Health Consultation

EVALUATION OF AMBIENT AIR DATA

CORONET INDUSTRIES, INCORPORATED
(*A/K/A BORDEN FEED PHOSPHATE COMPLEX; CONSOLIDATED MINERALS, INC; AMAX PHOSPHATE, INCORPORATED)*

PLANT CITY, HILLSBOROUGH COUNTY, FLORIDA

EPA FACILITY ID: FLD001704741

SEPTEMBER 19, 2005

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

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

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

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Prepared by:

Florida Department of Health
Bureau of Community Environmental Health
Under Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

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FOREWORD

The Florida Department of Health (DOH) has evaluated available air quality data collected at or near the Coronet Industries Site in Plant City, Florida. Area residents suspect that some of their health problems could be linked to poor air quality caused by emissions from Coronet's phosphate processing plant. A number of steps are necessary to conduct such an evaluation:

- *Evaluating exposure:* Florida DOH scientists begin by reviewing additional available information about environmental conditions at the site. These data add to our understanding of how much contamination is present, where it is found at 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. *If you have questions or comments about this report, we encourage you to contact us.*

  Please write to:

  Alrena Lightbourn
  Health Assessment Team
  Bureau of Community Environmental Health/Florida Department of Health
  4052 Bald Cypress Way, Bin # A-08
  Tallahassee, FL 32399-1712

  Or call us at (850) 245-4299, or toll-free during business hours: 1-877-798-2772

SUMMARY AND STATEMENT OF ISSUES

In January 2003, a resident of Plant City, Florida petitioned the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) to investigate illnesses around Coronet Industries, Incorporated, a former phosphate mine and phosphate rock processing facility. The Florida Department of Health (Florida DOH) has prepared this health consultation to address community concerns that inhalation of unhealthy levels of toxic air emissions and pollutants near the site could have resulted in respiratory health problems. Drinking water, soil, biota (fish), and cancer concerns were addressed in separate health consultation reports.

Air releases from past industrial production processes at the Coronet facility could have resulted in atmospheric transport of particle-bound pollutants to areas inhabited by residential, recreational, agricultural, and industrial/commercial receptors. These individuals could have been directly exposed to pollutants by inhaling contaminated ambient air. The current evaluation only considers direct inhalation of suspended particulate-phase pollutants and nonradioactive air toxics by receptors in locations of likely particulate fallout. Offsite deposition of airborne contaminants could have resulted in secondary contamination of soil and biota.

In order to determine whether residents of the area breathed airborne concentrations of toxic air pollutants that may pose unacceptable risks to human health, the Florida DOH quantitatively evaluated ambient air monitoring data collected in 2003 around Coronet Junction by the Hillsborough County Environmental Protection Commission (HCEPC). Ambient air data were not collected around Coronet Junction prior to or since 2003. Arsenic, cadmium, and chromium were identified as chemicals of concern. However, neither average nor maximum concentrations of these hazardous air pollutants were likely to cause cancer or other noncancer illness. Health outcome data evaluations also did not support an association between community health concerns and air emissions from the Coronet facility.

For the period over which ambient air monitoring occurred in 2003, this site presents no apparent public health hazard to communities located northwest, east and south of the Coronet facility. Ambient air monitors were collocated within residential communities near the Coronet site where health concerns were expressed. This assessment is limited because the absence of long-term, continuous monitoring makes it difficult to determine whether higher concentrations of pollutants were emitted in the past and whether those emissions could have posed a long-term public health threat. Based on the monitoring data for 2003, air around the Coronet Industries, Incorporated site is categorized as **no apparent public health hazard**.

BACKGROUND

Site Description and History

The Coronet Industries, Incorporated site is located at 4082 Coronet Road, in Section 2, Township 29 South, Range 22 East, Plant City, Hillsborough County, Florida (Figure C-1). Both the phosphate rock processing facility and former phosphate mining areas are located about 2 miles southeast of the outskirts of urbanized Plant City. The site is geographically located at latitude 27^{o}59’7” North and longitude -80^{o}14’39” West.

Coronet Industries occupies approximately 1322 acres of the 2522-acre property that comprises the Borden Feed Phosphate Complex (Figure C-2). The facility is owned by Amax Chemical

Corporation and has been in operation since 1908[1]. Early operations of the facility included extraction of natural deposits of phosphate rock from northern segments of the property using a shallow (less than 25 feet below ground surface) excavation technique. Phosphate rock from onsite mines and other areas across Florida were processed to extract usable forms of phosphorus for further use in manufacturing alpha tricalcium phosphate, a phosphorus-based supplement[2,3] used in feed for animals (except dogs and cats). Coronet also produced potassium fluoborate, an industrial inorganic chemical[4] that contains boron. The facility is currently inactive following voluntary closure of operations on April 14, 2004.

Site Visit

On May 23, 2005, staff of the Florida DOH and the HCEPC surveyed the perimeter of the facility and surrounding areas (Figure C-3) to understand the relationship between the site, site contaminants, and nearby residents who might have been exposed to airborne pollutant releases from the facility. The fenced site property is mostly flat (Figure C-4) and paved across most of the developed areas that comprise the plant. Less developed areas are covered by weeds and low brushes. Raised areas to the west of the property consisted primarily of bermed onsite waste disposal units. Access to the facility is limited by chain-linked fences around most of the perimeter, locking gates, and strict security personnel. Buildings at the facility that housed former processing operations remained intact. No unusual odors or visible physical hazards were observed during the visit.

The following land uses were observed within ¼-mile of the site boundaries. The Coronet facility is bordered on the east by Cason Road, residences, and small tracts of farmland. A few residential homes, agricultural plots, and a large vacant lot are immediately north of the site. There are continuous rows of both deciduous and non-deciduous trees along unfenced areas along the southern to southwestern boundaries; the local fire station is located southeast of the site. Park Road curves diagonally from the west to become Coronet Road. Compared to the other sparsely populated residential areas immediately surrounding the site, the area behind the fire station comprised the closest and most densely populated residential community.

Demographics

The 2002 population estimate[5] for Plant City, Florida was 29,915. Approximately 8.3% of the population is under 5 years of age; 12.3% is 65 years and older; and 79.4% is 5 to 64 years old. About 439 persons live within ¼ mile of the site[6] (Table B-1).

COMMUNITY HEALTH CONCERNS

During community meetings sponsored by local and state government environmental and health agencies in August 2003, local residents expressed a variety of health concerns they believed to be directly linked to operations at the Coronet facility. Their health concerns included:

- High incidences of various types of cancer, including prostate cancer;
- Fertility problems; and
- Other illnesses including bowel dysfunction, reproductive problems, and skin irritation.

Residents believe a number of health concerns in the community, including cancer and respiratory ailments such as chronic bronchitis and asthma may be attributable to industrial emissions. This health consultation addresses only those concerns related to air releases. The

Florida DOH has published its evaluation of soil[7], fish[8], and private well drinking water[9] contamination in other health consultation documents. The Florida DOH has also investigated the incidence of cancer around the Coronet Site[10].

DISCUSSION

To evaluate acute (short-term) exposure to hazardous air pollutants around the Coronet site, the Florida DOH conducted a preliminary screening of the relevant ambient air data using the inhalation unit risk approach (Appendix A). Ambient air monitoring data from the HCEPC (Appendix B) were the primary source of data quantitatively evaluated to determine the likelihood of chronic (long-term) inhalation risk or hazard. Other environmental data that were reviewed and qualitatively evaluated in the development of this health consultation included: facility-reported emissions from the U.S. Environmental Protection Agency Toxics Release Inventory (TRI), National Emissions Inventory (NEI), and Aerometric Information Retrieval System (AIRS) (Appendix D). Health outcome data from the Florida DOH cancer incidence study are summarized below.

Quality Assurance and Quality Control

This health consultation was developed based upon existing environmental data. In preparing this report, Florida DOH relied on the information in the referenced documents and assumed that adequate quality assurance and quality control (QA/QC) measures were followed with regard to chain-of-custody, laboratory procedures and data reporting, unless otherwise noted. The completeness and reliability of the referenced information determine the validity of the analyses.

Health Outcome Data Evaluation

Health outcome data can be used to give a more thorough evaluation of the public health implications of a given exposure. Guided by community concerns of elevated cancer incidence in the population living around the site, Florida DOH conducted an evaluation of cancer incidence[10] (including respiratory cancer) in cooperation with the State Cancer Registry.

The investigation addressed the concern over long-term exposure to chemicals such as arsenic and cadmium in air causing an increased rate of associated cancers in the population adjacent to Coronet Industries. Florida DOH reviewed local rates of cancers that have been shown in prior studies to be associated with chemicals such as arsenic and cadmium. Cancer incidence data from 1990 through 2000 as well as population information for Hillsborough County, Polk County and the state of Florida were extracted from the Florida Cancer Data System (FCDS).

The Coronet Investigation Area was defined as the 2000 Census tracts or Census block groups from both Hillsborough and Polk Counties. Approximately 452 incidences of lung and bronchus cancers were observed from1990-2000 among Whites in the Coronet Investigation Area, compared with 36 among non-Whites. Observed cancer incidence rates were lower than expected numbers of cases when age-specific rates for the entire State of Florida (excluding the investigation area) were applied.

A similar comparison was prepared based upon cancer incidence rates for Hillsborough and Polk Counties. For the time interval evaluated, neither Whites nor non-Whites exhibited elevated standardized incidence ratios (SIR). Results of this evaluation did not indicate a higher than expected lung and bronchial cancer incidence rate in the community, compared with neighboring Polk County. In addition, the community's lung and bronchus cancer incidence is not higher than the statewide average.

Environmental Data

Ambient Air Concentrations of Metals around Coronet Junction

In order to monitor pollutants in air around Coronet Junction and to determine the area of maximum impact in nearby communities in 2003, the Hillsborough County Environmental Protection Commission (HCEPC) installed three new stationary air sampling stations. Ambient air monitors continuously sample the air[11]. The three sites (Figure C-5) included a fire station (Station 25), a ball park (Kenny/Kelly), and a church (Springhead). All three Total Suspended Particulate (TSP) high-volume samplers were fitted with 8x10-inch quartz fiber filters, and samples were collected 24 hours daily every three days over two months.

The HCEPC collected ambient air samples around the Coronet site from August 22 through October 30, 2003. The filters were analyzed at the HCEPC laboratory using U.S. Environmental Protection Agency (EPA) Analytical Method IO-3.4 (*Determination of Inorganic Compounds in Ambient Air Using Inductively Coupled Plasma Spectrometer*). Air was monitored for the presence of total suspended particulates (TSP), arsenic, antimony, beryllium, cadmium, chromium, cobalt, lead, manganese, nickel, selenium, and boron. Florida DOH identified arsenic, cadmium, and chromium as chemicals of concern (COCs) at each of the site-boundary stations as well as at background monitors. These data are summarized in Appendix B.

Wind speed and direction information was collected hourly from HCEPC's Plant City High School monitoring site, approximately 4.5 km from Coronet Industries, Incorporated. All samples were generally collected under light wind conditions. Florida DOH qualitatively assessed particulate deposition in the Lincoln Park and Springhead communities. These communities are located northwest, and east-to-south of the Coronet facility. The prevailing winds are from the northeast. This suggests that the likely air deposition path is toward the southwest. It is unlikely that communities outside of this path would be significantly impacted.

Ambient Air Concentrations of Metals at Background Locations

Two existing ambient air monitoring stations located upwind of the Coronet Industries site were selected as background locations to establish average levels of air toxics in areas unaffected by the facility (Figure C-6). These stations were located at 5121 Gandy Blvd (foot of Gandy Bridge, "Gandy") and at 6700 Whiteway Drive (Lewis Elementary School in Temple Terrace, "Lewis")[12]. Annual averages for metals reported at these stations were taken from published 2002 and 2003 Hillsborough County Air Monitoring and Assessments Air Quality Technical Reports[13,14].

Data evaluated for these locations are summarized in Appendix B. In most instances, Coronet Junction sample concentrations were lower than levels detected at background stations (Tables B-14 and B-15). Overall, these data suggest that air arsenic, beryllium, cadmium, and chromium concentrations may be naturally occurring or consistent with background concentrations. These chemicals are known to be associated with Coronet site activities and releases. None of these chemicals was present in air at levels of health concern.

Modeled Ambient Air Data

At the request of the HCEPC, Air Management Division, the FLDEP, Division of Air Quality evaluated particulate deposition in the vicinity of the Coronet Industries facility[15]. Relevant information about site-specific air pollutant emissions, characteristics of onsite emission (point) sources and surrounding structures were combined with climatic data to determine deposition patterns relative to emissions from the site. Point source locations were adopted from the inventory of emission units listed in the Title V Air Operation Permit for the Coronet Industries facility[16].

Air concentrations and deposition rates of particulate matter were estimated by using an EPA-approved, regulatory air dispersion models called the Industrial Source Complex Short-Term version 3 (ISCST3). ISCST3 approximates the physical processes occurring in the atmosphere that directly influence the dispersion of gaseous and particulate emissions from the stack of an emission unit. Major site-specific inputs to the characterization of point sources at the Coronet Industries facility included:

- Stack height above ground level;
- Inside diameter of stack;
- Exit gas velocity or flow rate;
- Exit gas temperature;
- Building dimensions; and
- Emission rate.

A best-estimate, long-term deposition pattern was modeled using five years (1986 – 1990) of historical meteorological data from the National Weather Service at the Tampa International Airport. Model performance was reportedly checked using 12 months of total particulate (PM_{10}) data. The results of the deposition analysis showed that deposition decreases with distance from the facility in a generally concentric fashion, but is slightly greater to the southwest and northwest of the site. This depositional pattern is consistent with the predominant wind flow in the area.

Exposure Pathways Analysis

Human receptors mainly come into direct contact with COCs emitted to the atmosphere from industrial activities via inhalation of contaminated air. ATSDR's general approach to evaluating a site is to evaluate environmental data concerning release of chemicals into the environment and the further evaluation of pathways by which the public might be exposed to the chemicals.

An exposure pathway analysis was conducted to determine the potential for citizens residing in the general vicinity of the Coronet Industries site to be exposed to levels of hazardous air

pollutants and other airborne contaminants from the site. The following environmental and human components of an exposure pathway must be considered during such an evaluation:

(1) a *source* of contamination;
(2) a retention *medium* (e.g., air, water, soil, sediment, fish) and a *mechanism of COC 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 under past, present, or future exposure scenarios, the exposure pathway is considered complete. A potential exposure pathway is defined by the absence of one or more of these elements where past, present, or future exposure could possibly occur. In instances where no COCs are identified or where one or more components of a pathway is missing and will never be present, the exposure pathway is flagged as incomplete and is, therefore, eliminated.

Selection of Exposure Pathways for In-Depth Analysis

Because there were no known air monitoring or sampling events after 2003, this report only addresses past exposure scenarios. Florida DOH established four offsite land use scenarios under which individuals might have come into contact with contaminants in ambient air around Coronet Junction: residential, recreational, industrial/commercial, and agricultural. Each exposure pathway is evaluated on the basis of past inhalation exposure associated with the following human populations:

- Adult male, adult female, adolescent, child and infant residents exposed outdoors at their place of residence;
- Adult male, adult female, adolescent, child and infant churchgoers;
- Commercial workers;
- Adult and child subsistence farmers;
- Children of various ages recreating either on school/daycare playgrounds or at the local recreation center; and
- Senior citizens exposed outdoors at a local senior center.

All potentially exposed human populations were selected that would likely come into contact with contaminated air for limited periods of time at or near those locations. Individuals were expected to be continuously exposed to contaminated air during routine outdoor activities outside of their residence, workplace, or church. Infants, children, athletes and senior citizens were considered to be among the more susceptible subpopulations that could have been exposed.

Completed Exposure Pathways

To ensure that that the selection of potential receptors is relevant and appropriate, Florida DOH considered the spatial distribution of residential, commercial, and agricultural properties around

the ambient air monitoring station locations. The Florida DOH considered inhalation exposure to people outside their homes, churches, and schools, and in the outdoor work or play environment. Table B-3 summarizes all completed exposure pathways considered in this evaluation. Numerical exposure assumptions used to evaluate inhalation exposure by each receptor are provided in Table B-16. A brief description of each type of residential receptor evaluated in this health consultation is provided below:

- *Residents Around Coronet Junction*

  Established residential communities exist in most directions around the Coronet facility and are also likely to be present in the vicinity of the background monitoring stations. Nearby residents could have been exposed to airborne contaminants during routine outdoor activities outside their homes. With the exception of the infant, these individuals were conservatively assumed to have inhaled contaminated air during outdoor activities lasting 3 hours per day for 365 days of the year. Average daily inhalation rates were selected to account for all physical activity levels associated with outdoor exposure (e.g., heavy, moderate, sedentary).

- *Churchgoer*

  The Springhead air monitoring station was located at the Springhead Church of Christ, 2.6 miles northeast of the site. Exposure to ambient air concentrations detected above screening values at the Springhead monitoring station was evaluated for infant, child, adolescent, and adult churchgoers. Persons attending church twice per week for 50 weeks per year were estimated to spend at least 15 minutes outdoors socializing. Churchgoers are assumed to have most of the same characteristics as people in the residential setting; the only difference is that they only spend a fraction of their time outdoors during infrequent visits to church throughout the week.

- *Subsistence Farmer*

  A number of farming communities are interspersed within residential communities surrounding the Coronet facility. Florida DOH evaluated the agricultural exposure scenario to account for continuous and frequent direct exposure of residential receptors in a farm setting. The subsistence farmer adult was assumed to spend most of the day outdoors engaged in moderate physical activity on the farm over an 8-hour period. A shorter period was expected for a subsistence farmer child (5 hours) whose day would likely be split between farm activities and school.

- *Offsite Worker*

  An offsite worker (e.g. firemen, landscaping crews, construction/maintenance crews) engaged in heavy outdoor activity 5 days per week for 50 weeks of the year (i.e. 250 days per year) could have been exposed to contaminated air while performing his job. The offsite worker was assumed to perform the same work 8 hours per day for 25 years at the same location.

Recreational exposure scenarios were selected based upon their relevance to the locations of previously installed ambient air monitors within residential communities and distance from the site. Ambient air monitors were placed at a local church (Springhead), fire station (Station25), and a nearby ballpark (Kenny/Kelly). The evaluation considers exposure to children of various

ages who spend a limited amount of time engaging in rigorous physical activities on playgrounds or ballparks near the site.

The Martin Luther King, Jr. Recreation Center and Ballpark and Marshall Middle School are collocated 2.9 miles northwest of the site. Children between the ages of 5 and 18 years utilize the athletic facilities at the Recreation Center and Ballpark all year long to participate in outdoor sports such as football, baseball, softball, t-ball, and basket ball. The facility also houses the local Boys and Girls Club. Florida DOH assumed that a child daycare center could also be found in the neighborhood. Persons using any of the outdoor facilities associated with these establishments for recreational purposes could have been exposed to contaminated air. This cluster of potential receptors includes:

- *Preschoolers engaged in light recreational activities at a nearby daycare center*

  Young children who spend time at the local daycare facility could have been exposed to ambient air toxics during brief outdoor activities at playtime. During playtime, young children may spend up to an hour playing outdoors and inhaling particulates in contaminated ambient air.

