999, Coronet discovered hydrogen fluoride in on-site groundwater. In 2003, Coronet discovered groundwater contamination at its property boundary. On March 31, 2004, Coronet voluntarily ceased operations.

Since August 2003, Florida DOH and ATSDR have tested the urine of 106 nearby residents, tested approximately 145 nearby private drinking water wells, analyzed test results of approximately 40 surface soil samples, and tested 88 fish samples from the adjacent Gregg Enterprises property. They have also analyzed ambient (outdoor) air quality, assessed area cancer rates, mailed several fact sheets/newsletters to nearby residents, and held five public meeting/open house sessions.

For children who played in English Creek during the time when Coronet discharged wastewater, skin exposure is a completed pathway. Because metals in the waste water are not well absorbed through intact skin and contact was infrequent, these exposures were not likely a public health hazard.

Nearby residents are concerned about cancer, illnesses from drinking contaminated groundwater, respiratory ailments including bronchitis and asthma, fertility problems, and dental problems.

Florida DOH and US ATSDR categorize the area around the Coronet site as an “indeterminate public health hazard” for past exposures. In general, environmental test data are insufficient to determine the public health risk from exposures before 2003.

Based on the available environmental data reviewed for this and previous reports, the area around the Coronet site is currently “no apparent public health hazard.” Levels of contaminants measured in urine of nearby residents, private drinking water wells, off-site surface soil, fish, and outdoor air are not likely to cause respiratory ailments, fertility problems, dental problems, or other illness. The number of cancer cases reported in the Plant City area between 1990 and 2000 are not unusual.

If land use changes, on-site environmental data should be reviewed to determine the risk to site users.

PURPOSE AND HEALTH ISSUES

The Florida DOH evaluates the public health significance of hazardous waste sites through a cooperative agreement with the ATSDR. This public health assessment report reviews off-site surface water quality and addresses community health concerns for the Coronet Industries contaminated former phosphate mining and processing facility ("Coronet"). In seven previous reports, Florida DOH and ATSDR assessed the public health threat from nearby private drinking water wells, off-site soil, fish, and air; and reported on the results of urine testing (two reports) and area cancer rates. Florida DOH/ATSDR prepared these reports in response to a 2003 petition from a Plant City, Florida resident.

BACKGROUND

Site Location

The Coronet Industries, Incorporated site ("Coronet") is at 4082 Coronet Road, two miles southeast of Plant City, Hillsborough County, Florida (Figures 1 & 2). The site is at latitude 27°59'7" North and longitude -80°14'39" West (Section 2, Township 29 South, Range 22 East). The Coronet site occupies approximately 1,322 acres. The phosphate processing facility on the Coronet site is about two miles southeast of Plant City.

Site History

The Coronet Phosphate Company began phosphate mining in this area in the early 1900s. Until the mid-1920s, they mined phosphate rock from the northern part of the property using a shallow (less than 25 feet deep) excavation technique. In 1945, the Coronet Phosphate Company constructed a phosphate defluorinated plant to produce an animal feed supplement. The site has subsequently been owned/operated by the following: Smith-Douglas Fertilizer Company, Borden, Inc., Amax Chemical Corporation, and Consolidated Minerals. Coronet Industries, Inc. purchased the site from Consolidated Minerals in 1993 (Coronet 2005c).

Coronet processed phosphate rock to make alpha tricalcium phosphate, a nutritional supplement for poultry, turkey, cattle, and swine feed (HCEPC 2003a, ES&T 2002a). Coronet had the capacity to produce 250,000 tons of defluorinated phosphate annually. Coronet also produced potassium fluoroborate (KBF_4), a boron-containing industrial compound used in the aluminum alloy and electronics industries. Coronet Industries purchased the facility due in part to the close proximity of the site to railroad and interstate highway transport lines (Coronet 2005c).

Waste disposal areas on the site include an oil disposal area, an old municipal landfill, an old industrial landfill, and spoil piles containing dredged sludge from each process water collection pond.

Coronet operated under a state industrial wastewater facility permit (No. FL0034657-03-002). Two metallic fluoride salt recovery systems, the feed preparation area, a research and development facility, five defluorination units, two quality control laboratories, and storm

water runoff all contributed to facility wastewater production (ES&T 2002a). Wastewater collection areas include 10 unlined, closed-circuit, process water collection ponds spanning 332 acres (Figure 3) (Dynamac 1993). Prior to 1970, the site owners used a single liming process to treat their wastewater on-site. In 1970 the Florida Department of Air and Water Pollution Control (DAWPC) required the owners to add a second liming station to remove more phosphorus (FDEP 2006a).

From 1974 to 1976, the Florida Department of Air and Water Pollution Control tested the water in English Creek at Wiggins Road for nutrients and fluoride. In 1976 the Florida Department of Environmental Regulation (successor to DAWPC) issued the owners an industrial wastewater discharge permit. Under this National Pollution Discharge Elimination System (NPDES) permit, in emergencies the site owners were allowed to discharge wastewater into ditches leading to English Creek (Figure 4). The permit required the site owners test their wastewater when there was an off-site discharge. Surface water flow within the drainage ditches leading to these streams is generally intermittent. The site owners reported discharging wastewater into these ditches leading to English Creek numerous times beginning in 1979 (Dynamac 1993, DEP 2005, DEP 2006a, DEP 2006b).

In 1999, Coronet discovered 1.08% hydrofluoric acid in the water in the excavation beneath the spray tower adjacent to kiln #7. Coronet pumped this water into a nearby ditch. Coronet measured 750 parts per million fluorides (as HF) in the ditch water. Nearby monitoring wells (three shallow and one deep) contained detectable levels of fluoride (F) (ES&T 2002b).

In September 2003, Coronet installed eight new monitoring wells at the property boundary. Test results indicated that Coronet was violating its industrial wastewater permit. In October 2003, Florida DEP notified Coronet of its intent to take enforcement, requested Coronet submit a plan to correct permit violations, and requested assurance that Coronet had adequate financial resources. Coronet did not respond to these requests.

In December 2003, the Florida DEP and the US EPA conducted a joint Resource Conservation and Recovery Act (RCRA) compliance inspection. They inspected storm water discharge, wastewater discharges into English Creek, Coronet's drinking water system, and hazardous waste handling. EPA classified some wastewater ponds as hazardous waste. Since then, Coronet has treated some pond wastewater. In response to a citizen's complaint, Florida DEP and EPA made a second joint inspection in December 2003.

On March 31, 2004, Coronet voluntarily ceased operations (Coronet 2005b). Onsite cleanup efforts are ongoing.

Demographics

In 2000, about 832 people lived within ½ mile of the Coronet site (Table 1). About 55% were Caucasian, 31% were African American, and 14% were other races (BOC 2000).

Land and Natural Resource Use

Onsite Land Use

The paved phosphate processing area of the Coronet site is mostly flat. Weeds and bushes cover other areas. Large wastewater disposal ponds surrounded by raised soil berms are east and north of the processing area. Chain-linked fences, locked gates, and security personnel limit facility access. Facility buildings remain.

Off-Site Land Use

Land use within three miles of the site is residential, commercial, recreational, agricultural, and industrial. Cason Road, residences, and small farms are east of Coronet. A few homes, farms, and a large vacant area are north of the site. Trees border the southern and southwestern boundaries. The Springhead community exists around a fire station southeast of the site.

Regional Climate

The Hillsborough County climate is subtropical based on an annual average temperature of 72 degrees F (USDA 1989). The rainy season spans from June through September, resulting in an average annual precipitation of about 50 inches. Moderately high winds and accompanying thunderstorms occur at all seasons of the year. These rains can cause widespread flooding (SWFWMD 2005a).

Physiography and Topography

Hillsborough County is in the Floridian section of the Atlantic Coastal Plain physiographic province (USDA 1989). The land surface elevation for Plant City is 130 feet above mean sea level (Topozone 2005). Plant City is in the flat woods of northeast Hillsborough County, an area characterized by its large, nearly level plains (USDA 1989).

Regional Geology

Plant City soils are predominantly of the Myakka-Smyrna series - deep, poorly drained soils that have a fine, sandy subsoil. A seasonal high water table is within 10 inches of the surface soil for 1 to 4 months during most years. The slope is less than 2 percent.

Local and Regional Hydrology

The Coronet site is in the Alafia River Basin, a major drainage basin within the North Tampa Bay Watershed (SWFWMD 2005a). Howell Branch begins southwest of the site and flows south. English Creek, east of the site, also flows south and converges with Howell Branch about 3.6 miles south of Coronet, just north of Highway 60. These combined streams flow south another 3.6 miles where they join the North Prong of the Alafia River.

The principal sources of drinking water within a 4-mile radius of the Coronet site are the surficial aquifer, the intermediate aquifer, and the Floridan aquifer (Dynamac 1993).

The surficial aquifer is characteristically shallow, non-artesian, and non-karst. However, due to its location, the surficial aquifer is susceptible to pollution. This groundwater system stores water and feeds stream flows on and adjacent to the site. Groundwater flow in the surficial aquifer is complex due to past mining and large wastewater disposal ponds.

Locally, the intermediate aquifer occurs within permeable beds within the Hawthorne Formation, a 200-foot semi-confining unit composed of clay, sand, and limestone (Dynamac 1993). In these areas, water-soluble limestone below the earth's surface may dissolve, causing the land surface to sink or collapse and often, to fill up with water. Under karst conditions, surface water and groundwater may become closely interrelated such that surface water levels may directly reflect groundwater levels. These characteristics could also result in a high susceptibility to groundwater contamination (SWFWMD 2005a). Depressions exist within a 2-mile radius of the Coronet site, but they have not been confirmed as sinkholes (Dynamac 1993).

In contrast, the Floridan aquifer is deep and typically of karst topography (Dynamic 1993, SWFWMD 2005a). This is the primary hydrogeologic system of the site and region. The Floridan aquifer is the principal source of potable drinking water for local and regional townships.

Residents in the Lincoln Park neighborhood of Plant City, northwest of Coronet, receive potable water from Plant City Water System. This municipality derives its potable water source from groundwater wells (Dynamac 1993) to service 26,000 customers. The system appears unaffected by groundwater contamination from Coronet. Most residents south and east of Coronet, however, rely on private wells.

Recreational uses of surface waters near the Coronet site include the fishable and swimmable (Class III) waters of the North Prong of the Alafia River. Howell Branch and English Creek have insufficient water volume to support fishing for human consumption. Nearby residents report children and adolescents play in English Creek near the site.

Site Visits

Florida DOH visited the area several times between 2003 and 2005 to understand the relationship between the site, its contaminants, and nearby residents. Florida DOH participated in numerous public meetings. Florida DOH also spoke to local residents and other concerned community members by telephone. The Community Health Concerns section of this report addresses the numerous community health concerns.

Physical Hazards

Florida DOH observed a chain link fence and security personnel that restrict access to the phosphate-processing portion of the site. Access to the northern portion of the site, however, appears less restricted. Drowning in the wastewater ponds is a physical hazard, but no more so than other area lakes and ponds.

DISCUSSION

This section evaluates the public health risk from contact with Coronet wastewater discharged into nearby ditches leading to English Creek. This section also summarizes previous Florida DOH/ATSDR reports on area drinking water, soil, air, fish, urine testing, and cancer. Previous DOH/ATSDR reports are available on-line at

www.myfloridaeh.com/community/superfund/index.html

(under “Coronet Industries”) or by contacting either Florida DOH or ATSDR.

When dealing with the uncertainties inherent in public health assessments, Florida DOH makes interpretations and recommendations that protect public health. We presume people are exposed daily, over long time periods, to the highest measured chemical levels.

In preparing this report, Florida DOH relied on existing environmental data provided in the referenced documents. We assume the document authors followed adequate chain-of-custody, laboratory procedures, and data reporting quality assurance and quality control (QA/AC). The

completeness and reliability of the referenced information determine the validity of the analyses.

