The Negative Impacts of Lead-Contaminated Superfund Sites and the Toxicological Effects on Children in Dallas County

For:
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Abstract

This Study was conducted to investigate the toxicological effects of lead on children, from the age of 0 years old to 18 years old, that reside or attend schools, located within the 5-mile radius, of lead contaminated Superfund Sites, in Dallas County. The toxicological and cognitive effects on children were measured by investigating the unduplicated counts of elevated childhood blood lead levels, from the Year 1999 to the Year 2002, the percentage of schools' standardized test passing rates, from the Year 1994 to the Year 2002, and the socioeconomic indicators, from the Year 1999 to the Year 2002, for the children that reside within the 5-mile radius, of each Superfund Site; by comparing the same data with children, that reside or attend schools, located greater than the 5-mile radius of each Superfund Site. This study aims to determine the long-term effects, of childhood lead exposure and related cognitive effects, on school standardized test passing rates. Based on the results this study, the unduplicated counts of elevated childhood blood lead levels are significantly higher for the children that reside, within the 5-mile radius of each Superfund Site, than the unduplicated counts of elevated childhood blood lead levels, of children that reside, greater than the 5-mile radius of each Superfund Site. The standardized test passing rates are significantly lower, for the schools that are located, within the 5-mile radius of each Superfund Site, than the schools located greater than the 5-mile radius, of each Superfund Site. There were strong significant relationships between proximity of the children that reside, and the schools that are located, within the 5–mile radius of each Superfund Site, and the unduplicated counts of elevated childhood blood lead levels and standardized test passing rates. In addition, there were strong significant relationships between socioeconomic indicators of low economic status and counts of elevated blood lead levels and percentages of standardized test passing rates.

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1.0 Introduction

Historically, many sources of hazardous waste contamination have occurred in Dallas County since the establishment of cities and towns during the Industrial Revolution. The types of chemical organic and inorganic compounds in the hazardous waste vary considerably from each site. A specific, and often ubiquitous, contaminant of concern in hazardous waste is lead, which has detrimental toxicological effects in the developmental stages of children. Evidence for the impact of even low-level environmental lead (Pb) exposure on human health, behavior and cognition is increasing (Lanphear, et al., 2005; Budtz-Jørgensen et al., 2012; Nigg et al., 2010).

Many pollution-contaminated sites can be found across the United States. This is a consequence of hazardous waste dumping, exposed waste outdoors, and mismanaged waste products. This occurs at sites that range from production facilities, processing operations, landfills, and mines. The federal program tasked with addressing this problem is informally called Superfund. The historical roots of Superfund can be found in the late 1970s when hazardous waste became a national issue. The potential for toxic chemical exposures from hazardous waste to cause adverse health effects became a major public concern following the Love Canal and Times Beach incidents. In response, Congress established the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) in 1980. CERCLA (Superfund) enables the Environmental Protection Agency (EPA) to clean up contaminated sites. It also forces the parties responsible for the contamination to either perform cleanups or reimburse the government for EPA-led cleanup work. In instances where there is no obvious responsible party, Superfund gives EPA the funds and authority to clean up contaminated sites. For a site to be designated as a superfund site, CERCLA requires that specific criteria provided by a Hazard Ranking System be met to make the National Priorities List (NPL) of sites with known releases or threatened releases of hazardous substances, pollutants, or contaminants deleterious to human health. The Superfund designation is related to threats to human or environmental health. A Superfund risk assessment determines how threatening a hazardous waste site is to human health and the environment. All Superfund sites are designated such because of their potential to do harm to human populations or ecosystems.

In 2017, there were 53 Superfund Sites on the NPL in Texas. Twelve additional sites have been cleaned up and are considered deleted, with no further action required. The sites in this study fall into both categories. In this Study, the focus is on lead (Pb) contamination at these sites, and how lead exposure by dispersal from these sites may have affected cognitive performance in children locally. Surprisingly, in the literature, there are few studies relating to adverse health outcomes and exposure in the vicinity of Superfund Sites.

2.0 Background

2.1 Background on Lead

Lead is a heavy metal element that is present everywhere in the environment. Lead is a xenobiotic toxicant that has no known physiological function in the human body (it is not an essential element). It is a toxic element that affects the central nervous system (CNS), hematopoietic system (blood), hepatic and renal (liver and kidney) systems causing major health problems.

Typically, in its mineral form, it is bluish and white in color in its original states (native Galena ($PbSO_4$) and Cerussite ($PbCO_3$)), but oxidizes, in air, to a "grayish dull color". The physical characteristics of metallic lead include a high density, high durability, high ductility and high malleability. In addition, lead has a high resistance to corrosion, which makes lead a metallic element that has been widely utilized in many industrial applications.

The utilization of lead in ancient history includes its use as a cosmetic, in cooking utensils and containers, and in preservatives for alcoholic beverages and ciders. Its widespread use in the Roman Empire for these purposes suggests that lead poisoning was endemic in ancient Rome. In more recent times, lead has also been utilized in home roofing materials, drinking water transportation pipelines, lead-based paint, an additive in gasoline, and in lead-acid batteries.

Population exposures to lead occur not only from the end-use products, but also from the production practices such as primary and secondary lead smelters, lead-recycling plants, manufacturing operations, and other types of metal refineries.

The main lead exposure pathways for adults and children differ. The main exposure pathway of lead for adults is ingestion through food and water consumption. Historic lead ingestion for adults was through lead piping in water transmission lines. Since lead piping has been systematically removed from service (mostly), modern ways adults ingest lead have shifted. These include (mainly by an inhalation pathway): recreational shooting, hand loading ammunition, soldering, jewelry making, pottery making, gun smithing, glass polishing, painting, and stain glass crafting."(Klaassen & Watkins, 2010). "The primary route of lead exposure for children is, hand to mouth transfer of lead containing paint chips and dust from floors of older housing."(Klaassen & Watkins, 2010). The lead transfers when children crawl and play on the floor and their hands contact lead contaminated media.

Even though lead has excellent properties that can be widely utilized in the industrial and commercial markets, lead causes some serious toxicological effects in the human body in adults and children. Exposure can happen when lead contaminates the air, water, or land and comes in contact with the human body. Even trace amounts of lead in the human body can result in acute and chronic effects (depending on whether the exposure is short or long term) that can severely impact target organs. The following sections elaborate on the exposure pathways and effects of lead on the human body for adults and children.

2.2 Exposure Pathways of Lead into the Human Body

Lead can enter the human body by three main exposure pathways: Dermal Contact, Ingestion, and Inhalation. Each exposure pathway to lead has a toxicological effect on the body systems and specific target organs.

2.2.1 Dermal Contact

Dermal contact occurs when the skin of the human body of an adult or child comes into direct contact with the toxicant. Generally, inorganic forms of lead cannot be absorbed through the skin, unless if the toxicant is refined to a small powder. However, organic forms of lead can be readily absorbed into the skin through sweat glands and directly into the circulatory system. Alky lead, an organic form of lead, is readily absorbed through the skin can result in neurotoxicity, which results in damage to the nerves and/or the brain. However, almost exclusively environmental exposure to lead is in an inorganic form.

The specific targets for lead on the circulatory system include the heart, the blood vessels, and the blood itself. Lead is also known as a cardiotoxicant, which interferes with the electromechanical activities of the heart. As a result of exposure, the heart contraction cells are not be able to contract properly to allow the heart to beat in its normal rhythm. An irregular heartbeat can result in added stress on the heart and cause problems with blood pressure. The human body's blood vessels are negativity impacted by lead through the formation of atheromas (arterial plaques). Atheroma causes the artery walls to swell and causes the arteries to harden and narrow. The destruction of blood vessels, the hardening of the arteries, and swelling of arteries can result in hypertension and capillary destruction. If the lead remains in the body, this can result in "coronary and cerebral atherosclerosis" (Richards, 2008).

In addition to lead affecting the heart and the blood vessels, lead also can affect the hematopoietic system of the blood by interfering with the proper growth and the development of the erythrocytes (red blood cells). The erythrocytes transport oxygen from the lungs to other organs and tissues. In the development of erythrocytes, "heme" (red pigment composed of iron linked to a chemical called protoporphyrin) must be synthesized by utilizing iron. Heme is an essential component of several iron-containing proteins that include hemoglobin, which carries oxygen in the blood. (Genetics Home Reference, 2017). Lead in the body can result in the inhibition of sigma-aminolevulinic acid dehydratase (ALAD) and ferrochelatase. Delta-aminolevulinate dehydratase is a part of a "multi-step process" that is used to make heme. ALAD catalyzes the condensation of two units of ALA to form phorphobilinogen (PBG). Inhibition of the of ALAD results in the accumulation of ALA.

Ferrochelatase is also a part of the "multi-step process" to produce heme in the body. Ferrochelatase catalyzes the insertion of iron into the protoporphyrin ring to form heme. Inhibition of ferrochelatase results in accumulation of protoporphyrin IX, which takes the place of heme in the hemoglobin molecule and, as the erythrocytes containing protoporphyrin IX circulate, zinc is chelated at the site usually occupied by

iron."(Klaassen & Watkins, 2010). The inhibition of ALAD and ferrochelatase result in anemia in the human body under some instances.

2.2.2 Ingestion

Ingestion of lead occurs when it is consumed by eating and/or drinking. The immediate system impacted by the ingestion of lead is the digestive system. Once lead has entered into the stomach, dissolved, passed the intestine, crossed the intestinal wall, the primary target organ affected is the liver. The purpose of the liver is to reduce the toxic effects of any toxin by utilizing biotransformation reactions to convert xenobiotic toxins to other metabolites, which can be in a lipophilic to hydrophilic state. Once lead has been converted to a hydrophilic form, it can be easily excreted from the human body in urea.

At acute levels in the liver, lead can result in hepatocyte death, necrosis, and lipidosis. Hepatocyte death is the death of the cells (the hepatocytes) that receive toxicants and chemicals from the venous return from the digestive tract, prior to being released into the circulatory system (Richards, 2008). The hepatocytes perform the primary metabolic functions in the liver of making a toxicant less toxic through Phase I and Phase II biotransformation reactions. If the hepatocyte are damaged and do not function properly, then the liver will not be able to properly eliminate toxicants from the human body. Acute levels of lead in the liver can also in necrosis. Necrosis is when the cells swell, and there is a leakage of enzymes, nuclear disintegration, and inflammation" (Richards, 2008). Necrosis is death of the tissue. Lipidosis occurs when there is an acute quantity of lead in the liver that causes the liver to enlarge in size due to the lipid (fat) and triglyceride accumulation (Richards, 2008).

Lead is also a nephrotoxicant. Acute effects of lead on the kidneys can result in renal failure due to the harmful effects of lead on the proximal convoluted tubule in the kidneys. Chronic effects of lead on the kidneys include chronic tubulointerstital nephropathy. Chronic tubulointerstital nephropathy is a condition that has no cure and results in renal failure. In addition, lead in the kidneys result in nephron loss, interstitial fibrosis, and azotemia. Interstitial fibrosis (scaring) is a condition in which the capillaries and renal tubules are destroyed in the kidneys. Azotemia is a medical condition characterized by abnormally high levels of nitrogen-containing compounds, such as urea, creatinine, various body waste compounds, and other nitrogen-rich compounds in the blood. It is largely related to insufficient filtering of blood by the kidneys.

Lead also causes detrimental effects on the nervous system. These negative effects are referred to as neuropathy, (damage to the neuronal cell body) (Richards, 2008). Some acute doses of lead will result in brain swelling (cerebral edema/encephalopathy) and axonal loss. Brain swelling can result in learning defects and degenerative diseases in the brain (Richard, 2008). In the event that the liver cannot eliminate lead, the lead is stored in fat cells, but mostly stored in the bones.

2.2.3 Inhalation

In some cases airborne particles of lead can be inhaled from industrial sources and enter into the respiratory system. Depending on the diameter of the lead particle, the lead can be trapped in the upper nasal cavity mucus where it can be coughed or sneezed out of the human body. If the lead particulate is not removed in this way or via the mucocilliary escalator, the inhaled lead will enter the alveoli, may be dissolved and enter the blood stream, and redistributed systemically through the circulatory system.

Once in the circulatory system, lead can have negative impacts on the nervous system. Lead can cause neurological and developmental effects on the human body. Children are most susceptible to lead effects on the body. In utero lead exposure can result in birth defects, in lipidosis including: impaired motor functions, and depressed cognitive development. Thus, it is important that children and expectant mothers minimize lead exposures.

2.3 Differentiation of Lead Effects for Adults and Children

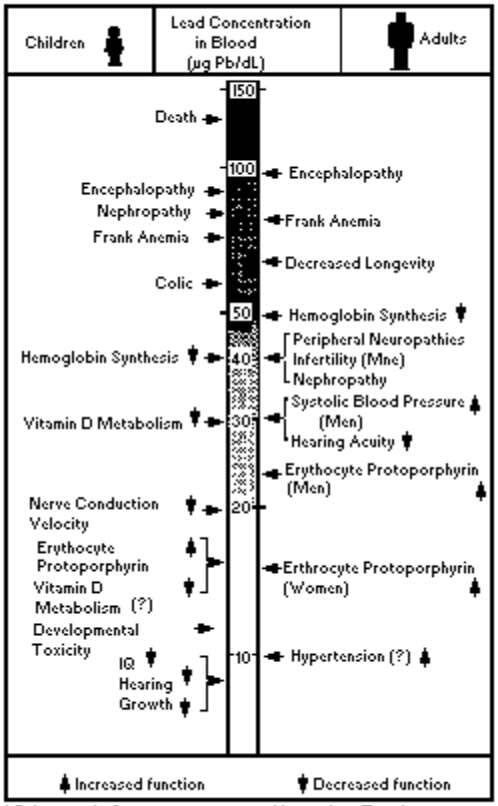
2.3.1 Toxicological Effects of Lead on Adults and Children at Various Blood Concentrations

Lead contamination in the human body effects adults and children differently based on the level of concentration of lead measured in the blood stream. According to the Centers for Disease Control (CDC), "there is no safe childhood blood lead level".

According to the CDC, children are more susceptible to health effects of lead poisoning, than adults. Figure 2.1 outlines the health effects for adults and children based on various blood lead levels.

Figure 2.1 Effects of Inorganic Lead in Children and Adults-Lowest Observable Adverse Effects Levels

Figure 1. Effects of Inorganic lead in children and adults – lowest observable adverse effect levels*



*(Adapted from case studies in Environmental Medicine: Lead Toxicity, 1990, ATSDR)

Blood lead concentration less than 5 µg/dl affect children's cognitive development resulting in a reduction in children's IQ. In addition to cognitive effects, hearing abilities and growth rate are decreased in children at blood lead levels less than 10 µg/dl. For adults, an increase in hypertension is encountered at a blood lead level of 10 µg/dl.

From a blood lead level of 11 µg/dl to 20 µg/dl, developmental toxicity, an increased level erythrocyte protoporhyrin, and decreased nerve conduction velocity occur in children. According to Allina Health, erythrocyte protoporhyrin "measures the non-complexed, non –heme protoporhyrin concentration in the blood. It is used to help evaluate if there is too little or too much lead in the blood." For adults, between a blood lead level of 11 µg/dl and 20 µg/dl, adult women experience an increase in erythrocyte protoporphyrin.

At blood lead levels between 21 µg/dl and 30 µg/dl, a decreased Vitamin D metabolism occurs that results bone defects experienced by children. This blood level lead range affects adult men by causing an increased level of erythrocyte protoporphyrin.

From blood lead levels of 31 μg/dl to 40 μg/dl, a decrease in hemoglobin synthesis occurs in children. In this blood lead level range, peripheral neuropathy, malfunctions of the nerves (emedicinehealth, 2017), nephropathy (damage or disease to the kidneys), and decreased hearing occur in adults. According to the National Institute of Neurological Disorders and Stroke, peripheral neuropathy is "damage to the peripheral nervous system" that consists of "the vast communications network that transmits information between the central nervous system (the brain and spinal cord) and every other part of the body." Adult men specifically experience infertility and an increase in systolic blood pressure.

At blood lead levels from 50 μg/dl to 100 μg/dl, colic, frank anemia, nephropathy, and encephalopathy are symptoms experienced in children. According to Healthline, "encephalopathy is a general term describing a disease that effects the function or structure of your brain." Adults experience decreased longevity, encephalopathy, and frank anemia.

At blood lead levels greater than 100 μg/dl but less than 150 μg/dl, children experience death. There are no observed health effects for adults at this range. Overall, based on the Centers for Disease Control's Figure, children seem to be more susceptible to lead in the blood, than adults on the same related health effects. Further explanation of specific health effects and symptoms of lead contamination in the human body for adults and children will are expounded upon in the following sections.

2.3.2 Specific Effects of Lead in Adults

The primary symptoms of lead poisoning in adults are in the reproductive system and in the peripheral nervous system. The health effects of lead in the human body vary between men and women. A blood lead level at or above 50 μg/dl will result in a negative impact on the male and the female reproductive systems. For men, lead can reduce the male sperm count. In addition, lead poisoning in men causes changes in the volume of sperm, their motility, and their morphology. In women, lead poisoning result in children that have low birth weight and stillbirths.

Lead poisoning in adults can lead to peripheral neuropathy (lack of feeling limb extremities). In the brain, lead causes the axons and the nerve cells to degenerate and lose their myelin coats- demylenation). Some symptoms of the degeneration of the nerves cells, at high levels of exposure, is a condition called wrist drop and foot drop. Wrist drop is when an individual is incapable of stretching out their wrist or move their hand from their wrist. Foot drop is the same condition of wrist drop, except that the incapability of movement pertains to the foot.

2.3.3 Specific Effects of Lead in Children

The effects of lead poisoning in children are much more severe than in adults. Lead poisoning in children primarily effects the child's physical and cognitive development, and the nervous system. Symptoms of lead poisoning in children include "lethargy,

irritability, loss of appetite, and dizziness."(Klaassen & Watkins, 2010). Symptoms of lead poisoning in children at extreme exposures can also lead to mental retardation, epilepsy, blindness, coma and death.

The reason why children are more susceptible to severe effects of lead poisoning than adults is due to the blood brain barrier in children is not completely developed. In embryos and newborns, this barrier is immature or "leaky," rendering the developing brain more vulnerable to toxins entering the brain through circulation. In adults, the blood brain barrier is completely developed that enables adults to be more resistant than children to the effects of lead poisoning. In children, lead can easily enter the brain and cause various neurological disorders, by negatively impacting the neurotransmitters in the brain. Children are also more susceptible to lead poisoning because of physiology and behavior. Children have a higher respiration rates than adults and smaller lung capacity. Since children are naturally physically active than adults, children would inhale in more particulate lead than adults. Children also explore their environment by mouthing behavior, resulting in inadvertent ingestion of lead contaminated soil and dust on objects (e.g., toys). Children also place their hands in their mouths, which can cause their hands to be an important route of exposure.

3.0 Previous Studies

Based on a review of other studies, there are approximately three research projects conducted on similar topics of this Study. The titles and authors of the research are shown below.

- Inequality in Lead Exposure and the Black White Test Score Gap by Anna Aizer Brown University and NBER, Janet Currie Princeton University and NBER, Peter Simon Brown University, and Patrick Vivier Brown University (February 7, 2015)
- Inequality Before Birth: The Developmental Consequences of Environmental Toxicants by Claudia Persico, Northwestern University, David Figlio, Northwestern University and National Bureau of Environmental Research, Jeffrey Roth University of Florida (April 4, 2016)
- What doesn't kill you makes you weaker: Prenatal Pollution Exposure and Educational Outcomes by Nicholas J. Sanders, Standford University January 2011.

Based on a review of the literature, there are three studies that are similar in nature and location to this Study. The first (Aizer et al., 2015) which focuses on the inequality in lead exposure and the black-white test score gap, attempted to explain the black vs. white standardized test gap, factoring-in socioeconomic indicators. The researchers suggested environmental toxins explain the black-white test score gap. They showed that low income black families that reside near Superfund Sites and near toxic emissions from industrial plants, have children that have lower test scores than white children. It was suggested that removing the environmental toxins would eliminate the black-white standardized test score gap. They used lead as the environmental toxin and studied children from the Year 1997 to the Year 2004 for the state of Rhode Island. They

followed childhood blood lead levels from birth to age 6 and linked the children information to standardized test scores from the 3rd grade to the 8th grade. The authors also followed the blood lead levels of children on free lunch vs. the children that were not on free lunch. The state of Rhode Island mandated that landlords that have a child residing within their property, which tested for elevated lead to mitigate the sources of lead in the houses, in order to rent their property or face prosecution. In addition, Rhode Island required all landlords to obtain a lead safe certificate in order to rent their property whether a child tested for elevated lead or not. The number of lead safe certificates by census tract was also studied.

Based on the their results, black children born from the Year 1997 to the Year 2004 had a 4.8 μg/dl average blood lead level and white children had an average blood lead level of 3.1 μg/dl. The pattern of average blood lead level is the same for children on free lunch and the children not on free lunch. The children on free lunch had higher average blood lead levels, than the children that are not on free lunch. The overall trends in the data, over time, show a significant decrease in average childhood blood lead levels for black children and children on free lunch. Researchers believe the decrease is due to an increase in the quantity of lead safe certificates obtained in census tracts with older housing units.

The second study (Figlio, 2016) focused on the developmental consequences of environmental toxicant exposure and consisted of examining the short term and long term environmental effects for children residing within two miles of Superfund Sites in the state of Florida. This investigation used population data from children from the Year 1994 to the Year 2002. The authors followed the siblings of non-moving and moving families and compared pre-natal exposure of a sibling conceived before and during Superfund Site cleanup and compared the data to other siblings, in moving and non moving families, conceived after Superfund Site cleanup. Standardized test scores were tied to birth records and compared to moving and non-moving siblings conceived before and during cleanup activities and compared the findings to the siblings conceived after the Superfund Site was cleaned up. This study does not follow only lead exposure, as in the previous study, but covers various environmental toxicants associated with the Superfund Sites in Florida. The comparison data, for this study consisted of comparing the vital statistics and the standardized test scores from the siblings that lived within a two-mile radius of the Superfund Site to the siblings that lived greater than two miles from the Superfund Sites.

Based on the results of the study, researchers found that children living within one mile of the Superfund Sites had low birth weight and APGAR (a measure of the physical condition of a newborn infant. It is obtained by (adding points (2, 1, or 0) for heart rate, respiratory effort, muscle tone, response to stimulation, and skin coloration; a score of ten represents the best possible condition). These items were tested on the siblings prior to and after Superfund Site clean-up. The negative trends found in children that resided within one-mile radius of a Superfund Site, were not as strong for the siblings that resided between one mile and two miles, of the Superfund Sites. The authors found that long-term cognitive outcomes on children improve after Superfund Site clean-up. In addition,

the standardized test scores were slightly lower for siblings that were conceived before or during Superfund Site cleanup, than the standardized test scores for siblings conceived after Superfund Site cleanup.
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The third study (Sanders 2011) involved prenatal pollution exposure and educational outcomes. Here, the authors investigated how air pollution resulting from the industrial recession in Texas, in the early 1980's, had pre-natal cognitive effects on children in utero and followed these effects on educational outcomes from the Year 1970 to the Year 1985. The researchers measured the total suspended particles in air, and other related data to quantify air pollution on the county level for several counties in Texas. The study measured the educational outcomes by the evaluating the math standardized test scores for high school students, by county. Based on the results, the study identified a significant negative relationship between prenatal effects and total suspended particles, and standardized math test scores for high school students.

This present Study, differs from other studies. Instead of focusing on the effects of pollution on a state wide or county level, this study focused on the effects of possible lead exposure, from Superfund Sites that consist of lead/heavy metal contamination, and the long term effects on the standardized test passing rates for elementary, middle, and high schools located within a 5-mile radius, of the Superfund Sites, in Dallas County. The results were compared to the elementary, middle, and high schools located greater than the 5-mile radius, from the Superfund Sites, located within Dallas County. In addition, the present Study differs from the other studies in that the standardized test passing rates are backdated to the age, grades, and the possible exposure, of prospective students, in reference to the operation, closure, and cleanup activities of the Superfund Sites. Socioeconomic factors, as well as proximity of each elementary, middle, and high school (to the site) are also taken into consideration to identify impacts on the standardized test passing rates. The present Study evaluates prospective students from the Year 1994 to the Year 2002 and provides a general approach to identifying general significant relationships between the Superfund Sites and student's standardized test passing rates.

4.0 Project Objectives

In this Study, the following key objectives were investigated:

- Evaluation of the extent of lead- contaminated Superfund Sites in specific areas of Dallas County by examination of exposure correlates
- Identification of elementary, middle, and high schools located near the lead-contaminated Superfund Sites that are mostly likely impacted by lead exposure.
- Identification of possible toxicological effects of lead-contaminated Superfund Sites on children from 0 years old to 18 years of age by evaluating their standardized test passing rates and public blood lead records, as well as, socioeconomic poverty indicators
- Comparison of the impact of possible lead exposure on students in or near the lead-contaminated Superfund Sites with the students located distance from Superfund Site areas

5.0 Data Collection

In the data collection phase of this Study, the following information was collected;

- School location in ArcGIS shapefile and standardized test passing rate information for schools in Dallas County
- Lead contaminated Federal and State Superfund Sites information in Dallas County
- Blood lead level information for children in Dallas County
- Dallas County ArcGIS basemaps and shapefiles
- Socioeconomic, Population, and Census information database files for Dallas County

The ArcGIS shapefile of the schools' coordinate location and the standardized test passing rate data was provided by the Texas Education Agency. The information for the lead-contaminated Federal and State Superfund Sites located in Dallas County was provided by the Environmental Protection Agency and the Texas Commission on Environmental Quality.

The Texas Department of State Health Services provided the toxicological data of elevated childhood blood lead levels for children in Dallas County. The Dallas County ArcGIS basemap and shapefiles were provided by the North Central Texas Council of Governments and the socioeconomic, census, and population information was provided by the Unites States Census.

A table that depicts the lead contaminated Federal and State Superfund Sites in Dallas County is shown below.

Table 5.1: List of Federal and State Superfund Sites for Dallas County

Site Name	Type of Site	Type of Operations	Site Status	Is Site Currently listed?
RSR Corporation (Dallas, TX)	Federal Superfund	Lead Smelter	Site has been cleaned up with portions of the site with institutional controls and groundwater monitoring. Site NPL listing is Final	Yes
Best Plate (Hutchins, TX)	State Superfund Site	Metal Fabrication and Plating Facility	Site has been cleaned up	No
Bio-Ecology	Federal Superfund	Class 1 solid waste	Site has been cleaned up	No

Site Name	Type of Site	Type of Operations	Site Status	Is Site Currently listed?
Systems (Grand Prairie, TX)	Site	management facility		
Sampson Horrice (Dallas, TX)	State Superfund Site	Gravel Pit/Landfill That accepted solid and hazardous waste	Site has been cleaned up	No

Dallas County has four Superfund Sites that have lead/metals contamination. Two are Federal Superfund Sites and two are State Superfund Sites.

6.0 Data Gaps

Data that could not be obtained, for this Study, includes the standardized test passing rates from the Year 1950 to the Year 1993. The electronic TAAS test data was not available for all schools, during this time period, from the Texas Education Agency. The only available standardized test passing rate data was available from the Year 1994 to the present. For this Study, standardized test passing rates were evaluated from the Year 1994 to the Year 2002. Years including and beyond the Year 2003, were not included in this Study, due to a new standardized test, introduced to Texas students, in the Year 2003. When the TAKS test replaced the TAAS test, in the Year 2003, there was a significant reduction in standardized test passing rates in schools across Texas.

Another data gap is the Bestplate Superfund Site located in Hutchins, Texas. There is no standardized test passing rate data available for any years from the former Wilmer-Hutchins Independent School district, from the Texas Education Agency's website. Therefore, no analysis was conducted on the Bestplate Superfund Site because school standardized test passing rate information could not be obtained

There are also three data gaps in the childhood elevated blood lead levels data set, from the Texas Department of State Health Services (TDSHS). The earliest the data that could be provided by the TDSHS was for the Year 1999. Therefore, the data that could be used in the analysis for childhood elevated blood lead levels was from the Year 1999 to the Year 2011. As a result, childhood elevated blood lead levels for Dallas County could not be completely utilized to represent elevated blood lead levels closest to the periods each lead contaminated Superfund Site was in operation, closed, and cleaned up. Furthermore, the elevated blood lead levels data could not be evaluated in direct comparison to the schools' standardized passing rates from the Year 1994 to the Year 1998. There would be a four-year delay, in the analysis of elevated blood lead data. Even though elevated blood lead level data was obtained from the Year 1999 to the Year 2011. The elevated

childhood blood lead level analysis was conducted from the Year 1999 to the Year 2002. This analysis was ended in the Year 2002 to be consistent with the dates with the distance analysis and the socioeconomic indicators vs. the standardized test passing rate analysis.

The second data gap in the childhood elevated blood lead level data are the ages covered in the excel table. According to Texas Department of State Health Services, childhood elevated blood lead levels include the ages of children from 0 years to 14 years of age. Children that are from 15 to 18 years of age are considered as adults and the data is covered under adult lead surveillance program, with the TDSHS. Obtaining information was extremely difficult and was not available. Therefore, critical data of elevated blood lead levels from the older students that may have been impacted by the lead contaminated Superfund sites could not be investigated.

The third data gap is in the excel table, provided by TDSHS, of the counts of children with elevated childhood blood lead levels, by concentration and zip code. Any count of any concentration, of elevated blood lead, was assigned a "<5" value, if the actual count was less than 5. No numeric value was assigned to the "<5" counts. Therefore, numeric estimated values were provided in this Study, for the "<5" values, in the original spreadsheet. Details of the estimation process is located in Section 7.2.2.

7.0 Methods

As an effort to investigate the key objectives, extensive research was conducted to obtain historical and current information on lead-contaminated Federal and State Superfund Sites in Dallas County. In addition, a computerized program, created by the Environmental Systems Research Institute, called Geographic Information Systems, otherwise known as ArcGIS, was used to depict the spatial extent of lead contaminated Federal and State Superfund Sites, in Dallas County, and georeferenced them to the Dallas County basemaps and school locations within Dallas County. The specific information obtained from the use of ArcGIS include;

- Identification and Distance of the schools located within and greater than the 5-mile radius of lead- contaminated Federal and State Superfund Sites
- The childhood blood lead level concentrations "breakdown" by zip code, for zip codes located within and greater than the 5-mile radius of the Federal and State Superfund Sites
- The socioeconomic indicator "breakdown" of people that reside in zip codes located within and greater than the 5-mile radius of the Federal and the State Superfund Sites
- Population information, by age range and by zip code, for zip codes located within and greater than the 5-mile radius Federal and State Superfund Sites.

After the basemaps and the pertinent shapefiles, from all data sources, were imported into ArcGIS, for Dallas County, the data was georeferenced to the same coordinate system and projection in ArcGIS. All basemaps and shapefiles were set to the North American

Datum 1983, Texas State Plane Coordinate System North Central FIPS 4202 feet. The projection was set to the Lambert Conformal Conic.

After all necessary shapefiles were set to the same coordinate system and projection, the lead-contaminated Federal and State Superfund Sites were digitized and georeferenced in ArcGIS. Each Superfund Site's map boundaries and square mileage, provided by the Environmental Protection Agency and the Texas Council on Environmental Quality, was used to provide accuracy in digitizing the shape and area, of each Superfund Site, in ArcGIS.

After each Superfund Site was digitized in ArcGIS, the 5-mile radius buffers were established, from the centroid, of each Superfund Site in Dallas County, in ArcGIS. From here, the schools located, within and greater than, the 5- mile radius of each lead contaminated Superfund Site were identified and the comparison group of schools were established.

For the standardized test passing rates, for the schools located within and greater than the 5-mile radius of each Superfund Site, the Texas Assessment of Academic Skills (TAAS) test was the standardized test, used in this analysis, to measure the detrimental effects of the lead-contaminated Superfund Sites on the cognitive abilities of students. The TAAS test was administered from the Year 1990 to the Year 2002. In the Year 2003, the Texas Assessment of Knowledge and Skills (TAKS) test, a more comprehensive examination, replaced the TAAS test, as the standardized test, that students are required to pass in order to graduate from high school and pursue a college career. In this Study, the standardized test passing rates for the TAKS test were not used, due to a significant reduction in standardized test passing rates that occurred in Texas schools, when the TAKS test was administered. For each elementary, middle, and high school, used in this Study, the standardized test passing rates for reading and math were averaged, for each tested grade level, to provide an overall standardized test passing rate for each school.

For the blood lead level analysis, the original spreadsheet of the toxicological childhood elevated blood lead level data, was broken down by counts of children with elevated blood lead levels, by zip code. Each count of elevated blood lead level was separated into four categories; 10-14 μg/dl, 15-19 μg/dl, equal to or greater than 20 μg/dl, and total counts. The total counts of elevated childhood blood lead level consisted of all three blood lead concentrations. The spreadsheet of the toxicological data was converted to a dbase file for import and manipulation in ArcGIS. Once the dbase file was in ArcGIS, elevated childhood blood lead level maps could be created and used for further analysis. In addition, after the census data spreadsheet was converted and imported into ArcGIS, population density maps, by age, could be created and used in further analysis.

During this Study, ArcGIS was used to create tables of all elementary, middle, and high schools, located within and greater than, the 5-mile radius of each Superfund Site, in Dallas County. In addition, ArcGIS was used to create tables of all zip codes that were located within, or that intersect the 5-mile radius of each Superfund Site. The "inside radius group of zip codes", for the blood lead level analysis, were designated as zip codes

that were located within, or that intersect, the 5-mile radius of each Superfund Site, since the zip codes cover a much larger surface area, than the schools. The comparison group of zip codes, for the blood lead level analysis, were selected from zip codes, located greater than and that did not intersect, the 5-mile radius of each Superfund Site. After the all tables were created, for analysis, Statistica was used to analyze each data set.

A program created by TIBCO Software Inc, called Statistica was used to analyze the tabular data for the analysis of each Superfund site. This program was used to determine statistical significant relationships between variables for each type of analysis. Specific tasks Statistica was used for, in this Study, is listed below.

- Identification of various significant relationships between variables for socioeconomic indicators, distance, standardized test passing rates, and elevated childhood blood lead level data
- Analyze data sets with data distributions that are not normal
- Analyze data sets with a low quantity of observations using the Spearman Rank Correlation
- Create statistical graphs of analyzed results

Based on the nature of the data, all data sets did not have a normal data distribution or even a pattern of left or right skewedness. In addition to the data distribution issues, all data sets had a low quantity of observations (less than 100), for each analysis. With non-normal data sets and low quantity observations, multiple linear regressions of the data sets could not be completed. According to statistical resources, there needs to be at least 100 observations to create a good multiple linear regression model. Due to these limitations in the data, the Spearman Rank Correlation Matrix was used, in Statistica, to identify significant relationships between variables in each data set. The Spearman Rank Correlation Matrix can be used to identify significant relationships in nonparametric data (not normal) for variables that do not have a linear relationship. This correlation measures the strength and direction of the relationship between variables. The criteria needed to use the Spearman Rank Correlation includes;

- Variables must have a monotonic relationship
- Variables must be ordinal, interval, or ratio

The variables in this Study have a monotonic relationship. According Laerd, “monotonic relationship is when 1) as one variable increases the second variable increases 2) as one variable increases, the second variable decreases.” The monotonic relationships between the two variables do not have to be a liner relationship, to satisfy this condition. The variables in this Study are ratio variables, in nature, and therefore meets both criteria to use the Spearman Rank Correlation Matrix, as the method to analyze significant relationships in the data. In this Study, Microsoft Excel and Microsoft Word were used to maintain data sets and create the dissertation.

There were four analyses conducted for each lead contaminated Superfund Site located within Dallas County. The types of analysis are listed below;

- The Distance Analysis

- The Socioeconomic Indicators vs. Blood Lead Level Analysis
- The Socioeconomic Indicators vs. Standardized Test Passing Rate Analysis
- The Blood Lead Level Analysis vs. Standardized Test Passing Rate Analysis

A comparison analysis was conducted for each analysis, listed above, to identify trends in the elevated childhood blood lead levels and the standardized test passing rates, of the data sets that represent data inside of the 5-mile radius of the Superfund Sites. By comparing this data to the elevated childhood blood lead levels and the standardized test passing rates, of the schools and the zip codes, located greater than the 5-mile radius of each Superfund Site, trends can be identified. The units of analysis, for the comparison analysis, are the distance schools are located from the centroid of each Superfund Site, the socioeconomic indicators, by zip code, the standardized test passing rates, of elementary, middle, and high schools, and the elevated childhood blood lead levels, of zip codes and schools, that are located greater than the 5- mile radius of each Superfund Site. The comparison group of schools and zip codes, were randomly selected from all cardinal directions of each Superfund site and cover various economic areas. It was not possible to create a comparison group, with many observations, of the same economic level as the economic level, of the schools and zip codes, located within the 5-mile radius of each Superfund Site, because all 3 Superfund Sites are located in low economic areas. In addition, some of the Superfund Site's 5-mile radiuses overlap. The standardized test passing rates and the schools evaluated, were from public schools in regular independent school districts. Even though Highland Park is a public independent school district, all Highland Park schools were removed from the study, due to the extreme wealth and academic advantage the students have over other regular independent school districts. All private, charter, and magnet schools were not included in this Study, due to an unfair academic advantage these schools have over the regular independent school districts. In addition, no special education, alternative, and Spanish test passing rate data were included in the overall passing rate for each school. Only English reading and math standardized tests were considered in the Study because Spanish tests were not provided at all schools.

The comparison group of data consists of one high school, one middle, and two elementary schools from the majority school districts located in all cardinal directions of each Superfund Site. In the event that the district did not have a high school or middle school within the district, an additional high school or middle school was used from a neighboring school district.

The 5-mile radius was utilized as the standard boundary for the comparison group, in all analyses, because if the radius was reduced to 2 miles, as specified in the research in the document review, there would be fewer observations of schools and fewer zip codes to conduct the analysis. In addition, some zip codes, in the analysis, cover a large surface area, which would further reduce the number of observations in the analysis. An extremely small quantity of observations would negatively affect the results of this Study. Therefore, the 5-mile radius was used as the standard boundary in this Study.

The distance analysis' units of analysis are the distance each school is located from the centroid of each Superfund Site, and the standardized test passing rates for elementary, middle, and high schools located within the 5-mile radius of each Superfund Site. The distance analysis consisted of identifying trends in standardized test passing rates for elementary, middle and high schools located within the Superfund Site's 5-mile radius, before the Superfund Site was cleaned up, and after the Superfund Site was cleaned up. These results were compared to the standardized test passing rates for elementary, middle and high schools located greater than the 5-mile radius of each Superfund Site. The analysis was conducted from the Year 1994 to the Year 2002. The analysis began in the Year 1994 because the Year 1994 was the earliest year electronic test passing rate files could be obtained from the Texas Education Agency. The analysis ends in the Year 2002 because the standardized test changed from the TAAS test to the TAKS test in the Year 2003. In the year 2003, standardized test passing rates for schools located within and outside the Superfund Sites dropped significantly. The standardized test passing rates, included in this Study, were backdated to the ages and grade level the prospective students were in, before and after, the Superfund Sites were cleaned up, as an effort to identify possible lead exposure, earlier in life.

The socioeconomic indicators vs. blood lead level analysis' unit of analysis are the socioeconomic indicators, by zip code, and the elevated childhood blood lead levels, for children from 0 years to 14 years of age, by zip code, for zip codes, located within or that intersect, the 5-mile radius of each Superfund Site. The socioeconomic indicators vs. blood lead level analysis consists of identifying trends in socioeconomic indicators and in the counts of elevated childhood blood lead levels, by zip code and comparing the results to the socioeconomic indicators and counts of elevated childhood blood lead level with the zip codes located greater than the 5-mile radius of each Superfund Site. The analysis was conducted from the Year 1999 to the Year 2002. The analysis started in the Year 1999 due to the earliest childhood blood lead level data that could be obtained from the Texas Department of State Health Services is the Year 1999. The analysis ended in the Year 2002 to stay consistent with the other ending dates of the other analyses.

The socioeconomic indicators vs. standardized test passing rate analysis' unit of analysis are the socioeconomic indicators, by zip code, and the standardized test passing rates for elementary, middle, and high schools, located within the 5-mile radius of each Superfund Site. The socioeconomic indicators vs. the standardized test passing rate analysis is similar to the socioeconomic indicators vs. blood lead analysis, except the socioeconomic indicators are analyzed with the standardized test passing rates for elementary, middle, and high schools, located within a 5-mile radius of each Superfund Site, and the results were compared to the standardized test passing rates for elementary, middle, and high schools located greater than 5-miles from the Superfund Sites. The standardized test passing rates were backdated to the ages and grade level the prospective students were in, before and after, the Superfund sites were cleaned up as an effort to identify possible lead exposure, earlier in life. This analysis starts from the Year 1999 to the Year 2002 to be consistent with the other analysis.

The blood lead level vs. standardized test passing rates analysis' unit of analysis are the elevated childhood blood lead level, by zip code, and the standardized test passing rates of children from ages 0 yrs to 14 yrs of age, averaged by zip code. The blood lead level vs. the standardized test passing rate analysis consists of identifying trends in the elevated childhood blood lead levels with the standardized test passing rates for the elementary, middle, and high schools located within the 5-mile radius of each Superfund Site. Then, comparing the results to the elevated childhood blood level and the standardized test passing rates for elementary, middle, and high schools, located greater than the 5-mile radius of the Superfund Sites. The analysis begins from the Year 1999 to the Year 2002 to be consistent with the other analysis. For this analysis, the variables could not be directly related, for significant relationships, because the time period is too short to properly backdate the blood lead levels and compare them to the standardized test passing rates. An indirect analysis could be conducted under the assumption that the counts of elevated childhood blood lead levels counts for the Year 1999 to the Year 2002 are similar to the counts of elevated childhood blood lead levels before the Year 1999.

7.1 Background Information Childhood Elevated Blood Lead Data

The Texas Department of State Health Services acquires and stores elevated and non-elevated blood lead level data for adults and for children that reside within the State of Texas. The adult blood lead level data is maintained under the Adult Blood Lead Epidemiology and Surveillance Program (ABLES) that consists of people from ages 15 years and over. The children blood lead data is maintained under the Texas Childhood Lead Poisoning Prevention Program (TXCLPPP), which consist of people from age 0 the age 14 years. According to the Centers for Disease Control, "No safe blood lead level in children has been identified". "The reference level at which the CDC recommends public health actions be initiated is greater than 5 μg/dl." "CDC's Childhood Lead Poisoning Prevention Program is committed to the Healthy People 2020 goals of eliminating blood lead levels greater than or equal to 10 μg/dl and differences in average risk based on race and social class as public health concerns." According to the Texas Administrative Code, Title 25, Part1, Chapter 37, Rule 37.334 (adults) and Texas Administrative Code Title 25, Part1, Chapter 99, Rule 99.1 (children), all healthcare facilities, including clinics, doctors, hospitals, physicians and laboratories are required to report elevated and non-elevated blood lead level to the Texas Department of State Health Services. For this Study, the childhood elevated blood lead level was analyzed. The adult elevated blood lead data, from ages 15-18 was not available from the TDSHS.

According to the TDSHS, all of the following individuals/ facilities are require to report all blood lead results; "

- Physicians
- Any persons in charge of a clinical or hospital laboratory, blood lab, mobile unit or other facility in which a laboratory examination reveals evidence of the reportable disease
- Health Professionals
- Administrator of a hospital
- Professional Registered Nurse

- Administrator or Director of a public health or private child care facility
- Administrator of a home health agency
- Administrator or Health Official of a public or private camp, home or institution
- Parent, Managing Conservator, or Guardian" (TDSHS, 2018)

The process of the TDSHS acquiring elevated and non elevated blood lead data begins when the child visits a doctor, hospital, physician, clinic or healthcare facility. The reporting guidelines and screening criteria, the TDSHS uses to acquire elevated childhood blood lead data is shown in the TDSHS Childhood Lead Screening Guidelines flow chart, located in Appendix A. In the flow chart, there are 2 main paths in the process of determination of what child is tested for lead; children that are enrolled in Medicaid/ Texas Health Steps, and children that are not enrolled in Medicaid//Texas Health Steps.

For the children that are enrolled in Medicaid/ Texas Health Steps, children are required to be tested for lead, via a capillary or a venous blood lead test, at 12 and 24 months of age, or tested between 12 months of age to 6 years of age, in the event that the child was never tested. Another method the Texas Department of State Health Services uses, to test children enrolled in Medicaid/ Texas Health Steps for lead, is the Lead Risk Screening Questionnaire. The Lead Risk Screening Questionnaire, located in Appendix A, determines if a child may have had lead exposure based on the age of buildings visited, remolding activities that have occurred in buildings visited, type of work or hobby the parent is involved in or around, if the child is a foreign refugee or refugee adoptee, and the use of products from other countries. Based on the responses to the questionnaire, the child may be tested for lead at all checkups from age 0 years to 6 years.

For the children that are not enrolled in Medicaid/ Texas Health Steps, the first item the medical personnel must determine is if a child resides in a targeted area. According to the Texas Department of State Health Services, the targeted areas represent "

- Areas with > or = 27% of housing built before 1950, and
- Areas with > or =3 % of children tested for lead at ages 1 and 2 with a blood lead level > or = 5 μg/dl."

These targeted areas are designated in zip code boundaries, which are further "broken down" by zip code, in the zip code boundary map. Copies of zip code boundary maps are shown in Appendix A.

In the event that the child does not reside in a targeted area zip code, then the Lead Risk Questionnaire must be completed when the child is age 6,12, and 24 months, as well as 3 and 4 years of age. However, if the parent requests a blood lead test for their child, a capillary or venous blood lead test must be given, immediately upon request.

In the event that a child resides within a targeted area zip code, then the medical personnel must administer a capillary or venous blood test when the child is 6, 12, and 24 months of age, as well as, when the child is 3 and 4 years of age. Additional testing would be required if the child had a change in risk exposure or if the child had an abnormal blood lead test.

7.2 Analysis

Dallas County contains a total of three lead contaminated Superfund Sites. A list of each lead contaminated Superfund Site is shown below.

- RSR Corporation (Dallas, Texas)
- Sampson Horrice (Dallas, Texas)
- Bio-Ecology (Grand Prairie, Texas)

The Bestplate Superfund Site was not included in the Study because no school passing rate information was available, for the former Wilmer-Hutchins School District. The table below shows the type of operations, the contaminants of concern, the media of contamination, the dates of operation, and the cleanup dates for each Superfund Site.

Table 7.1: Detailed Information on Superfund Sites in Dallas County

Site Name	Type of Operations	Contaminants of Concern	Media of Contamination	Dates of Operation	Dates of Clean up
RSR Corporation (Dallas, TX)	lead smelter	antimony, arsenic, cadmium, lead	soil and air	1934-1984	1991-1994
Bio-Ecology Systems (Grand Prairie, TX)	industrial class 1 solid waste management facility	arsenic, benzene, lead, cyanide, methylene chloride, naphthalene, toluene, trichloroethylene	soil, and groundwater	1972-1978	1983-1988
Sampson Horrice (Dallas, TX)	former gravel pit/landfill that illegally accepted solid and hazardous waste	metals, organics, pesticides	soil surface water, groundwater	1983-1984	1999-2000

There were four different analysis conducted for each site; the Distance Analysis, the Socioeconomic Indicators vs. Blood Lead Level Analysis, the Socioeconomic Indictors vs. Test Passing Rate Analysis, and the Blood Lead Level vs. Test Passing Rate Analysis.

All four analyses' data were compared to the data of schools and zip codes located greater than the 5-mile radius of each Superfund Site, to identify trends in the data located in close proximity of each lead contaminated Superfund Site. A detailed table of the Superfund Sites is located in Appendix B.

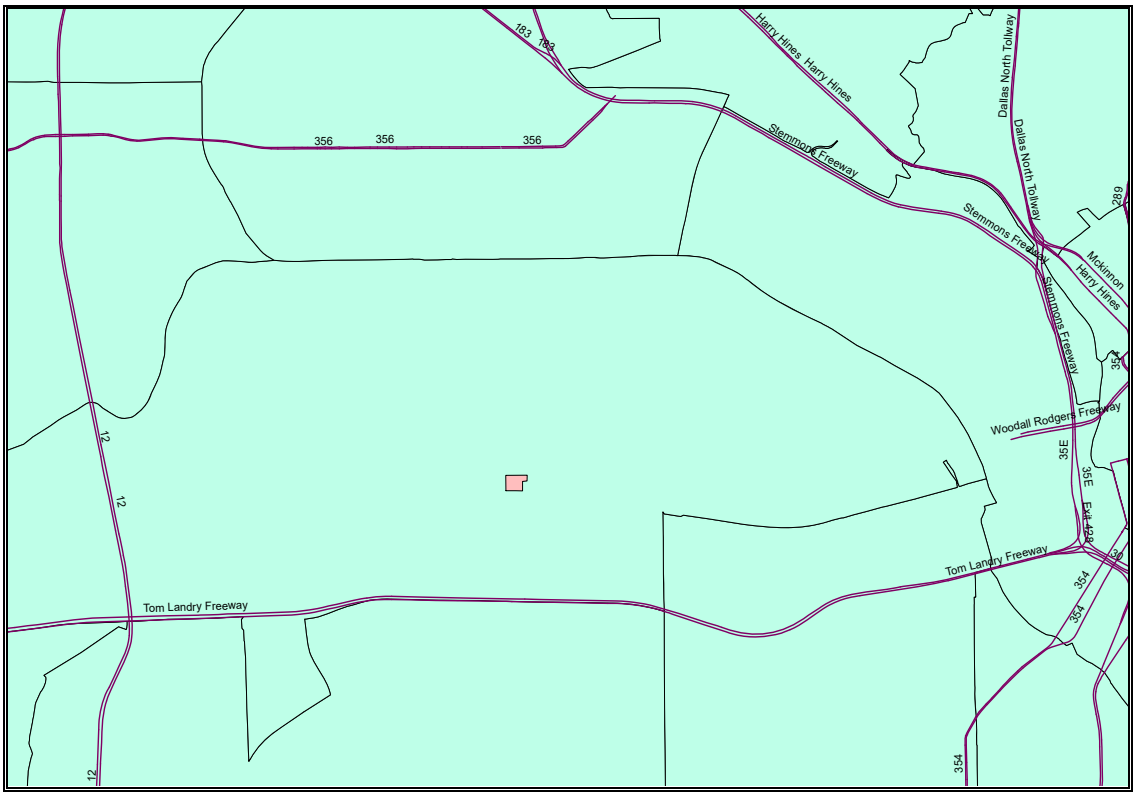
The Distance Analysis consisted of evaluating if a significant relationship exists between the distance the schools are located from the Superfund Sites, and the standardized test passing rates, of those schools, located within a 5-mile radius of each Superfund Site. The Socioeconomic Indicators vs Blood Lead Level Analysis evaluate whether socioeconomic indicators, as well as distance, have a significant relationship with the counts of elevated blood lead levels in children that reside within a 5-mile radius of the lead contaminated Superfund Sites. The Socioeconomic Indicators vs Test Passing Rate Analysis consisted of evaluating whether socioeconomic indicators, as well as distance, have a significant relationship with the percentage of standardized test passing rates, for schools located within a 5-mile radius of the Superfund Sites. The Blood Lead Level vs Test Passing Rate Analysis consisted of evaluating if there is a significant relationship between the counts of elevated childhood blood lead levels, and the student percentage standardized test passing rate, of students located within a 5-mile radius of each lead contaminated Superfund Site.

As previously stated, all four analyses were compared to a comparison group of test passing rates and blood lead levels, from zip codes and schools, that are located greater than the 5-mile radius of each lead contaminated Superfund Site. The comparison group measures potential trends of the lead contaminated Superfund Sites on areas located in close proximity, of the Superfund Sites, by comparing to standardized test passing rates and blood lead level data to schools and zip codes located greater than the 5-mile radius of each Superfund Site.

7.2.1 RSR Superfund Site and Distance Analysis

The RSR Corporation Superfund Site study area extends 13.6 square miles in West Dallas. The site is bounded on the north and on the east by the Trinity River, bounded on the west by Loop 12, and bounded on the south by Fort Worth Avenue and Interstate 30. The site consists of multi-family and single family housing, as well as, commercial and retail establishments. A map of the RSR Corporation Site is shown below in Figure 7.1.

Figure 7.1 RSR Site Map



The map was created in ArcGIS. The RSR Site boundary is the digitized pink polygon, in the center of the map. Even though the Environmental Protection Agency's study area for the RSR Site is much greater, than the previous site boundary, the remediation and the site cleanup activities far exceeded the property boundary, of the former RSR Lead Smelter Facility.

The RSR Corporation Site was a lead smelter that operated from the Year 1934 to Year 1984. The facility accepted lead bearing materials and lead acid batteries to produce lead bars, according to customer specifications. Lead contamination occurred in the air, water, and the soil. The facility is currently listed on the National Priorities List, a federal list of Superfund Sites that have severe contamination. The metal contaminants of concern were antimony, arsenic, cadmium, and lead. The RSR Site was cleaned up from the Year 1991 to the Year 1994. Some remediation and cleanup activities include the excavation and removal of excavated soils, backfilling with clean soils, remediation of contaminated soils, capping of soils, and groundwater well monitoring. Currently, operation and maintenance procedures are ongoing. The site is in the final stages for federal delisting. During cleanup activities, some homeowners refused to allow the Environmental Protection Agency to remove contaminated soils from their property. A table providing detailed site information of the RSR Superfund Site is shown below.

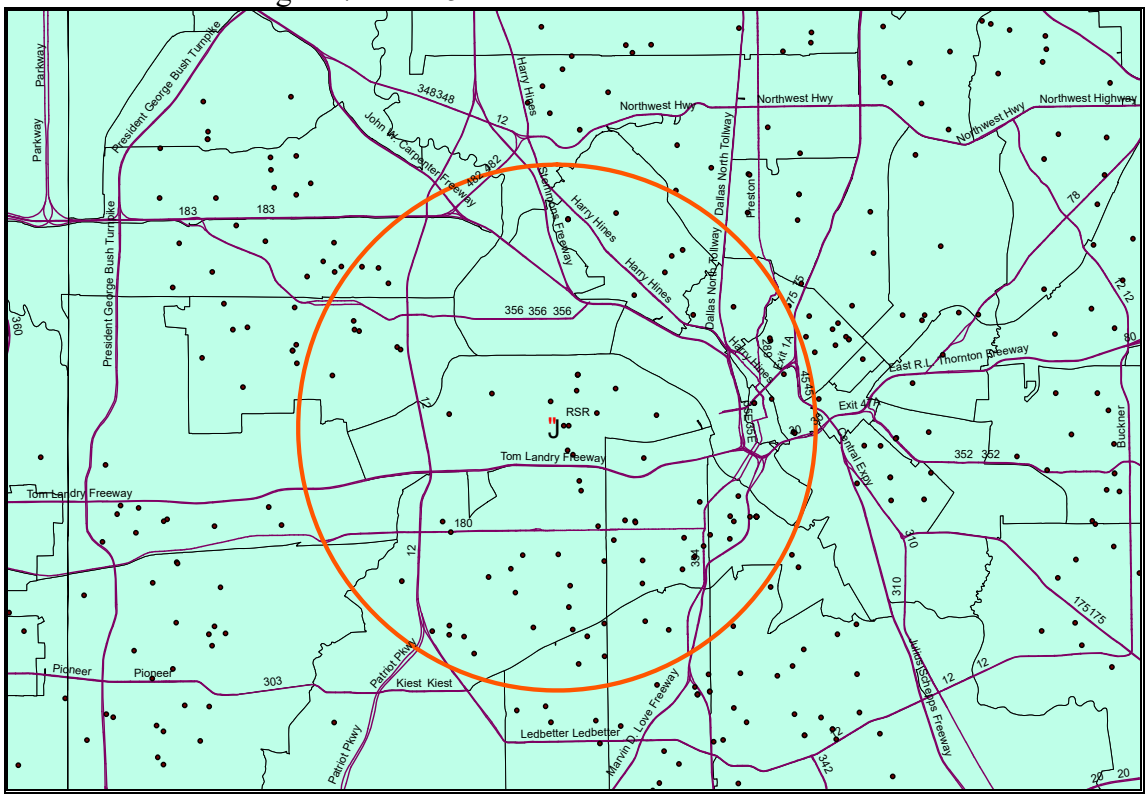
Table 7.2: RSR Superfund Site Brief Synopsis

Site Name and Location	Type of Superfund Site	Type of Facility	Size of facility	List of operations	Dates of Operation	List of contaminants	Media of contamination	Clean up start date	Clean up end date	Other info
RSR Dallas, TX (Dallas County)	Federal	Lead smelter	13.6 sq miles (they are including the study area)	processed spent car batteries and scrap lead.	1934-1984	ANTIMONY, ARSENIC, CADMIUM, LEAD	soil, water, air	1991	1994	Wind transported lead dust from the smelter into nearby parks, schools and neighborhoods, facility had a smoke stack

7.2.1.1 Schools

During the analysis of the RSR Corporation Site, ArcGIS was utilized to identify all elementary, middle, and high schools located within a 5-mile radius of the Superfund Site, by setting up a buffer. Five miles was used as the "close proximity" standard, in this Study, to allow for an adequate number of observations to conduct analysis. Figure 7.2 shows the schools located, within and greater than, the RSR Site 5-mile radius. The "dots" in the map show individual school location, in reference to the RSR Site and 5-mile radius buffer.

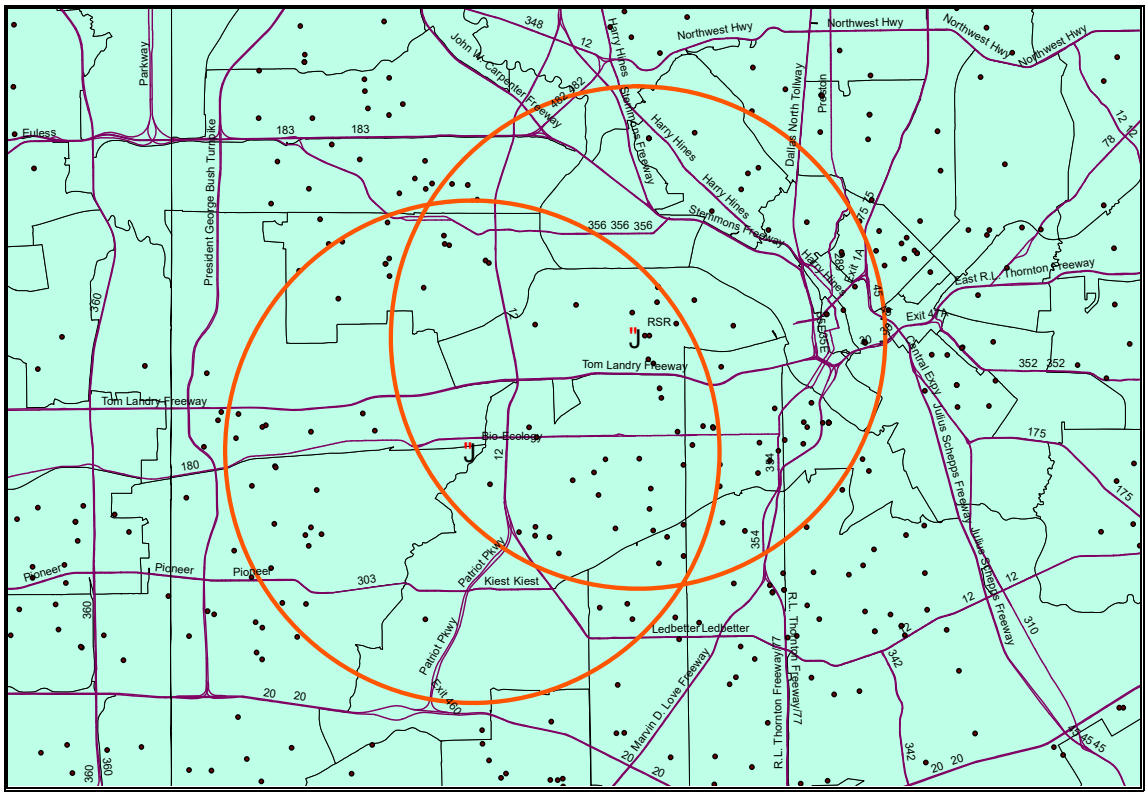
Figure 7.2 The 5 Mile-Radius Schools for RSR Site



Schools were selected from the 5-mile radius, of the centroid, of the RSR Superfund Site's digitized polygon. In this Study, some schools were located within the RSR Site

and the Bio-Ecology Sites' 5-mile radius buffers, due to the overlap of the 5-mile radius of both sites. During the analysis, it was determined that the RSR Superfund Site had a greater impact on the residents, located within both 5-mile radius buffers, due to the long duration of operations of the RSR Site, than the Bio-Ecology Site, and due to the air dispersion of emissions from the smoke stack, of the RSR Site. In addition, the RSR Site had a greater impact on the residents located within both the RSR and the Bio-Ecology's 5-mile radius buffers because the RSR Site's cleanup activities, covered a larger surface area, than the Bio-Ecology Site. Section 7.2.9 provides additional information on the Bio-Ecology Site. A map of the overlapping 5-mile radius buffers for the RSR Site and the Bio-Ecology Site is shown below. In the figure below, there are a large quantity of schools shared between the RSR and the Bio-Ecology's 5- mile radius buffers.

Figure 7.3 The 5-Mile Radius Overlap between the RSR Site and Bio-Ecology Site



7.2.1.2 RSR Distance Analysis

In the distance analysis, the standardized test passing rates, from the schools located within the 5-mile radius, of the RSR Site, are compared to the standardized test passing rates, of schools located greater than the 5-mile radius of the RSR Site. The distance analysis determines if proximity from the lead contaminated Superfund site has a significant relationship on each school's standardized test passing rates.

There are 62 schools located, within the 5-mile radius, of the RSR Superfund Site. The schools consist of 39 elementary schools, 9 middle schools, and 14 high schools. These numbers do not reflect the total number of schools located within the RSR Site's 5-mile radius because all magnet and private schools were removed from the Study.

The students, in Texas schools, take the standardized test in the 3rd grade, the 4th grade, the 5th grade, the 7th grade, the 8th grade, and the 10th grade. Students that do not initially pass the test are required to retest later the same year or the following year, until the student passes the standardized test.

The table below shows the year born, the grade, the age and year that prospective students, attending the schools located within the RSR Site's 5-mile radius, would have taken the standardized test. The table "back dates", the prospective elementary, middle, and high school students, back to the year the prospective students were born, the ages, and the grades, they were in, in reference to the time frame the RSR site was in operation, was closed, and was cleaned up. The table helps identify possible exposure, of prospective students, to the RSR Site, that might have occurred when the prospective students were young children, and possibly had their cognitive abilities compromised, assuming that the prospective students did not move out of the area.

Table 7.3: Distance Analysis: Prospective Students Possibly Effected by the RSR Site

Don't have laboratory data for 18 year olds		
Grade	Age(yrs)	Year
Born	0	1976
Pre-K	5	1981
5th	11	1987
6th	12	1988
8th	14	1990
9th	15	1991
12th	18	1994

The 14 year olds effected earliest		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born 4 years before RSR closed		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born 3 years before RSR closed		
Grade	Age(yrs)	Year
Born	0	1981
Pre-K	5	1986
5th	11	1992
6th	12	1993
8th	14	1995
9th	15	1996
12th	18	1998

Students Born 2 years before RSR closed		
Grade	Age(yrs)	Year
Born	0	1982
Pre-K	5	1987
5th	11	1993
6th	12	1994
8th	14	1996
9th	15	1997
12th	18	2000

Students Born 1 yr before RSR Closed		
Grade	Age(yrs)	Year
Born	0	1983
Pre-K	5	1988
5th	11	1994
6th	12	1995
8th	14	1997
9th	15	1998
12th	18	2001

Students born the Year RSR Closed		
Grade	Age(yrs)	Year
Born	0	1984
Pre-K	5	1989
5th	11	1995
6th	12	1996
8th	14	1998
9th	15	1999
12th	18	2002

Students Born 1 yr after RSR Closed		
Grade	Age(yrs)	Year
Born	0	1985
Pre-K	5	1990
5th	11	1996
6th	12	1997
8th	14	1999
9th	15	2000
12th	18	2003

Students Born the Year RSR Clean -Up Start date		
Grade	Age(yrs)	Year
Born	0	2000
Pre-K	5	2005
5th	11	2011
6th	12	2012
8th	14	2014
9th	15	2015
12th	18	2018

Students Born the Year RSR Clean -Up End date		
Grade	Age(yrs)	Year
Born	0	2004
Pre-K	5	2009
5th	11	2015
6th	12	2016
8th	14	2018
9th	15	2019
12th	18	2022

Students Born one Year after RSR Clean- Up End Date		
Grade	Age(yrs)	Year
Born	0	2005
Pre-K	5	2010
5th	11	2016
6th	12	2017
8th	14	2019
9th	15	2020
12th	18	2023

The RSR Corporation Site was in operation from the Year 1934 to the Year 1984. The "Clean Up" activities, for the RSR Site, commenced in Year 1991 and ended in Year 1994. Based on the table above, prospective students born in the Year 1934 until the Year 1984, most likely had exposure to lead particulate matter, in the air, and deposition of lead in the soil, due to the smoke stack from the lead smelting activities, from the RSR Site. The prospective students born, during the time of the RSR Site's operation, until the RSR Site's closure (Year 1934 to Year 1984), which resided within the RSR Site's 5-mile radius, would have been in middle and high school, college, and beyond, assuming

that the prospective students did not move outside of the RSR Site's 5-mile radius. According to the table above, prospective students born in the Year 1979 to the Year 1984 were in middle and high school and their standardized test passing rates can measured in the standardized tests administered in the Year 1994 to Year 2002.

According to the table above, the prospective students born the year the RSR Site closed (Year 1984) until the year the RSR Site was "cleaned-up" (Year 1994) would have been in high school, middle school and elementary school, and might have had detrimental effects to lead exposure in the soil. Their standardized test passing rates can be measured, during the Year 1994 to the Year 2002, assuming that the prospective students did not move away from the area. In addition, the lead smelter, of the RSR Superfund Site, might have effected prospective students that moved within the RSR Site's 5-mile radius, from the Year 1934 to Year 1994.

In the data analysis, the schools were separated into two groups; middle and high schools, and elementary schools, respectively. The separation was made to identify the significant relationships, of the older students, that might have been effected by the RSR Site, from the younger, elementary students, that may have not been effected by the RSR Site, when the Site was in operation, closed, and cleaned up.