- *Middle school children engaged in moderate outdoor recreation on school playgrounds*

  The Marshall Middle School playground is directly across the street from the ballpark where one of the ambient air monitors was placed. During lunch, break, physical education, or after school, students may frequent this recreational area and engage in outdoor activities that would result in their inhalation of particulates in contaminated ambient air.

- *Athletes engaged in heavy physical activity at the Ball Park.*

  Because of their increased inhalation rates and physical activity while outdoors, athletes may be more susceptible to air pollutants that could possibly result in higher risk[17,18]

- *Elementary school children*

  Several elementary schools exist within proximity to the Coronet site, the closest of which is 0.87-mile away in the Springhead community. This receptor group was evaluated relative to its proximity to Station25. Elementary school children could have been exposed to contaminated air while on recess outside their classrooms or on the schools playground.

- *Elderly Residents at Local Senior Center*

  The recreational activities of aging seniors were also considered in this evaluation as there is at least one Senior Center approximately 1.9 miles southwest of the Recreation Center and 2.2 miles west of the Coronet facility. Seniors engaged in sedentary to light physical activities outdoors could have experienced short-term exposure to particulates in contaminated air.

Eliminated and Potential Exposure Pathways

Since all phosphate-processing operations at the Coronet Industries site ceased in early 2004, and since there are currently no releases of toxic air emissions from the facility, this pathway was eliminated from further consideration (Table B-2). Operations are unlikely to resume in the near future.

Fate and Transport

Both natural and man-made processes can contribute chemical contaminants and particulates to the ambient environment. As with other atmospheric pollutants, particulate matter at a given location and sampled at a specific time could be the result of emission from a variety of sources.

In the mineral processing industry, particulate material and gaseous emissions are emitted during mining, beneficiation (i.e., milling or leaching) and mineral processing. Gaseous emissions are usually generated by operations that use heat during processing. Generally, particulate releases are flue dusts (e.g., from sinter, roaster, smelter, or refinery stacks) or fugitive dust (e.g., from crushers, tailings ponds, road use)[19]. The major emission sources for phosphate rock processing are dryers, calciners, and grinders[20]. These sources emit particulate matter in the form of fine rock dust and sulfur dioxide (SO_2). Arsenic, beryllium, cadmium and chromium are generally known to occur in industrial releases in the form of particulate matter with a diameter less than or equal to a nominal 10 microns (PM_{10}). Because particle dispersion and subsequent deposition are directly related to particle size, potential risks are directly dependent on particle-size distribution.

Meteorological factors such as wind direction, wind speed, and atmospheric stability can have a significant influence in determining where chemicals in the atmosphere are carried and their airborne concentrations. Airborne chemicals would be carried along in the direction in which the wind is blowing. In general, as wind speeds increase, the airborne concentrations will decrease due to more air being available to mix with the chemicals and dilute their concentrations. The level of atmospheric stability determines the amount of mixing that can occur in the air. Air quality is often correlated with the dominant transport direction of the wind; in this case, toward the southwest (Figure E-1).

Pollutants released into the atmosphere from stacks and fugitive emissions at Coronet Industries could have adsorbed to particulates in the air. Release of particulates high in arsenic, cadmium, and chromium from the stacks could have caused contaminants to become entrained in the release plume. Contaminated particulates could have been transported by prevailing winds to areas downwind of the facility and beyond the facility fence-line where human populations worked, played, or lived. Individuals engaged in outdoor activities could have been directly exposed to particle-bound pollutants simply by inhaling the contaminated air. Since metals are nonvolatile at ambient temperatures, all metals were assumed to be 100% present in the particulate phase and zero percent in the vapor phase.

Toxicological Implications

Environmental and Health Screening Criteria

The following section briefly discusses the method used to identify nonradioactive chemicals of concern (COCs) for further evaluation and to determine whether levels of air pollution indicate a past health hazard.

- As a preliminary step in assessing the potential health risks associated with contaminants at this site, Florida DOH compared average contaminant concentrations to medium-specific environmental guideline comparison values (CVs) in order to identify chemicals of concern for further evaluation of potential health effects. ATSDR's comparison values are media-specific concentrations that are considered unlikely to cause illness under default conditions of exposure. The following CVs were applied in the current evaluation:

  - *Cancer Risk Evaluation Guide (CREG).* CREGs are media-specific comparison values that are used to identify concentrations of cancer-causing substances that are unlikely to result in an increase of cancer rates in a population exposed over an entire lifetime. CREGs are derived from EPA's cancer slope factors, which indicate the relative potency of cancer-causing chemicals.

  - *Environmental Media Evaluation Guide (EMEG).* EMEGs are estimates of chemical concentrations that are not likely to cause an appreciable risk of deleterious, noncancerous health effects for fixed durations of exposure. EMEGs might reflect several different types of exposure: acute (1-14 days), intermediate (15-364 days), and chronic (365 or more days). EMEGs for inhalation exposures to airborne contaminants are derived from chronic inhalation MRLs. Therefore, the air EMEG for a chemical is the same as its MRL. The same air EMEG value is used for all segments of the population.

  - *Minimal Risk Level (MRL).* MRLs are estimates of daily human exposure to a substance that is likely to be without an appreciable risk of adverse, non-carcinogenic health effects over a specified duration of exposure. ATSDR MRLs are derived for continuous, daily (24-hours) exposures. In many instances, inhalation exposures from a site may be for less than 24 hours per day. Therefore, the use of air EMEGs based on MRLs to assess these situations would provide a conservative approach for identifying air contaminants of potential health concern.

If a contaminant is never found at levels greater than its comparison value, Florida DOH concludes the levels of corresponding contamination are not likely to cause illness.

- If a contaminant is found at levels greater than its comparison value, Florida DOH designates the pollutant as a 'contaminant of concern' (COC). Estimated exposure doses were calculated for each completed exposure pathway. These values were then used to examine the potential human exposures in greater detail.

  Florida DOH uses health-based comparison values (or health guidelines) to identify those contaminants that do not have a realistic possibility of causing adverse health effects. Because comparison values are based on extremely conservative assumptions, the presence of concentrations greater than comparison values does not necessarily suggest

that adverse health effects will occur among exposed populations. The health-based comparison values used in this report are concentrations of contaminants that the current public health literature suggests are not likely to cause illness. These comparison values are quite conservative, because they account for most sensitive populations. The following health-based guidelines were applied in the weight-of-evidence discussion:

- *Lowest-Observed-Adverse-Effect-Level (LOAEL).* The LOAEL is the lowest dose of a chemical in a study, or group of studies, that produces statistically or biologically significant increases in the frequency or severity of adverse effects between the exposed population and its appropriate control.
- *No-Observed-Adverse-Effect-Level (NOAEL).* The NOAEL is the dose of a chemical at which there were no statistically or biologically significant increases in the frequency or severity of adverse effects seen between the exposed population and its appropriate control. Effects may be produced at this dose, but they are not considered to be adverse.

For the remaining contaminants, Florida DOH reviews recent scientific studies to determine whether the extent of environmental contamination indicates a public health hazard. Scientists continue, however, to study how chemicals behave in the human body at environmental doses.

While exceeding a health guideline value does not necessarily mean that a contaminant represents a public health threat, it does suggest that the contaminant warrants further consideration.

Based on a review of the limited data available on toxic air contaminants monitored by the HCEPC, Florida DOH identified arsenic, cadmium, and chromium as chemicals of concern at background (upwind) and downwind sampling locations. Each of these chemicals was further evaluated to determine whether the pollutant reached levels associated with adverse health effects.

Public Health Implications

For a comprehensive analysis of available 2003 ambient air sampling data, Florida DOH elected to conduct an in-depth health effects screening analysis of estimated exposure doses based on:

- the diversity of susceptible subpopulations comprising those communities (e.g., elderly, children, asthmatics);
- the carcinogenicity of metallic arsenic, cadmium, and chromium, which are sometimes found in stack emissions; and,
- the potential for several different forms of arsenic, cadmium, and chromium to exert their toxicity via the inhalation exposure route.

Overall Findings

Ambient air data were evaluated for both acute and chronic health effects. In each case, appropriate quantitative methodologies were applied to assess the risk of airborne contaminant exposure. Quantitative risk assessment methods for evaluating noncancer hazard and theoretical excess cancer risk were used to provide initial information about the carcinogens evaluated in this report. Florida DOH acknowledges that such a quantitative assessment should not be used as the sole basis for any health conclusions for a site, and has supplemented this evaluation with

a margin-of-safety evaluation for a more comprehensive review of available data. The below analyses together support the conclusion that health effects from inhalation of airborne contaminants around Coronet Junction are unlikely to occur.

Acute (Short-Term) Noncancer Health Effects Analysis

Health effects that individuals might experience following acute (short-term) exposures to elevated levels of airborne contaminants can vary significantly from those experienced after long-term exposure to low doses, depending on the contaminant and its concentration. For example, a chemical that produces an increase in cancer rates after exposure to low concentrations for a long period of time (a chronic effect) might also cause immediate and severe nasal irritation if present at high levels for a short period of time (an acute effect).

Florida DOH assessed the potential for adverse, non-carcinogenic health effects from acute exposure to elevated levels of airborne contaminants around Coronet Junction. The evaluation entailed comparing the maximum detected concentrations for individual COCs from each monitoring station to noncancer no-observed-adverse-effect-levels (NOAELs) and lowest-observed-adverse-effect-levels (LOAELs) derived from acute dosing studies (Table A-4). COCs from the preliminary screen (i.e., arsenic, beryllium, cadmium, and chromium) were used as the basis for the evaluation. This evaluation does not consider carcinogenic effects resulting from acute exposures because there are insufficient data to reasonably support these estimations. Uncertainties also exist relative to extrapolation from long-term to short-term exposures and other factors such as mechanism of action, metabolism, promotional activity, and threshold effects[21].

The NOAEL, 'less serious' LOAEL, and 'serious' LOAEL values were determined from the toxicological literature for the individual COCs (Table A-4). 'Less serious' LOAEL effects are not expected to cause significant dysfunction or death, or the significance to the organism is not entirely clear. 'Serious' LOAELs evoke failure of a biological system and can lead to morbidity or mortality (e.g., acute respiratory distress or death).

Without exception, ambient air concentrations measured around Coronet Junction in 2003 were present at exposure levels substantially lower than acute health guideline values. It should be noted that the adverse effects observed in animal studies were due to exposure to combined forms (e.g., chromium chloride, potassium chromate, cadmium chloride, cadmium oxide, etc.) of the COCs rather than pure metal forms. Data on the concentrations of the different forms of metal COCs were not available for this evaluation. Additionally, very limited information exists on human exposures to inorganic forms of site-specific COCs. It is, therefore, uncertain whether the effects observed in animal studies would also be observed in humans under similar conditions. Taken together, the results suggest that a broad margin of safety exists for persons acutely exposed at the levels around Coronet in 2003 and negligible to no potential for acute adverse health effects due to inhalation exposure.

Chronic (Long-Term) Noncancer Hazard Estimates

The potential for noncancer toxicity to occur in an individual was evaluated by comparing the chronic (long-term) exposure level (dose) with the chemical-specific inhalation chronic reference dose (RfD) (Appendix B). This ratio of exposure to toxicity is called a hazard quotient and should not exceed a value of 1.

The noncancer hazard quotient (HQ) assumes that there is a level of exposure below which it is unlikely for even sensitive populations to experience adverse health effects. Exposure levels that exceed this threshold suggest that there may be concern for potential noncancer effects[22]. In the current evaluation of ambient air data, all of the noncancer HQs were found to be several orders of magnitude lower than 1. These results suggest that noncancer illness is unlikely to occur at the levels measured around Coronet in 2003.

Cancer Risk Estimates (Using Cancer Slope Factor)

EPA cancer slope factors (CSFs) (Table B-21) were used to convert estimated daily exposure levels averaged over a lifetime of exposure directly to incremental risk of an individual developing cancer[22]. The estimated chronic inhalation exposure doses (based on average concentrations) and corresponding risk levels for hypothetical residential and recreational receptors exposed to air pollutants around Coronet Junction are summarized in Appendix B.

In order for exposures to be considered "unlikely to cause cancer", the incremental lifetime cancer risk level for a hypothetical person exposed to a reasonably representative estimated exposure level must not exceed one-in-a-million (10^{-6}). EPA uses an "acceptable risk" range of $1x10^{-6}$ to $1x10^{-4}$. A risk of 10^{-4} predicts a probability of one additional cancer over background in a population of 10,000. Risks of 10^{-5} and 10^{-6} correspond to probabilities of 1 chance over background of an individual developing cancer in population of 100,000 and 1,000,000, respectively[22]. For all exposure points and receptors evaluated, lifetime inhalation of inorganic arsenic, cadmium, and chromium at levels measured were unlikely to cause cancer. In many cases, the risk was negligible.

Theoretical Cancer Risk Estimates (Using Inhalation Unit Risk)

Theoretical cancer risk estimates derived from direct comparisons of measured concentrations in ambient air with chemical-specific inhalation unit risk (IUR) levels are summarized in Appendix A. This calculation estimates the proportion of a population that may be affected by a carcinogen during a lifetime of exposure.

This approach assumes that the dose of a substance via the inhalation route is proportional to the concentration of the substance at low environmental concentrations and to the amount of the air inhaled. The longterm dose is reflective of the average concentration of the substance in air (ug/m^3). Short term doses are expected to vary with fluctuations in the breathing rate according to the activity level of the individual at the time of exposure as well as with fluctuations in the concentration of the substance in air. All estimated theoretical cancer risk levels fell within the range of 10^{-6} to 10^{-4}, suggesting the low likelihood of individuals developing cancer. Because of conservative models used to derive cancer slope factors and inhalation unit risks, calculated risk values represent theoretical estimates of risk. The true or actual risk is unknown and could be as low as zero[23].

Arsenic

Arsenic is an element that occurs naturally throughout the environment in association with other elements (e.g., oxygen, chlorine, and sulfur). These combined forms, called inorganic arsenic, commonly occur in soil and rocks that contain minerals and metal ores. When these materials are heated during industrial processing, arsenic can escape and enter the air as a fine dust. The

major source of occupational exposures to arsenic in the US is in industries involved in the manufacture of pesticides, herbicides, and other agricultural products. Based on the 1997 TRI, arsenic released to air made up 83% of the total releases of arsenic to the environment from 52 large manufacturing or processing facilities[24].

Arsenic can take on various forms in the environment but cannot be destroyed. Arsenic released to air exists mainly in the form of particulate matter[25] and has a residence time of 7-9 days[25]. Depending on location, weather conditions, and the level of industrial activity in an area, levels of arsenic in the air generally range from less than 0.001 to about 2 micrograms (1 microgram equals a millionth of a gram) of arsenic per cubic meter of air (less than 1–2 $\mu g/m^3$). The predominant form of airborne arsenic is arsenic trioxide dust[26].

Arsenic is a recognized human carcinogen and developmental toxicant. The EPA has classified inorganic arsenic as a Class A carcinogen due to clear evidence of the risk of lung cancer in humans exposed via the inhalation route[29]. Most people are exposed to arsenic by ingesting contaminated food or water.

Most cases of human toxicity from arsenic have been associated with exposure to inorganic arsenic[25]. Acute (short-term) high-level inhalation exposure to arsenic dust or fumes has resulted in gastrointestinal effects (i.e., nausea, diarrhea, abdominal pain); central and peripheral nervous system disorders have occurred in workers acutely exposed to inorganic arsenic[27]. The main health effects associated with chronic (longterm) inhalation exposure to inorganic arsenic are irritation of the skin and mucous membranes (i.e., dermatitis, conjunctivitis, pharyngitis, and rhinitis)[27,28]. No chronic inhalation exposure studies have been performed in animals for any inorganic arsenic compound[27]. Human inhalation studies have reported inorganic arsenic exposure to be strongly associated with lung cancer[27,28,29].

Margin of Exposure Evaluation

Florida DOH estimated a margin of safety taking the ratio of the appropriate health guideline (e.g., NOAEL, LOAEL) to the site-specific inhalation dose. For inhalation exposure, the measured concentration was the equivalent dose.

The ATSDR arsenic toxicological profile records the highest no-observed-adverse-effect-level (NOAEL) for noncancer chronic inhalation exposure to arsenic as 0.613 mg/m^3 (613 ug/m^3). This toxicity value is based upon human epidemiologic studies of respiratory system effects in individuals exposed for 0.5 to 50 years[30] . Average arsenic concentrations around Coronet Junction were estimated at 0.0032, 0.0034, and 0.004 ug/m^3. These values are approximately 192,000; 180,000; and 153,000 times lower than the highest tested dose of arsenic that has been reported to have no harmful (adverse) health effects on human populations.

By contrast, the lowest tested dose at which arsenic has been reported to cause harmful (adverse) noncancer health effects in human populations (LOAEL) is 0.0007 mg/m^3 (0.7 ug/m^3). Inhalation of As (III) at this level was shown to cause serious health effects by increasing the risk of still birth[31,32] in human developmental studies. Concentrations measured around Coronet Junction are 219, 206, and 175 times lower than this noncancer chronic exposure LOAEL.

The lack of consistency between the above human noncancer NOAEL and LOAEL for arsenic is one example of the level of difficulty that exists when toxicologists attempt to identify levels at

which noncancer effects occur. It is also likely that human variability among independent research subjects contributed to the vast difference in response to arsenic exposure between the two studies. In general, the toxicity of arsenic remains controversial amid ongoing research.

Jarup and associates reported significantly increased lung cancer mortality in males occupationally-exposed to arsenic for 3 months to 30 years[33]. Compared with the cancer LOAEL of 0.05 mg/m^3 (50 ug/m^3) derived from this study, average arsenic concentrations measured around Coronet Junction are approximately 14,706, 15,625, and 12,500 times lower than the levels at which lung cancer health effects were produced. Therefore, the arsenic concentrations measured around Coronet Junction do not appear to be high enough to cause noncancer health effects for the general population or for sensitive subpopulations.

Chromium

Chromium is a naturally occurring element in rocks, animals, plants, soil, and volcanic dust and gases. Exposure may occur from natural or industrial sources of chromium. Ore refining, chemical and refractory processing, cement-producing plants, automobile brake lining and catalytic converters for automobiles, leather tanneries, and chrome pigments also contribute to the atmospheric burden of chromium[34].

Chromium is present in the atmosphere primarily in particulate form[35]; it has an atmospheric residence time of less than 10 days[36]. Two forms of chromium occur in the environment: trivalent chromium (Cr III) and hexavalent chromium (Cr VI); hexavalent chromium is the more toxic form. The predominant form of airborne arsenic is hexavalent arsenic trioxide dust[35]. National average concentrations[37] of total chromium in the ambient air in urban, suburban, and rural areas monitored during 1977-1984 ranged from 0.005 to 0.525 ug/m^3. Approximately 35% of chromium emitted to the atmosphere annually from anthropogenic sources in the U.S. is hexavalent chromium[38].

