

**Bobby Jindal**  
GOVERNOR



**Alan Levine**  
SECRETARY

**State of Louisiana**  
Department of Health and Hospitals  
Office of the Secretary

June 11, 2010

The Honorable Joel T. Chaisson, II, President  
Louisiana State Senate  
P.O. Box 94183, Capitol Station  
Baton Rouge, LA 70804-9183

The Honorable Jim Tucker, Speaker  
Louisiana State House of Representatives  
P.O. Box 94062, Capitol Station  
Baton Rouge, LA 70804-9062

The Honorable Kay Katz, Chairwoman  
House Health and Welfare Committee  
Louisiana State House of Representatives  
P.O. Box 44486, Capitol Station  
Baton Rouge, LA 70804-4486

The Honorable Willie L. Mount, Chairwoman  
Senate Health and Welfare Committee  
Louisiana State Senate  
P.O. Box 94183, Capitol Station  
Baton Rouge, LA 70804-9183

Dear President Chaisson, Speaker Tucker, and Honorable Chairs:

In response to House Concurrent Resolution No. 188 (HCR 188) of the 2009 Regular Session, the Louisiana Department of Health and Hospitals (DHH) submits the enclosed report. HCR No. 188 urges and requests DHH to study the effects on human health and the environment by the operations of the Lafarge Cement Factory in Gert Town, New Orleans and to report findings and recommendations to the House and Senate Health and Welfare Committees. R.S. 24:772 also requires that the report be submitted to the President of the Senate and the Speaker of the House.

The office of public health within DHH is available to discuss the enclosed report with you at your convenience. Please contact Mr. Clayton Williams, assistant secretary of the office of public health, at (225) 342-6188 or Ms. Kathleen Aubin, with the office of public health's section of environmental epidemiology and toxicology, at (504) 219-4575 with any questions or comments you may have.

Sincerely,

A handwritten signature in black ink, appearing to read "Alan Levine".

Alan Levine  
Secretary

Enclosures

Cc: The Honorable Members of the House Health and Welfare Committee  
The Honorable Members of the Senate Health and Welfare Committee  
David R. Poynter Legislative Research Library

**LAFARGE CEMENT  
FACTORY/GERT TOWN  
NEW ORLEANS,  
LOUISIANA**

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REPORT PREPARED IN RESPONSE TO HCR  
188 OF THE 2009 REGULAR SESSION

**MAY 2010**

**Contact:**

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## EXECUTIVE SUMMARY

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As requested by House Concurrent Resolution 188 of the 2009 Regular Session, the Louisiana Department of Health and Hospitals' Section of Environmental Epidemiology and Toxicology (DHH/SEET) conducted a study of the health effects associated with the operation of the Lafarge Cement Factory in the Gert Town neighborhood in New Orleans, LA.

The Lafarge Earhart Cement Factory is a concrete loading facility located at 7123 Forshey Street, New Orleans, Louisiana, 70125. In early 2005, Lafarge North America purchased the plant from Dixie Building Materials Company, Inc. The facility, which manufactures ready-mix concrete, has been in operation since 1963. A review of the records from the Louisiana Department of Natural Resources (DNR) from the years 1963 through 1983 do not show any complaints against the facility, and the plant was found to be in compliance with the Air Quality Regulations (1). Between 1983 and 2005, three complaints were lodged against Dixie Building Materials Company, Inc (2). According to the Louisiana Department of Environmental Quality's (DEQ), Lafarge Earhart Plant Complaint Investigation report, Lafarge operated the facility from May 2005 through August 2005.

The facility sustained major damage due to Hurricane Katrina, and regular operations did not resume until May 2008 (2). In the time since Lafarge took ownership of the site in May 2005, one complaint has been lodged against the Lafarge Earhart plant. This complaint, referred to DEQ on March 24, 2009, alleged that air dust emissions from concrete operations were being emitted from the facility. Since reopening, the Lafarge Earhart Plant is operating below capacity. Due to the small amount of yearly emissions, the Lafarge Earhart facility has met the requirements for permit exemption (2). Therefore, DEQ has not collected air samples at the Lafarge Earhart site.

Particulate matter is a mixture of solid particles and liquid droplets found in the air such as dust, dirt, soot, or smoke (3). Estimations of particulate matter 10 (PM<sub>10</sub>) emissions, particulate matter up to 10 micrometers in size, were calculated by DEQ in March 2009 based on cubic yards of cement sample data which are provided in DEQ's Lafarge Earhart Plant Complaint Investigation report (2). These PM10 emission data are estimations and do not represent exposure data that can be used in health evaluations. The Agency for Toxic Substances and Disease Registry's (ATSDR) air monitoring experts, LSU Health Sciences faculty and DEQ representatives reviewed this data and all agree that the data provided in the aforementioned report is not sufficient to evaluate health conditions due to particulate matter exposure.

This study is being conducted to assess potential health effects by comparing the mortality and hospitalization rates in zip code area 70125 where the Gert Town neighborhood and the Lafarge Cement Factory are located with a control population. This type of review can show differences in rates between the study and comparison area, but cannot link any health outcome to an environmental factor. Detailed health effects data from zip code area 70125 were compared to two demographically similar zip code areas, 70114 and 70116. Mortality and hospitalization data (1999-2007) from the Louisiana Mortality Data and the Louisiana Hospital Inpatient Discharge Data (1999-2007) were examined. Population data used to calculate the mortality and hospitalization rates are from the United States Census Bureau 2000 (1999 - 2005) and the Greater New Orleans Community Data Center (2006-2007).

The study examined the following parameters: the crude death rates per 1000; crude hospitalization rates per 1000; mortality rate ratios; hospitalization rate ratios and 95 percent confidence intervals for the zip code area 70125 (study area); and the combined zip code areas 70114 and 70116 (comparison area) for

1999 – 2007. The results show that the primary causes of death are similar for both the study area and the comparison area, and are not statistically significant. For deaths related to respiratory diseases, the rates for both areas are comparable. Deaths related to circulatory diseases, myocardial infarction and acute cerebrovascular disease are slightly statistically significantly elevated in the study area, while coronary atherosclerosis and other heart disease are lower in the study area. Although the primary causes of death classified as myocardial infarction and acute cerebrovascular disease are slightly higher in the study area than in the comparison area for the years 1999-2007, these health outcomes cannot be definitively linked to particulate matter exposure to the Lafarge Cement Factory since many risk factors can contribute to these diseases. The causes of the above mentioned diseases cannot be determined or definitively linked to particulate matter exposure even though they are slightly statistically significantly higher in the study area than in the comparison area.

In reviewing hospitalizations, the crude hospitalization rates of the study and comparison areas are very similar for the years between 1999 and 2007; the study area was lower for the years 2000, 2001, 2002, 2005, 2006 and 2007. The leading causes of hospitalizations are similar in both areas; the study area has lower rates for circulatory system diseases, diseases of the musculoskeletal system and connective tissue, mental illness, certain conditions originating in the perinatal period, complications of pregnancy, childbirth and the puerperium, and diseases of the blood and blood-forming organs. For hospitalizations due to respiratory diseases, the study area had higher rates for asthma and aspiration pneumonia/food vomitus; and lower hospitalization rates for chronic obstructive pulmonary disease and bronchiectasis, and pleurisy, pneumothorax, and pulmonary collapse. Hypertension with complications and secondary hypertension are the only circulatory system related hospitalizations with slightly higher rates in the study area than in the comparison area. Although hypertension with complications and secondary hypertension circulatory system related hospitalizations are slightly higher in the study area than in the comparison area for the years 1999-2007, these health outcomes cannot be definitively linked to particulate matter exposure to the Lafarge Cement Factory since many risk factors can contribute to these diseases. The causes of the above mentioned diseases cannot be determined or definitively linked to particulate matter exposure even though they are slightly statistically significantly higher in the study area than in the comparison area.

The mortality rates for neoplasms were further evaluated. All crude death rates due to cancers such as prostate, colon, lung, and malignant neoplasms without specific sites were similar for all evaluated areas. Cancers of unknown primary site are slightly higher in the study area than in the comparison area.

Some past scientific studies have shown that long-term exposure to particulate matter is associated with infant mortality. Infant death rates, calculated for zip code area 70125 and the combined zip code areas 70114 and 70116, indicated there were no increased infant deaths in either the study area or the comparison area.

The mortality data and the hospitalization data for residents of the zip code area 70125, the zip code area where the LaFarge Cement Factory is located, did not show any consistent pattern of higher rates than the comparison zip code areas, 70114 and 70116 for the time span 1999 – 2007.