The earliest electronic standardized test passing rate data, obtained from the Texas Education Agency, for this Study, was for the Year 1994. Therefore, the standardized test passing rates were evaluated, for the Distance Analysis, from the Year 1994 to the Year 2002. Years beyond the Year 2002 were not analyzed because a new standardized test, the TAKS test replaced, the TAAS test, in the Year 2003. There was a significant "drop" in schools' standardized test passing rates, across Dallas County.

7.2.1.3 RSR Site Distance Analysis for Middle and High Schools Located Within the RSR Site's 5-mile Radius

The distance analysis consists of evaluating the standardized test passing rates, of the schools located within the 5-mile radius of the RSR Site, and the linear, radial, distance of these schools to the RSR Site, as an effort to determine if there is a significant relationship between the schools proximity to the Superfund Site and the standardized test passing rate. The results, of the distance analysis, were compared to a comparison group of middle and high schools, located greater than the 5-mile radius of the RSR Superfund Site, to determine if the schools located closer to the RSR Site had lower standardized test passing rates, due to possible lead exposure.

A table of the middle and high schools, located within the RSR Site's 5-mile radius, and each school's corresponding standardized test passing rates is shown below.

Table 7.4: RSR Distance and Test Passing Rates for Middle and High Schools Located Within the RSR Site's 5-mile Radius

	RSR Distance and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (5)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR Year 1999 (%)	PR Year 2000 (%)	PR Year 2001 (%)	PR Year 2002 (%)
DALLAS ISD	EDISON LEARNING CENTER	75212	0.2	21.8	15.1	18.1	22.5	25.6	36.1	45.0	35.4	59.9
DALLAS ISD	L G PINKSTON H S	75212	0.8	28.3	34.5	30.5	44.3	61.4	65.6	71.8	74.1	82.7
DALLAS ISD	RAUL QUINTANILLA MIDDLE	75211	1.1					54.1	55.7	38.1	47.1	68.2
DALLAS ISD	SUNSET H S	75208	2.4	26.1	29.7	40.0	47.6	53.1	49.4	60.6	58.7	54.1
DALLAS ISD	W E GREINER MIDDLE	75208	3.0		23.7	41.0	50.4	61.3	54.8	45.3	53.6	63.2
DALLAS ISD	W H ADAMSON H S	75203	3.6	20.2	23.6	23.6	45.5	47.4	43.4	47.3	52.3	57.7
DALLAS ISD	L V STOCKARD MIDDLE	75211	3.9	22.1	20.5	36.7	39.5	44.6	46.9	36.0	43.6	63.8
DALLAS ISD	THOMAS J RUSK MIDDLE	75235	4.0	23.4	21.1	21.9	33.0	49.7	56.6	51.6	57.4	60.6
IRVING ISD	BOWIE MIDDLE	75060	4.4	63.6	59.3	62.1	69.2	74.4	78.1	77.4	78.0	80.1
IRVING ISD	NIMITZ H S	75060	4.4	70.8	73.5	70.0	72.0	80.8	81.3	84.9	85.0	86.5
DALLAS ISD	WILLIAM B TRAVIS MIDDLE	75204	4.5	25.3	21.6	56.5	55.2	59.5		98.9		97.7
DALLAS ISD	MOISES MOLINA H S	75211	4.5					58.1	63.6	61.1	61.9	73.9
IRVING ISD	AUSTIN MIDDLE	75061	4.8	68.4	63.7	64.4	64.2	71.8	75.9	78.2	77.4	83.1
			Average =	**37.0**	**35.1**	**42.3**	**49.4**	**57.1**	**59.0**	**61.2**	**60.4**	**71.7**

In the table, the distance from the RSR Site, measured in miles, and the standardized test passing rates, per year, measured in percentage, is shown across the top of the table and the school district name, campus name, and the zip code the school is located in, is shown on the left side of the table. The dark grey shaded cells, in the table, denote years that the school was not opened or the year the school may have been repurposed, by changing the school's grade level, address, etc., which required the existing school number, designated within the Texas Education Agency, to be issued a new school number. In the instance that the school number changed, the campus level standard test passing rates were documented and reported, within the Texas Education Agency, on the district level, and not on the campus level. As the years increase, the test passing rates for the middle and high schools gradually increase .The standardized test passing rates range from 37%, in the Year 1994 to 71.7%, in the Year 2002.

A statistical program, called Statistica, was used to evaluate the data. Due to the nature of the data, a Spearman Rank Correlation Matrix was utilized to analyze the data. The data set does not have a normal data distribution and the variables have a monotonic relationship that is not a linear relationship. In addition, there are a low number of observations. According to the statistical resources, there needs to be a total of 100 observations for a good linear regression model. The limitations in the data, do not meet the criteria for a bivariate linear or multi linear regression analysis. Therefore, the Spearman Rank correlation matrix analysis was used. Under the Spearman Rank Correlation, there is no explanatory variable and response variable, but a test to check if there is a significant positive or negative relationship between two variables. The Spearman Rank Correlation Matrix, for middle and high schools, located within the RSR Site's 5-mile radius is shown below.

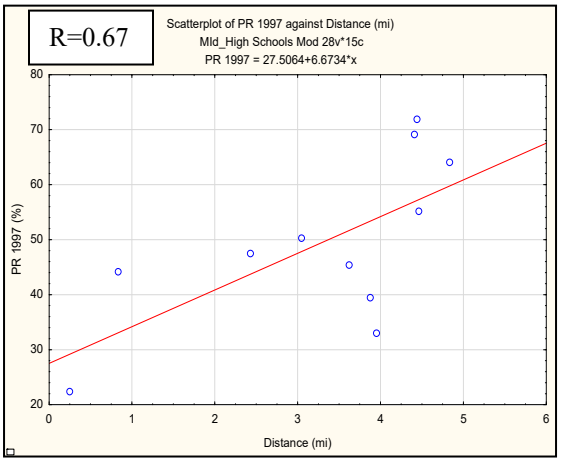
Table 7.5: RSR Correlation Matrix of Distance vs. Standardized Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of RSR Site

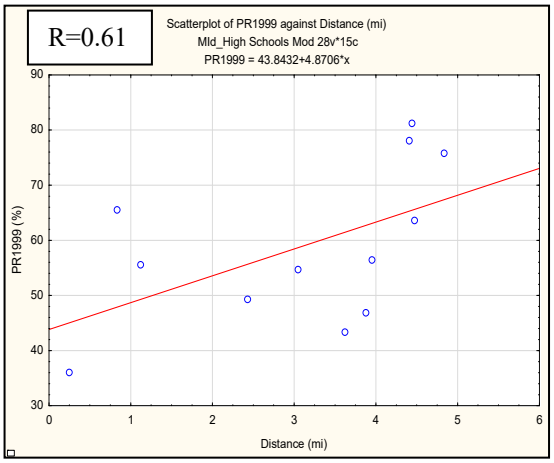
Variable	Spearman Rank Order Correlations (RSR Mid_High Schools Mod) MD pairwise deleted Marked correlations are significant at p <.05000									
	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR Year 1999 (%)	PR Year 2000 (%)	PR Year 2001 (%)	PR Year 2002 (%)
Distance (mi)	1.00	0.25	0.22	0.39	0.67	0.46	0.61	0.63	0.61	0.58
PR Year 1994 (%)	0.25	1.00	0.89	0.88	0.78	0.94	0.95	0.77	0.93	0.62
PR Year 1995 (%)	0.22	0.89	1.00	0.83	0.83	0.93	0.88	0.68	0.95	0.45
PR Year 1996 (%)	0.39	0.88	0.83	1.00	0.95	0.84	0.76	0.71	0.77	0.68
PR Year 1997 (%)	0.67	0.78	0.83	0.95	1.00	0.86	0.75	0.75	0.81	0.59
PR Year 1998 (%)	0.46	0.94	0.93	0.84	0.86	1.00	0.92	0.75	0.90	0.75
PR Year 1999 (%)	0.61	0.95	0.88	0.76	0.75	0.92	1.00	0.84	0.92	0.87
PR Year 2000 (%)	0.63	0.77	0.68	0.71	0.75	0.75	0.84	1.00	0.97	0.72
PR Year 2001 (%)	0.61	0.93	0.95	0.77	0.81	0.90	0.92	0.97	1.00	0.70
PR Year 2002 (%)	0.58	0.62	0.45	0.68	0.59	0.75	0.87	0.72	0.70	1.00

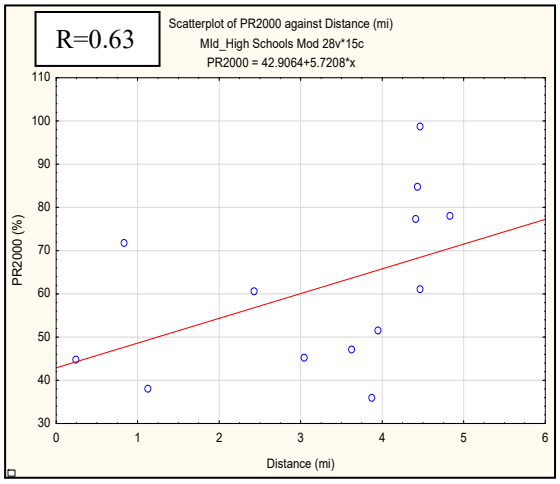
In correlation matrix, variable one is the distance, measured in miles and variable two are the standardized test passing rates, in percentage. Each variable is shown along the left side of the matrix and across the top of the matrix. The numeric values, in the center of the matrix, represent the correlation coefficient or R value of the corresponding variables on along the side and top of the table. All values shown in red, represent significant relationships. The higher the red value in the table, the stronger the significant relationship between the two variables. For the distance analysis, distance and the standardized test passing rates were evaluated for a significant relationship.

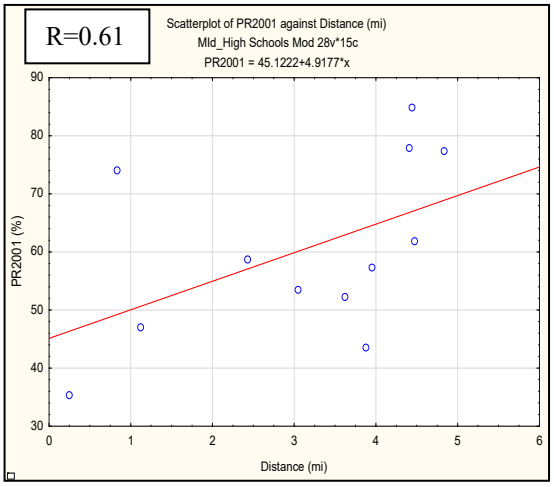
Based on the correlation matrix above, there is a strong significant relationship between the distance and the standardized test passing rate for the Year 1997, the Year 1999, the Year 2000, the Year 2001, and the Year 2002. The prospective students, that took the standardized test during these years, would have been born before the RSR Site closed (Year 1984) and before the RSR Site was "cleaned up" (Year 1994). There is a strong possibility that the prospective students, of the middle and high schools, could have suffered cognitive damage, when they were younger children, from the lead smelter of the RSR Site, given that the prospective students did not move out of the area. In addition, prospective students that moved within the 5-mile radius of RSR Site, could have possibly been exposed to lead, due to air and soil pollution, from the lead smelter, of the RSR Site. The reason the standardized test passing rates for the Year 1994, Year 1995, Year 1996, and the Year 1998 do not have significant relationships, may be the result of prospective students moving outside of the RSR Site's 5-mile radius, prospective students entering college, and/or other socioeconomic factors. The bivariate plots of the significant relationships for linear distance vs. the standardized test passing for the Year 1997, Year 1999, Year 2000, Year 2001, and Year 2002 are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

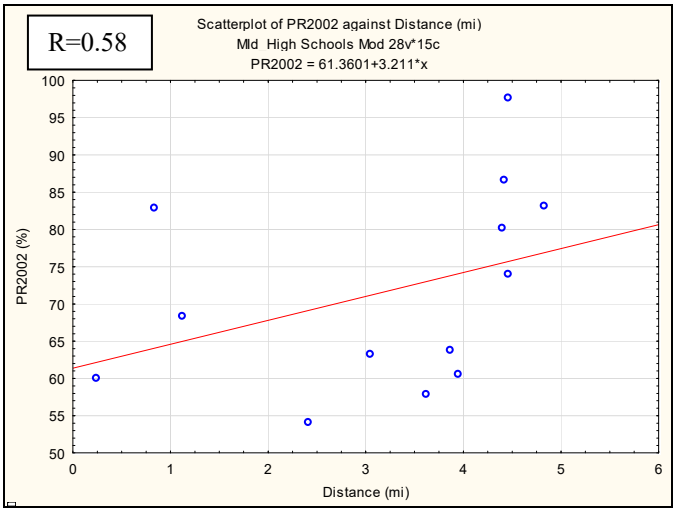
Graph 7.1- Graph 7.5: RSR Distance Analysis: Linear Distance To RSR Site vs Standardized Test Passing Rates for the Year 1997, 1999, 2000, 2001, and 2002











Based on all graphs, there is a positive relationship between the linear distance from the RSR Site and the standardized test passing rates. As the linear distance of the schools,

from the RSR Site increases, the standardized test passing rates increase. This indicates that there is a possibility that the students that took the TAAS test, in the Year 1997, the Year 1999, the Year 2000, the Year 2001, and the Year 2002 could have been exposed to lead, which later may have resulted in lower standardized test passing rates, due to their cognitive abilities possibly compromised.

7.2.1.4 RSR Comparison Group Distance Analysis for Middle High Schools Located Greater than the 5-mile Radius of the RSR Site (Comparison Group)

The comparison group of schools were selected from all cardinal directions from the RSR Site, but were located greater than the 5-mile radius from the RSR Site. A list of middle and high schools, used for the comparison group is depicted below.
Table 7.6: RSR Distance and Standardized Test Passing Rates for Middle and High Schools Located Greater than the 5-mile Radius of the RSR Site.

	RSR Distance and Middle and High School Test Passing Rates for Schools Greater than 5 miles											
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
CARROLLTON-FARMERS BRANCH ISD	SMITH H S	75006	13.9	67.6	74.1	81.5	80.9	84.5	79.9	81.1	85.4	88.1
CARROLLTON-FARMERS BRANCH ISD	LONG MIDDLE	75287	15.1	77.2	80.0	84.9	84.1	88.9	87.6	91.2	85.7	86.8
CEDAR HILL ISD	CEDAR HILL H S	75104	14.3	60.7	59.7	67.2	75.8	72.7	76.6	79.2	85.1	91.2
DUNCANVILLE ISD	J HERMAN REED MIDDLE	75116	9.1	62.0	56.3	59.6	64.5	67.1	71.3	69.3	72.7	77.2
COPPELL ISD	COPPELL MIDDLE WEST	75019	13.3	83.5	83.7	82.8	85.9	92.8	87.2	90.1	92.3	91.5
COPPELL ISD	COPPELL H S	75019	15.4	79.1	84.6	80.7	86.7	90.5	87.6	92.1	90.5	91.5
DALLAS ISD	W T WHITE H S	75244	9.8	55.3	47.2	60.3	61.3	65.1	71.5	74.4	80.0	87.8
DUNCANVILLE ISD	WILLIAM H BYRD MIDDLE SCH	75137	9.7	66.1	59.7	65.2	72.0	69.6	68.7	66.2	75.6	79.2
DUNCANVILLE ISD	DUNCANVILLE H S	75116	8.7	60.7	56.7	65.1	64.5	70.0	79.6	87.0	86.1	89.6
GARLAND ISD	LYLES MIDDLE	75043	17.4	75.4	73.1	70.3	66.7	69.5	67.1	67.1	66.6	71.6
GARLAND ISD	GARLAND H S	75040	16.0	68.8	68.9	77.8	80.5	82.6	70.2	70.7	71.2	77.8
GRAND PRAIRIE ISD	HARRY S TRUMAN MIDDLE	75052	12.2	72.2	72.4	83.3	85.6	87.4	85.2	84.4	87.4	84.8
IRVING ISD	LAMAR MIDDLE	75060	6.8	67.9	68.0	73.5	77.4	85.1	83.5	84.4	89.5	89.5
LANCASTER ISD	LANCASTER H S	75134	13.2	52.9	57.9	43.5	51.1	58.9	77.9	75.6	78.9	79.8
LANCASTER ISD	LANCASTER MIDDLE	75146	14.3	56.9	39.3	50.8	57.3	55.5	51.6	56.0	62.7	66.8
LEWISVILLE ISD	HEDRICK MIDDLE SCHOOL	75067	19.3	62.8	66.8	79.1	85.0	88.2	86.9	84.5	85.6	84.6
MESQUITE ISD	NORTH MESQUITE H S	75150	14.3	59.4	59.7	57.3	71.1	77.2	78.0	79.3	78.0	83.5
MESQUITE ISD	VANSTON MIDDLE	75150	13.6	58.9	59.2	68.6	68.4	69.7	69.2	73.9	78.0	74.1
PLANO ISD	FRANKFORD MIDDLE	75252	16.1						92.1	94.6	94.7	95.3
RICHARDSON ISD	RICHARDSON H S	75080	13.6	61.2	56.7	57.7	69.5	72.9	76.4	77.1	82.3	80.8
RICHARDSON ISD	RICHARDSON NORTH J H	75080	15.5	78.7	75.3	85.3	81.4	88.3	79.7	81.9	83.4	87.5
RED OAK ISD	RED OAK H S	75154	19.5	66.3	66.3	61.6	67.7	88.8	81.4	92.8	85.2	93.7
SUNNYVALE ISD	SUNNYVALE MIDDLE	75182	18.2	86.1	86.2	93.2	97.6	96.9	97.0	93.4	90.1	90.2
RICHARDSON ISD	PARKHILL J H	75248	14.3	85.4	90.5	91.5	95.8	94.5	89.3	93.2	96.4	92.2
DALLAS ISD	Bryan Adams H S	75228	11.7	58.6	50.6	55.6	61.1	65.8	55.6	79.1	74.6	77.7
GRAND PRAIRIE ISD	Grand Prairie HS	75050	7.7	37.7	41.5	52.8	61.6	66.4	69.4	74.4	71.0	79.5
IRVING ISD	IRVING H S	75061	5.5	59.3	66.1	62.0	67.9	68.9	75.0	79.8	76.4	85.3
			Average=	66.2	65.4	69.7	73.9	77.6	77.6	80.5	81.7	84.4

The school district name, the campus name, and the zip code the campus is located in, is shown in the table, as well, as the distance and the standardized test passing rate from the Year 1994 to the Year 2002. The dark grey shaded cells, in the table, denote years that the school was not opened or year the school may have been repurposed. In this instance, the campus level standard test passing rates, were documented and reported, on the district level, and not on the campus level.

The distance column indicates the linear radial distance the school is located, from the centroid of the RSR Site, in miles. The "PR Year" column represents the percentage of total students that passed the standardized test, of the students that took the test, at each school, per year. The standardized test passing rates range from 66.2%, for the Year 1994, to 88.4%, for Year 2002. These ranges, for the overall standardized test passing

rate, are significantly higher, than the standardized test passing rates for the middle and high schools, located within the RSR Site's 5-mile radius. The average standardized test passing rate, for the Year 1994, for middle and high schools, located within the 5-mile radius of the RSR Site, is 37.0%. This is lower than the comparison group's average standardized test passing rate. In addition, the standardized test passing rate for the Year 2002, for the middle and high schools, located within the 5-mile radius of the RSR Site, is 71.7%. All of the other average standardized test passing rates, between the Year 1994 to the Year 2002, are significantly lower, as well. The difference in standardized test passing rates could be a result of possible exposure of prospective students to the lead melting activities and emissions of the RSR Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data because the data distribution is not normal and due to the few number of observation. The correlation matrix for the schools located greater than the 5-mile radius of the RSR site is shown below.

Table 7.7: RSR Correlation Matrix for Middle and High Schools Located Greater Than The 5-Mile Radius of the RSR Site.

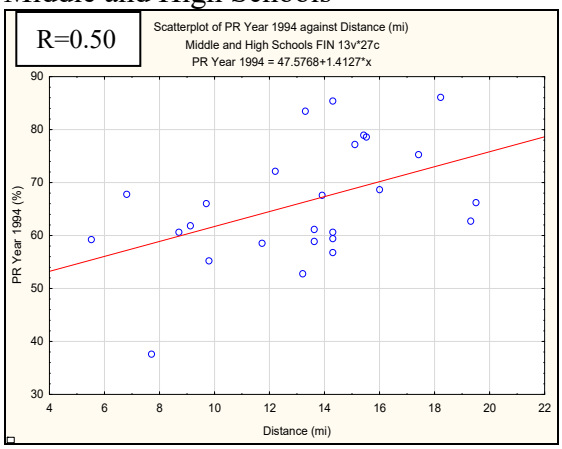
	Spearman Rank Order Correlations (Middle and High Schools FIN) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996	PR Year 1997 (%)	PR Year 1998 (%)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
Distance (mi) (%)	1.00	0.50	0.51	0.42	0.43	0.53	0.37	0.35	0.21	0.23
PR Year 1994 (%)	0.50	1.00	0.92	0.89	0.85	0.87	0.68	0.60	0.63	0.49
PR Year 1995 (%)	0.51	0.92	1.00	0.90	0.88	0.87	0.75	0.67	0.67	0.56
PR Year 1996 (%)	0.42	0.89	0.90	1.00	0.90	0.84	0.70	0.61	0.68	0.51
PR Year 1997 (%)	0.43	0.85	0.88	0.90	1.00	0.91	0.78	0.66	0.74	0.56
PR Year 1998 (%)	0.53	0.87	0.87	0.84	0.91	1.00	0.87	0.83	0.81	0.70
PR YEAR 1999 (%)	0.37	0.68	0.75	0.70	0.78	0.87	1.00	0.93	0.93	0.82
PR YEAR 2000 (%)	0.35	0.60	0.67	0.61	0.66	0.83	0.93	1.00	0.90	0.87
PR YEAR 2001 (%)	0.21	0.63	0.67	0.68	0.74	0.81	0.93	0.90	1.00	0.87
PR YEAR 2002 (%)	0.23	0.49	0.56	0.51	0.56	0.70	0.82	0.87	0.87	1.00

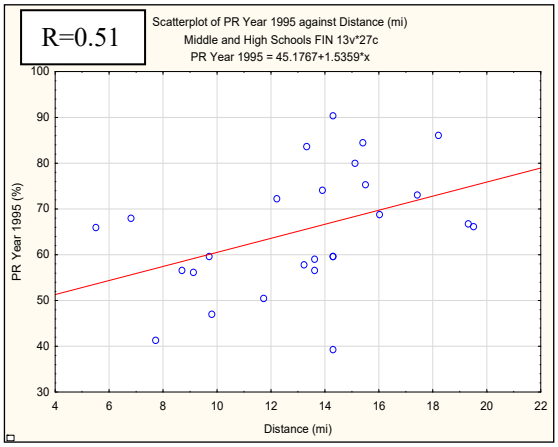
In the correlation matrix, variable one, the linear distance to the RSR Site, and variable two, the standardized test passing rates are shown across the side and top of the matrix. The numeric values in the center of the table represent the coefficients of correlation, or R value, between each variable. The values indicate the strength of relationship between each variable. This Study focuses on the significant relationships, shown in red, of the distance to the RSR Site and the standardized test passing rates.

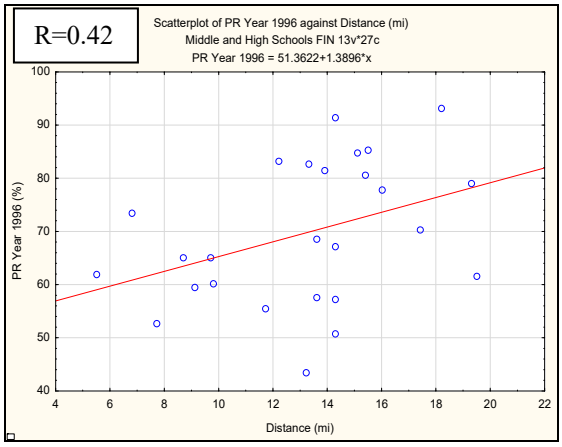
Based on the matrix, above, there is a weak to moderate significant relationship between distance, to the RSR Site and the standardized test passing rates for the Year 1994, Year 1995, Year 1996, Year 1997, and Year 1998, for the middle and high schools located greater than the RSR Site 5-mile radius. These significant relationships differ from the significant relationships between the distance and the standardized test passing rates, for the middle and high schools located within the RSR Site's 5-mile radius, in that, the significant relationships are overall, weaker, for the middle and high schools located greater than the 5-mile radius of the RSR Site, than the middle and high schools, located within the 5-mile radius of the RSR Site. In addition, the years of the significant relationships are different, for the middle and high schools located greater than the 5-mile

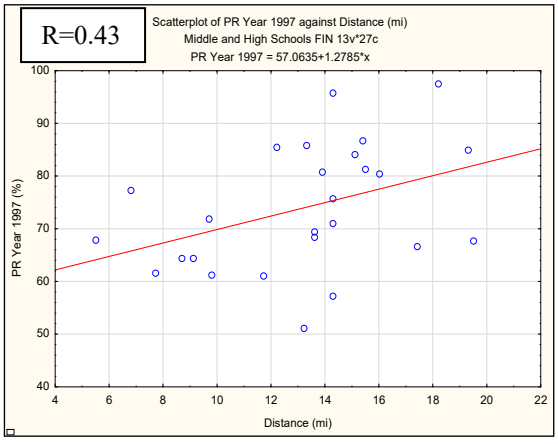
radius of the RSR Site, than for the middle and high schools located within the 5-mile radius of the RSR Site. The significant relationships between distance and the standardized test passing rates, for the middle and high schools located within the 5-mile radius of the RSR Site, are for the Year 1997 and for the Year 1999 to the Year 2002. The significant relationships between the distance and the standardized test passing rates, for the middle and the high schools located greater than the 5-mile radius of the RSR Site, are for the Year 1994 to the Year 1998. The Year 1997 is the only year the middle and high schools, located within and greater than the RSR Site's 5-mile radius, that have significant relationships. The other years are different. This might be due to socioeconomic indicators having a greater impact on prospective student's standardized test passing rates in the Year 1998 and earlier, for the middle and high schools located greater than the 5-mile radius of the RSR Site. The significant relationships, for the middle and high schools located within the RSR Site 5-mile radius, for the Year 1997 and the Year 1999 to the Year 2002, might be the result of possible delayed effects of the RSR Site on the prospective student's cognitive abilities. The bivariate plots for the significant relationships are shown below, for the middle and high schools located greater than the 5-mile radius of the RSR Site. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

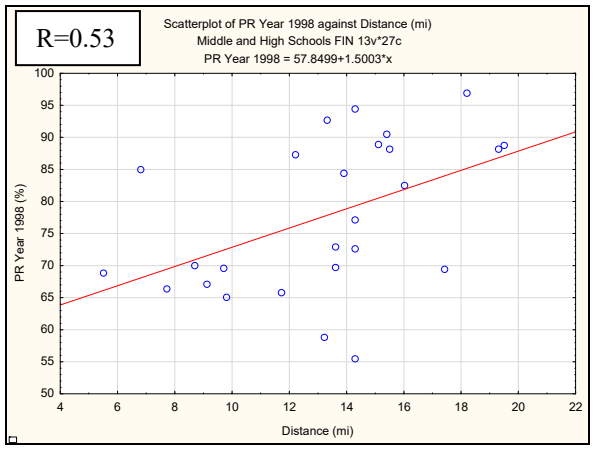
Graph 7.6- Graph 7.10: Comparison Group of Plots of Significant Relationships for Middle and High Schools







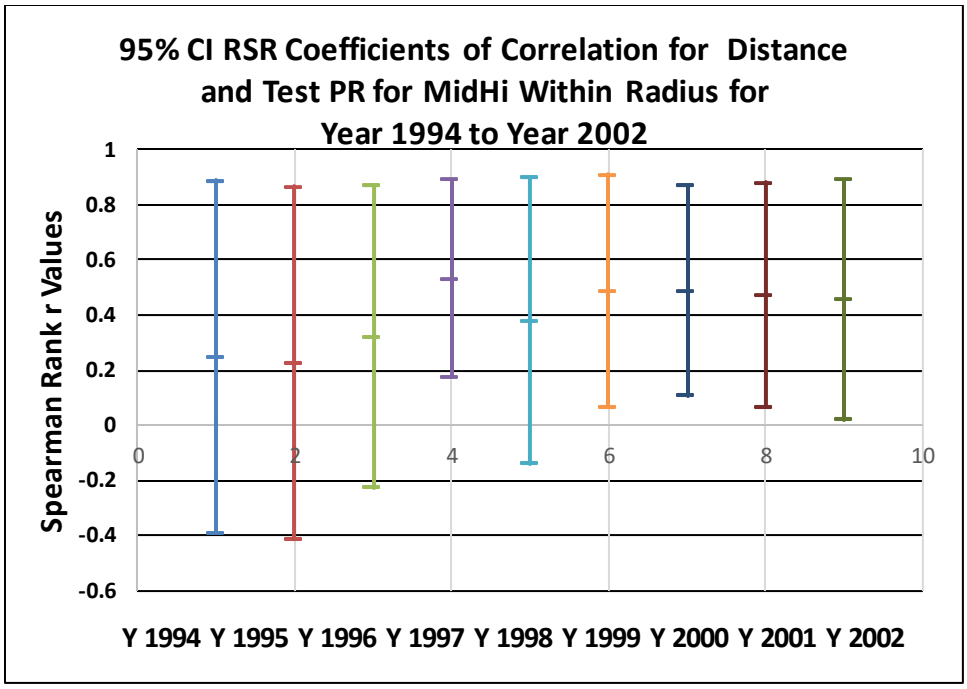




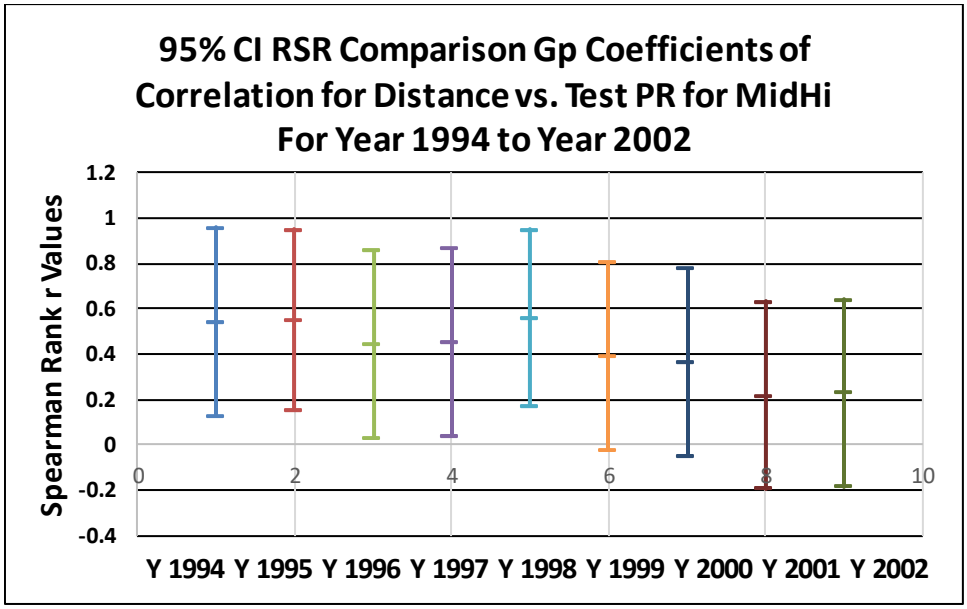
Based on the significant bivariate regressions, above, the greater the proximity the schools are located from the RSR Site, the higher the standardized test passing rate for middle and high schools.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1994 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for middle and high schools, located within and greater than the 5-mile radius of the RSR Superfund Site, are shown below.

Graph 7.11 RSR Coefficient of Correlation Confidence Interval Graph for Middle and High Schools for the Year 1994 to the Year 2002.



Graph 7.12: RSR Comparison Group Coefficient of Correlation Confidence Interval Graph for Middle and High Schools for the Year 1994 to the Year 2002.



Based on the graphs, the confidence intervals span a larger range for the coefficients of correlations that are not significant, than the coefficients of correlations that are significant, for the middle and high schools, located within, the 5-mile radius of the RSR Superfund Site. This could be due to a low quantity of observations for the middle and high schools located within the RSR Site's 5- mile radius.

7.2.1.5 RSR Distance Analysis for Elementary Schools Located Within the RSR Site's 5-Mile Radius

The purpose of distance analysis for the elementary schools, located within the 5- mile radius of the RSR Site, is to determine if prospective students, born the year after the RSR site closed (Year 1985) until the Year the RSR Site was cleaned (1994) had any negative cognitive impacts from the lead smelter, resulting in lower standardized test passing rates. A table of all of the elementary schools located within the RSR site 5-mile radius is shown below.

Table 7.8: RSR Distance and Standardized Test Passing Rates for Elementary Schools Located Within the RSR Site 5-Mile Radius

	RSR Distance and Elementary School Test Passing Rates											
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR Year 1999 (%)	PR Year 2000 (%)	PR Year 2001 (%)	PR Year 2002 (%)
DALLAS ISD	AMELIA EARHART EL	75212	0.5	44.8	45.9	38.7	61.4	83.7	79.5	70.6	75.8	69.8
DALLAS ISD	GEORGE W CARVER EL	75212	0.8	28.3	31.1	41.9	56.6	55.3	63.3	51.2	74.4	78.4
DALLAS ISD	STEVENS PARK EL	75211	1.3	42.2	49.2	57.7	30.3	63.4	71.9	59.4	61.1	71.4
DALLAS ISD	C F CARR EL	75212	1.4	34.2	70.7	41.5	57.1	56.5	43.1	52.3	58.3	87.5
DALLAS ISD	ELADIO R MARTINEZ EL	75212	1.4	44.3	41.9	56.9	51.0	71.8	81.0	75.5	75.9	78.5
DALLAS ISD	SIDNEY LANIER EL	75208	1.8	60.0	46.6	45.3	52.6	64.9	75.4	71.7	73.8	81.0
DALLAS ISD	LORENZO DE ZAVALA EL	75212	2.0	11.1	50.0	32.0	52.5	67.4	40.0	42.1	71.3	85.5
DALLAS ISD	LOUISE WOLFF KAHN EL	75211	2.1					56.3	69.2	85.7	62.5	71.3
DALLAS ISD	GABE P ALLEN EL	75212	2.1	50.0	47.4	66.7	68.4	91.8	86.4	75.0	73.2	60.0
DALLAS ISD	ROSEMONT EL	75208	2.4	50.0	40.7	68.9	70.9	75.0	82.9	81.9	73.3	80.6
DALLAS ISD	GEORGE PEABODY EL	75211	2.4	40.0	72.1	82.0	86.1	83.3	84.5	71.0	86.8	93.3
DALLAS ISD	ANSON JONES EL	75211	2.5	36.0	23.2	50.0	48.3	54.2	66.2	62.7	79.8	81.5
DALLAS ISD	LIDA HOOE EL	75211	2.7	44.5	42.9	47.6	54.9	60.5	54.8	47.6	61.0	81.7
DALLAS ISD	ARCADIA PARK EL	75211	2.8	44.4	60.0	25.0	46.2	63.2	61.2	63.5	57.6	78.4
DALLAS ISD	JAMES S HOGG EL	75208	3.1	26.5	42.6	52.2	47.8	43.4	58.6	62.3	65.7	80.8
DALLAS ISD	L O DONALD EL	75211	3.3	48.0	43.1	44.4	30.6	55.2	60.2	54.0	67.6	70.5
DALLAS ISD	JOHN H REAGAN EL	75208	3.3	41.0	41.5	54.9	58.2	56.3	64.9	58.4	79.0	82.1
DALLAS ISD	EDISON MEDRANO EL	75219	3.4							28.4	54.8	62.3
DALLAS ISD	WINNETKA EL	75208	3.4	43.3	50.0	40.9	43.8	56.3	59.3	50.5	61.8	76.7
IRVING ISD	SCHULZE EL	75060	3.4	43.4	59.7	59.8	82.3	86.7	80.6	67.8	76.8	84.9
DALLAS ISD	LEILA P COWART EL	75211	3.4	37.6	46.5	53.2	61.3	63.2	62.8	53.6	64.1	70.4
DALLAS ISD	ONESIMO HERNANDEZ EL	75235	3.6				33.1	48.3	43.9	49.8	58.2	48.5
DALLAS ISD	JOHN F PEELER EL	75208	3.7	33.3	35.5	36.5	42.6	48.6	53.1	46.4	54.3	68.3
DALLAS ISD	JAMES BOWIE EL	75203	3.7	25.5	40.5	54.3	57.9	63.9	73.2	40.6	70.3	78.9
DALLAS ISD	LENORE KIRK HALL EL	75211	3.8	39.9	38.7	61.2	77.6	66.4	70.9	70.4	76.8	76.0
DALLAS ISD	MARIA MORENO EL	75233	3.9				47.4	42.5	50.3	60.2	62.9	67.9
GRAND PRAIRIE ISD	HECTOR P GARCIA EL	75203	3.9							59.4	76.3	68.0
DALLAS ISD	MARGARET B HENDERSON EL	75224	4.1	31.5	53.0	53.0	50.4	42.5	42.6	45.5	45.7	58.3
DALLAS ISD	SAM HOUSTON EL	75219	4.1	44.4	21.6	40.7	62.9	60.5	43.8	39.3	53.8	62.0
DALLAS ISD	MAPLE LAWN EL	75235	4.2	31.3	25.5	48.1	46.2	43.9	56.3	43.3	53.6	61.6
DALLAS ISD	OBADIAH KNIGHT EL	75235	4.2	52.4	55.0	59.7	57.0	46.1	60.1	56.0	70.1	73.0
IRVING ISD	GILBERT F M EL	75061	4.2						90.7	85.9	80.5	90.4
DALLAS ISD	MARY MELEOD BETHUNE EL	75211	4.3				80.4	74.7	82.1	73.1	86.7	92.7
IRVING ISD	BRITAIN EL	75060	4.3	55.3	68.4	70.1	86.9	80.8	74.6	58.5	75.7	75.7
DALLAS ISD	WILLIAM B TRAVIS EL	75204	4.5	23.8	27.7	45.6	56.8	58.8	45.9		98.7	98.9
IRVING ISD	GOOD EL	75061	4.6	63.3	68.0	68.9	78.0	94.5	91.8	84.2	88.0	82.6
DALLAS ISD	LESLIE A STEMMONS EL	75211	4.6	44.3	52.4	69.1	69.9	71.0	71.6	68.3	80.8	79.2
			Average=	**40.5**	**46.4**	**52.2**	**57.8**	**63.3**	**65.6**	**60.2**	**69.9**	**75.9**

There are a total of 37 elementary schools located within the RSR Site 5-mile radius. The dark grey shaded cells, in the table, denote years that the school was not opened or year the school may have been repurposed. In this instance, the campus level standard test passing rates were documented and reported, on the district level, , and not on the campus level.

The distance is measured in miles and the standardized test passing rate is measured in percentage, for each school. Based on the table, the standardized test passing rate range from 40.5%, for the Year 1994, to 75.9%, for the Year 2002. As the years progress, the standardized test passing rates increase gradually.

The Spearman Rank correlation matrix was utilized to analyze the data. The Spearman Rank correlation matrix is used to analyze data when there are a few numbers of observations and when the data distribution is not normal. The correlation matrix for the elementary schools, located within the 5-mile radius of the RSR Site, is shown below.

Table 7.9: RSR Correlation Matrix for Elementary Schools Located Within the RSR Site 5- Mile Radius

	Spearman Rank Order Correlations (RSR Elementary School Mod) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR Year 1999 (%)	PR Year 2000 (%)	PR Year 2001 (%)	PR Year 2002 (%)
Distance (mi)	1.00	0.02	-0.01	0.30	0.23	-0.12	-0.06	-0.10	0.17	-0.04
PR Year 1994 (%)	0.02	1.00	0.36	0.32	0.33	0.47	0.54	0.57	0.14	-0.15
PR Year 1995 (%)	-0.01	0.36	1.00	0.29	0.27	0.38	0.21	0.27	0.05	0.21
PR Year 1996 (%)	0.30	0.32	0.29	1.00	0.62	0.46	0.66	0.55	0.51	0.12
PR Year 1997 (%)	0.23	0.33	0.27	0.62	1.00	0.72	0.57	0.44	0.62	0.39
PR Year 1998 (%)	-0.12	0.47	0.38	0.46	0.72	1.00	0.76	0.55	0.58	0.38
PR Year 1999 (%)	-0.06	0.54	0.21	0.66	0.57	0.76	1.00	0.80	0.66	0.29
PR Year 2000 (%)	-0.10	0.57	0.27	0.55	0.44	0.55	0.80	1.00	0.67	0.38
PR Year 2001 (%)	0.17	0.14	0.05	0.51	0.62	0.58	0.66	0.67	1.00	0.65
PR Year 2002 (%)	-0.04	-0.15	0.21	0.12	0.39	0.38	0.29	0.38	0.65	1.00

Based on the correlation matrix, variable number one, the distance, and variable number two, the standardized test passing rates, in percentage, are shown along the side and across the top of the matrix. The numeric values within the matrix are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the distance and the standardized test passing rates, for elementary schools located within the 5-mile radius, of the RSR Site.

Based on the correlation matrix, there are no significant relationships, for the elementary schools located within the 5-mile radius of the RSR Site, and the standardized test passing rates, from the Year 1994 to the Year 2002. This might be a result of prospective students moving out of the RSR Site's 5-mile radius, as well as, prospective students that were born after the RSR site closed (Year 1984), as well as, prospective students that might have moved within the RSR Site's 5-mile radius, after the RSR Site closed and before cleanup activities began(Year 1991 the Year 1994). No bivariate plots were prepared due to no significant relationships in the data set.

7.2.1.6 RSR Comparison Group Distance Analysis for Elementary Schools Located Greater than the RSR Site's 5-mile Radius (Comparison Group).

The comparison group of elementary schools, located greater than the RSR Site's 5-mile radius, is used to compare with the schools, located in close proximity of the RSR Site, to determine if the standardized test passing rates are lower for schools located in close proximity of the RSR Site, than the standardized test passing rates for elementary schools, located greater than 5-mile radius of the RSR Site. A table of the elementary schools located greater than 5-mile radius of the RSR Site is shown below.

Table 7.10: RSR Distance and Standardized Test Passing Rates for Elementary Schools Located Greater than 5-Mile Radius of the RSR Site

	RSR Distance and Elementary School Test Passing Rates for Schools Greater than 5 miles											
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
CARROLLTON-FARMERS BRANCH ISD	BLAIR EL	75234	10.9	26.9	34.2	42.9	45.3	55.6	54.1	47.8	51.1	59.7
CARROLLTON-FARMERS BRANCH ISD	KENT EL	75007	15.5	83.3	90.2	91.9	92.9	96.0	97.9	97.8	96.3	98.9
CEDAR HILL ISD	BRAY EL	75104	13.7	57.2	75.2	87.8	87.4	90.4	91.5	87.9	90.7	96.1
CEDAR HILL ISD	WATERFORD OAKS EL	75104	13.0	56.6	65.5	67.2	71.9	72.6	63.0	73.4	60.5	75.0
COPPELL ISD	PINKERTON EL	75019	13.8	81.1	78.8	92.6	95.2	97.6	96.8	99.4	99.4	98.4
COPPELL ISD	LAKESIDE EL	75019	14.3	81.2	86.2	94.0	96.2	97.5	94.9	96.4	96.7	97.7
DALLAS ISD	VICTOR H HEXTER EL	75218	10.7	82.6	80.7	86.4	87.1	85.2	83.5	73.1	74.9	82.9
DESOTO ISD	RUBY YOUNG EL	75115	12.2	69.9	78.4	68.3	81.0	84.8	88.4	86.2	92.6	88.2
DESOTO ISD	AMBER TERRACE EL	75115	13.8	60.7	64.3	62.3	73.4	78.7	78.0	76.3	86.5	86.5
DUNCANVILLE ISD	WILLIAM LEE HASTINGS	75116	9.2	66.4	68.7	65.5	71.2	75.1	81.6	76.3	82.9	83.9
DUNCANVILLE ISD	MERRIFIELD ELEMENTA	75137	9.4	59.7	66.5	76.7	75.5	76.3	82.4	74.0	82.0	81.2
GRAND PRAIRIE ISD	SUZANNA DICKINSON EL	75052	12.5	66.5	75.2	75.3	87.8	92.1	86.5	86.3	80.3	87.9
GRAND PRAIRIE ISD	FLORENCE HILL EL	75052	11.1	64.8	72.9	76.5	84.7	84.8	86.9	83.9	83.2	83.8
IRVING ISD	DAVIS EL	75061	7.9	64.1	70.2	76.3	81.5	82.2	81.1	77.7	79.6	85.6
IRVING ISD	LIVELY EL	75061	6.6	67.4	70.8	78.7	87.0	79.9	81.7	83.8	83.9	87.4
LANCASTER ISD	ROLLING HILLS EL	75146	12.9	46.5	61.8	59.8	77.1	70.1	67.2	59.7	68.7	63.9
LANCASTER ISD	LANCASTER EL	75146	14.2	49.0	58.1	63.0	64.3	57.7	61.6	66.2	71.6	75.1
LEWISVILLE ISD	INDIAN CREEK EL	75010	17.6	74.9	77.8	85.2	87.3	89.9	87.6	85.3	87.0	88.7
LEWISVILLE ISD	CREEKSIDE EL	75067	18.0	76.1	83.0	82.8	82.4	86.0	88.0	83.0	86.6	87.1
MESQUITE ISD	PRICE EL	75043	15.2	73.7	77.8	79.2	83.6	91.2	90.9	92.2	89.1	89.6
MESQUITE ISD	CANNADAY EL	75150	15.0	64.2	64.4	76.0	85.6	89.9	86.9	92.6	92.2	89.4
PLANO ISD	HUFFMAN EL	75093	17.0	85.3	91.7	88.5	88.2	92.0	91.9	97.0	91.5	94.1
RED OAK ISD	RED OAK INT	75154	17.0	64.9	61.5	73.0	79.5	86.6	85.4	89.7	84.4	89.0
RED OAK ISD	EASTRIDGE EL	75154	17.9	41.9	57.6	66.1	72.4	79.0	70.7	75.5	75.4	73.0
RED OAK ISD	SHIELDS EL	75154	16.9	62.0	77.4	75.0	82.0	88.0	83.6	85.8	84.1	90.8
RICHARDSON ISD	SPRING CREEK EL	75248	13.5	88.1	91.0	94.7	92.5	98.2	96.4	92.9	95.7	94.9
RICHARDSON ISD	LAKE HIGHLANDS EL	75238	11.7	67.4	82.6	76.0	85.4	90.7	92.5	89.8	87.5	86.0
			Average=	**66.0**	**72.7**	**76.4**	**81.4**	**84.0**	**83.4**	**82.6**	**83.5**	**85.7**

Based on the table, the school district name, the campus name, and the zip code each school is located in, is shown along the left side of the table. The distance and the standardized test passing rates are shown across the top of the table.

Based on the table, the average standardized test passing rates, for elementary schools located greater than the 5- mile radius of the RSR Site, range from 66.0%, for the Year 1994, to 85.7%, for the Year 2002. Overall, the average standardized test passing rates are higher, than the average standardized test passing rates for the elementary schools located within the RSR Site's 5-mile radius. For the Year 1994, standardized test passing rate was 40.5% for the elementary schools located within the 5-mile radius of the RSR Site. This is lower than the average standardized test passing rates, for elementary schools located greater than the 5-mile radius of the RSR Site. The standardized test passing rates follow the same general trend of being lower, for elementary schools located within the RSR Site's 5-mile radius, than the elementary school located greater than the RSR Site's 5-mile radius. The difference could be due to socioeconomic factors and not proximity to the RSR Site.

The Spearman Rank correlation matrix was used to analyze the data, because the data set does not have a normal data distribution and due to the few number of observations. The correlation matrix for the elementary schools located greater than 5-mile radius of the RSR Site is shown below.

Table 7.11: RSR Correlation Matrix of Distance vs. Standardized Test Passing Rates for Elementary Schools Located Greater Than the 5-mile Radius from the RSR Site.

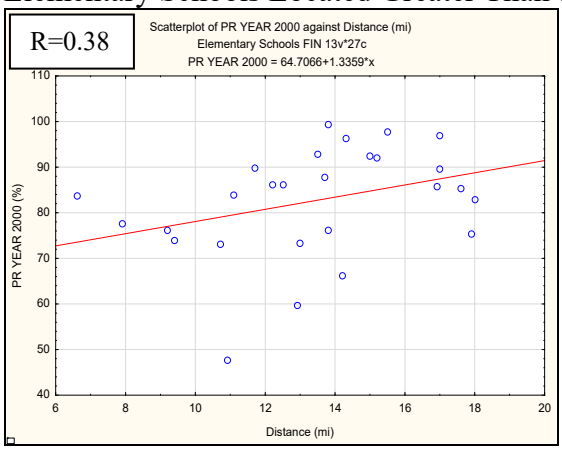
	Spearman Rank Order Correlations (Elementary Schools FIN) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
Distance (mi)	1.00	0.18	0.17	0.19	0.19	0.38	0.31	0.38	0.38	0.42
PR Year 1994 (%)	0.18	1.00	0.90	0.79	0.77	0.76	0.79	0.69	0.70	0.67
PR Year 1995 (%)	0.17	0.90	1.00	0.82	0.79	0.78	0.85	0.67	0.70	0.67
PR Year 1996 (%)	0.19	0.79	0.82	1.00	0.88	0.80	0.82	0.69	0.69	0.73
PR Year 1997 (%)	0.19	0.77	0.79	0.88	1.00	0.90	0.84	0.80	0.72	0.79
PR Year 1998 (%)	0.38	0.76	0.78	0.80	0.90	1.00	0.92	0.92	0.81	0.88
PR YEAR 1999 (%)	0.31	0.79	0.85	0.82	0.84	0.92	1.00	0.91	0.91	0.85
PR YEAR 2000 (%)	0.38	0.69	0.67	0.69	0.80	0.92	0.91	1.00	0.91	0.92
PR YEAR 2001 (%)	0.38	0.70	0.70	0.69	0.72	0.81	0.91	0.91	1.00	0.90
PR YEAR 2002 (%)	0.42	0.67	0.67	0.73	0.79	0.88	0.85	0.92	0.90	1.00

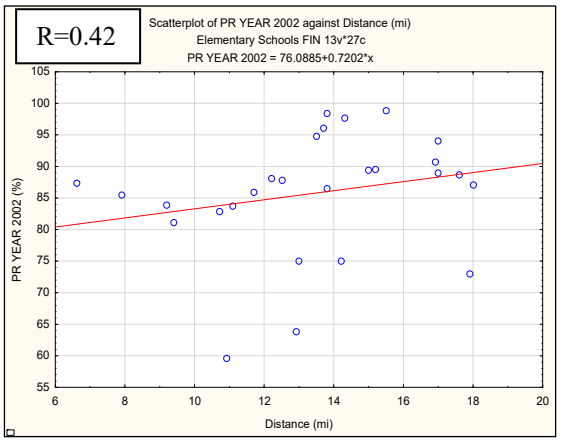
Based on the correlation matrix, variable one, the distance, and variable two, the standardized test passing rates, are shown across the sides and top of the matrix. The numeric values, in the center of the table, represent the coefficient of correlations, the R values. These values represent the strength of relationship between two corresponding variables. The significant relationships are shown in red. In this Study, the significant relationships, between the distance and the standardized test passing rates, for the elementary schools, located greater than the 5-mile radius of the RSR Site, were evaluated.

Based on the matrix, there are weak significant relationships between distance vs. standardized test passing rates, for elementary schools located greater than the 5-mile radius of the RSR Site, for the Year 2000 and the Year 2002, respectively. These significant regressions are most likely not a result of the RSR Site, but of other

socioeconomic indicators, since these elementary schools are located further than 5 miles from the RSR Site. The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.13- Graph 7.14: Comparison Group Plots of Significant Relationships for Elementary Schools Located Greater Than the RSR Site's 5-Mile Radius.

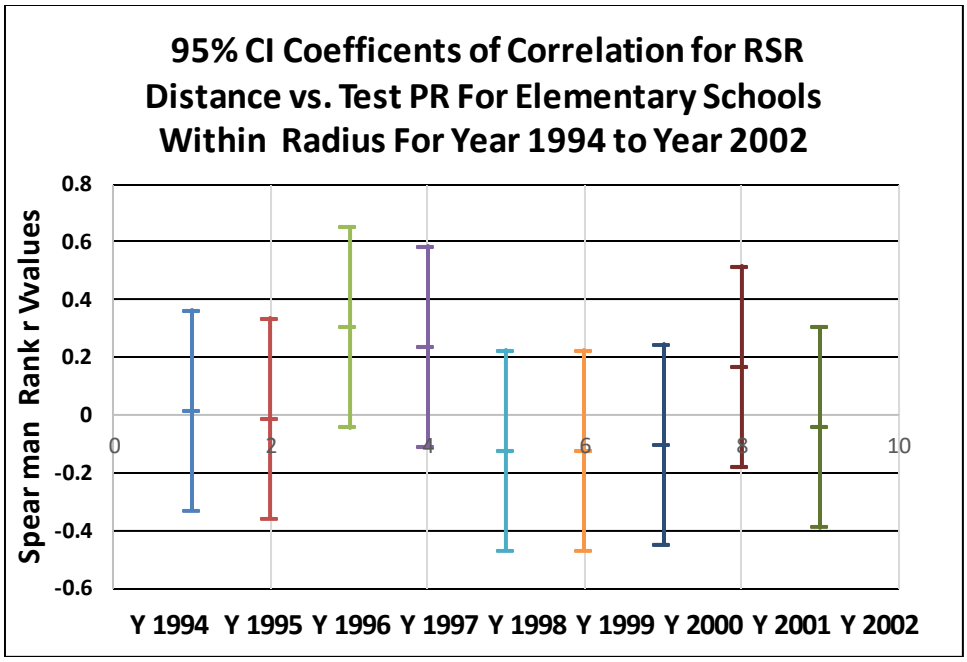




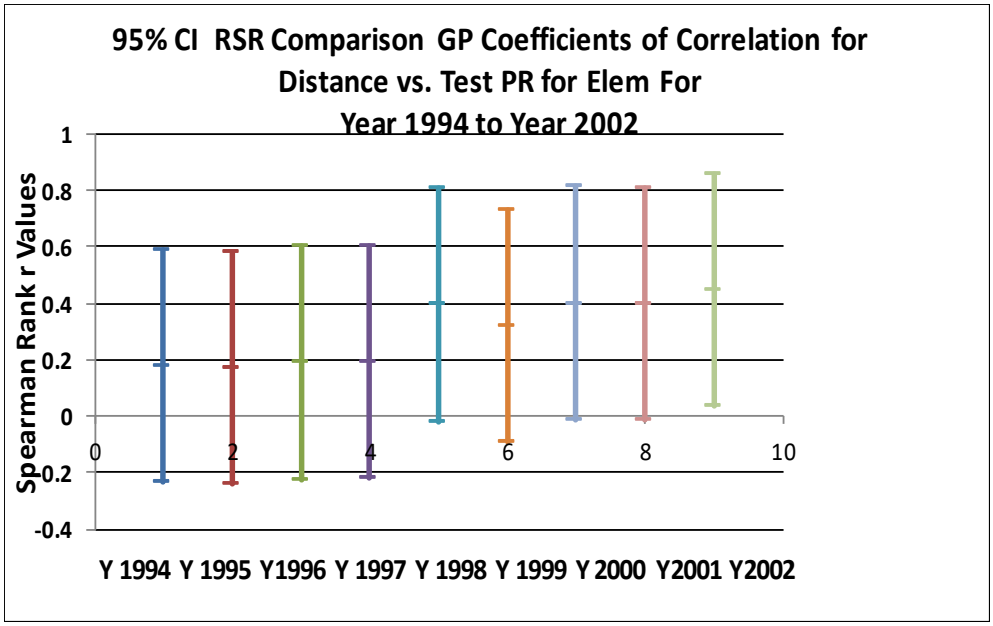
Based on the significant regressions, as the distance from the RSR Site increases, the elementary standardized passing rate increases.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1994 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for elementary schools, located within and greater than, the 5-mile radius of the RSR Superfund Site, are shown below.

Graph 7.15 RSR Coefficient of Correlation Confidence Interval Graph for Elementary Schools for the Year 1994 to the Year 2002.



Graph 7.16 RSR Comparison Group Coefficient of Correlation Confidence Interval Graph for Elementary Schools for the Year 1994 to the Year 2002.



Based on the graphs, the confidence intervals cover a greater positive range for the comparison group of coefficients of correlation, than the coefficients of correlations for elementary schools located within the 5-mile radius of the RSR Superfund Site. There were no significant relationships in the Spearman Rank r Values for the elementary schools located within the 5-mile radius of the RSR Superfund Site.

7.2.2 RSR Socioeconomic Indicators vs. Childhood Elevated Blood Lead Level Analysis

The purpose of the socioeconomic indicators vs. elevated childhood blood lead level analysis is to determine if a significant relationship exists between socioeconomic indictors and the counts of elevated childhood blood lead levels. The socioeconomic indicator data was provided by the Year 2000 Census, from the census.gov website. The elevated childhood blood lead level data was provided by the Texas Department of State Health Services, by zip code, in Dallas County. The childhood elevated blood lead level data , with the socioeconomic indicators data, for children that reside in zip codes, located within, or intersect, the RSR Site's 5-mile radius, were compared to the socioeconomic indicator data and the elevated childhood blood lead level data, for children that reside in zip codes located greater than the 5-mile radius of the RSR Site.

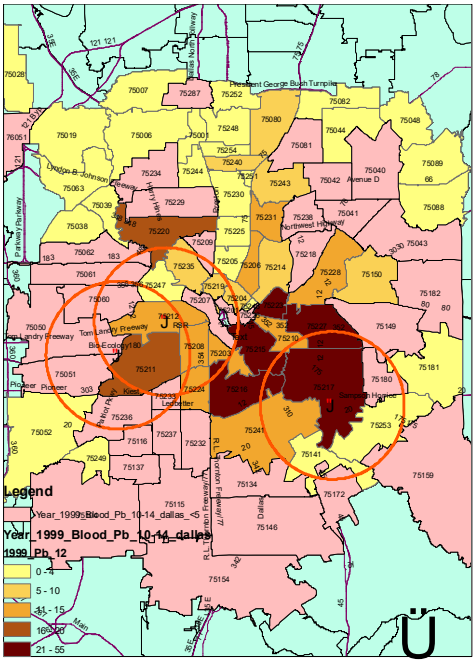
Children and adults, from ages 15 years and older, covered under the Adult Lead Surveillance Program, were not included in the Study, because the elevated blood lead data, for this age group, was not available from the Texas Department of State Health Services. Elevated childhood blood lead level data, for children from 0 years to 14 years of age, covered under the Texas Childhood Lead Poisoning Prevention Program, is used in the socioeconomic indicators vs. elevated blood lead level analysis. The method the Texas Department of State Health (TDSHS) uses to acquire elevated childhood blood lead level data is located in Section 7.1 of the report. The earliest year, that the elevated childhood blood lead data was available, from the TDSHS, for this Study, was the Year 1999. Therefore, the socioeconomic indicators vs elevated childhood blood lead level analysis was conducted from the Year 1999 to the Year 2002, for Dallas County. The analysis ended in the Year 2002 to provide consistency with the standardized test passing rate analysis.

According to the Centers for Disease Control (CDC), the recommended childhood blood lead level for "public health actions to be initiated" is 5 μg/dl. The CDC has a Childhood Lead Poisoning Prevention Program to reduce childhood elevated blood lead levels that are 10 μg/dl and greater. The lowest concentration of elevated childhood blood lead data, provided by the TDSHS, was 10 μg/dl. In the childhood elevated blood lead level data set, there were four categories of elevated blood levels; 10-14 μg/dl (low level), 15-19 μg/dl (medium level), equal to or greater than 20 μg/dl (high level), and the total counts of all elevated childhood blood lead levels, respectively. During the socioeconomic indicators vs elevated childhood blood lead level analysis, the overall counts for the medium level (15-19 μg/dl) and high level (= or > 20 μg/dl), of elevated blood lead levels, had extremely low quantity of counts. Therefore, no analysis was conducted on both elevated childhood blood lead level categories, and both elevated childhood blood lead levels were removed from the Study.

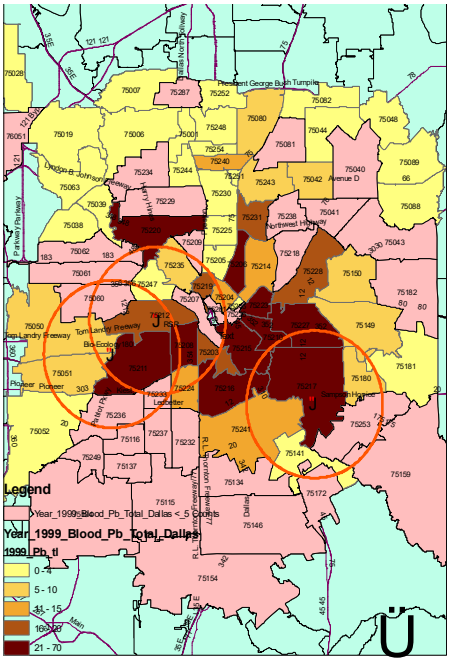
Dallas County Maps, of the elevated childhood blood lead level of 10-14 μg/dl and the total counts are depicted below, by zip code.

Figure 7.4- Figure 7.9: RSR Socioeconomic Indicators vs Elevated Childhood Blood Lead Level Maps for 10-14 µg/dl and Total Counts of Elevated Blood Lead Level.

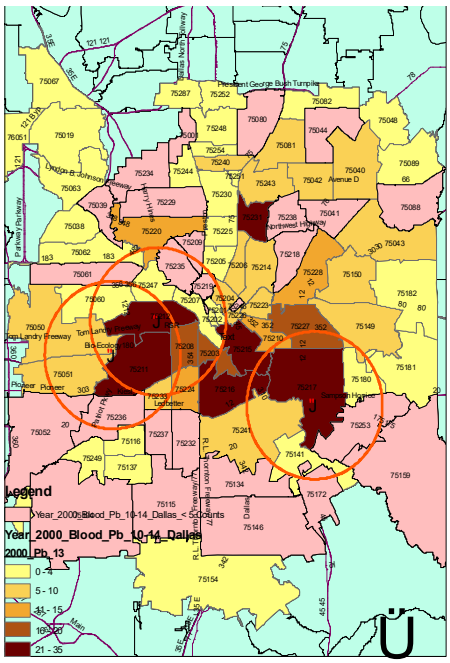
Dallas County Year 1999 Blood Lead Level 10-14 µg/dl



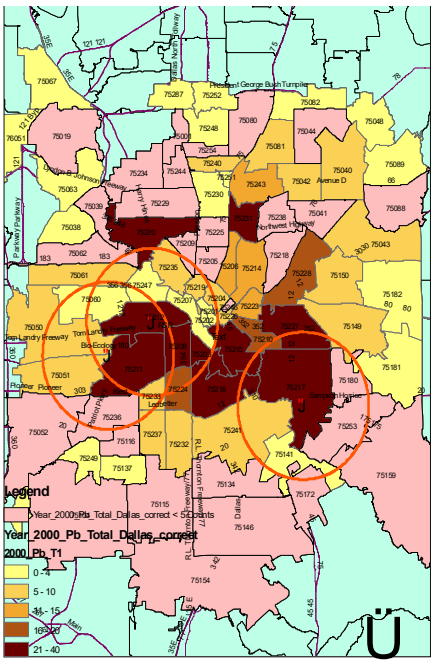
Dallas County Year 1999 Total Counts Blood Lead Level



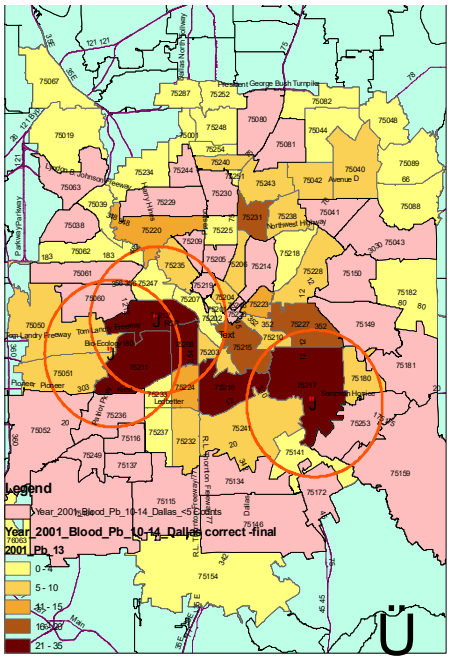
Dallas County Year 2000 Blood Lead Level 10-14 µg/dl



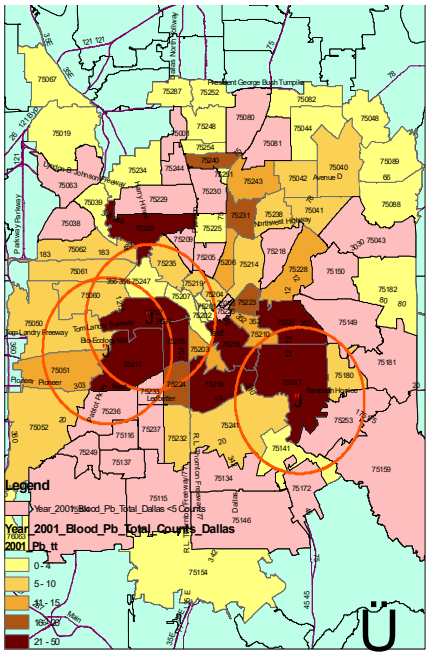
Dallas County Year 2000 Total Counts Blood Lead Level



Dallas County Year 2001 Blood Lead Level 10-14 µg/dl



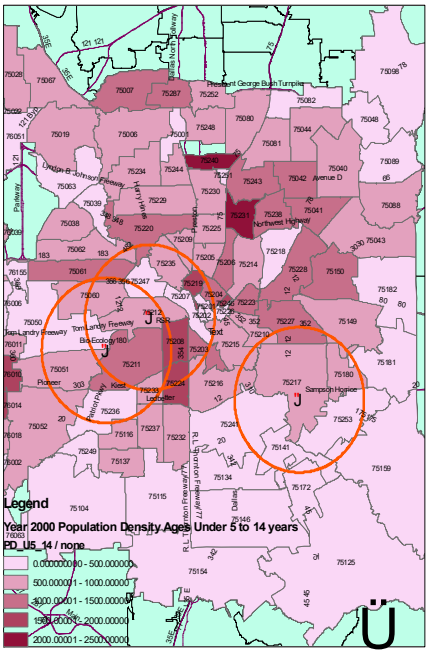
Dallas County Year 2001 Total Counts Blood Lead Level



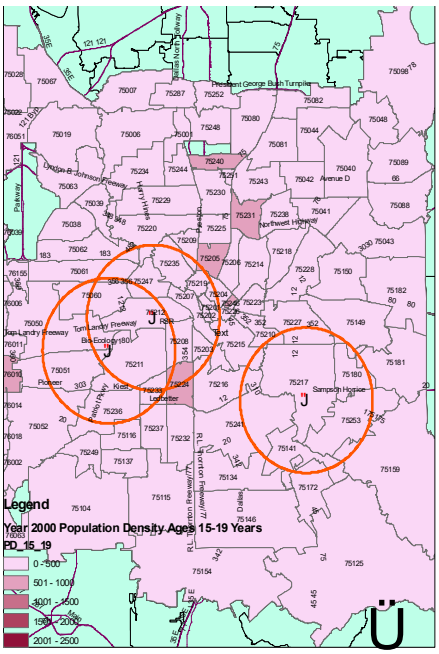
The darker the shading of the maps, the greater quantity of children with the 10-14 µg/dl elevated blood lead level and the total counts (10-14 µg/dl, 15 µg/dl, and = or > 20 µg/dl) of childhood elevated blood lead level. The circle indicates the 5-mile radius of each lead contaminated Superfund Site. The years the map covers are from the Year 1999 to the Year 2001.