The respiratory tract is the major target organ for chromium (VI) toxicity, for acute (short-term) and chronic (long-term) inhalation exposures. Shortness of breath, coughing, and wheezing were reported from a case of acute exposure to chromium (VI), while perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, and other respiratory effects have been noted from chronic exposure. The main health effects associated with chronic (longterm) inhalation exposure to hexavalent chromium are irritation of the skin and mucous membranes.

EPA has designated Cr VI as a known human carcinogen (Group A) by the inhalation route of exposure[39]. Human studies have clearly established that inhaled chromium (VI) is a human carcinogen, resulting in an increased risk of lung cancer[38,39]. The results of toxicological studies using animal models suggest that chromium (VI) can cause lung tumors via inhalation exposure[35,40]. Because emissions and exposure data for chromium do not identify specific compounds or valence states, there is greater uncertainty associated with risk estimation for this class of pollutants. EPA has assigned chromium a cancer risk assessment value based on the average proportion of the carcinogenic element chromium VI in environmental mixtures[41].

Margin of Exposure Evaluation

Average concentrations of chromium detected in ambient air around Coronet Junction were 0.0009, 0.0007, and 0.0017 ug/m^3. The highest reported noncancer chronic exposure NOAEL from animal studies[42] is 15.5 mg/m^3 (15,500 ug/m^3), based on the inhalation toxicity of chromium dioxide dust to rats exposed for 2 years. In human studies[43], the NOAEL is 1.99 mg/m^3 (1,990 ug/m^3), resulting from an occupational medicine study on trivalent chromium compounds. Measured site concentrations are 9 million to 17 million times lower than the highest level at which no adverse health effects were observed in animals. Compared with the NOAEL for human populations, site concentrations are approximately 1 million to 2 million times lower levels.

Respiratory system effects[44] were observed in workers occupationally exposed to chromium for up to 23.6 years. Effects observed at a LOAEL of 0.002 mg/m^3 (2 ug/m^3) included mild decreased lung function and atrophy of the nasal mucosa. Site concentrations are 1,176 to 2,857 times lower than this level of exposure. For this specific monitoring period, these results suggest that noncancer effects are not likely to be observed at or near chromium concentrations observed in ambient air around Coronet Junction. .

The potential for cancer effects was evaluated based on a LOAEL of 0.04 mg/m^3 (40 ug/m^3) derived from epidemiologic studies[45] of male workers who developed lung cancer after being occupationally exposed to mixtures of chromium III and IV for up to 49 years. Site concentrations were 23,500 to 57,100 times lower than levels of exposure at which cancer effects were observed. The vast differences between the measured site concentrations and the levels at which no effects were actually observed suggest that health effects due to inhalation of ambient air containing chromium around Cornet Junction is very unlikely.

Cadmium

Cadmium is a naturally occurring metal that is used in various chemical forms in metallurgical and other industrial processes, and in the production of pigments. 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. In the mining and electroplating industries, extraction of minerals that contain cadmium during the production of metals or and the use of cadmium in consumer products often results in the release of cadmium compounds in the environment[46]. Cadmium tends to remain the environment for long periods of time close to the source from which it was released[46] and can transported over long ranges in air[47]. Air levels of cadmium in U.S. cities are low[48], ranging from less than 0.001 to 0.04 µg/m^3. Atmospheric cadmium is in the form of particulate matter; the primary form of cadmium in air is cadmium oxide.

Cadmium is readily absorbed by the lungs (30-60%)[49] and is widely distributed throughout the body[50]. The acute (short-term) effects of cadmium in humans through inhalation exposure consist mainly of effects on the lung, such as pulmonary irritation. For chronic (longterm) inhalation exposure, both the lungs and kidneys are target organs for cadmium-induced toxicity[46,50]. Low-level chronic exposure over many years may result in a build-up of cadmium in the kidneys. Breathing high levels of cadmium severely damages the lungs and can cause death. Other cadmium toxicity, as seen in animal studies, includes reproductive and developmental (teratogenic) effects.

There is limited evidence from epidemiologic studies for cadmium-related respiratory tract cancer[46]. An inhalation unit risk of 1.8E-3 $(\mu g/m^3)^{-1}$ and an inhalation slope factor of 6.1E+0 $(mg/kg/day)^{-1}$ are based on respiratory tract cancer associated with occupational exposure[51]. Animal studies have demonstrated an increase in lung cancer from long-term inhalation exposure to cadmium. Based on limited evidence of multiple occupational exposure studies and adequate animal data, EPA has classified cadmium as a Group B1, probable human carcinogen.

Margin of Exposure Evaluation

Average concentrations of cadmium detected in ambient air around Coronet Junction were 0.0007, 0.007, and 0.003 ug/m^3. The highest reported noncancer chronic exposure NOAEL from animal studies is 0.095 mg/m^3 (95 ug/m^3). This value was derived from chronic inhalation studies performed on Wister rats[52] exposed to cadmium sulfate ($CdSO_4$) for 22 hours per day, 413 to 455 days. There are no human studies for which a noncancer human NOAEL is recorded in the literature.

The available toxicological data indicate that cadmium has the potential to cause adverse health effects in humans and animals. At a LOAEL of 0.0134 mg/m^3 (13.4 ug/m^3), Takenaka and associates[53] observed adenomatous hyperplasia in the bronchioalveolar area. Male Wistar rats were exposed to cadmium chloride ($CdCl_2$) aerosols for 23 hours daily over 18 months. This study was selected as the source of the noncancer chronic LOAEL. Measured site concentrations are 4,467 to 19,143 times lower than the lowest level at which adverse health effects were observed in animals. Cancer effects (i.e., lung epidemoid carcinoma; adenocarcinomas; mucoepidermoid carcinomas) were also observed in the same study population at an exposure level of 0.0134 mg/m^3.

The potential for cancer effects was evaluated based on a cancer LOAEL of 0.1 mg/m^3 (100 ug/m^3) derived from epidemiologic studies of male workers[54,55] who developed lung cancer and died after being occupationally exposed to cadmium oxide for up to 45 years. Site concentrations were 33,333 to 142,857 times lower than levels of exposure at which cancer effects were observed. Based on these findings, adverse health effects due to inhalation of cadmium at the levels measured around Coronet Junction would not be expected.

Cumulative Risk and the Effect of Chemical Mixtures

The general public is generally exposed to multiple contaminants from a variety of sources. In addition to assessing risks based on individual contaminants, Florida DOH evaluated the combined risks to recreational, commercial, and residential receptors from aggregate exposures to multiple chemical agents. Noncancer hazard quotients derived for each receptor were summed across chemicals to derive a hazard index. The hazard index method is used to screen for noncancer health hazards from potential additivity of the individual chemicals comprising the mixture[56]. Cancer risks for the individual chemicals are summed to screen for heath hazards from potential additivity of carcinogenic effects[56]. At risk levels associated with pollutant concentrations observed around Coronet Junction, the combined risks (calculated assuming response additivity) suggest that mixture components are not present at toxicologically significant exposure levels.

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.

Susceptible subpopulations that may hyperrespond to exposure to atmospheric pollutants include children, the elderly, and those with a preexisting disease (e.g., asthmatics), but the data to substantiate these assumptions are largely deficient.

CONCLUSIONS

ATSDR requires that one of five conclusion categories be used to summarize findings of a health consultation. These categories are as follows: (1) Urgent Public Health Hazard; (2) Public Health Hazard; (3) Indeterminate Public Health Hazard; (4) No Apparent Public Health Hazard; (5) No Public Health Hazard. A category is selected from site-specific conditions such as the degree of public health hazard based on the presence and duration of human exposure, contaminant concentration, the nature of toxic effects associated with site-related contaminants, presence of physical hazards, and community health concerns. Based on the available data, the Florida DOH finds that:

- Insufficient information is available to determine if community members were exposed to residential outdoor air ambient or fugitive dust emissions from the Coronet plant prior to 2003. The available data were not sufficient to determine whether air releases were significant enough to expose neighboring workers or homes to air toxics; therefore, pre-2003 residential outdoor exposures posed an indeterminate public health hazard.
- Site-specific emissions characteristics and meteorological conditions could affect ambient air evaluation results significantly. Wind rose data from Tampa International Airport indicates that wind direction is primarily from the northeast.
- Based on the wind rose data, the primary receptor populations for past air emissions from the facility would have been workers at neighboring businesses and residents southwest of the facility. Air concentrations were not measured in communities southwest of the Coronet facility. People may have been exposed to stack emissions and fugitive dusts in ambient air from the Coronet plant on a regular basis. However, without ambient air data, there is insufficient information to permit evaluation of the significance of this pathway of exposure.

- Health outcome data for the Plant City area do not indicate a higher than expected lung and bronchial cancer incidence rate in the community, compared with neighboring Polk County. The incidence of lung and bronchus cancer is not higher than the statewide average.

In summary, although we detected these metals, their low concentrations mean they pose no potential for significant risk of long-term health problems. It is also unlikely that individuals would be exposed to the specific concentrations determined by this evaluation; rather, it is possible that persons may have contacted levels of contaminants significantly lower than those reported here over the long-term.

Based on ATSDR's criteria, the Florida DOH concludes thus:

- Based on data available for 2003, the levels of chemicals measured in ambient air around the Coronet Industries, Incorporated site posed **no apparent public health hazard**. Prior to 2003, there was insufficient data. Therefore, exposure prior to 2003 posed an indeterminate health hazard.
- *Current* ambient air exposures to ambient air around the Coronet plant pose **no public health hazard**. This classification is based on the fact that site operations ceased in April 2004 and no chemicals are being processed or released to the atmosphere from the site.
- *Future* ambient air exposures from the facility are also expected to pose **no public health hazard** because all manufacturing operations at the facility have ceased and are not likely in the future.

RECOMMENDATIONS

Based upon the ambient air data evaluated in this report, the Florida DOH recommends no further public health action at this time.

PUBLIC HEALTH ACTION PLAN

The purpose of the public health action plan is to ensure that public health hazards are not only identified, but also addressed. The public health action plan for this site describes actions that Florida DOH and/or other government agencies plan to take at the site to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. Florida DOH will also follow up on the plan to ensure implementation of the following public health actions:

Actions Completed

- Relative to the evaluation of ambient air contamination, Florida DOH and the HCEPC conducted a site visit (windshield tour) of the Coronet facility on May 23, 2005.
- Florida DOH attended a meeting hosted by the HCEPC on May 23, 2005 to discuss Florida DOH's plans to evaluate ambient air data collected around Coronet Junction.

Actions Ongoing

- Florida DOH will combine the findings from this health consultation with findings from published health consultations for the Coronet site to create a comprehensive public health assessment report outlining overall conclusions and strategies for addressing public health implications.

Actions Planned

- No future actions are planned for this site.

AUTHORS AND TECHNICAL ADVISORS

Florida Department of Health Author

Alrena V. Lightbourn
Bureau of Community Environmental Health
Division of Environmental Health
(850) 245-4299

Florida Department of Health Designated Reviewer

Randy E. Merchant
Bureau of Community Environmental Health
Division of Environmental Health
(850) 245-4299

ATSDR Reviewer

Jennifer A. Freed
Technical Project Officer
Division of Health Assessment and Consultation
(404) 498-0508

ATSDR Regional Representative

Benjamin Moore
ATSDR, Region 4
(404) 562-1784

CERTIFICATION

The Coronet Industries Public Health Consultation was prepared by the Florida Department of Health, Bureau of Community Environmental Health, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry. It is in accordance with approved methodology and procedures existing at the time the health consultation was begun. Editorial review was completed by the Cooperative Agreement partner.

Jennifer Freed
Technical Project Officer,
CAT, SPAB, DHAC
ATSDR

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

Alan Yarbrough
Team Leader,
CAT, SPAB, DHAC,
ATSDR

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APPENDIX A: PRELIMINARY SCREENING EVALUATION: THEORETICAL CANCER RISK APPROACH

THEORETICAL CANCER RISK APPROACH

The Florida Department of Health (Florida DOH) conducted a preliminary screening of chemicals detected in air both at background locations and around Coronet Junction. The following approach was taken:

1. Average and maximum concentrations of each chemical were compared to environmental guideline comparison values to identify chemicals of concern (COCs) for further evaluation.

2. Measured ambient air concentrations for COCs were compared to the most conservative health-based comparison value for the specific chemical.

3. Florida DOH also computed the theoretical risk of an increase in cancer cases in a population using the following equation:

   $$ER = IUR \times Air\ Concentration$$

   Where,

   ER = Estimated Theoretical Risk (unitless)
   IUR = Inhalation Unit Risk (ug/m^3)

   This calculation estimates a theoretical excess cancer risk expressed as the proportion of a population that may be affected by a carcinogen during a lifetime of exposure. For example, in the case of an individual inhaling inorganic arsenic at a concentration of 0.0076 ug/m^3, an estimated cancer risk of 1.8×10^{-5} (1E-5) represents a possible 2 excess cancer cases in a population of 10,000.

Estimated theoretical risk values for the general population are summarized below in Tables A-1 and A-2. Table A-3 summarizes the results of health guideline comparisons with measured data. Because of the uncertainties and conservatism inherent in deriving the IURs, the theoretical risk value is only an estimate of risk; the true risk is unknown and could be as low as zero.

Table A-1. Theoretic Cancer Risk Approach: Site-Specific and Background Chemicals of Concern (Based on Exposure to Maximum Air Concentrations)

Exposure Point	Pollutant/COC	ATSDR Comparison Value (ug/m^3)	Maximum Concentration (ug/m^3)	Air Unit Risk $(ug/m^3)^{-1}$	Theoretical Risk
2003 Coronet Junction Stations					
Kenny/Kelly	Arsenic	0.0002	0.0076	4.3E-03	**3.3E-05**
	Beryllium	0.0004	0.0009	2.4E-03	**2.2E-06**
	Cadmium	0.0006	0.0221	1.8E-03	**4.0E-05**
	Chromium	0.00008	0.0105	1.2E-02	**1.3E-04**
Station25	Arsenic	0.0002	0.0047	4.3E-03	**2.0E-05**
	Beryllium	0.0004	0.0008	2.4E-03	**1.9E-06**
	Cadmium	0.0006	0.0012	1.8E-03	**2.2E-06**
	Chromium	0.00008	0.0028	1.2E-02	**3.4E-05**
Springhead	Arsenic	0.0002	0.0046	4.3E-03	**2.0E-05**
	Beryllium	0.0004	0.0008	2.4E-03	**1.9E-06**
	Cadmium	0.0006	0.0011	1.8E-03	**2.0E-06**
	Chromium	0.00008	0.0011	1.2E-02	**1.3E-05**
2003 Background Stations					
Gandy	Arsenic	0.0002	0.0137	4.3E-03	**5.9E-05**
	Beryllium	0.0004	0.0008	2.4E-03	**1.9E-06**
	Cadmium	0.0006	0.0019	1.8E-03	**3.4E-06**
	Chromium	0.00008	0.0145	1.2E-02	**1.7E-04**
Lewis	Arsenic	0.0002	0.021	4.3E-03	**9.0E-05**
	Beryllium	0.0004	0.0007	2.4E-03	**1.7E-06**
	Cadmium	0.0006	0.0017	1.8E-03	**3.1E-06**
	Chromium	0.00008	0.0193	1.2E-02	**2.3E-04**
2002 Background Stations					
Gandy	Arsenic	0.0002	0.0055	4.3E-03	**2.4E-05**
	Cadmium	0.0006	0.001	1.8E-03	**1.8E-06**
	Chromium	0.00008	0.0104	1.2E-02	**1.2E-04**
Lewis	Arsenic	0.0002	0.0282	4.3E-03	**1.2E-04**
	Cadmium	0.0006	0.0016	1.8E-03	**2.9E-06**
	Chromium	0.00008	0.005	1.2E-02	**6.0E-05**

ug/m^3 = micrograms chemical per cubic meter of air
Theoretical risk = Air Concentration (ug/m^3) x Inhalation Unit Risk $(ug/m^3)^{-1}$

Table A-2. Theoretic Cancer Risk Approach: Site-Specific and Background Chemicals of Concern (Based on Exposure to Average Air Concentrations)

Exposure Point	Chemical of Concern (COC)	ATSDR Comparison Value (ug/m^3)	Average Concentration (ug/m^3)	Air Unit Risk $(ug/m^3)^{-1}$	Theoretical Risk
2003 Coronet Junction Stations					
Kenny/Kelly	Arsenic	0.0002	0.0034	4.3E-03	**1.5E-05**
	Cadmium	0.0006	0.0007	1.8E-03	**1.3E-06**
	Chromium	0.00008	0.0009	1.2E-02	**1.1E-05**
Station25	Arsenic	0.0002	0.004	4.3E-03	**1.7E-05**
	Cadmium	0.0006	0.003	1.8E-03	**5.4E-06**
	Chromium	0.00008	0.0017	1.2E-02	**2.0E-05**
Springhead	Arsenic	0.0002	0.0032	4.3E-03	**1.4E-05**
	Cadmium	0.0006	0.0007	1.8E-03	**1.3E-06**
	Chromium	0.00008	0.0007	1.2E-02	**8.4E-06**
2003 Background Stations					
Gandy	Arsenic	0.0002	0.0021	4.3E-03	**9.0E-06**
	Chromium	0.00008	0.0015	1.2E-02	**1.8E-05**
Lewis	Arsenic	0.0002	0.0037	4.3E-03	**1.6E-05**
	Cadmium	0.0006		1.8E-03	**0.0E+00**
	Chromium	0.00008	0.0012	1.2E-02	**1.4E-05**
2002 Background Stations					
Gandy	Arsenic	0.0002	0.0032	4.3E-03	**1.4E-05**
	Chromium	0.00008	0.0033	1.2E-02	**4.0E-05**
Lewis	Arsenic	0.0002	0.0055	4.3E-03	**2.4E-05**
	Cadmium	0.0006	0.0007	1.8E-03	**1.3E-06**
	Chromium	0.00008	0.0028	1.2E-02	**3.4E-05**

ug/m^3 = micrograms chemical per cubic meter of air

Theoretical risk = Air Concentration (ug/m^3) x Inhalation Unit Risk $(ug/m^3)^{-1}$

Table A-3. Acute Inhalation Health Guideline Comparison to Measured Concentrations of Site-Specific and Background Chemicals of Concern (Based on 2003 Maximum Air Concentrations)

Contaminant	Lowest Observed [Max] (ug/m^3)	Highest Observed [Max] (ug/m^3)	Acute NOAEL (ug/m^3)	Ratio of NOAEL to Lowest Observed [Max]	Ratio of NOAEL to Highest Observed [Max]
Arsenic	0.0046	0.0210	123	26,654	5,852
Beryllium	0.0007	0.0009	198	294,026	219,264
Cadmium	0.0011	0.0221	110	99,581	4,972
Chromium	0.0011	0.0193	--	--	--

Contaminant	Lowest Observed [Max] (ug/m^3)	Highest Observed [Max] (ug/m^3)	Acute $LOAEL_{(less\ serious)}$ (ug/m^3)	Ratio of $LOAEL_{(less\ serious)}$ to Lowest Observed [Max]	Ratio of $LOAEL_{(less\ serious)}$ to Highest Observed [Max]
Arsenic	0.0046	0.0210	271	58,725	12,894
Beryllium	0.0007	0.0009	184	273,237	203,760
Cadmium	0.0011	0.0221	170	153,898	7,684
Chromium	0.0011	0.0193	900	853,989	46,682

Contaminant	Lowest Observed [Max] (ug/m^3)	Highest Observed [Max] (ug/m^3)	Acute $LOAEL_{(less\ serious)}$ (ug/m^3)	Ratio of $LOAEL_{(less\ serious)}$ to Lowest Observed [Max]	Ratio of $LOAEL_{(less\ serious)}$ to Highest Observed [Max]
Arsenic	0.0046	0.0210	21600	4,680,689	1,027,731
Beryllium	0.0007	0.0009	184	273,237	203,760
Cadmium	0.0011	0.0221	1600	1,448,456	72,319
Cadmium*	0.0011	0.0221	8630	8,188,808	447,627
Chromium	0.0011	0.0193	29000	27,517,431	1,504,194

NOAEL = No-observed-adverse-effect-level
LOAEL = Lowest-observed-adverse-effect-level
[ ] = symbol indicting 'chemical concentration'
*Based on data from human study.