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## REPORT TO THE LEGISLATURE HCR188 OF THE 2009 REGULAR SESSION

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### INTRODUCTION

This study's main goal "to study the effects on human health and the environment by the operations of the Lafarge Cement Factory in Gert Town, New Orleans, Louisiana" as requested by House Concurrent Resolution 188 of the 2009 Regular Session.

This review sought to study whether there exists a higher mortality and hospitalization rate in zip code area 70125, where Gert Town and the Lafarge cement factory are located, than in two demographically similar zip code areas located within five miles of the area (zip code areas 70114 and 70116) for the years 1999 through 2007, and to present the conclusions of such study in a written report to the House Committee on Health and Welfare and the Senate Committee on Health and Welfare prior to the 2010 Regular Session of the Louisiana Legislature.

### BACKGROUND

The Lafarge Earhart plant is a concrete loading facility located at 7123 Forshey Street, New Orleans, Louisiana, 70125. In early 2005, Lafarge North America purchased the plant from Dixie Building Materials Company, Inc. Dixie Building Materials Company, Inc. manufactured ready-mix concrete and had been in operation since 1963. There were no records of any complaints against the facility from the years 1963 through 1983 when the Louisiana Department of Natural Resources (LDNR) monitored air, and the plant was in compliance with the Air Quality Regulations (1). According to the Louisiana Department of Environmental Quality's (DEQ) Lafarge Earhart Complaint Investigation Report, from 1983 through 2005, Dixie Building Materials Company, Inc. had a total of three complaints lodged against the facility (2).

The Lafarge facility operated from May 2005 through August 2005, when the facility sustained major damage due to Hurricane Katrina. Regular operations resumed in May 2008, and detailed records on its operations have been maintained since May 2008. One complaint lodged against the Lafarge Earhart plant on March 24, 2009 had been referred to DEQ since Lafarge had taken ownership of the site. This complaint alleged that air dust emissions from concrete operations were being emitted from the facility. Regular operations at the Lafarge Earhart Cement Factory are similar to the operations at Dixie Building Materials Company, Inc. They include: trucks arrive at the facility, where they are filled with cement and aggregate before mixed concrete is transported to a job site. Presently, the Lafarge Earhart cement factory operates only once or twice a week unless the plant has a large order. According to DEQ's Lafarge Earhart Plant Complaint Investigation report, the Lafarge plant has produced 19,000 cubic yards of concrete since its operations resumed in May 2008. The maximum throughput for this facility is 30,000 cubic yards per year. Currently, due to the small amount of yearly emissions, the Lafarge Earhart facility has met the requirements for permit exemption (2). Therefore, DEQ has not collected air samples at the Lafarge Earhart site.

Since air monitoring data is not available, estimations of particulate matter 10 (PM<sub>10</sub>) emissions were calculated by DEQ in March 2009 based on cubic yards of cement sample data as shown in DEQ's Lafarge Earhart Plant Complaint Investigation report (2). These PM<sub>10</sub> emission data are only estimations and do not represent exposure data that can be used in health evaluations. ATSDR's air monitoring experts, LSU Health Sciences faculty, and DEQ representatives reviewed this data and all agree that the data provided in the aforementioned report is not sufficient to evaluate health conditions due to PM<sub>10</sub> exposure.

The evaluation of mortality and hospitalization data from the years 1999-2007 include years when both Dixie Building Materials, Inc. (1999 through 2005) and the Lafarge Earhart Facility (May 2005 through August 2005 and after May 2008) were in operation. The plant was closed following Hurricane Katrina and regular operations did not resume until May 2008.

### **PARTICULATE MATTER**

Particle pollution, also called particulate matter or PM, is a mixture of solid particles and liquid droplets found in the air. Dust, dirt, soot, and smoke are examples of particulate matter that are large enough to be seen with the naked eye; however, other particles included in this category are so small they can only be detected with an electron microscope. The size of the particle is linked to its potential for causing health problems. The greatest health problems are due to particles that are less than 10 micrometers in diameter because they can get deep into the lungs, and even have the potential to enter the bloodstream.

Numerous scientific studies have linked particle pollution exposure to increased respiratory symptoms, such as airway irritation, coughing or difficulty breathing. Other health effects link particulate matter exposure to decreased lung function, aggravated asthma, development of chronic bronchitis, irregular heartbeat, nonfatal heart attacks, and premature death in people with heart or lung disease (3). Short-term studies have shown consistent associations of daily exposure to particulate matter with mortality and morbidity on the same day or subsequent days (4).

Those patients who are especially affected are those with pre-existing conditions such as asthma, chronic obstructive pulmonary disease (COPD), pneumonia and other respiratory diseases, as well as patients with cardio-vascular diseases and diabetes. Long-term exposure to particulate matter is associated with increased infant mortality and cardiovascular cases, such as myocardial infarctions (4). Previous studies have shown that when air concentrations of suspended particulate matter are increased, the rate of deaths due to myocardial infarctions increases (5). With respect to morbidity, respiratory symptoms, lung growth, and immune system functions are affected (4). According to a systemic data assessment completed in 2004 by the World Health Organization European Center for Environment and Health, particulate matter exposure has been associated with increased lung cancer cases and subsequent increased death rates (6).

A review of mortality and hospitalization data was conducted in an attempt to identify any possible health effects that may be associated with the area surrounding the Lafarge Cement Factory. This review of health outcomes will characterize the causes of death and hospitalization in the two areas and differences in health effects known to be related to particulates were determined; however, this review is limited in that it cannot directly link any of the health outcomes to environmental factors.

### **POPULATIONS FOR COMPARISON**

Zip code areas have to be used because of population size. Because the study area focuses on the Gert Town neighborhood, the zip code 70125 is used for the study area. The comparison area was selected based on similar population size, racial composition, poverty levels, gender distributions and age distributions (See Appendix A). Zip Code areas 70114 and 70116 met these criteria, so their combined data was used for comparison.

Population data for the years 2000-2005 was obtained from the US Census Bureau. In 2005, Hurricane Katrina dramatically changed Orleans Parish's population. Since data from the US Census Bureau does not measure such rapid changes in population, the population data for the years 2006 and 2007 were

estimated using 2005, 2006 and 2007 data that was obtained from the Greater New Orleans Community Data Center (GNOCDC) database. The population numbers in the GNOCDC database are estimates and reflect households actively receiving mail. In order to determine an estimate of population numbers in each of the zip code areas for the years 2006 and 2007, we calculated population numbers based upon the number of households receiving mail in 2005, 2006 and 2007. For example, in zip code area 70125, for the year 2006, there were 3,362 households receiving mail, and in the year 2005, prior to Hurricane Katrina, there were 9,119 households receiving mail. From these household numbers, the percentage of households receiving mail in 2006 was calculated. Thirty-seven percent of the 2000 US Census population for zip code area 70125 was calculated, which yielded an estimated population of 8,807 in 2006.

#### **STUDY AREA: ZIP CODE 70125:**

In 2000, United States Census Bureau recorded 23,887 people, 8,977 households, 10,327 housing units, and 5,350 families residing in the zip code 70125, where Gert Town is located. The area's racial makeup was 25.6 percent White, 71.3 percent African American, 1.2 percent Asian, and 1.1 percent from two or more races. Hispanic or Latino of any race made up 2.6 percent of the population. The median age was 29.8 years. There were 43.4 percent males and 56.6 percent females. The median income for a household in 1999 was \$20,089, and the median income for a family was \$22,677. The per capita income in 1999 was \$14,377. About 37.3 percent of families and 39.5 percent of individuals were below the poverty line (7). For the year 2005, GNOCDC estimates there were 9,119 households receiving mail in this area. According to the GNOCDC, 3,362 households received mail in 2006 and 4855 households received mail in 2007 (8). The population in this area decreased considerably after 2005 as a result of Hurricane Katrina.

#### **COMPARISON AREA: ZIP CODE 70114:**

In 2000, the United States Census Bureau recorded 28,385 people, 10,384 households, 12,351 housing units and 6,800 families residing in the zip code area 70114. The racial makeup of the area was 21.8 percent White, 73.6 percent African American, 1.2 percent Asian and 1.4 percent from two or more races. Hispanic or Latino of any race made up 4.3 percent of the population. The median age was 29.6 years. There were 45.9 percent male and 54.1 percent female. The median income for a household in 1999 for this area was \$23,379, and the median income for a family was \$25,673. The per capita income in 1999 for this area was \$12,288. About 30.3 percent of families and 35.3 percent of the population were below the poverty line (7). GNOCDC estimates that 11,897 households received mail in zip code area 70114 in 2005, 11,936 households received mail in zip code area 70114 in 2006 and 11,304 households received mail in zip code area 70114 in 2007(8).