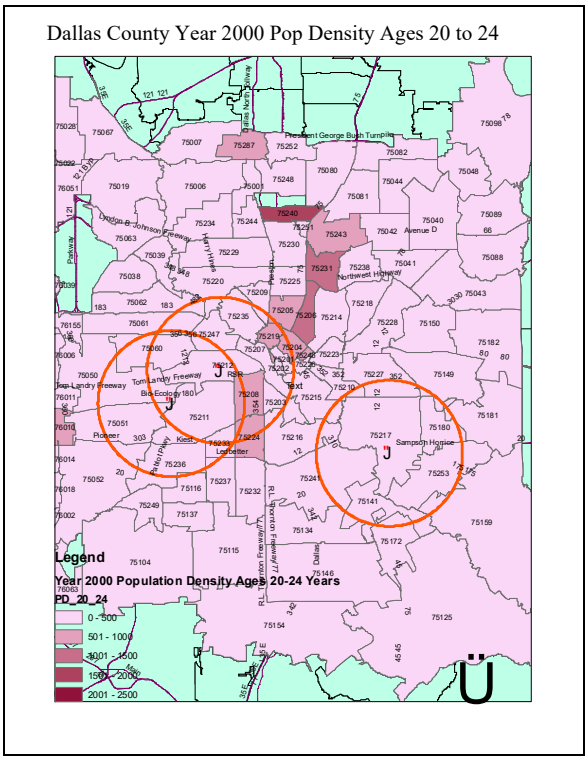
The population density maps for the Year 2000, by age range, for Dallas County, are shown below.
Figures 7.10 – Figure 7.12 Dallas County Population Density Maps for Childhood Ages; Under 5 Years to 14 Years, 15 Years to 19 Years, and 20 Years to 24 Years, respectively.

Dallas County Year 2000 Pop Density Ages Under 5 to 14



Dallas County Year 2000 Pop Density Ages 15 to 19





Based on the population maps, the darker the shading, the greater the population density, of the specified age range. The population maps assist to determine if lower elevated childhood blood lead level counts are the result of a lower population density.

In the elevated childhood blood lead level data set, provided by the TDSHS, counts of elevated blood lead that were less than 5, were designated as a "<5" count, in the spreadsheet. The TDSHS could not provide the actual number for "<5". In order to quantify and analyze the unspecified counts, of elevated childhood blood lead level data, an educated, systematic approach was utilized, to provide an educated guess value for the "<5" counts. Table 7.12 below various scenarios of the "<5" count of elevated blood lead level data. Below the table, is the explanation of how the educated guess was computed.

Table 7.12: Scenarios For Estimation of "<5" Values

Dallas County Texas, Unduplicated Children Tested for Lead, 1999-2011*				
	1999			
	Blood Lead Level			
Zip	10--14	15--19	>=20	Total
75039	0	0	0	0
75040	< 5	0	0	< 5
75042	< 5	< 5	< 5	7
75051	< 5	< 5	0	5
75229	< 5	< 5	< 5	< 5
75204	8	6	< 5	15
75211	25	< 5	8	37
75217	55	11	< 5	69
Total	**491**	**121**	**70**	**682**

The table above shows some examples of various cases of unspecified "<5" counts. This table was modified from the original TDSHS spreadsheet. The total counts, at the bottom of the table, depict the actual counts from the original spreadsheet. Based on these values, the highest overall counts are for the 10-14 μg/dl and for the total counts categories, of elevated childhood blood lead. A few zip codes, from Dallas County, are shown on the left side of the table. The four cases of elevated childhood blood lead levels, in μg/dl, are shown at the top of the table, as well as, the year the data was collected. The values, in the center table, represent unduplicated counts, of children that tested positive, for elevated blood lead. The "total" column, represents the total counts of all three concentrations of elevated blood levels.

For the educated guesses, some of the zip codes had no counts of childhood elevated blood lead, as specified for zip code 75039. Some childhood blood lead levels were "<5 for only one specified blood lead level concentration, similar to zip code 75040. Since the actual value, for the unspecified elevated blood lead count of "<5", must be from the number 1 to the number 4, the value of 2 was used for the educated guess, for zip codes that only had a "<5" designation in only one category of blood lead levels. The number 2 is close to the median value, from 1 to 4, that is a conservative value. For educated guesses, for zip codes that had the "<5 designation in more than one blood lead level category, the following process was followed.

For zip code 75042, a designation of the number "4"was assigned for the 10-14 μg/dl category, since the highest, overall total number of counts, for this category, is highest, for Dallas County. The number count of "2" was assigned to the medium range of blood lead level (15-19 μg/dl) and the number "1" was assigned to the high level range of the blood lead level (= or > 20 μg/dl), for zip code 75042. These numbers were assigned to reflect the overall blood lead category count distribution for Dallas County, as well as, to complete the total count of "7", for the "total counts" category, for the 75042 zip code.

For zip code 75051, there were two categories with the blood lead level designation count of "<5"; 10-14 μg/dl and 15-19 μg/dl, respectively. The total counts of elevated blood lead level, for zip code 75051, is the number "5". In providing an educated guess for the "<5" designation, the number "3" was assigned for the 10-14 μg/dl category and the number "2" was assigned for the 15-19 μg/dl category. The higher blood lead level count was assigned to the 10-14 category, as effort to reflect the overall blood lead category count distribution for Dallas County, as well as, to complete the total count of "5" ,for the "total counts" category, for the 75051 zip code.

For zip code 75229, all childhood elevated blood lead level categories were all "<5". In the event that all blood lead level category counts are "<5", the number "2" was assigned to the 10-14 μg/dl category and the number "1" was assigned for the 15-19 μg/dl and the =or >20 μg/dl. These values add to a total childhood elevated blood lead level of "4", since the total category count is "<5". The strategy provides more counts to the 10-14 μg/dl category, than the other elevated blood lead categories, since the largest number of elevated blood lead level counts for Dallas County is the 10-14 μg/dl blood lead category.

For the 75204, 75211, and 75217 zip codes, simple math was utilized to calculate the one missing count, for each zip code. For each zip code, the "total counts" were subtracted by the given values of elevated blood level counts, in the other categories, to calculate the actual count, for the missing elevated blood lead level value.

The process described above, was the method used to provide an educated guess on all "<5" values, in the original childhood blood lead level data set, provided by the TDSHS. In the analysis below, the highlighted counts, in the tables, represent "<5" values that were assigned an actual number, by the process described above. Section 7.1 provides the information on how the unduplicated counts of elevated blood lead levels data is acquired, by the TDSHS.

7.2.2.1 RSR Socioeconomic Indicators vs Elevated Childhood Blood Lead Level Analysis For Schools, Located Within or that Intersect, the 5-Mile Radius of the RSR Site

As previously stated, the socioeconomic indicators vs. elevated childhood blood lead level analysis consists of evaluating if there is a significant relationship between socioeconomic indicators and the childhood elevated blood lead levels, of children from age 0 to 14 yrs, that reside in zip codes, located within or intersect, the 5-mile radius of the RSR Site. This data was compared to the socioeconomic indicators vs. childhood elevated blood lead levels data of children, from age 0 to 14 yrs, that reside in zip codes, located greater than the 5- mile radius of the RSR Superfund Site.

The socioeconomic indicator data, used to identify whether children that live in zip codes with a high percentage of families with low income and with a high percentage of housing units constructed before the Year 1970, might increase the number of children with elevated childhood blood lead.

The socioeconomic indicators evaluated, are listed below;

- percentage of families that are below poverty level;
- percentage of female householder with children less than 18 years of age that are below poverty level;
- percentage of households with income less than $10,000 per year;
- percentage of households with income between $10,000 to $14,999;
- percentage of households with income between $15,000 to $24,999;
- percentage of housing units built the Year 1939 or earlier,
- percentage of housing units built between the Year 1940 to 1959;
- percentage of housing units constructed between the Year 1960 to Year 1969;
- percentage of housing units built between Year 1970 to Year 1979.

The socioeconomic indicator data was obtained from the Year 2000 census data, from census.gov website. The blood lead level data was obtained from the TDSHS. The housing units built dates were included in the Study, because housing units constructed before the Year 1970, were most likely painted with lead based paint. The housing units' built dates help indicate possible indoor lead exposure to children residing in the units. In addition, the proximity of the children, residing in zip codes located, within or that intersect, the 5-mile radius, of the RSR Site, will also help determine if the source of elevated blood lead, in children, is result of the lead smelter, of the RSR Site. The socioeconomic indicator data and the elevated childhood blood lead level data were evaluated from the Year 1999 to the Year 2002 to stay consistent with the socioeconomic indicator vs. the standardized test passing rate analysis. There is no elevated childhood blood lead data available, before the Year 1999, from the TDSHS. Therefore, the socioeconomic indicators and the blood lead level analysis starts the Year 1999. The original TDSHS spreadsheet, of elevated childhood blood lead level data, is located in Appendix A.

During the Study, counts for elevated blood lead levels of 10-14 μg/dl, 15-19 μg/dl, >or =20 μg/dl, and the total counts, were evaluated for children from age 0 years to 14 years. During the evaluation, the quantity of counts for blood lead level of 10-14 μg/dl and the total counts of elevated blood lead levels, were significantly higher than the quantity of counts for blood lead levels 15-19 μg/dl and >or =20 μg/dl. Due to these significantly lower counts, the 15-19 μg/dl and > or =20 μg/dl elevated blood lead levels were removed from the Study. It would be difficult to identify any significant relationships, in these elevated blood lead levels, due to an extremely low number of counts. Therefore, the analysis was conducted for the 10-14 μg/dl and the total counts elevated childhood blood lead levels.

In addition, for this analysis, there was no separation of data, for elementary schools and middle and high schools because the analysis was completed on a zip code basis and because separating the elementary schools from the middle and high schools would result in an extremely low number of observations. The table below shows the socioeconomic indictors and the 10-14 μg/dl elevated childhood blood lead level for the Year 1999, for

the children that reside in zip codes, located within or intersect, the 5-mile radius of the RSR Site.

Table 7.13: Year 1999 Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Level Zip Codes, Located Within or that Intersect, the RSR Site's 5-mile Radius

	RSR Year 1999 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	13
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	20
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	15
75219	22.0	9.9	6.3	13.8	21.4	22.3	17.1	9.8	54.8	10
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	2
75235	19.4	11.6	6.6	18.3	15.5	24.2	37.1	9.4	45.8	8
75203	30.2	24.5	10.4	20.7	13.5	21.4	40.8	15.2	44.9	13
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	2
75224	17.6	12.2	7.4	17.6	13.6	27.6	45.8	5.8	36.5	14
75061	10.7	6.9	5.8	16.7	17.3	21.0	23.0	2.1	23.1	2
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	8.0	8
75201	9.0	7.9	2.7	8.2	3.1	10.9	5.0	23.8	33.9	2
									Sum=	**109**

On the left side of the table, are the listed zip codes that are located within, or intersect, the RSR Site's 5-mile radius. The top of the table shows the list socioeconomic indicators, as well as, the counts of children with the elevated blood lead level of 10-14 µg/dl. The center of the table is populated with the percentages of the socioeconomic indicators, as well as, the counts of children with the elevated blood lead level of 10-14 µg/dl. The highlighted values, in the table, represent the estimated, "<5" count values from the original data set, supplied by the TDSHS. Further explanation of how these values were estimated, is located in Section 7.2. Based on the table above, there are a total of 109 unduplicated cases of the elevated childhood blood lead level of 10-14 µg/dl, for children that reside within the zip codes located within, or that intersect, the 5-mile radius, of the RSR Site. The high counts of blood lead cases could be a result of the socioeconomic indicators listed above, and/or the distance the zip codes are located within, or that intersect, the RSR Site.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data set not having a normal distribution and due to the low number of observations. The correlation matrix for the socioeconomic indicators vs. the blood lead level of 10-14 µg/dl is shown below.

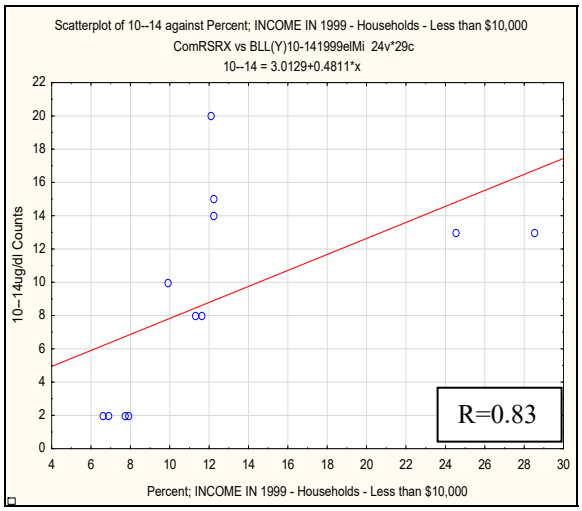
Table 7.14: Year 1999 Correlation Matrix of the Socioeconomic Indicators and the Elevated Blood Lead Level 10-14 µg/dl for the Zip Codes, Located Within or that Intersect, the 5-Mile Radius of the RSR Site.

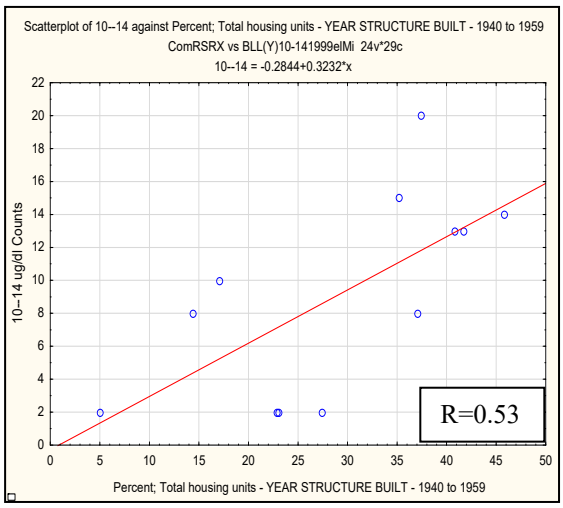
Variable	Spearman Rank Order Correlations (ComRSRX vs BLL(Y)10-141999elMi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.73	0.57	0.31	-0.19	-0.12	0.38	0.27	0.55	0.54
Percent; Household Income - Less than $10,000	0.73	1.00	0.73	0.46	-0.55	-0.07	0.72	0.42	0.58	0.83
Percent; Household Income - $10,000 to $14,999	0.57	0.73	1.00	0.64	-0.03	0.31	0.69	-0.04	0.52	0.56
Percent; Household Income - $15,000 to $24,999	0.31	0.46	0.64	1.00	0.12	0.60	0.66	-0.10	0.37	0.41
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.19	-0.55	-0.03	0.12	1.00	0.67	-0.02	-0.71	0.03	-0.37
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.12	-0.07	0.31	0.60	0.67	1.00	0.38	-0.50	0.31	0.12
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.38	0.72	0.69	0.66	-0.02	0.38	1.00	-0.13	0.47	0.66
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.27	0.42	-0.04	-0.10	-0.71	-0.50	-0.13	1.00	0.25	0.38
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.55	0.58	0.52	0.37	0.03	0.31	0.47	0.25	1.00	0.42
10--14 ug/dl (Counts) Blood Lead Level	0.54	0.83	0.56	0.41	-0.37	0.12	0.66	0.38	0.42	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within, or that intersect the 5-mile radius, of the RSR Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the number of counts of children with the elevated blood lead level of 10-14 µg/dl and percentage of households with income less than $10,000 per year, and the percentage of housing units built in the Year 1940 to the Year 1959. These items may be significant because people that live in households with income less than $10,000 per year, might reside in cheap houses, that have not been renovated, that have been painted with lead based paint. The children could have been exposed to indoor lead based contamination when they moved into the housing units that were constructed in between the Year 1940 to the Year 1959. Therefore, the counts of elevated blood lead level may be a result of socioeconomic factors, in addition, to the proximity of the prospective students residing in close proximity of the RSR Site. Bivariate plots of the significant relationships are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.16- Graph 7.17: Year 1999 RSR Plots of Significant Relationships for Socioeconomic Indicators vs Elevated Blood Lead Level of 10-14 µg/dl





In the graphs above, as the percentages of households with income less than $10,000 per year and the percentages of housing units built in the Year 1940 to the Year 1959 increases, the greater quantity of childhood blood lead level cases increases. The housing units that were built in the Year 1939 or earlier may not have been significant, due to these housing units being demolished or renovated.

7.2.2.2 Year 1999 Comparison Analysis for RSR Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Levels for Zip Codes Located Greater than the 5-mile Radius of the RSR Site (Comparison Group).

The purpose of the comparison analysis is to identify trends in the data by comparing the data from the children that reside within zip codes, located within or that intersect, the 5-mile radius of the RSR Site, with the data from the children that reside within zip codes, located greater than the 5-mile radius of the RSR Site. The table of the socioeconomic indicators and the counts of children, that reside in zip codes located greater than the 5-mile radius of the RSR Site, with the blood lead level of 10-14 µg/dl, for the Year 1999 is shown below.

Table 7.15: Year 1999 Comparison Analysis for Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Level for Zip Codes Located Greater Than the 5-Mile Radius of the RSR Superfund Site

	Year 1999 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from RSR Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75006	5.7	3.6	3.1	9.7	17.3	31.2	13.8	7.6	0.6	0
75007	2.8	2.2	1.4	4.5	8.7	25.3	2.3	0.3	0.2	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	2
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	2
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	2
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	2
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	2
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	5
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	0
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	41

In the table, the percentage of socioeconomic indicators and the counts of children with the 10-14 µg/dl blood lead concentration, are shown across the top, of the table. The zip codes located greater than the RSR Site's 5-mile radius, is shown on the left side of the table. The comparison table, for the Year 1999, shows significantly lower counts of elevated childhood blood lead cases, than the cases for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Superfund Site. The total counts for the elevated blood lead level 10-14 µg/dl is 109, for the children that reside in zip codes, located within or that intersect, the RSR Site's 5-mile radius, and the total counts of elevated blood lead level 10-14 µg/dl, for children that reside in the zip codes located greater than the RSR Site 5-mile radius is 41. The difference could be due to indoor lead exposure, due to a larger quantity of housing units, built before the Year 1970, located within the 5-mile radius of the RSR Site, than the housing units located greater than the RSR Site's 5-mile radius. Once again, the highlighted values were

estimated. Please refer to section 7.2.2 for explanation on the process of estimation for the highlighted values.

The Spearman Rank correlation matrix was used, to analyze the data, due to the data set not having a normal distribution and due to the low quantity of observations, for the children that reside in zip codes located greater than the 5-mile radius of the RSR Site. The comparison correlation matrix is shown below.

Table 7.16: Year 1999 Comparison Correlation Matrix of Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Level for Zip Codes Located Greater Than the 5-Mile Radius, of the RSR Superfund Site

	Spearman Rank Order Correlations (10-14 BLL 1999) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years-Below Poverty	Percent; Housing Units-YEAR BUILT - 1970 to 1979	Percent; Housing Units-YEAR BUILT - 1960 to 1969	Percent; Housing Units-YEAR BUILT - 1940 to 1959	Percent; Housing Units-YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.74	0.36	0.70	0.67	0.20	0.32	0.30	0.02	-0.02
Percent; Household Income - Less than $10,000	0.74	1.00	0.48	0.80	0.57	0.20	0.50	0.45	0.14	0.22
Percent; Household Income - $10,000 to $14,999	0.36	0.48	1.00	0.49	0.08	0.30	0.73	0.78	0.50	0.35
Percent; Household Income - $15,000 to $24,999	0.70	0.80	0.49	1.00	0.43	0.25	0.64	0.58	0.16	0.21
Fem Household-No Husband-with Child Less 18 Years-Below Poverty	0.67	0.57	0.08	0.43	1.00	-0.05	0.10	-0.03	-0.11	0.16
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.20	0.20	0.30	0.25	-0.05	1.00	0.49	0.19	-0.10	-0.16
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.32	0.50	0.73	0.64	0.10	0.49	1.00	0.87	0.34	0.33
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.30	0.45	0.78	0.58	-0.03	0.19	0.87	1.00	0.67	0.47
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.02	0.14	0.50	0.16	-0.11	-0.10	0.34	0.67	1.00	0.58
10--14 ug/dl (Counts) Blood Lead Level	-0.02	0.22	0.35	0.21	0.16	-0.16	0.33	0.47	0.58	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead level, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located greater than the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there is a weak and medium range strength significant relationship, between the number of counts of children with elevated blood lead level of 10-14 µg/dl and the percentage of housing units that were constructed in the Year 1940 to Year 1959 and the percentage of housing units constructed Year 1939. The elevated, unduplicated childhood blood lead level, for children that reside in zip codes located greater than the 5-mile radius of the RSR Site, is a most likely due to indoor lead contamination from, from lead based paint, of the housing units constructed from the Year 1940 to Year 1959 and from the Year 1939 or earlier.

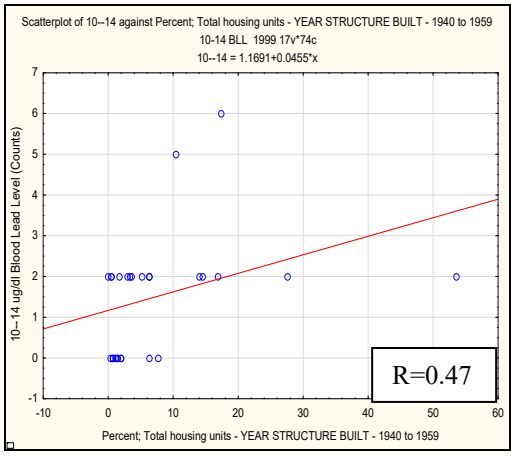
Compared to the correlation matrix for children, with the elevated blood lead level of 10-14 µg/dl, that reside in zip codes, located within or that intersect the 5-mile radius of the RSR Site, there are no significant relationships between socioeconomic indicators, related

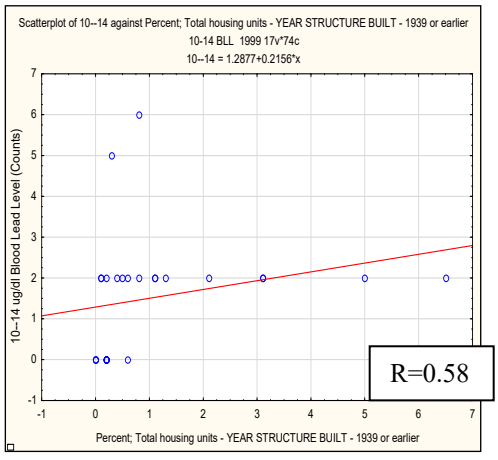
to households with low income or families below poverty level, as there were for the children that reside in zip codes, located within or that intersect, the 5-mile radius, of the RSR Site. Both correlation matrices, for children that reside in zip codes, located within or that intersect, and that reside in zip codes located outside of the RSR Site's 5-mile radius, had significant relationships with the counts of elevated childhood blood lead level of 10-14 µg/dl and the percentage of housing units constructed between the Year 1940 to Year 1959. The significant relationship is weaker, for the comparison group of children, than the children that reside within zip codes, located within or that intersect the RSR Site's 5-mile radius.

In the comparison groups' correlation matrix, there is a strong significant relationship between the counts of elevated childhood blood lead level of 10-14 µg/dl and the percentage of housing units, constructed, the Year 1939 and earlier. This could be due to the result of indoor lead exposure to lead- based paint, in housing units constructed before the Year 1970.

Overall, the strength of significant relationships, are lower for the comparison group, than the significant relationships for the children that reside in zip codes, located within or that intersect, the RSR Site's 5-mile radius. The higher values, of the coefficients of correlations, for the children that reside in zip codes, located within or that intersect, the 5- mile radius of the RSR Site, might be due to a higher percentage of low income families that have higher counts of elevated blood lead level of 10-14 µg/dl. In addition, the higher coefficients of correlations might due to a higher quantity of housing units, constructed between the Year 1940 to Year 1959 that might have resulted in more cases of elevated childhood blood lead level, due to indoor lead exposure. The graphs of the significant variable are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.18- Graph 7.19: Year 1999 Comparison Group Plots of Significant Relationships of Socioeconomic Indicators vs. Elevated Blood Lead Level of 10-14 µg/dl.





7.2.2.3 Year 1999 Socioeconomic Indicators and the Total Counts of Blood Lead Level for Children That Reside in Zip Codes, Located Within or that Intersect, the RSR Site's 5-mile Radius.

This analysis consists determining if a significant relationship exists between socioeconomic indicators and the total counts of all elevated blood lead levels, 10-14 µg/dl, 15-19 µg/dl, and = or >20µg/dl, combined. The table showing the socioeconomic indicators and the total counts of elevated blood lead levels is shown below.

Table 7.17: RSR Year 1999 Socioeconomic Indicators and Total Counts Blood Lead Levels for Zip Codes Located, Within or that Intersect, the 5-Mile Radius of RSR Superfund Site

	RSR Year 1999 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	17
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	28
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	21
75219	22.0	9.9	6.3	13.8	21.4	22.3	17.1	9.8	54.8	17
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	2
75235	19.4	11.6	6.6	18.3	15.5	24.2	37.1	9.4	45.8	10
75203	30.2	24.5	10.4	20.7	13.5	21.4	40.8	15.2	44.9	17
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	4
75224	17.6	12.2	7.4	17.6	13.6	27.6	45.8	5.8	36.5	15
75061	10.7	6.9	5.8	16.7	17.3	21.0	23.0	2.1	23.1	4
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	8.0	15
75201	9.0	7.9	2.7	8.2	3.1	10.9	5.0	23.8	33.9	2
									Sum=	**152**

In the table, the percentage of socioeconomic indicators and the total counts of elevated blood lead levels are shown across the top, of the table. The zip codes located within, or that intersect, the RSR Site's 5-mile radius is shown on the left side of the table. Based on the table, above, there are 152 unduplicated total counts of elevated childhood blood lead levels, for the children that reside in the zip codes, located within or that intersect, the 5-mile radius, of the RSR Superfund Site. The high total counts of elevated of childhood blood lead levels, could be a result of families, residing in housing units constructed before the Year 1970. The children, of these families, could have been exposed to indoor lead based paint. The highlighted values, in the table are estimated values from the "<5" counts, in the original data set. Additional information regarding the method to estimate "<5"values is expounded upon in section 7.2.2.

The Spearman Rank Correlation Matrix was utilized to analyze the data due to a non-normal data distribution, as well as, a small number of observations. The correlation matrix for the total counts of elevated childhood blood lead levels, for the Year 1999, for children that reside in zip codes located, within or that intersect, the 5-mile radius of the RSR Superfund Site is shown below.

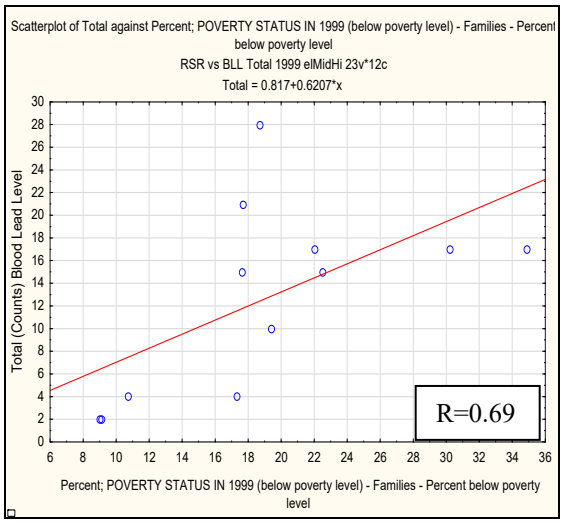
Table 7.18: Year 1999 RSR Correlation Matrix for Socioeconomic Indicators vs. Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes, Located Within or that Intersect, the 5-Mile Radius, of the RSR Site.

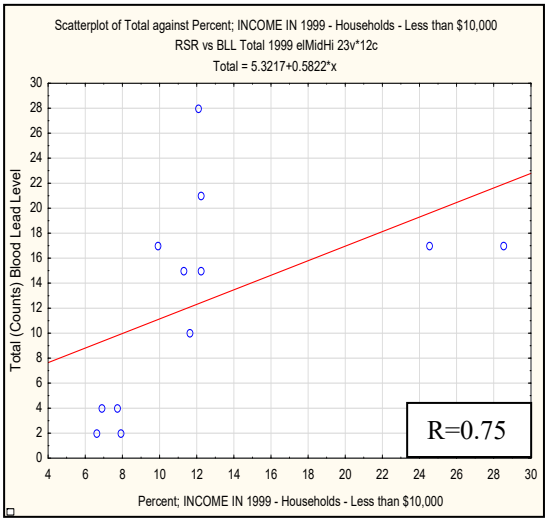
Variable	Spearman Rank Order Correlations (RSR vs BLL Total 1999 elMidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.73	0.57	0.31	-0.19	-0.12	0.38	0.27	0.55	0.69
Percent; Household Income - Less than $10,000	0.73	1.00	0.73	0.46	-0.55	-0.07	0.72	0.42	0.58	0.75
Percent; Household Income - $10,000 to $14,999	0.57	0.73	1.00	0.64	-0.03	0.31	0.69	-0.04	0.52	0.59
Percent; Household Income - $15,000 to $24,999	0.31	0.46	0.64	1.00	0.12	0.60	0.66	-0.10	0.37	0.34
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.19	-0.55	-0.03	0.12	1.00	0.67	-0.02	-0.71	0.03	-0.28
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.12	-0.07	0.31	0.60	0.67	1.00	0.38	-0.50	0.31	0.03
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.38	0.72	0.69	0.66	-0.02	0.38	1.00	-0.13	0.47	0.47
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.27	0.42	-0.04	-0.10	-0.71	-0.50	-0.13	1.00	0.25	0.40
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.55	0.58	0.52	0.37	0.03	0.31	0.47	0.25	1.00	0.45
Total (Counts) Blood Lead Level	0.69	0.75	0.59	0.34	-0.28	0.03	0.47	0.40	0.45	1.00

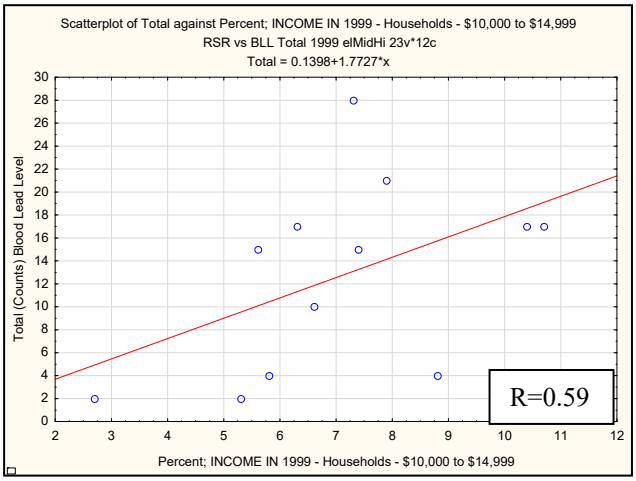
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the total counts of children with elevated blood lead levels and percentage of families below poverty level, households with income, less than $10,000 per year, and households with income, between $10,000 to $14,999, per year. Based on the correlation matrix, it seems that families and households, that are below poverty and have extremely low income, are more likely to have children that have elevated blood lead. This could be a result of the children living in close proximity to the RSR Superfund Site and could be the result of possible indoor lead exposure, if these families lived in housing units constructed before the Year 1970.The graphs of the significant relationships are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.20- Graph 7.22:Year 1999 RSR Plots of Significant Relationships between Socioeconomic Indicators and Total Counts of Elevated Blood Lead Level







Based on the graphs above, as the percentage of families below poverty level, the percentage of households with income less than $10,000, per year, and the percentage households with income between $10,000 to $14,999, per year, increase, the counts of total elevated childhood blood lead level increase. This shows that low income may be a socioeconomic factor that contributes to total counts of childhood elevated blood lead.

7.2.2.4 Year 1999 Comparison Analysis for Socioeconomic Indicators vs. Total Counts of Blood Lead Levels for Zip Codes, Located Greater than the 5-mile Radius of the RSR Site (Comparison Group)

The purpose of the comparison group analysis is to identify trends, in the data, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site, from the children that reside in zip codes located greater than the 5-mile radius of the RSR Superfund Site. The table of all of the socioeconomic indicators and the total

counts of childhood blood lead levels, for children that reside in zip codes located greater than the 5-mile radius of the RSR Superfund Site is shown below.

Table 7.19: Year 1999 Comparison of Socioeconomic Indicators and Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes, located Greater than the RSR Site's 5-Mile Radius

	Year 1999 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from RSR									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household- No Husband- with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75006	5.7	3.6	3.1	9.7	17.3	31.2	13.8	7.6	0.6	0
75007	2.8	2.2	1.4	4.5	8.7	25.3	2.3	0.3	0.2	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	4
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	4
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	2
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	2
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	7
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	0
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	4
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	47

Based on the above table, there are a total of 47 unduplicated total counts of elevated childhood blood lead. The total counts are significantly lower than the 152 cases of elevated blood lead, in children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site. The lower counts of elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the RSR Site, could be a result of lower percentages of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was utilized to analyze the data due to the data set not having a normal distribution and due to the low number of observations. The correlation matrix for the socioeconomic indicators and the total counts of elevated blood lead levels, for that reside in zip codes located greater than the 5-mile radius of the RSR Site, is shown below.

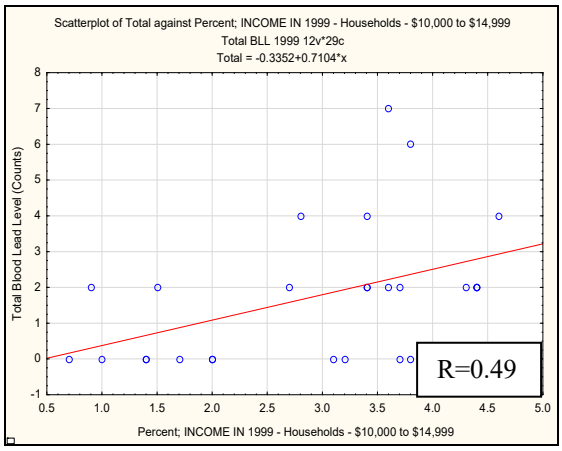
Table 7.20: Year 1999 Comparison Correlation Matrix for Socioeconomic Indicators vs. Total Counts Blood Lead Levels for Zip Codes Located Greater than 5-mile Radius of the RSR Superfund Site

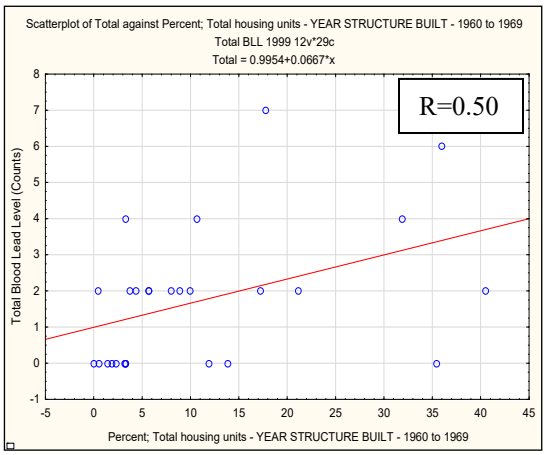
Variable	Spearman Rank Order Correlations (Total BLL 1999) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.74	0.36	0.70	0.67	0.20	0.32	0.30	0.02	0.12
Percent; Household Income - Less than $10,000	0.74	1.00	0.48	0.80	0.57	0.20	0.50	0.45	0.14	0.34
Percent; Household Income - $10,000 to $14,999	0.36	0.48	1.00	0.49	0.08	0.30	0.73	0.78	0.50	0.49
Percent; Household Income - $15,000 to $24,999	0.70	0.80	0.49	1.00	0.43	0.25	0.64	0.58	0.16	0.34
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.67	0.57	0.08	0.43	1.00	-0.05	0.10	-0.03	-0.11	0.03
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.20	0.20	0.30	0.25	-0.05	1.00	0.49	0.19	-0.10	0.11
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.32	0.50	0.73	0.64	0.10	0.49	1.00	0.87	0.34	0.50
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.30	0.45	0.78	0.58	-0.03	0.19	0.87	1.00	0.67	0.59
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.02	0.14	0.50	0.16	-0.11	-0.10	0.34	0.67	1.00	0.52
Total (Counts) of Blood Lead Level	0.12	0.34	0.49	0.34	0.03	0.11	0.50	0.59	0.52	1.00

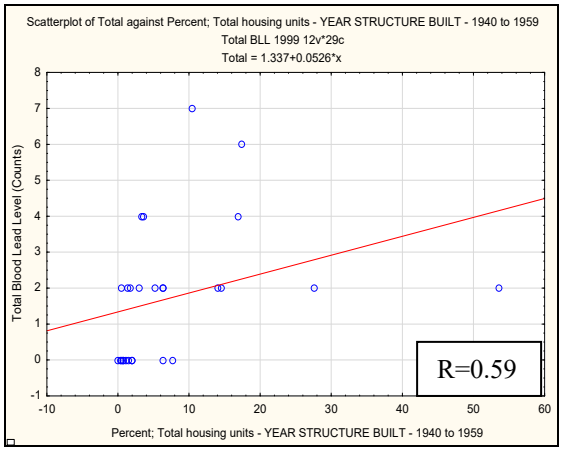
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the RSR Site.

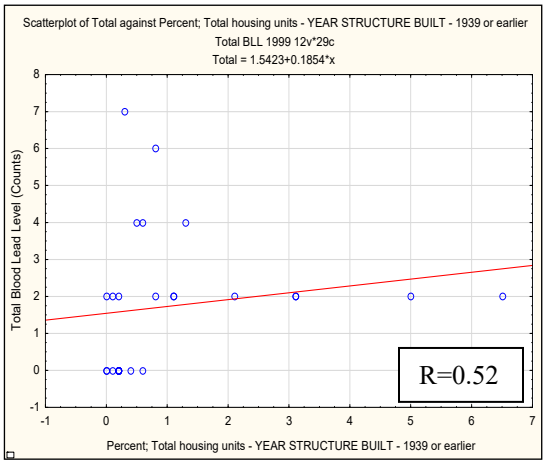
Based upon the correlation matrix, above, there is a weak to moderate significant relationship between the total counts of children with elevated blood lead level and the percentage of households with income between $10,000 to $14,999 per year, the percentage of housing units constructed from the Year 1960 to the Year 1969, the percentage of housing units constructed from the Year 1940 to the Year 1959, and the percentage of housing units constructed from the Year 1939 or earlier. The significant R values are lower, for the children that reside in zip codes located greater than the 5-mile radius of the RSR Site, than the R values, for the children that reside in zip codes, located within or that intersect, the RSR Superfund Site's 5-mile radius. This may be due to a lower percentage of households with low income and a lower percentage of housing units constructed before the Year 1970. The graphs of the significant variables are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.23- Graph 7.26 Year 1999 RSR Comparison Group Plots of Significant Relationships between Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels









Based on the graphs above, as the percentage of households with income between $10,000 to $14,999 per year, and the percentage of housing units constructed before 1970, increase, the counts of total elevated childhood blood lead level increase. This shows that low income and older housing units may contribute to elevated childhood blood lead exposure.

7.2.2.5 Year 2000 RSR Socioeconomic Indicators vs. Elevated Childhood Blood Lead Level 10-14 µg/dl Analysis for Children that Reside in Zip Codes, Located Within or that Intersect, the 5-Mile Radius of the RSR Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the elevated childhood blood lead level of 10- 14 µg/dl. The table of the socioeconomic indicators and the counts of 10-14 µg/dl elevated blood lead level, for the children that reside zip codes that are located within or that intersect the 5-mile radius of the RSR Superfund Site, is shown below.

Table 7.21: Year 2000 Socioeconomic Indicators and 10-14 µg/dl concentration BLL for Zip Codes, Located Within or That Intersect, the RSR Site's 5-Mile Radius

	RSR Year 2000 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	32
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	25
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	19
75219	22.0	9.9	6.3	13.8	21.4	22.3	17.1	9.8	54.8	4
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	0
75235	19.4	11.6	6.6	18.3	15.5	24.2	37.1	9.4	45.8	4
75203	30.2	24.5	10.4	20.7	13.5	21.4	40.8	15.2	44.9	19
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	5
75224	17.6	12.2	7.4	17.6	13.6	27.6	45.8	5.8	36.5	13
75061	10.7	6.9	5.8	16.7	17.3	21.0	23.0	2.1	23.1	4
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	8.0	5
75201	9.0	7.9	2.7	8.2	3.1	10.9	5.0	23.8	33.9	0
									Sum=	**130**

Based on the table, the zip codes, located within or that intersect, the 5-mile radius of the RSR Site, are shown on the left side of the table. The socioeconomic indicators and the counts of elevated childhood blood lead level of 10- 14 µg/dl, are shown across the top of the table. The counts of children, that reside in zip codes, located within or that intersect the RSR Superfund Site's 5 mile radius, have a total of 130 cases of elevated blood lead level of 10-14 µg/dl . The high number of cases could be a result of high percentages of low income families, families below poverty level, and housing units constructed before the Year 1970. In addition, it could be a result of the lead from the lead smelter. Even though "clean –up activities, for the RSR Site ended in the Year 1994, some residents that live in close proximity to the RSR Site, refused to allow the EPA to remove contaminated soil, from their properties. Highlighted values in the table represent estimated values. An explanation on the methodology to estimate these values is in Section7.2.2.

The Spearman Rank Correlation was utilized to analyze the data due to the data distribution that was not normal and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the counts of 10-14 µg/dl concentration of blood lead in children from ages 0 to 14, for the Year 2000 is shown below.

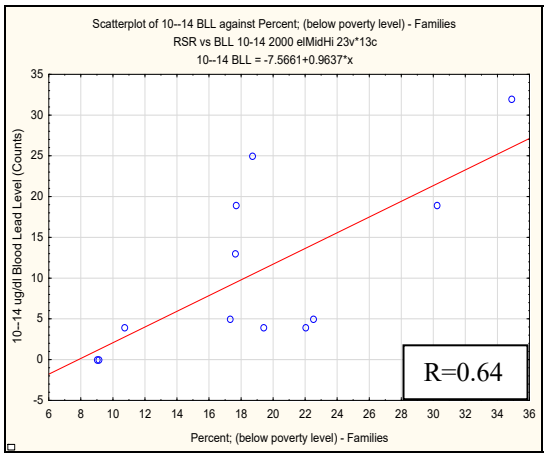
Table 7.22: Year 20000 Correlation Matrix of Socioeconomic Indicators and the 10-14 µg/dl BLL for Children that Reside in Zip Codes, Located Within or that Intersect, the RSR Site's 5-mile radius.

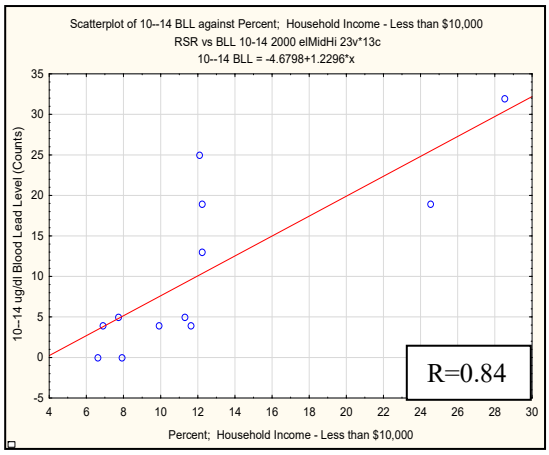
Variable	Spearman Rank Order Correlations (RSR vs BLL 10-14 2000 elMidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.73	0.57	0.31	-0.19	-0.12	0.38	0.27	0.55	0.64
Percent; Household Income - Less than $10,000	0.73	1.00	0.73	0.46	-0.55	-0.07	0.72	0.42	0.58	0.84
Percent; Household Income - $10,000 to $14,999	0.57	0.73	1.00	0.64	-0.03	0.31	0.69	-0.04	0.52	0.83
Percent; Household Income - $15,000 to $24,999	0.31	0.46	0.64	1.00	0.12	0.60	0.66	-0.10	0.37	0.46
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.19	-0.55	-0.03	0.12	1.00	0.67	-0.02	-0.71	0.03	-0.30
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.12	-0.07	0.31	0.60	0.67	1.00	0.38	-0.50	0.31	0.07
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.38	0.72	0.69	0.66	-0.02	0.38	1.00	-0.13	0.47	0.67
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.27	0.42	-0.04	-0.10	-0.71	-0.50	-0.13	1.00	0.25	0.06
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.55	0.58	0.52	0.37	0.03	0.31	0.47	0.25	1.00	0.36
10--14 ug/dl (Counts) Blood Lead Level	0.64	0.84	0.83	0.46	-0.30	0.07	0.67	0.06	0.36	1.00

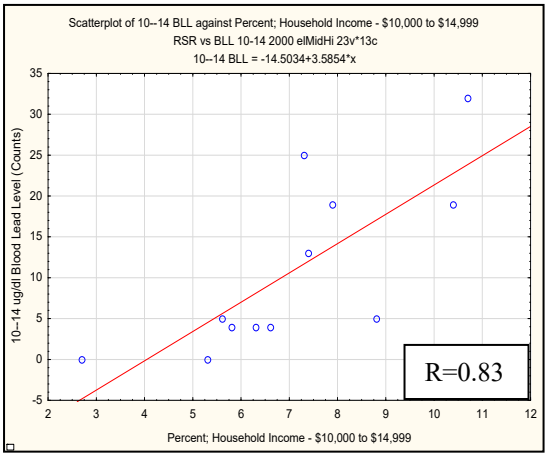
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl , for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site.

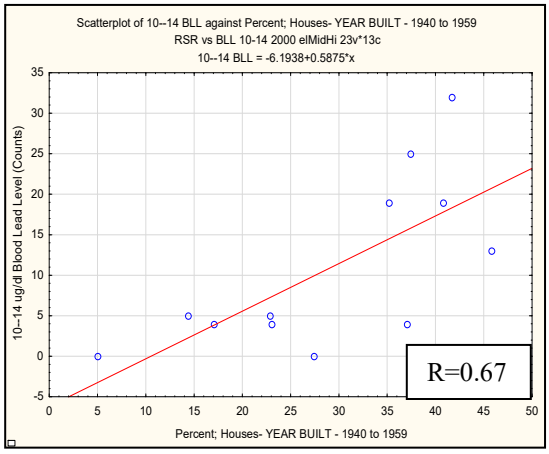
Based upon the correlation matrix, above, there is a strong correlation between the counts of the concentration of elevated blood lead level of 10-14 µg/dl and percentage of families below poverty level, the percentage of households with income less than $10,000 a year, the percentage of households with income between $10,000 to $14,999 per year, and the percentage of housing units built the Year 1940 to Year 1959. Based on the correlation matrix, it seems that the families and households that are below poverty and that have an extremely low income, are more likely to have children that are diagnosed with elevated blood lead. This may be due families and households, that have low income, residing in housing units that are older and cheaper, resulting in indoor lead exposure and effects from the lead smelter of the RSR Superfund Site. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graphs 7.27-7.30 Year 2000 RSR Plots of Significant Relationships between the Socioeconomic Indicators and the Elevated Blood Lead Level of 10-14 µg/dl.









Based on the above graphs as the income is low, families are below poverty level and the quantities of housing units were constructed in 1940 to 1959, the greater the number of cases of childhood blood leads level diagnoses.

7.2.2.6 Year 2000 Comparison Analysis for RSR Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Levels for Zip Codes Located Greater than the 5 mile Radius of the RSR Site.

The purpose of the comparison group analysis is to identify trends, in the data, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site, from the children that reside in zip codes located greater than the 5-mile radius of the RSR Superfund Site. The table of the socioeconomic indicators and the counts of 10-14 µg/dl elevated blood lead level, for children that reside in the zip codes that are located greater than 5-mile radius from the RSR Superfund Site, is shown below.

Table 7.23: Year 2000 Comparison Socioeconomic Indicators and Counts of 10-14 Blood Lead Levels for Zip Codes Located Greater Than 5-mile Radius of the RSR Superfund Site

	Year 2000 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from RSR Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household- No Husband- with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	2
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	0
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	5
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	7
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	2
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	5
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	2
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	0
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	2
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	35

The counts of the blood lead concentration 10-14 µg/dl, for the children that reside in zip codes, located greater than the 5-mile radius of the RSR Site, are much less than the counts of elevated blood lead level 10-14 µg/dl, for children that reside in the zip codes, located within of that intersect, RSR Site's 5-mile radius. The total counts, of children exposed the blood lead level of 10-14 µg/dl, for the Year 2000, is 35. The 35 count is much lower, than the counts for the children that reside in zip codes, located within or that intersect, the 5- mile radius of the RSR Site. This could be due to a smaller quantity of low income families, families below poverty level, and housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was utilized to analyze the tabular data due to the data distribution not being normal and due to the low quantity of observations. The correlation matrix for the socioeconomic indicators and the counts of elevated childhood blood lead level of 10-14 µg/dl, is shown below.

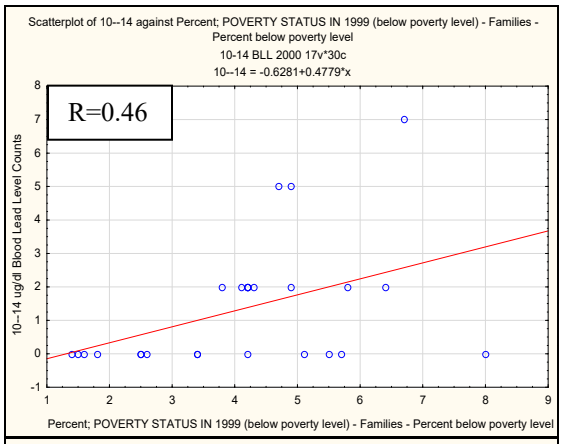
Table 7.24.Year 2000 Correlation Matrix for RSR Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater Than the RSR Site's 5-mile Radius.

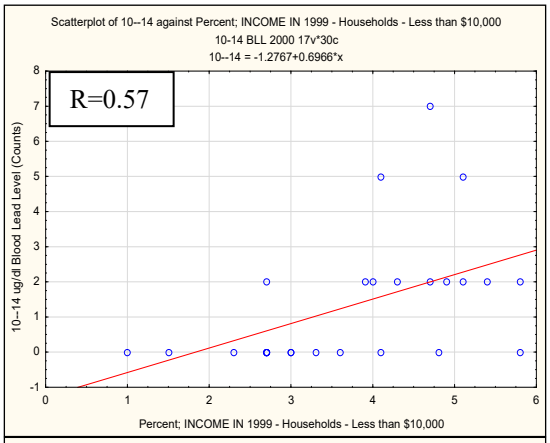
Variable	Spearman Rank Order Correlations (10-14 BLL 2000) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.46
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.57
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.24
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.53
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.37
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.11
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.42
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.43
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	0.37
10--14 ug/dl (Counts) Blood Lead Level	0.46	0.57	0.24	0.53	0.37	0.11	0.42	0.43	0.37	1.00

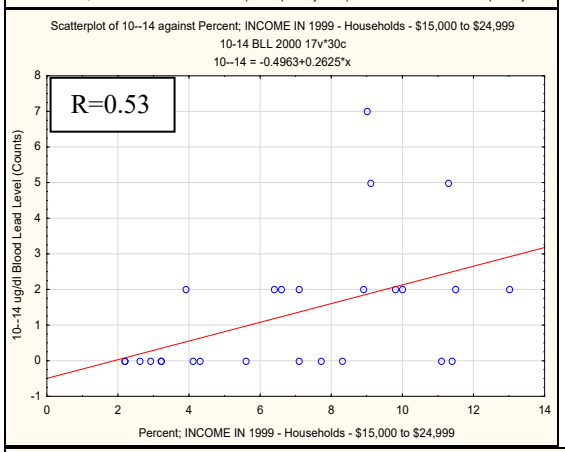
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located greater than the 5-mile radius of the RSR Site.

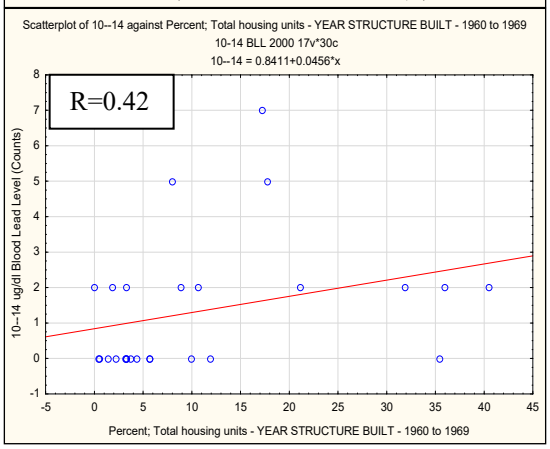
Based on this correlation matrix, there are significant relationships between the counts of elevated childhood blood lead level of 10-14 µg/dl and the percentage of families below poverty level, the percentage of households with income less than $10,000 per year, the percentage of households with income between $15,000 to $24,999 per year, the percentage of housing units built from the Year 1960 to the Year 1969, and the percentage of housing units built between the Year 1940 to the Year 1959. The significant relationships are similar to the significant relationships for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Superfund Site. However, the significant R values are much higher, for the children that reside in the zip codes, located within or that intersect, the RSR Site's 5-mile radius, than the R values, for the children that reside in the zip codes, located outside of the 5-mile radius of the RSR Site. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

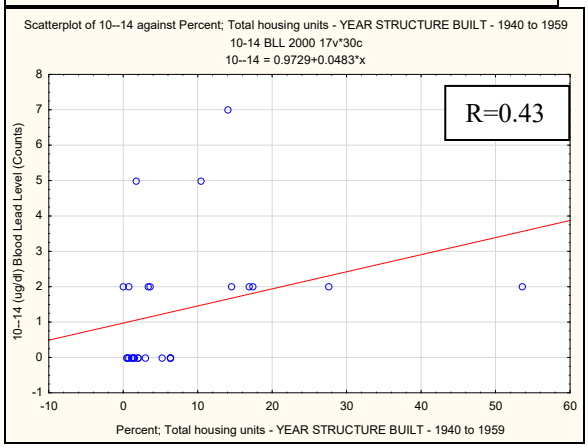
Graph 7.31- Graph 7.35 Year 2000 RSR Comparison Group Plots of Significant Relationships between Socioeconomic Indicators and Elevated Blood Lead Level of 10-14 µg/dl











Based on the above graphs, as the percentage of families below poverty level, the percentage of households with income less than $10,000 per year, the percentage households with income between $15,000 to $24,999 per year, the percentage of housing units built the Year 1960 to the Year 1969, and the percentage of housing units built between the Year 1940 to Year 1959, increase, the counts of 10-14 µg/dl concentration of childhood blood lead level, increase. This indicates that families that are below the poverty level and households that have low income, may have had indoor lead exposure, due to residing in cheap housing units constructed before the year 1970.

7.2.2.7 RSR Year 2000 Socioeconomic Indicators and the Total Elevated Childhood Blood Lead Level Counts for Children Residing in Zip Codes, Located Within or that Intersect the RSR Site's 5-Mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the total counts of elevated childhood blood lead levels of 10-14 μg/dl, 15-19 μg/dl, and => 20 μg/dl, combined. The table depicting the data table of the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes that are located, within or that intersect, the 5-mile radius of the RSR Site is shown below.

Table 7.25 Year 2000 Table of Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels for Zip Codes, Located Within or that Intersect, the RSR Site's 5-mile Radius.

	RSR Year 2000 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; (below poverty level) - Families	Percent; Household Income - Less than $10,000	Percent; Household Income- $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Houses - YEAR BUILT - 1970 to 1979	Percent; Houses - YEAR BUILT - 1960 to 1969	Percent; Houses - YEAR BUILT - 1940 to 1959	Percent; Housing units - YEAR BUILT - 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	38.0
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	37.0
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	28.0
75219	22.0	9.9	6.3	13.8	21.4	22.3	17.1	9.8	54.8	7.0
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	0.0
75235	19.4	11.6	6.6	18.3	15.5	24.2	37.1	9.4	45.8	7.0
75203	30.2	24.5	10.4	20.7	13.5	21.4	40.8	15.2	44.9	27.0
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	5.0
75224	17.6	12.2	7.4	17.6	13.6	27.6	45.8	5.8	36.5	18.0
75061	10.7	6.9	5.8	16.7	17.3	21.0	23.0	2.1	23.1	8.0
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	8.0	6.0
75201	9.0	7.9	2.7	8.2	3.1	10.9	5.0	23.8	33.9	0.0
									Sum=	**181.0**

In the table, the zip codes that are located within or that intersect the 5-mile radius of the RSR Site, is shown on the left side of the table, and the socioeconomic indicators and the total counts of elevated childhood blood levels, are located across the top of the table. There are a total of 181 total unduplicated cases of elevated blood lead levels, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site. The unduplicated cases could be extremely high due to indoor lead exposure, from a large quantity of housing units that were constructed prior to the Year 1970. In addition, low income households and families that are below the poverty level might have moved into cheaper houses that were constructed before the Year 1970, exposing them to indoor lead. In addition, the families could have been exposed to remnants of lead dust from the lead smelter of the RSR Site.

The Spearman Rank Correlation Matrix was the method used to analyze the data due to a low number of observations and due to the data set not having a normal distribution. The

correlation matrix, for the socioeconomic indicators and the total counts of childhood blood lead levels, is shown below.

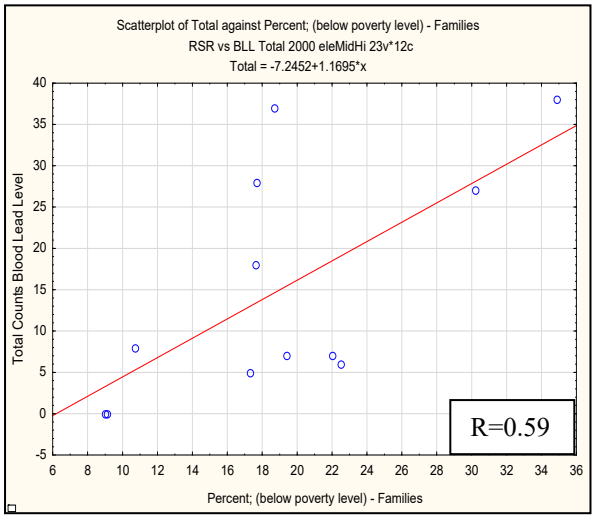
Table 7.26: Year 2000 Correlation Matrix for RSR Socioeconomic Indicators and Total Counts of Elevated Blood Lead for Children that Reside in Zip Codes, Located Within or that Intersect, the RSR Site's 5- Mile Radius.

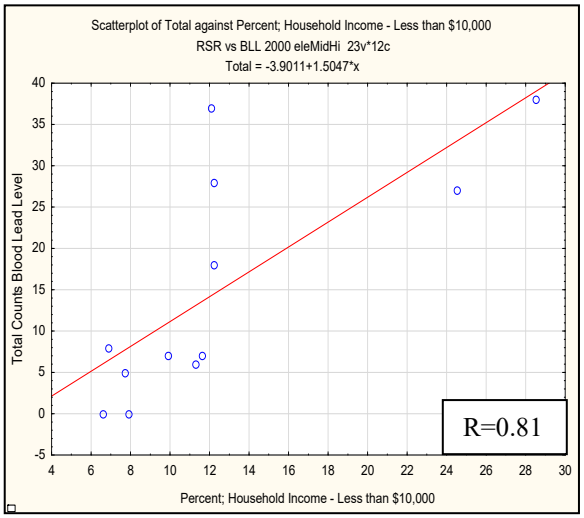
	Spearman Rank Order Correlations (RSR vs BLL Total 2000 eleMidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.73	0.57	0.31	-0.19	-0.12	0.38	0.27	0.55	0.59
Percent; Household Income - Less than $10,000	0.73	1.00	0.73	0.46	-0.55	-0.07	0.72	0.42	0.58	0.81
Percent; Household Income - $10,000 to $14,999	0.57	0.73	1.00	0.64	-0.03	0.31	0.69	-0.04	0.52	0.72
Percent; Household Income - $15,000 to $24,999	0.31	0.46	0.64	1.00	0.12	0.60	0.66	-0.10	0.37	0.48
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.19	-0.55	-0.03	0.12	1.00	0.67	-0.02	-0.71	0.03	-0.26
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.12	-0.07	0.31	0.60	0.67	1.00	0.38	-0.50	0.31	0.04
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.38	0.72	0.69	0.66	-0.02	0.38	1.00	-0.13	0.47	0.74
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.27	0.42	-0.04	-0.10	-0.71	-0.50	-0.13	1.00	0.25	0.14
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.55	0.58	0.52	0.37	0.03	0.31	0.47	0.25	1.00	0.49
Total (Counts) of Blood Lead Level	0.59	0.81	0.72	0.48	-0.26	0.04	0.74	0.14	0.49	1.00

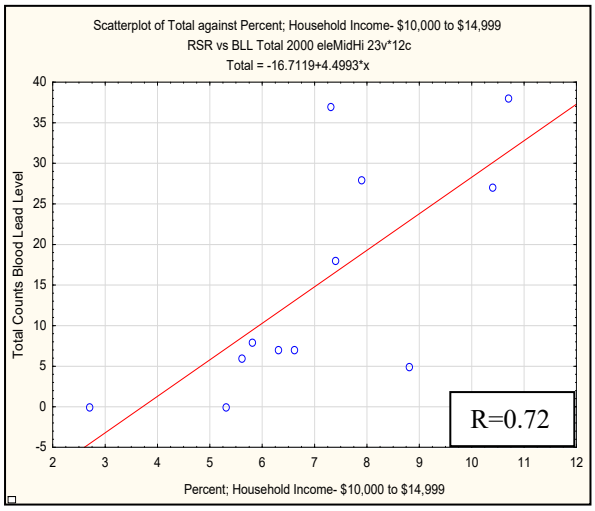
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site.

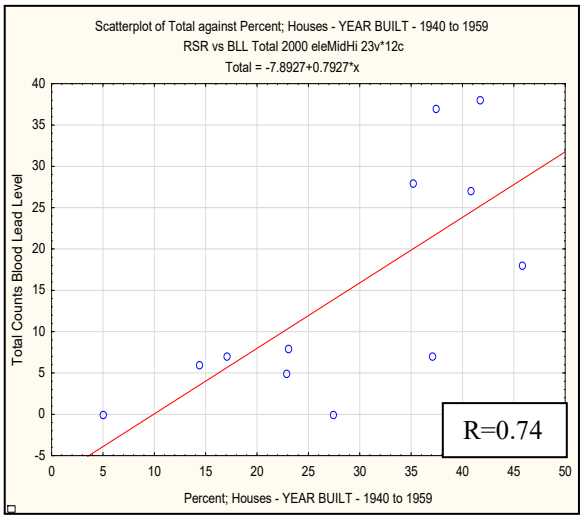
Based upon the correlation matrix, above, there is a strong significant relationship between the total counts of elevated blood lead levels and percentage of families below poverty level, the percentage of households with income less than $10,000 a year, the percentage of households with income between $10,000 to $14,999 per year, and the percentage of housing units built the Year 1940 to Year 1959. Based on the correlation matrix, it seems that families and households, that are below poverty level and that have extremely low income, are more likely to have children that are diagnosed with elevated blood lead. This may be due to indoor lead exposure from families residing in housing units constructed before the Year 1970, as well as, possible exposure to the RSR lead smelter. The bivariate plots of the significant bivariate relationships are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.36- Graph 7.39 Year 2000 RSR Plots of Significant Relationships between Socioeconomic Indicators and Total Counts of Elevated Blood Lead Level


Scatterplot of Total against Percent; (below poverty level) - Families
RSR vs BLL Total 2000 eleMidHi 23v*12c
Total = -7.2452+1.1695*x
Total Counts Blood Lead Level
Percent; (below poverty level) - Families
R=0.59


Scatterplot of Total against Percent; Household Income - Less than $10,000
RSR vs BLL 2000 eleMidHi 23v*12c
Total = -3.9011+1.5047*x
Total Counts Blood Lead Level
Percent; Household Income - Less than $10,000
R=0.81


Scatterplot of Total against Percent; Household Income- $10,000 to $14,999
RSR vs BLL Total 2000 eleMidHi 23v*12c
Total = -16.7119+4.4993*x
Total Counts Blood Lead Level
Percent; Household Income- $10,000 to $14,999
R=0.72


Scatterplot of Total against Percent; Houses - YEAR BUILT - 1940 to 1959
RSR vs BLL Total 2000 eleMidHi 23v*12c
Total = -7.8927+0.7927*x
Total Counts Blood Lead Level
Percent; Houses - YEAR BUILT - 1940 to 1959
R=0.74

Based on the above graphs, as the percentage of the households with low income, the percentage of families that are below poverty level, and the percentage of housing units that were constructed in the Year 1940 to the Year 1959, increase, the number of cases of elevated childhood blood lead levels increase.