APPENDIX B: DETAILED SITE-SPECIFIC EXPOSURE EVALUATION

Table B-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: US Census 2000.

Table B-2. Eliminated and Potential Offsite Exposure Pathways

	Eliminated Exposure Pathway Elements					
Pathway Name	Source	Environmental Media	Point of Exposure	Route of Exposure	Exposed Population	Time Frame
Ambient Air	Coronet fugitive and stack emissions	Air (Particulates/ Dust)	Air (Breathing Zone)	Inhalation	Nearby Residents	Present

	Potential Exposure Pathway Elements					
Pathway Name	Source	Environmental Media	Point of Exposure	Route of Exposure	Exposed Population	Time Frame
Ambient Air	Coronet fugitive and stack emissions	Air (Particulates/ Dust)	Air (Breathing Zone)	Inhalation	Nearby Residents	Past (pre-4/14/04), Future

Table B-3. Completed Offsite Exposure Pathways

Pathway Name	Completed Exposure Pathway Elements					Time Frame
	Source	Environmental Media	Point of Exposure	Route of Exposure	Exposed Population	
Ambient Air	Coronet fugitive and stack emissions	Ambient Air (Particulates)	***Industrial/Commercial Exposure Scenarios***			
			Air (Breathing Zone) Around *Station25 (Fire Station)*	Inhalation	Offsite Worker	Past
			Recreational Exposure Scenarios			
			Air (Breathing Zone) Around *Station25 (Fire Station)*	Inhalation	Offsite Worker	Past
					Subsistence Farmer Adult	
					Subsistence Farmer Child	
					Elementary School Child	
			Air (Breathing Zone) Around *Kenny/Kelly (Ball Park)*	Inhalation	Marshall Middle School Child (On School Playground)	
					Elementary School Child (Recreation Center Playground and Ballpark)	
					Middle School Child (Recreation Center Playground and Ballpark)	
					High School Student (Recreation Center Playground and Ballpark)	
					Young Child (Community Daycare)	
					Elderly Persons at Local Senior Center	
			Air (Breathing Zone) Around *Springhead (Springhead Church)*	Inhalation	Infant, child, adolescent, and adult churchgoers	Past
					Subsistence Farmer Adult	
					Subsistence Farmer Child	
			Residential Exposure Scenarios			
			Air (Breathing Zone) Around *Coronet Junction*	Inhalation	Infant, child, adolescent, and adult residents (outside residence)	Past

Table B-4. Summary of 2003 Ambient Air Monitoring Results for the Kenny/Kelly Station

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)	B (ng/m^3)
Kenny/Kelly	8/28/03	ND	0.06	ND	0.444	ND	3.66	ND	ND	ND	ND	ND
Kenny/Kelly	8/31/03	ND	0.06	ND	ND	ND	1.55	ND	ND	ND	ND	ND
Kenny/Kelly	9/3/03	2.38	0.16	1.16	1.58	ND	3.46	4.882	ND	ND	ND	ND
Kenny/Kelly	9/6/03	1.67	0.16	0.86	0.91	ND	1.85	ND	ND	ND	ND	ND
Kenny/Kelly	9/9/03	2.83	0.16	0.86	1.10	2.66	4.29	ND	ND	ND	ND	ND
Kenny/Kelly	9/12/03	2.29	0.16	0.72	2.83	0.58	6.57	5.811	ND	ND	ND	ND
Kenny/Kelly	9/15/03	4.43	0.10	0.94	0.16	2.16	4.07	ND	ND	ND	0.98	ND
Kenny/Kelly	9/18/03	4.59	0.10	1.13	0.375	2.471	5.76	ND	ND	ND	1.400	ND
Kenny/Kelly	9/21/03	3.53	0.09	0.80	ND	ND	1.13	ND	ND	ND	ND	ND
Kenny/Kelly	9/24/03	4.27	0.09	1.04	1.00	1.359	4.16	ND	ND	ND	ND	ND
Kenny/Kelly	9/27/03	4.72	0.09	0.82	0.03	ND	1.21	ND	ND	ND	0.84	ND
Kenny/Kelly	9/30/03	4.05	0.09	0.780	0.586	1.58	4.50	3.58	ND	ND	0.944	ND
Kenny/Kelly	10/3/03	4.00	0.62	ND	ND	4.43	5.19	3.71	ND	ND	ND	ND
Kenny/Kelly	10/6/03	2.573	0.63	0.074	ND	3.50	11.24	4.752	ND	ND	ND	ND
Kenny/Kelly	10/9/03	ND	0.69	ND	ND	2.13	5.86	ND	ND	ND	ND	ND
Kenny/Kelly	10/12/03	3.31	0.75	0.394	ND	7.12	2.33	7.36	ND	ND	ND	ND
Kenny/Kelly	10/18/03	4.56	0.74	ND	ND	4.27	5.17	8.10	ND	ND	1.91	ND
Kenny/Kelly	10/21/03	2.737	0.14	0.33	ND	7.96	6.45	3.256	ND	0.421	6.16	4.47
Kenny/Kelly	10/24/03	ND	0.16	0.42	ND	5.93	11.52	ND	ND	ND	5.93	2.603
Kenny/Kelly	10/27/03	ND	0.21	0.36	ND	5.10	5.80	4.10	ND	0.39	6.31	ND
Kenny/Kelly	10/30/03	2.38	0.22	0.32	ND	4.42	6.39	3.02	ND	0.30	6.71	4.85
	Min	**1.67**	**0.06**	**0.07**	**0.03**	**0.58**	**1.13**	**3.02**	**0.00**	**0.30**	**0.84**	**2.60**
	Max	**4.72**	**0.75**	**1.16**	**2.83**	**7.96**	**11.52**	**8.10**	**0.00**	**0.42**	**6.71**	**4.85**
	Mean	**3.39**	**0.26**	**0.69**	**0.90**	**3.71**	**4.86**	**4.86**	**ND**	**0.37**	**3.46**	**3.97**
	No. Detects	**16**	**21**	**16**	**10**	**15**	**21**	**10**	**0**	**3**	**9**	**3**
	Number Samples	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**

ND – not detected; As – arsenic; Be – beryllium; Cd – cadmium; Cr – chromium; Pb – lead; Mn – manganese; Ni – nickel; Sb – antimony; Co – cobalt; Se – selenium; B – boron; ng/m^3 = nanograms chemical per cubic meter of air.

Table B-5. Summary of 2003 Ambient Air Monitoring Results for the Springhead Station

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)	B (ng/m^3)
Springhead	8/28/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Springhead	8/31/03	ND	0.06	ND	ND	ND	1.07	ND	ND	ND	1.23	ND
Springhead	9/3/03	2.79	0.16	0.78	0.72	ND	2.55	3.68	ND	ND	ND	ND
Springhead	9/6/03	1.66	0.15	0.72	0.96	ND	2.28	ND	ND	ND	ND	ND
Springhead	9/9/03	2.95	0.23	0.84	0.96	ND	2.97	ND	ND	ND	ND	ND
Springhead	9/12/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Springhead	9/15/03	3.84	0.10	0.86	0.22	0.81	2.92	ND	ND	ND	0.99	ND
Springhead	9/18/03	4.35	0.09	0.85	0.17	1.51	3.98	ND	ND	ND	1.29	ND
Springhead	9/21/03	4.18	0.09	0.74	ND	0.30	1.82	ND	ND	ND	ND	ND
Springhead	9/24/03	4.27	0.09	0.77	1.05	0.80	4.15	3.59	ND	ND	ND	ND
Springhead	9/27/03	4.61	0.09	1.10	ND	0.18	1.29	ND	ND	ND	ND	ND
Springhead	9/30/03	3.43	0.09	0.70	ND	0.58	2.20	ND	ND	ND	1.17	ND
Springhead	10/3/03	ND	0.64	ND	ND	1.39	2.31	3.97	ND	ND	ND	ND
Springhead	10/6/03	ND	0.66	ND	ND	2.51	11.69	3.29	ND	ND	ND	ND
Springhead	10/9/03	ND	0.66	ND	ND	1.34	4.70	ND	ND	ND	ND	ND
Springhead	10/12/03	ND	0.70	0.54	ND	5.04	6.38	7.47	ND	ND	ND	ND
Springhead	1015/03	1.57	0.75	ND	ND	2.71	9.11	3.05	ND	ND	ND	ND
Springhead	10/18/03	ND	0.76	ND	ND	2.97	6.95	ND	ND	ND	2.65	ND
Springhead	10/21/03	ND	0.12	0.44	ND	3.98	6.57	ND	ND	0.29	2.78	2.22
Springhead	10/24/03	1.97	0.16	0.48	ND	3.19	9.86	3.63	ND	0.12	6.24	2.84
Springhead	10/27/03	ND	0.17	0.50	ND	4.51	7.66	3.19	ND	ND	1.33	ND
Springhead	10/30/03	2.45	0.17	0.37	ND	2.32	4.82	ND	ND	ND	4.31	ND
Min		**1.57**	**0.06**	**0.37**	**0.17**	**0.18**	**1.07**	**3.05**	**0.00**	**0.12**	**0.99**	**2.22**
Max		**4.61**	**0.76**	**1.10**	**1.05**	**5.04**	**11.69**	**7.47**	**0.00**	**0.29**	**6.24**	**2.84**
Mean		**3.17**	**0.30**	**0.69**	**0.68**	**2.13**	**4.76**	**3.98**	**ND**	**0.21**	**2.44**	**2.53**
No. Detects		**12**	**20**	**14**	**6**	**16**	**20**	**8**	**0**	**2**	**9**	**2**
Number Samples		**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**

ND – not detected ; As – arsenic; Be – beryllium; Cd – cadmium; Cr - chromium; Pb - lead; Mn - manganese; Ni - nickel; Sb - antimony; Co - cobalt; Se - selenium; B – boron; ng/m^3 = nanograms chemical per cubic meter of air.

Table B-6. Summary of 2003 Ambient Air Monitoring Results for Station25

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)	B (ng/m^3)
Station 25	8/22/03	ND	0.06	ND	0.32	ND	2.92	ND	ND	ND	ND	ND
Station 25	8/25/03	ND	0.06	ND	1.21	ND	4.24	ND	ND	ND	ND	ND
Station 25	8/28/03	ND	0.06	ND	0.07	ND	3.02	ND	ND	ND	ND	ND
Station 25	8/31/03	ND	0.06	ND	ND	ND	1.91	ND	ND	ND	ND	ND
Station 25	9/3/03	2.54	0.16	0.79	1.23	ND	2.97	5.69	ND	ND	ND	ND
Station 25	9/6/03	2.53	0.15	0.80	0.88	ND	1.98	ND	ND	ND	ND	ND
Station 25	9/9/03	3.72	0.23	4.16	10.54	1.25	9.70	3.44	ND	ND	1.23	11.68
Station 25	9/12/03	2.49	0.19	1.38	4.41	1.19	7.47	6.18	ND	ND	1.17	ND
Station 25	9/15/03	5.02	0.15	4.23	5.43	3.19	6.22	6.80	ND	ND	2.95	ND
Station 25	9/18/03	4.93	0.14	5.94	4.34	3.80	9.37	ND	ND	ND	1.93	ND
Station 25	9/21/03	3.27	0.09	0.97	ND	0.95	2.38	ND	ND	ND	ND	ND
Station 25	9/24/03	4.16	0.11	1.16	1.38	2.01	5.70	ND	ND	ND	0.94	ND
Station 25	9/27/03	4.20	0.09	1.50	0.15	0.36	1.12	ND	ND	ND	ND	ND
Station 25	9/30/03	4.43	0.14	3.82	6.25	1.44	6.88	3.39	ND	ND	2.05	ND
Station 25	10/3/03	4.22	0.67	2.83	ND	3.01	11.38	5.35	ND	ND	ND	8.60
Station 25	10/6/03	5.17	0.68	ND	ND	3.35	7.24	4.51	ND	ND	1.53	ND
Station 25	10/9/03	ND	0.81	22.12	ND	7.10	9.36	3.61	ND	ND	1.97	23.12
Station 25	10/12/03	6.24	0.72	0.40	ND	0.74	2.78	7.56	ND	ND	ND	ND
Station 25	10/15/03	2.29	0.81	5.51	ND	4.70	9.97	3.51	ND	ND	ND	30.69
Station 25	10/18/03	7.64	0.90	3.59	ND	7.20	24.53	4.91	ND	ND	ND	46.97
Station 25	10/21/03	1.83	0.15	3.90	ND	4.67	15.45	3.77	ND	ND	1.76	10.49
Station 25	10/24/03	5.01	0.16	0.66	ND	7.02	12.88	3.18	ND	0.50	2.07	6.55
Station 25	10/27/03	ND	0.14	0.60	ND	2.60	5.18	3.43	ND	0.19	3.98	ND
Station 25	10/30/03	6.09	0.24	0.56	ND	4.25	6.38	3.21	ND	ND	3.11	6.65
Min		**1.83**	**0.06**	**0.40**	**0.07**	**0.36**	**1.12**	**3.18**	**0.00**	**0.19**	**0.94**	**6.55**
Max		**7.64**	**0.90**	**22.12**	**10.54**	**7.20**	**24.53**	**7.56**	**0.00**	**0.50**	**3.98**	**46.97**
Mean		**4.21**	**0.29**	**3.42**	**3.02**	**3.27**	**7.13**	**4.57**	**ND**	**0.35**	**2.06**	**18.09**
No. Detects		**18**	**24**	**19**	**12**	**18**	**24**	**15**	**0**	**2**	**12**	**8**
Number Samples		**24**	**24**	**24**	**24**	**24**	**24**	**24**	**24**	**24**	**24**	**24**

ND – nondetect; As – arsenic; Be – beryllium; Cd – cadmium; Cr - chromium; Pb - lead; Mn - manganese; Ni - nickel; Sb - antimony; Co - cobalt; Se - selenium; B – boron; ; ng/m^3 = nanograms chemical per cubic meter of air.

Table B-7. Chemicals of Concern in Air Around Coronet Junction (As Determined From 2003 Ambient Air Monitoring Studies)

	No. of Samples	No. of Detects	Measured Concentration			Environmental Comparison Value (CV)		Exceeds CV	No. Detects Above CV
			Minimum (ug/m^3)	Average (ug/m^3)	Maximum (ug/m^3)	(ug/m^3)	Source		
Kenny/Kelly									
Arsenic	21	16	0.0017	0.0034	0.0047	0.0002	CREG	**YES**	16
Beryllium	21	21	0.00006	0.0003	0.0008	0.0004	CREG	NO	0
Cadmium	21	16	0.00007	0.0007	0.0012	0.0006	CREG	**YES**	16
Chromium	21	10	0.00003	0.0009	0.0028	0.00008	CREG	**YES**	10
Lead	21	15	0.0006	0.0037	0.0080	1.55	OAQPS	NO	0
Manganese	21	21	0.0011	0.0049	0.0115	0.04	C-EMEG	NO	0
Nickel	21	10	0.0030	0.0049	0.0081	0.09	C-EMEG	NO	0
Antimony	21	0	ND	ND	ND	0.15	EPA Reg 3	NO	0
Cobalt	21	3	0.0003	0.0004	0.0004	0.1	C-EMEG	NO	0
Selenium	21	9	0.0008	0.0035	0.0067	1.8	EPA Reg 3	NO	0
Boron	21	3	0.0026	0.0040	0.0048	2.1	EPA Reg 3	NO	0
Springhead									
Arsenic	22	12	0.0016	0.0032	0.0046	0.0002	CREG	**YES**	12
Beryllium	22	20	0.00006	0.0003	0.0008	0.0004	CREG	NO	0
Cadmium	22	14	0.0004	0.0007	0.0011	0.0006	CREG	**YES**	14
Chromium	22	6	0.0002	0.0007	0.0011	0.00008	CREG	**YES**	6
Lead	22	16	0.0002	0.0021	0.0050	1.55	OAQPS	NO	0
Manganese	22	20	0.0011	0.0048	0.0117	0.04	C-EMEG	NO	0
Nickel	22	8	0.0031	0.0040	0.0075	0.09	C-EMEG	NO	0
Antimony	22	0	ND	ND	ND	0.15	EPA Reg 3	NO	0
Cobalt	22	2	0.00012	0.0002	0.0003	0.1	C-EMEG	NO	0
Selenium	22	9	0.0010	0.0024	0.0062	1.8	EPA Reg 3	NO	0
Boron	22	2	0.0022	0.0025	0.0028	2.1	EPA Reg 3	NO	0

Table B-7. Chemicals of Concern in Air Around Coronet Junction (As Determined From 2003 Ambient Air Monitoring Studies) (Continued)

	No. of Samples	No. of Detects	Measured Concentration			Environmental Comparison Value (CV)		Exceeds CV	No. Detects Above CV
			Minimum (ug/m^3)	Average (ug/m^3)	Maximum (ug/m^3)	(ug/m^3)	Source		
Station 25									
Arsenic	24	18	0.0018	0.0040	0.0076	0.0002	CREG	**YES**	18
Beryllium	24	24	0.00006	0.0003	0.0009	0.0004	CREG	NO	0
Cadmium	24	19	0.0004	0.0030	0.0221	0.0006	CREG	**YES**	19
Chromium	24	12	0.00007	0.0017	0.0105	0.00008	CREG	**YES**	12
Lead	24	18	0.0004	0.0035	0.0072	1.55	OAQPS	NO	0
Manganese	24	24	0.0011	0.0066	0.0245	0.04	C-EMEG	NO	0
Nickel	24	15	0.0032	0.0047	0.0076	0.09	C-EMEG	NO	0
Antimony	24	0	ND	ND	ND	0.15	EPA Reg 3	NO	0
Cobalt	24	2	0.0002	0.0003	0.0005	0.1	C-EMEG	NO	0
Selenium	24	12	0.0009	0.0022	0.0040	1.8	EPA Reg 3	NO	0
Boron	24	8	0.0066	0.0190	0.0470	2.1	EPA Reg 3	NO	0