#### **COMPARISON AREA: ZIP CODE 70116:**

In 2000, the United States Census Bureau recorded 16,688 people, 8,010 households, 10,467 housing units and 3,326 families residing in the zip code area 70116. The racial makeup of the area was 29.2 percent White, 68.1 percent African American, 0.5 percent Asian, and 1.2 percent from two or more races. Hispanic or Latino of any race made up 2.6 percent of the population. The median age was 37.3 years. There were 50.9 percent males and 49.1 percent females. The median income for a household was \$21,150 in 1999, and the median income for a family was \$21,711. The per capita income for the zip code area in 1999 was \$17,794. About 33.7 percent of the families and 35.3 percent of the population were below the poverty line (7). GNOCDC estimates that 7,917 households received mail in zip code area 70116 in 2005, 5,733 households received mail in zip code area 70116 in 2006 and 6,706 households received mail in zip code area 70116 in 2007 (8). The population in this area decreased considerably after 2005 as a result of Hurricane Katrina.

## VITAL STATISTICS MORTALITY DATA

Mortality information presented in this report is gathered from data recorded on the Certificate of Death for deaths that occurred among Louisiana residents. All original death certificates flow to the Office of Public Health\ Vital Records Registry. Data are recorded on death certificates by funeral directors who solicit demographic information from available next of kin, and by physicians or coroners who record information on time, place and cause of death. Louisiana law requires that funeral directors send death certificates to the Vital Records Registry within five days of the occurrence of a death, and that the identities of persons included in the death registry be kept confidential. Death statistics are compiled in accordance with World Health Organization (WHO) regulations, which require member nations to classify causes of death according to the revision of the International Statistical Classification of Diseases, Injuries, and Causes of Death in effect at the time of death. Deaths that occurred from 1999 to present are coded in accordance with the tenth revision (ICD-10). All of the causes of death described in this report are underlying causes of death, defined as the disease or injury that initiated the sequence of events leading to death. Secondary causes of death are not considered. Death registration in Louisiana is considered to be 100 percent complete, since a death certificate must be filed before a burial permit may be obtained.

### MORTALITY DATA EVALUATED FOR ZIP CODE AREAS 70125 AND 70114/70116 COMBINED (1999-2007)

#### Methods:

**Mortality Rate:** A mortality rate (or crude death rate) is a statistical measure of the frequency of death within a population group at a specified point in time or time period. Crude death rates are computed for an entire population and disregard differences that may exist by gender, race, age or other variables.

Crude death rate = (Total number of deaths in zip code area / (Census 2000 total population for years 1999 - 2005 or Greater New Orleans Community Data Center (GNOCDC) total population for years 2006 or 2007 in the zip code area) \* 1000

Example of GNOCDC total population calculated for year 2006 =

(GNOCDC estimated total number of households receiving mail in 2006 /  
GNOCDC estimated total number of households receiving mail in 2005) \*  
Census 2000 Total Population for zip code areas

**Comparison of Crude Death Rate:** A rate ratio is a comparison of two groups in terms of incidence rates, person-time rates, or mortality rates. The mortality rate ratios in this report were calculated as follows:

Rate Ratio =  $\frac{\text{Crude death rate per 1000 for zip code area 70125}}{\text{Crude death rate per 1000 for combined zip code areas 70114 and 70116}}$

A rate ratio of 1 means that the crude death rates for both comparison groups, zip code area 70125 and zip code areas combined 70114 and 70116, are identical. If the ratio is greater than 1, the death rate in the study area is greater than the comparison area.



### Confidence Intervals:

To further evaluate rate ratios, 95percentconfidence intervals were calculated. Confidence Interval (C.I.) is defined as a range of values within which a true value is expected to fall 95 percent of the time. LDHH-SEET used the Winpepi version 9.7 statistical packages to estimate the 95 percent C.I.s and the statistical method used to calculate 95 percent C.I. was Fischer's test. A 95 percent C.I. indicates that if the survey were repeated many times, the true value would be expected to fall within the range 95 percent of the time (9). A confidence interval is a statistical method used to determine what ranges a true risk, such as cause of death or cause of hospitalization, is likely to be. C.I.s surrounding the risk estimates are statistically significant when they do not include 1.0 within the interval. If the interval includes 1.0, the difference in the hospitalization or death rates is not statistically significant.

### RESULTS:

The following table shows the crude death rates per 1000 individuals for zip code area 70125, the study area, and zip code areas 70114/70116 combined, the comparison area, for the years 1999 through 2007.

According to the rate ratio calculations in table 1, it appears that the crude death rates of both the study zip code area and the comparison zip code area have been very similar for the years 1999 through 2007. The rate ratio range for the years 1999 through 2007 is 0.95 – 1.35. The calculated rate ratio is slightly higher (statistically significantly) for the year 2006 indicating that there was a higher death rate in the study area than the comparison area during 2006.

The increased death rate for the year 2006 may be the result of the decrease in population from Hurricane Katrina which occurred in August 2005. In addition, the overall calculated rate ratio for the nine-year period (1999 – 2007) is slightly higher (statistically significantly) indicating that within that nine-year period span, there was a slightly higher death rate in the study area than in the comparison area.

**Table 1: Crude Death Rates per 1000 for zip code area 70125 and combined zip code areas 70114 and 70116 (1999 – 2007)**

| Total Deaths | 70125         |            |                           | 70114 & 70116 |            |                           | Rate Ratio | 95% Confidence Intervals |
|--------------|---------------|------------|---------------------------|---------------|------------|---------------------------|------------|--------------------------|
| Year         | Number deaths | Population | Crude Death Rate per 1000 | Number deaths | Population | Crude Death Rate per 1000 |            |                          |
| 1999         | 299           | 23887      | 12.52                     | 541           | 45073      | 12.00                     | 1.04       | 0.90 - 1.20              |
| 2000         | 273           | 23887      | 11.43                     | 495           | 45073      | 10.98                     | 1.04       | 0.89 - 1.21              |
| 2001         | 262           | 23887      | 10.97                     | 500           | 45073      | 11.09                     | 0.99       | 0.85 - 1.15              |
| 2002         | 272           | 23887      | 11.39                     | 500           | 45073      | 11.09                     | 1.03       | 0.88 - 1.19              |
| 2003         | 296           | 23887      | 12.39                     | 480           | 45073      | 10.65                     | 1.16       | 1.00 - 1.35              |
| 2004         | 239           | 23887      | 10.01                     | 474           | 45073      | 10.52                     | 0.95       | 0.81 - 1.11              |
| 2005         | 261           | 23887      | 10.93                     | 433           | 45073      | 9.61                      | 1.14       | 0.97 - 1.33              |
| 2006*        | 98            | 8807**     | 11.13                     | 333           | 40470**    | 8.23                      | 1.35       | 1.07 - 1.70              |
| 2007*        | 113           | 12717**    | 8.89                      | 354           | 41106**    | 8.61                      | 1.03       | 0.83 - 1.28              |
| Total Deaths | 2113          | 188733     | 11.20                     | 4110          | 397087     | 10.35                     | 1.08       | 1.03 - 1.14              |

**\*Years Lafarge was not in operation due to Hurricane Katrina**

**\*\* Population Estimates due to Hurricane Katrina**

## COMPARISON OF LEADING CAUSES OF DEATH:

In order to determine the leading causes of death for the zip code areas 70125 and 70114/70116, the mortality data was evaluated. Cardiovascular diseases and cancer are the two leading causes of death in both the United States and the state of Louisiana (10). As seen in table 2 below, diseases of the circulatory system and neoplasms are the primary causes of death for both the study area and the comparison area. When comparing rates for the study area with calculated rates for the comparison area, the causes of death are very similar. The rate ratios ranged from 0.53 to 1.24. All of the rate ratios greater than 1 had confidence intervals that included 1, indicating that they were not statistically significant.