7.2.2.8 RSR Year 2000 Comparison Analysis for RSR Socioeconomic Indicators and Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes Greater than 5-mile Radius, from the RSR Site.

The purpose of the comparison group analysis is to identify trends, in the data, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site, by comparing the data to the children that reside in zip codes located greater than the 5-mile radius of the RSR Superfund Site. This analysis focuses on the total counts of all childhood blood lead levels; 10-14 µg/dl, 15-19 µg/dl, and => 20 µg/dl, combined. The table of the socioeconomic indicators and the total counts, of elevated blood lead levels, for children that reside in the zip codes that are located greater than the 5-mile radius of the RSR Superfund Site, is shown below.

Table 7.27: Year 2000 Comparison Socioeconomic Indicators and Total Counts Blood Lead Levels for Zip Codes Located Greater Than 5-mile Radius of the RSR Superfund Site

	Year 2000 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from RSR									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household- No Husband- with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	4
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	4
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	4
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	4
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	0
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	5
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	8
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	2
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	6
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	4
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	4
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	55

The total counts, of elevated childhood blood lead levels, are much less in the table, than the total counts, for children that reside in the zip codes, located within or that intersect, the RSR Site's 5-mile radius. The total counts of childhood blood lead level is 55, for children that reside in zip codes located greater than the 5-mile radius, of RSR Site, and the total counts are 181 unduplicated cases, for the children that reside in the zip codes, located within or that intersect, the 5-mile radius, of the RSR Site. The lower counts, for the children that reside in zip codes, located greater than the 5-mile radius, of the RSR Site, may be due to a lower quantity of families below the poverty level, a lower quantity families with low income, as well as, a lower quantity of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data due to the non-normality of the data and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the total counts, of elevated childhood blood lead levels, for children that reside in zip codes located outside of the RSR Site's 5-mile radius is shown below.

Table 7.28:Year 2000 Correlation Matrix for RSR Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes Located Greater Than the 5-mile Radius of the RSR Site.

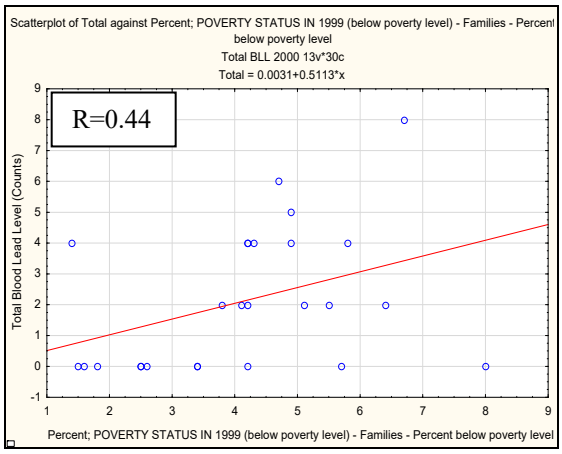
	Spearman Rank Order Correlations (Total BLL 2000) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.44
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.46
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.25
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.49
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.37
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.07
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.43
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.40
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	0.28
Total (Counts) of Blood Lead Level	0.44	0.46	0.25	0.49	0.37	0.07	0.43	0.40	0.28	1.00

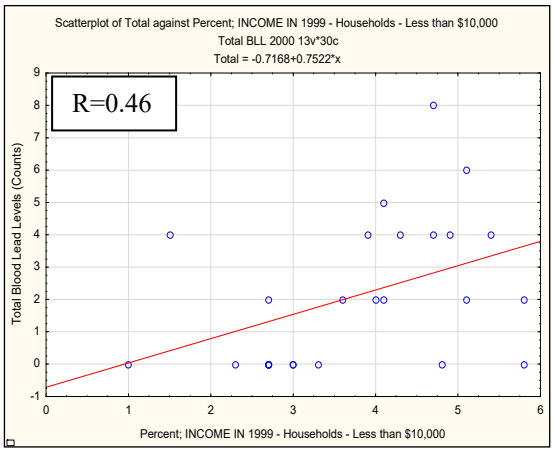
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the RSR Site.

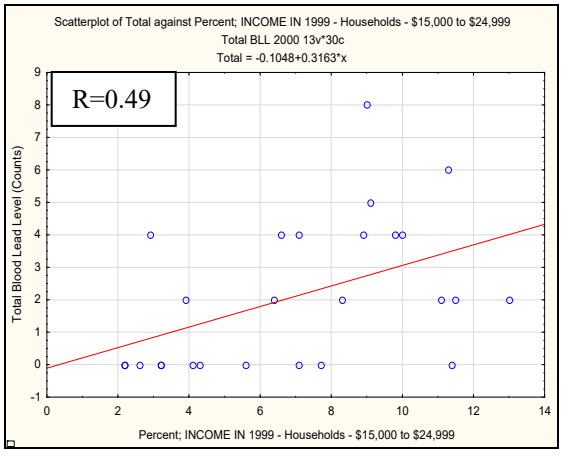
Based upon the correlation matrix, above, there are weak to moderate significant relationships, between the total counts of elevated blood lead levels, and percentage of families below poverty level, the percentage of households with income less than $10,000

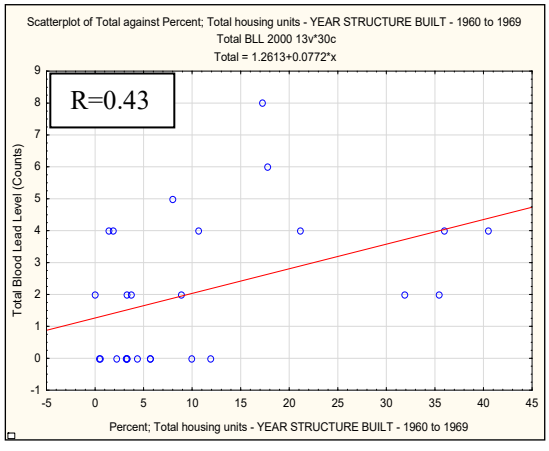
per year, the percentage of households with income between $ 15,000 to $24,999 per year, the percentage of housing units built the Year 1940 to Year 1959 and the percentage of housing units built the Year 1960 to the Year1969. Based on the correlation matrix, it seems that families and households that are below poverty level and that have low income, are more likely to have children that are diagnosed with elevated blood lead levels. This may be due indoor lead exposure as a result of families residing in housing units built before the Year 1970. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

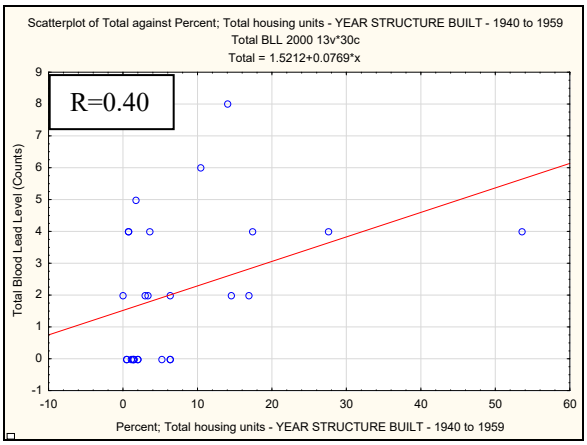
Graph 7.40- Graph 7.44 Year 2000 RSR Comparison Group Plots of Significant Relationships between Socioeconomic Indicators and Total Counts of Elevated Blood Lead Level











All of these bivariate plots are positive relationships, in relation to the socioeconomic indicators and the total counts of childhood blood lead levels. This indicates that low income and housing units that were constructed before 1970, may result in childhood elevated blood lead levels.

7.2.2.9 RSR Year 2001 Socioeconomic Indicators and the Elevated Childhood Blood Lead Level of 10-14 µg/dl Counts for Children Residing in Zip Codes, Located Within or that Intersect, the RSR Site's 5-Mile Radius

The purpose of this analysis is determine if a significant relationship exists between the socioeconomic indicators and the elevated childhood blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Superfund Site. The table depicting the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, that are located within or that intersect, the 5-mile radius of the RSR Site is shown below.
Table 7.29: Year 2001 Socioeconomic Indicators and the Counts of Elevated Blood Lead Level of 10-14 µg/dl for Zip Codes, Located Within or that Intersect, the RSR Site's 5-Mile Radius.

	RSR Year 2001 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; (below poverty level) - Families	Percent; Household Income - Less than $10,000	Percent; Household Income- $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Houses - YEAR BUILT - 1970 to 1979	Percent; Houses - YEAR BUILT - 1960 to 1969	Percent; Houses - YEAR BUILT - 1940 to 1959	Percent; Housing units - YEAR BUILT - 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	23
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	33
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	21
75219	22.0	9.9	6.3	13.8	21.4	22.3	17.1	9.8	54.8	3
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	3
75235	19.4	11.6	6.6	18.3	15.5	24.2	37.1	9.4	45.8	5
75203	30.2	24.5	10.4	20.7	13.5	21.4	40.8	15.2	44.9	9
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	0
75224	17.6	12.2	7.4	17.6	13.6	27.6	45.8	5.8	36.5	15
75061	10.7	6.9	5.8	16.7	17.3	21.0	23.0	2.1	23.1	3
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	8.0	5
75201	9.0	7.9	2.7	8.2	3.1	10.9	5.0	23.8	33.9	0
									Sum=	**120**

The zip codes, located within or that intersect, the 5-mile radius of the RSR Site, are shown on the left side of the table, and the socioeconomic indicators and the counts of children with the elevated blood lead of level 10-14 µg/dl, are shown across the top of the table. The highlighted numeric values represent estimated values. Further information on the estimation process is explained in Section 7.2.2.

Based on the table above, the children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site, have a total of 120 unduplicated cases of elevated childhood blood lead level, of 10-14 µg/dl. The high quantity of unduplicated cases, of elevated blood lead, could be a result of low income families residing in housing units that were constructed before the Year 1970. In addition, the high counts of elevated childhood blood lead level could be due to un- remediated soils, of the properties that were impacted by the RSR Site, that were not cleaned by the EPA, due to the discretion of the previous home owners.

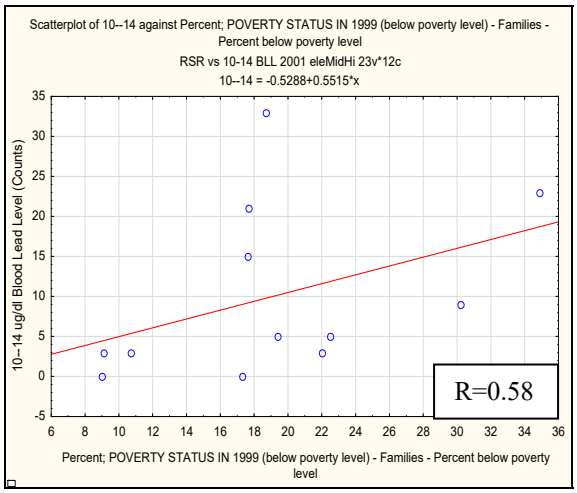
The Spearman Rank Correlation Matrix was utilized to analyze the data because the data set's distribution was not normal and because of the low number of observations. The correlation matrix for the socioeconomic indicators and the childhood elevated blood lead levels of 10-14 µg/dl, is shown below.

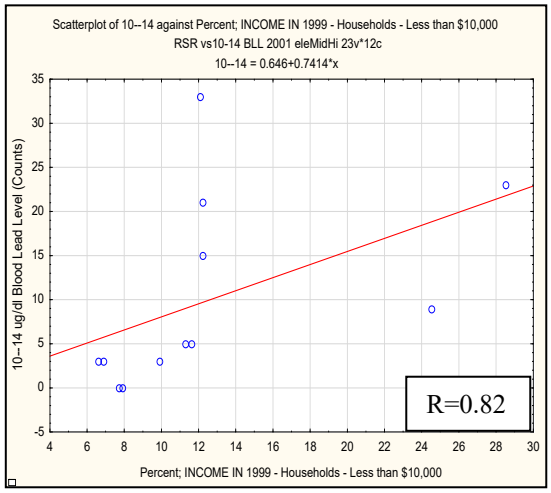
Table 7.30: Year 2001 Correlation Matrix for RSR Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10- 14 µg/dl for Zip Codes, Located Within or that Intersect, RSR Site's 5-mile Radius.

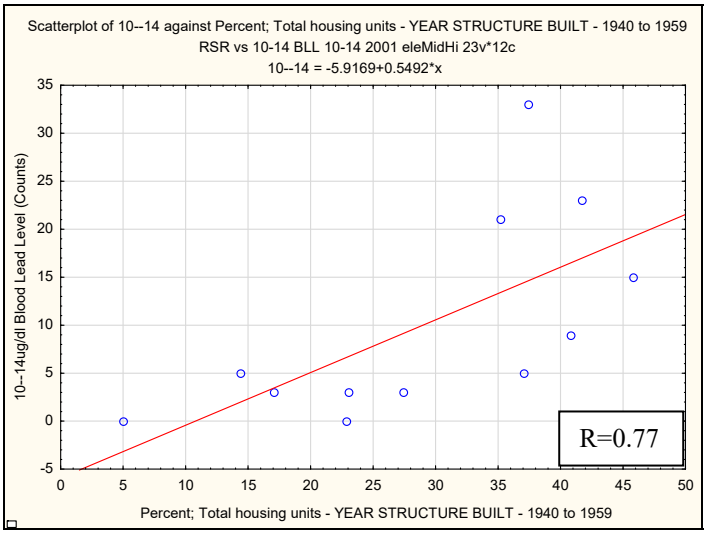
Variable	Spearman Rank Order Correlations (RSR vs 10-14 BLL 10-14 2001elMi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.73	0.57	0.31	-0.19	-0.12	0.38	0.27	0.55	0.58
Percent; Household Income - Less than $10,000	0.73	1.00	0.73	0.46	-0.55	-0.07	0.72	0.42	0.58	0.82
Percent; Household Income - $10,000 to $14,999	0.57	0.73	1.00	0.64	-0.03	0.31	0.69	-0.04	0.52	0.55
Percent; Household Income - $15,000 to $24,999	0.31	0.46	0.64	1.00	0.12	0.60	0.66	-0.10	0.37	0.38
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.19	-0.55	-0.03	0.12	1.00	0.67	-0.02	-0.71	0.03	-0.35
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.12	-0.07	0.31	0.60	0.67	1.00	0.38	-0.50	0.31	0.00
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.38	0.72	0.69	0.66	-0.02	0.38	1.00	-0.13	0.47	0.77
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.27	0.42	-0.04	-0.10	-0.71	-0.50	-0.13	1.00	0.25	0.19
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.55	0.58	0.52	0.37	0.03	0.31	0.47	0.25	1.00	0.34
10--14 ug/dl (Counts) Blood Lead Level	0.58	0.82	0.55	0.38	-0.35	0.00	0.77	0.19	0.34	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of elevated blood lead level of 10-14µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the counts of the concentration of elevated blood lead level of 10-14 µg/dl and percentage of families below poverty level, the percentage of households with income less than $10,000 a year, and the percentage of housing units built the Year 1940 to Year 1959. Based on the correlation matrix, it seems that families and households that are below poverty and that have extremely low income, are more likely to have children that are diagnosed with elevated blood lead. This may be due indoor lead exposure from low income families residing in cheap housing units that were constructed before the Year 1970, as well as, the effects of residing in close proximity to the RSR Superfund site. The graphs of the significant bivariate plots are shown below.
Graph 7.45- Graph 7.47 Year 2001 RSR Plots of Significant Relationships between Socioeconomic Indicators and Elevated Blood Lead Level of 10-14 µg/dl







Based on the above graphs, as the percentage of households with low income, the percentage families that are below poverty level, and the percentage of housing units that were constructed in Year 1940 to the Year 1959, increase, the greater the number of cases of childhood elevated blood lead level cases.

7.2.2.10 Year 2001 Comparison Analysis for RSR Socioeconomic Indicators and Elevated Childhood Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater than the 5-mile Radius of the RSR Site (Comparison Group).

The comparison group analysis was used to identify any trends in the data, for the children that reside in zip codes, located within or that intersect, the RSR Site's 5-mile radius, by comparing the data, to the children that reside in zip codes located greater than 5-mile radius of the RSR Site. The table of the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in the zip codes that are located greater than 5-mile radius, of the RSR Superfund Site, is shown below.

Table 7.31: Year 2001 Comparison Socioeconomic Indicators and Counts Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater than the 5-mile Radius of the RSR Superfund Site

	Year 2001 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from RSR Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household- No Husband- with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	0
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	2
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	2
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	10
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	2
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	2
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	0
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	0
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	2
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	6
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	40

The zip codes located greater than the 5- mile radius of the RSR Site, are listed along the left side of the table, and the socioeconomic indicators and the counts of elevated childhood blood lead level of 10-14 µg/dl, are shown cross the top of the table. Based on the table, there are much lower counts of elevated childhood blood lead level of 10-14 µg/dl, than the counts of elevated blood lead, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site. The unduplicated counts of childhood elevated blood lead level of 10-14 µg/dl is 40, for children that reside in zip codes located greater than 5-mile radius of the RSR Site, and the unduplicated counts of childhood elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes within the 5 mile radius is 120. The reason there are fewer counts of elevated childhood blood lead of level of 10-14 µg/dl, for children that reside in zip codes greater than the 5-mile radius of the RSR Site, could be due to a lower percentage of low income families and housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data since the data set does not have a normal distribution and due to the low quantity of observations. The correlation matrix for the socioeconomic indicators and the counts of elevated childhood

blood lead level of 10-14 µg/dl, for children that reside in zip codes located outside of the RSR Site's 5-mile radius, is shown below.

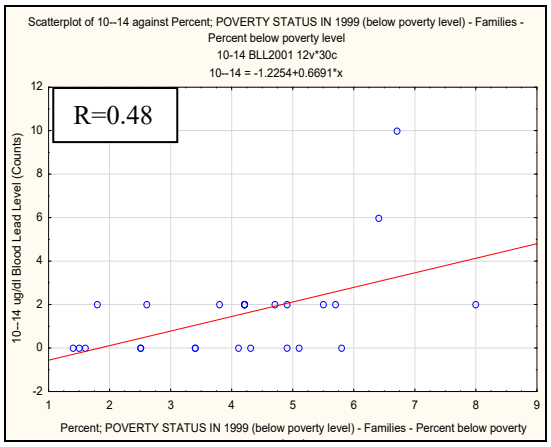
Table 7.32:Year 2001 Correlation Matrix for RSR Socioeconomic Indicators vs. Counts of Elevated Blood Lead Level of 10-14 µg/dl for the Zip Codes Located Greater than the RSR Site's 5-mile radius.

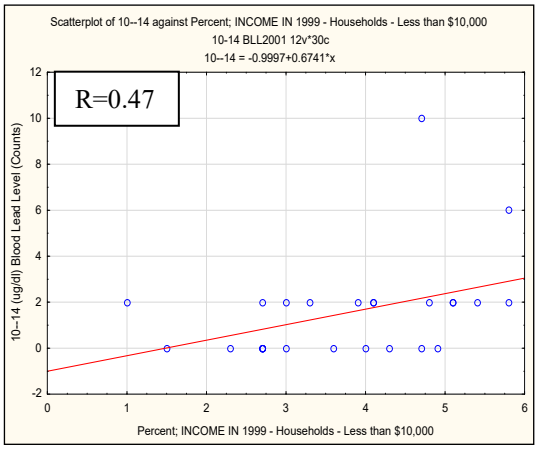
	Spearman Rank Order Correlations (10-14 BLL2001) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.48
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.47
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.12
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.59
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.35
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.33
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.29
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.23
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	-0.10
10--14 ug/dl (Counts) Blood Lead Level	0.48	0.47	0.12	0.59	0.35	0.33	0.29	0.23	-0.10	1.00

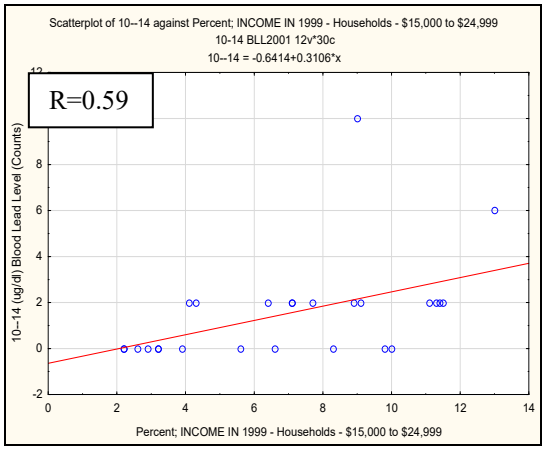
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of elevated blood lead level of 10-14µg/dl, for children that reside in zip codes, located greater than the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there are weak to moderate significant relationships, between the counts of the concentration of elevated blood lead level of 10-14 µg/dl, and percentage of families below poverty level, the percentage of households with income less than $10,000 a year, and the percentage of households, with income between $10,000 to $15,000 a year. Based on the correlation matrix, it seems that there that families and households that are below poverty and have extremely low income, are more likely to have children that are diagnosed with elevated blood lead. The R values, in the comparison group, of children that reside in zip codes, located greater than the 5-mile radius of the RSR Site, are much lower than the R values, for the children that reside in zip codes, located within or that interest, the 5-mile radius of the RSR Site. The plots of the significant bivariate relationships are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.45- Graph 7.47 Year 2001 RSR Comparison Group Plots of Significant Relationships between Socioeconomic Indicators and Elevated Blood Lead Level of 10-14 µg/dl







As the percentage of families below poverty level, the percentage of households with income less than $10,000 per year, the percentage of households with income from $15,000 per year to $24,999 per year increase, the cases of elevated childhood blood lead level increase.

7.2.2.11 RSR Year 2001 Socioeconomic Indicators and the Total Counts of Elevated Childhood Blood Lead Levels for Children Residing in Zip Codes, Located Within or that Intersect, the RSR Site's 5-Mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the total counts of childhood elevated blood lead levels. The total counts of childhood blood lead level analysis consists of all 3 blood levels; 10-14 µg/dl, 15-19 µg/dl and >= 20 µg/dl, combined. The table depicting the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site, is shown below. Table 7.33: Year 2001 Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels for Zip Codes, Located Within or that Intersect, the RSR Site's 5-mile Radius.

	RSR Year 2001 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; (below poverty level) - Families	Percent; Household Income - Less than $10,000	Percent; Household Income- $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Houses - YEAR BUILT - 1970 to 1979	Percent; Houses - YEAR BUILT - 1960 to 1969	Percent; Houses - YEAR BUILT - 1940 to 1959	Percent; Housing units - YEAR BUILT - 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	30
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	47
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	31
75219	22.0	9.9	6.3	13.8	21.4	22.3	17.1	9.8	54.8	5
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	5
75235	19.4	11.6	6.6	18.3	15.5	24.2	37.1	9.4	45.8	8
75203	30.2	24.5	10.4	20.7	13.5	21.4	40.8	15.2	44.9	12
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	4
75224	17.6	12.2	7.4	17.6	13.6	27.6	45.8	5.8	36.5	18
75061	10.7	6.9	5.8	16.7	17.3	21.0	23.0	2.1	23.1	5
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	8.0	6
75201	9.0	7.9	2.7	8.2	3.1	10.9	5.0	23.8	33.9	0
									Sum=	**171**

In the table above, the zip codes, located within or that intersect the RSR Site's 5-mile radius, are listed on the left side of the table, and the socioeconomic indicators and the total counts of childhood elevated blood lead cases, are located across the top of the table. The highlighted numeric values were estimated. Further explanation of the estimation processes is expounded upon in Section 7.2.2.

There are a total of 171 unduplicated cases of elevated childhood blood lead level. The high counts could be due to low income families residing in cheap housing units that were constructed before the Year 1970, as well as, the effects of residing in close proximity of the RSR Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data due to the data set not having a normal distribution and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the total counts of childhood elevated blood lead level, for Year 2001, is shown below.

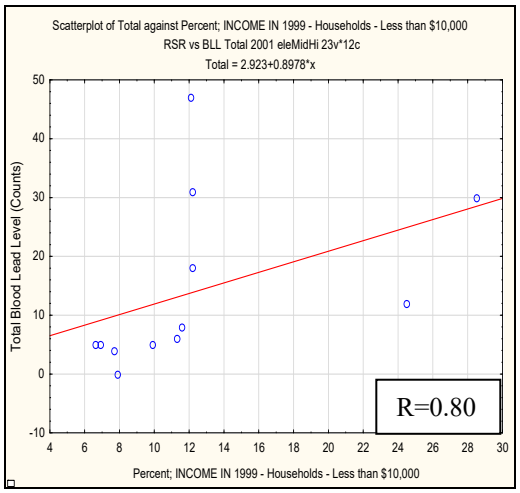
Table 7.34: Year 2001 Correlation Matrix for RSR Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for the Zip Codes, Located Within or that Intersect, the 5-Mile Radius of the RSR Site.

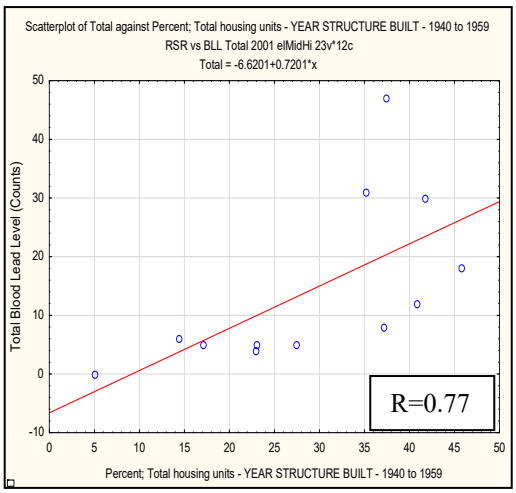
Variable	Spearman Rank Order Correlations (RSR vs BLL Total 2001 elMidhl) MD pairwise deleted Marked correlations are significant at p <.05000 Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.73	0.57	0.31	-0.19	-0.12	0.38	0.27	0.55	0.54
Percent; Household Income - Less than $10,000	0.73	1.00	0.73	0.46	-0.55	-0.07	0.72	0.42	0.58	0.80
Percent; Household Income - $10,000 to $14,999	0.57	0.73	1.00	0.64	-0.03	0.31	0.69	-0.04	0.52	0.57
Percent; Household Income - $15,000 to $24,999	0.31	0.46	0.64	1.00	0.12	0.60	0.66	-0.10	0.37	0.44
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.19	-0.55	-0.03	0.12	1.00	0.67	-0.02	-0.71	0.03	-0.31
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.12	-0.07	0.31	0.60	0.67	1.00	0.38	-0.50	0.31	0.06
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.38	0.72	0.69	0.66	-0.02	0.38	1.00	-0.13	0.47	0.77
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.27	0.42	-0.04	-0.10	-0.71	-0.50	-0.13	1.00	0.25	0.21
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.55	0.58	0.52	0.37	0.03	0.31	0.47	0.25	1.00	0.31
Total (Counts) of Blood Lead Level	0.54	0.80	0.57	0.44	-0.31	0.06	0.77	0.21	0.31	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, within or that intersect, the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the total counts of elevated blood lead levels and percentage of households with income less than $10,000 a year and the percentage of housing units built the Year 1940 to Year 1959. Based on the correlation matrix, it seems that there that families and households that have extremely low income, are more likely to have children that are diagnosed with elevated blood lead. This may be due to indoor lead exposure due to low income families residing in cheap housing units constructed before the Year 1970, as well as, the effects from residing in close proximity to the RSR Superfund Site. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.48- Graph 7.49 Year 2001 RSR Plots of Significant Relationships between Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels





Based on the above graphs, as the households with income less than $10,000 per year, and the percentage of housing units constructed in the Year 1940 to the Year 1959, increase, the quantity of cases of elevated childhood blood lead levels, increase.

7.2.2.12 RSR Year 2001 Comparison Analysis for RSR Socioeconomic Indicators and Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes Located Greater than the 5 mile Radius of the RSR Site.

The comparison group analysis, identifies trends in the data, from children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site, by comparing this data to the children that reside in zip codes, located greater than the 5-mile radius of the RSR Site. The table of the socioeconomic indicators and the total counts of elevated blood lead levels for children that reside in the zip codes that are located greater than the 5-mile radius of the RSR Superfund Site, is shown below.

Table 7.35: Year 2001 Comparison Socioeconomic Indicators and Total Counts Blood Lead Levels for Zip Codes Located Greater Than the 5-mile Radius of the RSR Superfund Site

	Year 2001 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from RSR									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household- No Husband- with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	4
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	4
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	10
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	2
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	4
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	4
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	2
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	0
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	4
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	7
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	55

The zip codes, located greater than the 5-mile radius of the RSR Site, are listed on the left side of the table, and the socioeconomic indicators and the total counts of elevated blood lead levels, are shown across the top of the table. The highlighted numeric values in the table represent estimated values. The estimation methodology is explained further in Section 7.2.2.

The total counts of elevated childhood blood lead levels, in the table, are much less than the total counts of childhood elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the RSR Site's 5-mile radius. The total counts of unduplicated cases of elevated childhood blood lead, for children that reside in zip codes greater than the 5- mile radius, is 55, and the total counts of elevated childhood blood lead level for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site, is 171 unduplicated cases. The reason the total unduplicated cases are lower, than the counts for children residing in zip codes, located within or that intersect, the 5- mile radius of the RSR Site, might be a result of lower percentages of low income households and housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix, was used to analyze the data, because the data set is does not have a normal distribution and because of a low quantity of observations. The correlation matrix for the socioeconomic indicators and the total counts of childhood elevated blood lead levels is shown below.

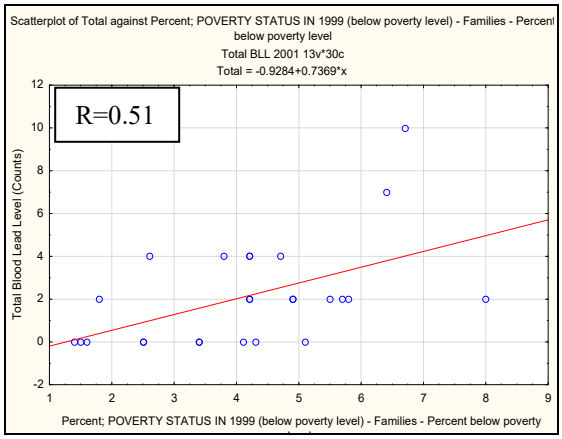
Table 7.36:Year 2001 Correlation Matrix for RSR Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes Located Greater Than the 5-Mile Radius of the RSR Site.

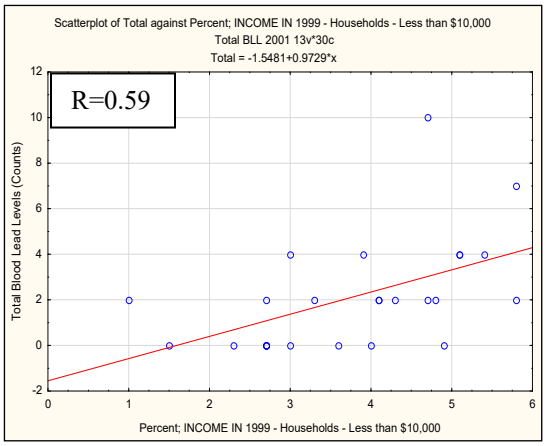
	Spearman Rank Order Correlations (Total BLL 2001) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.51
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.59
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.18
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.67
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.32
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.32
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.43
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.41
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	0.11
Total (Counts) of Blood Lead Level	0.51	0.59	0.18	0.67	0.32	0.32	0.43	0.41	0.11	1.00

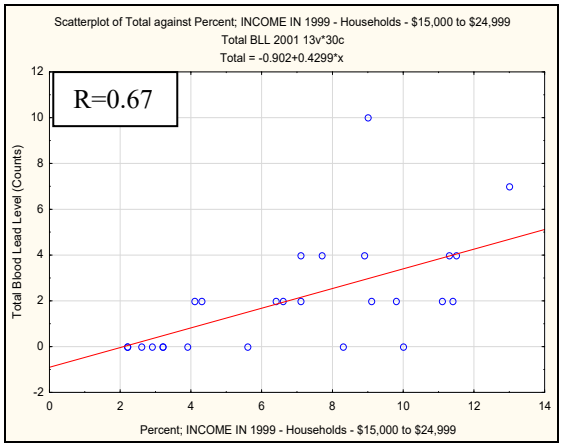
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the RSR Site.

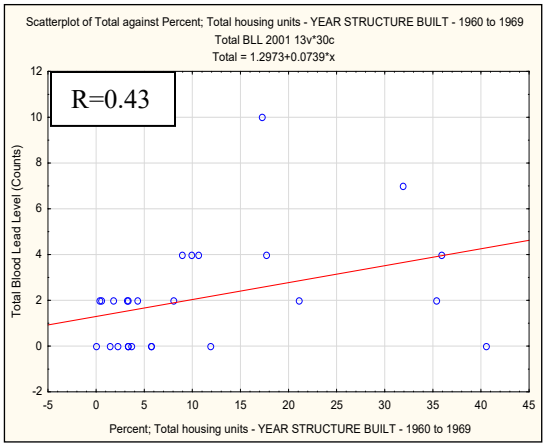
Based upon the correlation matrix, above, there is a moderate significant relationship between the total counts of the elevated blood lead level and the percentage of families below poverty level, the percentage of households with income less than $10,000 a year, the percentage households with income between $15,000 to 24,999 a year, the percentage of housing units built the Year 1940 to Year 1959, and the percentage of housing units constructed the Year 1960 to Year 1960. The R values for the correlation matrix for the comparison group of zip codes are much lower than the R values for the zip codes, located within or that intersect, the 5-mile radius of the RSR Site. Based on the correlation matrix, it seems that families and households that have extremely low income, are more likely to have children that are diagnosed with elevated blood lead. This may a result of indoor lead exposure from low income families residing in cheap housing units constructed before the Year 1970. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

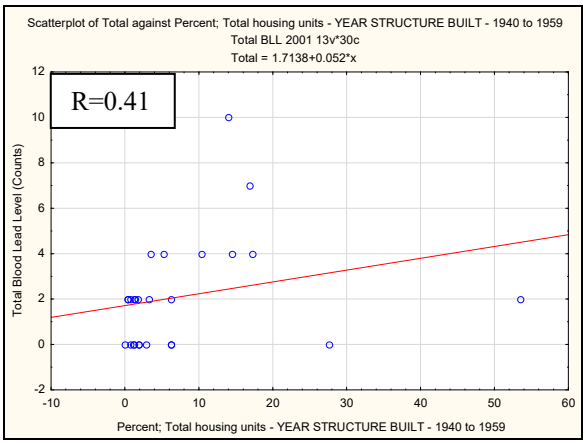
Graph 7.50- Graph 7.54 Year 2001 RSR Comparison Group Plots of Significant Relationships between Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels











Based on the graphs, above, as the percentage of families below poverty level, the percentage of households with income less than $10,000 per year, the percentage of households with $15,000 per year to $24,999 per year, the percentage of housing units constructed from the Year 1960 to the Year 1969 , and the percentage of housing units

constructed from the Year 1940 to the Year 1959, increase, the total counts of elevated childhood blood levels cases increase.

7.2.2.13 RSR Year 2002 Socioeconomic Indicators and the Elevated Childhood Blood Lead Level of 10-14 µg/dl for Children Residing in Zip Codes, Located Within or that Intersect, the RSR Site's 5-Mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the counts of childhood elevated blood lead level of 10-14 µg/dl. The table depicting the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site, is shown below.

Table 7.37: Year 2002 Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10-14 µg/dl for Zip Codes, Located Within or that Intersect, the RSR Site's 5-mile Radius.

	RSR Year 2002 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; (below poverty level) - Families	Percent; Household Income - Less than $10,000	Percent; Household Income- $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Houses - YEAR BUILT - 1970 to 1979	Percent; Houses - YEAR BUILT - 1960 to 1969	Percent; Houses - YEAR BUILT - 1940 to 1959	Percent; Housing units - YEAR BUILT - 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	28
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	35
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	20
75219	22.0	9.9	6.3	13.8	21.4	22.3	17.1	9.8	54.8	6
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	10
75235	19.4	11.6	6.6	18.3	15.5	24.2	37.1	9.4	45.8	3
75203	30.2	24.5	10.4	20.7	13.5	21.4	40.8	15.2	44.9	17
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	4
75224	17.6	12.2	7.4	17.6	13.6	27.6	45.8	5.8	36.5	12
75061	10.7	6.9	5.8	16.7	17.3	21.0	23.0	2.1	23.1	8
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	8.0	4
75201	9.0	7.9	2.7	8.2	3.1	10.9	5.0	23.8	33.9	0
									Sum=	**147**

Based on the table above, there are total of 147 unduplicated 10-14 µg/dl elevated childhood blood lead cases. The high counts may be due to a high percentage of low income families and a high percentage of housing units constructed before the Year 1970. In addition, the high counts of elevated childhood blood level of 10-14 µg/dl, could be a result of the effects of residing in close proximity of the RSR Site.

The Spearman Rank Correlation Matrix was used to analyze the data due the data set's distribution not being normal and because of a low number of observations. The correlation matrix for the socioeconomic indicators and the childhood elevated blood lead level of 10 µg/dl is shown below.

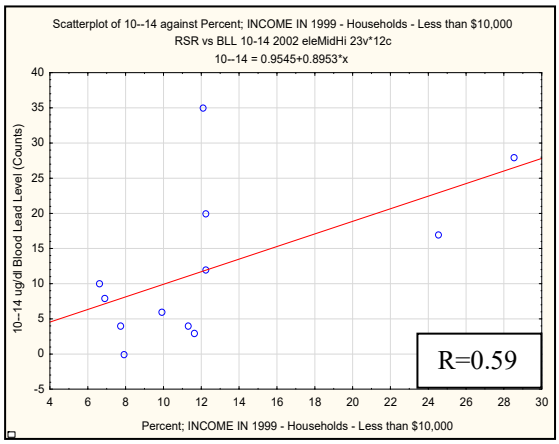
Table 7.38: Year 2002 Correlation Matrix for RSR Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10- 14 µg/dl for the Zip Codes, Located Within or that Intersect, the RSR Site's 5-mile Radius

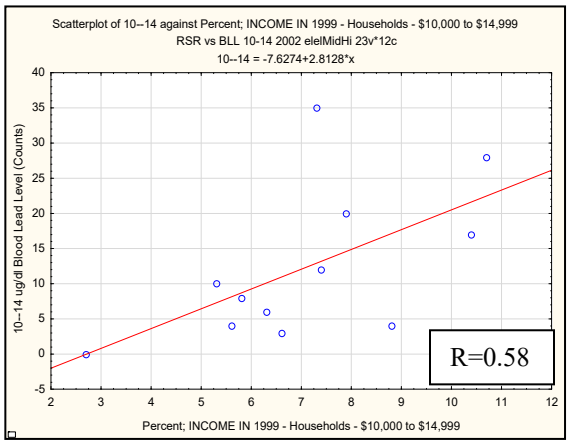
Variable	Spearman Rank Order Correlations (RSR vs BLL 10-14 2002 ElMidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.73	0.57	0.31	-0.19	-0.12	0.38	0.27	0.55	0.36
Percent; Household Income - Less than $10,000	0.73	1.00	0.73	0.46	-0.55	-0.07	0.72	0.42	0.58	0.59
Percent; Household Income - $10,000 to $14,999	0.57	0.73	1.00	0.64	-0.03	0.31	0.69	-0.04	0.52	0.58
Percent; Household Income - $15,000 to $24,999	0.31	0.46	0.64	1.00	0.12	0.60	0.66	-0.10	0.37	0.26
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.19	-0.55	-0.03	0.12	1.00	0.67	-0.02	-0.71	0.03	-0.07
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.12	-0.07	0.31	0.60	0.67	1.00	0.38	-0.50	0.31	0.09
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.38	0.72	0.69	0.66	-0.02	0.38	1.00	-0.13	0.47	0.72
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.27	0.42	-0.04	-0.10	-0.71	-0.50	-0.13	1.00	0.25	-0.04
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.55	0.58	0.52	0.37	0.03	0.31	0.47	0.25	1.00	0.22
10--14 ug/dl (Counts) Blood Lead Level	0.36	0.59	0.58	0.26	-0.07	0.09	0.72	-0.04	0.22	1.00

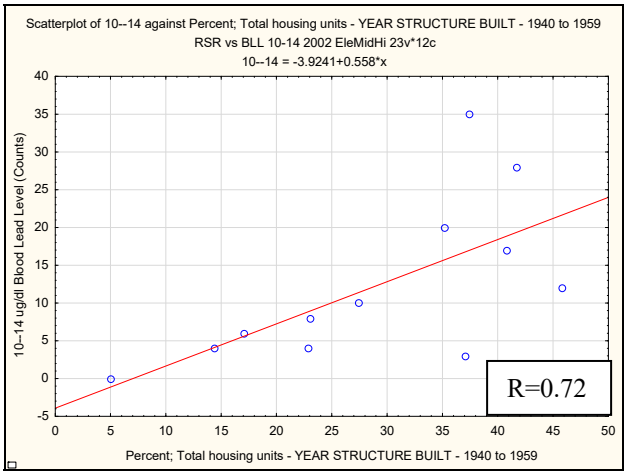
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there is a moderate to strong significant relationship between the counts of elevated blood lead level of 10-14 µg/dl and the percentage of households with income less than $10,000 a year, the percentage of households with income between $10,000 to $14,999 per year, and the percentage of housing units built the Year 1940 to Year 1959. Based on the correlation matrix, it seems that families and households that have extremely low income, are more likely to have children that are diagnosed with elevated blood lead. This may be due to indoor lead exposure for low income families that reside in older housing units constructed before the Year 1970, as well as, the effects of residing in close proximity to the RSR Superfund site. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.55- Graph 7.57 Year 2002 RSR Plots of Significant Relationships between Socioeconomic Indicators and the Elevated Blood Lead Level 10-14 µg/dl







Based on the graphs above, as the percentage of households with low income and the percentage of housing units constructed in 1940 to 1959, increase, the greater the number of cases of elevated childhood blood lead.

7.2.2.14 RSR Year 2002 Comparison Analysis for RSR Socioeconomic Indicators and Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater than the 5-mile Radius of the RSR Site. (Comparison Group)

The comparison group analysis identifies trends in the data, for the children that reside in zip codes, located within or that intersect, the RSR Site's 5-mile radius, by comparing the data to the data, for the children that reside in zip codes, located greater than the 5- mile radius of the RSR Site's 5-mile radius. The table of the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in the zip

codes that are located greater than the 5-mile radius of the RSR Superfund Site, is shown below.

Table 7.39: Year 2002 Comparison Socioeconomic Indicators and Counts Blood Lead Level of 10-14 μg/dl for Zip Codes Located Greater Than the 5-mile Radius of the RSR Superfund Site

	Year 2002 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from RSR Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household- No Husband- with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	2
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	2
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	3
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	0
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75125	8.5	6.4	4.8	12.0	18.8	11.8	11.4	9.5	9.4	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	2
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	6
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	8
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	3
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	4
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	2
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	6
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	54

The zip codes located greater than the 5- mile radius of the RSR Site, are shown on the left side of the table, and the socioeconomic indictors and the counts of childhood blood lead level of 10-14 µg/dl, are shown cross the top of the table. The counts of elevated childhood blood lead level of 10-14 µg/dl, are much less, in the table, than the 10-14 µg/dl counts, in the zip codes located, within or that intersect, the RSR Site's 5-mile radius. The unduplicated counts of elevated childhood blood lead of level 10-14 µg/dl, for children that reside in zip codes located greater the RSR Site 5-mile radius, is 54 and the unduplicated counts of elevated childhood blood lead of level 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the RSR Site's 5-mile radius, is 147. The reason the cases of elevated childhood blood lead are much lower, than the cases for the zip codes located in closer proximity to the RSR Site, could be due to a lower percentage of low income families and a lower percentage of housing units, constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the low quantity of observations and due to the data set, not having a normal distribution. The correlation matrix, for the socioeconomic indicators and the counts of childhood elevated blood lead level of 10-14 µg/dl, is shown below.

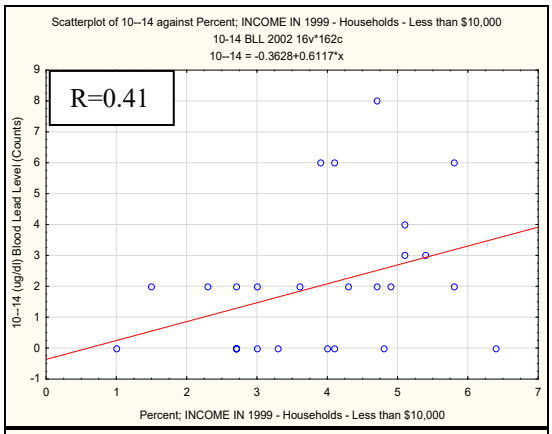
Table 7.40: Year 2002 Correlation Matrix for RSR Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater than the 5-mile Radius of the RSR Site.

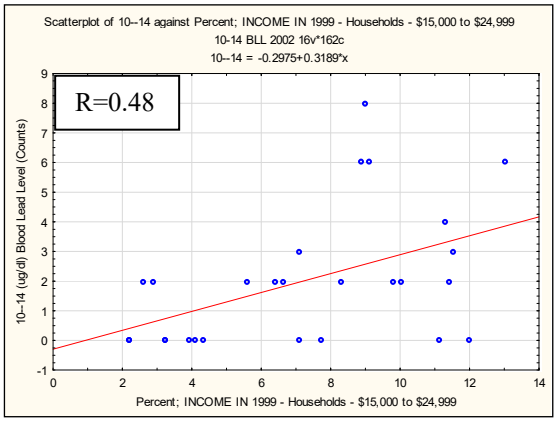
Variable	Spearman Rank Order Correlations (10-14 BLL 2002) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.79	0.48	0.75	0.68	0.19	0.39	0.37	0.13	0.29
Percent; Household Income - Less than $10,000	0.79	1.00	0.57	0.83	0.60	0.19	0.53	0.51	0.24	0.41
Percent; Household Income - $10,000 to $14,999	0.48	0.57	1.00	0.56	0.16	0.29	0.75	0.78	0.54	0.25
Percent; Household Income - $15,000 to $24,999	0.75	0.83	0.56	1.00	0.49	0.24	0.65	0.60	0.23	0.48
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.60	0.16	0.49	1.00	-0.05	0.14	0.03	-0.04	0.17
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.19	0.19	0.29	0.24	-0.05	1.00	0.49	0.19	-0.10	0.27
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.39	0.53	0.75	0.65	0.14	0.49	1.00	0.87	0.36	0.43
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.37	0.51	0.78	0.60	0.03	0.19	0.87	1.00	0.68	0.40
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.13	0.24	0.54	0.23	-0.04	-0.10	0.36	0.68	1.00	0.19
10--14 ug/dl (Counts) Blood Lead Level	0.29	0.41	0.25	0.48	0.17	0.27	0.43	0.40	0.19	1.00

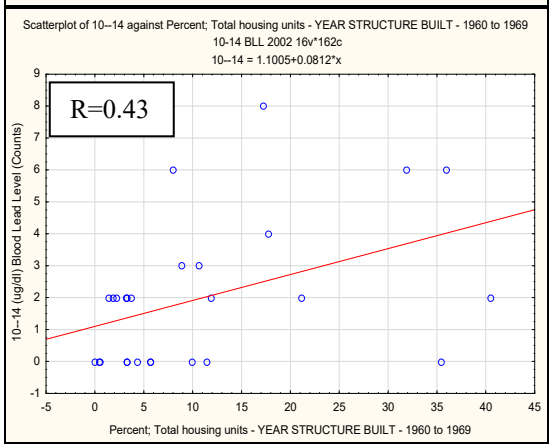
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, greater than the 5-mile radius of the RSR Site.

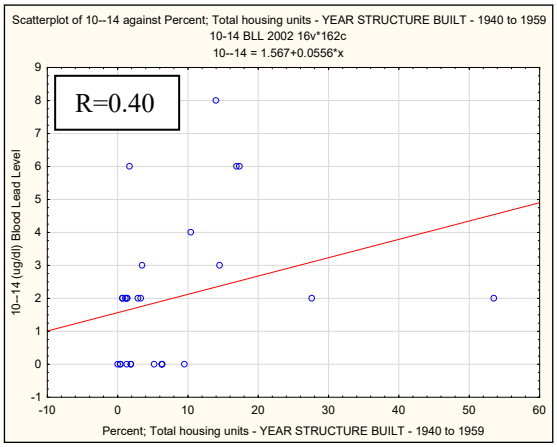
Based upon the correlation matrix, above, there is a weak significant relationship between the counts of the concentration of elevated blood lead level of 10-14 µg/dl and percentage of households with income less than $10,000 a year, and percentage of households with income between $15,000 to $14,999 per year, and the percentage of housing units built the Year 1940 to Year 1959 and the percentage of housing units built between the Year 1960 to Year 1969. In addition, the R values are lower for the comparison group, than the R values, for the zip codes, located within or that intersect, the 5-mile radius of the RSR Site. Based on the correlation matrix, it seems that households that have extremely low income and families that reside in housing units constructed before the Year 1970 are more likely to have children that are diagnosed with elevated blood lead. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.58- Graph 7.61 Year 2002 RSR Comparison Group Plots of Significant Relationships between Socioeconomic Indicators and the Elevated Blood Lead Level 10-14 µg/dl









Based the tables, as the percentage of the significant socioeconomic indicators increase, the elevated childhood blood lead level increase.

7.2.2.15 RSR Year 2002 Socioeconomic Indicators and the Total Counts of Elevated Childhood Blood Lead Levels for Children Residing in Zip Codes, Located Within or that Intersect, the RSR Site's 5-mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the total counts of childhood elevated blood lead levels. The table depicting the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site, is shown below.

Table 7.41: Year 2002 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes, Located Within or that Intersect, the RSR Site's 5-mile Radius.

	RSR Year 2002 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; (below poverty level) - Families	Percent; Household Income - Less than $10,000	Percent; Household Income- $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Houses - YEAR BUILT - 1970 to 1979	Percent; Houses - YEAR BUILT - 1960 to 1969	Percent; Houses - YEAR BUILT - 1940 to 1959	Percent; Housing units - YEAR BUILT - 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	37
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	47
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	42
75219	22.0	9.9	6.3	13.8	21.4	22.3	17.1	9.8	54.8	10
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	21
75235	19.4	11.6	6.6	18.3	15.5	24.2	37.1	9.4	45.8	5
75203	30.2	24.5	10.4	20.7	13.5	21.4	40.8	15.2	44.9	22
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	6
75224	17.6	12.2	7.4	17.6	13.6	27.6	45.8	5.8	36.5	16
75061	10.7	6.9	5.8	16.7	17.3	21.0	23.0	2.1	23.1	13
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	8.0	9
75201	9.0	7.9	2.7	8.2	3.1	10.9	5.0	23.8	33.9	0
									Sum=	**228**

The zip codes located within the RSR Site's 5-mile radius, are listed on the left side of the table. The socioeconomic indicators and the total unduplicated counts of elevated childhood blood lead levels, are shown across the top of the table. Based on the table above, there is a total of 228 counts of elevated childhood blood lead cases. The high counts might be a result of higher percentages of low income families residing in housing units constructed before the Year 1970. In addition, the effects of residing in close proximity of the RSR Site, could also be a source of lead exposure , in children.

The Spearman Rank Correlation Matrix was used to analyze the data because the data set did not have a normal distribution and due to a small quantity of observations. The correlation matrix for the socioeconomic indicators and the total counts of childhood elevated blood lead levels, for the Year 2002, is shown below.

Table 7.42:Year 2002 Correlation Matrix for RSR Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes, Located Within or that Intersect, the 5-Mile Radius of the RSR Site.

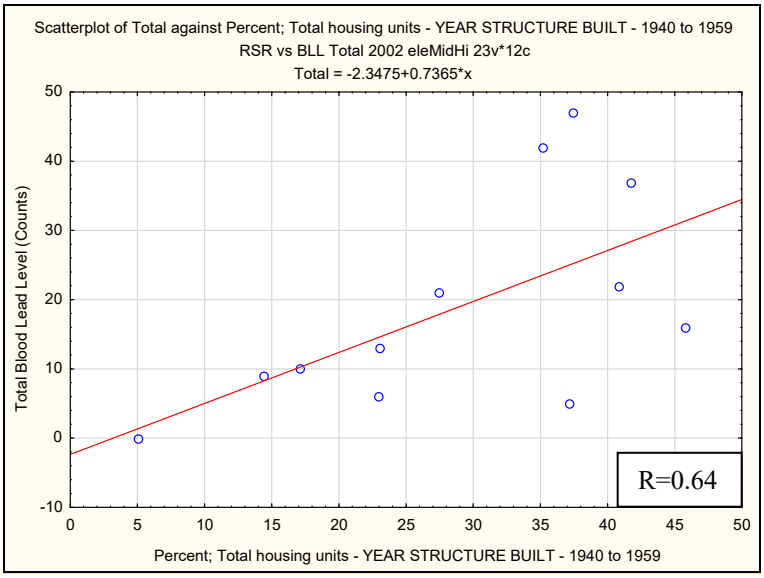
	Spearman Rank Order Correlations (RSR vs BLL Total 2002 ElMidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.73	0.57	0.31	-0.19	-0.12	0.38	0.27	0.55	0.31
Percent; Household Income - Less than $10,000	0.73	1.00	0.73	0.46	-0.55	-0.07	0.72	0.42	0.58	0.53
Percent; Household Income - $10,000 to $14,999	0.57	0.73	1.00	0.64	-0.03	0.31	0.69	-0.04	0.52	0.50
Percent; Household Income - $15,000 to $24,999	0.31	0.46	0.64	1.00	0.12	0.60	0.66	-0.10	0.37	0.19
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.19	-0.55	-0.03	0.12	1.00	0.67	-0.02	-0.71	0.03	-0.08
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.12	-0.07	0.31	0.60	0.67	1.00	0.38	-0.50	0.31	0.02
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.38	0.72	0.69	0.66	-0.02	0.38	1.00	-0.13	0.47	0.64
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.27	0.42	-0.04	-0.10	-0.71	-0.50	-0.13	1.00	0.25	0.03
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.55	0.58	0.52	0.37	0.03	0.31	0.47	0.25	1.00	0.12
Total (Counts) of Blood Lead Level	0.31	0.53	0.50	0.19	-0.08	0.02	0.64	0.03	0.12	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown

along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the total counts of elevated blood lead levels and the percentage of housing units built the Year 1940 to the Year 1959. Based on the correlation matrix, it seems that there is a direct link of older housing units, that were constructed between Year 1940 and 1959, and elevated childhood blood lead levels. In addition, elevated childhood blood lead cases, could be due to the effects of families residing in close proximity to the RSR Superfund Site. The graph of the significant bivariate plot is shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.62 Year 2002 RSR Plots of Significant Relationships between Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels



Based on the above graph, as the percentage of housing units that were constructed between the Year 1940 to the Year 1959 increase, the total counts of childhood blood lead level cases increases.

7.2.2.16 Year 2002 Comparison Analysis for RSR Socioeconomic Indicators and the Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes Located Greater than the 5-mile Radius of the RSR Site (Comparison Group).

The comparison group analysis identifies trends in the data, for the children that reside in zip codes, located within or that intersect, the RSR Site's 5-mile radius, by comparing

this data to the data, for the children that reside in zip codes, located greater than the 5-mile radius of the RSR Site. The table of the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in the zip codes that are located greater than the 5-mile radius of the RSR Superfund Site is shown below.

Table 7.43: Year 2002 Comparison Socioeconomic Indicators and the Total Counts Blood Lead Levels for Zip Codes Located Greater Than the 5-mile Radius of the RSR Superfund Site

	Year 2002 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from RSR									
Zip	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household- No Husband- with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	4
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	4
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	2
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	4
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	5
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	4
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75125	8.5	6.4	4.8	12.0	18.8	11.8	11.4	9.5	9.4	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	2
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	9
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	11
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	5
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	8
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	4
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	11
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	89

In the table, the highlighted values are estimated values. Further information on the estimation methodology, please refer to Section 7.2.2. The total counts of elevated childhood blood lead levels, in the table, are much less than the total counts of elevated childhood blood lead cases, for children that reside in the zip codes, located within or that intersect, the RSR Site's 5 mile radius. The total unduplicated counts of elevated childhood blood lead cases, for the children that reside in zip codes located greater than the 5 mile radius, is 89 and the total unduplicated cases of elevated childhood blood lead levels, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the RSR Site, is 228. The low total counts of elevated childhood blood lead levels, for children that reside in zip codes located greater than the 5-mile radius of the RSR Site, may be due to lower percentages of low income families and a lower percentage of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data because the data set did not have a normal data distribution and due to a small quantity of observations. The correlation matrix, for the socioeconomic indicators and the total counts of childhood elevated blood lead levels is shown below.

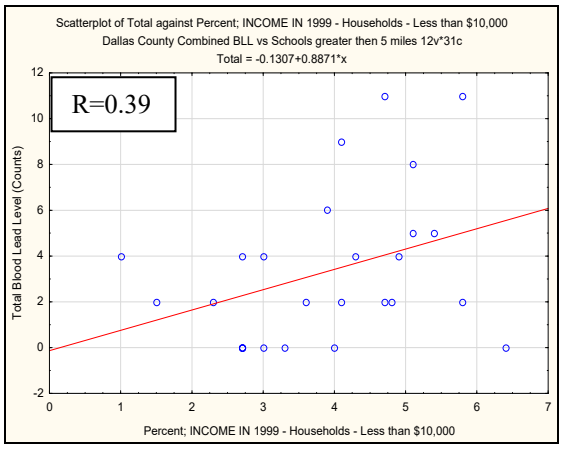
Table 7.44:Year 2002 Correlation Matrix for RSR Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes Located Greater than the 5-Mile Radius of the RSR Site.

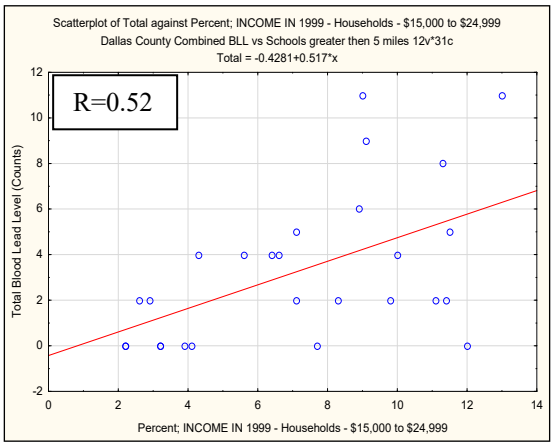
	Spearman Rank Order Correlations (Total BLL 2002) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.79	0.48	0.75	0.68	0.19	0.39	0.37	0.13	0.30
Percent; Household Income - Less than $10,000	0.79	1.00	0.57	0.83	0.60	0.19	0.53	0.51	0.24	0.39
Percent; Household Income - $10,000 to $14,999	0.48	0.57	1.00	0.56	0.16	0.29	0.75	0.78	0.54	0.17
Percent; Household Income - $15,000 to $24,999	0.75	0.83	0.56	1.00	0.49	0.24	0.65	0.60	0.23	0.52
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.60	0.16	0.49	1.00	-0.05	0.14	0.03	-0.04	0.17
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.19	0.19	0.29	0.24	-0.05	1.00	0.49	0.19	-0.10	0.34
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.39	0.53	0.75	0.65	0.14	0.49	1.00	0.87	0.36	0.44
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.37	0.51	0.78	0.60	0.03	0.19	0.87	1.00	0.68	0.32
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.13	0.24	0.54	0.23	-0.04	-0.10	0.36	0.68	1.00	-0.02
Total (Counts) of Blood Lead Level	0.30	0.39	0.17	0.52	0.17	0.34	0.44	0.32	-0.02	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there are weak to moderate significant relationships between the total counts of elevated blood lead levels, and the percentage of households with income less than $10,000 per year, the percentage households with income between $15,000 to $24,000 per year, and the percentage of housing units built the Year 1960 to the Year 1969. The R values, for the zip codes, located greater than the RSR Site's 5-mile radius, are lower than the R values for the zip codes, located within or that intersect, the 5-mile radius of the RSR Site. Based on the correlation matrix, it seems that there is a direct link of households with low income, and older housing units, that result in increased cases of elevated childhood blood lead levels. The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.63- Graph 7.65 Year 2002 RSR Comparison Group Plots of Significant Relationships between Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels





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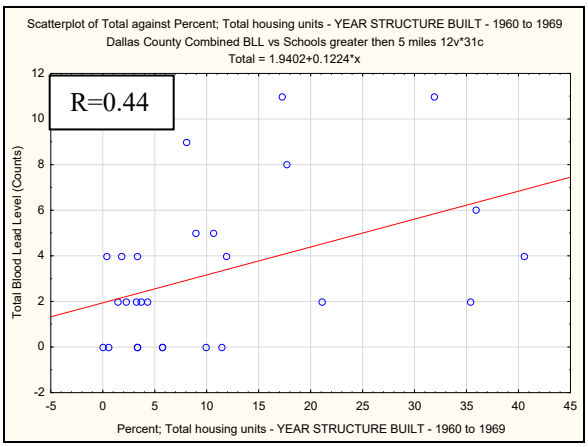
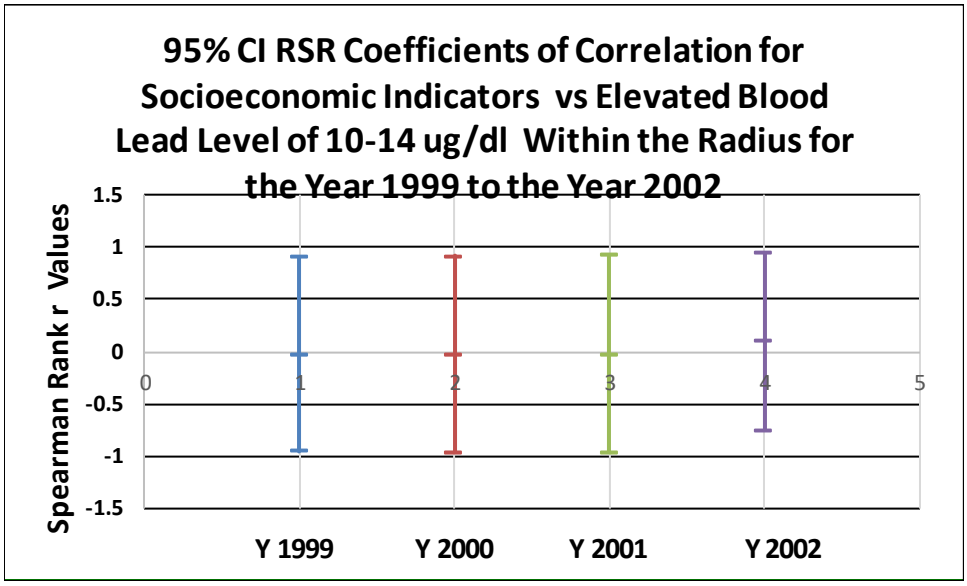


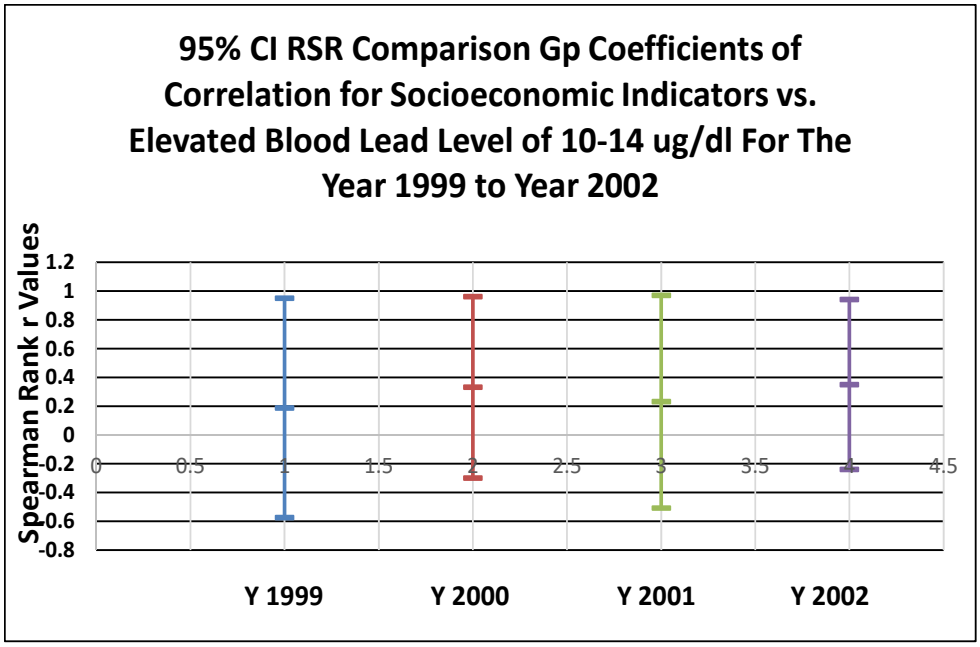
Based on the above graphs, as the percentages of socioeconomic indicators increase, the number of total cases of elevated childhood blood levels, increase.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1999 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for the socioeconomic indicators vs. the elevated blood lead level of 10-14 µg/dl and the total counts of elevated blood lead levels, for children that reside in zip codes, located within and greater than, the 5-mile radius of the RSR Superfund Site, are shown below.

Graph 7.66 RSR Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Elevated Blood Lead Level of 10-14 µg/dl from the Year 1999 to the Year 2002.



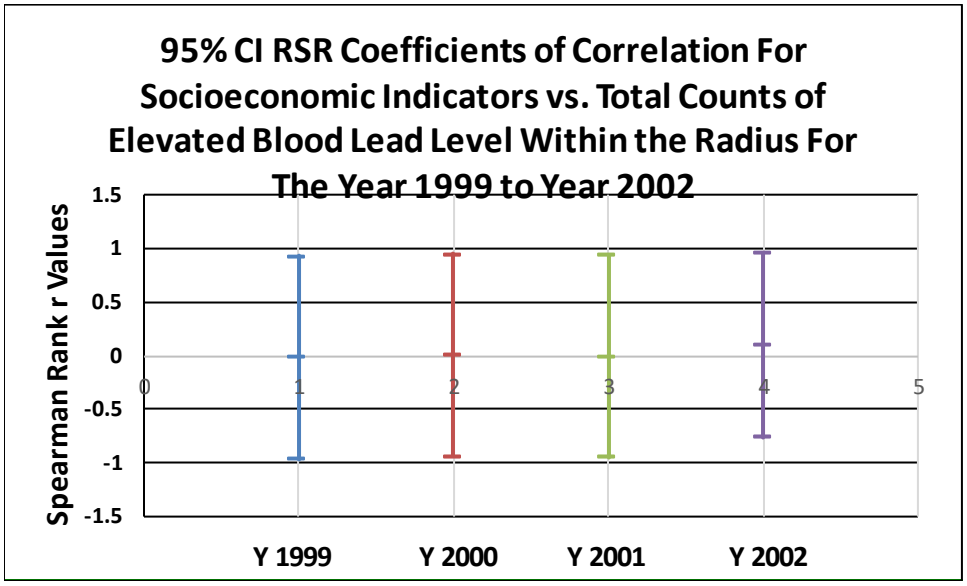
Graph 7.67 RSR Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Elevated Blood Lead Level of 10-14 µg/dl from the Year 1999 to the Year 2002.