Off-Site Surface Water: English and Howell Creeks

Environmental Contamination

To prevent breaching of the wastewater pond impoundments following heavy rains, Coronet's operating permit allowed emergency discharge of treated wastewater into ditches leading to English Creek. Coronet reported its first wastewater discharge to English Creek in 1979. Prior to wastewater discharge, Florida DEP required Coronet to raise the pH with lime and to test the water quality (FDEP 2005). Coronet has been subject to past and current Florida DEP enforcement actions.

In response to concerns of nearby residents, on September 25, 2003, the Hillsborough County Environmental Protection Commission (EPC) collected water samples from six places along Howell Creek. Howell Creek drains the area southwest of Coronet. Hillsborough EPC analyzed the water samples for metals (HCEPC 2003b).

We reviewed the available water quality data for both English and Howell Creeks (Table 2).

Exposure Pathways Analysis

We evaluated possible exposure pathways to determine the potential for people living near English Creek and Howell Creek to be exposed to contaminants. The following are environmental and human components of an exposure pathway:

(1) a *source* of contamination;
(2) an environmental *medium* (e.g., air, water, soil, sediment, fish) and a *mechanism of contaminant release and transport* through that environmental medium;
(3) a *route* of human exposure;
(4) a specific point of potential human contact with the contaminated medium, which is referred to as the *exposure point; and,*
(5) a *receptor population.*

When all of these elements are present, the exposure pathway is "complete." When one or more elements is missing but may exist in the future, the exposure pathway is "potential." In instances where we did not find any contaminants or where one or more components of a pathway is missing and will never be present, the exposure pathway is "incomplete."

Nearby residents reported children played in English and Howell Creeks. For children who played in these creeks, skin exposure is a completed pathway. Since nearby residents have private drinking water wells, drinking water from these creeks is not a likely exposure pathway. Neither is eating fish since neither is big enough to sustain a sport fish population. Likewise, since the metals associated with Coronet wastewater such as fluoride, boron, and arsenic and are not very volatile, inhalation of vapors from these creeks is not a likely exposure pathway.

Toxicological Implications

This subsection evaluates the public health threat from skin exposure to separate contaminants in Coronet wastewater discharge. This assessment does not consider possible synergistic (interactive) health effects from simultaneous exposure to multiple contaminants. The science of toxicology is only beginning to study the health effects from multiple chemical exposures. Appendix C contains a detailed discussion of the risk of illness, dose response/threshold, and uncertainty in public health assessments.

Arsenic - Arsenic is a naturally occurring element found in soil and rock, including rock mined for phosphate. Arsenic can leach from soil and rock into groundwater. Mining and manufacturing can increase arsenic concentrations in soil, air, and water. For most people, however, food is the major source of exposure.

The toxicological information on health effects from skin contact with arsenic is very limited. Skin contact with pure inorganic arsenic dust may cause redness, irritation, and swelling. Skin contact with arsenic dissolved in water, however, is less likely to cause these effects. Because this metal is not well absorbed through intact skin and contact was infrequent, these exposures were not likely a public health hazard. Too little is known, however, to quantify the risk (ATSDR 2005a).

Boron - Boron is a compound that occurs naturally in water, air, and food at low levels. Boron is often found combined with other substances to form compounds called borates. Borates are mostly used to produce glass.

The toxicological information on health effects from skin contact with boron is very limited. In rabbits, skin contact with pure boron oxide dust causes redness. Skin contact with boron dissolved in water, however, is less likely to cause these effects. Because this metal is not well absorbed through intact skin and contact was infrequent, these exposures were not likely a public health hazard. Too little is known, however, to quantify the risk (ATSDR 1992).

Cadmium - The main sources of cadmium in the air are the burning of fossil fuels such as coal or oil and the incineration of municipal waste. Food and the smoking of tobacco are common sources of general exposure.

The toxicological information on health effects from skin contact with cadmium is limited. Contact with cadmium dissolved in water causes irritation in some sensitive individuals. Because this metal is not well absorbed through intact skin and contact was infrequent, these exposures were not likely a public health hazard. Too little is known, however, to quantify the risk (ATSDR 1999).

Chromium – Chromium occurs naturally in rocks, animals, plants, and soil. Most of the chromium in soil does not dissolve easily in water and can attach strongly to the soil. Chromium can enter your body when you breathe air, eat food, or drink water containing chromium. If your skin comes in contact with chromium, very little will enter your body unless your skin is damaged.

Skin contact with concentrated chromium solutions in the workplace can cause skin irritation and skin ulcers. Chromium can be absorbed across the skin, especially if the skin is damaged. Because this metal is not well absorbed through intact skin and contact was infrequent, these exposures were not likely a public health hazard. Too little is known, however, to quantify the

risk (ATSDR 2000).

Fluorides - Fluorides occur naturally in rocks, coal, clay, and soil. In water, fluorides associate with aluminum and settle out, remaining strongly attached to sediment particles. Fluorides are frequently added to drinking water supplies (1 part per million) and toothpaste to prevent dental decay.

The toxicological information on health effects from skin contact with fluorides is limited. A 1% sodium fluoride solution applied to rats for 24-hour causes skin swelling, inflammation, and cell death. Although fluorides are likely absorbed across the skin faster than arsenic, boron, cadmium, and lead; contact was infrequent and these exposures were not likely a public health hazard. Too little is known, however, to quantify the risk (ATSDR 2003a).

Lead - Lead is a heavy, low melting, naturally occurring, bluish-grey metal. It combines with two or more other elements to form lead compounds in soil and rocks. The largest use of lead is in automotive batteries. Refineries once added lead to gasoline to increase its octane rating but phased out lead in the 1980s. Bullet and fishing weight sinker producers are reducing their lead content because of its harm to the environment. Lead released into the environment in water is likely to bind strongly to sediment particles for many years.

The toxicological information on health effects from skin contact with lead is very limited. Because this metal is not well absorbed through intact skin and contact was infrequent, these exposures were not likely a public health hazard. Too little is known, however, to quantify the risk (ATSDR 2005b).

Previous Florida DOH/ATSDR Reports

Environmental Data Reviews

Scoping Report

In a June 2003 scoping report, Florida DOH visited the site, compiled community health concerns, summarized some of the environmental data, and recommended further assessment (FDOH 2003).

Nearby Private Residential Drinking Water Wells

Between August and December 2003, the Florida DOH coordinated with the Hillsborough County Health Department (HCHD) and Florida DEP to test approximately 145 private drinking water wells within ¼ mile south and east of Coronet (Figure 5). In a March 2004 report, Florida DOH found the concentrations of arsenic, boron, cadmium, lead, sodium, thallium and radium 226/228 in private drinking water wells were not likely to cause cancer or non-cancer illnesses (ATSDR 2004a).

Area Surface Soil

Between August and November 2003, the Hillsborough County EPC tested approximately 40 surface soil samples (0–6 inches below land surface) around the Coronet site, around the former

landfills on the Gregg Enterprises property, and in the Lincoln Park community (Figure 7). The Hillsborough EPC tested the soil for metals, including those associated with phosphate mining and processing. In addition, the Hillsborough EPC tested the Lincoln Park community soil for chlorinated pesticides, herbicides, polychlorinated biphenyls (PCBs), semi-volatile compounds, and gross alpha radiation. In addition to the above chemicals, Hillsborough EPC also tested the Gregg Enterprises property soil for volatile compounds and radium 226/228.

In a June 2004 report, Florida DOH categorized the surface soil around Coronet, including the Gregg Enterprises property and Lincoln Park community, as no apparent public health hazard. We do not expect contaminant levels to cause illness. For past exposures, the Florida DOH categorizes the surface soil as an indeterminate public health hazard. This is because there are no past surface soil sampling data. Current surface soil might not be representative of past concentrations (ATSDR 2004c).

Fish

In February 2004, the Florida Fish and Wildlife Conservation Commission collected 88 largemouth bass and blue tilapia from four ponds on Gregg Enterprises property, between the Coronet facility and the Lincoln Park community. Florida DOH had fillet samples analyzed for mercury and organochlorine pesticides. They also had fish from Pond 4 analyzed for dioxins and furans, as this pond contained the largest and oldest fish. They did not analyze for arsenic since fish store arsenic in a relatively non-toxic form. In a July 2004 report, Florida DOH concluded the levels of mercury, organochlorine pesticides, dioxins, and furans posed no apparent public health hazard and did not warrant a site-specific fish consumption advisory beyond the existing state-wide advisory (ATSDR 2004d).

Air

Florida DOH evaluated ambient (outdoor) air test data collected in 2003 around Coronet by the Hillsborough EPC (Figure 8). In a September 2005 report, they found that neither the average nor maximum concentrations of arsenic, cadmium, and chromium were likely to cause cancer or other noncancer illness. Based on the 2003 air quality, Florida DOH categorizes air around the Coronet site as no apparent public health hazard. The absence of long-term, continuous monitoring, however, limits this assessment to air quality in 2003. It is difficult to determine whether higher concentrations of pollutants were emitted in the past and whether those emissions could have posed a long-term health threat. Because the plant is being dismantled, future exposures are unlikely (ATSDR 2005c).

In a separate report, the Hillsborough County Environmental Protection Commission found that levels of total suspended particulates near Cornet in 2003 were “low” (HCEPC 2003c).

Health Outcome Data Reviews

Urine Testing

In August 2003, Florida DOH collected 24-hour urine samples from 106 residents in 35 nearby homes: 78 adults and 28 children (3-17 years). Because people normally excrete arsenic in their

urine after eating fish and shellfish, Florida DOH and ATSDR requested participants not eat any fish or shellfish in the four days prior to sample collection. The National Center for Environmental Health Laboratory (NCEH) in Atlanta, Georgia analyzed the urine samples for metals. In separate December 2003 and March 2004 reports, Florida DOH and ATSDR concluded the levels of arsenic, lead, cadmium, uranium, fluoride, and boron in the urine of these nearby residents are not associated with adverse health effects (ATSDR 2003b, 2004b).

Area Cancer Incidence

Guided by community concerns, Florida DOH evaluated the Florida Cancer Data System for Coronet area cancer rates. The study area included all of Plant City and part of eastern Polk County (Figure 6). Florida DOH looked for lung, bronchus, liver, kidney, bladder, prostate, breast, melanoma, and bone cancers associated with exposure to arsenic, radium, and cadmium. In a March 2004 report, Florida DOH found no statistically significant increase in the number of area cancers compared to Hillsborough/Polk County or state averages (FDOH 2004). The large number of people necessary to obtain statistical significance limited the ability of this evaluation to demonstrate a change in the cancer rate in the small number of people living immediately adjacent to the site.

COMMUNITY HEALTH CONCERNS

Residents near Coronet have expressed a number of health concerns. Residents expressed their health concerns during public meetings, in newspaper articles, and in one-on-one conversations with Florida DOH staff. Nearby residents are concerned about:

- Cancer (all types)
- Illnesses from drinking contaminated groundwater
- Respiratory ailments including bronchitis and asthma
- Fertility problems
- Dental problems

Cancer

Based on the environmental data reviewed for this and previous health consultation reports, residents living near the Coronet site were not exposed to contaminants at levels likely to significantly increase the risk of cancer. Environmental data are lacking, however, prior to 2003. Contaminant concentrations in the environment prior to 2003 may have been higher or lower.

In 2003, the levels of site-related contaminants in the urine of nearby residents were not associated with adverse health effects. In the past, however, urine levels may have been higher or lower (ATSDR 2003b, 2004b).

Florida DOH reviewed the Florida Cancer Data System for cancers associated with contaminants found at the Coronet site. In a March 2004 report, they found no statistically significant increase in the number of observed cancers in the Plant City area from 1990 to 2000 compared to the expected number of cases (FDOH 2004). The large number of people necessary to obtain statistical significance limited the ability of this evaluation to demonstrate a change in the cancer

rate in the small number of people living immediately adjacent to the site.

Cancer is a relatively common disease. The American Cancer Society estimates doctors will diagnose about one of every three persons in the U.S. today with some form of cancer during their lifetime (ACS 2005). Sometimes a "cluster" of cancer cases (more than would be expected based on state or national rates) will occur in an area. When health officials investigate such clusters, however, it is usually not possible to identify a specific cause. A cluster will occasionally occur in an area based on chance alone.