**Table 2: All Deaths (ICD-10 Categories) for zip code area 70125 and 70114/70116 combined (1999 – 2007)**

| Underlying Cause of Death   | 70125         |                      |               | 70114 & 70116 |                      |               |            | 95% Confidence Intervals |
|---|---------------|----------------------|---------------|---------------|----------------------|---------------|------------|--------------------------|
|   | Number deaths | Population 1999-2007 | Rate per 1000 | Number deaths | Population 1999-2007 | Rate per 1000 | Rate Ratio |                          |
| Other*  | 52            | 188733               | 0.28          | 88            | 397087               | 0.22          | 1.24       | 0.87-1.77                |
| Infectious & Parasitic  | 136           | 188733               | 0.72          | 231           | 397087               | 0.58          | 1.24       | 1.00-1.54                |
| Mental & behavioral   | 64            | 188733               | 0.34          | 117           | 397087               | 0.29          | 1.15       | 0.84-1.57                |
| Genitourinary   | 74            | 188733               | 0.39          | 136           | 397087               | 0.34          | 1.14       | 0.85-1.53                |
| Respiratory   | 127           | 188733               | 0.67          | 237           | 397087               | 0.60          | 1.13       | 0.90-1.40                |
| External Causes (primarily assaults)                              | 209           | 188733               | 1.11          | 399           | 397087               | 1.00          | 1.10       | 0.92-1.30                |
| Circulatory   | 688           | 188733               | 3.65          | 1317          | 397087               | 3.32          | 1.10       | 1.00-1.21                |
| Nervous System  | 77            | 188733               | 0.41          | 148           | 397087               | 0.37          | 1.09       | 0.82-1.45                |
| Neoplasms   | 443           | 188733               | 2.35          | 857           | 397087               | 2.16          | 1.09       | 0.97-1.22                |
| Digestive   | 76            | 188733               | 0.40          | 163           | 397087               | 0.41          | 0.98       | 0.74-1.30                |
| Blood, blood-forming organs, immune mechanism                     | 8             | 188733               | 0.04          | 18            | 397087               | 0.05          | 0.94       | 0.35-2.26                |
| Musculoskeletal system & connective tissue                        | 16            | 188733               | 0.08          | 36            | 397087               | 0.09          | 0.94       | 0.48-1.73                |
| Certain conditions in perinatal period                            | 11            | 188733               | 0.06          | 25            | 397087               | 0.06          | 0.93       | 0.41-1.95                |
| Endocrine, nutritional, metabolic disease                         | 124           | 188733               | 0.66          | 307           | 397087               | 0.77          | 0.85       | 0.68-1.05                |
| Congenital malformations, deformations, chromosomal abnormalities | 4             | 188733               | 0.02          | 14            | 397087               | 0.04          | 0.60       | 0.14-1.91                |
| Skin & subcutaneous tissue  | 4             | 188733               | 0.02          | 16            | 397087               | 0.04          | 0.53       | 0.13-1.63                |
| Pregnancy, childbirth, puerperium                                 | 0             | 188733               | 0.00          | 1             | 397087               | 0.00          | 0.00       | -                        |

\*This category primarily includes other ill-defined and unspecified causes of mortality.

## COMPARISON OF CAUSES OF DEATH DUE TO RESPIRATORY DISEASES:

Since numerous scientific studies have linked particle pollution exposure to increased respiratory symptoms, the department further evaluated respiratory-related deaths. As shown in table 3 below, the calculated crude respiratory-related death rates range from 0.01 to 0.32 for the study zip code area, and 0.01 to 0.27 for the comparison zip code area. The calculated rate ratio range is 0.35 - 1.46, and none are statistically significant.

**Table 3: Respiratory System: Causes of Death for zip code area 70125 and 70114/70116 combined (1999-2007)**

| Respiratory Death                          | 70125         |                      |               | 70114 & 70116 |                      |               |            | 95% Confidence Intervals |
|--|---------------|----------------------|---------------|---------------|----------------------|---------------|------------|--------------------------|
|  | Number deaths | Population 1999-2007 | Rate per 1000 | Number deaths | Population 1999-2007 | Rate per 1000 | Rate Ratio |                          |
| Asthma                                     | 9             | 188733               | 0.05          | 13            | 397087               | 0.03          | 1.46       | 0.55-3.68                |
| Aspiration pneumonia, food/vomitus         | 7             | 188733               | 0.04          | 12            | 397087               | 0.03          | 1.23       | 0.41-3.38                |
| Chronic obstructive pulmonary disease      | 61            | 188733               | 0.32          | 109           | 397087               | 0.27          | 1.18       | 0.85-1.63                |
| Pneumonia (except caused by TB or STDs)    | 32            | 188733               | 0.17          | 61            | 397087               | 0.15          | 1.10       | 0.70-1.72                |
| Respiratory failure, insufficiency, arrest | 5             | 188733               | 0.03          | 10            | 397087               | 0.03          | 1.05       | 0.28-3.38                |
| Other lower respiratory disease            | 11            | 188733               | 0.06          | 23            | 397087               | 0.06          | 1.01       | 0.44-2.15                |
| Pleurisy, pneumothorax, pulmonary collapse | 1             | 188733               | 0.01          | 3             | 397087               | 0.01          | 0.70       | 0.01-8.73                |
| Other*                                     | 1             | 188733               | 0.01          | 6             | 397087               | 0.02          | 0.35       | 0.01-2.89                |

\*Includes categories with fewer than three deaths: Upper respiratory infections and diseases; Lung disease due to external agents; and acute bronchitis.

### COMPARISON OF CAUSES OF DEATH DUE TO CIRCULATORY DISEASES:

The circulatory related deaths were further evaluated since scientific studies have shown that some of the health effects linked to particulate matter exposure includes irregular heartbeat, nonfatal heart attacks, and premature death in people with heart or lung disease. As shown in table 4 below, the crude circulatory-related death rates range is 0.02 - 0.71 for the study area and the crude circulatory-related death rate range for the comparison area is 0.01 – 0.57. All causes of death which are circulatory related such as heart valve disorders, acute myocardial infarction, and heart diseases, are similar for both the study zip code area and the comparison zip code area. The calculated rate ratio range is 0.54-2.10. Acute myocardial infarction and acute cerebrovascular disease are the only calculated rate ratios that are slightly higher (statistically significant) indicating that slightly more deaths from myocardial infarctions and acute cerebrovascular disease occurred in the study area than in the comparison area.

**Table 4: Circulatory System: Causes of Death for Zip code areas 70125 and 70114/70116 combined (1999-2007)**

| Circulatory  | 70125         |                      |               | 70114 & 70116 |                      |               |            | 95% Confidence |
|--|---------------|----------------------|---------------|---------------|----------------------|---------------|------------|----------------|
|  | Number deaths | Population 1999-2007 | Rate per 1000 | Number deaths | Population 1999-2007 | Rate per 1000 | Rate Ratio |                |
| Other*   | 3             | 188733               | 0.02          | 3             | 397087               | 0.01          | 2.10       | 0.28-15.71     |
| Heart valve disorders                                      | 18            | 188733               | 0.10          | 23            | 397087               | 0.06          | 1.65       | 0.84-3.19      |
| Late effects of cerebrovascular disease                    | 7             | 188733               | 0.04          | 9             | 397087               | 0.02          | 1.64       | 0.52-4.94      |
| Cardiac dysrhythmias                                       | 15            | 188733               | 0.08          | 20            | 397087               | 0.05          | 1.58       | 0.75-3.24      |
| Acute myocardial infarction                                | 130           | 188733               | 0.69          | 183           | 397087               | 0.46          | 1.49       | 1.18-1.88      |
| Acute cerebrovascular disease                              | 134           | 188733               | 0.71          | 201           | 397087               | 0.51          | 1.40       | 1.12-1.75      |
| Pulmonary heart disease                                    | 15            | 188733               | 0.08          | 27            | 397087               | 0.07          | 1.17       | 0.58-2.28      |
| Congestive heart failure; nonhypertensive                  | 50            | 188733               | 0.26          | 101           | 397087               | 0.25          | 1.04       | 0.73-1.48      |
| Other & ill-defined heart disease                          | 68            | 188733               | 0.36          | 139           | 397087               | 0.35          | 1.03       | 0.76-1.39      |
| Hypertension with complications and secondary hypertension | 81            | 188733               | 0.43          | 167           | 397087               | 0.42          | 1.02       | 0.77-1.34      |
| Other & ill-defined cerebrovascular                        | 14            | 188733               | 0.07          | 29            | 397087               | 0.07          | 1.02       | 0.50-1.99      |
| Other circulatory disease                                  | 7             | 188733               | 0.04          | 16            | 397087               | 0.04          | 0.92       | 0.32-2.37      |
| Cardiac arrest and ventricular fibrillation                | 9             | 188733               | 0.05          | 22            | 397087               | 0.06          | 0.86       | 0.35-1.95      |
| Peripheral & visceral atherosclerosis                      | 10            | 188733               | 0.05          | 26            | 397087               | 0.07          | 0.81       | 0.35-1.73      |
| Coronary atherosclerosis and other heart disease           | 86            | 188733               | 0.46          | 227           | 397087               | 0.57          | 0.80       | 0.62-1.03      |
| Peri-, endo-, and myocarditis; cardiomyopathy              | 26            | 188733               | 0.14          | 69            | 397087               | 0.17          | 0.79       | 0.49-1.26      |
| Aortic, peripheral, and visceral artery aneurysms          | 7             | 188733               | 0.04          | 24            | 397087               | 0.06          | 0.61       | 0.22-1.47      |
| Essential hypertension                                     | 8             | 188733               | 0.04          | 31            | 397087               | 0.08          | 0.54       | 0.22-1.21      |