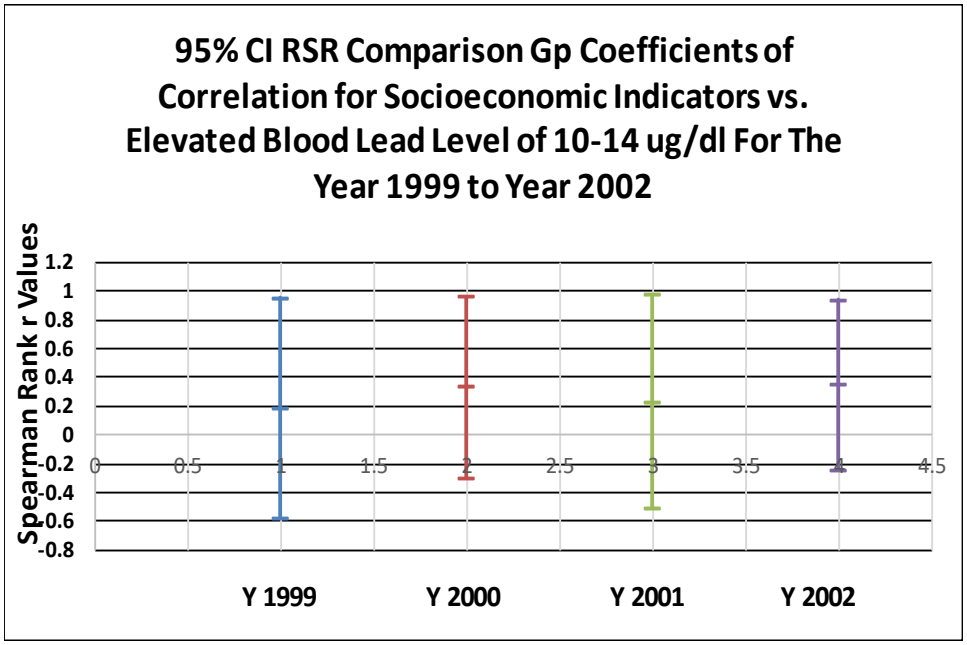
Based on the graphs, there were significant coefficients of correlations in the confidence intervals from the Year 1999 to the Year 2002, for the children that resided in zip codes, located within and that intersect, the 5-mile radius of the RSR Site. In addition, there

were significant coefficients of correlations, in every year, in the confidence intervals for the children that reside in zip codes located greater than the 5-mile radius of the RSR Superfund Site.

Graph 7.68 RSR Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Total Counts of Elevated Blood Lead Level from the Year 1999 to the Year 2002.



Graph 7.69 RSR Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Total Counts of Elevated Blood Lead Level from the Year 1999 to the Year 2002.



Based on the graphs, there were significant coefficients of correlations in the confidence intervals from the Year 1999 to the Year 2002, for the children that resided in zip codes, located within and that intersect, the 5-mile radius of the RSR Site. In addition, there were also significant coefficients of correlation, in every year, for the confidence intervals for the children that reside in zip codes located greater than the 5-mile radius of the RSR Superfund Site.

7.2.3 RSR Socioeconomic Indicators vs. the Test Passing Rate Analysis

The RSR socioeconomic indicators vs. the test passing rate analysis determines if there is a significant relationship between the socioeconomic indicators, and the standardized test passing rates for elementary, middle, and high schools. This is analysis covered the Year 1999 to the Year 2002. The Year 2003 to the Year 2011 was not included in the Study because the standardized test was changed, by the Texas Education Agency, in the Year 2003. The test change resulted in a significant reduction in the standardized test passing rates for schools across Dallas County.

For the socioeconomic indicators vs. the test passing rate analysis, the middle and high schools were separated from the elementary schools, due to the prospective middle and high schools students, having a higher possibility, of being impacted by the RSR Site's lead smelter, given that the students didn't move out of the area. In the RSR socioeconomic indicators vs. test passing rate analysis, distance to the site is included, to determine if socioeconomic indicators, as well as distance, effect the student standardized test passing rates, for in schools located within the 5 –mile radius, and the schools located greater than the 5-mile radius, of the RSR Site.

The socioeconomic indicators evaluated are listed below;

- percentage of families that are below poverty level;
- percentage of female householder with children less than 18 years of age that are below poverty level;
- percentage of households with income less than $10,000 per year;
- percentage of households with income between $10,000 to $14,999;
- percentage of households with income between $15,000 to $24,999;
- percentage of housing units built the Year 1939 or earlier;
- percentage of housing units built between the Year 1940 to 1959;
- percentage of housing units constructed between the Year 1960 to Year 1969;
- percentage of housing units built between Year 1970 to Year 1979.

The socioeconomic indicator data was obtained, from the Year 2000 Census Data, from the uscensus.gov website. The standardized test passing rate data was obtained from the Texas Education Agency. The housing units built dates were included in the Study, due to the use of lead based paint in homes constructed before the Year 1970. The housing units built dates will provide an indication of whether indoor lead contamination, other socioeconomic indicators, and the lead smelter are the source of elevated blood lead in children.

A table that depicts the ages, the grades, and the year the prospective students would take the standardized test, in reference to the operation, closure, and cleanup activities of the RSR Site is shown below.

Table 7.45 Children's Age and Grade in Reference to the RSR Site.

Don't have laboratory data for 18 year olds		
Grade	Age(yrs)	Year
Born	0	1976
Pre-K	5	1981
5th	11	1987
6th	12	1988
8th	14	1990
9th	15	1991
12th	18	1994

The 14 year olds effected earliest		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born 4 years before RSR closed		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born 3 years before RSR closed		
Grade	Age(yrs)	Year
Born	0	1981
Pre-K	5	1986
5th	11	1992
6th	12	1993
8th	14	1995
9th	15	1996
12th	18	1998

Students Born 2 years before RSR closed		
Grade	Age(yrs)	Year
Born	0	1982
Pre-K	5	1987
5th	11	1993
6th	12	1994
8th	14	1996
9th	15	1997
12th	18	2000

Students Born 1 yr before RSR Closed		
Grade	Age(yrs)	Year
Born	0	1983
Pre-K	5	1988
5th	11	1994
6th	12	1995
8th	14	1997
9th	15	1998
12th	18	2001

Students born the Year RSR Closed		
Grade	Age(yrs)	Year
Born	0	1984
Pre-K	5	1989
5th	11	1995
6th	12	1996
8th	14	1998
9th	15	1999
12th	18	2002

Students Born 1 yr after RSR Closed		
Grade	Age(yrs)	Year
Born	0	1985
Pre-K	5	1990
5th	11	1996
6th	12	1997
8th	14	1999
9th	15	2000
12th	18	2003

Students Born the Year RSR Clean -Up Start date		
Grade	Age(yrs)	Year
Born	0	2000
Pre-K	5	2005
5th	11	2011
6th	12	2012
8th	14	2014
9th	15	2015
12th	18	2018

Students Born the Year RSR Clean -Up End date		
Grade	Age(yrs)	Year
Born	0	2004
Pre-K	5	2009

Students Born one Year after RSR Clean- Up End Date		
Grade	Age(yrs)	Year
Born	0	2005
Pre-K	5	2010

5th	11	2015	5th	11	2016
6th	12	2016	6th	12	2017
8th	14	2018	8th	14	2019
9th	15	2019	9th	15	2020
12th	18	2022	12th	18	2023

7.2.3.1 Year 1999 Middle and High Schools Socioeconomic Indicators vs the Test Passing Rates for Schools located Within the 5-mile Radius of the RSR Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the 5-mile radius of the RSR Site. The table of the middle and high schools, located within the 5-mile radius of the RSR Site, is located below.

TABLE 7.46: Year 1999 Middle and High Schools of Socioeconomic Indicators vs. Test Passing Rates for Schools Located Within the RSR Superfund Site's 5-mile Radius

	RSR Year 1999 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR1999 (%)
DALLAS ISD	EDISON LEARNING CENTER (Mid)	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	36.1
DALLAS ISD	L G PINKSTON H S	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	65.6
DALLAS ISD	RAUL QUINTANILLA MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	55.7
DALLAS ISD	SUNSET H S	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	49.4
DALLAS ISD	W E GREINER MIDDLE	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	54.8
IRVING ISD	WHEELER TRANSITIONAL AND DEVELOPMENTAL SEC (Mid/HS)	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	
DALLAS ISD	W H ADAMSON H S	75203	30.2	24.5	10.4	20.7	44.9	13.5	21.4	40.8	15.2	43.4
DALLAS ISD	L V STOCKARD MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	46.9
DALLAS ISD	THOMAS J RUSK MIDDLE	75235	19.4	11.6	6.6	18.3	45.8	15.5	24.2	37.1	9.4	56.6
IRVING ISD	BOWIE MIDDLE	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	78.1
IRVING ISD	NIMITZ H S	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	81.3
DALLAS ISD	WILLIAM B TRAVIS MIDDLE	75204	22.5	11.3	5.6	13.3	41.8	11.6	10.3	14.4	8.7	
DALLAS ISD	MOISES MOLINA H S	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	63.6
DALLAS ISD	HEALTH SPECIAL (Mid/HS)	75201	9.0	7.9	2.7	8.2	33.9	3.1	10.9	5.0	23.8	
IRVING ISD	AUSTIN MIDDLE	75061	10.7	6.9	5.8	16.7	23.1	17.3	21.0	23.0	2.1	75.9
											Average	59.0

The school district name, the school name, and the zip code each school is located in are shown on the left side of the table, and the socioeconomic indicators and the standardized test passing rates are shown across the top of the table. The parts of the table that do not show a standardized passing rate were either not opened, during the specified year, or the campus was repurposed. Based on the table, above, the average standardized test passing rates, for the middle and high schools located within the RSR Site's 5-mile radius, is 59.0%. The average test passing rate could be low, because the prospective students resided in close proximity of the RSR Site. If this is the case, then prospective students could have been exposed to lead, while the RSR Site was in operation (before the Year 1984), or after the facility was shut down and until the site cleanup activities were completed (Year 1991 to the Year 1994). In addition to close proximity to the RSR Site, socioeconomic factors might contribute to low standardized test passing rates.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the non-normal data distribution and due to a few number of observations. The correlation matrix

for the socioeconomic indicators and the standardized test passing rates, for the middle and high schools, located within the 5-mile radius of the RSR Site, is shown below.

Table 7.47: Year 1999 Correlation Matrix for RSR Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the RSR Site.

Variable	Spearman Rank Order Correlations (RSR vs Test PR 1999 MidHi) MD pairwise deleted Marked correlations are significant at p <.05000 Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 1999
Percent; Families - Percent Below Poverty Level	1.00	0.78	0.79	0.55	0.88	-0.27	-0.01	0.76	0.17	-0.60
Percent; Household Income - Less than $10,000	0.78	1.00	0.96	0.49	0.78	-0.61	-0.18	0.80	0.47	-0.72
Percent; Household Income - $10,000 to $14,999	0.79	0.96	1.00	0.56	0.70	-0.40	-0.05	0.86	0.28	-0.72
Percent; Household Income - $15,000 to $24,999	0.55	0.49	0.56	1.00	0.54	-0.05	0.47	0.58	0.29	-0.45
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.88	0.78	0.70	0.54	1.00	-0.36	0.07	0.77	0.29	-0.57
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.27	-0.61	-0.40	-0.05	-0.36	1.00	0.69	-0.07	-0.83	0.74
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.01	-0.18	-0.05	0.47	0.07	0.69	1.00	0.37	-0.37	0.18
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.76	0.80	0.86	0.58	0.77	-0.07	0.37	1.00	0.06	-0.61
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.17	0.47	0.28	0.29	0.29	-0.83	-0.37	0.06	1.00	-0.63
Percent; Standardized Test Passing Rate for Year 1999	-0.60	-0.72	-0.72	-0.45	-0.57	0.74	0.18	-0.61	-0.63	1.00

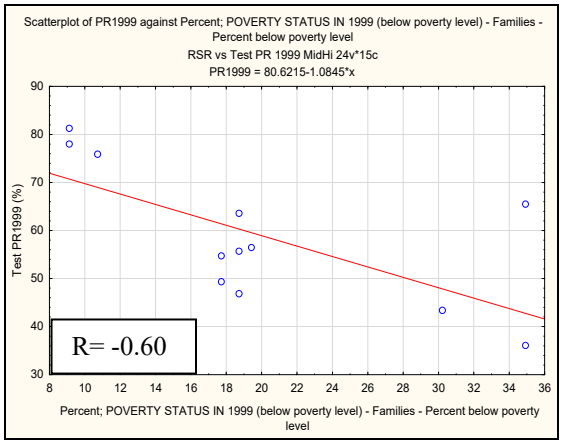
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the RSR Site.

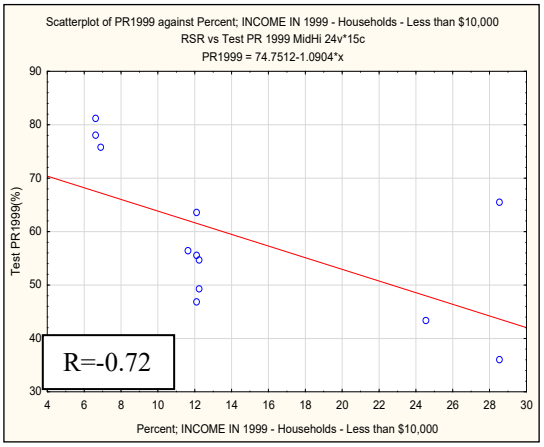
Based upon the correlation matrix, above, there is a strong, negative, significant relationship, between the percentage standardized test passing rates and the percentage of the families below poverty level, the percentage of households that have income lower than $10,000 per year, the percentage of households with income between $10,000 to $14,999 per year, the percentage of housing units constructed from the Year 1940 to the Year 1959, and the percentage of housing units constructed from the Year 1939 and earlier. Based on these significant negative relationships, there is a link between low income and housing units built before the Year 1970, and lower standardized test passing rates. This might be due to indoor lead exposure, as well as, exposure to the negative effects of the RSR Site's lead smelter, at a young age.

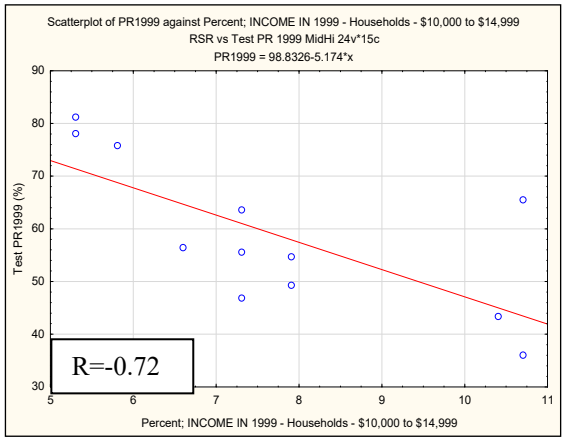
In addition, there is significant, positive, relationship between the standardized passing rates and the percentage of housing units built between the Year 1970 to Year 1979. The positive relationship indicates that housing units, built from the Year 1970 to the Year 1979, contain less lead based paint, due to the government phase out of lead based pain in the Year 1978. The lead based paint phase out resulted in lower indoor lead exposure and higher standardized test passing rates. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of

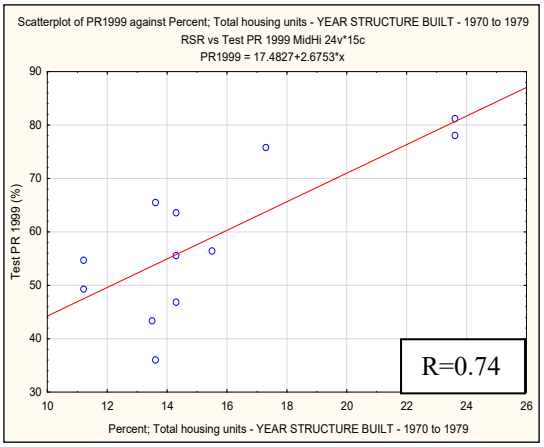
the significant relationships, and not to determine if a linear relationship exists between the variables.

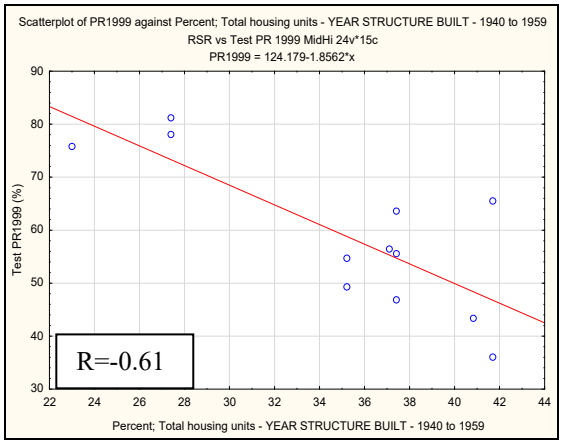
Graph 7.70- Graph 7.75 Year 1999 RSR Plots of Significant Relationships between Socioeconomic Indicators and the Standardized Test Passing Rate for Middle and High Schools Located Within the RSR Site's 5-Mile Radius

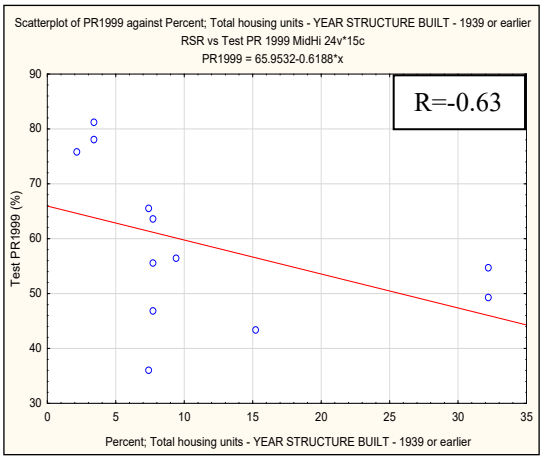












Based on the tables above, most of the plots are negative, except for the plot on the housing units built in the Year 1970 to Year 1979. For the negative relationships, as the

percentage families that are below poverty, the percentage of households with income less than $10,000, the percentage of households with income between $10,000 to $14,999, the percentage of housing units constructed from the Year 1940 to the Year 1959, and the housing units built from the Year 1939 and earlier, increase, the percentage of standardized test passing rates, decrease. The trend indicates that families below poverty level and households with low income, are a contributing factor to lower standardized test passing rates. In addition, as the percentage of the housing units that were constructed in the Year 1970 to Year 1979, increase, the percentage of student standardized test passing rates increase. The trend indicates that lower exposure to indoor lead, result in higher student standardized test passing rates.

7.2.3.2 RSR Year 1999 Comparison Socioeconomic Indicators vs. Standardized Test Passing Rate Analysis for Middle and High Schools Located Greater than the RSR Site's 5-Mile Radius (Comparison Group).

The comparison group analysis identifies trends in the data, for the middle and high schools, located within the RSR Site's 5-mile radius, by comparing this data to the data, to the middle and high schools located greater than the 5- mile radius of the RSR Site. The table of the socioeconomic indicators and the standardized test passing rates, for middle and high schools, located greater than the RSR Site's 5-mile radius, is shown below.

Table 7.48: RSR Year 1999 Socioeconomic Indicators vs Test Passing Rate for Middle and High Schools Located Greater Than the RSR Site's 5-Mile Radius.

	Year 1999 Socioeconomic Indicators and Standardized Test Passing Rate for Middle/High Schools Greater than 5 Miles from RSR Site											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR1999
CARROLLTON-FARMERS BRANCH ISD	SMITH H S	75006	3.6	3.1	9.7	5.7	17.3	31.2	13.8	7.6	0.6	79.9
CARROLLTON-FARMERS BRANCH ISD	LONG MIDDLE	75287										87.6
CEDAR HILL ISD	CEDAR HILL H S	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	76.6
CEDAR HILL ISD	BESSIE COLEMAN MIDDLE	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	
COPPELL ISD	COPPELL MIDDLE WEST	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	87.2
COPPELL ISD	COPPELL H S	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	87.6
DALLAS ISD	W T WHITE H S	75244	4.1	3.8	11.1	5.5	20.3	33.9	35.4	6.3	0.0	71.5
DUNCANVILLE ISD	WILLIAM H BYRD MIDDLE SCHOOL	75137	3.0	1.5	7.7	2.6	13.3	36.2	9.9	5.2	0.8	68.7
DUNCANVILLE ISD	DUNCANVILLE H S	75116	4.7	4.6	13.0	5.2	8.3	40.7	28.8	10.0	1.6	79.6
FERRIS ISD	FERRIS H S	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	91.0
FERRIS ISD	FERRIS J H	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	74.8
GARLAND ISD	LYLES MIDDLE	75043	4.1	3.6	9.1	4.9	18.4	40.2	8.0	1.7	0.2	67.1
GARLAND ISD	GARLAND H S	75040	4.7	3.4	9.0	6.7	17.7	27.9	17.2	14.0	1.1	70.2
GRAND PRAIRIE ISD	HARRY S TRUMAN MIDDLE	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	85.2
IRVING ISD	LADY BIRD JOHNSON MIDDLE	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	
LANCASTER ISD	LANCASTER H S	75134	7.2	5.3	10.9	9.2	22.1	24.6	17.5	15.1	1.2	77.9
LANCASTER ISD	LANCASTER MIDDLE	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	51.6
LEWISVILLE ISD	FLOWER MOUND H S	75022										
LEWISVILLE ISD	HEDRICK MIDDLE SCHOOL	75067										86.9
MESQUITE ISD	NORTH MESQUITE H S	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	78.0
MESQUITE ISD	VANSTON MIDDLE	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	69.2
PLANO ISD	FRANKFORD MIDDLE	75252	4.7	2.6	8.3	3.5	9.6	6.2	1.1	0.2	0.1	92.1
RICHARDSON ISD	RICHARDSON H S	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	76.4
RICHARDSON ISD	RICHARDSON NORTH J H	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	79.7
SUNNYVALE ISD	SUNNYVALE H S	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
SUNNYVALE ISD	SUNNYVALE MIDDLE	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
RICHARDSON ISD	PARKHILL J H	75248	3.0	3.2	5.6	1.6	10.9	45.7	11.9	1.1	0.0	89.3
DALLAS ISD	BRYAN ADAMS H S	75231	11.1	6.5	21.8	18.0	33.7	43.4	17.1	4.9	0.6	55.6
LEWISVILLE ISD	LEWISVILLE H S	75067										82.2
GRAND PRAIRIE ISD	GRAND PRAIRIE H S	75050	7.5	5.9	13.8	10.6	35.7	17.8	15.9	21.3	1.9	69.4
IRVING ISD	IRVING H S	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	75.0
											Average	77.3

The school district name, the campus name, and the zip code the middle and high schools are located in, are shown on the left side of the table. The socioeconomic indicators and the standardized tests passing rates, for the middle and high schools located greater than the RSR Site's 5-mile radius is shown across the top of the table. The grey shaded areas represent schools that were not opened, during the specified year, or schools that were repurposed. In addition, the socioeconomic indicators, grey areas, represent socioeconomic indicator data that was not available, from the uscensus.gov website. The average standardized test passing rates, for middle and high schools, located greater than RSR Site's 5-mile radius, is 77.3% and the average standardized test passing rate, for the middle and high schools, located within the RSR Site 5-mile radius, is 59.0%. The standardized test passing rates are much higher for the middle and high schools, located outside of the RSR Site's 5-mile radius, than the standardized test passing rates, for the middle and high schools, located within the RSR Site's 5-mile radius. The higher standardized test passing rates for the middle and high schools, located outside of the RSR Site's 5-mile radius site, is due to no impacts from the lead smelter of the RSR Site. In addition, the higher standardized test passing rates might be due to a lower percentage of low income families and a lower percentage of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data set having a low quantity of observations and due to the data set not having a normal data

distribution. The correlation matrix of the socioeconomic indicators and the standardized test passing rate is shown below.

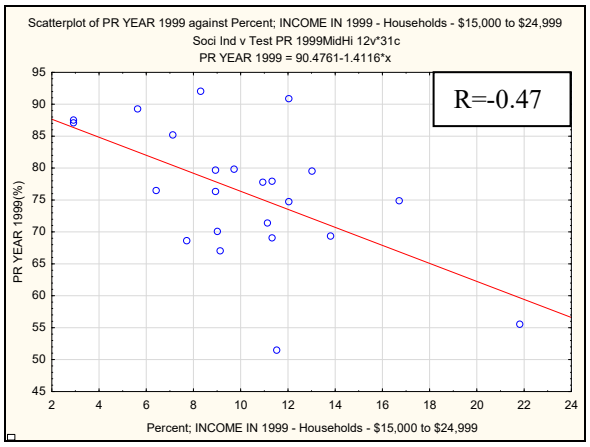
Table 7.49 Year 1999 Socioeconomic Indicators vs Test Passing Rate for Middle and High Schools Located Greater Than the RSR Site's 5-mile Radius.

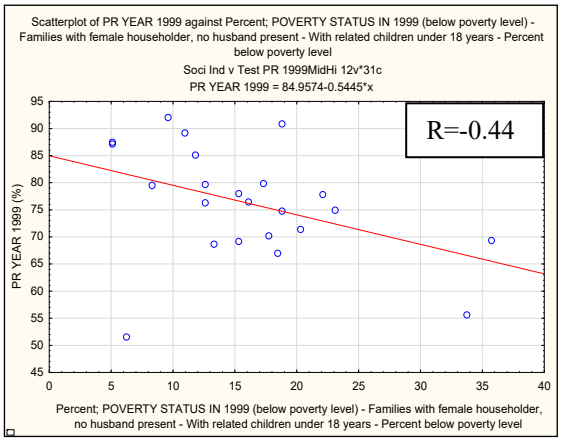
Variable	Spearman Rank Order Correlations (Soci Ind v Test PR 1999MidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 1999
Percent; Household Income - Less than $10,000	1.00	0.75	0.92	0.85	0.73	0.05	0.54	0.63	0.29	-0.40
Percent; Household Income - $10,000 to $14,999	0.75	1.00	0.70	0.76	0.58	0.17	0.60	0.67	0.53	-0.35
Percent; Household Income - $15,000 to $24,999	0.92	0.70	1.00	0.88	0.73	0.07	0.61	0.63	0.30	-0.47
Percent; Families - Percent Below Poverty Level	0.85	0.76	0.88	1.00	0.91	0.12	0.59	0.62	0.34	-0.39
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.73	0.58	0.73	0.91	1.00	0.09	0.44	0.44	0.15	-0.44
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.05	0.17	0.07	0.12	0.09	1.00	0.41	0.03	-0.24	-0.34
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.54	0.60	0.61	0.59	0.44	0.41	1.00	0.77	0.07	-0.25
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.63	0.67	0.63	0.62	0.44	0.03	0.77	1.00	0.54	-0.40
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.29	0.53	0.30	0.34	0.15	-0.24	0.07	0.54	1.00	-0.26
Percent; Standardized Test Passing Rate for Year 1999	-0.40	-0.35	-0.47	-0.39	-0.44	-0.34	-0.25	-0.40	-0.26	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located greater than the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there is a weak, negative significant relationship between the percentage of standardized test passing rates and the percentage of households with income between $15,000 to $24,999 per year and the percentage of female householders with no husband present, that have children less than 18 years of age. This indicates that low income households and single mother households may result in low standardized test passing rates. Also the R values are lower for the middle and high schools, located greater than the 5-mile radius of the RSR Site, than the R values for the middle and high schools located within the RSR Site's 5 mile radius. These weak significant relationships might be the result of a lower percentage of low income households and single mother households, residing in areas located greater than the 5-mile radius of the RSR Site. The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.76- Graph 7.77 Year 1999 RSR Comparison Group Plots of Significant Relationships between Socioeconomic Indicators and the Standardized Test Passing Rate for Middle and High Schools





Based on the above plots, as the percentage of households with income between $15,000 to $24,000 per year and the percentage of single mother household's increase, the standardized test passing rates decrease. These relationships show that there is a negative impact of low income households and single mother households on middle and high schools' standardized test passing rates.

7.2.3.3 RSR Year 2000 Middle and High Schools Socioeconomic Indicators vs the Test Passing Rates for Schools Located Within the 5-mile Radius of the RSR Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the 5-mile radius of the RSR Site. The table of the middle and high schools, located within the 5-mile radius of the RSR Site is located below.

TABLE 7.50: Year 2000 Middle and High Schools of Socioeconomic Indicators vs. Test Passing Rates for Schools Located Within the RSR Superfund Site's 5-Mile Radius

	RSR Year 2000 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2000 (%)
DALLAS ISD	EDISON LEARNING CENTER (Mid)	75212	28.5	10.7	14.5	34.9	63.2	13.6	18.2	41.7	7.4	45.0
DALLAS ISD	L G PINKSTON H S	75212	28.5	10.7	14.5	34.9	63.2	13.6	18.2	41.7	7.4	71.8
DALLAS ISD	RAUL QUINTANILLA MIDDLE	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	38.1
DALLAS ISD	SUNSET H S	75208	12.2	7.9	16.1	17.7	28.3	11.2	11.9	35.2	32.2	60.6
DALLAS ISD	W E GREINER MIDDLE	75208	12.2	7.9	16.1	17.7	28.3	11.2	11.9	35.2	32.2	45.3
IRVING ISD	WHEELER TRANSITIONAL AND DEVELOPMENTAL SEC (Mid/HS)	75060	6.6	5.3	12.5	9.1	19.1	23.6	21.6	27.4	3.4	
DALLAS ISD	W H ADAMSON H S	75203	24.5	10.4	20.7	30.2	44.9	13.5	21.4	40.8	15.2	47.3
DALLAS ISD	L V STOCKARD MIDDLE	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	36.0
DALLAS ISD	THOMAS J RUSK MIDDLE	75235	11.6	6.6	18.3	19.4	45.8	15.5	24.2	37.1	9.4	51.6
IRVING ISD	BOWIE MIDDLE	75060	6.6	5.3	12.5	9.1	19.1	23.6	21.6	27.4	3.4	77.4
IRVING ISD	NIMITZ H S	75060	6.6	5.3	12.5	9.1	19.1	23.6	21.6	27.4	3.4	84.9
DALLAS ISD	WILLIAM B TRAVIS MIDDLE	75204	11.3	5.6	13.3	22.5	41.8	11.6	10.3	14.4	8.7	98.9
DALLAS ISD	MOISES MOLINA H S	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	61.1
DALLAS ISD	HEALTH SPECIAL (Mid/HS)	75201	7.9	2.7	8.2	9.0	33.9	3.1	10.9	5.0	23.8	
IRVING ISD	AUSTIN MIDDLE	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	78.2
											Average	61.2

The school district name, the campus name, and the zip code the schools are located in are shown on the left side of the table. The socioeconomic indicators and standardized

test passing rates are shown across the top of the table. The grey shaded parts of the table, represent schools that were not opened or the school was repurposed, during the specified year. Based on the above table, the average standardized test passing rate, for the middle and high schools, is 61.2%. The low standardized test passing rates may be due to the effects of the RSR Site, as well as, the effects of socioeconomic indicators, that prospective students encountered when they were young children.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data set not having a normal data distribution and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates, for the middle and high schools, located within the 5-mile radius, of the RSR Site, is shown below.

Table 7.51:Year 2000 Correlation Matrix for RSR Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Within the 5-Mile Radius of the RSR Site.

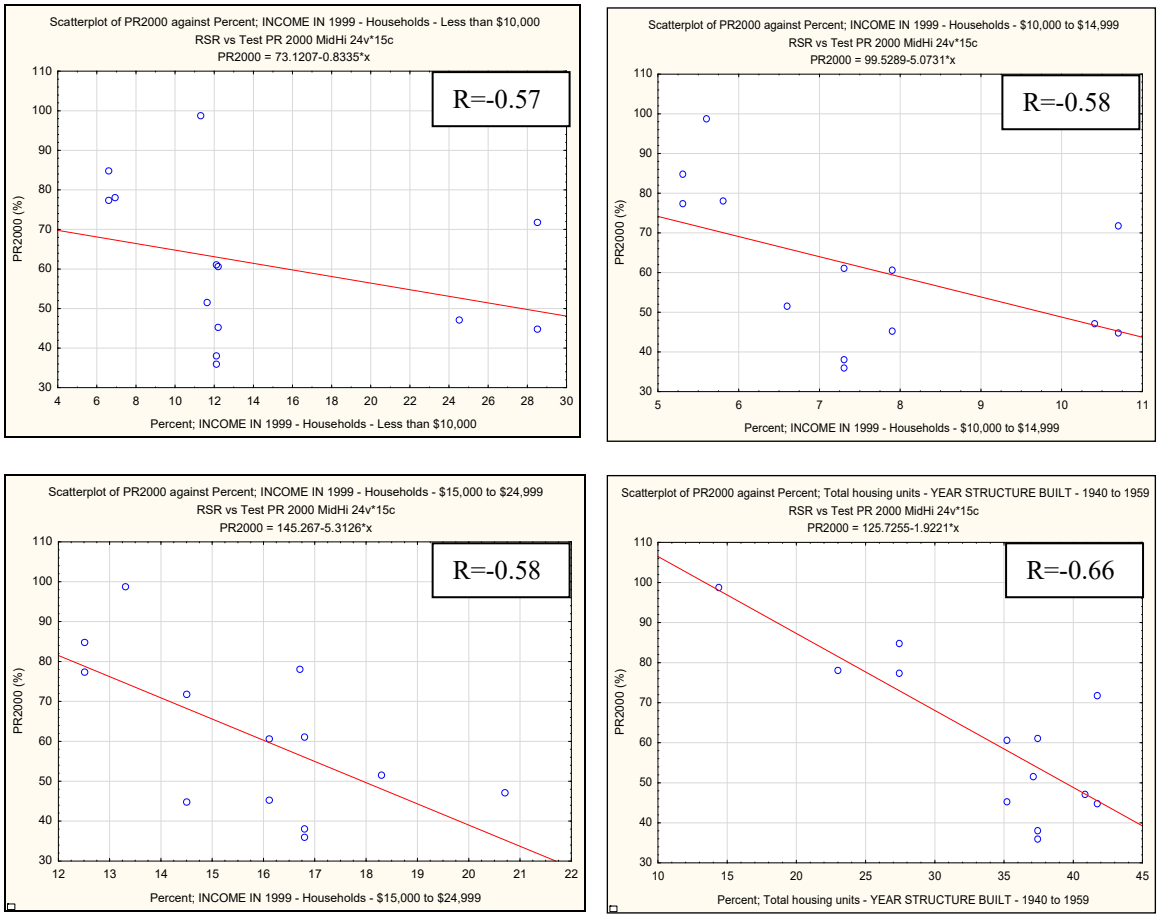
	Spearman Rank Order Correlations (RSR vs Test PR 2000 MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2000
Percent; Household Income - Less than $10,000	1.00	0.96	0.49	0.78	0.78	-0.61	-0.18	0.80	0.47	-0.57
Percent; Household Income - $10,000 to $14,999	0.96	1.00	0.56	0.79	0.70	-0.40	-0.05	0.86	0.28	-0.58
Percent; Household Income - $15,000 to $24,999	0.49	0.56	1.00	0.55	0.54	-0.05	0.47	0.58	0.29	-0.58
Percent; Families - Percent Below Poverty Level	0.78	0.79	0.55	1.00	0.88	-0.27	-0.01	0.76	0.17	-0.31
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.78	0.70	0.54	0.88	1.00	-0.36	0.07	0.77	0.29	-0.50
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.61	-0.40	-0.05	-0.27	-0.36	1.00	0.69	-0.07	-0.83	0.27
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.18	-0.05	0.47	-0.01	0.07	0.69	1.00	0.37	-0.37	-0.35
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.80	0.86	0.58	0.76	0.77	-0.07	0.37	1.00	0.06	-0.66
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.47	0.28	0.29	0.17	0.29	-0.83	-0.37	0.06	1.00	-0.39
Percent; Standardized Test Passing Rate for Year 2000	-0.57	-0.58	-0.58	-0.31	-0.50	0.27	-0.35	-0.66	-0.39	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there is a moderate to strong, negative, significant relationship, between the percentage of standardized test passing rates and the percentage of households with income less than $10,000 per year, the percentage of households with income between $10,000 to $14,999 per year, the percentage of households with income between $15,000 to $24,999 per year, and the percentage of housing units constructed between the Year 1940 to Year 1959. Based on the correlation matrix, it seems that there is a direct link of households with low income and housing units constructed before the Year 1970, and lower standardized test passing rates. This might be due to prospective students being exposed to indoor lead, as young children. In addition, the lower standardized test passing rates could be the result of possible

exposure, of the prospective students, to the lead smelter of the RSR Site. In the event that the prospective students resided, within the 5-mile radius of the RSR Site, from birth or when they were young children, they could have been exposed to lead when the RSR Site was in operation (Year 1934 to the Year 1984), and after the RSR Site closed until the clean–up activities began (Year 1984 to the Year 1991). If the prospective students did not move out of the area, or if new prospective students moved into the area, then there is a strong possibility that the prospective students could have come in contact with lead contaminated soils and the polluted air from the lead smelter, in their childhood, and had their cognitive abilities compromised. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.78- Graph 7.81 Year 2000 Plots of Significant Relationships between Socioeconomic Indicators and the Standardized Test Passing Rates for Middle and High Schools Located Within the RSR Site's 5-mile radius



Based upon the graphs above, as the percentage of households with income less than $10,000 year, the percentage of households that have income between $10,000 to $14,999 per year, the percentage of households that have income between $15,000 to $24,999 per year, and the percentage of housing units constructed between the Year 1940

to Year 1959, increases, the percentage of the standardized test passing rates, decreases. This shows a negative relationship between households with low income, housing units constructed before the Year 1970.

7.2.3.4 RSR Year 2000 Comparison Analysis for RSR Socioeconomic Indicators and the Standardized Test Passing Rates for Middle and High Schools Located Greater than the 5-mile radius of the RSR Site (Comparison Group).

The comparison group analysis identifies trends in the data, for the middle and high schools, located within the RSR Site's 5-mile radius, by comparing this data to the data, of the middle and high schools located greater than the 5- mile radius of the RSR Site. The table of the socioeconomic indicators and standardized test passing rates, for children that attend the middle and high schools, located greater than the 5-mile radius, of the RSR Superfund Site, is shown below.

Table 7.52: Year 2000 Comparison Socioeconomic Indicators and Standardized Test Passing Rate for Middle and High Schools Located Greater Than the 5-mile Radius of the RSR Superfund Site.

District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2000
CARROLLTON-FARMERS BRANCH ISD	SMITH H S	75006	3.6	3.1	9.7	5.7	17.3	31.2	13.8	7.6	0.6	81.1
CARROLLTON-FARMERS BRANCH ISD	LONG MIDDLE	75287										91.2
CEDAR HILL ISD	CEDAR HILL H S	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	79.2
CEDAR HILL ISD	BESSIE COLEMAN MIDDLE	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	
COPPELL ISD	COPPELL MIDDLE WEST	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	90.1
COPPELL ISD	COPPELL H S	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	92.1
DALLAS ISD	W T WHITE H S	75244	4.1	3.8	11.1	5.5	20.3	33.9	35.4	6.3	0.0	74.4
DUNCANVILLE ISD	WILLIAM H BYRD MIDDLE SCHOOL	75137	3.0	1.5	7.7	2.6	13.3	36.2	9.9	5.2	0.8	66.2
DUNCANVILLE ISD	DUNCANVILLE H S	75116	4.7	4.6	13.0	5.2	8.3	40.7	28.8	10.0	1.6	87.0
FERRIS ISD	FERRIS H S	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	93.5
FERRIS ISD	FERRIS J H	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	71.0
GARLAND ISD	LYLES MIDDLE	75043	4.1	3.6	9.1	4.9	18.4	40.2	8.0	1.7	0.2	67.1
GARLAND ISD	GARLAND H S	75040	4.7	3.4	9.0	6.7	17.7	27.9	17.2	14.0	1.1	70.7
GRAND PRAIRIE ISD	HARRY S TRUMAN MIDDLE	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	84.4
IRVING ISD	LADY BIRD JOHNSON MIDDLE	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	
LANCASTER ISD	LANCASTER H S	75134	7.2	5.3	10.9	9.2	22.1	24.6	17.5	15.1	1.2	75.6
LANCASTER ISD	LANCASTER MIDDLE	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	56.0
LEWISVILLE ISD	FLOWER MOUND H S	75022										97.0
LEWISVILLE ISD	HEDRICK MIDDLE SCHOOL	75067										84.5
MESQUITE ISD	NORTH MESQUITE H S	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	79.3
MESQUITE ISD	VANSTON MIDDLE	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	73.9
PLANO ISD	FRANKFORD MIDDLE	75252	4.7	2.6	8.3	3.5	9.6	6.2	1.1	0.2	0.1	94.6
RICHARDSON ISD	RICHARDSON H S	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	77.1
RICHARDSON ISD	RICHARDSON NORTH J H	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	81.9
SUNNYVALE ISD	SUNNYVALE H S	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
SUNNYVALE ISD	SUNNYVALE MIDDLE	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
RICHARDSON ISD	PARKHILL J H	75248	3.0	3.2	5.6	1.6	10.9	45.7	11.9	1.1	0.0	93.2
DALLAS ISD	BRYAN ADAMS H S	75231	11.1	6.5	21.8	18.0	33.7	43.4	17.1	4.9	0.6	79.1
LEWISVILLE ISD	LEWISVILLE H S	75067										86.0
GRAND PRAIRIE ISD	GRAND PRAIRIE H S	75050	7.5	5.9	13.8	10.6	35.7	17.8	15.9	21.3	1.9	74.4
IRVING ISD	IRVING H S	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	79.8
											Average	80.8

The school district name, campus name, and the zip codes the middle and high schools are located in, are shown on the left side of the table, and the socioeconomic indicators and the standardized test passing rates, are shown across the top of the table. The grey areas, in the table, represent schools that may have not been opened or that was repurposed, during the specified year. The grey shaded areas, representing socioeconomic indicator data, was not available, from the uscensus.gov website.

The average standardized test passing rate, for middle and high schools located greater than the 5-mile radius, of RSR Superfund Site is 80.8%, and the average standardized test passing rate for the middle and high schools, located within the RSR Site's 5-mile radius, is 61.2%. There is approximately a 20 point difference, between the average standardized test passing rate, for the middle and high schools located inside the RSR Site's 5-mile radius, and the average standardized test passing rate, for the middle and high schools located greater than the RSR Site's 5-mile radius. The difference could be due to the middle and high schools, located greater than the RSR Site's 5-mile radius, having lower percentages of low income families and lower percentages of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data set not having a normal distribution, and due to the low quantity of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates, for middle and high schools, is shown below.

Table 7.53:Year 2000 Correlation Matrix for RSR Socioeconomic Indicators and Passing Rate Standardized Test for Middle and High Schools Located Greater than the 5-mile Radius of the RSR Site.

	Spearman Rank Order Correlations (Soci Ind vs Test PR 2000 MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2000
Percent; Household Income - Less than $10,000	1.00	0.75	0.92	0.85	0.73	0.05	0.54	0.63	0.29	-0.28
Percent; Household Income - $10,000 to $14,999	0.75	1.00	0.70	0.76	0.58	0.17	0.60	0.67	0.53	-0.21
Percent; Household Income - $15,000 to $24,999	0.92	0.70	1.00	0.88	0.73	0.07	0.61	0.63	0.30	-0.30
Percent; Families - Percent Below Poverty Level	0.85	0.76	0.88	1.00	0.91	0.12	0.59	0.62	0.34	-0.29
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.73	0.58	0.73	0.91	1.00	0.09	0.44	0.44	0.15	-0.38
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.05	0.17	0.07	0.12	0.09	1.00	0.41	0.03	-0.24	-0.27
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.54	0.60	0.61	0.59	0.44	0.41	1.00	0.77	0.07	-0.19
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.63	0.67	0.63	0.62	0.44	0.03	0.77	1.00	0.54	-0.41
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.29	0.53	0.30	0.34	0.15	-0.24	0.07	0.54	1.00	-0.27
Percent; Standardized Test Passing Rate for Year 2000	-0.28	-0.21	-0.30	-0.29	-0.38	-0.27	-0.19	-0.41	-0.27	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located greater than the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there are no significant, negative, relationships between the standardized test passing rates and the socioeconomic indicators. Therefore, no socioeconomic indicators, negatively affect the stand test passing rates, for middle and high school, aged students, that attend schools located greater than the 5-mile radius of the RSR Site.

7.2.3.5 RSR Year 2001 Socioeconomic Indicators vs the Test Passing Rates for Middle and High Schools, Located Within the 5-Mile Radius of the RSR Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the 5-mile radius of the RSR Site. The table of the socioeconomic indicators and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the RSR Site, is located below.

TABLE 7.54: Year 2001 Middle and High Schools of Socioeconomic Indicators vs. Test Passing Rates for Schools Located Within the RSR Superfund Site's 5-mile Radius

	RSR Year 2001 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units-YEAR BUILT - 1970 to 1979	Percent; Housing Units-YEAR BUILT - 1960 to 1969	Percent; Housing Units-YEAR BUILT - 1940 to 1959	Percent; Housing Units-YEAR BUILT-1939 or earlier	Test PR 2001 (%)
DALLAS ISD	EDISON LEARNING CENTER (Mid)	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	35.4
DALLAS ISD	L G PINKSTON H S	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	74.1
DALLAS ISD	RAUL QUINTANILLA MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	47.1
DALLAS ISD	SUNSET H S	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	58.7
DALLAS ISD	W E GREINER MIDDLE	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	53.6
IRVING ISD	WHEELER TRANSITIONAL AND DEVELOPMENTAL SEC (Mid/HS)	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	
DALLAS ISD	W H ADAMSON H S	75203	30.2	24.5	10.4	20.7	44.9	13.5	21.4	40.8	15.2	52.3
DALLAS ISD	L V STOCKARD MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	43.6
DALLAS ISD	THOMAS J RUSK MIDDLE	75235	19.4	11.6	6.6	18.3	45.8	15.5	24.2	37.1	9.4	57.4
IRVING ISD	BOWIE MIDDLE	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	78.0
IRVING ISD	NIMITZ H S	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	85.0
DALLAS ISD	WILLIAM B TRAVIS MIDDLE	75204	22.5	11.3	5.6	13.3	41.8	11.6	10.3	14.4	8.7	
DALLAS ISD	MOISES MOLINA H S	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	61.9
DALLAS ISD	HEALTH SPECIAL (Mid/HS)	75201	9	7.9	2.7	8.2	33.9	3.1	10.9	5	23.8	
IRVING ISD	AUSTIN MIDDLE	75061	10.7	6.9	5.8	16.7	23.1	17.3	21	23	2.1	77.4
											Average	60.4

The name of the school district, the campus name, and the zip codes the schools are located in, is shown along the left side of the table. The socioeconomic indicators and the test passing rates, are shown across the top portion of the table. The grey, shaded parts of the table, represent schools that were not open yet or schools that were repurposed.

Based on the above table, the average standardized test passing the middle and high schools is 60.4%. The low standardized test passing rate average, could be a result of the exposure of prospective students to lead particulate matter deposition in the soil from the lead smelter, of the RSR Site. In addition, the low standardized test passing rates could be a result of indoor lead exposure, from housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was utilized to analyze the data due to the data not having a normal distribution and due to the a low quantity of observations. The correlation matrix, for the socioeconomic indicators and the standardized test passing rates, for the middle and high schools, located within the 5-mile radius of the RSR Site, is shown below.

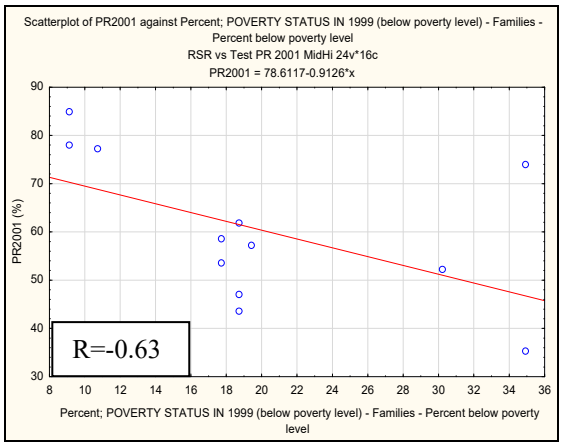
Table 7.55: Year 2001 Correlation Matrix for RSR Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Within the 5-Mile Radius of the RSR Site.

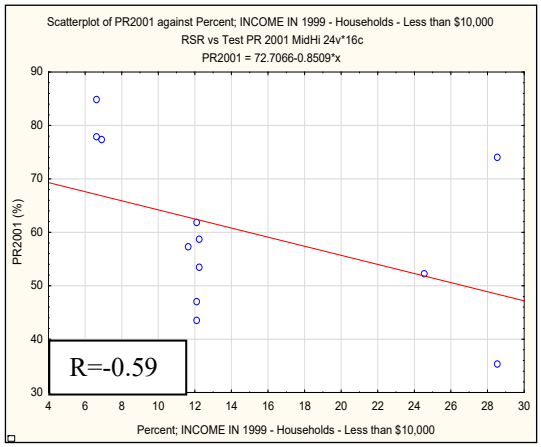
Variable	Spearman Rank Order Correlations (RSR vs Test PR 2001 MidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2001
Percent; Families - Percent Below Poverty Level	1.00	0.78	0.79	0.55	0.88	-0.27	-0.01	0.76	0.17	-0.63
Percent; Household Income - Less than $10,000	0.78	1.00	0.96	0.49	0.78	-0.61	-0.18	0.80	0.47	-0.59
Percent; Household Income - $10,000 to $14,999	0.79	0.96	1.00	0.56	0.70	-0.40	-0.05	0.86	0.28	-0.59
Percent; Household Income - $15,000 to $24,999	0.55	0.49	0.56	1.00	0.54	-0.05	0.47	0.58	0.29	-0.50
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.88	0.78	0.70	0.54	1.00	-0.36	0.07	0.77	0.29	-0.61
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.27	-0.61	-0.40	-0.05	-0.36	1.00	0.69	-0.07	-0.83	0.55
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.01	-0.18	-0.05	0.47	0.07	0.69	1.00	0.37	-0.37	-0.07
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.76	0.80	0.86	0.58	0.77	-0.07	0.37	1.00	0.06	-0.64
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.17	0.47	0.28	0.29	0.29	-0.83	-0.37	0.06	1.00	-0.51
Percent; Standardized Test Passing Rate for Year 2001	-0.63	-0.59	-0.59	-0.50	-0.61	0.55	-0.07	-0.64	-0.51	1.00

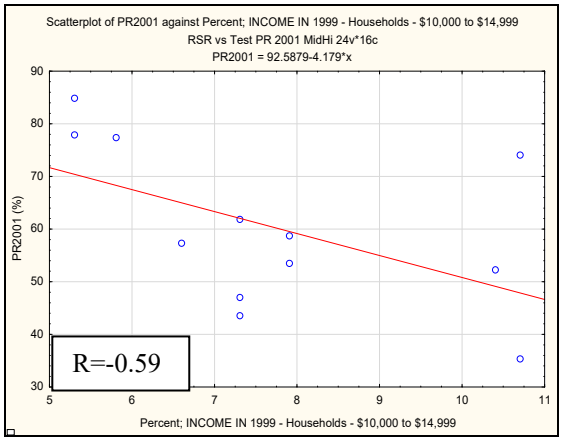
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the RSR Site.

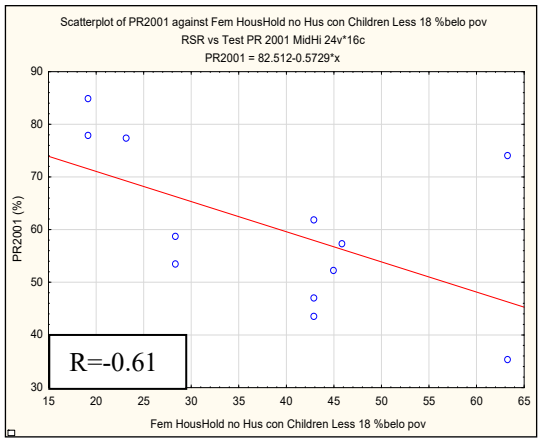
Based upon the correlation matrix, above, there is a moderate to strong, negative significant relationship between the percentage of standardized test passing rates and the percentage of families below poverty level, the percentage of households with income less than $10,000 per year, the percentage of households with income between $10,000 to $14,999 per year, the percentage of female householders with no husband present with children less than 18 years of age, and the percentage housing units constructed between Year 1940 to Year 1959. Based on the correlation matrix, it seems that there is a direct link of low income households, single mother households, and housing units constructed before the Year 1970, having a negative impact on the standardized test passing rates of middle and high schools located in close proximity of the RSR Site. This could be a result of low income families residing in cheaper housing units, that were constructed before the Year 1970. The prospective students could have been exposed to indoor lead, as well as, exposed to lead from the RSR Site while the site was in operation (Year 1934-Year 1984) and after the site was closed until the cleanup activities commenced (Year 1991). The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

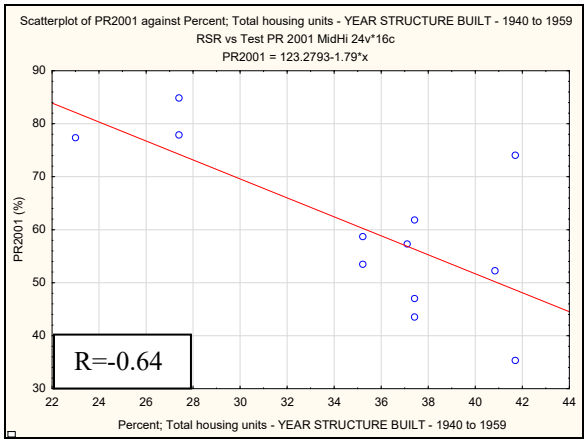
Graph 7.82- Graph 7.86 Year 2001 Plots of Significant Relationships between Socioeconomic Indicators and the Standardized Test Passing Rates for Middle and High Schools Located Within the RSR Site's 5-mile radius











Based on the graphs above, as the percentage of families below poverty level, the percentage households with income less than $10,000 per year, the percentage of households with income between $10,000 to $14,999 per year, the percentage of single mother households, and the percentage of housing units constructed from the Year 1940 to the Year 1959, increase, the student standardized test passing rate decreases.

7.2.3.6 Year 2001 Comparison Analysis for RSR Socioeconomic Indicators and the Standardized Test Passing Rates for Middle and High Schools Located Greater than the 5-mile Radius of the RSR Site (Comparison Group).

The comparison group analysis identifies trends in the data, for the middle and high schools, located within the RSR Site's 5-mile radius, by comparing this data to the data, of the middle and high schools located greater than the 5- mile radius of the RSR Site. The table of the socioeconomic indicators and the standardized test passing rates, for middle and high schools located greater than the 5-mile radius of the RSR Superfund Site, is shown below.

Table 7.56 Year 2001 Comparison Socioeconomic Indicators and Standardized Test Passing Rate for Middle and High Schools Located Greater Than the 5-mile Radius of RSR Superfund Site.

	Year 2001 Socioeconomic Indicators and Standardized Test Passing Rate for Middle/High Schools Greater than 5 Miles from RSR Site											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2001
FARMERS BRANCH ISD	SMITH H S	75006	3.6	3.1	9.7	5.7	17.3	31.2	13.8	7.6	0.6	85.4
CARROLLTON-FARMERS BRANCH	LONG MIDDLE	75287										85.7
CEDAR HILL ISD	CEDAR HILL H S	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	85.1
CEDAR HILL ISD	BESSIE COLEMAN MIDDLE	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	
COPPELL ISD	COPPELL MIDDLE WEST	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	92.3
COPPELL ISD	COPPELL H S	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	90.5
DALLAS ISD	W T WHITE H S	75244	4.1	3.8	11.1	5.5	20.3	33.9	35.4	6.3	0.0	80.0
DUNCANVILLE ISD	WILLIAM H BYRD MIDDLE SCHOOL	75137	3.0	1.5	7.7	2.6	13.3	36.2	9.9	5.2	0.8	75.6
DUNCANVILLE ISD	DUNCANVILLE H S	75116	4.7	4.6	13.0	5.2	8.3	40.7	28.8	10.0	1.6	86.1
FERRIS ISD	FERRIS H S	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	95.1
FERRIS ISD	FERRIS J H	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	76.4
GARLAND ISD	LYLES MIDDLE	75043	4.1	3.6	9.1	4.9	18.4	40.2	8.0	1.7	0.2	66.6
GARLAND ISD	GARLAND H S	75040	4.7	3.4	9.0	6.7	17.7	27.9	17.2	14.0	1.1	71.2
GRAND PRAIRIE ISD	HARRY S TRUMAN MIDDLE	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	87.4
IRVING ISD	LADY BIRD JOHNSON MIDDLE	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	
LANCASTER ISD	LANCASTER H S	75134	7.2	5.3	10.9	9.2	22.1	24.6	17.5	15.1	1.2	78.9
LANCASTER ISD	LANCASTER MIDDLE	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	62.7
LEWISVILLE ISD	FLOWER MOUND H S	75022										96.7
LEWISVILLE ISD	HEDRICK MIDDLE SCHOOL	75067										85.6
MESQUITE ISD	NORTH MESQUITE H S	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	78.0
MESQUITE ISD	VANSTON MIDDLE	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	78.0
PLANO ISD	FRANKFORD MIDDLE	75252	4.7	2.6	8.3	3.5	9.6	6.2	1.1	0.2	0.1	94.7
RICHARDSON ISD	RICHARDSON H S	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	82.3
RICHARDSON ISD	RICHARDSON NORTH J H	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	83.4
SUNNYVALE ISD	SUNNYVALE H S	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
SUNNYVALE ISD	SUNNYVALE MIDDLE	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
RICHARDSON ISD	PARKHILL J H	75248	3.0	3.2	5.6	1.6	10.9	45.7	11.9	1.1	0.0	96.4
DALLAS ISD	BRYAN ADAMS H S	75231	11.1	6.5	21.8	18.0	33.7	43.4	17.1	4.9	0.6	74.6
LEWISVILLE ISD	LEWISVILLE H S	75067										85.9
GRAND PRAIRIE ISD	GRAND PRAIRIE H S	75050	7.5	5.9	13.8	10.6	35.7	17.8	15.9	21.3	1.9	71.0
IRVING ISD	IRVING H S	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	76.4
											Average	82.3

The school district name, the campus name, and zip codes the schools are located in, are shown on the left side of the table, and the socioeconomic indicators and the standardized test passing rates, are shown across the top of the table. The grey areas, in the table, represent schools that were not opened or schools that were repurposed. In addition, the grey socioeconomic indicator data was not available from the uscensus.gov website.

The average standardized test passing rate, for middle and high schools, located outside of the RSR Superfund Site's 5-mile radius, is 82.3%, and the average standardized test passing rate, is 60.4%, for the middle and high schools located within the 5-mile radius of

the RSR Site. This is approximately a 22 point difference between the average standardized test passing rate, for middle and high schools, located within and outside of the 5-mile radius of the RSR Site. The significant difference could be due to a lower percentage of low income households, families below poverty level, housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data due to a low number of observations and due to the data set not having a normal data distribution. The correlation matrix for the socioeconomic indicators and the standardized test passing rates, for middle and high schools, is shown below.

Table 7.57: Year 2001 Correlation Matrix for RSR Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Greater than the 5-mile Radius of the RSR Site.

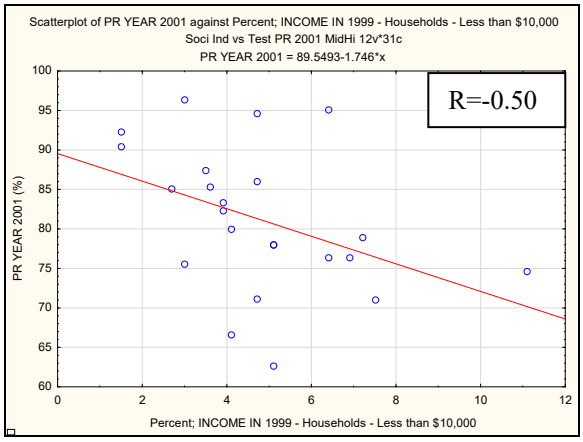
	Spearman Rank Order Correlations (Soci Ind vs Test PR 2001 MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2001
Percent; Household Income - Less than $10,000	1.00	0.75	0.92	0.85	0.73	0.05	0.54	0.63	0.29	-0.50
Percent; Household Income - $10,000 to $14,999	0.75	1.00	0.70	0.76	0.58	0.17	0.60	0.67	0.53	-0.39
Percent; Household Income - $15,000 to $24,999	0.92	0.70	1.00	0.88	0.73	0.07	0.61	0.63	0.30	-0.51
Percent; Families - Percent Below Poverty Level	0.85	0.76	0.88	1.00	0.91	0.12	0.59	0.62	0.34	-0.46
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.73	0.58	0.73	0.91	1.00	0.09	0.44	0.44	0.15	-0.49
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.05	0.17	0.07	0.12	0.09	1.00	0.41	0.03	-0.24	-0.22
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.54	0.60	0.61	0.59	0.44	0.41	1.00	0.77	0.07	-0.23
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.63	0.67	0.63	0.62	0.44	0.03	0.77	1.00	0.54	-0.51
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.29	0.53	0.30	0.34	0.15	-0.24	0.07	0.54	1.00	-0.35
Percent; Standardized Test Passing Rate for Year 2001	-0.50	-0.39	-0.51	-0.46	-0.49	-0.22	-0.23	-0.51	-0.35	1.00

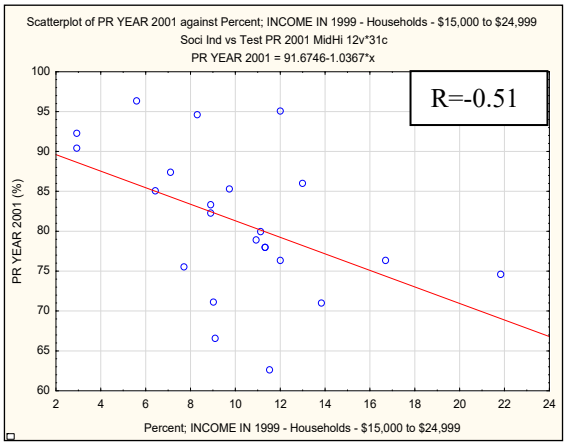
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located greater than the 5-mile radius of the RSR Site.

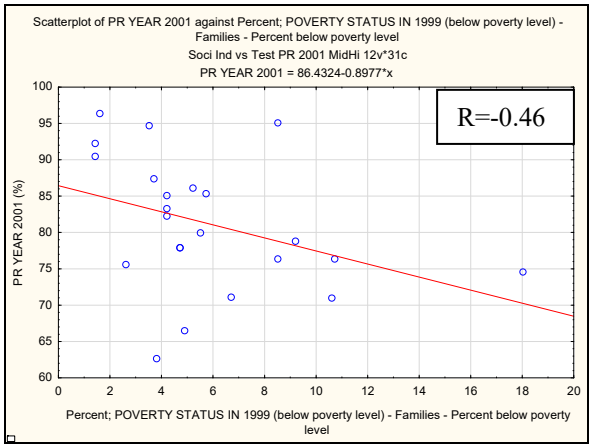
Based upon the correlation matrix, above, there is a negative weak to moderate, significant relationship between the standardized test passing rates and the percentage of households with income less than $10,000 per year, the percentage of households with income between $15,000 to $24,000 per year, the percentage of families below poverty level, the percentage of female householders, with no husband present, with children less than 18 years of age, and the percentage housing units constructed between the Year 1940 to the Year 1959. Based on the correlation matrix, it seems that there is a direct link between households with low income, families below poverty level, single mother households, and housing units constructed between Year 1940 to Year 1959, and lower standardized test passing rates for middle and high school aged students. In addition, R values are lower for the schools located outside of the 5-mile radius of the RSR Site, than the R values for the middle and the high schools located within the RSR Site's 5-mile

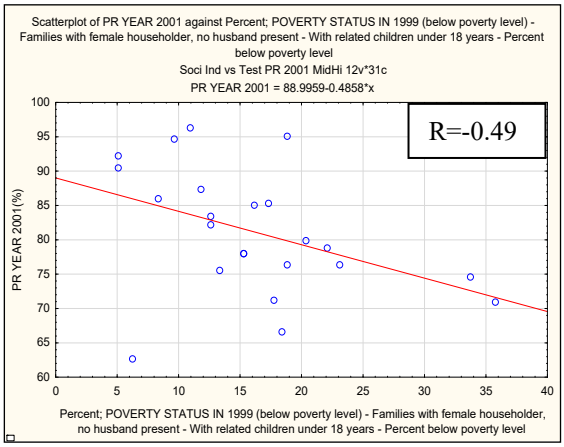
radius. This indicates that the significant relationships are weaker, for the middle and high schools, located greater than the 5-mile radius, than the significant relationships for the middle and high schools that are located in close proximity of the RSR Site. The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

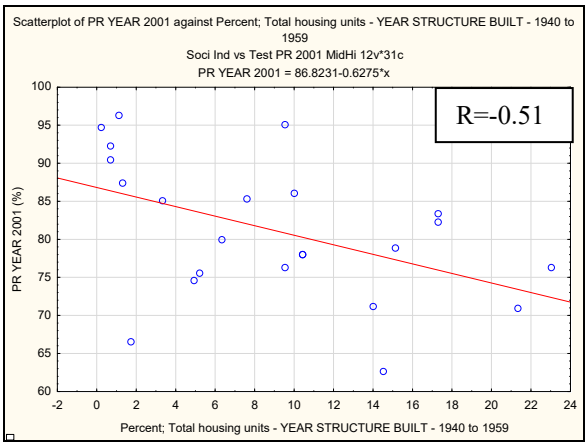
Graph 7.87- Graph 7.91: Year 2001 RSR Comparison Group Plots of Significant Relationships between Socioeconomic Indicators and the Standardized Test Passing Rates for Middle and High Schools











Based on the graphs above, as the percentage of households with low income, the percentage of families below poverty, the percentage single mother households, the percentage of housing units constructed between Year 1940 to Year 1959 increase, the percentage of middle and high school standardized test passing rates decrease. Therefore, if prospective students live in a household with low income, in a family that is below the poverty level, and /or reside in a housing unit constructed between the Year 1940 to 1959, then the prospective students will most likely have lower standardized test passing rates.