Illnesses from drinking contaminated groundwater

Based on the testing of approximately 145 nearby private drinking water wells between August and December 2003, Florida DOH concluded there was no apparent public health hazard. In a March 2004 report, we concluded that contaminant levels were not likely to have caused illness. We suspect exposures occurred in the past, but they do not know the contaminant levels (ATSDR 2004a).

Respiratory ailments including bronchitis and asthma

Florida DOH reviewed 2003 air monitoring data around Coronet. In a September 2005 report, they concluded that in 2003 the air around Coronet was no apparent public health hazard and the levels of metals tested "pose no potential for significant risk of long-term health problems." Prior to 2003, air-monitoring data were insufficient to determine the public health threat (ATSDR 2005c).

Bronchitis is an inflammation of the mucous membrane of the bronchial tubes leading to the lungs. Cough, hypersecretion of mucus, and expectoration of sputum over a long period are characteristic of chronic bronchitis. It is associated with frequent bronchial infection usually due to inhalation, over a prolonged period, of air contaminated by dust or by noxious gases of combustion such as cigarette smoke.

About three percent of the U.S. population suffers from chronic bronchitis. Most are older than 40 and male sufferers outnumber female sufferers two to one. The disease is most prevalent in industrial cities and in smokers. The lack of air monitoring prior to 2003 prevents determining if contaminants from Coronet caused chronic bronchitis in nearby residents.

Asthma is an allergic narrowing of the airways of the lungs resulting in difficult breathing. Recurrent attacks of breathlessness accompanied by wheezing when breathing out are characteristic of asthma. The main symptoms are breathlessness, wheezing, a dry cough, and a feeling of tightness in the chest. It varies in severity from day to day and from hour to hour. Attacks may be most frequent in the early morning.

Asthma occurs in about five percent of the overall population and ten percent of children. Although asthma can develop at any age, it frequently starts in childhood and clears up or becomes less severe in early adulthood. More than half of the affected children grow out of asthma completely by the age of 21.

Pollen, house dust, house dust mites, animal fur, dander, or feathers usually trigger asthma attacks. Respiratory infections, tobacco smoke, or other air pollutants can also trigger it. The lack of air monitoring prior to 2003 prevents determining if contaminants from Coronet triggered any asthma attacks.

Fertility problems

Based on the environmental data reviewed for this and previous health consultation reports, residents living near the Coronet site were not exposed to contaminants at levels likely to cause fertility problems. Environmental data are lacking, however, prior to 2003. Contaminant concentrations in the environment prior to 2003 may have been higher or lower.

In 2003, the levels of site-related contaminants in the urine of nearby residents were not associated with fertility problems. In the past, however, urine levels may have been higher or lower (ATSDR 2003b, 2004b).

Dental problems

Based on the environmental data reviewed for this and previous health consultation reports, residents living near the Coronet site were not exposed to contaminants at levels likely to cause dental problems. Between October 2003 and February 2004, levels of hydrogen fluoride gas in the air around Coronet were below detection limits. Environmental data are lacking, however, prior to 2003. Contaminant concentrations in the environment prior to 2003 may have been higher or lower.

CHILD 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 sometimes engage in hand-to-mouth behaviors that increase their exposure potential. Children are shorter than are adults; this 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 systems 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.

In reviewing the available health and environmental data, Florida DOH evaluated health risks to children, the immune-compromised, and the elderly. Levels of contaminants found in media to which offsite residents might be exposed are not expected to cause adverse health effects in these subpopulations for exposures occurring since 2003. Florida DOH is more uncertain about exposure before 2003.

CONCLUSIONS

Florida DOH and US ATSDR categorize the area around the Coronet Industries, Incorporated site as an "indeterminate public health hazard" for past exposures. In general, environmental test data are insufficient to determine the public health risk from exposures before 2003.

Based on the available environmental data reviewed for this and previous reports, the area around the Coronet site is currently "no apparent public health hazard." Levels of contaminants measured in urine of nearby residents, private drinking water wells, off-site surface soil, fish, and outdoor air are not likely to cause illness. The number of cancer cases reported in the Plant City area between 1990 and 2000 are not unusual. Although most of the metals in wastewater discharged to English Creek are not well absorbed across the skin, too little is known to quantify the health risk.

If use of the Coronet site changes from industrial to commercial or residential, on-site environmental data should be reviewed to determine the health threat for site users.

Off-Site Surface Water Quality and Community Health Concerns Conclusions

1. Coronet discharged wastewater into ditches leading to English Creek. Howell Creek drains the area southwest of Coronet. For children who played in English or Howell Creeks, skin exposure is a completed pathway. The toxicological information on health effects from skin contact with arsenic, boron, cadmium, chromium, fluoride, and lead found in the wastewater, however, is very limited. Because these metals are not well absorbed through intact skin and contact was infrequent, these exposures were not likely a public health hazard. Too little is known, however, to quantify the risk.

2. Nearby residents are concerned about cancer, fertility problems, dental problems, and respiratory ailments. Based on the environmental data reviewed for this and previous health consultation reports, residents living near the Coronet site are not currently being exposed to contaminants at levels likely to significantly increase the risk of fertility problems, dental problems, or cancer. In general, environmental data are lacking prior to 2003. In 2003, the levels of site-related contaminants in the urine of nearby residents were not associated with adverse health effects. Urine levels, however, may have been different in the past. In 2003, levels of metals in ambient (outdoor) air did not pose a significant risk of causing respiratory ailments such as asthma and bronchitis. Prior to 2003, air-monitoring data were insufficient to determine the public health threat.

Conclusions from Previously Published Florida DOH/ATSDR Reports

3. In August 2003, levels of arsenic, lead, cadmium, uranium, fluoride, and boron in urine from 106 nearby residents were not associated with adverse health effects. Prior to August 2003, urine levels may have been higher or lower.

4. In the summer/fall of 2003, levels of metals and volatile organic chemicals in approximately 145 private drinking water wells within ¼ mile south and east of Coronet were not likely to cause illness. Prior to 2003, Florida DEP and DOH suspect people were exposed but since they do not

know the contaminant levels, the public health threat is indeterminate. Based on the limited extent of current groundwater contamination, it is unlikely, however, that nearby residents were exposed prior to 2003 to contaminants at high enough concentrations and for long enough to cause widespread illness.

5. Based on the February 2004 test for mercury, dioxins/furans, and organochlorine pesticides in 88 fish from four Gregg Enterprises ponds, there is no apparent public health hazard for people who eat fish from these ponds.

6. There is no statistically significant increase in the number of cases of lung, bronchus, liver, kidney, bladder, prostate, breast, melanoma, and bone cancer reported between 1990 and 2000 in the Plant City area.

7. In 2003, levels of contaminants in 40 surface soil samples from Lincoln Park, Gregg Enterprises, and other areas surrounding Coronet are not expected to cause illness. Prior to 2003, the public health threat from exposure to surface soil is indeterminate due to a lack of test data.

8. In 2003, the levels of metals in ambient (outdoor) air surrounding the Coronet site posed no apparent public health hazard. Prior to 2003, ambient air was an indeterminate health hazard due to insufficient data.

RECOMMENDATIONS

1. Review on-site environmental data to determine the health threat for future users if the Coronet site land use changes from industrial to commercial or residential.

Recommendations from Previously Published Florida DOH/ATSDR Reports

2. Conduct blood lead testing on three individuals with urine lead levels above the 95th percentile comparison range.

Status: In January 2004, the Hillsborough CHD offered free blood lead testing to three individuals with urine lead levels above the 95th percentile comparison range. These individuals did not respond to the offer.

3. Retest those private drinking water wells with concentrations less than the drinking water standard but more than ½ the drinking water standard.

Status: Every six months since May 2004, the Hillsborough CHD retested approximately 20 private drinking water wells with concentrations less than the drinking water standard but more than ½ the drinking water standard. A few of the wells retested exceeded the drinking water MCL for arsenic and homes have been supplied with bottled water

4. Residents whose private drinking water wells have contaminant levels above a drinking water standard should continue drinking bottled water or water from an alternative source.

Status: The Florida DEP has continued to supply bottled water to individuals with private

drinking water wells exceeding a drinking water standard.

5. Children and women of childbearing age who eat fish from ponds on the Gregg Enterprises property should follow statewide fish consumption guidance to limit their mercury intake: one 4-ounce serving of fish per week for children and one 8-ounce serving of fish per week for women of childbearing age.

Status: Florida DOH continues to provide fish consumptions advisories for lakes and rivers throughout Florida. The Hillsborough EPC continues to educate county residents about fish consumption advisories.

6. Gregg Enterprises property owners should maintain their fence and no trespassing signs to reduce physical hazards (drowning or snake bites).

Status: The county health department confirmed that the warning signs are being maintained.

PUBLIC HEALTH ACTION PLAN

The purpose of the public health action plan is to ensure that Florida DOH and ATSDR not only identify public health hazards, but address them as well. A public health action plan for a site generally describes actions that Florida DOH and/or other government agencies would take to mitigate and prevent adverse human health effects from exposure to hazardous substances in the environment.

Actions Completed

Florida DOH and ATSDR, in cooperation with the Hillsborough County Health Department, Florida Department of Environmental Protection, and the Hillsborough Environmental Protection Commission:

1. Met with community leaders, summarized environmental data, and reviewed the need for a comprehensive public health assessment.
2. Collected/tested the urine of 106 nearby residents and interpreted/publicized the results.
3. Tested approximately 145 private drinking water wells within ¼ mile south and east of Coronet and interpreted/publicized the results.
4. Interpreted and publicized the test results of approximately 40 surface soil samples around the Coronet site, the former landfills on the Gregg Enterprises property, and in the Lincoln Park community.
5. Coordinated testing of 88 fish from four ponds on Gregg Enterprises property and interpreted/publicized the results.
6. Interpreted and publicized the 2003 Coronet area ambient (outdoor) air quality test results.
7. Compiled, interpreted, and publicized Coronet area cancer rates.
8. Developed and mailed fact sheets and newsletters to the Springhead and Lincoln Park communities near Coronet.
9. Held five public meeting/open house sessions in the Springhead and Lincoln Park communities.
10. Distributed health education materials to Coronet area residents and health care providers at

public meetings and by direct mail.
11. On June 15, 2006, briefed the Hillsborough County Environmental Protection Commission (EPC) on the draft public health assessment report and held an open house to solicit public comment.

Reports documenting the above actions are available from Florida DOH and ATSDR. These reports are also online at www.myfloridaeh.com/community/superfund/index.html.

In January 2004, the Hillsborough CHD offered free blood lead testing to three individuals with urine lead levels above the 95th percentile comparison range. These individuals did not respond to the offer. Every six months since May 2004, the Hillsborough CHD retested 20 private drinking water wells with concentrations less than the drinking water standard but more than ½ the drinking water standard. The Florida DEP has continued to supply bottled water to individuals with private drinking water wells exceeding a drinking water standard.

Actions Planned

The Florida DOH will distribute the final public health assessment report.

Please see the individual "status" update under the recommendations for actions that have occurred as a follow-up to Florida DOH recommendations.

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CERTIFICATION

The Florida Department of Health, Bureau of Community Environmental Health prepared this Health Consultation under a cooperative agreement with the Agency for Toxic Substances and Disease Registry. Florida DOH followed approved methodologies and procedures existing at the time the health consultation was begun. The Cooperative Agreement Partner completed editorial review.