CREG: ATSDR Cancer Risk Evaluation Guide
OAQPS: U.S. EPA Office of Air Quality Planning & Standards promulgated national ambient air quality criterion for lead.
C-EMEG: ATSDR Chronic Environmental Media Evaluation Guide
EPA Reg 3: U.S. EPA Region 3 Risk-based Concentration (http://www.epa.gov/region3)
ug/m^3: micrograms chemical per cubic meter of air
ND: not detected

Table B-8. Summary of 2003 Ambient Air Monitoring Results for Lewis Station (Background Location)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)
Lewis	3/4/2003	4.23	0.03	0.03	0.68	0.51	3.07	2.73	10.92	0.09	0.83
Lewis	3/10/2003	4.00	0.03	0.03	0.32	0.36	3.93	1.28	10.92	0.09	0.83
Lewis	3/16/2003	6.95	0.03	0.03	0.81	16.52	4.07	2.87	10.92	0.09	0.83
Lewis	3/22/2003	6.44	0.03	0.03	0.80	0.63	7.34	1.40	10.92	0.09	0.83
Lewis	3/28/2003	21.02	0.03	0.03	0.44	0.36	2.59	0.91	10.92	0.09	0.83
Lewis	2/26/03	3.88	0.03	0.03	1.41	0.87	4.90	4.07	10.92	0.09	0.83
Lewis	2/20/03	4.10	0.03	0.03	2.25	1.72	4.39	1.99	10.92	0.09	0.83
Lewis	2/14/03	5.20	0.03	0.03	1.41	1.48	5.13	0.55	10.92	0.09	0.83
Lewis	2/8/03	6.19	0.03	0.03	2.02	0.51	3.20	0.91	10.92	0.09	0.83
Lewis	1/27/03	0.80	0.03	0.03	0.80	0.63	5.84	0.30	10.92	0.09	1.98
Lewis	1/21/03	1.93	0.03	0.03	1.53	37.41	7.56	2.37	10.92	0.09	2.96
Lewis	1/15/03	0.80	0.03	0.03	0.80	1.72	5.14	0.43	10.92	0.09	0.83
Lewis	1/9/03	0.80	0.03	0.03	1.29	4.03	2.58	0.67	10.92	0.09	0.83
Lewis	1/3/03	0.80	0.03	0.24	0.19	8.52	2.34	1.15	10.92	0.09	2.48
Lewis	4/3/2003	6.00	0.27	0.03	0.51	0.36	4.79	2.05	10.92	0.09	0.83
Lewis	4/9/2003	0.80	0.27	0.03	0.51	0.36	2.24	1.38	10.92	0.09	0.83
Lewis	4/15/2003	3.28	0.17	0.03	0.61	4.09	5.40	2.78	10.92	0.51	0.83
Lewis	4/21/2003	10.54	0.16	0.03	0.49	2.41	4.33	6.98	10.92	0.84	0.83
Lewis	4/27/2003	7.65	0.17	0.03	0.10	2.04	4.36	3.37	10.92	0.09	0.83
Lewis	5/3/2003	4.03	0.16	0.03	0.16	2.93	3.33	3.48	10.92	0.09	0.83
Lewis	5/9/2003	2.99	0.17	0.03	0.58	5.22	5.46	6.55	10.92	0.66	0.83
Lewis	5/15/2003	4.92	0.17	0.03	0.53	7.63	6.75	3.67	10.92	0.58	0.83
Lewis	5/21/2003	1.57	0.17	0.03	0.51	2.94	2.68	2.89	10.92	0.09	0.83
Lewis	5/27/03	2.21	0.17	0.03	0.52	4.80	6.01	2.82	10.92	0.54	0.83
Lewis	6/26/03	2.57	0.03	0.29	0.84	2.26	2.95	1.52	10.92	0.09	0.83
Lewis	6/20/03	2.45	0.03	0.23	1.24	1.23	5.53	2.72	10.92	0.09	0.83
Lewis	6/14/2003	2.35	0.03	0.40	1.11	0.82	2.90	2.55	10.92	0.09	0.83

Table B-8. Summary of 2003 Ambient Air Monitoring Results for Lewis Station (Background Location) (continued)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)
Lewis	6/8/2003	4.16	0.35	1.62	1.35	6.51	2.28	7.09	10.92	0.97	0.83
Lewis	6/2/2003	3.97	0.36	1.68	1.70	6.29	5.64	2.39	10.92	1.00	0.83
Lewis	7/2/2003	6.82	0.29	1.19	2.53	6.94	18.29	3.87	10.92	0.86	0.83
Lewis	7/8/2003	7.15	0.29	1.18	1.23	3.74	7.80	2.53	10.92	0.57	0.83
Lewis	7/14/2003	2.20	0.03	0.03	0.77	0.36	1.51	1.02	10.92	0.09	0.83
Lewis	7/20/2003	4.49	0.03	0.03	1.05	0.36	4.82	3.60	10.92	0.09	0.83
Lewis	7/26/2003	3.30	0.03	0.03	0.87	0.36	2.88	3.33	10.92	0.09	0.83
Lewis	8/1/2003	0.80	0.45	1.62	1.20	7.26	4.92	2.54	10.92	1.02	2.18
Lewis	8/7/2003	0.80	0.45	1.56	0.68	8.91	3.02	2.61	10.92	0.94	2.80
Lewis	8/13/2003	0.80	0.67	0.25	1.88	4.16	12.03	1.35	10.92	0.09	0.83
Lewis	8/19/2003	0.80	0.67	0.34	1.94	11.77	4.10	3.94	10.92	0.09	0.83
Lewis	8/25/2003	0.80	0.47	1.59	0.73	4.51	2.48	2.36	10.92	0.92	2.08
Lewis	8/31/2003	0.80	0.48	1.61	1.03	6.74	3.45	1.98	10.92	0.92	2.81
Lewis	9/6/2003	2.16	0.03	0.26	0.51	2.66	1.40	0.62	10.92	0.09	0.83
Lewis	9/12/03	1.96	0.03	0.30	0.33	2.40	3.34	3.02	10.92	0.09	0.83
Lewis	9/18/2003	0.80	0.03	0.24	0.29	2.30	4.16	0.62	10.92	0.09	0.83
Lewis	9/24/03	2.07	0.03	0.35	0.09	2.11	3.71	0.62	10.92	0.09	0.83
Lewis	9/30/2003	0.80	0.03	0.29	0.10	0.94	2.49	1.10	10.92	0.09	0.83
Lewis	10/6/03	0.80	0.03	0.32	19.28	3.27	4.27	6.67	10.92	0.76	0.83
Lewis	10/12/2003	3.30	0.03	0.35	0.85	4.46	7.77	3.11	10.92	0.70	0.83
Lewis	10/18/03	2.11	0.03	0.36	0.50	2.18	3.21	1.95	10.92	0.69	0.83
Lewis	10/24/2003	12.20	0.03	0.42	1.50	4.82	9.96	2.79	10.92	0.09	0.83
Lewis	10/30/03	3.55	0.03	0.24	1.31	2.91	3.72	2.80	10.92	0.09	0.83
Lewis	11/5/2003	4.33	0.03	0.50	0.40	1.91	3.33	1.52	10.92	0.09	0.83
Lewis	11/11/2003	3.23	0.03	0.44	0.75	1.87	2.94	2.57	10.92	0.09	0.83
Lewis	11/17/2003	3.29	0.03	0.69	1.23	3.30	3.70	1.78	10.92	0.09	0.83
Lewis	11/23/2003	8.47	0.03	0.65	1.45	4.26	2.26	2.81	10.92	0.09	0.83

Table B-8. Summary of 2003 Ambient Air Monitoring Results for Lewis Station (Background Location) (continued)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)
Lewis	11/29/2003	3.02	0.03	0.38	0.92	1.90	2.70	0.62	10.92	0.09	0.83
Lewis	12/5/2003	3.37	0.03	0.47	1.17	4.48	4.42	0.46	10.92	0.09	0.83
Lewis	12/11/2003	2.84	0.03	0.39	1.12	5.21	3.51	0.56	10.92	0.09	0.83
Lewis	12/17/03	3.06	0.03	0.42	0.80	5.62	3.57	0.24	10.92	0.09	0.83
Lewis	12/23/03	4.00	0.03	0.56	1.15	4.27	3.00	1.95	10.92	0.09	0.83
Lewis	12/29/03	3.15	0.03	0.69	1.20	3.93	4.32	2.44	10.92	0.57	0.83
Min		**0.80**	**0.03**	**0.03**	**0.09**	**0.36**	**1.40**	**0.24**	**10.92**	**0.09**	**0.83**
Max		**21.02**	**0.67**	**1.68**	**19.28**	**37.41**	**18.29**	**7.09**	**10.92**	**1.02**	**2.96**
Mean		**3.73**	**0.12**	**0.38**	**1.24**	**4.08**	**4.50**	**2.35**	**10.92**	**0.28**	**1.02**
No. Detects		**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**
Number Samples		**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**

As – arsenic; Be – beryllium; Cd – cadmium; Cr - chromium; Pb - lead; Mn - manganese; Ni - nickel; Sb - antimony; Co - cobalt; Se - selenium.
ng/m^3:nanograms chemical per cubic meter of air

Table B-9. Summary of 2003 Ambient Air Monitoring Results for Gandy Station (Background Location)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)
GandyA	2/26/03	0.80	0.03	0.03	2.15	4.79	11.15	8.00	10.92	0.09	0.83
GandyA	3/4/2003	13.72	0.03	0.03	1.54	6.40	8.74	6.19	10.92	0.09	0.83
GandyA	3/10/2003	3.91	0.03	0.03	0.69	3.82	6.65	1.90	10.92	0.09	0.83
GandyA	3/16/2003	5.61	0.03	0.03	14.48	8.82	3.94	2.99	10.92	0.09	0.83
GandyA	3/22/2003	3.91	0.03	0.03	1.18	0.76	9.10	4.10	10.92	0.09	0.83
GandyA	3/28/2003	4.64	0.03	0.03	2.64	6.26	7.01	2.51	10.92	0.09	0.83
GandyA	2/20/03	0.80	0.03	0.03	1.05	2.60	4.81	1.90	10.92	0.09	0.83
GandyA	2/14/03	0.80	0.03	0.03	1.29	1.00	6.63	0.92	10.92	0.09	0.83
GandyA	2/8/03	0.80	0.03	0.03	1.07	4.00	4.01	2.17	10.92	0.09	0.83
GandyA	2/2/03	0.80	0.03	0.03	0.68	1.25	2.84	4.09	10.92	0.09	0.83
GandyA	1/21/2003	0.80	0.03	0.37	1.91	5.28	11.17	3.73	10.92	0.09	3.47
GandyA	1/15/2003	0.80	0.03	0.37	1.05	5.29	5.06	1.29	10.92	0.09	2.74
GandyA	1/9/2003	0.80	0.03	0.24	1.05	2.84	2.85	0.80	10.92	0.09	2.25
GandyA	1/3/2003	0.80	0.03	0.25	1.30	2.84	3.47	1.04	10.92	0.09	2.75
GandyA	4/3/2003	2.21	0.28	0.03	0.69	3.79	11.63	3.97	10.92	0.09	0.83
GandyA	4/9/2003	0.80	0.27	0.03	0.51	0.36	2.17	0.99	10.92	0.09	0.83
GandyA	4/15/2003	1.80	0.17	0.03	1.46	11.67	11.61	3.93	10.92	0.61	0.83
GandyA	4/21/2003	0.80	0.16	0.03	0.44	3.17	4.37	4.21	10.92	0.56	0.83
GandyA	4/27/2003	0.80	0.17	0.03	0.27	2.93	5.65	2.33	10.92	0.58	0.83
GandyA	5/3/2003	0.80	0.16	0.03	0.28	2.49	3.95	3.95	10.92	0.53	0.83
GandyA	5/9/2003	0.80	0.17	0.03	0.64	5.81	4.42	4.61	10.92	0.54	0.83
GandyA	5/15/2003	0.80	0.17	0.03	0.78	4.15	7.62	2.87	10.92	0.58	0.83
GandyA	5/21/2003	0.80	0.17	0.03	0.65	5.05	5.26	3.14	10.92	0.53	0.83
GandyA	5/27/03	0.80	0.17	0.03	0.57	2.99	3.81	4.26	10.92	0.54	0.83
Gandy A	6/26/03	2.32	0.03	0.51	1.63	3.69	5.06	3.16	10.92	0.09	0.83
Gandy A	6/20/03	0.80	0.03	0.24	2.08	1.50	6.08	5.50	10.92	0.09	0.83
Gandy A	6/14/2003	1.72	0.03	0.56	3.15	0.36	10.81	6.49	10.92	0.54	0.83

Table B-9. Summary of 2003 Ambient Air Monitoring Results for Gandy Station (Background Location) (continued)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)
Gandy A	6/8/2003	3.71	0.36	1.76	1.53	2.03	2.48	4.09	10.92	0.94	0.83
Gandy A	6/2/2003	3.54	0.36	1.76	1.65	3.99	6.30	4.14	10.92	1.00	0.83
Gandy A	7/2/2003	5.82	0.31	1.23	2.32	4.34	24.49	3.09	10.92	0.97	0.83
Gandy A	7/8/2003	5.25	0.27	1.20	1.82	7.41	11.17	19.76	10.92	1.15	0.83
Gandy A	7/14/2003	1.94	0.03	0.03	1.51	2.63	3.53	2.45	10.92	0.09	0.83
Gandy A	7/20/2003	0.80	0.03	0.03	0.89	0.36	6.63	1.66	10.92	0.09	0.83
Gandy A	7/26/2003	1.55	0.03	0.03	1.91	0.36	4.99	3.10	10.92	0.09	0.83
Gandy A	8/1/2003	0.80	0.46	1.67	2.05	8.08	6.01	4.73	10.92	1.12	2.52
Gandy A	8/7/2003	0.80	0.46	1.56	1.26	5.58	5.02	3.21	10.92	1.04	1.83
Gandy A	8/13/2003	0.80	0.79	0.62	2.61	9.88	15.09	5.13	10.92	0.54	0.83
Gandy A	8/19/2003	0.80	0.71	0.26	1.74	4.18	2.83	11.79	10.92	0.09	0.83
Gandy A	8/25/2003	0.80	0.59	1.94	2.43	12.72	5.20	11.91	10.92	1.28	3.37
Gandy A	8/31/2003	0.80	0.49	1.68	1.33	7.42	3.36	3.41	10.92	0.95	3.16
Gandy A	9/6/2003	4.97	0.03	0.27	0.29	4.27	1.35	3.61	10.92	0.09	0.83
Gandy A	9/12/03	1.67	0.03	0.40	1.21	20.39	6.15	4.00	10.92	0.09	1.92
Gandy A	9/18/2003	0.80	0.03	0.26	0.36	3.71	4.80	0.93	10.92	0.09	0.83
Gandy A	9/24/03	2.43	0.03	0.39	1.22	5.50	4.60	1.85	10.92	0.09	0.83
Gandy A	9/30/2003	0.80	0.03	0.27	0.15	2.90	3.58	0.62	10.92	0.09	0.83
Gandy A	10/6/03	0.80	0.03	0.49	1.30	16.82	5.29	3.99	10.92	0.81	0.83
Gandy A	10/12/2003	0.80	0.03	0.26	0.59	4.08	2.30	8.46	10.92	0.75	0.83
Gandy A	10/18/03	0.80	0.03	0.29	0.26	2.36	3.21	2.25	10.92	0.71	0.83
Gandy A	10/24/2003	0.80	0.03	0.60	2.08	17.21	12.72	4.08	10.92	0.88	0.83
Gandy A	10/30/03	0.80	0.03	0.31	0.90	6.60	6.51	3.71	10.92	0.09	0.83
Gandy A	11/5/2003	3.83	0.03	0.47	1.42	2.43	3.44	8.64	10.92	0.65	0.83
Gandy A	11/11/2003	0.00	0.03	0.00	0.00	0.00	0.00	0.00	10.92	0.09	0.83
Gandy A	11/17/2003	3.38	0.03	0.53	1.77	5.19	4.29	3.80	10.92	0.52	0.83
Gandy A	11/23/2003	3.10	0.03	0.58	1.14	4.23	2.77	2.83	10.92	0.53	0.83

Table B-9. Summary of 2003 Ambient Air Monitoring Results for Gandy Station (Background Location) (continued)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)
Gandy A	11/29/2003	3.56	0.03	0.45	1.06	3.81	2.16	1.20	10.92	0.09	0.83
Gandy A	12/5/2003	2.80	0.03	0.44	1.13	2.80	2.44	1.85	10.92	0.09	0.83
Gandy A	12/11/2003	2.06	0.03	0.49	1.08	2.69	2.38	1.00	10.92	0.09	0.83
Gandy A	12/17/03	2.47	0.03	0.50	1.35	3.57	3.94	1.70	10.92	0.53	0.83
Gandy A	12/23/03	3.34	0.03	0.44	1.45	6.12	3.52	3.16	10.92	0.09	0.83
Gandy A	12/29/03	2.81	0.03	0.57	1.63	5.93	5.24	2.78	10.92	0.60	0.83
Min		**0.00**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.92**	**0.09**	**0.83**
Max		**13.72**	**0.79**	**1.94**	**14.48**	**20.39**	**24.49**	**19.76**	**10.92**	**1.28**	**3.47**
Mean		**2.06**	**0.13**	**0.41**	**1.48**	**4.89**	**5.79**	**3.83**	**10.92**	**0.38**	**1.10**
No. Detects		**59**	**60**	**59**	**59**	**59**	**59**	**59**	**60**	**60**	**60**
Number Samples		**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**

As – arsenic; Be – beryllium; Cd – cadmium; Cr - chromium; Pb - lead; Mn - manganese; Ni - nickel; Sb - antimony; Co - cobalt; Se - selenium.
ng/m^3:nanograms chemical per cubic meter of air

Table B-10. Chemicals of Concern in Air At Gandy and Lewis Air Monitoring Stations (2003 Background Locations)