7.2.3.7 RSR Year 2002 Middle and High Schools Socioeconomic Indicators vs the Test Passing Rates for Schools located Within the 5-mile Radius of the RSR Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the 5-mile radius of the RSR Site. The table of the socioeconomic indicators and the standardized test passing rates for the middle and high schools located within the 5 mile radius of the RSR Site, is located below.

TABLE 7.58: Year 2002 Middle and High Schools of Socioeconomic Indicators vs. Test Passing Rates for Schools Located Within the RSR Superfund Site's 5-Mile Radius

	RSR Year 2002 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2002 (%)
DALLAS ISD	EDISON LEARNING CENTER (Mid) (75212)	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	59.9
DALLAS ISD	L G PINKSTON H S	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	82.7
DALLAS ISD	RAUL QUINTANILLA MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	68.2
DALLAS ISD	SUNSET H S	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	54.1
DALLAS ISD	W E GREINER MIDDLE	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	63.2
IRVING ISD	WHEELER TRANSITIONAL AND DEVELOPMENTAL SEC (Mid/HS)	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	
DALLAS ISD	W H ADAMSON H S	75203	30.2	24.5	10.4	20.7	44.9	13.5	21.4	40.8	15.2	57.7
DALLAS ISD	L V STOCKARD MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	63.8
DALLAS ISD	THOMAS J RUSK MIDDLE	75235	19.4	11.6	6.6	18.3	45.8	15.5	24.2	37.1	9.4	60.6
IRVING ISD	BOWIE MIDDLE	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	80.1
IRVING ISD	NIMITZ H S	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	86.5
DALLAS ISD	WILLIAM B TRAVIS MIDDLE	75204	22.5	11.3	5.6	13.3	41.8	11.6	10.3	14.4	8.7	97.7
DALLAS ISD	MOISES MOLINA H S	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	73.9
DALLAS ISD	HEALTH SPECIAL (Mid/HS)	75201	9	7.9	2.7	8.2	33.9	3.1	10.9	5	23.8	
IRVING ISD	AUSTIN MIDDLE	75061	10.7	6.9	5.8	16.7	23.1	17.3	21	23	2.1	83.1
											Average	71.7

The school district name, the campus name, and the zip codes the schools are located in are shown on the left side of the table, and the socioeconomic indicators and the standardized test passing rates, are shown across the top of the table. The grey areas represent schools that were not opened yet or schools that were repurposed. Based on the above table, the average standardized test passing the middle and high schools is 71.7%. This is the highest average standardized test passing rate from the Year 1999 to the Year 2002. The reason for the increase in standardized test passing rates could be a result of reduced impacts of the RSR Site on prospective students, after the facility was closed (Year 1984) and after cleanup activities were completed (Year 1994). In addition, the increase in the average standardized test passing rates could be the result of impacted prospective students moving out of the area or graduating from high school.

The Spearman Rank Correlation Matrix was utilized to analyze the data due to the data set not having a normal distribution and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for the middle and high schools, located within the 5-mile radius of the RSR Site, is shown below.

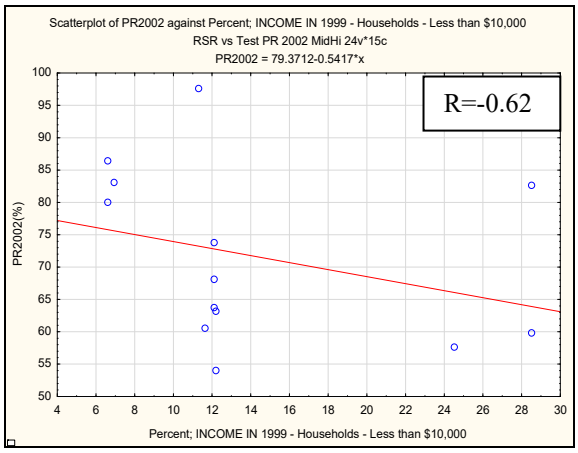
Table 7.59:Year 2002 Correlation Matrix for RSR Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the RSR Site.

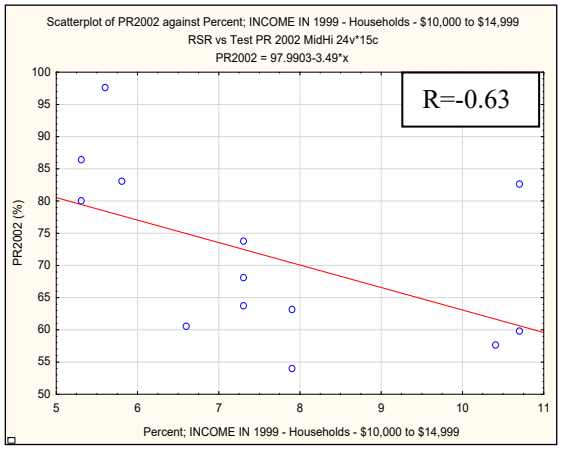
Variable	Spearman Rank Order Correlations (RSR vs Test PR 2002 MidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2002
Percent; Families - Percent Below Poverty Level	1.00	0.78	0.79	0.55	0.88	-0.27	-0.01	0.76	0.17	-0.27
Percent; Household Income - Less than $10,000	0.78	1.00	0.96	0.49	0.78	-0.61	-0.18	0.80	0.47	-0.62
Percent; Household Income - $10,000 to $14,999	0.79	0.96	1.00	0.56	0.70	-0.40	-0.05	0.86	0.28	-0.63
Percent; Household Income - $15,000 to $24,999	0.55	0.49	0.56	1.00	0.54	-0.05	0.47	0.58	0.29	-0.54
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.88	0.78	0.70	0.54	1.00	-0.36	0.07	0.77	0.29	-0.41
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.27	-0.61	-0.40	-0.05	-0.36	1.00	0.69	-0.07	-0.83	0.45
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.01	-0.18	-0.05	0.47	0.07	0.69	1.00	0.37	-0.37	0.00
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.76	0.80	0.86	0.58	0.77	-0.07	0.37	1.00	0.06	-0.52
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.17	0.47	0.28	0.29	0.29	-0.83	-0.37	0.06	1.00	-0.63
Percent; Standardized Test Passing Rate for Year 2002	-0.27	-0.62	-0.63	-0.54	-0.41	0.45	0.00	-0.52	-0.63	1.00

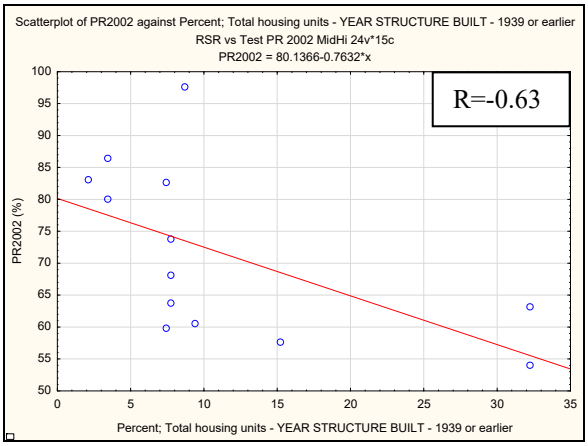
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there is a negative strong, significant relationship between the percentage of standardized test passing rates and the percentage of households with income less than $10,000 per year, the percentage of households with income between $10,000 to $14,999 per year, and the percentage of housing units constructed between Year 1939 or earlier. Based on the correlation matrix, it seems that there is a direct link between low income households and housing units that were constructed from the Year 1939 or earlier and lower standardized test passing rates. This could be a result a large percentage of low income families residing cheaper housing units that were constructed before the Year 1970. The prospective students could have been exposed to indoor lead based paint, as well as, been exposed to lead from the RSR Site, resulting in their cognitive abilities being compromised. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.92- Graph 7.94: Year 2002 RSR Plots of Significant Relationships between Socioeconomic Indicators and the Standardized Test Passing Rates for Middle and High Schools Located Within the RSR Site's 5 Mile Radius







Based on the graphs above, as the percentage of households income less than $10,000 per year, the percentage of households with income between $10,000 to $14,999 per year, and the percentage of housing units constructed in the Year 1939 or earlier, increase, the standardized test passing rates decrease.

7.2.3.8 RSR Year 2002 Comparison Analysis for RSR Socioeconomic Indicators and the Standardized Test Passing Rates for Middle and High Schools Located Greater than the 5-mile Radius of the RSR Site.

The comparison group analysis identifies trends in the data, for the middle and high schools, located within the RSR Site's 5-mile radius, by comparing this data to the data, of the middle and high schools located greater than the 5- mile radius of the RSR Site. The table of the socioeconomic indicators and the standardized test passing rates, middle and high schools, located greater than the 5-mile radius of the RSR Superfund Site, is shown below.

Table 7.60: Year 2002 Comparison Socioeconomic Indicators and Standardized Test Passing Rate for Middle and High Schools Located Greater Than the 5-mile Radius of the RSR Superfund Site.

	Year 2002 Socioeconomic Indicators and Standardized Test Passing Rate for Middle/High Schools Greater than 5 Miles from RSR Site											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2002
CARROLLTON-FARMERS BRANCH ISD	SMITH H S	75006	3.6	3.1	9.7	5.7	17.3	31.2	13.8	7.6	0.6	88.1
CARROLLTON-FARMERS BRANCH ISD	LONG MIDDLE	75287										86.8
CEDAR HILL ISD	CEDAR HILL H S	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	91.2
CEDAR HILL ISD	BESSIE COLEMAN MIDDLE	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	
COPPELL ISD	COPPELL MIDDLE WEST	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	91.5
COPPELL ISD	COPPELL H S	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	91.5
DALLAS ISD	W T WHITE H S	75244	4.1	3.8	11.1	5.5	20.3	33.9	35.4	6.3	0.0	87.8
DUNCANVILLE ISD	WILLIAM H BYRD MIDDLE SCHOOL	75137	3.0	1.5	7.7	2.6	13.3	36.2	9.9	5.2	0.8	79.2
DUNCANVILLE ISD	DUNCANVILLE H S	75116	4.7	4.6	13.0	5.2	8.3	40.7	28.8	10.0	1.6	89.6
FERRIS ISD	FERRIS H S	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	93.6
FERRIS ISD	FERRIS J H	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	73.8
GARLAND ISD	LYLES MIDDLE	75043	4.1	3.6	9.1	4.9	18.4	40.2	8.0	1.7	0.2	71.6
GARLAND ISD	GARLAND H S	75040	4.7	3.4	9.0	6.7	17.7	27.9	17.2	14.0	1.1	77.8
GRAND PRAIRIE ISD	HARRY S TRUMAN MIDDLE	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	84.8
IRVING ISD	LADY BIRD JOHNSON MIDDLE	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	
LANCASTER ISD	LANCASTER H S	75134	7.2	5.3	10.9	9.2	22.1	24.6	17.5	15.1	1.2	79.8
LANCASTER ISD	LANCASTER MIDDLE	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	66.8
LEWISVILLE ISD	FLOWER MOUND H S	75022										98.5
LEWISVILLE ISD	HEDRICK MIDDLE SCHOOL	75067										84.6
MESQUITE ISD	NORTH MESQUITE H S	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	83.5
MESQUITE ISD	VANSTON MIDDLE	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	74.1
PLANO ISD	FRANKFORD MIDDLE	75252	4.7	2.6	8.3	3.5	9.6	6.2	1.1	0.2	0.1	95.3
RICHARDSON ISD	RICHARDSON H S	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	80.8
RICHARDSON ISD	RICHARDSON NORTH J H	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	87.5
SUNNYVALE ISD	SUNNYVALE H S	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
SUNNYVALE ISD	SUNNYVALE MIDDLE	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
RICHARDSON ISD	PARKHILL J H	75248	3.0	3.2	5.6	1.6	10.9	45.7	11.9	1.1	0.0	92.2
DALLAS ISD	BRYAN ADAMS H S	75231	11.1	6.5	21.8	18.0	33.7	43.4	17.1	4.9	0.6	77.7
LEWISVILLE ISD	LEWISVILLE H S	75067										88.7
GRAND PRAIRIE ISD	GRAND PRAIRIE H S	75050	7.5	5.9	13.8	10.6	35.7	17.8	15.9	21.3	1.9	79.5
IRVING ISD	IRVING H S	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	85.3
											Average	84.5

The district name, the campus name, and the zip codes that the schools are located in, are shown on the left side of the table. The socioeconomic indicators and the standardized test passing rates are shown across the top of the table. The grey areas represent schools that were not opened, or schools that were repurposed, during the specified year. In addition, the grey shaded socioeconomic indicator data was not available from the uscensus.gov website. The average standardized test passing rate, for middle and high schools located outside of the RSR Superfund Site, is 84.5% and the average standardized test passing rate, for middle and high schools, located within the RSR Site's 5-mile radius is 71.7%. There is about a 13 point difference in standardized test passing rates for middle and high schools located within and outside of the RSR Site's 5-mile radius. The 13 point difference in the average standardized test passing rates is the lowest difference in standardized test passing rates from the Year 1999 to the Year 2002. This low difference in standardized test passing rates might be due to reduced effects of the RSR Site on the prospective students' cognitive abilities, due to the RSR Site's closure and cleanup activities, for the middle and high schools located in close proximity of the RSR Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data due to the data set not being normal and due to the low number of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates, for middle and high schools, is shown below.

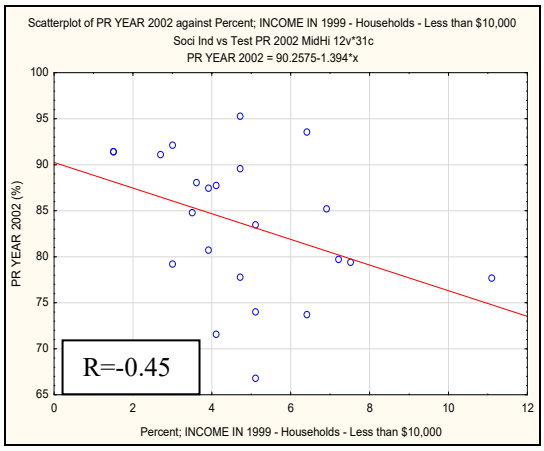
Table 7.61.Year 2002 Correlation Matrix for RSR Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Greater than the 5-mile Radius of the RSR Site.

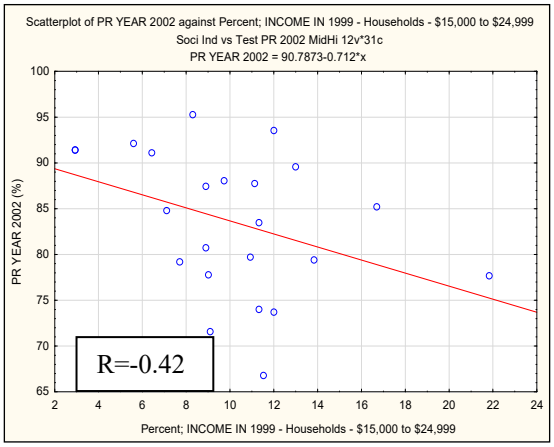
	Spearman Rank Order Correlations (Soci Ind vs Test PR 2002 MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2002
Percent; Household Income - Less than $10,000	1.00	0.75	0.92	0.85	0.73	0.05	0.54	0.63	0.29	-0.45
Percent; Household Income - $10,000 to $14,999	0.75	1.00	0.70	0.76	0.58	0.17	0.60	0.67	0.53	-0.33
Percent; Household Income - $15,000 to $24,999	0.92	0.70	1.00	0.88	0.73	0.07	0.61	0.63	0.30	-0.42
Percent; Families - Percent Below Poverty Level	0.85	0.76	0.88	1.00	0.91	0.12	0.59	0.62	0.34	-0.36
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.73	0.58	0.73	0.91	1.00	0.09	0.44	0.44	0.15	-0.36
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.05	0.17	0.07	0.12	0.09	1.00	0.41	0.03	-0.24	-0.28
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.54	0.60	0.61	0.59	0.44	0.41	1.00	0.77	0.07	-0.21
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.63	0.67	0.63	0.62	0.44	0.03	0.77	1.00	0.54	-0.43
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.29	0.53	0.30	0.34	0.15	-0.24	0.07	0.54	1.00	-0.30
Percent; Standardized Test Passing Rate for Year 2002	-0.45	-0.33	-0.42	-0.36	-0.36	-0.28	-0.21	-0.43	-0.30	1.00

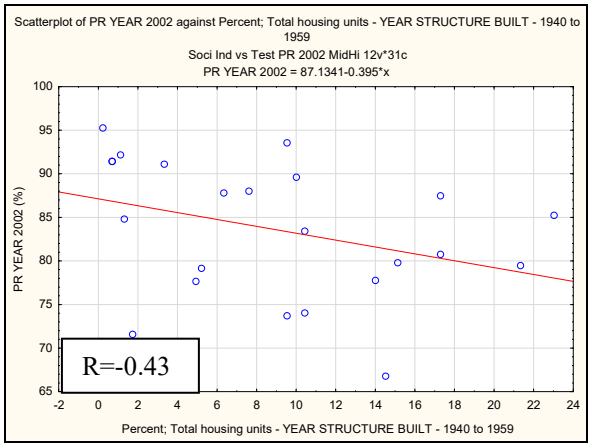
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located greater than the 5-mile radius of the RSR Site.

Based upon the correlation matrix, above, there is a negative weak significant relationship between the standardized test passing rates and the percentage of households with income less than $10,000 per year, the percentage of households with income between $15,000 to $24,000 per year, and the percentage of housing units constructed between the Year 1940 to the Year 1959. Based on the correlation matrix, it seems that there is a direct link between households with low income and housing units constructed between Year 1940 to Year 1959, and lower standardized test passing rates for middle and high school aged students. In comparing this data to the middle and high schools located within the 5-mile radius of the RSR Site, R values are lower for the schools located outside of the 5-mile radius, than the R values for schools located inside of the RSR 5-mile radius. This indicates that the significant relationships are weaker for the middle and high schools located greater than the RSR Site's 5-mile radius, than the significant relationships for the middle and high schools located within the RSR Site's 5-mile radius of the RSR Site. The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.95- Graph 7.97: Year 2002 RSR Comparison Group Plots of Significant Relationships between Socioeconomic Indicators and the Standardized Test Passing Rates for Middle and High Schools







Based on the graphs above, as the percentage of households with low income and the percentage of housing units constructed between the Year 1940 to 1959, increase, the standardized test passing rates decrease.

7.2.3.9 RSR Socioeconomic Indicators vs. the Test Passing Rate Analysis for Elementary Schools

The RSR socioeconomic indicators vs the test passing rate analysis determines if a significant relationship exists between socioeconomic indicators and the standardized test passing rates for elementary schools located within the RSR Site's 5-mile radius. The socioeconomic indicators and the standardized test passing rates were evaluated from Year 1999 to Year 2002. The Year 2003 to the Year 2011 was not included in the Study due to the standardized test changed by the Texas Education Agency, in the Year 2003. The change resulted in a significant reduction in standardized test passing rates across Dallas County.

For the socioeconomic indicators vs the test passing rate analysis, the middle and high schools, were separated from the elementary schools, due to the prospective middle and high schools students having a higher possibility of being impacted by the RSR Site lead smelter, given that the students didn't move out of the area. Elementary schools were expected to have a low possibility of lead exposure from the RSR Site, since the site was

closed and may have been cleaned up, well before the prospective elementary students would have take the standardized test. In the RSR socioeconomic indicators vs. test passing rate analysis, socioeconomic indicators were also evaluated to determine if socioeconomic indicators, as well as distance, effect the standardized test passing rates

The socioeconomic indicators evaluated are listed below;

- percentage of families that are below poverty level;
- percentage of female householder with children less than 18 years of age that are below poverty level;
- percentage of households with income less than $10,000 per year;
- percentage of households with income between $10,000 to $14,999;
- percentage of households with income between $15,000 to $24,999;
- percentage of housing units built the Year 1939 or earlier;
- percentage of housing units built between the Year 1940 to 1959;
- percentage of housing units built between the Year 1960 to Year 1969;
- percentage of housing units built between Year 1970 to Year 1979.

The socioeconomic indicator data was obtained, from the Year 2000 Census Data, from the uscensus.gov website. The standardized test passing rate data was obtained from the Texas Education Agency. The housing units built dates were included in the Study, due to the use of lead based paint in homes constructed before the Year 1970. The housing units built dates will provide an indication of whether indoor lead contamination, other socioeconomic indicators, and the lead smelter are the source of elevated blood lead in children.

A table that depicts the ages, the grades, and the year the prospective students would take the standardized test, in reference to the operation, closure, and cleanup activities of the RSR Site is shown below.

7.62 Children's Grade and Age in Reference to the RSR Site

Don't have laboratory data for 18 year olds		
Grade	Age(yrs)	Year
Born	0	1976
Pre-K	5	1981
5th	11	1987
6th	12	1988
8th	14	1990
9th	15	1991
12th	18	1994

The 14 year olds effected earliest		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born 4 years before RSR closed		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born 3 years before RSR closed		
Grade	Age(yrs)	Year
Born	0	1981
Pre-K	5	1986
5th	11	1992
6th	12	1993
8th	14	1995
9th	15	1996
12th	18	1998

Students Born 2 years before RSR closed		
Grade	Age(yrs)	Year
Born	0	1982
Pre-K	5	1987
5th	11	1993
6th	12	1994
8th	14	1996
9th	15	1997
12th	18	2000

Students Born 1 yr before RSR Closed		
Grade	Age(yrs)	Year
Born	0	1983
Pre-K	5	1988
5th	11	1994
6th	12	1995
8th	14	1997
9th	15	1998
12th	18	2001

Students born the Year RSR Closed		
Grade	Age(yrs)	Year
Born	0	1984
Pre-K	5	1989
5th	11	1995
6th	12	1996
8th	14	1998
9th	15	1999
12th	18	2002

Students Born 1 yr after RSR Closed		
Grade	Age(yrs)	Year
Born	0	1985
Pre-K	5	1990
5th	11	1996
6th	12	1997
8th	14	1999
9th	15	2000
12th	18	2003

Students Born the Year RSR Clean -Up Start date		
Grade	Age(yrs)	Year
Born	0	2000
Pre-K	5	2005
5th	11	2011
6th	12	2012
8th	14	2014
9th	15	2015
12th	18	2018

Students Born the Year RSR Clean -Up End date		
Grade	Age(yrs)	Year
Born	0	2004
Pre-K	5	2009
5th	11	2015
6th	12	2016
8th	14	2018
9th	15	2019
12th	18	2022

Students Born one Year after RSR Clean- Up End Date		
Grade	Age(yrs)	Year
Born	0	2005
Pre-K	5	2010
5th	11	2016
6th	12	2017
8th	14	2019
9th	15	2020
12th	18	2023

7.2.3.10 RSR Year 1999 Elementary Schools Socioeconomic Indicators vs the Test Passing Rates for Schools located within the 5-mile Radius of the RSR Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for elementary schools

located within the 5-mile radius of the RSR Site. The table of the socioeconomic indicators and the standardized test passing rates for the middle and high schools located within the 5 mile radius of the RSR Site, is located below. In this analysis, there were no significant relationships between the socioeconomic indicators and the standardized test passing rates, for elementary schools located within the 5-mile radius of the RSR Site, from the Year 1999 to the Year 2002. Therefore, this analysis and the comparison analysis could not be completed. The tables and the correlation matrices, for the elementary schools located within the RSR Site's 5-mile radius, are shown below from the Year 1999 to the Year 2002.

TABLE 7.63: Year 1999 to Year 2002 RSR Socioeconomic Indicators vs. Test Passing Rates for Elementary Schools Located Within the RSR Superfund Site's 5-Mile Radius

	RSR Year 1999 Socioeconomic Indicators and Elementary Schools Test Passing Rates														
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Test PR1999	Percent; Test PR 2000	Percent; Test PR 2001	Percent; Test PR 2002
DALLAS ISD	AMELIA EARHART EL	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	79.5	70.6	75.8	69.8
DALLAS ISD	GEORGE W CARVER EL	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	63.3	51.2	74.4	78.4
DALLAS ISD	STEVENS PARK EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	71.9	59.4	61.1	71.4
DALLAS ISD	C F CARR EL	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	43.1	52.3	58.3	87.5
DALLAS ISD	ELADIO R MARTINEZ EL	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	81.0	75.5	75.9	78.5
DALLAS ISD	SIDNEY LANIER EL	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	75.4	71.7	73.8	81.0
DALLAS ISD	LORENZO DE ZAVALA EL	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	40.0	42.1	71.3	85.5
DALLAS ISD	LOUISE WOLFF KAHN EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	69.2	85.7	62.5	71.3
DALLAS ISD	GABE P ALLEN EL	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	86.4	75.0	73.2	60.0
DALLAS ISD	ROSEMONT EL	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	82.9	81.9	73.3	80.6
DALLAS ISD	GEORGE PEABODY EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	84.5	71.0	86.8	93.3
DALLAS ISD	ANSON JONES EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	66.2	62.7	79.8	81.5
DALLAS ISD	LIDA HOOE EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	54.8	47.6	61.0	81.7
DALLAS ISD	ARCADIA PARK EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	61.2	63.5	57.6	78.4
DALLAS ISD	JAMES S HOGG EL	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	58.6	62.3	65.7	80.8
DALLAS ISD	L O DONALD EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	60.2	54.0	67.6	70.5
DALLAS ISD	JOHN H REAGAN EL	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	64.9	58.4	79.0	82.1
DALLAS ISD	EDISON MEDRANO EL	75219	22.0	9.9	6.3	13.8	54.8	21.4	22.3	17.1	9.8		28.4	54.8	62.3
DALLAS ISD	WINNETKA EL	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	59.3	50.5	61.8	76.7
IRVING ISD	SCHULZE EL	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	80.6	67.8	76.8	84.9
DALLAS ISD	LEILA P COWART EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	62.8	53.6	64.1	70.4
DALLAS ISD	ONESIMO HERNANDEZ EL	75235	19.4	11.6	6.6	18.3	45.8	15.5	24.2	37.1	9.4	43.9	49.8	58.2	48.5
DALLAS ISD	JOHN F PEELER EL	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	53.1	46.4	54.3	68.3
DALLAS ISD	JAMES BOWIE EL	75203	30.2	24.5	10.4	20.7	44.9	13.5	21.4	40.8	15.2	73.2	40.6	70.3	78.9
DALLAS ISD	LENORE KIRK HALL EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	70.9	70.4	76.8	76.0
DALLAS ISD	MARIA MORENO EL	75233	17.3	7.7	8.8	16.8	31.2	23.6	38.1	22.9	1.3	50.3	60.2	62.9	67.9
GRAND PRAIRIE ISD	HECTOR P GARCIA EL	75203	30.2	24.5	10.4	20.7	44.9	13.5	21.4	40.8	15.2		59.4	76.3	68.0
DALLAS ISD	F G BOTELLO ELEMENTAR	75203	30.2	24.5	10.4	20.7	44.9	13.5	21.4	40.8	15.2				
DALLAS ISD	MARGARET B HENDERSO	75224	17.6	12.2	7.4	17.6	36.5	13.6	27.6	45.8	5.8	42.6	45.5	45.7	58.3
DALLAS ISD	SAM HOUSTON EL	75219	22.0	9.9	6.3	13.8	54.8	21.4	22.3	17.1	9.8	43.8	39.3	53.8	62.0
DALLAS ISD	MAPLE LAWN EL	75235	19.4	11.6	6.6	18.3	45.8	15.5	24.2	37.1	9.4	56.3	43.3	53.6	61.6
DALLAS ISD	OBADIAH KNIGHT EL	75235	19.4	11.6	6.6	18.3	45.8	15.5	24.2	37.1	9.4	60.1	56.0	70.1	73.0
IRVING ISD	GILBERT F M EL	75061	10.7	6.9	5.8	16.7	23.1	17.3	21.0	23.0	2.1	90.7	85.9	80.5	90.4
DALLAS ISD	MARY MELEOD BETHUNE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	82.1	73.1	86.7	92.7
IRVING ISD	BRITAIN EL	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	74.6	58.5	75.7	75.7
DALLAS ISD	WILLIAM B TRAVIS EL	75204	22.5	11.3	5.6	13.3	41.8	11.6	10.3	14.4	8.7	45.9		98.7	98.9
DALLAS ISD	J T BRASHEAR EL	75204	22.5	11.3	5.6	13.3	41.8	11.6	10.3	14.4	8.7				
IRVING ISD	GOOD EL	75061	10.7	6.9	5.8	16.7	23.1	17.3	21.0	23.0	2.1	91.8	84.2	88.0	82.6
DALLAS ISD	LESLIE A STEMMONS EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	71.6	68.3	80.8	79.2
											Average=	65.6	60.2	69.9	75.9

The school district name, the campus name, and the zip codes that the schools are located in, are shown on the left side of the table, and the socioeconomic indicators and the standardized test passing rates, are shown across the top of the table. The parts of the table that do not show a standardized test passing rate, represent schools that were not opened, or schools that were repurposed, during the specified year.

Based on the above table, the average standardized test passing rates, from the Year 1999 to the Year 2002, for the elementary schools located within the 5-mile radius of the RSR Site, are 65.6%, 60.2%, 69.9%, and 75.9%, respectively. The average test passing rates

could be low due to the prospective students living in close proximity of the RSR Site and due to a higher percentage of low income households and housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to a non-normal data distribution and due to a few number of observations. The correlation matrices, for the socioeconomic indicators vs. standardized test passing rates, for the elementary schools located within the 5-mile radius of the RSR Site, from the Year 1999 to the Year 2002, is shown below.

Table 7.64:.Year 1999 Correlation Matrix for RSR Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the RSR Site.

	Spearman Rank Order Correlations (RSR vs Test PR 1999 Elem) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 1999
Percent; Families - Percent Below Poverty Level	1.00	0.52	0.43	-0.03	0.91	-0.22	-0.19	0.52	0.08	-0.21
Percent; Household Income - Less than $10,000	0.52	1.00	0.93	0.07	0.46	-0.73	-0.33	0.78	0.19	-0.05
Percent; Household Income - $10,000 to $14,999	0.43	0.93	1.00	0.10	0.43	-0.59	-0.23	0.70	0.07	-0.08
Percent; Household Income - $15,000 to $24,999	-0.03	0.07	0.10	1.00	0.11	0.07	0.58	0.35	0.19	-0.10
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.91	0.46	0.43	0.11	1.00	0.04	0.10	0.61	-0.04	-0.23
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.22	-0.73	-0.59	0.07	0.04	1.00	0.65	-0.24	-0.56	0.09
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.19	-0.33	-0.23	0.58	0.10	0.65	1.00	0.22	-0.36	-0.06
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.52	0.78	0.70	0.35	0.61	-0.24	0.22	1.00	-0.23	-0.01
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.08	0.19	0.07	0.19	-0.04	-0.56	-0.36	-0.23	1.00	-0.22
Percent; Standardized Test Passing Rate for Year 1999	-0.21	-0.05	-0.08	-0.10	-0.23	0.09	-0.06	-0.01	-0.22	1.00

Table 7.65:Year 2000 Correlation Matrix for RSR Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the RSR Site.

	Spearman Rank Order Correlations (RSR vs Test PR 2000 Elem) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2000
Percent; Household Income - Less than $10,000	1.00	0.93	0.07	0.52	0.46	-0.73	-0.33	0.78	0.19	-0.04
Percent; Household Income - $10,000 to $14,999	0.93	1.00	0.10	0.43	0.43	-0.59	-0.23	0.70	0.07	-0.01
Percent; Household Income - $15,000 to $24,999	0.07	0.10	1.00	-0.03	0.11	0.07	0.58	0.35	0.19	-0.06
Percent; Families - Percent Below Poverty Level	0.52	0.43	-0.03	1.00	0.91	-0.22	-0.19	0.52	0.08	-0.28
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.46	0.43	0.11	0.91	1.00	0.04	0.10	0.61	-0.04	-0.31
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.73	-0.59	0.07	-0.22	0.04	1.00	0.65	-0.24	-0.56	0.00
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.33	-0.23	0.58	-0.19	0.10	0.65	1.00	0.22	-0.36	-0.04
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.78	0.70	0.35	0.52	0.61	-0.24	0.22	1.00	-0.23	-0.01
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.19	0.07	0.19	0.08	-0.04	-0.56	-0.36	-0.23	1.00	-0.29
Percent; Standardized Test Passing Rate for Year 2000	-0.04	-0.01	-0.06	-0.28	-0.31	0.00	-0.04	-0.01	-0.29	1.00

Table 7.66:Year 2001 Correlation Matrix for RSR Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the RSR Site.

Variable	Spearman Rank Order Correlations (RSR vs Test PR 2001 Elem) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2001
Percent; Families - Percent Below Poverty Level	1.00	0.52	0.43	-0.03	0.91	-0.22	-0.19	0.52	0.08	-0.09
Percent; Household Income - Less than $10,000	0.52	1.00	0.93	0.07	0.46	-0.73	-0.33	0.78	0.19	-0.06
Percent; Household Income - $10,000 to $14,999	0.43	0.93	1.00	0.10	0.43	-0.59	-0.23	0.70	0.07	-0.08
Percent; Household Income - $15,000 to $24,999	-0.03	0.07	0.10	1.00	0.11	0.07	0.58	0.35	0.19	-0.15
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.91	0.46	0.43	0.11	1.00	0.04	0.10	0.61	-0.04	-0.24
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.22	-0.73	-0.59	0.07	0.04	1.00	0.65	-0.24	-0.56	-0.05
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.19	-0.33	-0.23	0.58	0.10	0.65	1.00	0.22	-0.36	-0.18
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.52	0.78	0.70	0.35	0.61	-0.24	0.22	1.00	-0.23	-0.05
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.08	0.19	0.07	0.19	-0.04	-0.56	-0.36	-0.23	1.00	-0.23
Percent; Standardized Test Passing Rate for Year 2001	-0.09	-0.06	-0.08	-0.15	-0.24	-0.05	-0.18	-0.05	-0.23	1.00

Table 7.67:Year 2002 Correlation Matrix for RSR Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the RSR Site.

Variable	Spearman Rank Order Correlations (RSR vs Test PR 2002 Elem) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2002
Percent; Families - Percent Below Poverty Level	1.00	0.52	0.43	-0.03	0.91	-0.22	-0.19	0.52	0.08	-0.16
Percent; Household Income - Less than $10,000	0.52	1.00	0.93	0.07	0.46	-0.73	-0.33	0.78	0.19	0.00
Percent; Household Income - $10,000 to $14,999	0.43	0.93	1.00	0.10	0.43	-0.59	-0.23	0.70	0.07	-0.07
Percent; Household Income - $15,000 to $24,999	-0.03	0.07	0.10	1.00	0.11	0.07	0.58	0.35	0.19	-0.25
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.91	0.46	0.43	0.11	1.00	0.04	0.10	0.61	-0.04	-0.31
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.22	-0.73	-0.59	0.07	0.04	1.00	0.65	-0.24	-0.56	-0.18
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.19	-0.33	-0.23	0.58	0.10	0.65	1.00	0.22	-0.36	-0.27
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.52	0.78	0.70	0.35	0.61	-0.24	0.22	1.00	-0.23	-0.09
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.08	0.19	0.07	0.19	-0.04	-0.56	-0.36	-0.23	1.00	-0.11
Percent; Standardized Test Passing Rate for Year 2002	-0.16	0.00	-0.07	-0.25	-0.31	-0.18	-0.27	-0.09	-0.11	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for elementary schools, located within the 5-mile radius of the RSR Site.

Based upon all of the correlation matrices, above, there are no significant relationships between the socioeconomic indicators and the standardized test passing rates for

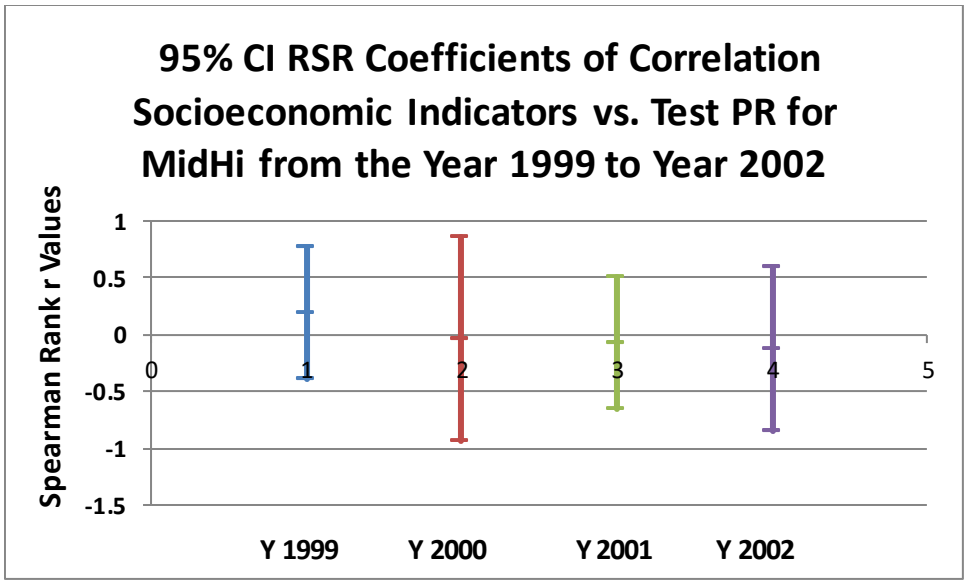
elementary schools located within the 5-mile radius of the RSR Site. Since there are no significant relationships, this indicates that the prospective students had minimum exposure to the RSR Site and that the prospective students had a minimal effect of socioeconomic indicators on their standardized test passing rates.

7.2.3.11 RSR Year 1999 to the Year 2002 Comparison Group Socioeconomic Indicators vs. Standardized Test Passing Rate Analysis for Elementary Schools Located Greater than the RSR Site 5 Mile Radius.

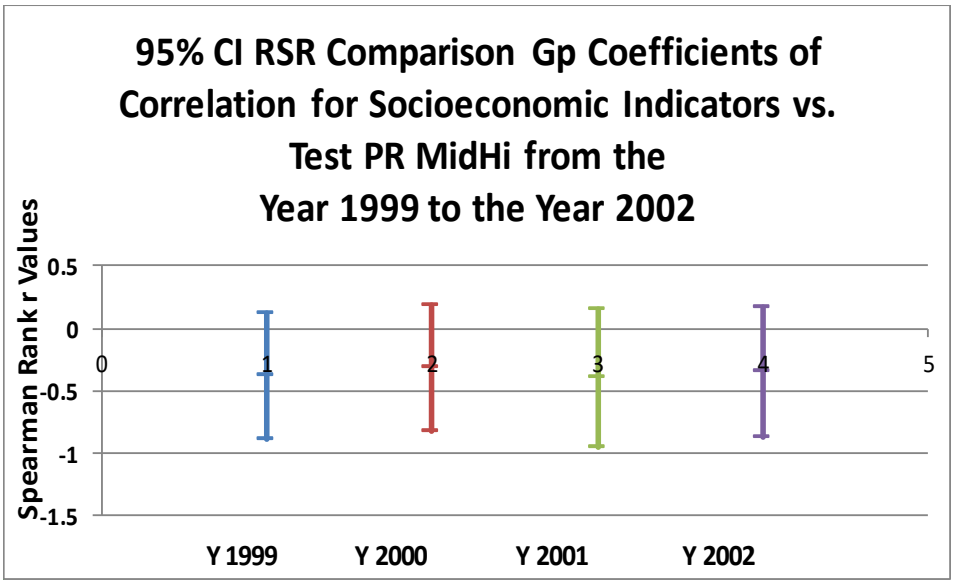
The comparison group analysis identifies trends in the data, for the elementary schools, located within the RSR Site's 5-mile radius, by comparing this data to the data of the middle and high schools located greater than the 5- mile radius of the RSR Site. Unfortunately, no comparison analysis was conducted because there were no significant relationships for any of the elementary schools located within the 5-mile radius of the RSR Site, from the Year 1999 to the Year 2000.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1999 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for the socioeconomic indicators vs. the standardized test passing rates, for the middle and high schools and elementary schools, located within and greater than, the 5-mile radius of the RSR Superfund Site, are shown below.

Graph 7.98 RSR Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.

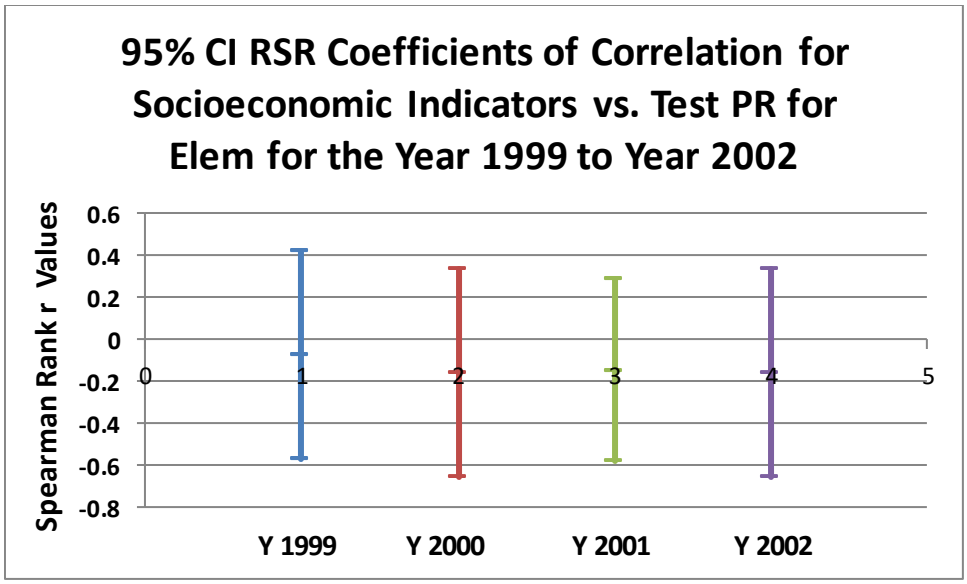


Graph 7.99 RSR Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.

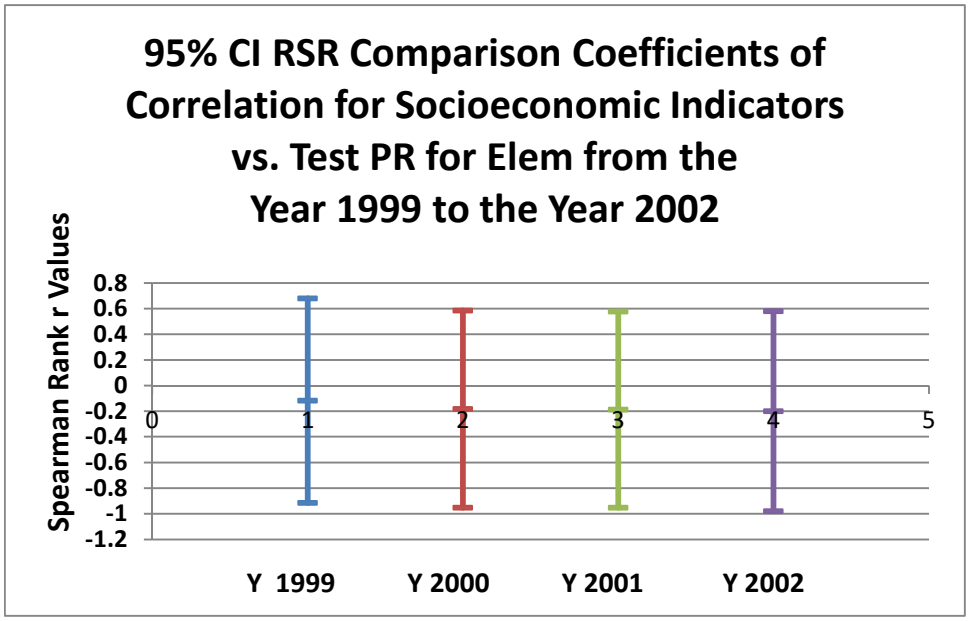


Based on the confidence interval graphs, there are significant coefficients of correlations, in the confidence intervals for every year, for the middle and high schools located within the 5-mile radius of the RSR Site. In addition, the confidence interval graph, for the comparison group, have significant coefficients of correlations for every year.

Graph 7.100 RSR Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.



Graph 7.101 RSR Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.



In the confidence interval graph, there are no significant coefficients of correlations, in the confidence intervals for any years, for the elementary schools located within the 5-mile radius of the RSR Site. The confidence interval graph, for the comparison group, have significant coefficients of correlations for every year.

7.2.4 RSR Childhood Blood Lead Level vs. Test Passing Rate Analysis

The childhood blood lead level vs standardized test passing rate analysis doesn't include the socioeconomic indicators, but examines if there is a significant relationship between elevated childhood blood level and student standardized test passing rates.

The elevated childhood blood level was examined, for children from ages 0 yrs to 14 yrs that reside within the RSR Site 5-mile radius, for the Year 1999 to the Year 2002. The elevated childhood blood lead levels, that were examined, was the 10 -14 μg/dl concentration and the total overall counts (10-14 μg/dl, 15-19 μg/dl, and = or > 20 μg/dl), of elevated childhood blood lead. Other elevated childhood blood levels that were not included in the Study, individually, due extremely low quantity of counts, were the 15-19 μg/dl , and the = or > 20 μg/dl concentrations. The elevated childhood blood lead level results were evaluated from the Year 1999 to the Year 2002.

The student standardized test passing rates were evaluated from the Year 1999 to the Year 2002, for consistency with the childhood blood lead level analysis. Since the blood lead level analysis is zip code based, the standardized test passing rates were averaged per school type, per zip code, since there can be multiple schools located within a single zip code. The analysis was separated into four groups the 10-14 μg/dl counts and the total counts, of elevated blood lead levels, with the test passing rates for middle and high schools, as well as, the test passing rates for elementary schools.

A direct comparison of the unduplicated counts of elevated blood lead levels and the standardized test passing rates, could not be completed because the unduplicated total counts are measured, per zip code, per year, and the standardized test passing rates are used to measure the impacts, of lead exposure, from the earlier years of children. Therefore, an indirect comparison can be completed, under the assumption that the unduplicated counts , of elevated childhood blood lead data, from the Year 1999 to the Year 2002, are similar to the unduplicated counts, before the Year 1999. A comparison analysis was completed to compare the same data, for zip codes and schools, located greater than the RSR Site 5-mile radius.

7.2.4.1 RSR Year 1999 to the Year 2002, of Elevated Childhood Blood Lead Level 10 -14 μg/dl vs Test Passing Rates for Middle and High Schools, Located Within the RSR Site 5-Mile Radius.

The elevated childhood blood lead level vs the student standardized test passing rates, for middle and high schools, analysis was conducted to determine if there is an indirect significant relationship, between elevated childhood blood lead levels and student standardized test passing rates. The table of the elevated childhood blood lead levels and student standardized test passing rates, for middle schools and high schools, located within the RSR Site 5-mile radius, is shown below.

TABLE 7.68: RSR Elevated Childhood Blood Lead Level of 10-14 μg/dl and the Standardized Test Passing Rates for Middle and High Schools Located Within the RSR Superfund Site's 5-mile Radius

	RSR 10-14 ug/dl Counts of Blood Lead Levels vs Percentage Middle and High School Test Passing Rates							
Zip Code	10--14 BLL 1999	10--14 BLL 2000	10--14 BLL 2001	10--14 BLL 2002	PR1999	PR2000	PR2001	PR2002
75212	13	32	23	28	50.9	58.4	54.8	71.3
75211	20	25	33	35	55.4	45.1	50.9	68.6
75208	15	19	21	20	52.1	53.0	56.2	58.7
75060	2	0	3	10	79.7	81.2	81.5	83.3
75203	13	19	9	17	43.4	47.3	52.3	57.7
75235	8	4	5	3	56.6	51.6	57.4	60.6
75204	8	5	5	4		98.9		97.7
75201	2	0	0	0				
75061	2	4	3	8	75.9	78.2	77.4	83.1
Total/ Average	**83**	**108**	**102**	**125**	**59.1**	**64.2**	**61.5**	**72.6**

The zip codes, that the schools are located in, are shown on the left side of the table. The elevated counts of elevated blood lead level of 10-14 µg/dl, from the Year 1999 to the Year 2002, and the student standardized test passing rates, for middle and high schools, for the Year 1999 to the Year 2002, are shown across the top of the table, for the zip codes and schools located within the 5-mile radius. The grey areas, for the standardized test passing rates, represent schools that were not opened or schools that have been repurposed. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in section7.2.2. Based on the above table, the total counts of elevated blood lead level of 10-14 µg/dl are shown at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate is shown at the bottom of the table, as well, for the Year 1999 to the Year 2002.

The counts of elevated childhood blood lead level of 10-14 µg/dl increase, from the Year 1999 to the Year 2002, and the average student standardized test passing rates, increase, from the Year 1999 to the Year 2002. The increase in the unduplicated counts of 10-14 µg/dl childhood elevated blood lead level, over time, may be due to indoor lead exposure as a result low income families or families that are below poverty level that moved into cheap houses constructed before the Year 1970 that are located within the RSR Site 5 mile radius. The increase in standardized test passing rates could be due to the negative impacts of the RSR Site, on prospective students' cognitive abilities due to either prospective students moving out of the area, or impacted students graduating from high school. In addition, it could be a result of the RSR Site being closed, reducing the negative cognitive impacts on prospective students.

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not having a normal distribution and due to a few number of observations. The correlation matrix for the elevated childhood blood lead level of 10-14 µg/dl and the student standardized test passing rates for the middle and high schools located within the 5 mile radius of the RSR site is shown below.

Table 7.69: RSR Correlation Matrix for Elevated Childhood Blood Lead Level10-14 µg/dl vs. Standardized Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the RSR Site.

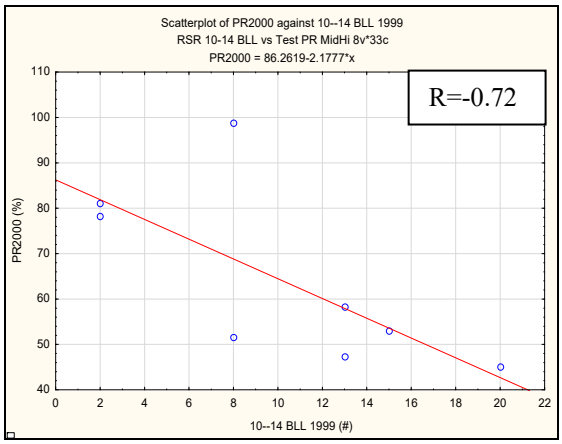
Variable	Spearman Rank Order Correlations (RSR 10-14 BLL vs Test PR MidHi) MD pairwise deleted Marked correlations are significant at p <.05000 10--14 BLL 1999	10--14 BLL 2000	10--14 BLL 2001	10--14 BLL 2002	PR1999	PR2000	PR2001	PR2002
10--14 BLL 1999	1.00	0.88	0.96	0.78	-0.65	-0.72	-0.87	-0.61
10--14 BLL 2000	0.88	1.00	0.95	0.82	-0.78	-0.49	-0.85	-0.39
10--14 BLL 2001	0.96	0.95	1.00	0.86	-0.67	-0.65	-0.88	-0.48
10--14 BLL 2002	0.78	0.82	0.86	1.00	-0.54	-0.48	-0.75	-0.31
PR1999	-0.65	-0.78	-0.67	-0.54	1.00	0.57	0.79	0.75
PR2000	-0.72	-0.49	-0.65	-0.48	0.57	1.00	0.86	0.83
PR2001	-0.87	-0.85	-0.88	-0.75	0.79	0.86	1.00	0.61
PR2002	-0.61	-0.39	-0.48	-0.31	0.75	0.83	0.61	1.00

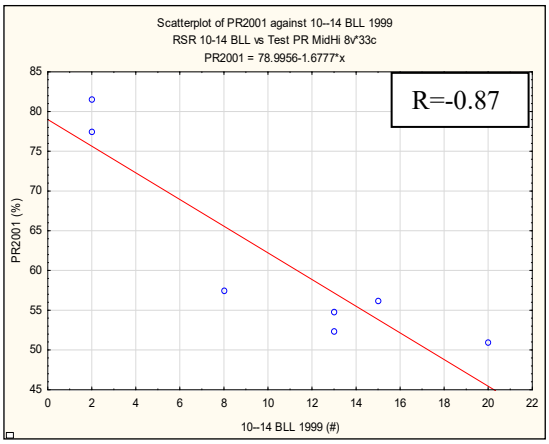
In the correlation matrix, each variable for the elevated childhood blood lead and the standardized test passing rates, is shown at the left side and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between elevated blood lead and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

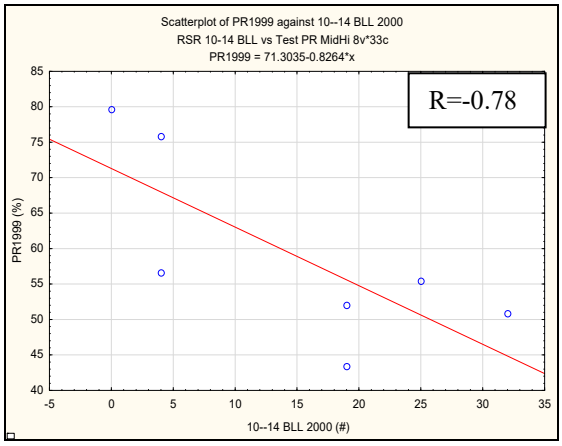
Based upon the correlation matrix, above, there is a strong negative, significant correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl, for the Year 1999, and the percentage of standardized test passing rates for the Year 2000 and the Year 2001. The negative R values of -0.72 and -0.87, represent significant correlations, respectively. In addition, there is a strong significant, negative correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl, for the Year 2000, and the percentage of student standardized test passing rate for the Year 1999, and the percentage of student standardized test passing rate for the Year 2001. The significant negative R values for both correlation are -0.78 and -0.85 respectively. There is also a strong, significant, negative correlation between the counts of elevated blood lead level of 10-14 µg/dl, for the Year 2001 and the percentage of student standardized test passing rate for the Year 2001. The significant negative R value that represents the correlation is -0.88. Even though the correlations above are significant, the correlations are not directly related to each other. The blood lead levels are unduplicated counts for each specified year. The student standardized passing rates are used to measure the negative cognitive impacts of lead exposure from the RSR Site lead smelter hen the prospective students were young children. It is impossible for the unduplicated counts, per year, to be directly related to the student standardized test passing rates. There is an indirect correlation between both variables, based on the assumption that the elevated childhood blood lead level of 10-14 µg/dl are similar to the unduplicated counts before the Year 1999.

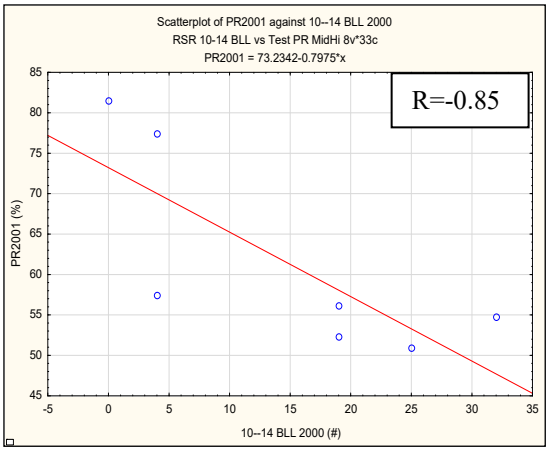
The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

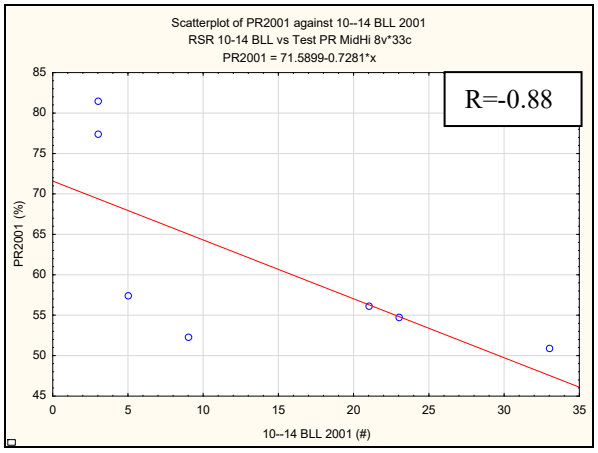
Graph 7.102- Graph 7.106: Year 1999 to Year 2002 RSR Plots of Significant Relationships between the Elevated Blood Lead Level 10-14 µg/dl and the Standardized Test Passing Rates for Middle and High Schools Located Within the RSR Site's 5-Mile Radius











Based on the graphs above, as the counts of elevated childhood blood lead level of 10-14 µg/dl increases, the percentage student standardized test passing rates decreases. Therefore, there is a negative effect on student standardized test passing rates when there are high counts of elevated childhood blood lead levels.

7.2.4.2 RSR Year 1999 to the Year 2002 Comparison Analysis Elevated Childhood Blood Lead Level of 10-14 µg/dl vs. Test Passing Rates for Middle and High Schools for Located Greater Than the 5-mile of the RSR Site (Comparison Group)

The comparison group, of childhood elevated blood lead level vs. student standardized test passing rate analysis, is used to identify any trends in the data, for middle and high schools, located within the RSR Site 5-mile radius, by comparing it to childhood elevated blood lead level vs. the student standardized test passing rate, for the for middle and high schools, located greater than 5 miles from the RSR Site. The table depicting elevated childhood blood lead level of 10-14 µg/dl vs. student standardized test passing rate, for the middle and high schools, located greater than 5 miles from the RSR Site is shown below.

Table 7.70: RSR Elevated Childhood Blood Lead Level and Student Standardized Test Passing Rate for middle and High Schools located Greater Than 5 miles from the RSR Site

	Dallas County 10-14 ug/dl Counts of Blood Lead Levels vs Percentage Middle and High School Test Passing Rates Greater than 5 Mile Radius							
Zip Code	10--14 BLL 1999 (#)	10--14 BLL 2000 (#)	10--14 BLL 2001 (#)	10--14 BLL 2002 (#)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
75287	2	0	0	0	87.6	91.2	85.7	86.8
75104	2	2	2	2	76.6	79.2	85.1	91.2
75019	0	0	0	2	87.4	91.1	91.4	91.5
75248	0	0	0	2	89.3	93.2	96.4	92.2
75244	0	0	2	0	71.5	74.4	80.0	87.8
75137	2	0	2	0	68.7	66.2	75.6	79.2
75043	2	5	2	6	67.1	67.1	66.6	71.6
75040	2	7	10	8	70.2	70.7	71.2	77.8
75146	2	2	2	3	51.6	56.0	62.7	66.8
75150	5	5	2	4	73.6	76.6	78.0	78.8
75080	6	2	2	6	78.1	79.5	82.9	84.2
Total/ Average	**23**	**23**	**24**	**33**	**74.7**	**76.8**	**79.6**	**82.5**

The zip codes, the schools are located in, are shown on the left side of the table and the elevated total counts of elevated blood lead level, for the Year 1999 to the Year 2000, and the student standardized test passing rate for middle and high schools students, for the Year 1999 to the Year 2002 are shown across the top of the table. The grey areas represent schools that were not opened yet or schools that were repurposed. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section7.2.2.

Based on the above table, the total counts of total elevated blood lead level are shown at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate is shown, at the bottom of the table, as well, for the Year 1999 to the Year 2002. The total counts of elevated childhood blood lead level slowly increases from the Year 1999 to the Year 2002 and the average student standardized test passing rates, increase, from the Year 1999 to the Year 2002. The unduplicated total counts of childhood elevated blood lead level, over time, may be due to indoor lead exposure, as a result of low income families, or families that are below poverty level that moved into cheap houses constructed before the Year 1970. The high student

standardized test passing rates could be due to no impacts of the RSR Site on prospective student cognitive abilities, for the students that attend middle and high schools located greater than 5 miles from the RSR Site. The total counts of childhood elevated blood lead level of 10-14 µg/dl, for the middle and high schools, located greater than 5 miles from the RSR Site, are significantly lower than the counts of childhood elevated blood lead level of 10-14 µg/dl, for the middle and high schools, located within the RSR Site 5-mile radius. The significant difference could be a result of the middle and high schools located greater than 5 miles from the RSR Site having no impact from the RSR Site. In addition, the average standardized test passing rates, for middle and high schools located greater than 5 miles from the RSR Site, are significantly higher than the average standardized test passing rates for middle and high schools located within the RSR Site's 5 mile radius. The higher childhood average test passing rate may be a result of the middle and high schools not being impacted by the RSR Site.

The Spearman Rank correlation matrix was utilized to analyze the data as due to the data set not having a normal distribution, and due to the low number of observations. The correlation matrix, for the elevated childhood blood lead level of 10-14 µg/dl and the student standardized test passing rates, for the middle and high schools, located greater than 5 miles from the RSR Site is shown below.

Table 7.71: RSR Comparison Correlation Matrix for RSR Elevated Childhood Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rates for Middle and High Schools Located Greater Than The 5-mile Radius of the RSR Site.

	Spearman Rank Order Correlations (10-14 BLL vs Test PR MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	10--14 BLL 1999	10--14 BLL 2000	10--14 BLL 2001	10--14 BLL 2002	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
10--14 BLL 1999	1.00	0.61	0.46	0.51	-0.20	-0.23	-0.40	-0.57
10--14 BLL 2000	0.61	1.00	0.74	0.88	-0.43	-0.42	-0.62	-0.69
10--14 BLL 2001	0.46	0.74	1.00	0.54	-0.72	-0.72	-0.77	-0.66
10--14 BLL 2002	0.51	0.88	0.54	1.00	-0.27	-0.22	-0.44	-0.54
PR YEAR 1999	-0.20	-0.43	-0.72	-0.27	1.00	0.96	0.92	0.77
PR YEAR 2000	-0.23	-0.42	-0.72	-0.22	0.96	1.00	0.95	0.81
PR YEAR 2001	-0.40	-0.62	-0.77	-0.44	0.92	0.95	1.00	0.95
PR YEAR 2002	-0.57	-0.69	-0.66	-0.54	0.77	0.81	0.95	1.00

In the correlation matrix, each variable for the elevated blood lead and the standardized test passing rates, is shown at the left side and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the blood lead levels and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

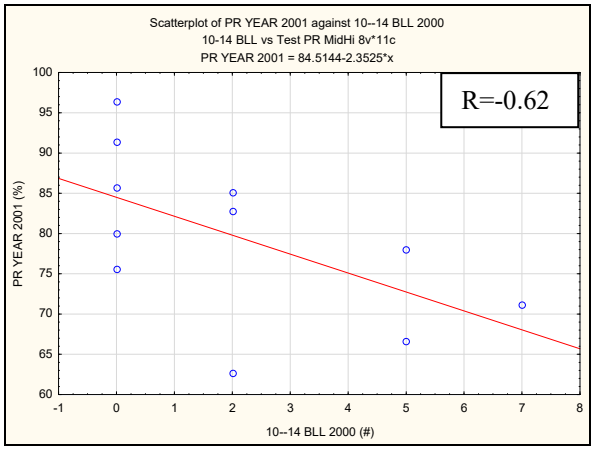
Based upon the correlation matrix, above, there is a strong, significant, negative correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl, for

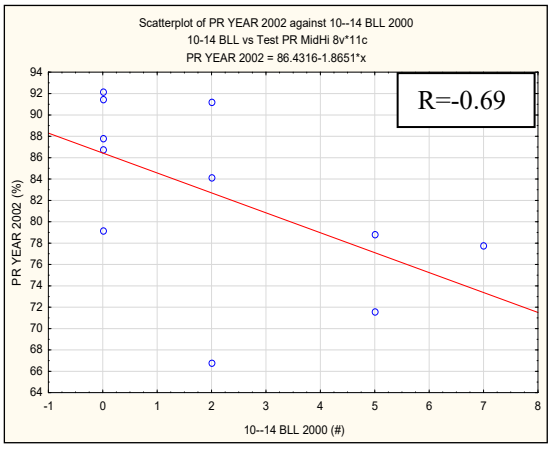
the Year 2000, and the percentage of standardized test passing rates for the Year 2001 and the Year 2002. The negative R values of -0.62 and -0.69 represent the significant relationships respectively. In addition, there is a strong, significant, negative correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl, for the Year 2001, and the percentage of student standardized test passing rate for the Year 1999, Year 2000, Year 2001,and the Year 2002. The significant negative R values for the correlations are -0.72,-0.72,-0.77, and 0.66, respectfully. As previously stated, even though the correlations above are significant, the correlations are not directly related to each other. The blood lead levels are unduplicated counts for each specified year. The student standardized passing rates are used to measure the negative cognitive impacts of lead exposure from the RSR Site lead smelter, when the prospective students were young children. The unduplicated counts per year cannot be directly related to the student standardized test passing rate. An indirect correlation between both variables can be completed, under the assumption that the total counts, of elevated childhood blood lead level are similar to the unduplicated counts for the years before the Year 1999.

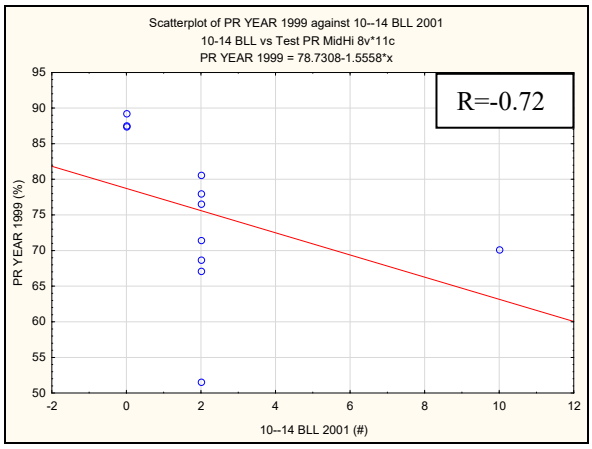
Based on the comparison data, the majority of the significant correlation R values are lower than the significant correlations R values for the elevated childhood blood lead level of 10-14 µg/dl. Therefore, under the assumption that the low counts of childhood elevated blood lead level of 10-14 µg/dl, from the Year 1999 to the Year 2002, is similar to the counts of elevated childhood blood lead level of 10-14 µg/dl for the years before the Year 1999, there is a weak indirect relationship between unduplicated counts of elevated childhood blood lead level of 10-14 µg/dl and the percentage of student standardized test passing rates.