Jennifer Freed
Technical Project Officer
CAT CAPEB, DHAC, ATSDR

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

Alan Yarbrough
Team Lead,
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APPENDIX A: Tables

Table 1. Summary Population Statistics in the Vicinity of the Coronet Site *

Radius (miles)	Total Population	Housing Units	Block Count	Area Within Radius (sq. mi)	White	African American	Other (combined)
0.25	439	122	8	0.2	198	173	68
0.5	832	249	10	0.8	455	257	120
1	2051	602	20	3.1	1301	274	476
1.5	2885	894	36	7.1	2046	279	560

*Source: BOC 2000

Table 2. Maximum Concentrations in Off-Site Surface Water

Contaminants of Concern	Maximum Concentration (ug/L)	# > Comparison Value/Total # of Samples	Comparison Value *	
			(ug/L)	Source
Arsenic	209	51/51	0.02	ATSDR CREG
Boron	36,000	14/14	100	ATSDR child intermediate EMEG
Cadmium	17	15/42	2	ATSDR child chronic EMEG
Chromium	142	1/6	100	EPA MCL
Fluoride	51,100	103/103	500	ATSDR child chronic EMEG
Lead	52	11/41	15	EPA MCL

Source: FDEP 2006a, FDEP 2006b, and HCEPC 2003b

ug/L = micrograms per liter

CREG = cancer risk evaluation guideline for ingestion (drinking) exposure

EMEG = environmental media evaluation guideline for ingestion (drinking) exposure

MCL = maximum concentration limit for drinking water

* Comparison values (ingestion exposure) used to select chemicals for further scrutiny, not for determining the possibility of illness.

APPENDIX B: Figures

Figure 1. Map of Florida/Hillsborough County

Figure 2. Coronet/Plant City Area Map

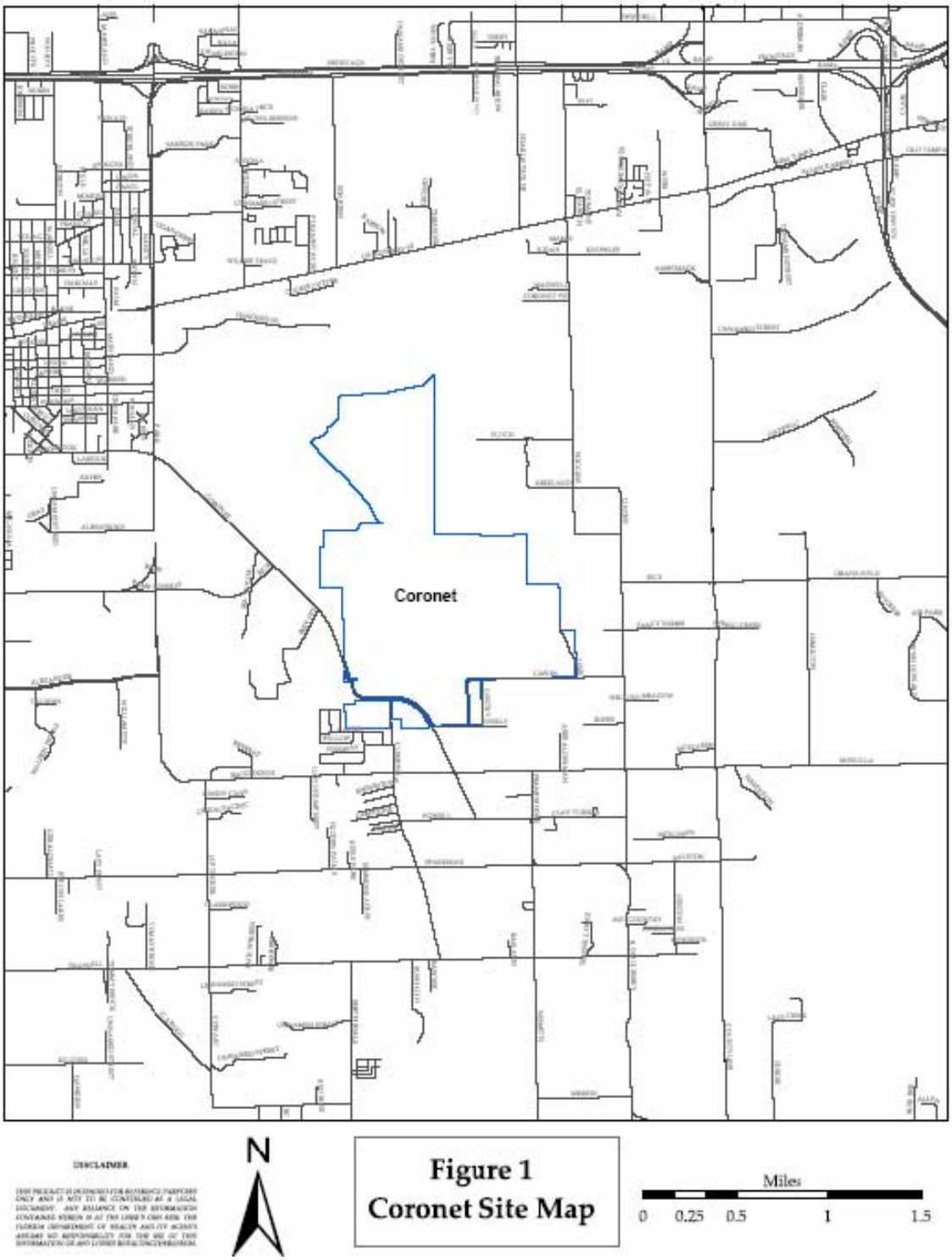


Figure 3. Coronet Waste Water Ponds

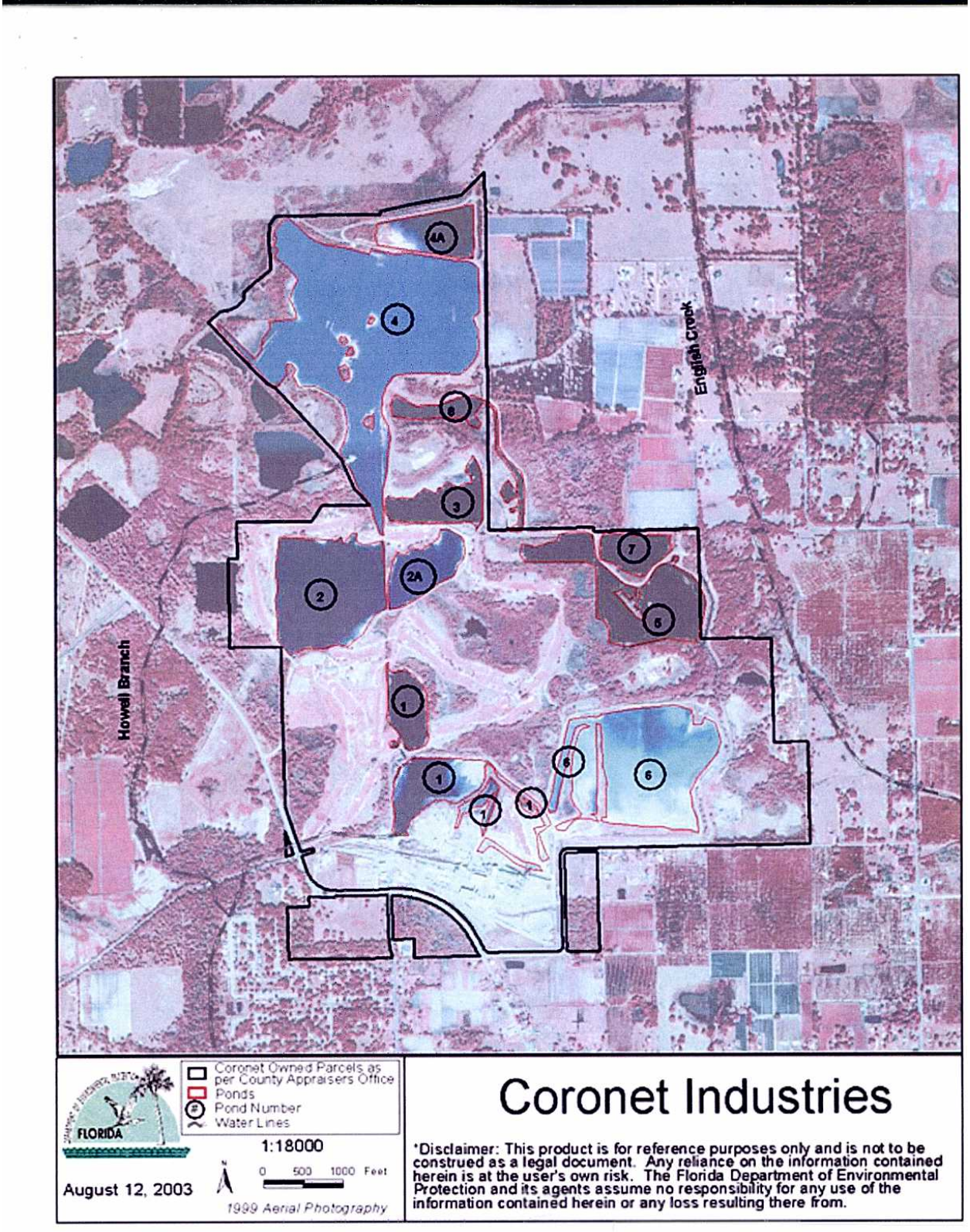
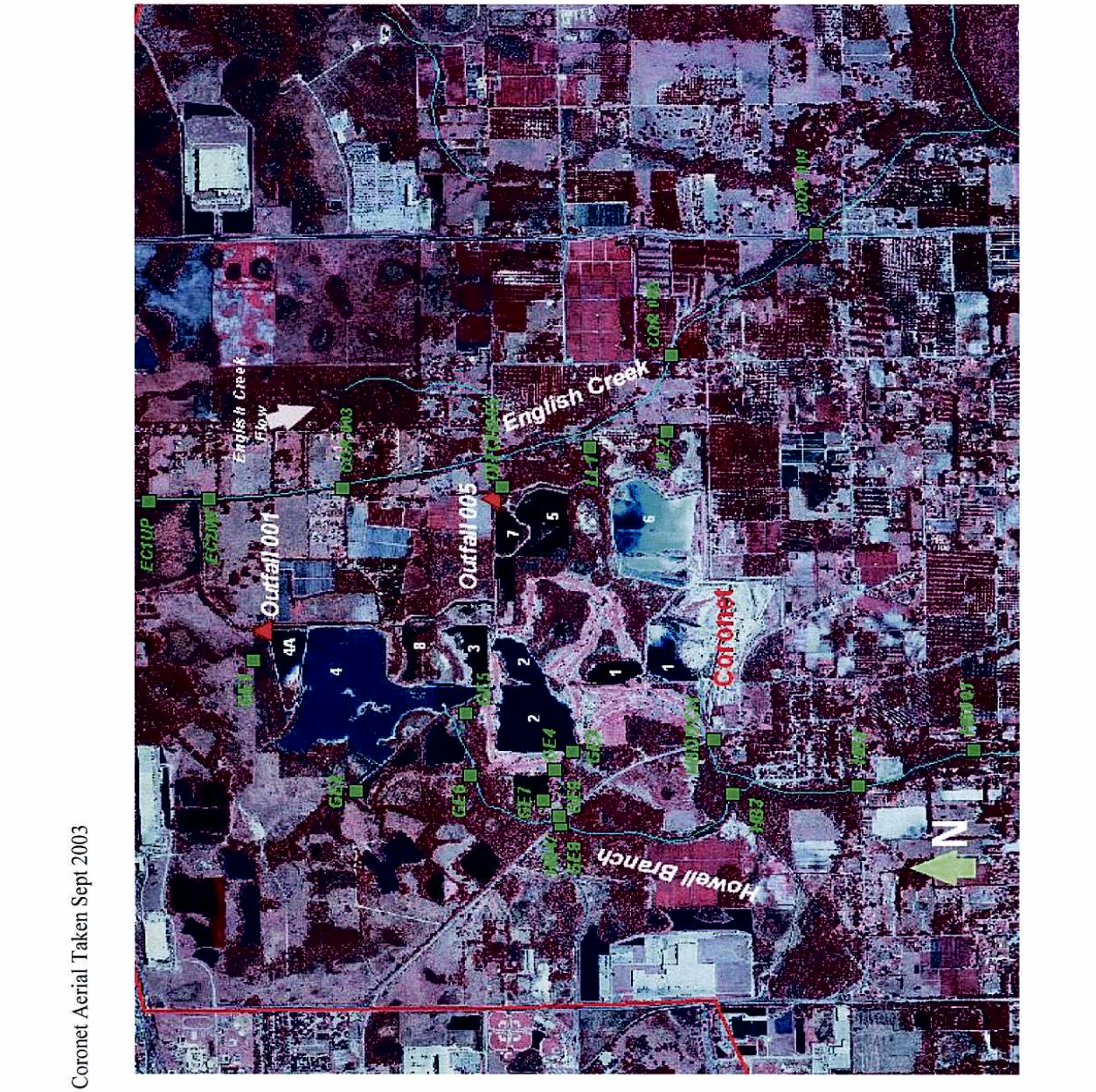