\*Includes categories with less than 3 deaths: phlebitis, thrombophlebitis & thrombosis; other disease of veins & lymphatics; conduction disorders; and aortic and peripheral arterial embolism

## DETAILED REVIEW OF CANCER CAUSES OF DEATH:

Cancer is the second highest cause of death in the United States and the state of Louisiana. Rates for neoplasms in the study zip code area and the comparison zip code area were further evaluated. As shown in table 5 below, the calculated crude death rate range for neoplasm-related deaths is 0.01 - 2.26 for the study zip code area, and the calculated crude death rate range for the comparison zip code area is 0.01 – 2.12. All crude death rates for all primary causes of death due to cancers such as prostate, colon, breast, lung, and malignant neoplasms without specific sites, are similar for both the study zip code area and the comparison zip code area. The calculated rate ratio range is 0.91 to 2.43. Cancer of unknown primary site is the only category which has a calculated rate ratio that is slightly higher (statistically significant), which indicates there were slightly more deaths due to cancer of unknown primary site in the study area than in the comparison area.

**Table 5: Neoplasms Causes of Death for zip code area 70125 and 70114/70116 combined (1999-2007)**

|  | 70125         |                      |               | 70114 & 70116 |                      |               |            | 95% Confidence |
|--|---------------|----------------------|---------------|---------------|----------------------|---------------|------------|----------------|
|  | Number deaths | Population 1999-2007 | Rate per 1000 | Number deaths | Population 1999-2007 | Rate per 1000 | Rate Ratio |                |
| <b>Neoplasms</b>                         |               |                      |               |               |                      |               |            |                |
| Malignant                                | 426           | 188733               | 2.26          | 840           | 397087               | 2.12          | 1.07       | 0.95-1.20      |
| Cancer of pancreas                       | 25            | 188733               | 0.13          | 35            | 397087               | 0.09          | 1.50       | 0.86-2.58      |
| Cancer of colon                          | 52            | 188733               | 0.28          | 81            | 397087               | 0.20          | 1.35       | 0.94-1.94      |
| Cancer of prostate                       | 34            | 188733               | 0.18          | 53            | 397087               | 0.13          | 1.35       | 0.85-2.12      |
| Malignant neoplasm without specific site | 31            | 188733               | 0.16          | 54            | 397087               | 0.14          | 1.21       | 0.75-1.91      |
| Cancer of breast                         | 41            | 188733               | 0.22          | 80            | 397087               | 0.20          | 1.08       | 0.72-1.59      |
| Other cancers                            | 138           | 188733               | 0.73          | 295           | 397087               | 0.74          | 0.98       | 0.80-1.21      |
| Cancer of bronchus, lung                 | 105           | 188733               | 0.56          | 242           | 397087               | 0.61          | 0.91       | 0.72-1.15      |
| Benign                                   | 2             | 188733               | 0.01          | 4             | 397087               | 0.01          | 1.05       | 0.10-7.34      |
| Cancer of Unknown Primary Site           | 15            | 188733               | 0.08          | 13            | 397087               | 0.03          | 2.43       | 1.08-5.54      |

**INFANT DEATHS:**

Past scientific studies have shown that long-term exposure to particulate matter is associated with infant mortality (4). As shown in table 6 below, the infant crude death rates are similar for the zip code area 70125 and the combined zip code areas 70114/70116, 0.10 and 0.14, respectively. The calculated rate ratio is 0.71 and not statistically significant.

**Table 6: Infant Deaths for zip code area 70125 and 70114/70116**

|                      | 70125         |                      |               | 70114 & 70116 |                      |               |            | 95% Confidence Intervals |
|----------------------|---------------|----------------------|---------------|---------------|----------------------|---------------|------------|--------------------------|
|                      | Number Deaths | Population 1999-2007 | Rate per 1000 | Number Deaths | Population 1999-2007 | Rate per 1000 | Rate Ratio |                          |
| <b>Infant Deaths</b> |               |                      |               |               |                      |               |            |                          |
|                      | 19            | 188733               | 0.10          | 56            | 397087               | 0.14          | 0.71       | 0.40-1.22                |

## LOUISIANA HOSPITAL INPATIENT DISCHARGE DATA (LaHIDD)

Louisiana hospitals are required by law to submit data on all admitted patients to the Louisiana Department of Health and Hospitals/ Office of Public Health (LDHH/OPH). Annual LaHIDD datasets contain patient address, age; sex; race; admit and discharge date; and diagnosis and treatment information on all hospital admissions. The primary diagnosis and up to eight secondary diagnoses are listed. These diagnoses are coded according to ICD-9 (International Classification of Disease, version 9).

Datasets are available for 1999 through 2007 for inpatients only. Data is available through 2007 since it takes years to review the data for quality assurance and completeness. LaHIDD does not contain data on emergency room visits. Address including zip codes is a variable available in LaHIDD thus allowing calculation of hospitalization rate by zip code of residence.

### Methods:

**Hospitalization Rate:** A hospitalization rate (or crude hospitalization rate) is a statistical measure of the frequency of hospitalizations within a population group at a specified point in time or time period. Crude hospitalization rates are computed for an entire population and disregard differences that may exist by gender, race, age, or other variables.

### Comparison of Crude Hospitalization Rates:

Crude hospitalization rate = (Total number of hospitalizations in zip code area / (Census 2000 total population in the zip code area or GNOCDC total population for years 2006 and 2007 in the zip code area) \* 1000

Example of GNOCDC total population calculated for year 2006 =

(GNOCDC estimated total number of households receiving mail in 2006 /  
GNOCDC estimated total number of households receiving mail in 2005) \*  
Census 2000 Total Population for zip code area

A rate ratio is a comparison of two groups in terms of incidence rates, person-time rates, or mortality rates. The hospitalization rate ratios in this report were calculated as follows:

Rate Ratio = 
$$\frac{\text{Crude hospitalization rate per 1000 for zip code area 70125}}{\text{Combined crude hospitalization rate per 1000 for areas 70114 and 70116}}$$

A rate ratio of 1 means that the crude hospitalization rates for both comparison groups, zip code area 70125 and zip code areas combined 70114 and 70116, are identical. If the ratio is greater than 1, the hospitalization rate in the study area is greater than the comparison area.

To further evaluate rate ratios, 95 percent confidence intervals (C.I.s) were calculated. Confidence Interval (C.I.) is defined as a range of values within which a true value is expected to fall 95 percent of the time. LDHH-SEET used the Winpepi version 9.7 statistical package to estimate the 95 percent C.I.s. A 95percentconfidence interval indicates that if the survey were repeated many times, the true value would be expected to fall within the range 95percentof the time. If the interval includes 1, the observed value has been seen by chance.

The following table shows the crude hospitalization rates per 1000 individuals for zip code area 70125 and zip code area 70114/70116 combined for the years 1999 through 2007. According to the rate ratio calculations in table 7, it appears that the crude hospitalization rates of both zip code areas are very similar for the years 1999 through 2007 and there has not been much change over time. According to table 7, the calculated rate ratio range is 0.88-0.99. The calculated rate ratios for the years 2000, 2001, 2002, 2005, 2006, 2007 and total hospitalizations for the time period 1999 through 2007 are statistically significantly lower in the study population than the comparison population.