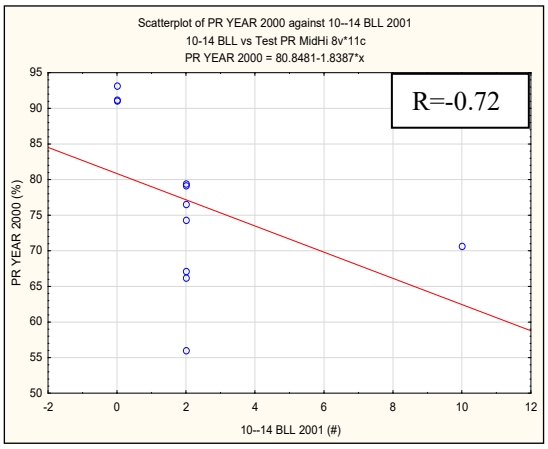
The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

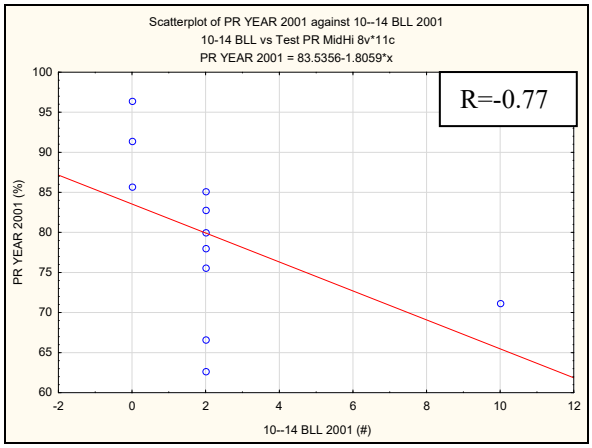
Graph 7.107- Graph 7.112: Year 1999 to Year 2002 RSR Comparison Group Plots of Significant Relationships between the Elevated Blood Lead Level 10-14 µg/dl and the Standardized Test Passing Rates for Middle and High Schools

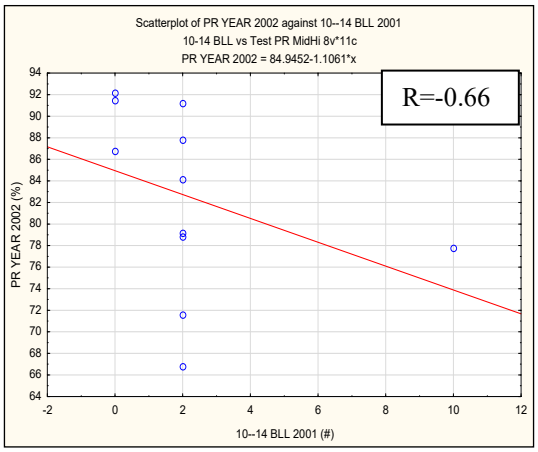












Based on all of the graphs shown above, as the counts of elevated childhood blood lead level, increases, the percentage of student standardized test passing rates decrease. Therefore, high counts of elevated blood lead levels negatively affect the percentage student standardized test passing rate. Based on the comparison group of data, there are several counts of elevated blood lead level of 10-14 µg/dl that are less than 5 for the middle and high schools located greater than 5 miles from the RSR Site 5 mile radius.

7.2.4.3 RSR Total Counts of Elevated Childhood Blood Lead Levels vs Test Passing Rates for Middle and High Schools, Located Within the RSR Site 5-mile Radius.

The elevated childhood blood lead level vs the student standardized test passing rate analysis, for middle and high schools analysis was conducted to determine if there is a significant relationship between the elevated childhood blood lead levels and the student standardized test passing rates. The table of the elevated childhood blood lead levels and student standardized test passing rates, for middle schools and high schools, located within the RSR Site 5 mile radius, are shown below.

TABLE 7.72: RSR Total Counts of Elevated Childhood Blood Lead Levels and the Standardized Test Passing Rates for Middle and High Schools Located Within the RSR Superfund Sites 5-mile Radius

	RSR Total Counts Blood Lead Levels vs Percentage Middle and High School Test Passing Rates							
Zip Code	Total BLL 1999	Total BLL 2000	Total BLL 2001	Total BLL 2002	PR1999	PR2000	PR2001	PR2002
75212	17	38	30	37	50.9	58.4	54.8	71.3
75211	28	37	47	47	55.4	45.1	50.9	68.6
75208	21	28	31	42	52.1	53.0	56.2	58.7
75060	2	0	5	21	79.7	81.2	81.5	83.3
75203	17	27	12	22	43.4	47.3	52.3	57.7
75235	10	7	8	5	56.6	51.6	57.4	60.6
75204	15	6	6	9		98.9		97.7
75201	2	0	0	0				
75061	4	8	5	13	75.9	78.2	77.4	83.1
Total/ Average	**116**	**151**	**144**	**196**	**59.1**	**64.2**	**61.5**	**72.6**

The zip codes the schools are located are shown on the left side, of the table, and the elevated total counts of elevated blood lead level, for the Year 1999 to the Year 2000, and the student standardized test passing rates, for middle and high schools students, for the Year 1999 to the Year 2002, are shown across the top of the table. The grey areas represent schools that were not opened yet or schools that ere repurposed. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section 7.2.2. Based on the above table, the total counts of total elevated blood lead level are shown, at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate is shown, at the bottom of the table, as well, for the Year 1999 to the Year 2002.

The total counts of elevated childhood blood lead level increases from the Year 1999 to the Year 2002 and the and the average student standardized test passing increases from the Year 1999 to the Year 2002. The increase in the unduplicated total counts of childhood elevated blood lead level, over time, may be due to indoor lead exposure as a result low income families or families that are below poverty level that moved into cheap houses constructed before the Year 1970 that are located within the RSR Site 5 mile radius. The increase in standardized test passing rates could be due to the impacts of the RSR Site on prospective student cognitive abilities, being reduced, due to prospective students either moving out of the area, or affected students graduating from high school. In addition, it could be a result of the RSR Site being closed, reducing the negative cognitive impacts on prospective students.

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not having a normal distribution and due to a few number of observations. The correlation matrix, for the elevated childhood blood lead level of 10-14 μg/dl and the student standardized test passing rates, for the middle and high schools, located within the 5-mile radius of the RSR site is shown below.

Table 7.73: RSR Correlation Matrix for Total Counts Elevated Childhood Blood Lead Levels vs. Standardized Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the RSR Site.

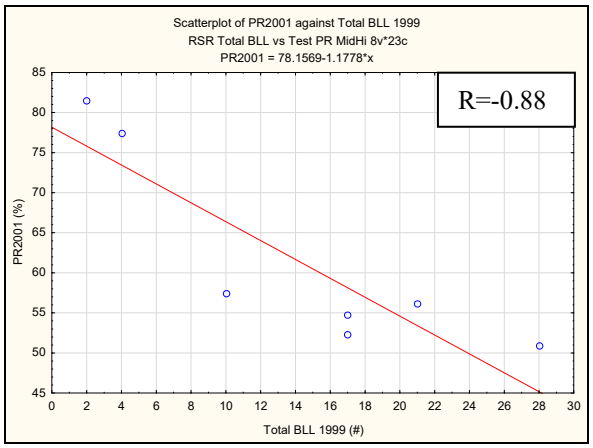
Variable	Spearman Rank Order Correlations (RSR Total BLL vs Test PR MidHi) MD pairwise deleted Marked correlations are significant at p <.05000 Total BLL 1999	Total BLL 2000	Total BLL 2001	Total BLL 2002	PR1999	PR2000	PR2001	PR2002
Total BLL 1999	1.00	0.86	0.97	0.82	-0.67	-0.66	-0.88	-0.55
Total BLL 2000	0.86	1.00	0.87	0.80	-0.71	-0.60	-0.79	-0.50
Total BLL 2001	0.97	0.87	1.00	0.85	-0.63	-0.73	-0.85	-0.61
Total BLL 2002	0.82	0.80	0.85	1.00	-0.50	-0.50	-0.71	-0.38
PR1999	-0.67	-0.71	-0.63	-0.50	1.00	0.57	0.79	0.75
PR2000	-0.66	-0.60	-0.73	-0.50	0.57	1.00	0.86	0.83
PR2001	-0.88	-0.79	-0.85	-0.71	0.79	0.86	1.00	0.61
PR2002	-0.55	-0.50	-0.61	-0.38	0.75	0.83	0.61	1.00

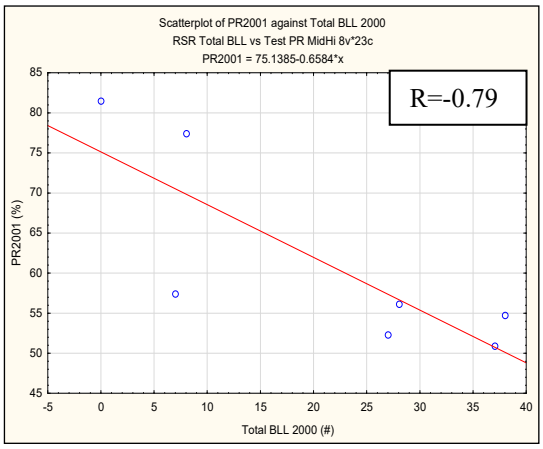
In the correlation matrix, each variable for elevated childhood blood lead and the standardized test passing rates, is shown at the left side and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the elevated blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

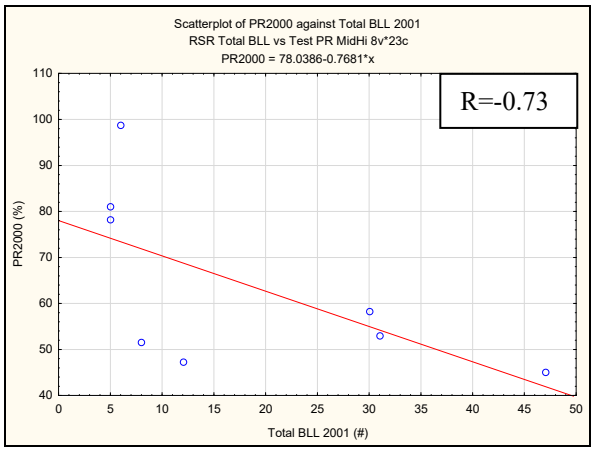
Based upon the correlation matrix, above, there is a strong, significant, negative correlation between the total counts of elevated childhood blood lead level, for the Year 1999 and the percentage of standardized test passing rates for the Year 2001. The negative R value of -0.88 represent the significant bivariate regression. In addition, there is a strong, significant, negative correlation between the total counts of elevated childhood blood lead level, for the Year 2000, and the percentage of student standardized test passing rate for the Year 2001. The significant negative R value for the correlation is -0.79. There is also a strong negative, significant, correlation between the total counts of elevated blood lead level, for the Year 2001 and the percentage of student standardized test passing rates, for the Year 2000, and the student standardized test passing rate for the Year 2001. The significant negative R values that represent the correlations are -0.73 and -0.85, respectfully. Even though the correlations above are significant, the correlations are not directly related to each other. The blood lead levels are unduplicated counts for each specified year. The student standardized passing rates are used to measure the negative cognitive impacts of lead exposure from the RSR Site lead smelter when the prospective students were young children. The unduplicated counts, per year, cannot be directly related to the student standardized test passing rate. An indirect correlation between both variables can be completed, under the assumption that the total counts of elevated childhood blood lead level, are similar to the unduplicated counts for the years before the Year 1999.

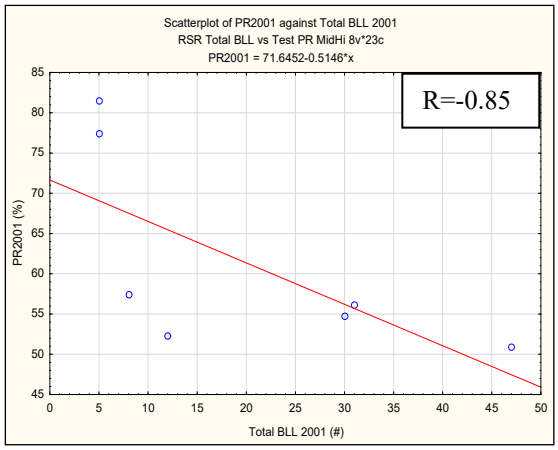
The graphs of the significant plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.113- Graph 7.116: Year 1999 to Year 2002 RSR Plots of Significant Relationships between the Total Counts of Elevated Blood Lead Levels and the Standardized Test Passing Rates for Middle and High Schools Located Within the RSR Site's 5-Mile Radius









Based on the above graphs, as the total counts of childhood elevated blood lead level increases, the percentage student standardized test passing rates, decreases. Therefore, there is a negative impact on the student standardized test passing rates with high counts of unduplicated total counts of elevated childhood blood lead cases.

7.2.4.4 RSR Comparison of the Total Counts of Elevated Childhood Blood Lead Levels vs. Standardized Test Passing Rates for Middle and High Schools Located Greater Than the 5-mile Radius of the RSR Site (Comparison Group)

The comparison group of childhood blood lead level vs student standardized test passing rate analysis is used to identify any trends in the data, for middle and high schools, located within the RSR Site 5 mile radius, by comparing it to childhood elevated blood lead level vs the student standardized test passing rates, for the for middle and high schools, located greater than 5 miles from the RSR Site. The table depicting the total counts of elevated childhood blood lead level vs student standardized test passing rate for

the middle and high schools located greater than 5 miles from the RSR Site is shown below.

Table 7.74: RSR Total Counts of Elevated Childhood Blood Lead Levels and Standardized Test Passing Rate for Middle and High Schools Located Greater the 5-mile radius of the RSR Site

	Dallas County Total Counts Blood Lead Levels vs Percentage Middle and High School Test Passing Rates Greater Than 5 mile Radius							
Zip Code	Total BLL 1999 (#)	Total BLL 2000 (#)	Total BLL 2001 (#)	Total BLL 2002 (#)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
75287	2	0	0	0	87.6	91.2	85.7	86.8
75104	4	2	2	4	76.6	79.2	85.1	91.2
75019	0	4	0	2	87.4	91.1	91.4	91.5
75248	0	0	0	4	89.3	93.2	96.4	92.2
75244	0	2	2	2	71.5	74.4	80.0	87.8
75137	2	0	4	0	68.7	66.2	75.6	79.2
75043	2	5	2	9	67.1	67.1	66.6	71.6
75040	2	8	10	11	70.2	70.7	71.2	77.8
75146	2	2	4	5	51.6	56.0	62.7	66.8
75150	7	6	4	8	73.6	76.6	78.0	78.8
75080	6	4	4	6	78.1	79.5	82.9	84.2
Total/ Average	**27**	**33**	**32**	**51**	**74.7**	**76.8**	**79.6**	**82.5**

The zip codes that the schools are located, are shown on the left side of the table, and the elevated total counts of elevated blood lead level, for the Year 1999 to the Year 2000, and the student standardized test passing rate for middle and high schools students for the Year 1999 to the Year 2002, are shown across the top of the table. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section 7.2.2. Based on the above table, the total counts of total elevated blood lead level are shown at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate is shown at the bottom of the table, as well, for the Year 1999 to the Year 2002.

The total counts of elevated childhood blood lead level slowly increases from the Year 1999 to the Year 2002 and the average student standardized test passing increases from the Year 1999 to the Year 2002. The unduplicated total counts of childhood elevated blood lead level, over time, may be due to indoor lead exposure as a result low income families, or families that are below poverty level that moved into cheap houses constructed before the Year 1970. The high student standardized test passing rates could be due to no impacts of the RSR Site on prospective student cognitive abilities for the students that attend middle and high schools, located greater than 5 miles, from the RSR Site. The total counts of childhood elevated blood lead level, for the middle and high schools located greater than 5 miles from the RSR Site, are significantly lower than the total counts of childhood elevated blood lead level of 10-14 μg/dl, for the middle and high schools located within the RSR Site 5 mile radius. The significant difference could be a result of the middle and high schools located greater than 5 miles from the RSR Site having no impact from the RSR Site. In addition, the average standardized test passing rates, for middle and high schools located greater than 5 miles from the RSR Site, are significantly higher than the average standardized test passing rates for middle and high schools located within the RSR Site's 5 mile radius. The higher childhood average test passing rate may be a result of the middle and high schools not being impacted by the RSR Site.

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not having a normal distribution and due the low number of observations. The

correlation matrix, for the total counts of elevated childhood blood lead level and the percentage of student standardized test passing rates, for the middle and high schools, located greater than 5 miles from the RSR Site is shown below.

Table 7.75: RSR Comparison Correlation Matrix for Total Counts of Elevated Childhood Blood Lead Levels vs and Standardized Test Passing Rates for Middle and High Schools Located Greater Than The 5-mile Radius of the RSR Site.

	Spearman Rank Order Correlations (Total BLL vs Test PR MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	Total BLL 1999	Total BLL 2000	Total BLL 2001	Total BLL 2002	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
Total BLL 1999	1.00	0.36	0.56	0.42	-0.16	-0.16	-0.30	-0.43
Total BLL 2000	0.36	1.00	0.50	0.82	-0.31	-0.25	-0.41	-0.45
Total BLL 2001	0.56	0.50	1.00	0.55	-0.65	-0.69	-0.74	-0.72
Total BLL 2002	0.42	0.82	0.55	1.00	-0.36	-0.28	-0.50	-0.56
PR YEAR 1999	-0.16	-0.31	-0.65	-0.36	1.00	0.99	0.96	0.84
PR YEAR 2000	-0.16	-0.25	-0.69	-0.28	0.99	1.00	0.95	0.81
PR YEAR 2001	-0.30	-0.41	-0.74	-0.50	0.96	0.95	1.00	0.95
PR YEAR 2002	-0.43	-0.45	-0.72	-0.56	0.84	0.81	0.95	1.00

In the correlation matrix, each variable for elevated blood lead and the standardized test passing rates, is shown at the left side and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the elevated blood lead and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

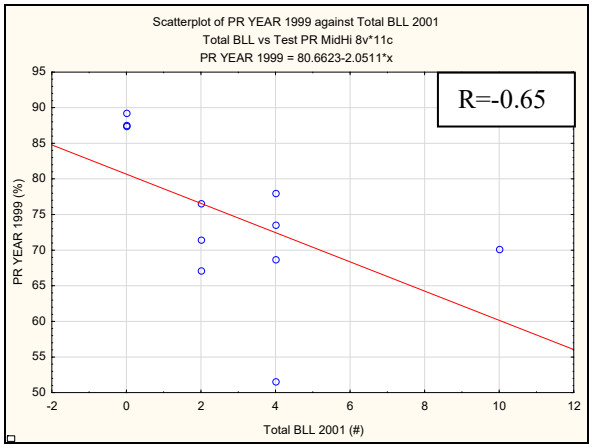
Based upon the correlation matrix, above, there is a strong negative correlation between the total counts of elevated childhood blood lead level, for the Year 2001, and the percentage of standardized test passing rates for the Year 1999, Year 2000, Year 2001, and Year 2002. The negative R values of -0.65, -0.69, -0.74, and -0.72 represent the significant bivariate regressions respectively. As previously stated, even though the correlations above are significant, the correlations are not directly related to each other. The blood lead levels are unduplicated counts for each specified year. The student standardized passing rates are used to measure the negative cognitive impacts of lead exposure from the RSR Site lead smelter hen the prospective students were young children. The unduplicated counts per year cannot be directly related to the student standardized test passing rate. An indirect correlation, between both variables, can be done, under the assumption that the total counts of elevated childhood blood lead level are similar to the unduplicated counts for the years before the Year 1999. .

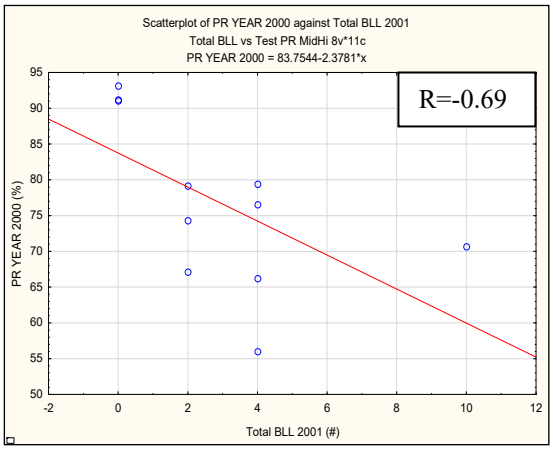
Based on the comparison data, the majority of the significant correlation R values are lower than the significant correlations R values for the total counts of elevated childhood blood lead level. Therefore, under the assumption that the low counts of total counts of childhood elevated blood lead level, from the Year 1999 to the Year 2002, is similar to

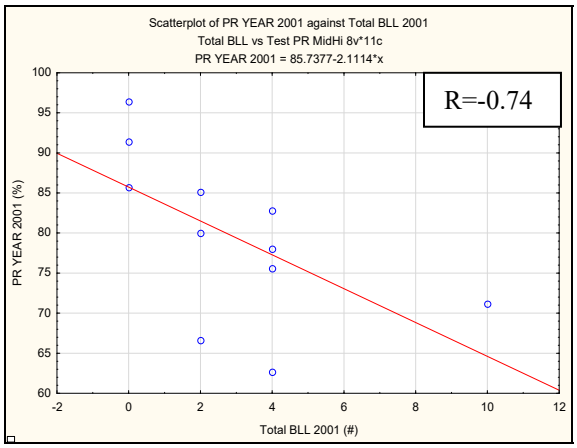
the total counts of elevated childhood blood lead level for the years before the Year 1999, there is a weak indirect relationship between unduplicated total counts of elevated childhood blood lead level and the percentage of student standardized test passing rates.

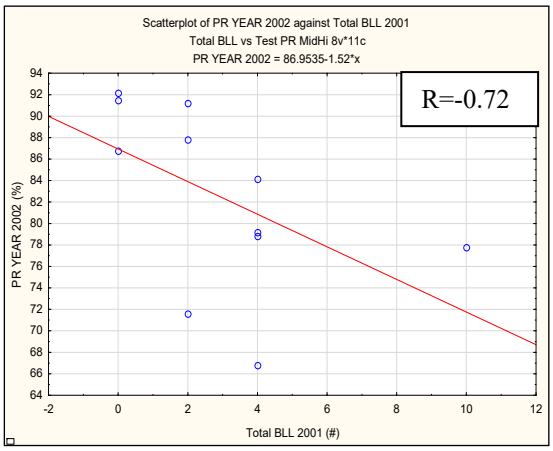
The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.117- Graph 7.120: Year 1999 to Year 2002 RSR Comparison Group Plots of Significant Relationships between the Total Counts of Elevated Blood Lead Levels and the Standardized Test Passing Rates for Middle and High Schools









Based on the graphs above, as the total counts of elevated childhood blood lead level increases, the percentage student standardized test passing rate decreases. Therefore, high total counts of elevated blood lead level have a negative impact on the percentage of standardized test passing rate. Based on the comparison group of data, there are several total counts of elevated blood lead level that are less than 5 for the middle and high schools, located greater than 5 miles from the RSR Site.

7.2.4.5 RSR Elevated Childhood Blood Lead Level of 10-14 µg/dl and Total Counts of Childhood Blood Lead vs Test Passing Rates for Elementary Schools, Located Within the RSR Site's 5-mile Radius.

The elevated childhood blood lead level vs the student standardized test passing rate analysis, for the elementary schools, was conducted to determine if there is a direct effect of elevated childhood blood lead levels on student standardized test passing rates. For all of the elementary schools, there was not significant bivariate regression between the elevated childhood blood lead level, 10-14 µg/dl and the total counts of blood lead level and the student standardized test passing rate. The table of the elevated childhood blood lead levels and student standardized test passing rates, for the elementary schools, located within the RSR Site 5 mile radius, are shown below.

TABLE 7.76: RSR Elevated Childhood Blood Lead Level of 10-14 µg/dl and the Standardized Test Passing Rates for Elementary Schools Located Within the RSR Superfund Site's 5-mile Radius

	RSR 10-14 ug/dl Counts of Blood Lead Levels vs Percentage Elementary School Test Passing Rates							
Zip Code	10--14 BLL 1999 (#)	10--14 BLL 2000 (#)	10--14 BLL 2001 (#)	10--14 BLL 2002 (#)	PR1999 (%)	PR2000 (%)	PR2001 (%)	PR2002 (%)
75212	13	32	23	28	65.6	61.1	71.5	76.6
75211	20	25	33	35	68.7	64.5	71.3	78.8
75208	15	19	21	20	65.7	61.9	68.0	78.3
75219	10	4	3	6	43.8	33.9	54.3	62.2
75060	2	0	3	10	77.6	63.2	76.3	80.3
75235	8	4	5	4	53.4	49.7	60.6	61.0
75203	13	19	9	17	73.2	50.0	73.3	73.5
75233	2	5	0	4	50.3	60.2	62.9	67.9
75224	14	13	15	12	42.6	45.5	45.7	58.3
75061	2	4	3	8	91.3	85.1	84.3	86.5
75204	8	5	5	4	45.9		98.7	98.9
Total /Average	**107**	**130**	**120**	**148**	**61.6**	**57.5**	**69.7**	**74.8**

TABLE 7.77: RSR Total Counts of Elevated Childhood Blood Lead Levels and the Standardized Test Passing Rates for Elementary Schools Located Within the RSR Superfund Site's 5-mile Radius

	RSR Total Counts Blood Lead Levels vs Percentage Elementary School Test Passing Rates							
Zip Code	Total BLL 1999 (#)	Total BLL 2000 (#)	Total BLL 2001 (#)	Total BLL 2002 (#)	PR1999 (%)	PR2000 (%)	PR2001 (%)	PR2002 (%)
75212	17	38	30	37	65.6	61.1	71.5	76.6
75211	28	37	47	47	68.7	64.5	71.3	78.8
75208	21	28	31	42	65.7	61.9	68.0	78.3
75219	17	7	5	10	43.8	33.9	54.3	62.2
75060	2	0	5	21	77.6	63.2	76.3	80.3
75235	10	7	8	5	53.4	49.7	60.6	61.0
75203	17	27	12	22	73.2	50.0	73.3	73.5
75233	4	5	4	6	50.3	60.2	62.9	67.9
75224	15	18	18	16	42.6	45.5	45.7	58.3
75061	4	8	5	13	91.3	85.1	84.3	86.5
75204	15	6	6	9	45.9		98.7	98.9
Total/Average	**150**	**181**	**171**	**228**	**61.6**	**57.5**	**69.7**	**74.8**

The zip codes the schools are located are shown on the left side of the tables and the counts of elevated blood lead level of 10-14 µg/dl and childhood total counts of elevated blood lead level for the Year 1999 to the Year 2000, and the student standardized test passing rate for middle and high schools students for the Year 1999 to the Year 2002 are shown across the top of each table. The grey areas represent schools that were not opened yet or ere repurposed. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section 7.2.2. Based on each above table, the childhood elevated blood lead level of 10-14 µg/dl and

the total counts of the childhood elevated blood lead level, are shown at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate, is shown at the bottom of each table, as well, for the Year 1999 to the Year 2002. The counts of elevated childhood blood lead level of 10-14 µg/dl and the total counts of elevated childhood blood lead level increases from the Year 1999 to the Year 2002 and the and the average student standardized test passing increases from the Year 1999 to the Year 2002. The increase in the unduplicated total counts of childhood elevated blood lead level, over time, may be due to indoor lead exposure as a result low income families or families that are below poverty level that moved into cheap houses constructed before the Year 1970 that are located within the RSR Site 5 mile radius. The increase in standardized test passing rates could be due to the impacts of the RSR Site on prospective student cognitive abilities being reduced due to either prospective students moving out of the area, or affected students graduating from high school. In addition, it could be a result of the RSR Site being closed, reducing the negative cognitive impacts on prospective students.

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not having a normal distribution and due to a few number of observations. The correlation matrix, for the counts of elevated childhood blood lead level of 10-14 µg/dl, as well as, the total counts of elevated childhood blood lead level vs the student standardized test passing rates, for the elementary schools, located within the 5 mile radius of the RSR site are shown below. In addition, the correlation matrices, for the counts of childhood elevated blood lead level of 10-14 µg/dl and the total counts of elevated childhood blood lead level and the student standardized test passing rates, for the elementary schools, located within the 5 mile radius of the RSR site, are shown below

Table 7.78: RSR Correlation Matricies for RSR Elevated Childhood Blood Lead Level of 10-14 µg/dl vs. Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the RSR Site.

	Spearman Rank Order Correlations (RSR 10-14 BLLvs Test PR element) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	10--14 BLL 1999	10--14 BLL 2000	10--14 BLL 2001	10--14 BLL 2002	PR1999	PR2000	PR2001	PR2002
10--14 BLL 1999	1.00	0.78	0.90	0.75	-0.17	-0.07	-0.35	-0.22
10--14 BLL 2000	0.78	1.00	0.83	0.73	-0.04	0.10	-0.05	-0.04
10--14 BLL 2001	0.90	0.83	1.00	0.81	0.03	0.15	-0.06	0.00
10--14 BLL 2002	0.75	0.73	0.81	1.00	0.38	0.40	0.04	0.11
PR1999	-0.17	-0.04	0.03	0.38	1.00	0.82	0.64	0.58
PR2000	-0.07	0.10	0.15	0.40	0.82	1.00	0.79	0.94
PR2001	-0.35	-0.05	-0.06	0.04	0.64	0.79	1.00	0.91
PR2002	-0.22	-0.04	0.00	0.11	0.58	0.94	0.91	1.00

Table 7.79: RSR Correlation Matrix for Total Counts of Elevated Childhood Blood Lead Levels vs. and Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the RSR Site.

Variable	Spearman Rank Order Correlations (RSR Total BLL vs Test PR elemen) MD pairwise deleted Marked correlations are significant at p <.05000 Total BLL 1999	Total BLL 2000	Total BLL 2001	Total BLL 2002	PR1999	PR2000	PR2001	PR2002
Total BLL 1999	1.00	0.79	0.80	0.65	-0.12	-0.06	-0.20	-0.07
Total BLL 2000	0.79	1.00	0.86	0.74	0.15	0.20	-0.10	-0.07
Total BLL 2001	0.80	0.86	1.00	0.74	0.05	0.17	-0.12	-0.04
Total BLL 2002	0.65	0.74	0.74	1.00	0.45	0.49	0.16	0.27
PR1999	-0.12	0.15	0.05	0.45	1.00	0.82	0.64	0.58
PR2000	-0.06	0.20	0.17	0.49	0.82	1.00	0.79	0.94
PR2001	-0.20	-0.10	-0.12	0.16	0.64	0.79	1.00	0.91
PR2002	-0.07	-0.07	-0.04	0.27	0.58	0.94	0.91	1.00

In the correlation matrix, each variable for elevated blood lead and the standardized test passing rates, is shown at the left side and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

Based upon the correlation matrices, above, there are no significant relationships between the childhood elevated blood lead level of 10-14 µg/dl and total counts of childhood blood lead level, with the student standardized test passing rates, from the Year 1999 to the Year 2002. This means that there is no indirect impact of the counts of elevated childhood blood lead level and the student standardized test passing rate for elementary schools for the Year 1999 to the Year 2002.

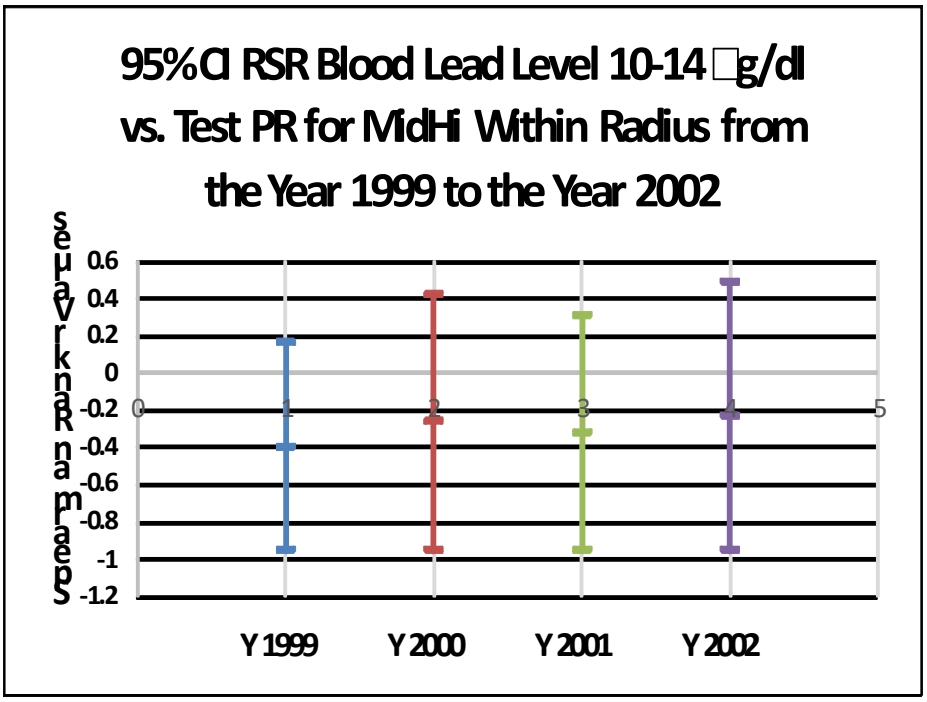
7.2.4.6 RSR Year 1999 to the Year 2002 Comparison Analysis of Elevated Childhood Blood Lead Level of 10-14 µg/dl and the Total Counts of Elevated Childhood Blood Lead Levels vs Test Passing Rates for Elementary Schools Located Greater Than the 5-miles radius of the RSR Site

The analysis could not be completed because there were no significant relationships, for the childhood elevated blood lead levels vs student standardized test passing rates, for the elementary schools, from the Year 1999 to the Year 2002. The comparison analysis could not be completed because there is no data to compare with.

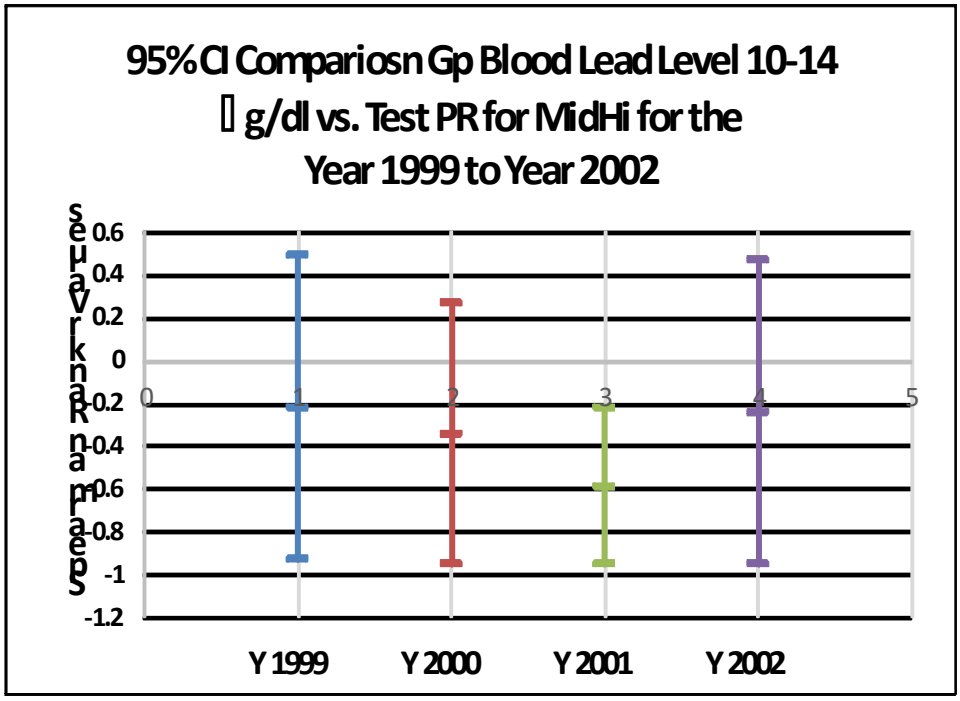
Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1999 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for the elevated blood lead level of 10-14 µg/dl and total counts of elevated blood lead levels vs. the standardized test passing rates, for the

middle and high schools and elementary schools, located within and greater than, the 5-mile radius of the RSR Superfund Site, are shown below.

Graph 7.121 RSR Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.

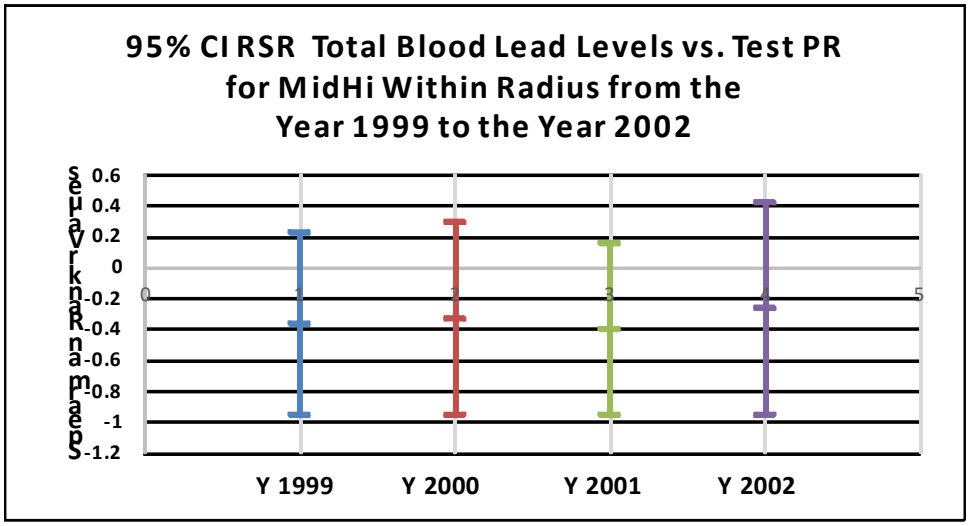


Graph 7.122 RSR Comparison Group Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl dl vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.

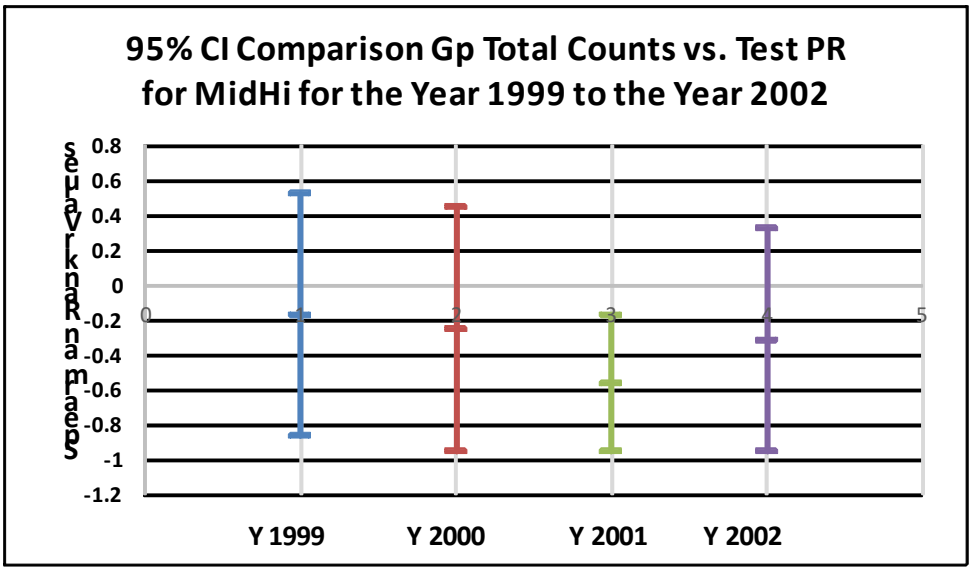


In the confidence interval graphs, there are indirect significant coefficients of correlations, in the confidence intervals for every year , except for the Year 2002, for the middle and high schools located within the 5-mile radius of the RSR Site. In the comparison group, there were indirect significant coefficients of correlations, in the confidence intervals, for the Year 2000 and the Year 2001.

Graph 7.123 RSR Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.

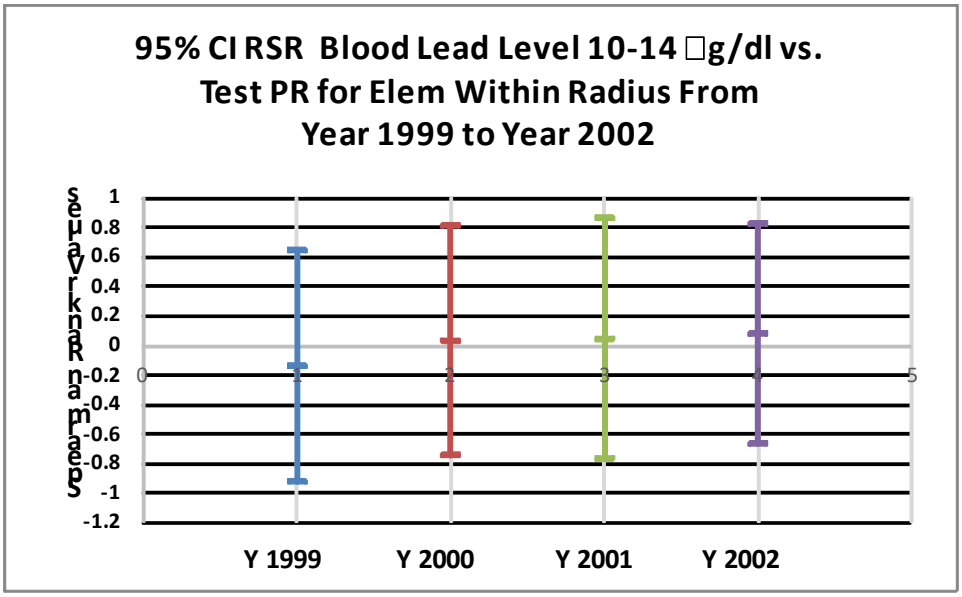


Graph 7.124 RSR Comparison Group Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.

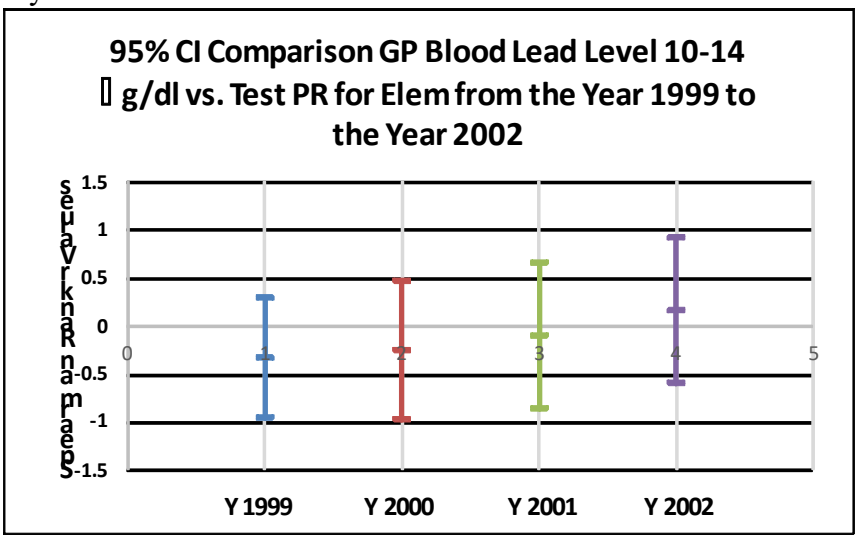


In the confidence interval graphs, there are indirect significant coefficients of correlations, in the confidence intervals for every year , except for the Year 2002, for the middle and high schools located within the 5-mile radius of the RSR Site. In the comparison group, there were indirect significant coefficients of correlations, in the confidence interval for the Year 2001.

Graph 7.121 RSR Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.

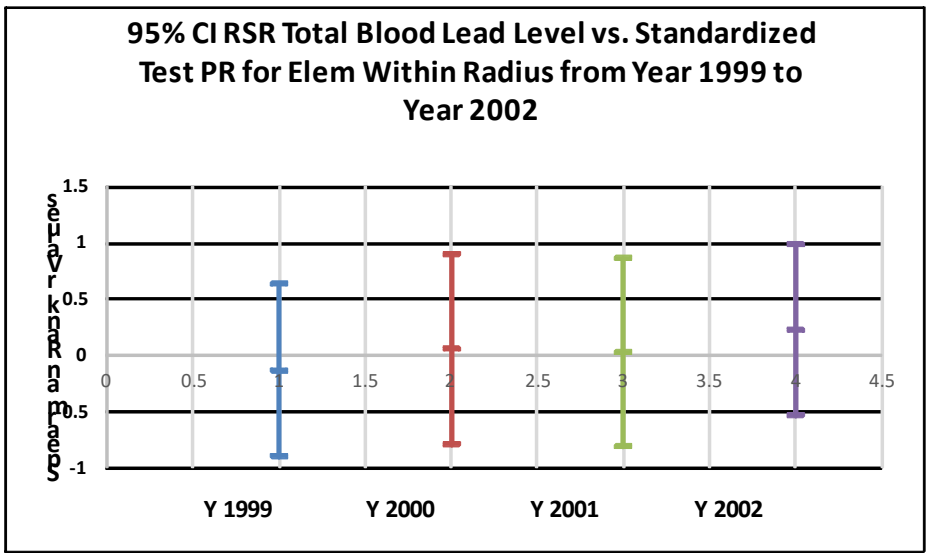


Graph 7.122 RSR Comparison Group Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.

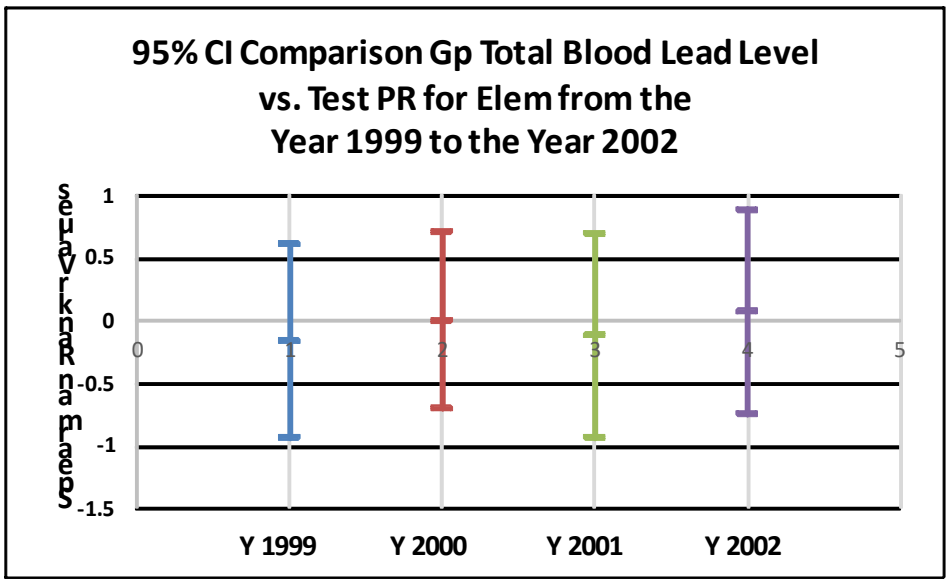


In the confidence interval graphs, there were no indirect significant coefficients of correlations, in the confidence intervals for every year, for the middle and high schools located within the 5-mile radius of the RSR Site, as well as, in the comparison group.

Graph 7.123 RSR Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.



Graph 7.124 RSR Comparison Group Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.

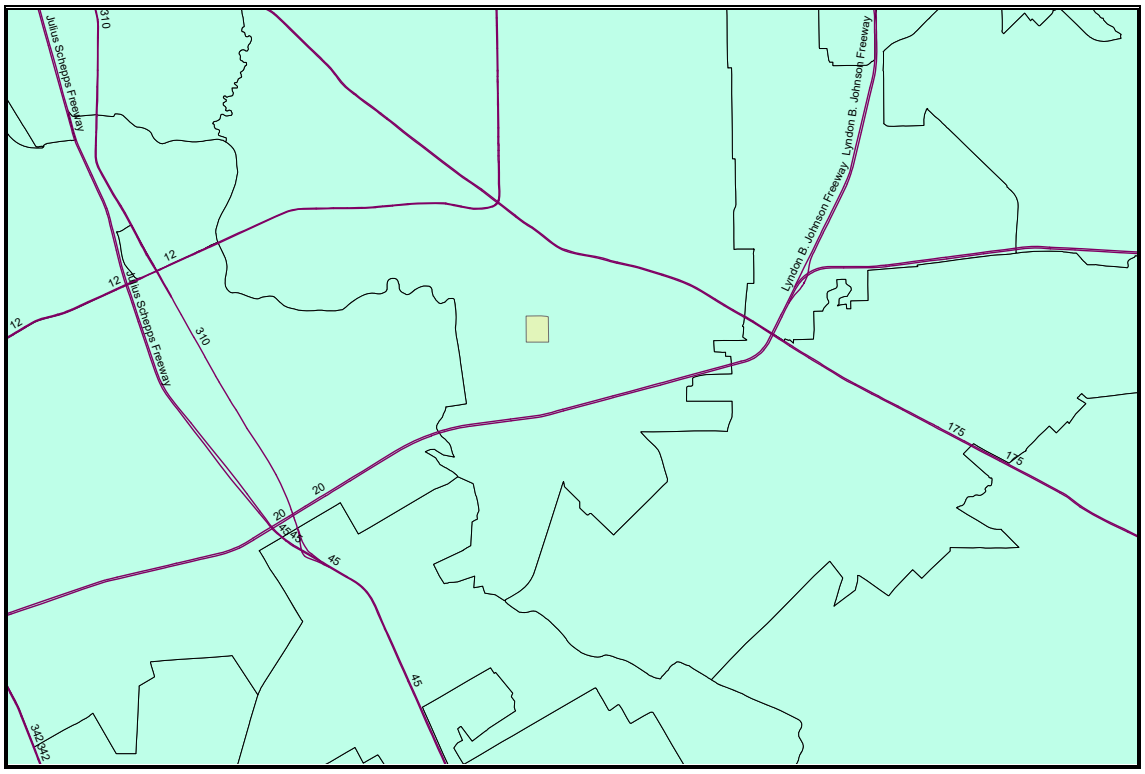


In the confidence interval graphs, there were no indirect significant coefficients of correlations, in the confidence intervals for every year, for the middle and high schools located within the 5-mile radius of the RSR Site, as well as, in the comparison group

7.2.5 Sampson Horrice Superfund Site and Distance Analysis

The Sampson Horrice Superfund Site consists of 2-10 acre tracts of land located in Southeast Dallas. The site is bounded on the north by Midland Road, bounded on the east by private property, bounded on the west by Dowdy Ferry Road, and bounded on the south by Rylie Road. The site does not have any personnel, equipment or buildings. A security fence extends along the perimeter of the property. A map of the Sampson Horrice Site is shown below in Figure 7.13.

Figure 7.13 Sampson Horrice Superfund Site



The map was created by ArcGIS software. The Sampson Horrice Site is the digitized pink polygon, in the center of the map.

The Sampson Horrice Site was a gravel pit/ landfill that operated from the Year 1983 to the Year 1984. This facility illegally accepted and buried approximately 200 to 500 drums of solid and hazardous waste. The contaminants of concern consisted of metals, including lead, organics, and pesticides. The contaminants of concern polluted the soil, the groundwater, and the surface water. The Sampson Horrice Superfund Site was listed on the State Superfund list, but after site cleanup, the site was removed from the State Superfund List. In August of the Year 1999, an initial removal action occurred to repackage and remove some buried drums, from the site. The site cleanup activities ended in January 2000, after the removal of the remaining drums and the removal of contaminated soils. A table providing detailed site information of the Sampson Horrice Superfund Site is shown below.

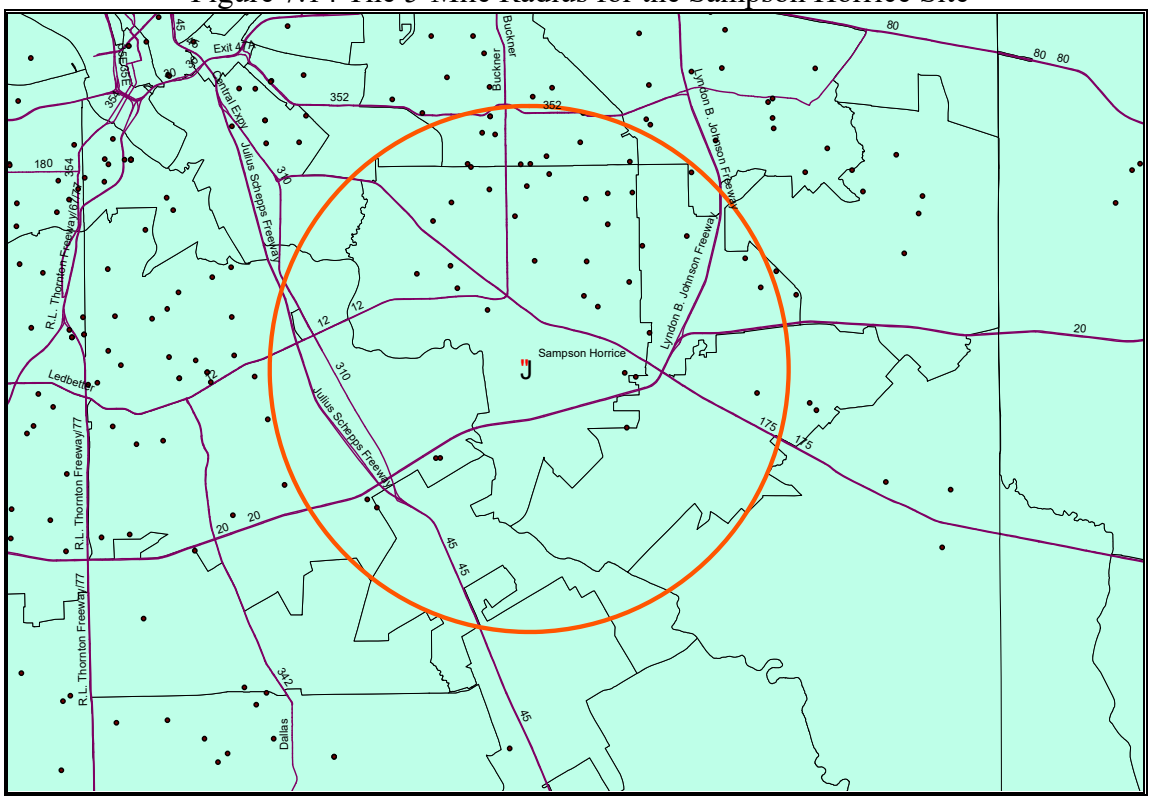
Table 7.80: Sampson Horrice Superfund Site Table of Brief Synopsis

Site Name and Location	Type of Superfund Site	Type of Facility	Size of facility	List of operations	Dates of Operation	List of contaminants	Media of contamination	Clean up start date	Clean up end date	Other info
Sampson Horrice Dallas, TX (Dallas County)	State	inactive gravel pit that illegally accepted hazardous and solid waste	2-10 acre tracts	inactive gravel pit that illegally accepted hazardous and solid waste	1983-1984	Metals, Organics, Pesticides	soil and surface water, groundwater	Initial removal action-Aug 1999 (drum removal and repackaging)	Initial removal-Jan 2000 (removal of Contaminated soils and drums)	

7.2.5.1 Schools

During the analysis of the Sampson Horrice Site, ArcGIS was used to identify all high, middle, and elementary schools located within a 5-mile radius of the Sampson Horrice Superfund Site, by setting up a 5-mile radius buffer. A map displaying the 5-mile radius buffer is shown in Figure 7.14.

Figure 7.14 The 5-Mile Radius for the Sampson Horrice Site



Schools were selected from the centroid of the Sampson Horrice Superfund Site's digitized polygon to the a 5-mile radius of the Sampson Horrice Site.

All of the schools located within the Sampson Horrice Site's 5-mile radius were not used, in the Study, due to the removal of all magnet and private schools. The magnet and private schools have an academic advantage, over public schools, since the students must test into or pay money into these schools. In addition, the students that attend these schools usually do not reside in close proximity of the private or magnet school. There are a total of 27 public schools located within the 5-mile radius of the Sampson Horrice Superfund Site. The schools consist of 22 elementary schools, 3 middle schools, and 2 high schools.

7.2.5.2 Sampson Horrice Distance Analysis

The purpose of the distance analysis is to determine if a significant relationship exists between distance of the school to the Sampson Horrice Superfund Site and the

standardized test passing rates of those schools. In the distance analysis, the standardized test passing rates, from the schools located within the 5-mile radius, of the Sampson Horrice Site, are compared to the standardized test passing rates, of schools located greater than the 5-mile radius of the Sampson Horrice Site.

The students, in Texas schools, take the standardized test in the 3rd grade, the 4th grade, the 5th grade, the 7th grade, the 8th grade, and the 10th grade. Students that do not initially pass the test are required to retest later the same year or the following year, until the student passes the standardized test.

The earliest electronic standardized test passing rate data , obtained from the Texas Education Agency, was for the Year 1994. Therefore, the standardized test passing rates were evaluated, for the distance analysis, from the Year 1994 to the Year 2002. Years beyond the Year 2002 were not analyzed due to a new standardized test, the TAKS test, that was introduced in the Year 2003. In the Year 2003, there was a significant reduction in the standardized test passing rates, for schools across Dallas County.

The table below shows the year born, the grade, the age and year that prospective students, attending the schools located within the Sampson Horrice Site's 5-mile radius, would have taken the standardized test. The table "back dates", the prospective elementary, middle, and high school students, back to the year the prospective students were born, the ages, and the grades, they were in, in reference to the time frame the Sampson Horrice Site was in operation, was closed, and was cleaned up. The table helps identify possible exposure, of prospective students, to the Sampson Horrice Site, that might have occurred when the prospective students were young children, and possibly had their cognitive abilities compromised, assuming that the prospective students did not move out of the area.

Table 7.81: Prospective Students Possibly Affected by the Sampson Horrice Site

Students Born 4 years before Sampson Horrice operated		
Grade	Age(yrs)	Year
Born	0	1979
Pre-K	5	1984
5th	11	1990
6th	12	1991
8th	14	1993
9th	15	1994
12th	18	1997

Students Born 3 years before Sampson Horrice operated		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born 2 years before Sampson Horrice operated		
Grade	Age(yrs)	Year
Born	0	1981
Pre-K	5	1986
5th	11	1992
6th	12	1993
8th	14	1995
9th	15	1996
12th	18	1999

Students Born 1 yr before Sampson Horrice Closed		
Grade	Age(yrs)	Year
Born	0	1982
Pre-K	5	1987
5th	11	1993
6th	12	1994
8th	14	1996
9th	15	1997
12th	18	2000

Sampson Horrice started operation		
Grade	Age(yrs)	Year
Born	0	1983
Pre-K	5	1988
5th	11	1994
6th	12	1995
8th	14	1997
9th	15	1998
12th	18	2001

Students Born the year Sampson Horrice Closed		
Grade	Age(yrs)	Year
Born	0	1984
Pre-K	5	1989
5th	11	1995
6th	12	1996
8th	14	1998
9th	15	1999
12th	18	2002

Students Born 1 year after Sampson Horrice closed		
Grade	Age(yrs)	Year
Born	0	1985
Pre-K	5	1990
5th	11	1996
6th	12	1997
8th	14	1999
9th	15	2000
12th	18	2003

Students Born 1 year before the Year Sampson Horrice Clean -Up Start date		
Grade	Age(yrs)	Year
Born	0	1998
Pre-K	5	2003
5th	11	2009
6th	12	2010
8th	14	2012
9th	15	2013
12th	18	2016

Students Born the Year Sampson Horrice Clean -Up Start date		
Grade	Age(yrs)	Year
Born	0	1999
Pre-K	5	2004
5th	11	2010
6th	12	2011
8th	14	2013
9th	15	2014
12th	18	2017

Students Born the Year Sampson Horrice Clean -Up End date		
Grade	Age(yrs)	Year
Born	0	2000
Pre-K	5	2005
5th	11	2011
6th	12	2012
8th	14	2014
9th	15	2015
12th	18	2018

Students Born 1 Year after Sampson Horrice Clean -Up End date		
Grade	Age(yrs)	Year
Born	0	2001
Pre-K	5	2006
5th	11	2012
6th	12	2013
8th	14	2015
9th	15	2016
12th	18	2019

The Sampson Horrice Superfund Site was in operation from the Year 1983 to the Year 1984. The cleanup activities for the Sampson Horrice Site commenced in Year 1999 and ended in Year 2000. Based on the above table, prospective students born in the Year 1983 until the Year 1984, could have had exposure to the leachate from the gravel pit that illegally accepted hazardous and solid waste. The prospective students could have been exposed to metals if they played near or around the gravel pit, or even played in creeks that were effected by the leachate from the gravel pit, when the prospective students were children. In addition, prospective students could have been directly effected by the leachate from the gravel pit, if their families, obtained their drinking water from a water well, in close proximity of the Sampson Horrice Site, and not from their municipality.

The prospective students, born before the Sampson Horrice Site was in operation until the Sampson Horrice Site's closure (Year 1984), would have been in middle and high school, assuming that the prospective students did not move outside of the Sampson Horrice Site's 5-mile radius. Prospective middle school students, born before the Sampson Horrice site closed, would have taken the standardized test from before the Year 1994 to the Year 1998, and prospective high school students, born before the Sampson Horrice Site was in operation until the Sampson Horrice Site was closed, would have taken the standardized test from before the Year 1994 to the Year 2000. Therefore the prospective students' cognitive abilities could have been compromised, in the event the prospective students were exposed to the leachate from the Sampson Horrice Site, resulting in lower standardized test passing rates

In addition, the prospective students born after the Sampson Horrice Site was closed (Year 1985) until the Sampson Horrice Site was clean up (Year 2000), could have also been exposed to the leachate from the Sampson Horrice, resulting in lower standardized test passing rates. The prospective middle and high school students, born after the Sampson Horrice Site was closed until the Sampson Horrice Site was cleaned up, would have taken the standardized test from the Year 1997 to the Year 2015. Therefore there is a possibility that the prospective students could have been exposed to the leachate from the Sampson Horrice Site, and that their standardized tests negatively impacted. Even prospective elementary students, born after the Sampson Horrice Site closed and until the site as cleaned up could have been effected from the leachate from the site. The prospective elementary student would have taken the standardized test the Year 1994 and beyond.

The distance analysis was separated into two groups; middle and high schools, and elementary schools. The separation was made to capture the standardized test passing rates of the older prospective students that are more likely to have been directly effected by the Sampson Horrice Site, from the prospective elementary students that may have not been effected by the Sampson Horrice Site.

7.2.5.3 Sampson Horrice Middle and High School Distance Analysis

The purpose of the distance analysis is to determine if a significant relationship exists between the distance the middle and high schools are located from the Sampson Horrice Site and the standardized test passing rates of those schools. The table of the middle and high schools, located within the 5-mile radius of the Sampson Horrice Site, and the standardized test passing rates are shown below.

Table 7.82: Sampson Horrice Distance vs. Test Passing Rates for Middle and High Schools Located Within the Sampson Horrice Site's 5-mile Radius

	Sampson Horrice Distance and Middle and High School Test Passing Rates										
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR Year 1999 (%)	PR Year 2000 (%)	PR Year 2001 (%)	PR Year 2002 (%)
DALLAS ISD	H GRADY SPRUCE HS	75217	1.8	20.2	17.4	34.8	33.3	41.2	44.6	53.8	58.3	62.5
DALLAS ISD	EB COMSTOCK MIDDLE	75217	2.5	21.9	16.7	27.2	27.2	29.2	40.2	42.3	52.8	63.6
DALLAS ISD	FRED F FLORENCE	75217	3.7	26.0	24.5	28.3	28.5	33.3	33.1	35.1	31.0	43.9
DALLAS ISD	WW SAMUELL HS	75217	3.7	27.3	32.2	41.3	42.0	43.2	41.3	51.0	53.5	58.1
DALLAS ISD	JOHN B HOOD MIDDLE	75227	4.6	27.3	15.5	28.8	25.1	26.3	24.3	41.6	36.6	42.1
			Average	**24.5**	**21.3**	**32.1**	**31.2**	**34.6**	**36.7**	**44.8**	**46.4**	**54.0**

In the table, the district name, the campus name, and the zip codes the schools are located in, are shown on the left side, of the table. The distance column indicates the linear radial distance the school is located from the Sampson Horrice Site, in miles. The PR Year column, represents the percentage of students that passed the standardized test, out of the students that took the test, at each school, per year. As the years increase, the test passing rates for the middle and high schools, gradually increase. The standardized test passing rates range from 24.5% , in the Year 1994 to 54.0%, in the Year 2002.

The Spearman Rank Correlation Matrix, was used to analyze the data, due to the data set not having a normal distribution and due to a low quantity of observations. The correlation matrix of the distance vs. the standardized test passing rates, for middle and high schools is shown below.