Figure 4. Coronet Area Surface Water



Coronet Aerial Taken Sept 2003

Figure 5. Coronet Area Private Well Sample Locations

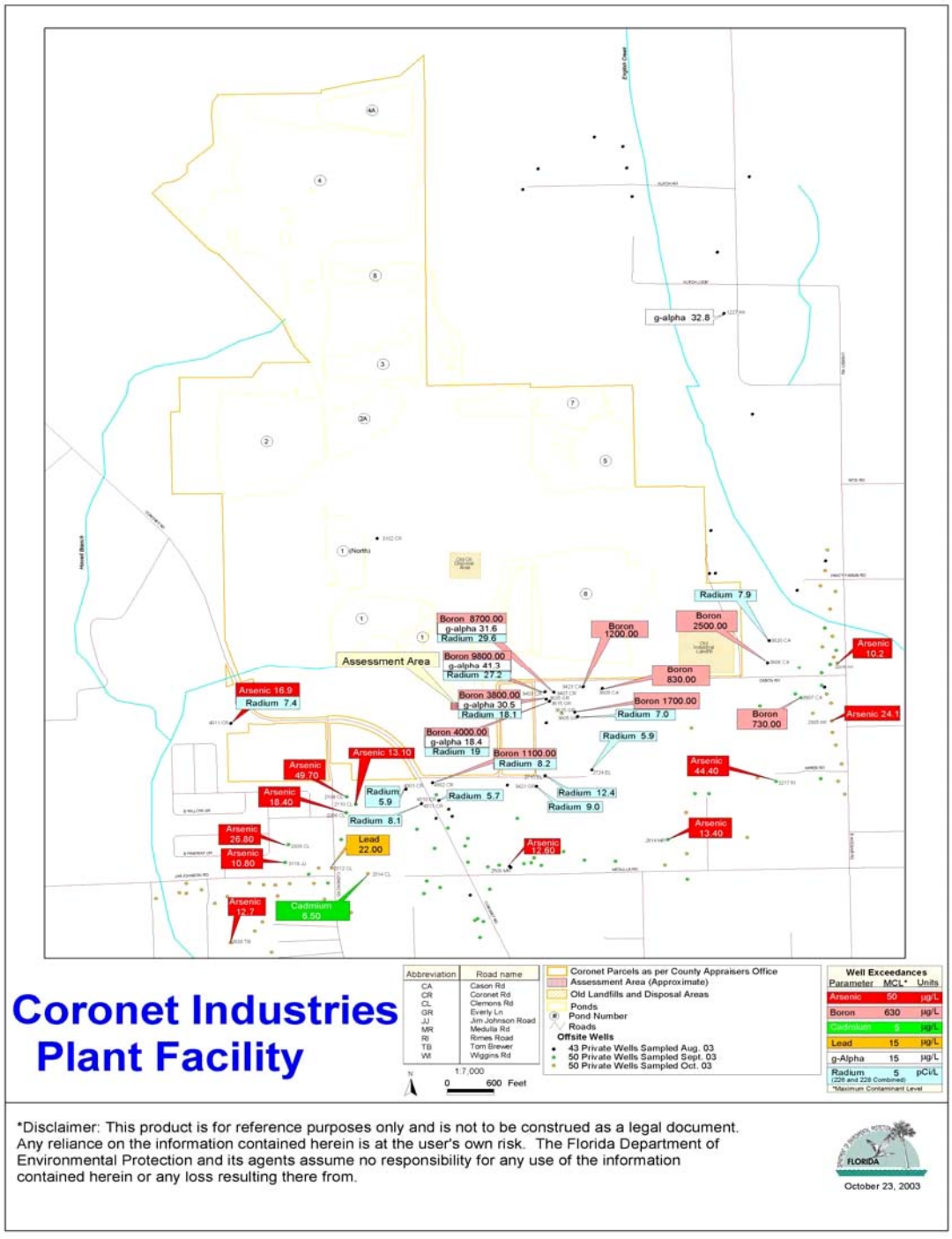


Figure 6. Plant City Area Cancer Rate Investigation Map

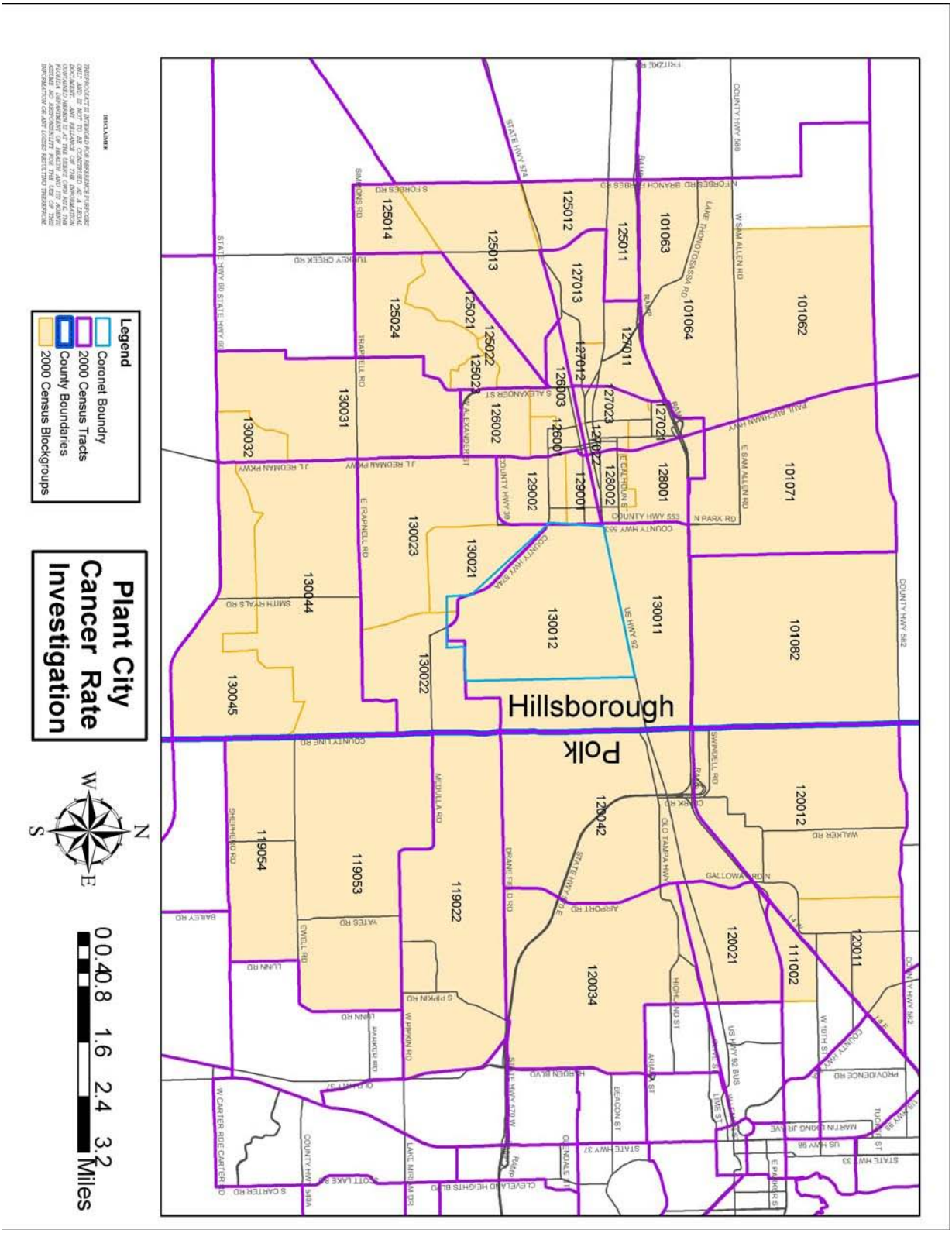


Figure 7. Coronet Area Surface Soil Sample Locations

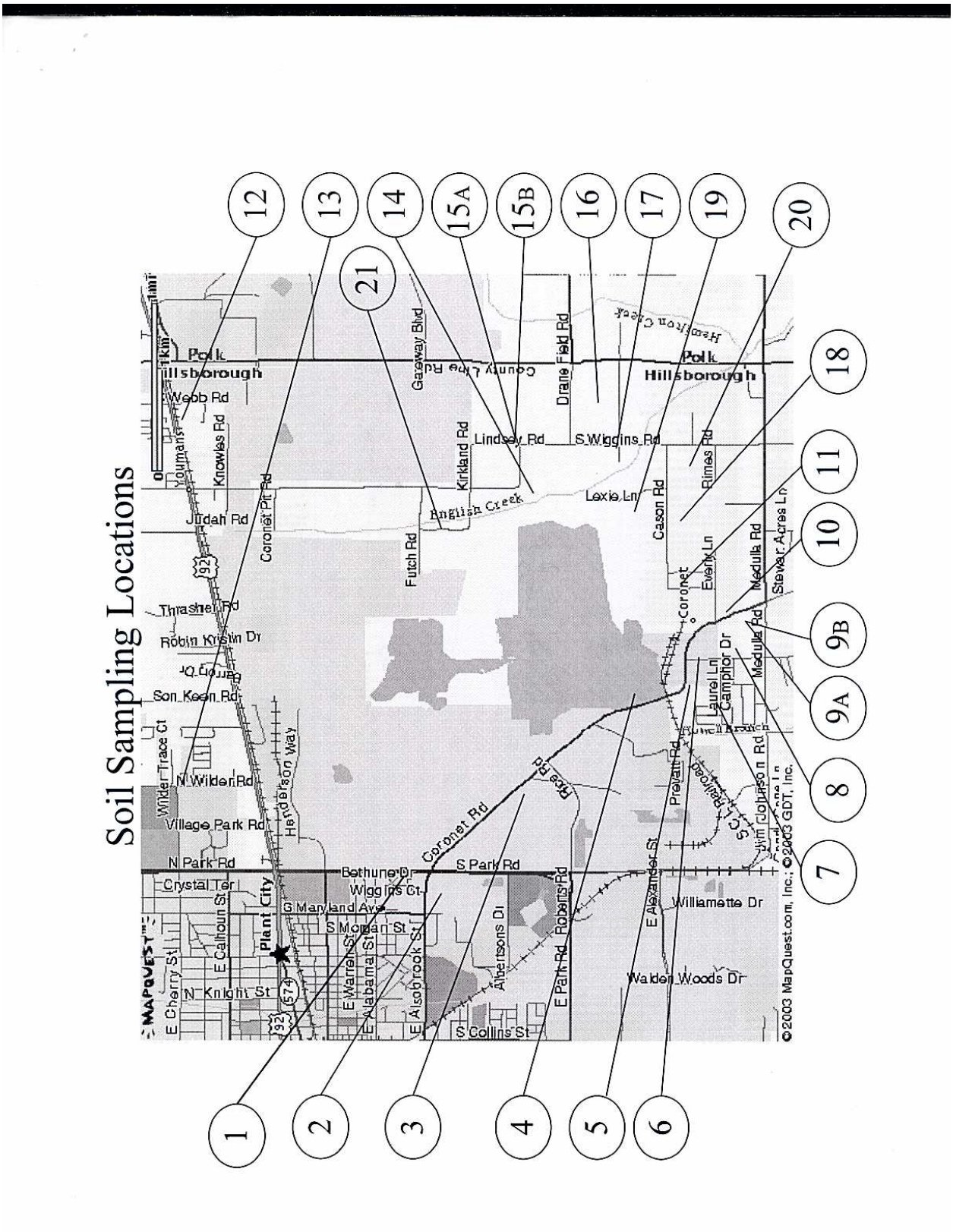
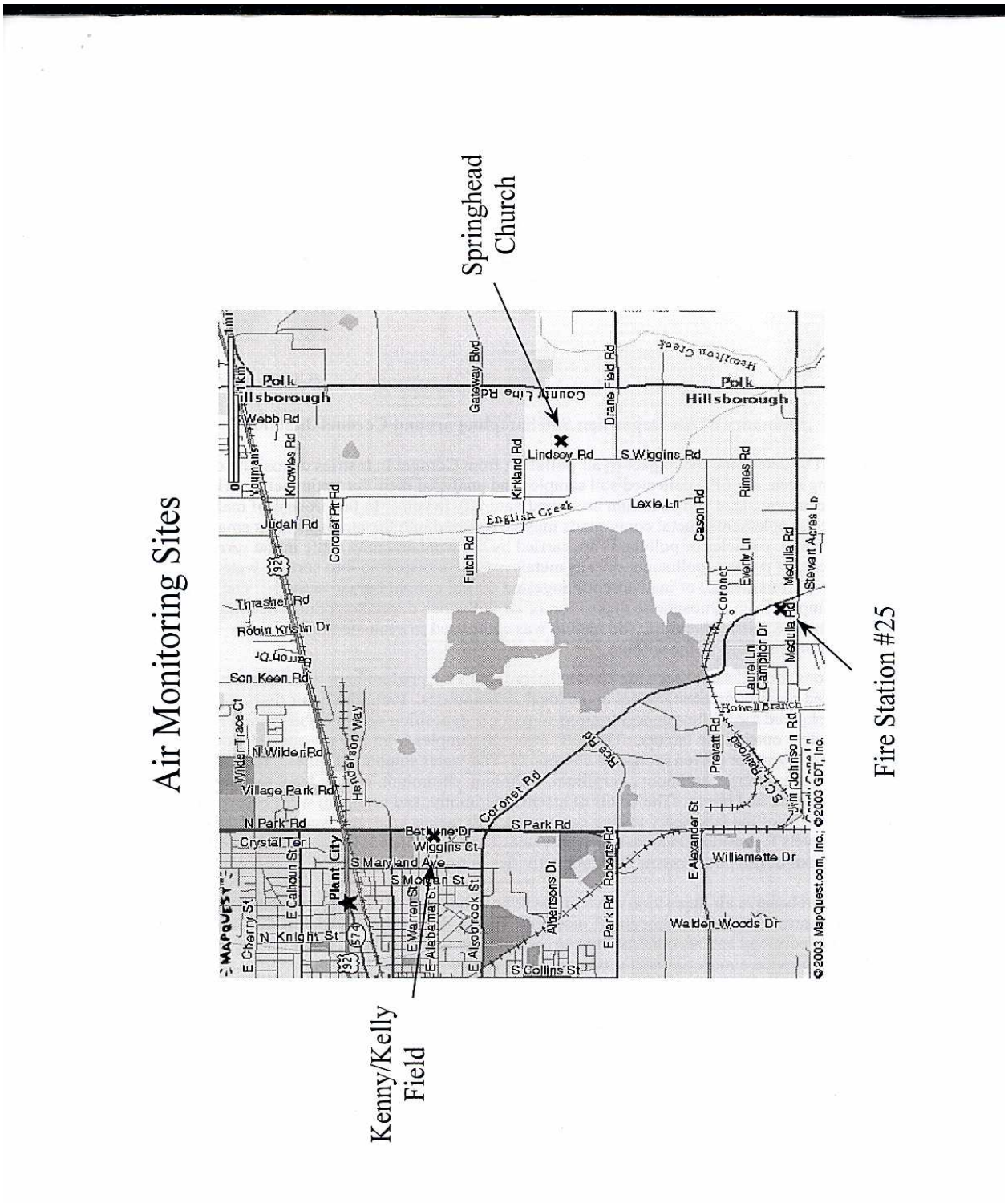