**Table 7: Crude Hospitalization Rates per 1000 for zip code area 70125 and combined zip code areas 70114 and 70116 (1999-2007)**

| Total Hospitalizations | 70125              |            |                     | 70114 & 70116      |            |                     |            |                          |
|------------------------|--------------------|------------|---------------------|--------------------|------------|---------------------|------------|--------------------------|
| Year                   | # Hospitalizations | Population | Crude Rate per 1000 | # Hospitalizations | Population | Crude Rate per 1000 | Rate ratio | 95% Confidence Intervals |
| 1999                   | 2954               | 23887      | 123.67              | 6109               | 45073      | 135.54              | 0.91       | 0.91 - 1.00              |
| 2000                   | 2816               | 23887      | 117.89              | 5934               | 45073      | 131.65              | 0.90       | 0.87 - 0.97              |
| 2001                   | 2938               | 23887      | 123.00              | 6278               | 45073      | 139.29              | 0.88       | 0.86 - 0.95              |
| 2002                   | 2934               | 23887      | 122.83              | 6169               | 45073      | 136.87              | 0.90       | 0.87 - 0.96              |
| 2003                   | 3304               | 23887      | 138.32              | 6397               | 45073      | 141.93              | 0.97       | 0.93 - 1.02              |
| 2004                   | 3164               | 23887      | 132.46              | 6008               | 45073      | 133.29              | 0.99       | 0.98 - 1.08              |
| 2005                   | 2334               | 23887      | 97.71               | 4947               | 45073      | 109.76              | 0.89       | 0.85 - 0.94              |
| 2006*                  | 810                | 8807**     | 91.97               | 4091               | 40470**    | 101.09              | 0.91       | 0.84 - 0.98              |
| 2007*                  | 1181               | 12717**    | 92.87               | 4337               | 41106**    | 105.51              | 0.88       | 0.83 - 0.94              |
| Grand Total            | 22435              | 188733     | 118.87              | 50270              | 397087     | 126.60              | 0.94       | 0.92 - 0.96              |

**\*Years Lafarge was not in operation due to Hurricane Katrina**

**\*\* Population Estimates due to Hurricane Katrina**

### COMPARISON OF PRIMARY DIAGNOSIS OF HOSPITALIZATION:

The top 3 primary diagnoses for hospitalizations in the state of Louisiana (2005) and in the United States (2002) were: circulatory system diseases, complications/conditions of pregnancy, and respiratory system diseases (10, 11). As seen in table 8 below, the leading primary diagnosis (ICD-9 category) for hospitalizations from the study area and the comparison area (hospitalization rates greater than 10.0) are respiratory system diseases, circulatory system diseases, mental illness, and conditions/complications of pregnancy. The calculated crude hospitalization rate range is 0.19 – 20.19 for the study zip code area and the calculated crude hospitalization rate range for the comparison zip code area is 0.16 – 22.40. When comparing the calculated rate ratio for the study area with calculated rate ratio for the comparison area, it appears that the primary causes of hospitalization were very similar for both areas evaluated. The calculated rate ratio range is 0.73 to 1.19. Calculated rate ratios for hospitalizations identified with the following primary diagnosis are statistically significantly lower: circulatory system diseases; diseases of the musculoskeletal system and connective tissue; mental illness; certain conditions originating in the perinatal period; complications of pregnancy, childbirth and the puerperium; and diseases of the blood and blood-forming organs.

**Table 8: All Hospitalizations (ICD- 9 Categories) for zip code area 70125 and 70114/70116 combined (1999-2007)**

| All Hospitalizations (Primary diagnosis)  | 70125       |                      |               | 70114 & 70116 |                      |               | Rate Ratio  | 95% Confidence Intervals |
|---|-------------|----------------------|---------------|---------------|----------------------|---------------|-------------|--------------------------|
|   | #           | Population 1999-2007 | Rate per 1000 | #             | Population 1999-2007 | Rate per 1000 |             |                          |
| Residual or unclassified codes  | 57          | 188733               | 0.30          | 101           | 397087               | 0.25          | 1.19        | 0.84 - 1.66              |
| Congenital anomalies  | 35          | 188733               | 0.19          | 64            | 397087               | 0.16          | 1.15        | 0.74 - 1.76              |
| Diseases of the nervous system and sense organs                                   | 462         | 188733               | 2.45          | 882           | 397087               | 2.22          | 1.10        | 0.98 - 1.24              |
| Endocrine, nutritional, and metabolic diseases and immunity disorders             | 878         | 188733               | 4.65          | 1744          | 397087               | 4.39          | 1.06        | 0.98 - 1.15              |
| Injury and poisoning  | 1722        | 188733               | 9.12          | 3456          | 397087               | 8.70          | 1.05        | 0.99 - 1.11              |
| <b>Diseases of the respiratory system</b>   | <b>2060</b> | <b>188733</b>        | <b>10.91</b>  | <b>4158</b>   | <b>397087</b>        | <b>10.47</b>  | <b>1.04</b> | <b>0.99 - 1.10</b>       |
| Diseases of the skin and subcutaneous tissue                                      | 587         | 188733               | 3.11          | 1190          | 397087               | 3.00          | 1.04        | 0.94 - 1.15              |
| Symptoms, signs, and ill-defined conditions and factors influencing health status | 787         | 188733               | 4.17          | 1599          | 397087               | 4.03          | 1.04        | 0.95 - 1.13              |
| Neoplasms   | 966         | 188733               | 5.12          | 1987          | 397087               | 5.00          | 1.02        | 0.95 - 1.11              |
| Infectious and parasitic diseases   | 700         | 188733               | 3.71          | 1452          | 397087               | 3.66          | 1.01        | 0.93- 1.11               |
| Missing   | 330         | 188733               | 1.75          | 686           | 397087               | 1.73          | 1.01        | 0.89 - 1.16              |
| Diseases of the digestive system  | 1683        | 188733               | 8.92          | 3535          | 397087               | 8.90          | 1.00        | 0.95 - 1.06              |
| Diseases of the genitourinary system  | 992         | 188733               | 5.26          | 2124          | 397087               | 5.35          | 0.98        | 0.91 - 1.06              |
| Diseases of the circulatory system  | 3811        | 188733               | 20.19         | 8896          | 397087               | 22.40         | 0.90        | 0.87 - 0.94              |
| Diseases of the musculoskeletal system and connective tissue                      | 557         | 188733               | 2.95          | 1319          | 397087               | 3.32          | 0.89        | 0.80 - 0.98              |
| Complications of pregnancy, childbirth, and the puerperium                        | 3035        | 188733               | 16.08         | 7292          | 397087               | 18.36         | 0.88        | 0.84 - 0.91              |
| Mental Illness  | 1549        | 188733               | 8.21          | 3974          | 397087               | 10.01         | 0.82        | 0.77 - 0.87              |
| Certain conditions originating in the perinatal period                            | 1947        | 188733               | 10.32         | 5009          | 397087               | 12.61         | 0.82        | 0.78 - 0.86              |
| Diseases of the blood and blood-forming organs                                    | 277         | 188733               | 1.47          | 802           | 397087               | 2.02          | 0.73        | 0.63 - 0.83              |

## COMPARISON OF CAUSES OF HOSPITALIZATIONS DUE TO RESPIRATORY DISEASES:

Since numerous scientific sources have linked particle pollution exposure to increased respiratory symptoms such as irritation of the airways, coughing, or difficulty breathing, we further evaluated the hospitalizations with a respiratory-related diagnosis. As seen in table 9 below, respiratory infections are the 1<sup>st</sup> leading primary cause of hospitalization and asthma is the 2<sup>nd</sup> leading primary cause of hospitalization for respiratory system related hospitalizations for both the comparison zip code area and study area. The calculated crude hospitalization rate range is 0.02 – 4.82 for the study zip code area and the calculated crude hospitalization rate range for the comparison zip code area is 0.05 – 4.85. When comparing the calculated rate ratio for the study area with the comparison area, the primary causes of hospitalization were very similar for both areas evaluated. The calculated rate ratio range is 0.30 to 1.59. Calculated rate ratios for hospitalizations for chronic obstructive pulmonary disease and bronchiectasis; and pleurisy, pneumothorax, and pulmonary collapse are lower (statistically significant). Asthma and aspiration pneumonitis/food vomitus hospitalizations are slightly higher (statistically significant) in the study area than the comparison area. Aspiration pneumonitis/food vomitus is defined as chemical injury caused by the inhalation and breathing of sterile gastric contents (usually food or vomit) from the mouth into the lungs (12).