	No. of Samples	No. of Detects	Measured Concentration			Environmental Guideline		[Average] Exceeds CV	No. Detects Above CV
			Minimum (ug/m^3)	Average (ug/m^3)	Maximum (ug/m^3)	(ug/m^3)	Source		
Gandy									
Arsenic	60	59	ND	0.0021	0.0137	0.0002	CREG	**YES**	59
Beryllium	60	60	0.00003	0.0001	0.0008	0.0004	CREG	NO	0
Cadmium	60	59	ND	0.0004	0.0019	0.0006	CREG	NO	0
Chromium	60	59	ND	0.0015	0.0145	0.00008	CREG	**YES**	59
Lead	60	59	ND	0.0049	0.0204	1.55	OAQPS	NO	0
Manganese	60	59	ND	0.0058	0.0245	0.04	C-EMEG	NO	0
Nickel	60	59	ND	0.0038	0.0198	0.09	C-EMEG	NO	0
Antimony	60	60	0.0109	0.0109	0.0109	0.15	EPA Reg 3	NO	0
Cobalt	60	60	0.00009	0.0004	0.0013	0.1	C-EMEG	NO	0
Selenium	60	60	0.0008	0.0011	0.0035	1.8	EPA Reg 3	NO	0
Lewis									
Arsenic	60	60	0.0008	0.0037	0.0210	0.0002	CREG	**YES**	60
Beryllium	60	60	0.00003	0.0001	0.0007	0.0004	CREG	NO	0
Cadmium	60	60	0.00003	0.0004	0.0017	0.0006	CREG	NO	0
Chromium	60	60	0.00009	0.0012	0.0193	0.00008	CREG	**YES**	60
Lead	60	60	0.0004	0.0012	0.0374	1.55	OAQPS	NO	0
Manganese	60	60	0.0014	0.0041	0.0183	0.04	C-EMEG	NO	0
Nickel	60	60	0.0002	0.0024	0.0071	0.09	C-EMEG	NO	0
Antimony	60	60	0.0109	0.0109	0.0109	0.15	EPA Reg 3	NO	0
Cobalt	60	60	0.00009	0.0003	0.0010	0.1	C-EMEG	NO	0
Selenium	60	60	0.0008	0.0010	0.0030	1.8	EPA Reg 3	NO	0

ug/m^3: micrograms chemical per cubic meter of air

Table B-11. Summary of 2002 Ambient Air Monitoring Results for Gandy Station (Background Location)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)	Fe (ng/m^3)
Gandy A	1/2/02	3.31	0.20	0.65	2.89	13.28	4.94	4.11	ND	0.29	1.94	238.68
Gandy A	1/8/02	ND	0.18	0.34	3.30	3.92	2.28	3.65	ND	0.23	ND	115.60
Gandy A	1/14/02	2.48	0.18	0.49	5.01	14.16	4.76	7.03	ND	0.32	1.43	208.30
Gandy A	1/20/02	ND	0.18	0.32	3.13	3.40	2.55	4.28	ND	ND	ND	137.44
Gandy A	2/1/02	ND	ND	ND	3.40	2.31	3.59	7.39	ND	ND	ND	311.48
Gandy A	2/7/02	ND	ND	ND	3.07	ND	8.42	1.67	ND	ND	ND	335.83
Gandy A	2/13/02	ND	ND	ND	2.86	0.81	4.04	2.12	ND	ND	ND	214.75
Gandy A	2/19/02	ND	ND	ND	3.64	156.12	7.18	4.86	ND	ND	ND	377.18
Gandy A	2/25/02	ND	ND	ND	3.25	3.91	4.76	3.11	ND	ND	ND	331.96
Gandy A	3/3/02	ND	ND	ND	4.21	4.31	8.47	3.70	ND	ND	ND	466.97
Gandy A	3/9/02	ND	ND	ND	2.69	5.62	2.66	3.92	ND	ND	ND	173.40
Gandy A	3/15/02	ND	ND	ND	3.48	8.22	7.92	7.12	ND	0.21	ND	439.46
Gandy A	3/21/02	ND	ND	ND	3.40	2.38	5.74	2.67	ND	ND	ND	314.09
Gandy A	3/27/02	ND	ND	ND	2.39	2.53	5.83	3.65	ND	ND	ND	168.50
Gandy A	4/2/02	ND	ND	ND	10.37	6.29	13.84	5.79	ND	ND	ND	457.16
Gandy A	4/8/02	ND	ND	ND	6.72	3.92	12.15	2.58	ND	ND	ND	431.25
Gandy A	4/14/02	ND	ND	ND	3.87	2.54	3.72	4.09	ND	ND	ND	155.08
Gandy A	4/20/02	ND	ND	ND	2.23	1.91	2.18	6.38	ND	ND	ND	144.11
Gandy A	4/26/02	ND	ND	ND	2.67	6.42	6.19	4.95	ND	ND	ND	304.10
Gandy A	5/8/02	3.43	0.12	0.67	4.30	9.89	6.78	5.80	ND	0.65	ND	341.57
Gandy A	5/14/02	2.36	0.13	0.65	3.33	4.06	4.60	3.06	ND	0.31	ND	259.42
Gandy A	5/20/02	ND	0.11	0.58	2.68	4.80	3.29	2.05	ND	0.22	ND	170.20
Gandy A	5/26/02	2.45	0.26	0.54	3.01	4.41	2.88	2.67	ND	0.31	ND	169.29
Gandy A	6/1/02	4.89	0.34	1.03	2.77	8.68	3.32	3.69	ND	0.50	1.70	189.47
Gandy A	6/7/02	3.28	0.32	0.93	2.59	5.13	3.95	3.56	ND	0.33	2.83	220.95
Gandy A	6/13/02	3.51	0.29	0.92	2.37	5.14	4.89	3.07	ND	0.35	1.46	194.65
Gandy A	6/19/02	2.94	0.34	0.99	2.80	5.15	5.74	3.64	ND	0.34	2.46	367.31

Table B-11. Summary of 2002 Ambient Air Monitoring Results for Gandy Station (Background Location) (continued)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)	Fe (ng/m^3)
Gandy A	6/25/02	2.69	0.35	0.89	2.41	4.14	4.10	4.11	ND	0.47	2.29	230.03
Gandy A	7/1/02	4.28	0.23	0.72	3.16	8.01	5.03	2.90	ND	0.37	1.55	250.58
Gandy A	7/7/02	2.85	0.23	0.53	3.71	3.27	7.91	5.97	ND	0.50	1.49	480.37
Gandy A	7/13/02	ND	0.25	0.47	3.13	2.30	4.05	5.18	ND	0.31	ND	214.68
Gandy A	7/19/02	3.08	0.25	0.43	3.78	5.49	5.63	3.46	ND	0.42	1.95	290.03
Gandy A	7/25/02	3.40	0.24	0.66	3.47	5.98	5.67	6.86	ND	0.39	2.52	288.67
Gandy A	7/31/02	ND	0.29	0.75	4.14	3.98	18.06	5.62	ND	0.76	1.63	880.51
Gandy A	8/6/02	ND	0.09	0.39	3.16	3.76	8.22	3.07	ND	0.56	1.61	441.93
Gandy A	8/18/02	3.31	0.13	0.65	3.50	5.78	3.94	5.95	ND	0.49	3.00	254.28
Gandy A	8/24/02	2.72	0.10	0.45	3.37	5.41	11.68	7.31	ND	0.34	1.89	297.05
Gandy A	8/30/02	2.71	0.13	0.49	3.75	5.22	3.01	4.09	ND	0.27	2.64	178.04
Gandy A	9/5/02	ND	0.33	ND	3.70	3.84	2.95	9.60	11.86	ND	ND	164.05
Gandy A	9/11/02	ND	0.27	ND	2.51	2.23	1.68	7.68	ND	ND	ND	96.28
Gandy A	9/17/02	ND	0.31	0.38	3.75	10.39	10.22	4.61	ND	ND	ND	635.49
Gandy A	9/23/02	ND	0.32	0.15	3.04	8.43	3.44	2.37	ND	ND	ND	272.50
Gandy A	9/29/02	ND	0.32	0.21	3.25	13.14	3.35	4.71	ND	ND	1.60	257.23
Gandy A	10/5/02	ND	0.38	0.49	3.67	9.34	6.78	3.87	ND	ND	ND	505.09
Gandy A	10/11/02	ND	0.33	ND	2.97	3.77	3.46	3.04	ND	ND	ND	250.16
Gandy A	10/17/02	ND	0.34	ND	2.52	5.87	2.95	1.51	ND	ND	ND	152.88
Gandy A	10/23/02	ND	0.37	0.47	3.19	8.86	4.01	3.70	ND	ND	ND	279.28
Gandy A	10/29/02	ND	0.33	ND	2.85	2.92	2.90	2.24	ND	ND	ND	213.66
Gandy A	11/4/02	2.27	0.12	0.21	5.22	6.69	10.97	5.37	10.80	ND	1.35	457.03
Gandy A	11/10/02	ND	0.04	ND	1.77	1.33	4.44	2.92	ND	ND	ND	245.34
Gandy A	11/16/02	ND	0.05	ND	1.95	ND	2.74	6.89	ND	ND	ND	202.29
Gandy A	11/22/02	ND	0.04	ND	1.52	1.17	3.60	1.40	ND	ND	ND	130.75
Gandy A	11/28/02	ND	0.06	ND	2.05	2.09	3.35	1.72	ND	ND	2.40	166.69
Gandy A	12/4/02	ND	ND	ND	2.56	7.72	6.02	2.08	9.71	ND	ND	316.19

Table B-11. Summary of 2002 Ambient Air Monitoring Results for Gandy Station (Background Location) (continued)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)	Fe (ng/m^3)
Gandy A	12/10/02	ND	ND	ND	1.78	ND	2.63	2.31	ND	ND	ND	121.27
Gandy A	12/16/02	2.73	ND	ND	2.07	4.25	11.60	4.07	12.12	ND	ND	437.20
Gandy A	12/22/02	5.54	ND	ND	2.40	12.34	4.51	4.22	ND	ND	ND	305.41
Gandy A	12/28/02	ND	ND	ND	1.95	1.27	2.28	1.47	ND	ND	ND	135.53
Min		**2.27**	**0.04**	**0.15**	**1.52**	**0.81**	**1.68**	**1.40**	**9.71**	**0.21**	**1.35**	**96.28**
Max		**5.54**	**0.38**	**1.03**	**10.37**	**156.12**	**18.06**	**9.60**	**12.12**	**0.76**	**3.00**	**880.51**
Mean		**3.21**	**0.22**	**0.57**	**3.25**	**8.15**	**5.48**	**4.15**	**11.12**	**0.39**	**1.99**	**282.56**
No. Detects		**20**	**38**	**29**	**58**	**55**	**58**	**58**	**4**	**23**	**19**	**58**
Number Samples		**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**	**58**

ND – not detected; As – arsenic; Be – beryllium; Cd – cadmium; Cr - chromium; Pb - lead; Mn - manganese; Ni - nickel; Sb - antimony; Co - cobalt; Se - selenium; Fe – iron; ng/m^3 – nanogram chemical per cubic meter of air.

Table B-12. Summary of 2002 Ambient Air Monitoring Results for Lewis Station (Background Location)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)	Fe (ng/m^3)
Lewis	1/2/02	3.78	0.19	0.42	2.29	3.69	2.06	1.77	ND	ND	ND	133.50
Lewis	1/8/02	2.84	0.18	0.48	3.60	3.35	2.41	1.90	ND	0.17	ND	130.20
Lewis	1/14/02	2.92	0.19	0.61	2.91	4.04	3.01	3.09	ND	0.15	1.35	147.72
Lewis	1/20/02	ND	0.18	0.37	2.70	4.89	2.91	5.71	ND	0.19	1.86	122.58
Lewis	1/26/02	ND	0.20	0.56	3.32	9.04	6.63	5.35	ND	0.26	ND	350.33
Lewis	2/1/02	ND	ND	ND	3.59	ND	3.24	3.67	ND	ND	ND	236.93
Lewis	2/7/02	ND	ND	ND	2.54	ND	1.95	1.73	ND	ND	ND	120.04
Lewis	2/19/02	ND	ND	ND	2.92	ND	3.34	1.15	ND	ND	ND	166.92
Lewis	2/25/02	ND	ND	ND	2.82	ND	3.20	1.58	ND	ND	ND	189.48
Lewis	3/3/02	ND	ND	ND	3.93	2.98	6.83	3.45	ND	ND	1.43	353.88
Lewis	3/9/02	ND	ND	ND	2.46	1.97	3.07	1.68	ND	ND	ND	119.49
Lewis	3/15/02	ND	ND	ND	3.17	4.62	7.89	4.33	ND	ND	ND	389.99
Lewis	3/21/02	ND	ND	ND	2.81	6.84	4.75	3.24	ND	ND	ND	233.70
Lewis	3/27/02	ND	ND	ND	2.75	1.89	6.53	2.94	ND	ND	ND	257.88
Lewis	4/2/02	3.59	ND	ND	3.59	2.74	5.63	6.25	ND	ND	ND	352.20
Lewis	4/8/02	ND	ND	0.23	3.05	1.34	4.56	2.71	ND	ND	ND	213.18
Lewis	4/14/02	2.86	ND	ND	2.47	ND	2.17	2.42	ND	ND	ND	108.21
Lewis	4/20/02	15.72	ND	ND	2.48	ND	3.59	3.77	ND	ND	ND	192.38
Lewis	4/26/02	28.16	ND	ND	2.51	ND	5.90	4.41	ND	ND	ND	274.22
Lewis	5/2/02	13.36	0.12	0.78	3.30	10.07	7.83	4.16	ND	0.29	ND	361.25
Lewis	5/8/02	3.19	0.13	1.56	4.00	2.77	7.85	6.05	ND	0.40	ND	385.12
Lewis	5/14/02	2.95	0.12	0.64	2.70	4.51	4.54	2.50	ND	0.15	ND	209.22
Lewis	5/20/02	3.45	0.11	0.62	2.78	1.06	3.13	2.05	ND	ND	ND	112.07
Lewis	5/26/02	ND	0.23	0.39	2.43	ND	2.42	2.09	ND	0.39	ND	111.78
Lewis	6/1/02	4.65	0.31	1.16	2.72	ND	2.42	3.47	ND	0.32	ND	113.20
Lewis	6/7/02	4.03	0.33	1.45	3.64	2.36	4.95	5.03	ND	0.44	1.62	214.64
Lewis	6/13/02	4.84	0.24	0.85	3.09	7.87	4.68	7.52	ND	0.33	2.20	250.31

Table B-12. Summary of 2002 Ambient Air Monitoring Results for Lewis Station (Background Location) (continued)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)	Fe (ng/m^3)
Lewis	6/19/02	3.75	0.34	1.14	2.45	2.63	3.10	2.38	ND	0.31	ND	137.52
Lewis	6/25/02	6.54	0.36	1.35	3.15	3.11	4.21	3.13	ND	0.33	ND	210.10
Lewis	7/7/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	426.96
Lewis	7/13/02	3.27	0.24	0.51	3.07	2.84	4.00	3.97	ND	0.26	1.79	208.97
Lewis	7/19/02	5.18	0.26	0.74	3.95	20.03	6.75	4.52	ND	0.19	2.16	340.15
Lewis	7/25/02	4.71	0.23	0.57	3.26	3.14	4.82	3.97	ND	0.27	ND	207.77
Lewis	7/31/02	6.14	0.27	1.32	5.02	13.00	13.45	3.47	10.02	0.48	1.64	688.28
Lewis	8/6/02	3.46	0.07	0.72	3.49	4.50	9.74	3.14	ND	0.45	ND	499.29
Lewis	8/12/02	2.45	0.08	0.55	3.34	4.18	3.25	2.60	ND	0.24	1.82	136.67
Lewis	8/18/02	5.81	0.12	0.92	3.37	5.59	3.52	4.65	ND	0.30	2.46	174.14
Lewis	8/24/02	3.46	0.08	0.48	3.17	5.49	3.81	5.65	ND	0.29	2.65	160.82
Lewis	8/30/02	3.74	ND	0.44	2.67	1.92	2.06	2.51	ND	0.29	ND	119.90
Lewis	9/5/02	ND	0.27	ND	2.69	8.96	2.10	2.83	ND	ND	ND	147.50
Lewis	9/11/02	ND	0.29	0.38	2.67	7.07	2.89	3.20	ND	ND	ND	165.85
Lewis	9/17/02	ND	0.29	ND	2.62	4.98	6.49	2.89	ND	ND	ND	369.61
Lewis	9/23/02	ND	0.30	ND	2.52	3.41	2.05	3.60	ND	ND	ND	124.90
Lewis	9/29/02	ND	0.30	ND	2.38	4.88	1.58	2.30	ND	ND	ND	102.61
Lewis	10/5/02	ND	0.33	0.15	2.83	4.55	3.07	3.70	ND	ND	ND	179.54
Lewis	10/11/02	ND	0.34	ND	2.86	5.81	4.54	2.09	ND	ND	ND	274.57
Lewis	10/17/02	ND	0.35	ND	2.36	3.93	3.68	2.09	ND	ND	ND	159.77
Lewis	10/23/02	ND	0.32	ND	2.44	3.73	2.43	3.87	ND	ND	ND	122.04
Lewis	10/29/02	ND	0.32	ND	2.97	6.57	3.59	6.42	ND	ND	ND	253.45
Lewis	11/4/02	2.38	0.04	ND	1.81	30.58	4.19	3.17	27.17	ND	ND	264.05
Lewis	11/10/02	ND	0.05	ND	1.39	2.36	2.59	3.12	ND	ND	ND	150.51
Lewis	11/16/02	ND	0.04	ND	1.20	1.95	1.36	3.21	ND	ND	ND	86.57
Lewis	11/22/02	ND	0.06	ND	1.61	1.43	4.23	1.75	ND	ND	ND	175.53
Lewis	11/28/02	ND	0.06	ND	1.60	1.11	3.50	1.62	ND	ND	1.58	133.77

Table B-12. Summary of 2002 Ambient Air Monitoring Results for Lewis Station (Background Location) (continued)

Air Monitoring Station	Date Sampled	As (ng/m^3)	Be (ng/m^3)	Cd (ng/m^3)	Cr (ng/m^3)	Pb (ng/m^3)	Mn (ng/m^3)	Ni (ng/m^3)	Sb (ng/m^3)	Co (ng/m^3)	Se (ng/m^3)	Fe (ng/m^3)
Lewis	12/4/02	ND	ND	ND	2.35	2.40	4.93	2.06	ND	ND	ND	234.45
Lewis	12/10/02	ND	ND	0.10	1.96	4.30	2.23	2.66	ND	ND	ND	135.04
Lewis	12/16/02	2.24	ND	ND	1.95	7.52	2.68	1.16	ND	ND	ND	217.87
Lewis	12/22/02	4.39	ND	0.12	1.84	5.21	2.95	1.91	ND	ND	ND	186.71
Lewis	12/28/02	ND	ND	ND	2.08	2.07	2.72	1.74	ND	ND	ND	156.40
Min		**2.24**	**0.04**	**0.10**	**1.20**	**1.06**	**1.36**	**1.15**	**10.02**	**0.15**	**1.35**	**86.57**
Max		**28.16**	**0.36**	**1.56**	**5.02**	**30.58**	**13.45**	**7.52**	**27.17**	**0.48**	**2.65**	**688.28**
Mean		**5.50**	**0.21**	**0.68**	**2.79**	**5.21**	**4.14**	**3.26**	**18.59**	**0.30**	**1.88**	**216.98**
No. Detects		**25**	**33**	**24**	**49**	**44**	**49**	**49**	**2**	**18**	**10**	**50**
Number Samples		**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**	**59**

ND – not detected; As – arsenic; Be – beryllium; Cd – cadmium; Cr - chromium; Pb - lead; Mn - manganese; Ni - nickel; Sb - antimony; Co - cobalt; Se - selenium; Fe – iron; ; ng/m^3 – nanogram chemical per cubic meter of air.