Figure 8. Coronet Area Air Sample Locations



APPENDIX C: Risk of Illness, Dose Response/Threshold, and Uncertainty in Public Health Assessments

Risk of Illness

In this health assessment, the risk of illness is the chance that exposure to a hazardous contaminant is associated with a harmful health effect or illness. The risk of illness is not a measure of cause and effect; only an in-depth health study can identify a cause and effect relationship. Instead, we use the risk of illness to decide if the site needs a follow-up health study and to identify possible associations.

The greater the exposure to a hazardous contaminant (dose), the greater the risk of illness may be. The amount of a substance required to harm a person's health (toxicity) also determines the risk of illness. Exposure to a hazardous contaminant above a minimum level increases everyone's risk of illness. Only in unusual circumstances, however, do many people become ill.

Information from human studies provides the strongest evidence that exposure to a hazardous contaminant is related to a particular illness. Some of this evidence comes from doctors reporting an unusual incidence of a specific illness in exposed individuals. Studies that are more formal compare illnesses in people with different levels of exposure. However, human information is very limited for most hazardous contaminants, and scientists must frequently depend upon data from animal studies. Hazardous contaminants associated with harmful health effects in humans are often associated with harmful health effects in other animal species. There are limits, however, in only relying on animal studies. For example, scientists have found some hazardous contaminants are associated with cancer in animals, but lack evidence of a similar association in humans. In addition, humans and animals have differing abilities to protect themselves against low levels of contaminants, and most animal studies test only the possible health effects of high exposure levels. Consequently, the possible effects on humans of low-level exposure to hazardous contaminants are uncertain when information is derived solely from animal experiments.

Dose Response/Thresholds

The focus of toxicological studies in humans or animals is identification of the relationship between exposure to different doses of a specific contaminant and the chance of having a health effect from each exposure level. This dose-response relationship provides a mathematical formula or graph that we use to estimate a person's risk of illness. The actual shape of the dose-response curve requires scientific knowledge of how a hazardous substance affects different cells in the human body. There is one important difference between the dose-response curves used to estimate the risk of noncancer illnesses and those used to estimate the risk of cancer: the existence of a threshold dose. A threshold dose is the highest exposure dose at which there is no risk of illness. The dose-response curves for noncancer illnesses include a threshold dose that is greater than zero. Scientists include a threshold dose in these models because the human body can adjust to varying amounts of cell damage without illness. The threshold dose differs for different contaminants and different exposure routes, and we estimate it from information gathered in human and animal studies. In contrast, the dose-response curves used to estimate the risk of cancer assume there is no threshold dose (or, the cancer threshold dose is zero). This assumes a single contaminant molecule may be sufficient to cause a clinical case of cancer. This assumption is very conservative, and many scientists believe a threshold dose greater than zero

also exists for the development of cancer.

Uncertainty

All risk assessments, to varying degrees, require the use of assumptions, judgments, and incomplete data. These contribute to the uncertainty of the final risk estimates. Some more important sources of uncertainty in this public health assessment include environmental sampling and analysis, exposure parameter estimates, use of modeled data, and present toxicological knowledge. These uncertainties may cause risk assessors to overestimate or underestimate the risk. Because of the uncertainties described below, this public health assessment does not represent an absolute estimate of risk to persons exposed to chemicals at or near the former paper mill site.

Environmental chemistry analysis errors can arise from random errors in the sampling and analytical processes, resulting in either an over- or under-estimation of risk. We can control these errors to some extent by increasing the number of samples collected and analyzed and by sampling the same locations over several different periods. The above actions tend to minimize uncertainty contributed from random sampling errors.

There are two areas of uncertainty related to exposure parameter estimates. The first is the exposure-point concentration estimate. The second is the estimate of the total chemical exposures. In this assessment, we used maximum detected concentrations as the exposure point concentration. We believe using the maximum measured value to be appropriate because we cannot be certain of the peak contaminant concentrations, and we cannot statistically predict peak values. Nevertheless, this assumption introduces uncertainty into the risk assessment that may over- or under-estimate the actual risk of illness. When selecting parameter values to estimate exposure dose, we used default assumptions and values within the ranges recommended by the Agency for Toxic Substances and Disease Registry or the U.S. Environmental Protection Agency. These default assumptions and values are conservative (health protective) and may contribute to the over-estimation of risk of illness. Similarly, we assumed the maximum exposure period occurred regularly for each selected pathway. Both assumptions are likely to contribute to the over-estimation of risk of illness.

We also see data gaps and uncertainties in the design, extrapolation, and interpretation of toxicological experimental studies. Data gaps contribute uncertainty because information is either not available or is addressed qualitatively. Moreover, the available information on the interaction among chemicals found at the site, when present, is qualitative (that is, a description instead of a number) and we cannot apply a mathematical formula to estimate the dose. These data gaps may tend to underestimate the actual risk of illness. In addition, we see great uncertainties in extrapolating from high-to-low doses, and from animal-to-human populations. Extrapolating from animals to humans is uncertain because of the differences in the uptake, metabolism, distribution, and body organ susceptibility between different species. Human populations are also variable because of differences in genetic constitution, diet, home and occupational environment, activity patterns, and other factors. These uncertainties can result in an over- or underestimation of risk of illness. Finally, we see great uncertainties in extrapolating from high doses to low doses, and controversy in interpreting these results. Because the models used to estimate dose-response relationships in experimental studies are conservative, they tend to overestimate the risk. Techniques used to derive acceptable exposure levels account for such variables by using safety factors. Currently, there is much debate in the scientific community about how much we overestimate the actual risks and what the risk

estimates really mean.

APPENDIX D: Glossary of Environmental Health Terms

This glossary defines words used by the Agency for Toxic Substances and Disease Registry (ATSDR) in communications with the public. It is not a complete dictionary of environmental health terms. If you have questions or comments, call the ATSDR toll-free telephone number, 1-888-422-8737.

Absorption
The process of taking in. For a person or an animal, absorption is the process of a substance getting into the body through the eyes, skin, stomach, intestines, or lungs.

Acute
Occurring over a short time [compare with chronic].

Acute exposure
Contact with a substance that occurs once or for only a short time (up to 14 days) [compare with intermediate duration exposure and chronic exposure].

Additive effect
A biologic response to exposure to multiple substances that equals the sum of responses of all the individual substances added together [compare with antagonistic effect and synergistic effect].

Adverse health effect
A change in body function or cell structure that might lead to disease or health problems**.**

Aerobic
Requiring oxygen [compare with anaerobic].

The Agency for Toxic Substances and Disease Registry (ATSDR)
The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency with headquarters in Atlanta, Georgia, and 10 regional offices in the United States. ATSDR's mission is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances.

Ambient
Surrounding (for example, *ambient* air).

Anaerobic
Requiring the absence of oxygen [compare with aerobic].

Analyte
A substance measured in the laboratory. A chemical for which a sample (such as water, air, or blood) is tested in a laboratory. For example, if the analyte is mercury, the laboratory test will determine the amount of mercury in the sample.

Analytic epidemiologic study
A study that evaluates the association between exposure to hazardous substances and disease by testing scientific hypotheses.

Antagonistic effect
A biologic response to exposure to multiple substances that is **less** than would be expected if the known effects of the individual substances were added together [compare with additive effect and synergistic effect].

Background level
An average or expected amount of a substance or radioactive material in a specific

environment, or typical amounts of substances that occur naturally in an environment.

Biodegradation

Decomposition or breakdown of a substance through the action of microorganisms (such as bacteria or fungi) or other natural physical processes (such as sunlight).

Biologic indicators of exposure study

A study that uses (a) biomedical testing or (b) the measurement of a substance [an analyte], its metabolite, or another marker of exposure in human body fluids or tissues to confirm human exposure to a hazardous substance [also see exposure investigation].

Biologic monitoring

Measuring hazardous substances in biologic materials (such as blood, hair, urine, or breath) to determine whether exposure has occurred. A blood test for lead is an example of biologic monitoring.

Biologic uptake

The transfer of substances from the environment to plants, animals, and humans.

Biota

Plants and animals in an environment. Some of these plants and animals might be sources of food, clothing, or medicines for people.

CAP [see Community Assistance Panel.]

Cancer

Any one of a group of diseases that occur when cells in the body become abnormal and grow or multiply out of control.

Cancer risk

A theoretical risk for getting cancer if exposed to a substance every day for 70 years (a lifetime exposure). The true risk might be lower.

Carcinogen

A substance that causes cancer.