**Table 9: Respiratory System Related Hospitalizations for Zip code areas 70125 and 70114/70116 combined (1999-2007)**

| Respiratory  | 70125 |                      |               | 70114 & 70116 |                      |               | Rate Ratio | 95% Confidence Intervals |
|--|-------|----------------------|---------------|---------------|----------------------|---------------|------------|--------------------------|
|  | #     | Population 1999-2007 | Rate per 1000 | #             | Population 1999-2007 | Rate per 1000 |            |                          |
| Aspiration pneumonitis; food/vomitus                     | 93    | 188733               | 0.49          | 123           | 397087               | 0.31          | 1.59       | 1.20 - 2.10              |
| Other upper respiratory disease                          | 35    | 188733               | 0.19          | 55            | 397087               | 0.14          | 1.34       | 0.85 - 2.08              |
| Asthma   | 490   | 188733               | 2.60          | 815           | 397087               | 2.05          | 1.26       | 1.13 - 1.42              |
| Respiratory failure; insufficiency; arrest (adult)       | 121   | 188733               | 0.64          | 223           | 397087               | 0.56          | 1.14       | 0.91 - 1.43              |
| Other lower respiratory disease                          | 91    | 188733               | 0.48          | 174           | 397087               | 0.44          | 1.10       | 0.84 - 1.43              |
| Respiratory infections                                   | 909   | 188733               | 4.82          | 1926          | 397087               | 4.85          | 0.99       | 0.94 - 1.07              |
| Chronic obstructive pulmonary disease and bronchiectasis | 276   | 188733               | 1.46          | 688           | 397087               | 1.73          | 0.84       | 0.73 - 0.97              |
| Pleurisy; pneumothorax; pulmonary collapse               | 42    | 188733               | 0.22          | 133           | 397087               | 0.33          | 0.66       | 0.46 - 0.95              |
| Lung disease due to external agents                      | 3     | 188733               | 0.02          | 21            | 397087               | 0.05          | 0.30       | 0.06 - 1.01              |

#### **COMPARISON OF CAUSES OF HOSPITALIZATION DUE TO CIRCULATORY DISEASES:**

Since scientific sources have shown that some of the health effects that are linked to particulate matter exposure include irregular heartbeat, nonfatal heart attacks, and premature death in people with heart or lung disease, hospitalizations due to circulatory conditions were further evaluated. Hospitalization rates for circulatory conditions range from 0.01 to 4.55 for the study zip code area and 0.01 to 5.73 for the comparison area. As shown in table 10, rates of hospitalization for circulatory related conditions are similar for both the study zip code area and the comparison zip code area. Calculated rate ratios for nonspecific chest pain; congestive heart failure; acute myocardial infarction; coronary atherosclerosis and other heart disease; and other diseases of veins and lymphatics are lower (statistically significant) in the study area. Hypertension with complications and secondary hypertension are the only circulatory system related hospitalizations with a calculated rate ratio that are slightly higher (statistically significant).

**Table 10: Circulatory System Related Hospitalizations for Zip code areas 70125 and 70114/70116 combined (1999-2007)**

| Circulatory System  | 70125       |                      |               | 70114 & 70116 |                      |               | Rate Ratio | 95% Confidence Intervals |
|---|-------------|----------------------|---------------|---------------|----------------------|---------------|------------|--------------------------|
|   | #           | Population 1999-2007 | Rate per 1000 | #             | Population 1999-2007 | Rate per 1000 |            |                          |
| <b>Cerebrovascular disease</b>  | <b>630</b>  | 188733               | 3.34          | <b>1306</b>   | 397087               | 3.29          | 1.01       | 0.92 - 1.12              |
| Acute cerebrovascular disease   | 422         | 188733               | 2.24          | 864           | 397087               | 2.18          | 1.03       | 0.91 - 1.16              |
| Late effects of cerebrovascular disease   | 30          | 188733               | 0.16          | 40            | 397087               | 0.10          | 1.58       | 0.95 - 2.60              |
| Occlusion or stenosis of precerebral arteries                                   | 60          | 188733               | 0.32          | 149           | 397087               | 0.38          | 0.85       | 0.62 - 1.15              |
| Other and ill-defined cerebrovascular disease                                   | 12          | 188733               | 0.06          | 23            | 397087               | 0.06          | 1.10       | 0.50 - 2.30              |
| Transient cerebral ischemia   | 106         | 188733               | 0.56          | 230           | 397087               | 0.58          | 0.97       | 0.76 - 1.23              |
| <b>Diseases of arteries; arterioles; and capillaries</b>                        | <b>238</b>  | 188733               | 1.26          | <b>537</b>    | 397087               | 1.35          | 0.93       | 0.80 - 1.09              |
| Aortic and peripheral arterial embolism or thrombosis                           | 25          | 188733               | 0.13          | 59            | 397087               | 0.15          | 0.89       | 0.54 - 1.45              |
| Aortic; peripheral; and visceral artery aneurysms                               | 26          | 188733               | 0.14          | 59            | 397087               | 0.15          | 0.93       | 0.56 - 1.49              |
| Other circulatory disease   | 71          | 188733               | 0.38          | 135           | 397087               | 0.34          | 1.11       | 0.82 - 1.49              |
| Peripheral and visceral atherosclerosis   | 116         | 188733               | 0.61          | 284           | 397087               | 0.72          | 0.86       | 0.69 - 1.07              |
| <b>Diseases of the heart</b>  | <b>2320</b> | 188733               | 12.29         | <b>5909</b>   | 397087               | 14.88         | 0.83       | 0.79 - 0.87              |
| Acute myocardial infarction   | 225         | 188733               | 1.19          | 596           | 397087               | 1.50          | 0.79       | 0.68 - 0.93              |
| Cardiac arrest and ventricular fibrillation                                     | 7           | 188733               | 0.04          | 20            | 397087               | 0.05          | 0.74       | 0.26 - 1.81              |
| Cardiac dysrhythmias  | 295         | 188733               | 1.56          | 606           | 397087               | 1.53          | 1.02       | 0.89 - 1.18              |
| Conduction disorders  | 29          | 188733               | 0.15          | 58            | 397087               | 0.15          | 1.05       | 0.65 - 1.67              |
| Congestive heart failure; nonhypertensive                                       | 858         | 188733               | 4.55          | 2277          | 397087               | 5.73          | 0.79       | 0.73 - 0.86              |
| Coronary atherosclerosis and other heart disease                                | 401         | 188733               | 2.12          | 1141          | 397087               | 2.87          | 0.74       | 0.66 - 0.83              |
| Heart valve disorders   | 38          | 188733               | 0.20          | 66            | 397087               | 0.17          | 1.21       | 0.79 - 1.83              |
| Nonspecific chest pain  | 347         | 188733               | 1.84          | 899           | 397087               | 2.26          | 0.81       | 0.72 - 0.92              |
| Other and ill-defined heart disease   | 2           | 188733               | 0.01          | 4             | 397087               | 0.01          | 1.05       | 0.10 - 7.34              |
| Peri-, endo-, and myocarditis; cardiomyopathy (except that caused by TB or STD) | 54          | 188733               | 0.29          | 100           | 397087               | 0.25          | 1.14       | 0.80 - 1.60              |
| Pulmonary heart disease   | 64          | 188733               | 0.34          | 142           | 397087               | 0.36          | 0.95       | 0.70 - 1.28              |
| <b>Diseases of veins and lymphatics</b>   | <b>117</b>  | 188733               | 0.62          | <b>302</b>    | 397087               | 0.76          | 0.82       | 0.65 - 1.01              |
| Hemorrhoids   | 13          | 188733               | 0.07          | 46            | 397087               | 0.12          | 0.59       | 0.30 - 1.12              |
| Other diseases of veins and lymphatics  | 15          | 188733               | 0.08          | 57            | 397087               | 0.14          | 0.55       | 0.29 - 0.99              |
| Phlebitis; thrombophlebitis and thromboembolism                                 | 82          | 188733               | 0.43          | 190           | 397087               | 0.48          | 0.91       | 0.69 - 1.18              |
| Varicose veins of lower extremity   | 7           | 188733               | 0.04          | 9             | 397087               | 0.02          | 1.64       | 0.52 - 4.94              |
| <b>Hypertension</b>   | <b>506</b>  | 188733               | 2.68          | <b>842</b>    | 397087               | 2.12          | 1.26       | 1.13 - 1.41              |
| Essential hypertension  | 83          | 188733               | 0.44          | 155           | 397087               | 0.39          | 1.13       | 0.85 - 1.48              |
| Hypertension with complications and secondary hypertension                      | 423         | 188733               | 2.24          | 687           | 397087               | 1.73          | 1.30       | 1.15 - 1.46              |

## CONCLUSION

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The mortality data and the hospitalization data for residents of the zip code area 70125, the zip code area where the LaFarge Cement Factory is located, did not show any consistent pattern of higher rates than the comparison zip de areas, 70114 and 70116 for the time span 1999 – 2007.

Past scientific studies have shown an association between daily exposures to particulate matter and increased respiratory symptoms; however, the hospitalization data evaluated from the Louisiana Hospital Inpatient Discharge Data from 1999 through 2007 did not find any consistent pattern of higher rates in the study area than the comparison area. There was a very slightly higher rate of hospitalizations identified for asthma and aspiration pneumonia/food vomitus in the study zip code area. The mortality data evaluated from the Louisiana Mortality Data from 1999 through 2007 showed no increased higher death rate due to respiratory causes in the zip code area 70125.