Table B-13. Chemicals of Concern in Air At Background Sampling Locations (As Determined From 2002 Ambient Air Monitoring Studies)

	No. of Samples	No. of Detects	Measured Concentration			Environmental Comparison Value (CV)		[Average] Exceeds CV	No. Detects Above CV
			Minimum (ug/m^3)	Average (ug/m^3)	Maximum (ug/m^3)	(ug/m^3)	Source		
Gandy									
Arsenic	58	20	0.0023	0.0032	0.0055	0.0002	CREG	**YES**	20
Beryllium	58	38	0.00004	0.0002	0.0004	0.0004	CREG	NO	0
Cadmium	58	29	0.0002	0.0006	0.0010	0.0006	CREG	NO	0
Chromium	58	58	0.0015	0.0033	0.0104	0.00008	CREG	**YES**	58
Lead	58	55	0.0008	0.0082	0.1561	1.55	OAQPS	NO	0
Manganese	58	58	0.0017	0.0055	0.0181	0.04	C-EMEG	NO	0
Nickel	58	58	0.0014	0.0042	0.0096	0.09	C-EMEG	NO	0
Antimony	58	4	0.0097	0.0111	0.0121	0.15	EPA Reg 3	NO	0
Cobalt	58	23	0.0002	0.0004	0.0008	0.1	C-EMEG	NO	0
Selenium	58	19	0.0014	0.0020	0.0030	1.8	EPA Reg 3	NO	0
Iron	58	58	0.0963	0.2826	0.8805	110	EPA Reg 3	NO	0
Lewis									
Arsenic	59	28	0.0022	0.0055	0.0282	0.0002	CREG	**YES**	28
Beryllium	59	38	0.00004	0.0002	0.0004	0.0004	CREG	NO	0
Cadmium	59	29	0.0001	0.0007	0.0016	0.0006	CREG	**YES**	14
Chromium	59	58	0.0012	0.0028	0.0050	0.00008	CREG	**YES**	58
Lead	59	49	0.0011	0.0052	0.0306	1.55	OAQPS	NO	0
Manganese	59	58	0.0014	0.0041	0.0135	0.04	C-EMEG	NO	0
Nickel	59	58	0.0012	0.0033	0.0075	0.09	C-EMEG	NO	0
Antimony	59	2	0.0100	0.0186	0.0272	0.15	EPA Reg 3	NO	0
Cobalt	59	22	0.0002	0.0003	0.0005	0.1	C-EMEG	NO	0
Selenium	59	12	0.0014	0.0019	0.0027	1.8	EPA Reg 3	NO	0
Iron	59	50	0.0866	0.2170	0.6883	110	EPA Reg 3	NO	0

ug/m^3 – micrograms chemical per cubic meter of air

Table B-14. Comparison of Average Background and Site Ambient Air Concentrations for Selected Contaminants of Concern

	2002 Background Sites		2003 Background Sites		2003 Coronet Junction Sites		
Contaminant	**Gandy**	**Lewis**	**Gandy**	**Lewis**	**Kenny/Kelly**	**Springhead**	**Station25**
Average Concentration							
(ug/m^3)							
Arsenic	0.0032	0.0055	0.0021	0.0037	0.0034	0.0032	0.0040
Cadmium	--	0.0007	--	--	0.0007	0.0007	0.0030
Chromium	0.0033	0.0028	0.0015	0.0012	0.0009	0.0007	0.0017

-- Not a chemical of concern for this dataset
ug/m^3 – micrograms chemical per cubic meter of air

Table B-15. Comparison of Maximum Background and Site Ambient Air Concentrations for Selected Contaminants of Concern

	2002 Background Sites		2003 Background Sites		2003 Coronet Junction Sites		
Contaminant	**Gandy**	**Lewis**	**Gandy**	**Lewis**	**Kenny/Kelly**	**Springhead**	**Station25**
Maximum Detected Concentration							
(ug/m^3)							
Arsenic	0.0055	0.0282	0.0137	0.0210	0.0047	0.0046	0.0076
Beryllium	--	--	0.0008	0.0007	0.0008	0.0008	0.0009
Cadmium	0.0010	0.0016	0.0019	0.0017	0.0012	0.0011	0.0221
Chromium	0.0104	0.0050	0.0145	0.0193	0.0028	0.0011	0.0105

-- Not a chemical of concern for this dataset
ug/m^3 – micrograms chemical per cubic meter of air

Table B-16. Summary of Receptor-Specific Exposure Assumptions Used to Estimate Inhalation Dose

	IR_{air}	ED	ET	EF	BW	AT_{carc}	$AT_{noncarc}$	CF1	CF2
	(m^3/day)	(years)	(hr/day)	(days/year)	(kg)	(days)	(days)	(day/24 hr)	(mg/1000 ug)
Residential Receptors: Outside Reisdence									
Adult Male	15.2	30	3	365	70	25550	10950	0.04167	0.001
Adult Female	11.3	30	3	365	70	25550	10950	0.04167	0.001
Child	10	6	3	365	16	25550	2190	0.04167	0.001
Infant	4.5	1	0.25	365	10	25550	365	0.04167	0.001
Adolescent	15.2	14	3	365	56	25550	5110	0.04167	0.001
Residential Receptors: Churchgoers									
Adult Male	15.2	30	0.25	100	70	25550	10950	0.04167	0.001
Adult Female	11.3	30	0.25	100	70	25550	10950	0.04167	0.001
Child	10	6	0.25	100	16	25550	2190	0.04167	0.001
Infant	4.5	1	0.25	100	10	25550	365	0.04167	0.001
Adolescent	15	14	0.25	100	56	25550	5110	0.04167	0.001
Residential Receptors: Farmers									
Subsistence Farmer Adult	12.8	30	8	350	70	25550	10950	0.04167	0.001
Subsistence Farmer Child	6	6	5	350	16	25550	2190	0.04167	0.001
Industrial/Commercial Receptors									
Offsite Male Worker	15.2	25	3	365	70	25550	9125	0.04167	0.001
Recreational Receptors									
Young Child (2-5 year-old) at Community Daycare	1	3	1	250	17.5	25550	1095	0.04167	0.001
Middle School Adolescent (10-12 year-old) at School Playground	9.7	11	5	180	25	25550	4015	0.04167	0.001
Elementary School Child (5-9 year-old) at Recreation Center	8.3	5	5	180	21	25550	1825	0.04167	0.001
Middle School Adolescent (10-12 year-old) at Recreation Center	15	3	5	180	25	25550	1095	0.04167	0.001
High School Adolescent (13-18 year-old) at Recreation Center	15	4	5	180	56	25550	1460	0.04167	0.001
Elementary School Child (5-9 year-old)	8.3	5	5	180	21	25550	1825	0.04167	0.001
Elderly at local Senior Center (65-70 year-old)	0.5	5	1	365	70	25550	1825	0.04167	0.001

Table B-16. Summary of Receptor-Specific Exposure Assumptions Used to Estimate Inhalation Dose (Continued)

Exposure Dose Equation

$$\textbf{Average Daily Dose } (ADD)_{inh} = (C_{air} \times IR_{air} \times ED \times ET \times EF \times CF1 \times CF2) / (BW \times AT)$$

Where,

ADD = Average daily inhalation dose (mg/kg/day)
C_{air} = Contaminant concentration (mg/m^3)
IR = Inhalation rate (m^3/day)
ET = Exposure time (hours/day)
EF = Exposure frequency (day/year)
ED = Exposure duration (years/lifetime)
BW = Body weight (kg)
AT = Averaging time (days), for non-carcinogenic effects; AT = ED, for carcinogenic or chronic effects; AT = 70 years or 25,550 days (lifetime)
CF = Conversion factor

Sources of Exposure Parameters

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Public Health Assessment Guidance Manual. Atlanta, GA. January.

U.S. Environmental Protection Agency (EPA). 1997. Exposure Factors Handbook. Volume I. EPA/600/P-95/002Fa. Office of Research and Development, Washington, DC. August.

U.S. Environmental Protection Agency (EPA). 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03. Office of Solid Waste and Emergency Response, Washington, DC. March.

Table B-17. Chemical-Specific Inhalation Toxicity Values for Chemicals of Concern in Ambient Air at Coronet Junction

Chemical of Concern (COC)	Toxicity Designation	EPA Inhalation Reference Concentration (RfC) (mg/m^3)	EPA Chronic Inhalation Reference Dose (RfD_i) (mg/kg/d)	EPA Inhalation Cancer Slope Factor (CSFi) $(mg/kg/d)^{-1}$	ATSDR Inhalation Minimum Risk Level (MRL) (mg/m^3)	Target Organ	Critical Effect	EPA Cancer Classification
Arsenic	C	0.0011	--	15.1	--	Skin	Inorganic arsenic: hyperpigmentation, keratosis, and possible vascular compilations	A
Cadmium	C	0.0035	0.000057	6.3	--	Kidney	Significant proteinuria	B1
Chromium	C	3.5	0.00003	41	0.000005 (Intermediate)	--	No effects observed	A (Hexavalent Chromium)

Toxicity values were obtained from the most current online version EPA Integrated Risk Information System (IRIS), available at http://www.epa.gov/iris.

---	Not determined
C	Carcinogen, cancer-causing agent
EPA	US Environmental Protection Agency
mg/kg/d	milligrams of chemical per kilogram of body weight per day
mg/m^3	milligrams of chemical per cubic meter of air
$(mg/kg/d)^{-1}$	per milligram of chemical per kilogram of body weight per day
A	Human carcinogen
B1	Probable human carcinogen

Table B-18. Summary of Receptor-Specific Estimated Risk and Hazard Levels (Residential Pathway: Inhalation of Air Around Coronet Junction) (Based on 2003 Sampling Data)

		AdultMale		Adultfemale		Child		Infant		Adolescent	
	$C_{air(avg)}$ (ug/m^3)	Risk (unitless)	Hazard (unitless)	Risk (unitless)	Hazard (unitless)	Risk (unitless)	Hazard (unitless)	Risk (unitless)	Hazard (unitless)	Risk (unitless)	Hazard (unitless)
Kenny/Kelly											
Arsenic	0.0034	6:10,000,000	---	4:10,000,000	---	3:10,000,000	---	3:1,000,000,000	---	3:10,000,000	---
Cadmium	0.0007	---	0.0003	---	0.0002	---	0.0009	---	0.0001	---	0.0004
Chromium	0.0009	---	0.0008	---	0.0006	---	0.0023	---	0.0001	---	0.0010
Springhead											
Arsenic	0.0032	5:10,000,000	---	4:10,000,000	---	3:10,000,000	---	3:1,000,000,000	---	3:10,000,000	---
Cadmium	0.0007	---	0.0003	---	0.0002	---	0.0009	---	0.0001	---	0.0004
Chromium	0.0007	---	0.0006	---	0.0005	---	0.0018	---	0.0001	---	0.0008
Station 25											
Arsenic	0.0040	7:10,000,000	---	5:10,000,000	---	4:10,000,000	---	4:1,000,000,000	---	4:10,000,000	---
Cadmium	0.0030	---	0.0014	---	0.0011	---	0.0041	---	0.0002	---	0.0018
Chromium	0.0017	---	0.0015	---	0.0011	---	0.0043	---	0.0003	---	0.0019

ug/m^3 – micrograms chemical per cubic meter of air

Table B-19. Summary of Receptor-Specific Estimated Risk and Hazard Levels (Residential Pathway: Inhalation of Air Around 2003 Background Locations)

		AdultMale		Adultfemale		Child		Infant		Adolescent	
	$C_{air(avg)}$	Risk	Hazard	Risk	Hazard	Risk	Hazard	Risk	Hazard	Risk	Hazard
	(ug/m^3)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)
Gandy											
Arsenic	0.0021	4:10,000,000	---	3:10,000,000	---	2:10,000,000	---	2:1,000,000,000	---	2:10,000,000	---
Chromium	0.0015	3:10,000,000	0.0013	2:10,000,000	0.0010	1:10,000,000	0.0038	1:1,000,000,000	0.0002	1:10,000,000	0.0017
Lewis											
Arsenic	0.0037	8:10,000,000	---	5:10,000,000	---	4:10,000,000	---	4:1,000,000,000	---	4:10,000,000	---
Chromium	0.0012	2:10,000,000	0.0011	2:10,000,000	0.0008	1:10,000,000	0.0032	1:1,000,000,000	0.0002	1:10,000,000	0.0014

ug/m^3 – micrograms chemical per cubic meter of air

Table B-20. Summary of Receptor-Specific Estimated Risk and Hazard Levels (Residential Pathway: Inhalation of Air Around 2002 Background Locations)

		AdultMale		Adultfemale		Child		Infant		Adolescent	
	$C_{air(avg)}$	Risk	Hazard	Risk	Hazard	Risk	Hazard	Risk	Hazard	Risk	Hazard
	(ug/m_3)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)
Gandy 2002											
Arsenic	0.0032	6:10,000,000	---	4:10,000,000	---	3:10,000,000	---	3:1,000,000,000	---	3:10,000,000	---
Chromium	0.0033	---	0.0029	---	0.0022	---	0.0085	---	0.0005	---	0.0037
Lewis 2002											
Arsenic	0.0055	10:10,000,000	---	7:10,000,000	---	5:10,000,000	---	6:1,000,000,000	---	6:10,000,000	---
Cadmium	0.0007	---	0.0003	---	0.0002	---	0.0009	---	0.0001	---	0.0004
Chromium	0.0028	---	0.0025	---	0.0019	---	0.0073	---	0.0004	---	0.0032

ug/m^3 – micrograms chemical per cubic meter of air

Table B-21. Summary of Receptor-Specific Estimated Risk and Hazard Levels (Worker/Recreational Pathways: Inhalation of Air Around Coronet Junction)

		Middle School Adolescent (School Playground)		Elementary School Child (Recreation Center)		Middle School Adolescent (Recreation Center)	
	Cair(avg)	Risk	Hazard	Risk	Hazard	Risk	Hazard
	(ug/m^3)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)
Kenny/Kelly							
Arsenic	0.0034	3:10,000,000	--	1:10,000,000	--	1:10,000,000	--
Cadmium	0.0007	6:100,000,000	0.0005	3:100,000,000	0.0005	3:100,000,000	0.0008
Chromium	0.0009	8:100,000,000	0.0012	4:100,000,000	0.0012	4:100,000,000	0.0018

		High School Adolescent (Recreation Center)		Community Daycare Young Child (Daycare)		Elementary School Child	
	Cair(avg)	Risk	Hazard	Risk	Hazard	Risk	Hazard
	(ug/m^3)	(unitless)	(unitless)	(unitless)	(mg/kg/day)	(unitless)	(unitless)
Kenny/Kelly							
Arsenic	0.0034	8:100,000,000	--	4:1,000,000,000	--	1:10,000,000	--
Cadmium	0.0007	2:100,000,000	0.0003	7:10,000,000,000	0.00002	3:100,000,000	0.0005
Chromium	0.0009	2:100,000,000	0.0008	9:10,000,000,000	0.00005	3:100,000,000	0.0009

		Subsistence Farmer Adult		Subsistence Farmer		Adult Male Churchgoer	
	Cair(avg)	Risk	Hazard	Risk	Hazard	Risk	Hazard
	(ug/m^3)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)
Springhead							
Arsenic	0.0032	1:100,000	--	3:10,000,000	--	1:100,000,000	--
Cadmium	0.0007	3:10,000,000	0.0007	7:100,000,000	0.0009	3:1,000,000,000	0.000008
Chromium	0.0007	3:10,000,000	0.0014	7:100,000,000	0.0017	3:1,000,000,000	0.000014

Table B-21. Summary of Receptor-Specific Estimated Risk and Hazard Levels (Worker/Recreational Pathways: Inhalation of Air Around Coronet Junction) (continued)

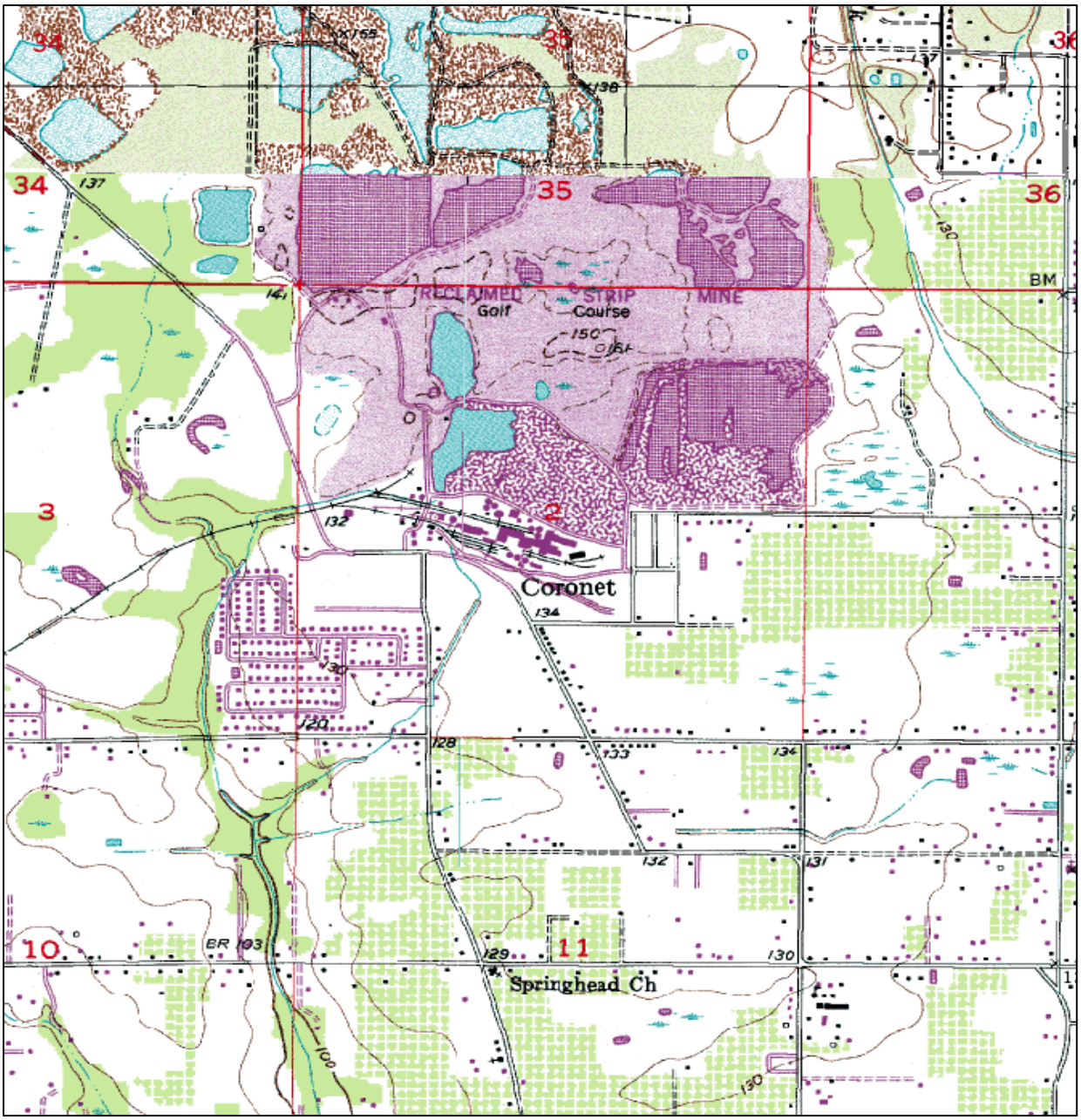
		Infant Churchgoer		Adolescent Churchgoer		Elementary School Child	
	Cair(avg)	Risk	Hazard	Risk	Hazard	Risk	Hazard
	(ug/m^3)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)
Springhead							
Arsenic	0.0032	9:1,000,000,000	--	5:100,000,000	--	1:10,000,000	--
Cadmium	0.0007	2:1,000,000,000	0.00002	1:100,000,000	0.000009	3:100,000,000	0.0005
Chromium	0.0007	2:1,000,000,000	0.00003	1:100,000,000	0.00002	3:100,000,000	0.0009