Case study

A medical or epidemiologic evaluation of one person or a small group of people to gather information about specific health conditions and past exposures.

Case-control study

A study that compares exposures of people who have a disease or condition (cases) with people who do not have the disease or condition (controls). Exposures that are more common among the cases may be considered as possible risk factors for the disease.

Central nervous system

The part of the nervous system that consists of the brain and the spinal cord.

CERCLA [see Comprehensive Environmental Response, Compensation, and Liability Act of 1980]

Chronic

Occurring over a long time [compare with acute].

Chronic exposure

Contact with a substance that occurs over a long time (more than 1 year) [compare with acute exposure and intermediate duration exposure]

Cluster investigation

A review of an unusual number, real or perceived, of health events (for example, reports of cancer) grouped together in time and location. Cluster investigations are designed to confirm case reports; determine whether they represent an unusual disease occurrence; and, if possible, explore possible causes and contributing environmental factors.

Community Assistance Panel (CAP)

A group of people from a community and from health and environmental agencies who work with ATSDR to resolve issues and problems related to hazardous substances in the community. CAP members work with ATSDR to gather and review community health concerns, provide information on how people might have been or might now be exposed to hazardous substances, and inform ATSDR on ways to involve the community in its activities.

Comparison value (CV)

Calculated concentration of a substance in air, water, food, or soil that is unlikely to cause harmful (adverse) health effects in exposed people. The CV is used as a screening level during the public health assessment process. Substances found in amounts greater than their CVs might be selected for further evaluation in the public health assessment process.

Completed exposure pathway [see exposure pathway].

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 CERCLA).

CERCLA, also known as Superfund, is the federal law that concerns the removal or cleanup of hazardous substances in the environment and at hazardous waste sites. ATSDR, which was created by CERCLA, is responsible for assessing health issues and supporting public health activities related to hazardous waste sites or other environmental releases of hazardous substances. This law was later amended by the Superfund Amendments and Reauthorization Act (SARA).

Concentration

The amount of a substance present in a certain amount of soil, water, air, food, blood, hair, urine, breath, or any other media.

Contaminant

A substance that is either present in an environment where it does not belong or is present at levels that might cause harmful (adverse) health effects.

Delayed health effect

A disease or an injury that happens as a result of exposures that might have occurred in the past.

Dermal

Referring to the skin. For example, dermal absorption means passing through the skin.

Dermal contact

Contact with (touching) the skin [see route of exposure].

Descriptive epidemiology

The study of the amount and distribution of a disease in a specified population by person, place, and time.

Detection limit

The lowest concentration of a chemical that can reliably be distinguished from a zero concentration.

Dose (for chemicals that are not radioactive)

The amount of a substance to which a person is exposed over some time period. Dose is a measurement of exposure. Dose is often expressed as milligram (amount) per kilogram (a measure of body weight) per day (a measure of time) when people eat or drink contaminated water, food, or soil. In general, the greater the dose, the greater the likelihood of an effect. An "exposure dose" is how much of a substance is encountered in the environment. An "absorbed dose" is the amount of a substance that actually got into the body through the eyes, skin, stomach, intestines, or lungs.

Dose (for radioactive chemicals)

The radiation dose is the amount of energy from radiation that is actually absorbed by the

body. This is not the same as measurements of the amount of radiation in the environment.

Dose-response relationship
The relationship between the amount of exposure [dose] to a substance and the resulting changes in body function or health (response).

Environmental media
Soil, water, air, biota (plants and animals), or any other parts of the environment that can contain contaminants.

Environmental media and transport mechanism
Environmental media include water, air, soil, and biota (plants and animals). Transport mechanisms move contaminants from the source to points where human exposure can occur. The environmental media and transport mechanism is the second part of an exposure pathway.

EPA United States Environmental Protection Agency.

Epidemiologic surveillance [see Public health surveillance].

Epidemiology
The study of the distribution and determinants of disease or health status in a population; the study of the occurrence and causes of health effects in humans.

Exposure
Contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term [acute exposure], of intermediate duration, or long-term [chronic exposure].

Exposure assessment
The process of finding out how people come into contact with a hazardous substance, how often and for how long they are in contact with the substance, and how much of the substance they are in contact with.

Exposure-dose reconstruction
A method of estimating the amount of people's past exposure to hazardous substances. Computer and approximation methods are used when past information is limited, not available, or missing.

Exposure investigation
The collection and analysis of site-specific information and biologic tests (when appropriate) to determine whether people have been exposed to hazardous substances.

Exposure pathway
The route a substance takes from its source (where it began) to its end point (where it ends), and how people can come into contact with (or get exposed to) it. An exposure pathway has five parts: a source of contamination (such as an abandoned business); an environmental media and transport mechanism (such as movement through groundwater); a point of exposure (such as a private well); a route of exposure (eating, drinking, breathing, or touching), and a receptor population (people potentially or actually exposed). When all five parts are present, the exposure pathway is termed a completed exposure pathway.

Exposure registry
A system of ongoing follow-up of people who have had documented environmental exposures.

Feasibility study
A study by EPA to determine the best way to clean up environmental contamination. A number of factors are considered, including health risk, costs, and what methods will work well.

Groundwater

Water beneath the earth's surface in the spaces between soil particles and between rock surfaces [compare with surface water].

Hazard

A source of potential harm from past, current, or future exposures.

Hazardous Substance Release and Health Effects Database (HazDat)

The scientific and administrative database system developed by ATSDR to manage data collection, retrieval, and analysis of site-specific information on hazardous substances, community health concerns, and public health activities.

Hazardous waste

Potentially harmful substances that have been released or discarded into the environment.

Health investigation

The collection and evaluation of information about the health of community residents. This information is used to describe or count the occurrence of a disease, symptom, or clinical measure and to evaluate the possible association between the occurrence and exposure to hazardous substances.

Indeterminate public health hazard

The category used in ATSDR's public health assessment documents when a professional judgment about the level of health hazard cannot be made because information critical to such a decision is lacking.

Incidence

The number of new cases of disease in a defined population over a specific time period [contrast with prevalence].

Ingestion

The act of swallowing something through eating, drinking, or mouthing objects. A hazardous substance can enter the body this way [see route of exposure].

Inhalation

The act of breathing. A hazardous substance can enter the body this way [see route of exposure].

Intermediate duration exposure

Contact with a substance that occurs for more than 14 days and less than a year [compare with acute exposure and chronic exposure].

In vitro In an artificial environment outside a living organism or body. For example, some toxicity testing is done on cell cultures or slices of tissue grown in the laboratory, rather than on a living animal [compare with in vivo].

In vivo

Within a living organism or body. For example, some toxicity testing is done on whole animals, such as rats or mice [compare with in vitro].

Lowest-observed-adverse-effect level (LOAEL)

The lowest tested dose of a substance that has been reported to cause harmful (adverse) health effects in people or animals.

Medical monitoring

A set of medical tests and physical exams specifically designed to evaluate whether an individual's exposure could negatively affect that person's health.

Metabolism

The conversion or breakdown of a substance from one form to another by a living organism.

Metabolite

Any product of metabolism.

mg/kg

Milligram per kilogram.

mg/cm^2

Milligram per square centimeter (of a surface).

mg/m^3

Milligram per cubic meter; a measure of the concentration of a chemical in a known volume (a cubic meter) of air, soil, or water.

Migration

Moving from one location to another.

Minimal risk level (MRL)

An ATSDR estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of harmful (adverse), noncancerous effects. MRLs are calculated for a route of exposure (inhalation or oral) over a specified time period (acute, intermediate, or chronic). MRLs should not be used as predictors of harmful (adverse) health effects [see reference dose].

National Priorities List for Uncontrolled Hazardous Waste Sites (National Priorities List or **NPL)** EPA's list of the most serious uncontrolled or abandoned hazardous waste sites in the United States. The NPL is updated on a regular basis.

National Toxicology Program (NTP)

Part of the Department of Health and Human Services. NTP develops and carries out tests to predict whether a chemical will cause harm to humans.

No apparent public health hazard

A category used in ATSDR's public health assessments for sites where human exposure to contaminated media might be occurring, might have occurred in the past, or might occur in the future, but where the exposure is not expected to cause any harmful health effects.

No-observed-adverse-effect level (NOAEL)

The highest tested dose of a substance that has been reported to have no harmful (adverse) health effects on people or animals.

No public health hazard

A category used in ATSDR's public health assessment documents for sites where people have never and will never come into contact with harmful amounts of site-related substances.

NPL [see National Priorities List for Uncontrolled Hazardous Waste Sites]

Plume

A volume of a substance that moves from its source to places farther away from the source. Plumes can be described by the volume of air or water they occupy and the direction they move. For example, a plume can be a column of smoke from a chimney or a substance moving with groundwater.

Point of exposure

The place where someone can come into contact with a substance present in the environment [see exposure pathway].

Population

A group or number of people living within a specified area or sharing similar characteristics (such as occupation or age).

Potentially responsible party (PRP)

A company, government, or person legally responsible for cleaning up the pollution at a hazardous waste site under Superfund. There may be more than one PRP for a particular site.

ppb

Parts per billion.

ppm
Parts per million.

Public availability session
An informal, drop-by meeting at which community members can meet one-on-one with ATSDR staff members to discuss health and site-related concerns.

Public comment period
An opportunity for the public to comment on agency findings or proposed activities contained in draft reports or documents. The public comment period is a limited time period during which comments will be accepted.

Public health action
A list of steps to protect public health.

Public health advisory
A statement made by ATSDR to EPA or a state regulatory agency that a release of hazardous substances poses an immediate threat to human health. The advisory includes recommended measures to reduce exposure and reduce the threat to human health.

Public health assessment (PHA)
An ATSDR document that examines hazardous substances, health outcomes, and community concerns at a hazardous waste site to determine whether people could be harmed from coming into contact with those substances. The PHA also lists actions that need to be taken to protect public health.

Public health hazard
A category used in ATSDR's public health assessments for sites that pose a public health hazard because of long-term exposures (greater than 1 year) to sufficiently high levels of hazardous substances or radionuclides that could result in harmful health effects.

Public health hazard categories
Public health hazard categories are statements about whether people could be harmed by conditions present at the site in the past, present, or future. One or more hazard categories might be appropriate for each site. The five public health hazard categories are no public health hazard, no apparent public health hazard, indeterminate public health hazard, public health hazard, and urgent public health hazard.

Public health statement
The first chapter of an ATSDR toxicological profile. The public health statement is a summary written in words that are easy to understand. The public health statement explains how people might be exposed to a specific substance and describes the known health effects of that substance.

Public health surveillance
The ongoing, systematic collection, analysis, and interpretation of health data. This activity also involves timely dissemination of the data and use for public health programs.

Receptor population
People who could come into contact with hazardous substances [see exposure pathway].

Reference dose (RfD)
An EPA estimate, with uncertainty or safety factors built in, of the daily lifetime dose of a substance that is unlikely to cause harm in humans.

Remedial investigation
The CERCLA process of determining the type and extent of hazardous material contamination at a site.

RfD [see reference dose]

Risk

The probability that something will cause injury or harm.

Risk reduction

Actions that can decrease the likelihood that individuals, groups, or communities will experience disease or other health conditions.

Risk communication

The exchange of information to increase understanding of health risks.

Route of exposure

The way people come into contact with a hazardous substance. Three routes of exposure are breathing [inhalation], eating or drinking [ingestion], or contact with the skin [dermal contact].

Safety factor [see uncertainty factor]

SARA [see Superfund Amendments and Reauthorization Act]

Sample

A portion or piece of a whole. A selected subset of a population or subset of whatever is being studied. For example, in a study of people the sample is a number of people chosen from a larger population [see population]. An environmental sample (for example, a small amount of soil or water) might be collected to measure contamination in the environment at a specific location.

Sample size

The number of units chosen from a population or an environment.

Source of contamination

The place where a hazardous substance comes from, such as a landfill, waste pond, incinerator, storage tank, or drum. A source of contamination is the first part of an exposure pathway.

Special populations

People who might be more sensitive or susceptible to exposure to hazardous substances because of factors such as age, occupation, sex, or behaviors (for example, cigarette smoking). Children, pregnant women, and older people are often considered special populations.