Long-term exposure to particulate matter is associated with increased cardiovascular cases such as myocardial infarctions. The mortality data from 1999 through 2007 indicated that acute myocardial infarction and acute cerebrovascular disease in the zip code area 70125 were only slightly higher (statistically significant) than in the comparison area. Evaluation of the circulatory system related hospitalizations indicated that hypertension complications and secondary hypertension were the only circulatory system related hospitalizations that were slightly significantly higher in the study zip code area than in the comparison zip code areas.

In this study, we cannot make associations of health effects and particulate matter exposure because of several factors including: many risk factors contribute to these diseases; there may not be a sufficient amount of pollution to produce a health effect; the severity of health effects may not be severe enough to cause hospitalization or death; and the small population in each of the groups may not be sufficient to show an increase in hospitalizations or deaths above the normal rates.

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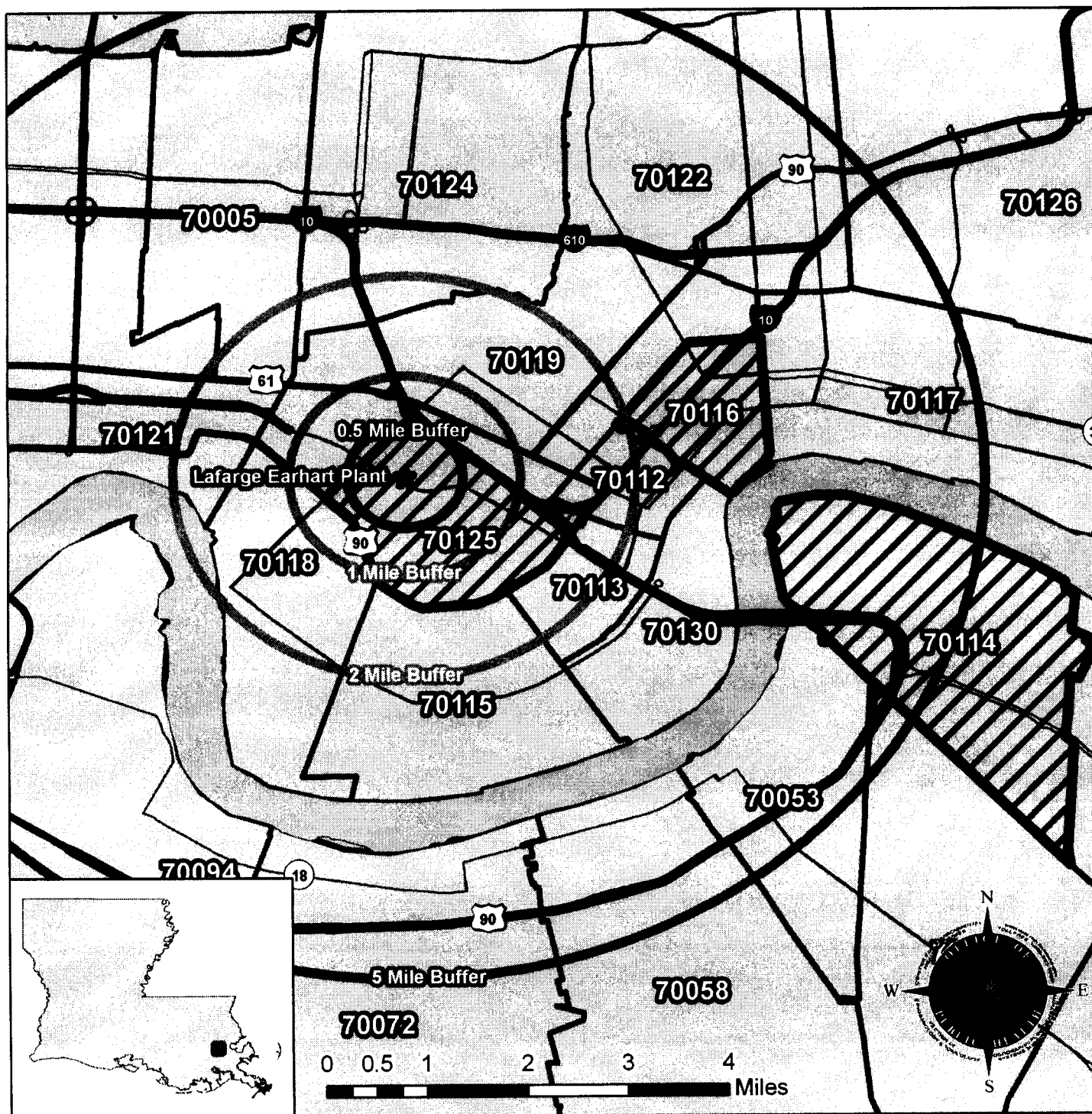
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## APPENDICES

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Appendix A: Lafarge Earhart Plant Map: Zip code 70125 and Similar Zip Codes 70114/70116

Appendix B: House Concurrent Resolution 188



## Lafarge Earhart Plant: Zip Code 70125 and Similar Zip Codes\*

| Zip Code | Total Population<br>(% Difference)** | Minority<br>Percentage** | Individuals Below<br>Poverty Level<br>(% of Total Population)** | Gender Distribution<br>(Male/Female)** | Age Distribution:<br>18-64<br>(% Difference)** | Age Distribution:<br>65+<br>(% Difference)** |
|----------|--------------------------------------|--------------------------|---|--|--|--|
| 70125    | 23,887                               | 74.3%                    | 8,721 (39.5%)   | 10,366 (43.4%)<br>/ 13,521 (56.6%)     | 17,442   | 2,925  |
| 70114    | 28,385 (+18.8%)                      | 78.2%                    | 9,837 (35.3%)   | 13,025 (45.9%)<br>/ 15,360 (54.1%)     | 19,204 (+10.1%)                                | 2,839 (-3.0%)                                |
| 70116    | 16,688 (-30.1%)                      | 70.8%                    | 5,581 (35.3%)   | 8,489 (50.9%)<br>/ 8,199 (49.1%)       | 12,822 (-26.5%)                                | 2,259 (-22.8%)                               |

Map produced September, 2009 by the Louisiana Department of Health and Hospitals (LDHH) / Office of Public Health (OPH) / Section of Environmental Epidemiology and Toxicology (SEET) using 2000 US Census data.

Disclaimer: SEET cannot guarantee the accuracy of the information contained on these maps and expressly disclaims liability for errors and omissions in their contents.

\*For a zip code to be considered similar, it needed to have a total population between 15,000 and 30,000, of which at least 20% were white and 30%-40% were African Americans living below poverty and the population between 18 and 64 had to be within 30% of 70125.

\*\* Data comes from US. Census Bureau, American Fact Finder (<http://factfinder.census.gov/home/saff/main.html>)

**ENROLLED**

Regular Session, 2009

HOUSE CONCURRENT RESOLUTION NO. 188

BY REPRESENTATIVE HINES AND SENATOR GRAY EVANS

**A CONCURRENT RESOLUTION**

To urge and request the Department of Health and Hospitals to study the effects on human health and the environment by the operations of the Lafarge Cement Factory in Gert Town, New Orleans, Louisiana, and to report findings and recommendations to the House Committee on Health and Welfare and the Senate Committee on Health and Welfare prior to the 2010 Regular Session of the Legislature.

WHEREAS, the Louisiana Constitution requires that the state's natural resources and the healthful, scenic, historic, and esthetic quality of the environment be protected, conserved, and replenished insofar as possible and consistent with the health, safety, and welfare of the people; and

WHEREAS, the legislature previously declared that the purity of the air in the environment is a matter of vital concern to the welfare of the people of the state and to promote an environment free from pollution that jeopardizes the health and welfare of the citizens of the state, consistent with sound policies for employment and industrial development; and

WHEREAS, the Lafarge Cement Factory operates in Gert Town, New Orleans, Louisiana, which results in particulate matter emanating in the surrounding residential areas that has been reported as far as five miles from the facility; and

WHEREAS, numerous Gert Town residents have experienced respiratory difficulties and illnesses.

THEREFORE, BE IT RESOLVED that the Legislature of Louisiana does hereby urge and request the Department of Health and Hospitals to study the effects on human health and the environment by the operations of the Lafarge Cement Factory in Gert Town, New Orleans, Louisiana, and to report findings and recommendations to the House



HCR NO. 188

**ENROLLED**

Committee on Health and Welfare and the Senate Committee on Health and Welfare prior to the 2010 Regular Session of the Legislature.

BE IT FURTHER RESOLVED that a copy of this Resolution be transmitted to the secretary of the Department of Health and Hospitals.

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SPEAKER OF THE HOUSE OF REPRESENTATIVES

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PRESIDENT OF THE SENATE