		Offsite Male Worker		Subsistence Farmer		Subsistence Farmer Child	
	Cair(avg)	Risk	Hazard	Risk	Hazard	Risk	Hazard
	(ug/m^3)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)	(unitless)
Station25							
Arsenic	0.0040	1:100,000	--	1:100,000	--	4:10,000,000	--
Cadmium	0.0030	8:10,000,000	0.0026	1:100,000	0.0031	3:10,000,000	0.0039
Chromium	0.0017	5:10,000,000	0.0028	6:10,000,000	0.0033	2:10,000,000	0.0042

ug/m^3 – micrograms chemical per cubic meter of air

APPENDIX C: FIGURES

Figure C-1. Topographic Map of Coronet Industries Site and Vicinity



Map center is UTM 17 393733E 3096290N (WGS84/NAD83)
Nichols quadrangle
Projection is UTM Zone 17 NAD83 Datum

Figure C-2. Aerial Photograph of Coronet Industries Site and Vicinity

Image courtesy of the U.S. Geological Survey

Figure C-3. Locations of 2003 Ambient Air Monitoring Stations Around the Coronet Industries Site

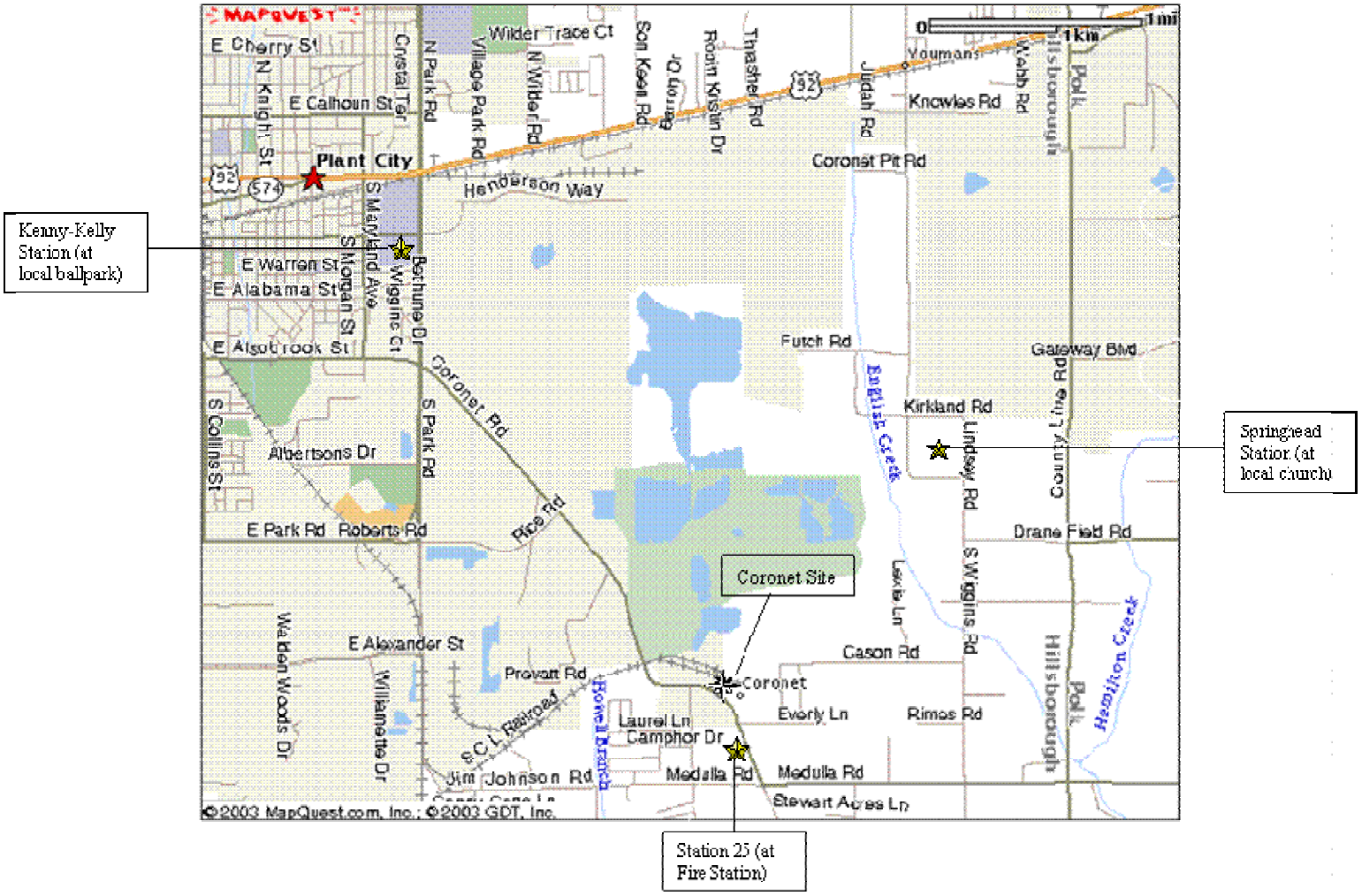


Figure C-4. Locations of Gandy and Lewis Background Air Monitoring Stations

APPENDIX D: SOURCES OF AIR POLLUTANT DATA

AEROMETRIC INFORMATION RETRIEVAL SYSTEM (AIRS)

(*Available on the internet at*: http://www.epa.gov/enviro/html/air.html **)**

The Aerometric Information Retrieval System (AIRS) database is an EPA computer-based repository for information about airborne pollutants in the United States. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. The AIRS database was used to identify significant sources of emissions (Tables D-1) for industrial facilities in Plant City, Florida, including the Coronet Industries site.

TOXICS RELEASE INVENTORY (TRI)

(*Available on the internet at*: http://www.epa.gov/tri)

The Toxics Release Inventory (TRI) is a publicly available EPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain industrial manufacturing companies and government facilities.

Air emissions reported to the TRI were evaluated for the site[1] (Tables D-3 and D-4). Between 1988 and 2002, Coronet Industries, Incorporated released 298,525 pounds of toxic chemicals through air emissions. The primary air pollutants released from the facility were lead compounds and hydrogen sulfide. According to the 2002 TRI database, 24 pounds of lead compounds were released via fugitive air, and 768 pounds were released to the environment through stack air. Lead compounds were produced as an impurity of the manufacturing process. From 1988 to 2002, total releases of lead compounds to the environment increased by 33%[2]. Activities and uses of hydrogen fluoride at the facility included:

- Production (manufacture) of the chemical
- Manufacture of the chemical for onsite use/processing
- Manufacture the chemical as a byproduct
- Process the chemical as a reactant

Approximately 8,776 pounds of hydrogen sulfide was released as fugitive emissions in 2002 and 10,224 pounds via stack air. From 1988 to 2002, releases of hydrofluoric acid (19000 pounds) – a suspected respiratory toxicant – to air increased 46%[3]. The release of these chemicals dominated total releases to air in 2002. Approximately 77% of the total environmental onsite releases (25,793 pounds) from the site in 2002 were directly contributed to air. Of 47 Hillsborough County facilities releasing TRI chemicals to the environment, Coronet Industries ranked 11th in total releases.

NATIONAL-SCALE AIR TOXICS ASSESSMENT (NATA)

(*Available on the internet at*: http://www.epa.gov/ttn/atw/nata)

NATA refers to the EPA's ongoing comprehensive evaluation of 33 toxic air pollutants across the United States. The goal of the national-scale assessment is to identify those air toxics which are of greatest potential concern, in terms of contribution to population risk. The results of the NATA study provide answers to questions about emissions, ambient air concentrations, exposures and risks across broad geographic areas (such as counties, states and the Nation) at a moment in time.

The NATA database was queried to determine the relative sources of chemicals of concern found around Hillsborough County. The 1996 modeled ambient air concentrations for Hillsborough County, Florida were used to estimate the predicted contribution of major, area and other, on-road, and non-road mobile sources of air pollution (Table D-5). It was assumed that county-wide contributions would be representative of source contributions to air around Coronet Junction. At least 38.8% of arsenic in ambient air was predicted to come from major sources; 31.1% from area or other sources; 0.4% from on-road sources; and 29.7% from non-road mobile sources. Area and other sources were estimated to contribute 48.4% of the cadmium in air; major sources - 47%; and no-road mobile sources - 4.6%. The most significant contributor of chromium to ambient air was predicted to be major sources (62.1%); area and other sources contributed 18%; on-road sources contributed 2.8%; and non-road mobile sources were predicted to contribute 17.1% of chromium to the air.

AIR QUALITY INDEX (AQI)

The AQI is an EPA index for reporting daily air quality. It tells how clean or polluted the air is, and what associated health effects might be a concern. The AQI focuses on health effects that people may experience within a few hours or days after breathing polluted air.

The AQI concept has been used as a tool to interpret the level of health concern relative to the concentration of particulate matter and sulfur dioxide concentrations in ambient air. Compared with national and regional average air quality indices (50 and 20.9, respectively), the average air quality index for Plant City is 7. An AQI value between 0 and 50 indicates that the air quality for a specific area is considered satisfactory, and air pollution poses little or no risk (Table D-5).

Table D-1. AIRS Database – Top 15 Significant Sources of Emissions[1]

(Plant City, Hillsborough County, Florida)

PLANT NAME	STREET ADDRESS	CITY NAME	ZIP CODE	STACKS	POINTS
CF INDUSTRIES INCORPORATED PLANT CITY PHOSPATE COMPLEX	10608 PAUL BUCHMAN HIGHWAY	PLANT CITY	33565	22	55
ALUMINUM COMPANY OF AMERICA EXTRUSIONS INCORPORATED	1650 ALUMAX CIRCLE	PLANT CITY	33566	17	37
JAMES HARDIE BUILDING PR0DUCTS INCORPORATED	*809 S. WOODROW WILSON ROAD*	*PLANT CITY*	*33566*	*5*	*18*
INTERNATIONAL PAPER COMPANY PLANT CITY LPD	*2104 HENDERSON WAY*	*PLANT CITY*	*33566*	*6*	*7*
DART CONTAINER CORPORATION OF FLORIDA	4610 AIRPORT ROAD	PLANT CITY	33566	5	5
PALM HARBOR HOMES	605-609 SOUTH FRONTAGE ROAD	PLANT CITY	33566	2	4
PARADISE, INC.	*1200 WEST HAINES STREET*	*PLANT CITY*	*33566*	*4*	*4*
WILLIAMETTE INDUSTRIES, INC.	2402 WILLIAMETTE DRIVE	PLANT CITY	33567	3	4
CONSOLIDATED FABRICATING, INC.	2604 HIGHWAY 92 EAST	PLANT CITY	33566	3	3
FLEETWOOD ENTERPRISES INCORPORATED	3804 SYDNEY ROAD	PLANT CITY	33566	2	2
GATSBY SPAS INCORPORATED	4408 AIRPORT ROAD	PLANT CITY	33567	2	2
HARDEE MANUFACTURING COMPANY, INC.	*2299 HWY 92 EAST*	*PLANT CITY*	*33564*	*2*	*2*
REDMAN HOMES INCORPORATED	1602 INDL. PARK DR.	PLANT CITY	33567	0	2
STYLE CREST PRODUCTS	3904 BUILDERS CIRCLE	PLANT CITY	33567	2	2
ASGROW FLORIDA COMPANY	*4144 HIGHWAY 39 NORTH*	*PLANT CITY*	*33566*	*1*	*1*
CORONET INDUSTRIES INCORPORATED	4802 CORONET ROAD	PLANT CITY	335640	0	1

**Italicized facilities are within 5 miles of the Coronet Industries facility, with International Paper being the closest.

Table D-2. Detailed Toxic Release Inventory for Coronet Industries, Inc. Site, Plant City, Hillsborough County, Florida (Data as of 2003)

Year	Chemical	Fugitive Air	Stack Air	Total Air
1988	HYDROGEN FLUORIDE	0	12980	12980
1988	PHOSPHORIC ACID	0	0	0
1988	SODIUM HYDROXIDE (SOLUTION)	0	0	0
1989	HYDROGEN FLUORIDE	0	13360	13360
1989	PHOSPHORIC ACID	0	0	0
1990	HYDROGEN FLUORIDE	0	11700	11700
1990	PHOSPHORIC ACID	0	0	0
1991	HYDROGEN FLUORIDE	0	9137	9137
1991	PHOSPHORIC ACID	0	0	0
1992	HYDROGEN FLUORIDE	0	7800	7800
1992	PHOSPHORIC ACID	0	0	0
1993	HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)	0	0	0
1993	HYDROGEN FLUORIDE	0	7908	7908
1993	PHOSPHORIC ACID	0	0	0
1993	SULFURIC ACID (1994 AND AFTER 'ACID AEROSOLS' ONLY)	0	0	0
1994	HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)	0	0	0
1994	HYDROGEN FLUORIDE	0	7610	7610
1994	PHOSPHORIC ACID	0	0	0
1994	SULFURIC ACID (1994 AND AFTER 'ACID AEROSOLS' ONLY)	0	0	0
1995	HYDROGEN FLUORIDE	0	17022	17022
1995	PHOSPHORIC ACID	0	0	0
1996	HYDROGEN FLUORIDE	750	27053	27803
1996	PHOSPHORIC ACID	0	0	0
1997	HYDROGEN FLUORIDE	750	26691	27441
1997	PHOSPHORIC ACID	0	0	0
1998	HYDROGEN FLUORIDE	750	25397	26147
1999	HYDROGEN FLUORIDE	750	26921	27671
2000	HYDROGEN FLUORIDE	10022	25120	35142
2000	MERCURY COMPOUNDS	0	0	0
2001	HYDROGEN FLUORIDE	8680	23319	31999
2001	LEAD COMPOUNDS	28	895	923
2002	HYDROGEN FLUORIDE	8776	10224	19000
2002	LEAD COMPOUNDS	24	768	792

Table D-3. Summary Toxic Air Release Inventory for Coronet Industries, Inc. Site, Plant City, Hillsborough County, Florida (Data as of 2003)

Year	Aggregate Releases of TRI Chemicals to the Air	Fugutive Air Emissions for Hydrogen Sulfide	Air Stack Releases for Hydrogen Sulfide	Fugutive Air Emissions for Lead	Air Stack Releases for Lead
2002	19792	8776	10224	24	768
2001	32922	8680	23319	28	895
2000	35142	10022	25120	NR	NR
1999	27671	750	26921	NR	NR
1998	26147	750	25397	NR	NR
1997	27441	750	26691	NR	NR
1996	27803	750	27053	NR	NR
1995	17022	0	17022	NR	NR
1994	7610	0	7610	NR	NR
1993	7908	0	7908	NR	NR
1992	7800	0	7800	NR	NR
1991	9137	0	9137	NR	NR
1990	11700	0	11700	NR	NR
1989	13360	0	13360	NR	NR
1988	12980	0	12980	NR	NR
1987	14090	0	14090	NR	NR
Total	**298525**	**30478**	**266332**	**52**	**1663**

NR – Not reported

Table D-4. 1996 Modeled Ambient Concentration for Florida: Estimated Annual Average Ambient Concentrations (µg/m^3) for Florida

	Perent Distribution of Ambient Concentrations Across Census Tracts		Contribution to Average from…				
Pollutant	Average	95th	Major	Area and Other	Onroad Mobile	Nonroad Mobile	Estimated Background
Statewide							
Arsenic Compounds	5.43E-05	1.49E-04	1.32E-05	3.15E-05	4.94E-07	9.08E-06	0.00E+00
Cadmium Compounds	7.09E-05	1.34E-04	1.23E-05	5.75E-05	0.00E+00	1.06E-06	0.00E+00
Chromium Compounds	5.47E-04	1.65E-03	1.30E-04	2.92E-04	3.57E-05	9.05E-05	0.00E+00
Hillsborough County							
Arsenic Compounds	1.32E-04	3.21E-04	5.12E-05	4.10E-05	5.80E-07	3.92E-05	0.00E+00
Cadmium Compounds	1.05E-04	2.70E-04	4.93E-05	5.08E-05	0.00E+00	4.80E-06	0.00E+00
Chromium Compounds	1.53E-03	3.60E-03	9.46E-04	2.76E-04	4.21E-05	2.62E-04	0.00E+00

Table D-5. Health Effects by Air Quality Index[4]

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
When the AQI is in this range:	***...air quality conditions are:***	***...as symbolized by this color:***
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

1 [EPA] US Environmental Protection Agency. 2005. State fact sheet for Florida (2002): reported disposal, other releases and other waste management activities (in pounds). Washington: US Environmental Protection Agency; 2005 Apr [cited 2005 Apr 19]. Available from: http://www.epa.gov/TRI.

2 Environmental Defense Fund. 2005. Environmen tal release report for Coronet Industries, Incorporated, Plant City, FL. New York: Environmental Defense Fund; 2005 Apr [cited 2005 Apr 19]. Available from: www.scorecard.org/env-releases.

3 Environmental Defense Fund. 2005. Air releases of suspected respiratory toxicants from Coronet Industries, Incorporated, Plant City, FL. New York: Environmental Defense Fund; 2005 Apr [cited 2005 Apr 19]. Available from: www.scorecard.org/env-releases.

4 House and Home. 2005. Neighborhood details for Plant City, FL – Plant City-Walden Lake. ONLINE [cited 2005 Apr 20]. Available from:http://houseandhome.msn.com.

APPENDIX E: WIND ROSE OF TAMPA AREA WINDS

Figure E-1. Wind Rose Depicting the Predominant Wind Speed/Transport Direction of Tampa Area Winds