Statistics

A branch of mathematics that deals with collecting, reviewing, summarizing, and interpreting data or information. Statistics are used to determine whether differences between study groups are meaningful.

Substance A chemical.

Superfund [see Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act (SARA)

Superfund Amendments and Reauthorization Act (SARA)

In 1986, SARA amended the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and expanded the health-related responsibilities of ATSDR. CERCLA and SARA direct ATSDR to look into the health effects from substance exposures at hazardous waste sites and to perform activities including health education, health studies, surveillance, health consultations, and toxicological profiles.

Surface water

Water on the surface of the earth, such as in lakes, rivers, streams, ponds, and springs [compare with groundwater].

Surveillance [see public health surveillance]

Survey

A systematic collection of information or data. A survey can be conducted to collect

information from a group of people or from the environment. Surveys of a group of people can be conducted by telephone, by mail, or in person. Some surveys are done by interviewing a group of people [see prevalence survey].

Synergistic effect

A biologic response to multiple substances where one substance worsens the effect of another substance. The combined effect of the substances acting together is greater than the sum of the effects of the substances acting by themselves [see additive effect and antagonistic effect].

Teratogen

A substance that causes defects in development between conception and birth. A teratogen is a substance that causes a structural or functional birth defect.

Toxic agent

Chemical or physical (for example, radiation, heat, cold, microwaves) agents that, under certain circumstances of exposure, can cause harmful effects to living organisms.

Toxicological profile

An ATSDR document that examines, summarizes, and interprets information about a hazardous substance to determine harmful levels of exposure and associated health effects. A toxicological profile also identifies significant gaps in knowledge on the substance and describes areas where further research is needed.

Toxicology

The study of the harmful effects of substances on humans or animals.

Tumor

An abnormal mass of tissue that results from excessive cell division that is uncontrolled and progressive. Tumors perform no useful body function. Tumors can be either benign (not cancer) or malignant (cancer).

Uncertainty factor

Mathematical adjustments for reasons of safety when knowledge is incomplete. For example, factors used in the calculation of doses that are not harmful (adverse) to people. These factors are applied to the lowest-observed-adverse-effect-level (LOAEL) or the no-observed - adverse-effect-level (NOAEL) to derive a minimal risk level (MRL). Uncertainty factors are used to account for variations in people's sensitivity, for differences between animals and humans, and for differences between a LOAEL and a NOAEL. Scientists use uncertainty factors when they have some, but not all, the information from animal or human studies to decide whether an exposure will cause harm to people [also sometimes called a safety factor].

Urgent public health hazard

A category used in ATSDR's public health assessments for sites where short-term exposures (less than 1 year) to hazardous substances or conditions could result in harmful health effects that require rapid intervention.

Volatile organic compounds (VOCs)

Organic compounds that evaporate readily into the air. VOCs include substances such as benzene, toluene, methylene chloride, and methyl chloroform.

APPENDIX E: Response to Public Comments

This appendix summarizes and responds to public comments on the May 25, 2006 public health assessment report, public comment draft. Florida DOH received 18 comments from nearby residents, their attorney, an unidentified party, and the site owner.

Comment: One commenter disagreed with the draft report findings
Response: The data reviewed for this report support its findings.

Comment: One commenter reported drinking well water with arsenic and suffering frequent headaches and diverticulitus.
Response: Headaches are very common. Seven out of 10 Americans are affected. Pain can be anywhere in he head and can go down into the neck. Sinus headaches (common with sinusitis or when the membrane lining the sinus is inflamed), rebound headaches and cluster headaches are some less common types. Tension headaches and migraines are the two most common types. A dull pain characterizes tension headaches. Stress, worry, too much caffeine, alcohol, eyestrain, and overexertion can also trigger headaches. Migraines typically include throbbing pain. The pain is usually centered on only one side of the head. Migraines can be prompted by many factors, including changes in hormone levels, reactions to allergies (especially to food), and stress. Family history is a factor in who will likely get migraines. More women than men have migraines.

Headaches have been associated with exposure to arsenic. The level of arsenic that caused headaches in people after short-term exposure to arsenic was approximately 2,000 times higher than the highest estimated drinking water dose for a resident near Coronet. Reports of headaches in people exposed to arsenic for long time periods to levels four to five times higher than the highest estimated dose for a resident near Coronet have been inconsistent. Some studies reported various neurological effects, such as headaches, while others have reported no neurological effects. Overall, not enough information is known to determine if the highest level of arsenic measured in a private well near Coronet can cause headaches (ATSDR 2005d).

Diverticulosis is a condition due to small marble-sized sacs or bulges (called diverticula), found in weak areas of the digestive tract. It is a condition caused by the inflammation or infection of one or more of these sacs in the walls of the lower end of the colon. The presence of diverticula does not always lead to diverticulitis. In fact, only 10 to 25% of people develop the condition. The symptoms of diverticulitis can include severe muscle spasm, pain in the abdomen (commonly on the left side), nausea and fever. It can lead to serious complications. These include narrowing of the intestine, an abscess and peritonitis (or inflammation of the membrane that lines the abdomen). In the United States and many other nations, diverticulitis is very common. Diets low in fiber and high in processed carbohydrates (foods such as bread, pasta or potatoes) contribute to the greater incidence of diverticulitis. People over the age of 60 are the most likely to suffer from this condition.

Available studies have not shown an association between diverticulitis and any of the contaminants of concern identified in soil or groundwater collected around the Coronet facility.

Comment: One commenter reported a bad breath problem caused by chemicals.
Response: Bad breath is usually caused by certain foods/beverages, tobacco use, poor oral hygiene, tooth decay, dry mouth, or gum disease. Bad breath may also be cause by respiratory infections, sinus infections, postnasal drip, bronchitis, as well as diseases of the kidneys, liver, or gastrointestinal tract. The levels of chemicals measured since 2003 in private drinking water wells around Coronet are not associated with bad breath.

Comment: One commenter inquired about the health risk from airborne fluorides from the Coronet facility.
Response: Between August and October 2003, Hillsborough County Environmental Protection Commission (EPC) staff collected air borne dust samples near Coronet and analyzed for fluoride particulates using ion chromatography. The highest average fluoride dust concentration (0.1 ug/m^3 or 0.0002 ppm) is less than the ATSDR acute duration inhalation minimal risk level for the more toxic fluorine (0.01 ppm) (ATSDR 2003a). Therefore between August and October 2003, fluoride dust levels near Coronet were not likely to cause illness.

Between October 2003 and February 2004, EPC also monitored the air near Coronet for hydrogen fluoride gas using a Fourier Transform Infrared Spectrometer. They did not detect any hydrogen fluoride gas (detection limits unavailable).

Concerning the ability a fluorides to cause cancer, in its 2003 Toxicological Profile for Fluorides, Hydrogen Fluoride, and Fluorine (ATSDR 2003a), ATSDR concludes:

> "A number of studies have been done to assess whether there is an association between fluoride and cancer in people who live in areas with fluorinated water or naturally high levels of fluoride in drinking water, or people who work in jobs where they may be exposed to fluorides. Most studies have not found any association between fluoride and cancer in people. A study in rats and mice found that a small number of male rats developed bone cancer after drinking water with high levels of fluoride in it throughout their lives. This was considered equivocal evidence that fluoride cases cancer in male rats. Fluoride did not cause cancer in mice or female rats. Another study found no evidence that even higher doses of fluoride caused cancer in rats. Both animal studies had problems that limited their usefulness in showing whether fluoride can cause cancer in humans. The International Agency for Research on Cancer (IARC) has determined that the carcinogenicity of fluoride to humans is not classifiable."

Comment: One commenter wanted to know when Coronet started testing its wastewater discharge to English Creek and why the draft public health assessment report only reviewed wastewater quality data since 1989.
Response: From 1974 to 1976, the Florida Department of Air and Water Pollution Control tested the water in English Creek at Wiggins Road for nutrients and fluoride. In 1976 the Florida Department of Environmental Regulation (successor to DAWPC) issued the owners an industrial wastewater discharge permit. This permit required the site owners test their wastewater when there was an off-site discharge. The site owners reported their first wastewater discharge to English Creek in 1979. Florida DOH obtained the water quality data beginning in 1974 and incorporated them into this report.

Comment: Three commenters suggested improving the maps in Appendix B
Response: The maps have been improved to more clearly show the site boundaries and sample locations.

Comment: One commenter asserted that the Coronet site is currently owned by Coronet Industries, Inc. rather than AMAX Chemical Corporation.
Response: The report has been modified to accurately reflect past and current site ownership.

Comment: One commenter asserted that the Coronet Phosphate Company rather than the AMAX Chemical Corporation constructed the defluorination plant in 1945.
Response: The report has been modified to accurately reflect past and current site ownership.

Comment: Two commenters suggested that the report consider that in the past contaminant levels may have been higher or lower rather than just higher.
Response: The report has been modified to acknowledge that past contaminant levels may have been lower as well as higher.

Comment: One commenter suggested Table 2 should use EPA maximum contaminant levels (MCLs) or DEP health advisory levels (HALs) for comparison values rather than ATSDR cancer risk evaluation guidelines (CREGs) or ATSDR environmental media evaluation guidelines (EMEGs).
Response: The public health assessment process relies first on ATSDR comparison values to screen all of the chemicals found on and around sites. In the absence of ATSDR comparison values for some chemicals, we use other comparison values such as drinking water maximum contaminant levels (MCLs) and health advisory levels (HALs). In Table 2, we only used EPA MCLs in the absence of ATSDR comparison values.

Regardless of the source of the comparison values, they are only used to initially screen out chemicals whose levels are so low that they are not likely to cause illness. This enables the health assessment to focus on, or scrutinize, those chemicals whose concentrations have the potential to cause illness. Comparison values are not used to determine the likelihood of illness. For each chemical whose maximum concentration is above a comparison value, the health assessment considers in detail its potential to cause illness.

Comment: One commenter asserted the draft report didn't consider exposures before 2003 and therefore its conclusions are not supported.
Response: The report has been modified to more clearly delineate the time period to which its conclusions refer.

Comment: One commenter recommended the report more prominently state that its finding of "no apparent public health hazard" only applies to current (2003-present) exposures.
Response: The report has been modified to more clearly delineate the time period to which its conclusions refer.

Comment: One commenter recommended use of residential exposure standards rather than worker/occupational exposure standards for nearby residents.
Response: In the Health Outcome Data Reviews section, the draft public health assessment report references two Florida DOH/ATSDR health consultation reports (ATSDR 2003b &

ATSDR 2004b) that detail urine tests for nearby residents. In these reports Florida DOH/ATSDR compared the levels of cadmium, uranium, and arsenic in urine of nearby residents to national averages. Most of the urine test results were within national averages. In the absence of residential urine standards, Florida DOH/ATSDR also compared the results to workplace or occupational guidelines.

Comment: One commenter recommended in cases where "too little is known to quantify the systemic health risk," the report conclude the risk is "unknown" or "indeterminate" rather than "no apparent."
Response: In cases where too little is known to quantify the health risk, the report has been modified to conclude the risk is "indeterminate" rather than "no apparent."

Comment: One commenter recommended the report acknowledge untreated and unpermitted surface water discharges from Coronet.
Response: The report has been modified to reflect that waste water discharges from the site have been subject to past and current Florida DEP enforcement actions.

Comment: One commenter recommended the report discuss possible synergistic health effects from exposure to multiple chemicals.
Response: The report has been modified to note that the science of toxicology is only now beginning to address possible synergistic health effects from exposure to multiple chemicals.

Comment: One commenter recommended the report explain "extra scrutiny" mentioned in the footnote for Table 2.
Response: For each chemical whose maximum concentration is above a comparison value, the health assessment considers in detail its potential to cause illness. In the Discussion section, the report considers the potential for those six contaminants identified in Table 2 to cause illness.

Comment: One commenter asserted too little environmental testing has been done to determine the health risk for nearby residents.
Response: The report conclusions are based on available data. Most off-site testing occurred in 2003. The report has been modified to more clearly delineate the time period to which its conclusions refer.