Table 7.83: Sampson Horrice Correlation Matrix for Middle and High Schools Located Within a 5-mile Radius of Sampson Horrice Site

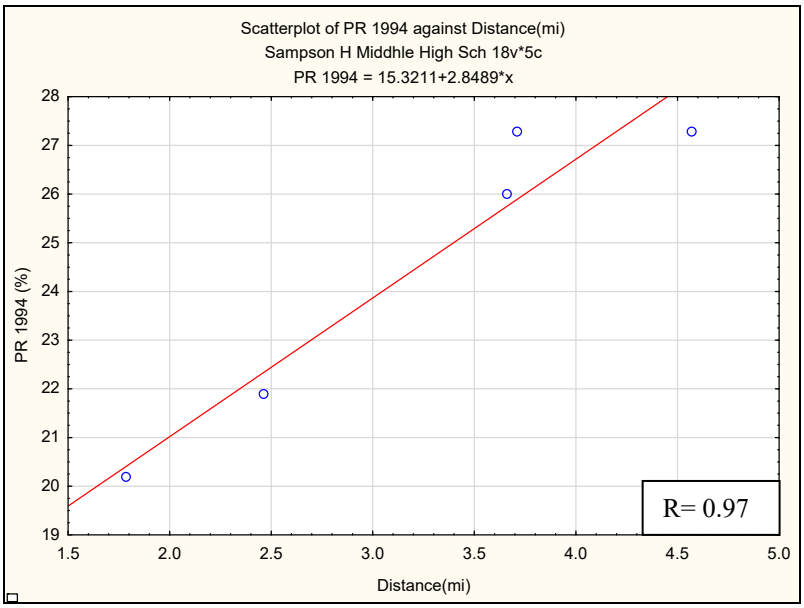
	Spearman Rank Order Correlations (Sampson H Middle High Sch) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Distance (mi)	PR Year 1994	PR Year 1995	PR Year 1996	PR Year 1997	PR Year 1998	PR Year 1999	PR Year 2000	PR Year 2001	PR Year 2002
Distance (mi)	1.00	0.97	-0.10	0.20	-0.30	-0.30	-0.70	-0.50	-0.50	-0.80
PR Year 1994	0.97	1.00	0.10	0.31	-0.10	-0.10	-0.56	-0.41	-0.41	-0.72
PR Year 1995	-0.10	0.10	1.00	0.50	0.90	0.90	0.50	0.20	0.20	0.10
PR Year 1996	0.20	0.31	0.50	1.00	0.70	0.70	0.50	0.60	0.60	-0.20
PR Year 1997	-0.30	-0.10	0.90	0.70	1.00	1.00	0.80	0.60	0.60	0.30
PR Year 1998	-0.30	-0.10	0.90	0.70	1.00	1.00	0.80	0.60	0.60	0.30
PR Year 1999	-0.70	-0.56	0.50	0.50	0.80	0.80	1.00	0.90	0.90	0.70
PR Year 2000	-0.50	-0.41	0.20	0.60	0.60	0.60	0.90	1.00	1.00	0.60
PR Year 2001	-0.50	-0.41	0.20	0.60	0.60	0.60	0.90	1.00	1.00	0.60
PR Year 2002	-0.80	-0.72	0.10	-0.20	0.30	0.30	0.70	0.60	0.60	1.00

In correlation matrix, variable one is the distance, measured in miles and variable two are the standardized test passing rates, in percentage. Each variable is shown along the left side of the matrix and across the top of the matrix. The numeric values, in the center of

the matrix, represent the correlation coefficient or R value of the corresponding variables on along the side and top of the table. All values shown in red, represent significant relationships. The higher the red value in the table, the stronger the significant relationship between the two variables. For the distance analysis, the distance and the standardized test passing rates were evaluated for a significant relationship.

Based on the correlation matrix above, there is a significant relationship between the linear distance, from the Sampson Horrice Site, and the student standardized test passing rate for the Year 1994. Therefore, there is a possibility that prospective students, that were born before the Sampson Horrice Site closed (Year 1984), could have been exposed to the Sampson Horrice Site's and had their cognitive abilities compromised, resulting in lower standardized test passing rates. The significant bivariate plots for linear distance vs. the standardized test passing rates for the Year 1994 is shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.125: Year 1994 to Year 2002 Sampson Horrice Plots of Significant Relationships between the Distance vs. the Standardized Passing Rates for Middle and High Schools Located Within the 5- Mile Radius of the Sampson Horrice Site



Based on the graph, there is a positive relationship between the linear distance from the Sampson Horrice Superfund Site and the student standardized test passing rates. Therefore, the greater the distance the middle and high school is located from the Sampson Horrice Site, the higher the standardized test passing rate of the school.

7.2.5.4 Sampson Horrice Comparison Distance Analysis for Middle High Schools Greater Than the 5-mile Radius of thhe Sampson Horrice Site (Comparison Group)

The comparison group identifies trends in the data by comparing the distance and standardized test passing rates, of the middle and high schools located within the 5-mile radius of the Sampson Horrice Site, to the same data, for the middle and high schools located greater than the 5-mile radius of the Sampson Horrice Site. A table of the distance and the standardized test passing rates for the middle and high schools, located greater than the 5-mile radius of the Sampson Horrice Site is shown below.
Table 7.84: Sampson Horrice: Middle and High Schools Located Greater than the 5-mile radius of the Sampson Horrice Site.

	Sampson Horrice Distance and Middle and High School Test Passing Rates for Schools Greater than 5 miles											
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
CEDAR HILL ISD	CEDAR HILL H S	75104	17.6	60.7	59.7	67.2	75.8	72.7	76.6	79.2	85.1	91.2
DUNCANVILLE ISD	J HERMAN REED MIDDLE	75116	13.4	62.0	56.3	59.6	64.5	67.1	71.3	69.3	72.7	77.2
DALLAS ISD	W T WHITE H S	75244	17.8	55.3	47.2	60.3	61.3	65.1	71.5	74.4	80.0	87.8
DUNCANVILLE ISD	WILLIAM H BYRD MIDDLE SC	75137	15.2	66.1	59.7	65.2	72.0	69.6	68.7	66.2	75.6	79.2
DUNCANVILLE ISD	DUNCANVILLE H S	75116	14.9	60.7	56.7	65.1	64.5	70.0	79.6	87.0	86.1	89.6
FERRIS ISD	FERRIS H S	75125	11.1	62.2	71.1	74.3	83.9	88.0	91.0	93.5	95.1	93.6
FERRIS ISD	FERRIS J H	75125	10.9	65.3	64.7	69.3	71.1	84.1	74.8	71.0	76.4	73.8
GARLAND ISD	LYLES MIDDLE	75043	12.6	75.4	73.1	70.3	66.7	69.5	67.1	67.1	66.6	71.6
GARLAND ISD	GARLAND H S	75040	15.0	68.8	68.9	77.8	80.5	82.6	70.2	70.7	71.2	77.8
LANCASTER ISD	LANCASTER H S	75134	8.2	52.9	57.9	43.5	51.1	58.9	77.9	75.6	78.9	79.8
LANCASTER ISD	LANCASTER MIDDLE	75146	9.6	56.9	39.3	50.8	57.3	55.5	51.6	56.0	62.7	66.8
MESQUITE ISD	NORTH MESQUITE H S	75150	8.4	59.4	59.7	57.3	71.1	77.2	78.0	79.3	78.0	83.5
MESQUITE ISD	VANSTON MIDDLE	75150	9.5	58.9	59.2	68.6	68.4	69.7	69.2	73.9	78.0	74.1
RICHARDSON ISD	RICHARDSON H S	75080	18.5	61.2	56.7	57.7	69.5	72.9	76.4	77.1	82.3	80.8
RICHARDSON ISD	RICHARDSON NORTH J H	75080	19.8	78.7	75.3	85.3	81.4	88.3	79.7	81.9	83.4	87.5
RED OAK ISD	RED OAK H S	75154	15.1	66.3	66.3	61.6	67.7	88.8	81.4	92.8	85.2	93.7
SUNNYVALE ISD	SUNNYVALE MIDDLE	75182	9.8	86.1	86.2	93.2	97.6	96.9	97.0	93.4	90.1	90.2
DALLAS ISD	Bryan Adams H S	75231	9.3	58.6	50.6	55.6	61.1	65.8	55.6	79.1	74.6	77.7
GRAND PRAIRIE ISD	Grand Prairie HS	75050	19.4	37.7	41.5	52.8	61.6	66.4	69.4	74.4	71.0	79.5
IRVING ISD	Irving H S	75061	18.3	59.3	66.1	62.0	67.9	68.9	75.0	79.8	76.4	85.3
			Average	**62.6**	**60.8**	**64.9**	**69.8**	**73.9**	**74.1**	**77.1**	**78.5**	**82.0**

The distance column indicates the linear radial distance the school is located from the Sampson Horrice Site, in miles. The PR Year column, represents the percentage of students that passed the standardized test, out of the students that took the test, at each school, per year. The standardized test passing rates range from 62.6%, for the Year 1994, to 82.0%, for the Year 2002. The range of the average standardized test passing rates are significantly higher, in the table, than the average standardized test passing rates, for the middle and high schools located within the Sampson Horrice Site's 5-mile radius. The average standardized test passing rates, for the Year 1994 and for the Year 2002, for the middle and high schools located within the 5-mile radius of the RSR Site, is 24.5% and 54.0%, respectfully. The significant difference could be due possible exposure of prospective students to the leachate from the gravel pit, of Sampson Horrice Site.

The Spearman Rank Correlation Matrix was used to analyze the data to due to the data set not having a normal distribution and due to a low number of observations. The correlation matrix for the middle and high schools, located greater than the 5-mile radius of the Sampson Horrice Site is shown below.
Table 7.85: Sampson Horrice Distance Analysis: Correlation Matrix for Middle and High Schools Located Greater than the 5-mile Radius of the Sampson Horrice Site.

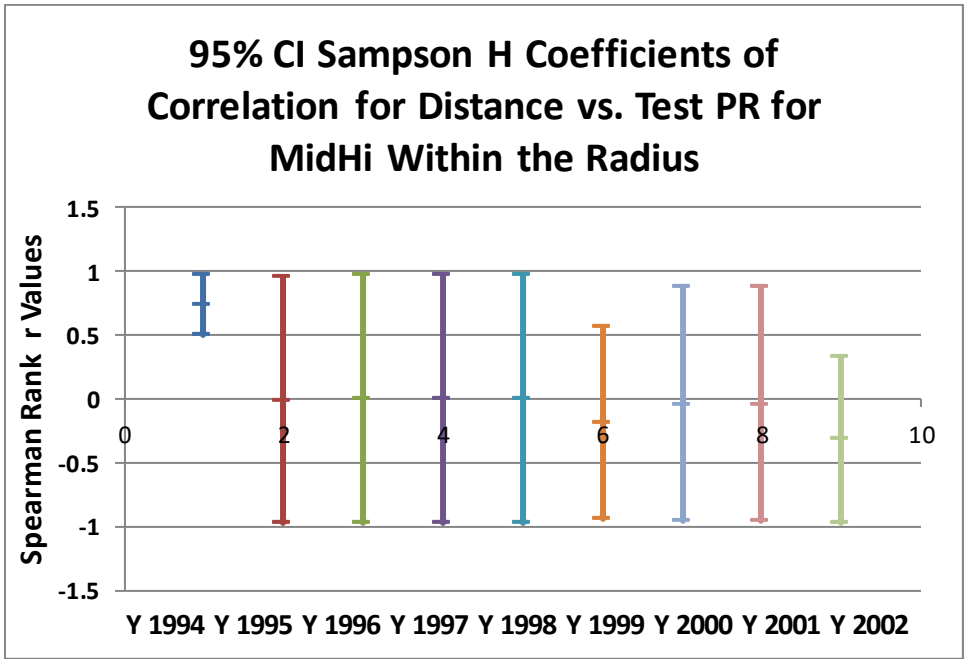
Variable	Spearman Rank Order Correlations (Midde and High Schools FIN) MD pairwise deleted Marked correlations are significant at p <.05000 Distance (mi)	PR Year 1994	PR Year 1995	PR Year 1996	PR Year 1997	PR Year 1998	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
Distance (mi)	1.00	0.16	0.05	0.18	0.21	0.14	0.10	0.09	0.09	0.34
PR Year 1994	0.16	1.00	0.83	0.80	0.73	0.78	0.35	0.17	0.25	0.16
PR Year 1995	0.05	0.83	1.00	0.83	0.77	0.77	0.51	0.40	0.37	0.32
PR Year 1996	0.18	0.80	0.83	1.00	0.81	0.72	0.33	0.23	0.34	0.22
PR Year 1997	0.21	0.73	0.77	0.81	1.00	0.85	0.49	0.36	0.45	0.38
PR Year 1998	0.14	0.78	0.77	0.72	0.85	1.00	0.69	0.57	0.60	0.50
PR YEAR 1999	0.10	0.35	0.51	0.33	0.49	0.69	1.00	0.86	0.88	0.84
PR YEAR 2000	0.09	0.17	0.40	0.23	0.36	0.57	0.86	1.00	0.84	0.86
PR YEAR 2001	0.09	0.25	0.37	0.34	0.45	0.60	0.88	0.84	1.00	0.86
PR YEAR 2002	0.34	0.16	0.32	0.22	0.38	0.50	0.84	0.86	0.86	1.00

In correlation matrix, variable one is the distance, measured in miles and variable two are the standardized test passing rates, in percentage. Each variable is shown along the left side of the matrix and across the top of the matrix. The numeric values, in the center of the matrix, represent the correlation coefficient or R value of the corresponding variables on along the side and top of the table. All values shown in red, represent significant relationships. The higher the red value in the table, the stronger the significant relationship between the two variables. For the distance analysis, the distance and the standardized test passing rates were evaluated for a significant relationship.

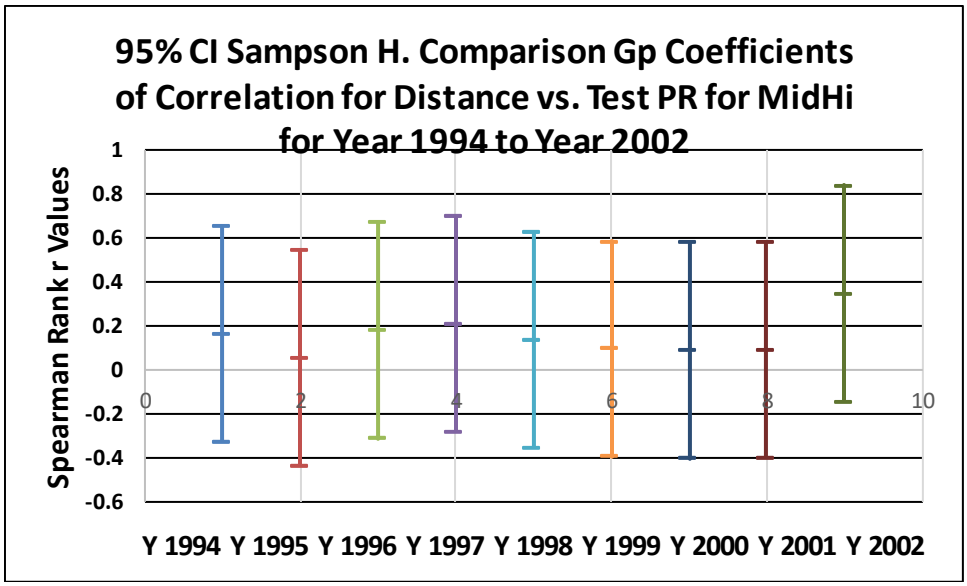
Based on the matrix above, there are no significant relationships between the linear distance and the standardized test passing rates. The comparison group of middle and high schools should not be impacted by the leachate from the Sampson Horrice Site due to the long distance the schools are located from the Sampson Horrice Site. In addition, the comparison group further indicate that there is a possibility that the prospective students, attending the middle and high schools located within the 5-mile radius of the Sampson Horrice Site, may have been exposed to the leachate from the gravel pit from the Sampson Horrice, given that the prospective students did not move from the area.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1994 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for middle and high schools, located within and greater than, the 5-mile radius of the Sampson Horrice Superfund Site, are shown below.

Graph 7.126 Sampson Horrice Coefficient of Correlation Confidence Interval Graph for Distance vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1994 to the Year 2002.



Graph 7.127 Sampson Horrice Comparison Group Coefficient of Correlation Confidence Interval Graph for Distance vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1994 to the Year 2002.



Based on the confidence interval graphs, the smallest confidence interval was for the significant Spearman Rank r Value, in the Year 1994, for the middle and high schools,

located within the Sampson Horrice Site's 5-mile radius. The rest of the Spearman Rank R Values were not significant from the Year 1995 to the Year 2002, for the middle and high schools, located within the Sampson Horrice Site's 5-mile radius. There were no significant r values, for the confidence intervals, for the comparison group of middle and high schools.

7.2.5.5: Sampson Horrice Distance Analysis for Elementary Schools Located Within the Sampson Horrice Site's 5-Mile Radius

The purpose of the distance analysis is to determine if a significant relationship exists between the distance the elementary schools are located from the Sampson Horrice Site and the standardized test passing rates of those schools. A table of the distance and the standardized test passing rates for the elementary schools located within the Sampson Horrice Site's 5-mile radius is shown below.

Table 7.86: Sampson Horrice Distance Analysis: Elementary Schools Located Within the Sampson Horrice Site's 5-mile Radius

	Sampson Horrice Distance and Elementary School Test Passing Rates											
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR Year 1999 (%)	PR Year 2000 (%)	PR Year 2001 (%)	PR Year 2002 (%)
DALLAS ISD	WA BLAIR EL	75217	1.4	26.8	34.2	41.4	45.3	55.5	54.1	63.8	51.1	59.7
DALLAS ISD	JULIUS DORSEY EL	75217	1.7	27.4	38.4	31.6	63.1	42.3	43.5	52.1	63.0	70.6
DALLAS ISD	FREDERICK DOUGLASS	75227	2.1	27.4	77.5	47.9	67.1	68.3	71.3	61.2	57.0	90.7
DALLAS ISD	BH MACON EL	75217	2.1	43.5	45.9	51.9	57.8	66.1	68.4	68.1	68.7	74.5
DALLAS ISD	NANCY MOSELEY EL	75217	2.1	40.1	44.5	44.4	66.4	59.6	74.6	52.2	54.7	70.7
DALLAS ISD	WILLIAM M ANDERSON EL	75217	2.3	40.2	47.5	42.8	52.5	54.1	51.2	61.0	64.7	62.5
DALLAS ISD	RICHARD LAGOW EL	75217	2.4	38.5	51.0	43.9	52.5	52.0	62.1	55.8	65.8	76.5
DALLAS ISD	GILBERT CUELLAR SR EL	75217	2.5				36.6	62.3	58.8	59.2	58.7	69.5
DALLAS ISD	RUFUS C BURLESON EL	75217	2.8	26.8	32.5	43.7	63.1	62.3	71.2	65.5	63.2	68.9
DALLAS ISD	JQ ADAMS EL	75217	2.9	44.5	33.9	44.4	40.1	39.9	57.8	58.3	54.2	66.5
DALLAS ISD	PLEASANT GROVE EL	75217	3.4				72.0	68.4	76.3	76.4	75.4	86.1
DALLAS ISD	NATHANIEL HAWTHORNE	75217	3.5	29.8	39.3	62.3	56.9	55.7	75.6	71.2	76.1	87.8
DALLAS ISD	JOHN IRELAND EL	75217	3.5	58.6	59.0	56.9	56.3	51.7	65.3	71.4	55.3	74.0
DALLAS ISD	EDISON RUNYON EL	75217	3.9	38.0	41.3	48.3	42.0	52.0	48.0	45.5	50.9	61.2
MESQUITE ISD	FLOYD EL	75180	4.0			65.6	68.3	52.5	65.2	87.0	93.8	98.3
DALLAS ISD	ANNIE WEBB BLANTON EL	75227	4.1	62.5	39.8	56.1	65.7	63.2	58.1	67.1	45.2	61.1
DALLAS ISD	EDWARD TITCHE EL	75227	4.4	35.3	31.7	52.6	44.3	47.2	45.5	64.9	60.4	68.8
DALLAS ISD	KLEBERG EL	75253	4.4	43.9	41.8	62.7	63.6	77.9	67.6	57.7	71.6	90.9
DALLAS ISD	SAN JACINTO EL	75227	4.5	42.3	54.2	50.0	45.7	65.0	67.3	78.2	78.9	72.0
MESQUITE ISD	GRAY ELEMENTARY	75180	4.7							78.4	70.1	78.2
MESQUITE ISD	HODGES EL	75180	4.7			51.7	54.3	82.1	84.4	80.6	84.6	84.3
MESQUITE ISD	MCWHORTER EL	75149	4.9	41.1	55.0	58.0	46.9	69.1	55.7	76.6	74.1	92.3
			Average	**39.2**	**45.1**	**50.3**	**55.3**	**59.4**	**63.0**	**66.0**	**65.3**	**75.7**

The school district name, the campus name, and the zip codes the schools are located in, are shown on the left side of the table. The distance and the standardized test passing rates are shown across the top of the table. There are a total of 22 elementary schools located within the Sampson Horrice Site's 5-mile radius. The dark grey shaded parts of the table represent schools that were not opened or schools that were repurposed. Based on the table, the average standardized test passing rates range from 39.2%, for the Year 1994 to 75.7%, for the Year 2002. As the years progress, average standardized test passing rates gradually increase. The increase might be due to lower impacts of the leachate of the gravel pit, on prospective students, after the Sampson Horrice Site was cleaned up.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data not having a normal distribution and due to a low quantity of observations. The correlation matrix for the distance vs. the standardized test passing rates for the elementary schools located within the 5-mile radius of the Sampson Horrice site, is shown below.

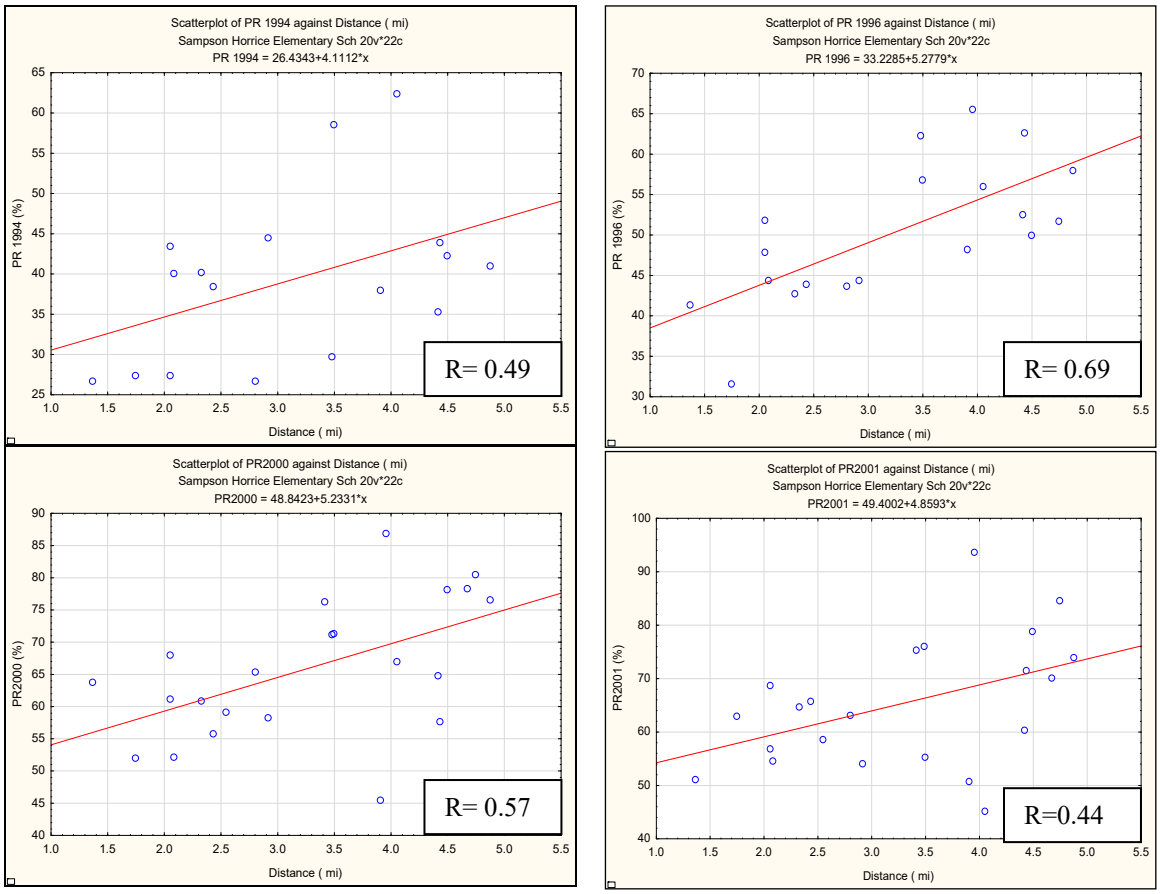
Table 7.87: Sampson Horrice Distance Analysis Correlation Matrix for Elementary Schools Located Within the Sampson Horrice Site's 5- Mile Radius

	Spearman Rank Order Correlations (Sampson Horrice Elementary Sch) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Distance (mi)	PR Year 1994	Pr Year 1995	PR Year 1996	PR Year 1997	PR Year 1998	PR Year 1999	PR Year 2000	PR Year 2001	PR Year 2002
Distance (mi)	1.00	0.49	0.10	0.69	-0.11	0.32	0.09	0.57	0.44	0.34
PR Year 1994	0.49	1.00	0.34	0.53	-0.02	0.13	0.04	0.26	0.00	0.10
PR Year 1995	0.10	0.34	1.00	0.24	0.25	0.44	0.28	0.25	0.30	0.57
PR Year 1996	0.69	0.53	0.24	1.00	0.24	0.32	0.29	0.58	0.42	0.60
PR Year 1997	-0.11	-0.02	0.25	0.24	1.00	0.36	0.55	0.21	0.25	0.49
PR Year 1998	0.32	0.13	0.44	0.32	0.36	1.00	0.62	0.42	0.43	0.48
PR Year 1999	0.09	0.04	0.28	0.29	0.55	0.62	1.00	0.41	0.45	0.56
PR Year 2000	0.57	0.26	0.25	0.58	0.21	0.42	0.41	1.00	0.64	0.47
PR Year 2001	0.44	0.00	0.30	0.42	0.25	0.43	0.45	0.64	1.00	0.75
PR Year 2002	0.34	0.10	0.57	0.60	0.49	0.48	0.56	0.47	0.75	1.00

In correlation matrix, variable one is the distance, measured in miles and variable two are the standardized test passing rates, in percentage. Each variable is shown along the left side of the matrix and across the top of the matrix. The numeric values, in the center of the matrix, represent the correlation coefficient or R value of the corresponding variables on along the side and top of the table. All values shown in red, represent significant relationships. The higher the red value in the table, the stronger the significant relationship between the two variables. For the distance analysis, the distance and the standardized test passing rates were evaluated for a significant relationship.

Based on the correlation matrix, there is a significant relationship between the linear distance the elementary schools are located from the Sampson Horrice Site, and the percentage of standardized test passing rates for the Year 1994, the Year 1996, the Year 2000, and the Year 2001. The significant relationships might be due to some of the prospective students exposure to the leachate from the Sampson Horrice Site, when they were young children, after the Sampson Horrice Site was closed (Year 1984) and before l the Sampson Horrice Site was cleaned up (Year 2000). These prospective students would have taken the elementary standardized test approximately, from the Year 1994 and beyond. The graphs of the significant regressions are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.128- Graph 7.131: Year 1994 to Year 2002 Sampson Horrice Plots of Significant Relationships between the Distance vs. the Standardized Passing Rates for Elementary Schools Located Within the 5- Mile Radius of the Sampson Horrice Site



Based on the graphs, above, as the distance the elementary schools are located from the Sampson Horrice Site increase, the percentage of the standardized test passing rates increase. Therefore, the greater the distance the elementary schools are located from the Sampson Horrice Site, the higher the standardized test passing rates of those schools.

7.2.5.6 Sampson Horrice Comparison Distance Analysis for Elementary Schools Located Greater than the Sampson Horrice Site's 5-mile Radius (Comparison Group).

The comparison group identifies trends in the data by comparing the distance and standardized test passing rates, of the middle and high schools located within the 5-mile radius of the Sampson Horrice Site, to the same data, for the middle and high schools located greater than the 5-mile radius of the Sampson Horrice Site. A table of the distance and the standardized test passing rates for the elementary schools located greater than the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.88: Sampson Horrice Elementary Schools Located Greater than the 5-Mile Radius of the Sampson Horrice Site

	Sampson Horrice Distance and Elementary School Test Passing Rates for Schools Greater than 5 miles											
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
CEDAR HILL ISD	WATERFORD OAKS EL	75104	15.7	56.6	65.5	67.2	71.9	72.6	63.0	73.4	60.5	75.0
DALLAS ISD	VICTOR H HEXTER EL	75218	11.0	82.6	80.7	86.4	87.1	85.2	83.5	73.1	74.9	82.9
DESOTO ISD	RUBY YOUNG EL	75115	12.8	69.9	78.4	68.3	81.0	84.8	88.4	86.2	92.6	88.2
DESOTO ISD	AMBER TERRACE EL	75115	13.0	60.7	64.3	62.3	73.4	78.7	78.0	76.3	86.5	86.5
DUNCANVILLE ISD	WILLIAM LEE HASTINGS EL	75116	14.6	66.4	68.7	65.5	71.2	75.1	81.6	76.3	82.9	83.9
DUNCANVILLE ISD	MERRIFIELD ELEMENTARY	75137	13.9	59.7	66.5	76.7	75.5	76.3	82.4	74.0	82.0	81.2
GARLAND ISD	STEADHAM EL	75089	17.7							90.2	89.8	94.4
GARLAND ISD	ROBERT B SEWELL EL	75048	19.0	78.0	86.2	90.3	83.5	90.3	85.5	86.8	86.8	79.3
LANCASTER ISD	ROLLING HILLS EL	75146	10.4	46.5	61.8	59.8	77.1	70.1	67.2	59.7	68.7	63.9
LANCASTER ISD	LANCASTER EL	75146	9.3	49.0	58.1	63.0	64.3	57.7	61.6	66.2	71.6	75.1
MESQUITE ISD	PRICE EL	75043	11.1	73.7	77.8	79.2	83.6	91.2	90.9	92.2	89.1	89.6
MESQUITE ISD	CANNADAY EL	75150	8.4	64.2	64.4	76.0	85.6	89.9	86.9	92.6	92.2	89.4
RED OAK ISD	RED OAK INT	75154	15.0	64.9	61.5	73.0	79.5	86.6	85.4	89.7	84.4	89.0
RED OAK ISD	EASTRIDGE EL	75154	12.7	41.9	57.6	66.1	72.4	79.0	70.7	75.5	75.4	73.0
RED OAK ISD	SHIELDS EL	75154	15.3	62.0	77.4	75.0	82.0	88.0	83.6	85.8	84.1	90.8
RICHARDSON ISD	SPRING CREEK EL	75248	19.1	88.1	91.0	94.7	92.5	98.2	96.4	92.9	95.7	94.9
RICHARDSON ISD	LAKE HIGHLANDS EL	75238	12.8	67.4	82.6	76.0	85.4	90.7	92.5	89.8	87.5	86.0
			Average	**64.5**	**71.4**	**73.7**	**79.1**	**82.2**	**81.1**	**81.2**	**82.6**	**83.7**

In the table, the district name, the campus name, and the zip codes the elementary schools are located in, are shown on the left side of the table. The distance the school is located from the Sampson Horrice Site and the standardized test passing rates, are shown across the top of the table. Based on the table, the standardized test passing rates range from 64.5%, for the Year 1994, to 83.7%, for the Year 2002. Overall, the standardized test passing rates are higher, for the elementary schools located outside of the Sampson Horrice Site, than the standardized test passing rates for the elementary schools, located within the Sampson Horrice Site's 5-mile radius. The standardized test passing rates are 39.2% and 75.7% , for the Year 1994 and the Year 2002, respectively. The standardized test passing rates follow the same general trend of being lower. This difference could be due to possible exposure of the prospective students, of the elementary schools located within the 5-mile radius of the Sampson Horrice Site, to the leachate from the Sampson Horrice Site.

The Spearman Rank Correlation Matrix was used to analyze the data, due to a low number of observations and due to the data set not having a normal distribution. The correlation matrix for the distance vs. the standardized test passing rates for the elementary schools located greater than 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.89: Sampson Horrice Distance Analysis for Elementary Schools Located Greater Than the 5-mile Radius of the Sampson Horrice Site.

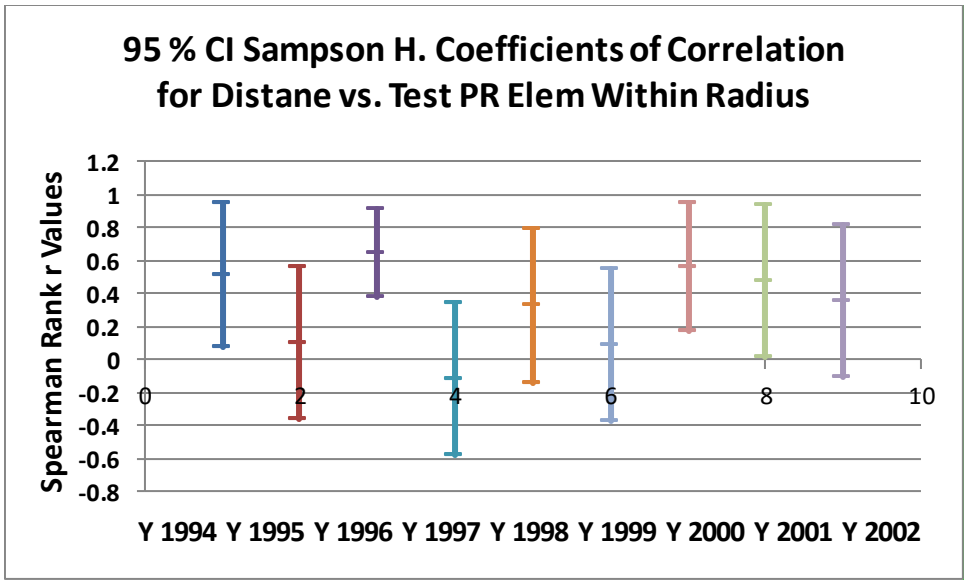
Variable	Spearman Rank Order Correlations (Elementary Schools FIN) MD pairwise deleted Marked correlations are significant at p <.05000 Distance (mi)	PR Year 1994	PR Year 1995	PR Year 1996	PR Year 1997	PR Year 1998	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
Distance (mi)	1.00	0.30	0.42	0.31	0.02	0.25	0.21	0.33	0.24	0.33
PR Year 1994	0.30	1.00	0.86	0.76	0.74	0.74	0.80	0.62	0.66	0.60
PR Year 1995	0.42	0.86	1.00	0.76	0.69	0.66	0.73	0.48	0.55	0.43
PR Year 1996	0.31	0.76	0.76	1.00	0.79	0.79	0.74	0.58	0.51	0.47
PR Year 1997	0.02	0.74	0.69	0.79	1.00	0.85	0.83	0.64	0.64	0.59
PR Year 1998	0.25	0.74	0.66	0.79	0.85	1.00	0.92	0.88	0.80	0.72
PR YEAR 1999	0.21	0.80	0.73	0.74	0.83	0.92	1.00	0.89	0.90	0.76
PR YEAR 2000	0.33	0.62	0.48	0.58	0.64	0.88	0.89	1.00	0.91	0.82
PR YEAR 2001	0.24	0.66	0.55	0.51	0.64	0.80	0.90	0.91	1.00	0.80
PR YEAR 2002	0.33	0.60	0.43	0.47	0.59	0.72	0.76	0.82	0.80	1.00

In correlation matrix, variable one is the distance, measured in miles and variable two are the standardized test passing rates, in percentage. Each variable is shown along the left side of the matrix and across the top of the matrix. The numeric values, in the center of the matrix, represent the correlation coefficient or R value of the corresponding variables on along the side and top of the table. All values shown in red, represent significant relationships. The higher the red value in the table, the stronger the significant relationship between the two variables. For the distance analysis, the distance and the standardized test passing rates were evaluated for a significant relationship.

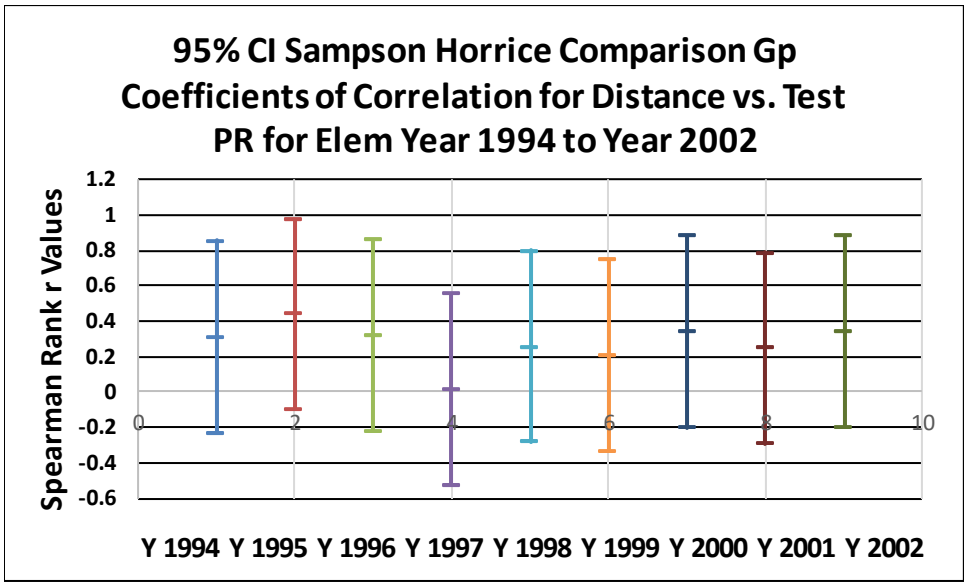
There are no significant relationships between the distance and the standardized test passing rates for the elementary schools located greater than the 5-mile radius of the Sampson Horrice Site. Therefore, there is no impact, from the leachate of the Sampson Horrice, on the elementary schools located greater than the 5-mile radius of the Sampson Horrice Site.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1994 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for elementary schools, located within and greater than, the 5-mile radius of the Sampson Horrice Superfund Site, are shown below.

Graph 7.132 Sampson Horrice Coefficient of Correlation Confidence Interval Graph for Distance vs. Standardized Test Passing Rates for Elementary Schools from the Year 1994 to the Year 2002.



Graph 7.133: Sampson Horrice Comparison Group Coefficient of Correlation Confidence Interval Graph for Distance vs. Standardized Test Passing Rates for Elementary Schools from the Year 1994 to the Year 2002.



Based on the graphs, the significant Spearman Rank r Values have shorter ranged confidence intervals, than the non-significant Spearman Rank r Values, for the elementary schools located within the Sampson Horrice Site's 5-mile Radius. In the comparison group confidence interval graph, there were no significant Spearman Rank r Values from the Year 1994 to the Year 2002.

7.2.6. Sampson Horrice Socioeconomic Indicators vs. Elevated Blood Lead Level Analysis

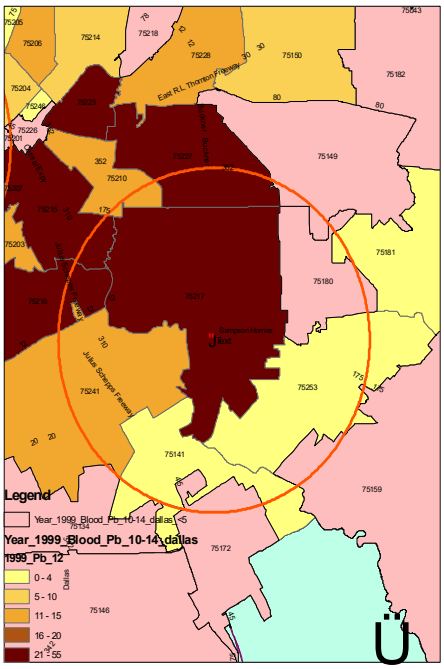
The purpose of the socioeconomic indicators vs. elevated childhood blood lead level analysis is to determine if a significant relationship exists between socioeconomic indictors and the counts of elevated childhood blood lead levels. The socioeconomic indicator data was provided by the Year 2000 Census, from the census.gov website. The elevated childhood blood lead level data was provided by the Texas Department of State Health Services, by zip code, in Dallas County. The childhood elevated blood lead level data , with the socioeconomic indicators data, for children that reside in zip codes, located within, or that intersect, the Sampson Horrice Site's 5-mile radius, were compared to the socioeconomic indicator data and the elevated childhood blood lead level data, for children that reside in zip codes located greater than the 5-mile radius of the Sampson Horrice Site.

Children and adults, from ages 15 years and older, covered under the Adult Lead Surveillance Program, were not included in the Study, because the elevated blood lead data, for this age group, was not available from the Texas Department of State Health Services. Elevated childhood blood lead level data, for children from 0 years to 14 years of age, covered under the Texas Childhood Lead Poisoning Prevention Program, is used in the socioeconomic indicators vs. elevated blood lead level analysis. The method the Texas Department of State Health (TDSHS) uses to acquire elevated childhood blood lead level data is located in Section 7.1 of the report. The earliest year, that the elevated childhood blood lead data was available, from the TDSHS, for this Study, was the Year 1999. Therefore, the socioeconomic indicators vs. elevated childhood blood lead level analysis was conducted from the Year 1999 to the Year 2002, for Dallas County. The analysis ended in the Year 2002 to provide consistency with the standardized test passing rate analysis.

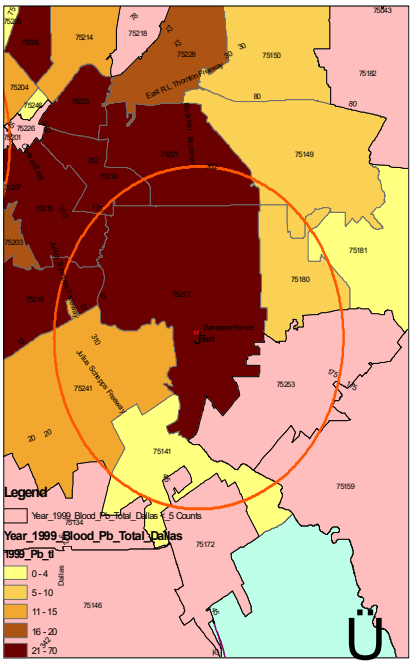
According to the Centers for Disease Control (CDC), the recommended childhood blood lead level for "public health actions to be initiated" is 5 μg/dl. The CDC has a Childhood Lead Poisoning Prevention Program to reduce childhood elevated blood lead levels that are 10 μg/dl and greater. The lowest concentration of elevated childhood blood lead data, provided by the TDSHS, was 10 μg/dl. In the childhood elevated blood lead level data set, there were four categories of elevated blood levels; 10-14 μg/dl (low level), 15-19 μg/dl (medium level), equal to or greater than 20 μg/dl (high level), and the total counts of all elevated childhood blood lead levels, respectively. During the socioeconomic indicators vs. elevated childhood blood lead level analysis, the overall counts for the medium level (15-19 μg/dl) and high level (= or > 20 μg/dl), of elevated blood lead levels, had extremely low quantity of counts. Therefore, no analysis was conducted on both elevated childhood blood lead level categories, and both elevated childhood blood lead levels were removed from the Study. Sampson Horrice Maps, of the elevated childhood blood lead level of 10-14 μg/dl and the total counts are depicted below, by zip code.

Figure 7.15-Figure 7.20: Sampson Horrice Socioeconomic Indicators vs Elevated Childhood Blood Lead Level Maps for 10-14 μg/dl and Total Counts of Elevated Blood Lead Level.

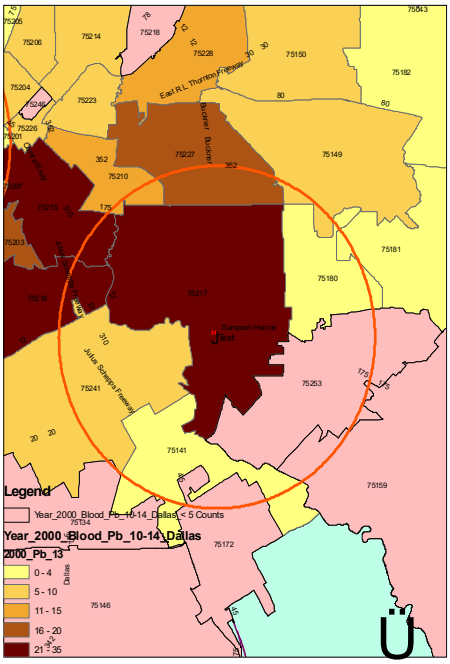
Sampson H. Year 1999 Blood Lead Level 10-14 ug/dl



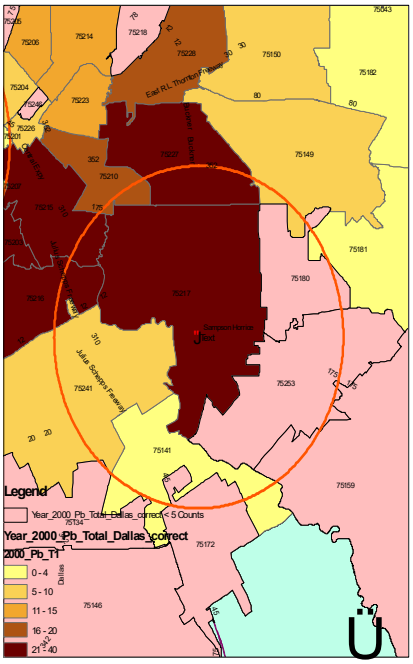
Sampson H. Year 1999 Total Counts Blood Lead Level

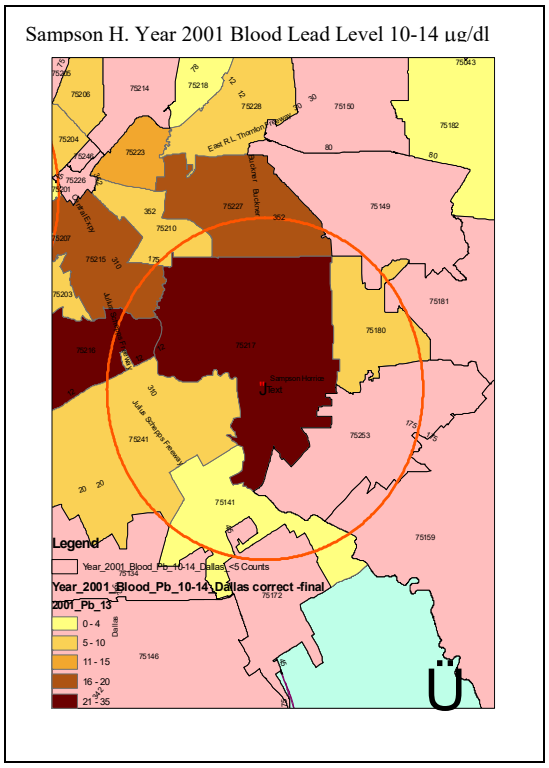


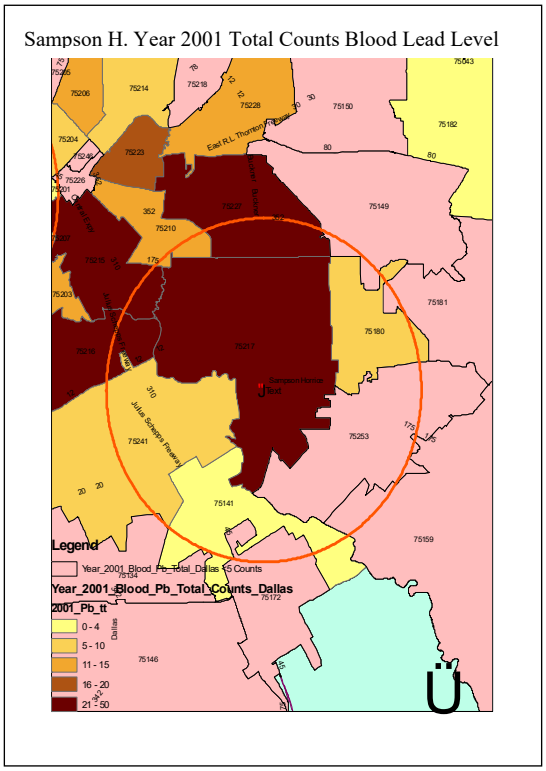
Sampson H. Year 2000 Blood Lead Level 10-14 ug/dl



Sampson H. Year 2000 Total Counts Blood Lead Level





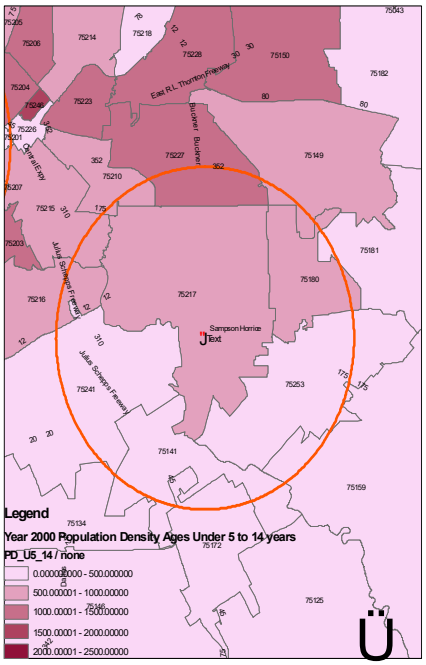


The darker the shading of the maps, the greater quantity of children with the 10-14 µg/dl elevated blood lead level and the total counts (10-14 µg/dl, 15 µg/dl, and = or > 20 µg/dl) of childhood elevated blood lead level. The circle indicates the 5-mile radius of each lead contaminated Superfund Site. The years the map covers are from the Year 1999 to the Year 2001.

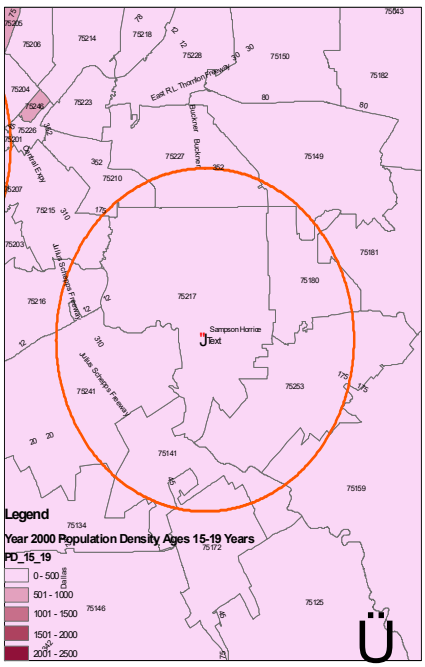
The population density maps for the Year 2000, by age range, for the Sampson Horrice Site, are shown below.

Figure 7.21- Figure 7.23 Sampson Horrice Population Density Maps for Childhood Ages; Under 5 Years to 14 Years, 15 Years to 19 Years, and 20 Years to 24 Years, respectively.

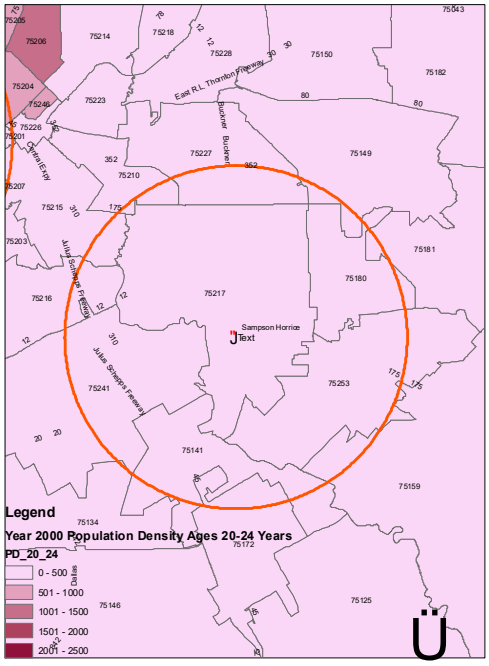
Sampson H. Population Density Ages Under 5 to 14



Sampson H. Population Density Ages 15 to 19



Sampson H. Population Density Ages 20 to 24



Based on the population maps, the darker the shading, the greater the population density, of the specified age range. The population maps assist to determine if lower elevated childhood blood lead level counts are the result of a lower population density.

In the elevated childhood blood lead level data set, provided by the TDSHS, counts of elevated blood lead that were less than 5, were designated as a "<5" count, in the spreadsheet. The TDSHS could not provide the actual number for "<5". In order to quantify and analyze the unspecified counts, of elevated childhood blood lead level data, an educated, systematic approach was utilized, to provide an educated guess value for the "<5" counts. Table 7.90 below various scenarios of the "<5" count of elevated blood lead level data. Below the table, is the explanation of how the educated guess was computed.

Table 7.90: Scenarios For Estimation of "<5" Values

Dallas County Texas, Unduplicated Children Tested for Lead, 1999-2011*

	1999 Blood Lead Level			
Zip	10--14	15--19	>=20	Total
75039	0	0	0	0
75040	< 5	0	0	< 5
75042	< 5	< 5	< 5	7
75051	< 5	< 5	0	5
75229	< 5	< 5	< 5	< 5
75204	8	6	< 5	15
75211	25	< 5	8	37
75217	55	11	< 5	69
Total	**491**	**121**	**70**	**682**

The table above shows some examples of various cases of unspecified "<5" counts. This table was modified from the original TDSHS spreadsheet. The total counts, at the bottom of the table, depict the actual counts from the original spreadsheet. Based on these values, the highest overall counts are for the 10-14 μg/dl and for the total counts categories, of elevated childhood blood lead. A few zip codes, from Dallas County, are shown on the left side of the table. The four cases of elevated childhood blood lead levels, in μg/dl, are shown at the top of the table, as well as, the year the data was collected. The values, in the center table, represent unduplicated counts, of children that tested positive, for elevated blood lead. The "total" column, represents the total counts of all three concentrations of elevated blood levels.

For the educated guesses, some of the zip codes had no counts of childhood elevated blood lead, as specified for zip code 75039. Some childhood blood lead levels were "<5 for only one specified blood lead level concentration, similar to zip code 75040. Since the actual value, for the unspecified elevated blood lead count of "<5", must be from the number 1 to the number 4, the value of 2 was used for the educated guess, for zip codes

that only had a "<5" designation in only one category of blood lead levels. The number 2 is close to the median value, from 1 to 4, that is a conservative value. For educated guesses, for zip codes that had the "<5 designation in more than one blood lead level category, the following process was followed.

For zip code 75042, a designation of the number "4"was assigned for the 10-14 μg/dl category, since the highest, overall total number of counts, for this category, is highest, for Dallas County. The number count of "2" was assigned to the medium range of blood lead level (15-19 μg/dl) and the number "1" was assigned to the high level range of the blood lead level (= or > 20 μg/dl), for zip code 75042. These numbers were assigned to reflect the overall blood lead category count distribution for Dallas County, as well as, to complete the total count of "7", for the "total counts" category, for the 75042 zip code.

For zip code 75051, there were two categories with the blood lead level designation count of "<5"; 10-14 μg/dl and 15-19 μg/dl, respectively. The total counts of elevated blood lead level, for zip code 75051, is the number "5". In providing an educated guess for the "<5" designation, the number "3" was assigned for the 10-14 μg/dl category and the number "2" was assigned for the 15-19 μg/dl category. The higher blood lead level count was assigned to the 10-14 category, as effort to reflect the overall blood lead category count distribution for Dallas County, as well as, to complete the total count of "5" ,for the "total counts" category, for the 75051 zip code.

For zip code 75229, all childhood elevated blood lead level categories were all "<5". In the event that all blood lead level category counts are "<5", the number "2" was assigned to the 10-14 μg/dl category and the number "1" was assigned for the 15-19 μg/dl and the =or >20 μg/dl. These values add to a total childhood elevated blood lead level of "4", since the total category count is "<5". The strategy provides more counts to the 10-14 μg/dl category, than the other elevated blood lead categories, since the largest number of elevated blood lead level counts for Dallas County is the 10-14 μg/dl blood lead category.

For the 75204, 75211, and 75217 zip codes, simple math was utilized to calculate the one missing count, for each zip code. For each zip code, the "total counts" were subtracted by the given values of elevated blood level counts, in the other categories, to calculate the actual count, for the missing elevated blood lead level value.

The process described above, was the method used to provide an educated guess on all "<5" values, in the original childhood blood lead level data set, provided by the TDSHS. In the analysis below, the highlighted counts, in the tables, represent "<5" values that were assigned an actual number, by the process described above. Section 7.1 provides the information on how the unduplicated counts of elevated blood lead levels data is acquired, by the TDSHS.

7.2.6.1 Sampson Horrice Socioeconomic Indicators vs. Blood Lead Level Analysis

As previously stated, the socioeconomic indicators vs. elevated childhood blood lead level analysis consists of evaluating if there is a significant relationship between socioeconomic indicators and the childhood elevated blood lead levels, of children from age 0 to 14 yrs , that reside in zip codes, located within or intersect, the 5-mile radius of the Sampson Horrice Site. This data was compared to the socioeconomic indicators vs. childhood elevated blood lead levels data of children, from age 0 to 14 yrs, that reside in zip codes, located greater than the 5- mile radius of the Sampson Horrice Superfund Site.

The socioeconomic indicator data, used to identify whether children that live in zip codes with a high percentage of families with low income and with a high percentage of housing units constructed before the Year 1970, might increase the number of children with elevated childhood blood lead.

The socioeconomic indicators evaluated, are listed below;

- percentage of families that are below poverty level;
- percentage of female householder with children less than 18 years of age that are below poverty level;
- percentage of households with income less than $10,000 per year;
- percentage of households with income between $10,000 to $14,999;
- percentage of households with income between $15,000 to $24,999;
- percentage of housing units built the Year 1939 or earlier,
- percentage of housing units built between the Year 1940 to 1959;
- percentage of housing units constructed between the Year 1960 to Year 1969;
- percentage of housing units built between Year 1970 to Year 1979.

The socioeconomic indicator data was obtained from the Year 2000 census data, from census.gov website. The blood lead level data was obtained from the TDSHS. The housing units built dates were included in the Study, because housing units constructed before the Year 1970, were most likely painted with lead based paint. The housing units' built dates help indicate possible indoor lead exposure to children residing in the units. In addition, the proximity of the children, residing in zip codes located, within or that intersect, the 5-mile radius, of the Sampson Horrice Site, will also help determine if the source of elevated blood lead, in children, is result of the gravel pit/ landfill, of the Sampson Horrice Site. The socioeconomic indicator data and the elevated childhood blood lead level data were evaluated from the Year 1999 to the Year 2002 to stay consistent with the socioeconomic indicators vs. the standardized test passing rates analysis. There is no elevated childhood blood lead data available, before the Year 1999, from the TDSHS. Therefore, the socioeconomic indicators and the blood lead level analysis starts the Year 1999. The original TDSHS spreadsheet, of elevated childhood blood lead level data, is located in Appendix A.

During the Study, counts for elevated blood lead levels of 10-14 μg/dl, 15-19 μg/dl, >or =20 μg/dl, and the total counts, were evaluated for children from age 0 years to 14 years. During the evaluation, the quantity of counts for blood lead level of 10-14 μg/dl and the total counts of elevated blood lead levels, were significantly higher than the quantity of counts for blood lead levels 15-19 μg/dl and >or =20 μg/dl. Due to these significantly

lower counts, the 15-19 µg/dl and > or =20 µg/dl elevated blood lead levels were removed from the Study. It would be difficult to identify any significant relationships, in these elevated blood lead levels, due to an extremely low number of counts. Therefore, the analysis was conducted for the 10-14 µg/dl and the total counts elevated childhood blood lead levels.

In addition, for this analysis, there was no separation of data, for elementary schools and middle and high schools because the analysis was completed on a zip code basis and because separating the elementary schools from the middle and high schools would result in an extremely low number of observations. The table below shows the socioeconomic indictors and the 10-14 µg/dl elevated childhood blood lead level for the Year 1999, for the children that reside in zip codes, located within or intersect, the 5-mile radius of the Sampson Horrice Site.

Table 7.91: Year 1999 Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Level for Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius

	Sampson Horrice Year 1999 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75217	19.1	14.3	7.1	17.4	19.5	24.3	33.0	3.3	40.4	55
75227	17.2	12.0	6.8	16.9	16.7	18.1	29.8	3.9	36.6	38
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	41.8	8
75180	10.5	7.3	6.2	13.8	27.3	21.0	17.3	2.1	24.8	4
75253	13.1	9.7	6.1	15.9	15.9	5.9	9.0	2.6	25.9	0
75149	6.6	5.7	4.2	10.0	22.4	16.7	18.6	1.2	25.3	4
									Total	**109**

The left side of the table shows the zip codes that are located, within the Sampson Horrice Site's 5-mile Radius. The top of the table shows the socioeconomic indicators, as well as, the counts of children, with elevated blood lead level of 10-14 µg/dl. The highlighted values, in the table, represent the estimated, "<5" count values from the original data set, supplied by the TDSHS. For further explanation of the process to estimate these values is in section 7.2.2.

Based on the table above, there are a total of 109 unduplicated cases of elevated childhood blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. The high counts of elevated childhood blood lead might be the result of the socioeconomic indicators and the result of the close proximity the zip codes are located to the Sampson Horrice Site.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data set not having a normal distribution and due to the low number of observations.

Table 7.92: Year 1999 Sampson Horrice Correlation Matrix of the Socioeconomic Indicators and the Blood lead Level 10-14 µg/dl for the Zip Codes Located Within or that Intersect, the 5-Mile Radius of the Sampson Horrice Site.

Variable	Spearman Rank Order Correlations (Samp vs BLL 10-14 1999 EleMidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.83	0.37	0.43	-0.71	0.03	0.09	0.94	0.94	0.64
Percent; Household Income - Less than $10,000	0.83	1.00	0.77	0.83	-0.43	0.37	0.49	0.77	0.77	0.81
Percent; Household Income - $10,000 to $14,999	0.37	0.77	1.00	0.94	0.14	0.71	0.60	0.31	0.20	0.64
Percent; Household Income - $15,000 to $24,999	0.43	0.83	0.94	1.00	-0.09	0.49	0.49	0.37	0.31	0.55
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.71	-0.43	0.14	-0.09	1.00	0.66	0.43	-0.77	-0.77	-0.06
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.03	0.37	0.71	0.49	0.66	1.00	0.83	-0.09	-0.09	0.67
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.09	0.49	0.60	0.49	0.43	0.83	1.00	0.03	0.14	0.81
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.94	0.77	0.31	0.37	-0.77	-0.09	0.03	1.00	0.89	0.58
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.94	0.77	0.20	0.31	-0.77	-0.09	0.14	0.89	1.00	0.64
10--14 ug/dl (Counts) Blood Lead Level	0.64	0.81	0.64	0.55	-0.06	0.67	0.81	0.58	0.64	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius, of the Sampson Horrice Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the counts of children with the elevated blood lead level of 10-14 µg/dl and the percentage of households with income less than $10,000 per year and the percentage of housing units built in the Year 1940 to the Year 1959. These significant relationships may be result of a high percentage of low income households and a high percentage of older housing units constructed before the Year 1970. The children could have been exposed to indoor lead when their families moved into older housing units. In addition, the children might have been exposed to the lead in the leachate from the Sampson Horrice Site. The bivariate plots of the significant variables are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.134- Graph 7.135: Year 1999 Sampson Horrice Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl

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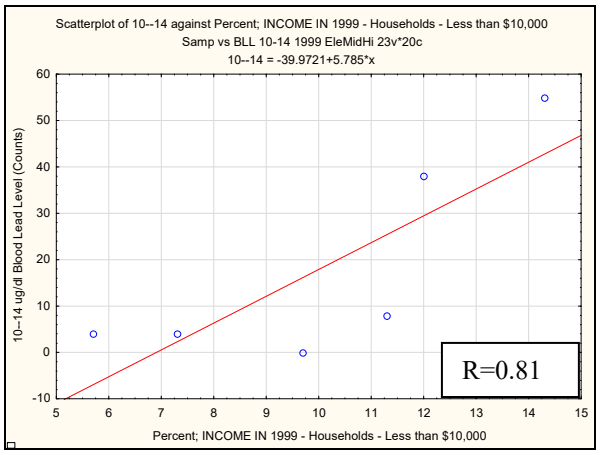
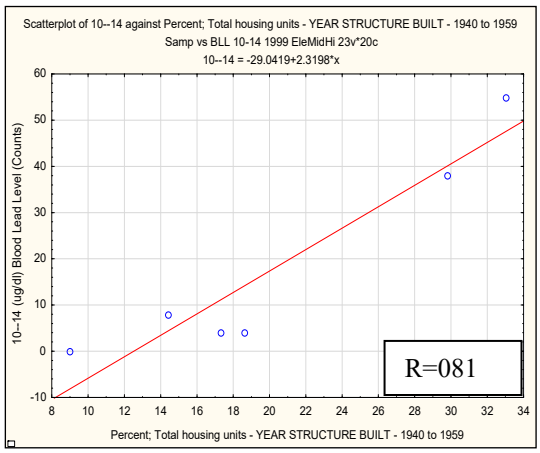




In the graphs above, as the percentages of households with income less than $10,000 and the percentages of houses built in 1940 to 1959 increases, by zip code, the greater quantity of childhood blood lead level cases increases. The houses that were built in 1939 or earlier may not have been significant, due to houses built during that period, may have been demolished or renovated.

7.2.6.2 Year 1999 Comparison Analysis for Sampson Horrice Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Levels for Zip Codes Greater than the 5 mile Radius of the Sampson Horrice Site (Comparison Analysis).

The purpose of the comparison analysis is to identify trends in the data by comparing the data from the children that reside within zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, with the data from the children that reside within zip codes, located greater than the 5-mile radius of the Sampson Horrice Site. The table of the socioeconomic indicators and the counts of 10-14 µg/dl elevated blood lead level, for children that reside in the zip codes located greater than the 5-mile radius of the Sampson Horrice Superfund Site, is shown below.

Table 7.93: Year 1999 Sampson Horrice Comparison Socioeconomic Indicators and Counts of 10-14 Blood Lead Levels for Zip Codes Located Greater Than the 5-mile Radius of the Sampson Horrice Superfund Site

	Year 1999 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from Sampson H. Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75006	5.7	3.6	3.1	9.7	17.3	31.2	13.8	7.6	0.6	0
75007	2.8	2.2	1.4	4.5	8.7	25.3	2.3	0.3	0.2	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	2
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	2
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	2
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	2
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	2
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	5
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	0
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	41

The comparison table shows significantly lower counts of elevated childhood blood lead cases, than the cases of elevated blood lead level, for the children that reside in the zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Superfund Site. The total counts of the elevated blood lead level of 10-14 µg/dl, is 109, for the children that reside in zip codes, located within or that intersect, the Sampson Horrice Site's 5-mile radius, and the total counts of elevated blood lead level of 10-14 µg/dl, for the children that reside in zip codes located greater than the Sampson Horrice Site's 5- mile radius, is 41. The significant difference, in the number of cases, could be the due to indoor lead exposure, from a large quantity of housing units built before the Year 1970, that were constructed within the 5-mile radius of the Sampson Horrice Site. Once again, the highlighted values were estimated. Please refer to section 7.2.2 for an explanation on the process of estimation for the highlighted values.

The Spearman Rank Correlation Matrix was used to analyze the data due to the data set not having a normal distribution and due to a low number of observations. The correlation matrix for the socioeconomic indicators vs. the elevated childhood blood lead level of 10-14 µg/dl , for children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.94: Year 1999 Sampson Horrice Comparison Correlation Matrix of Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Level for Zip Codes

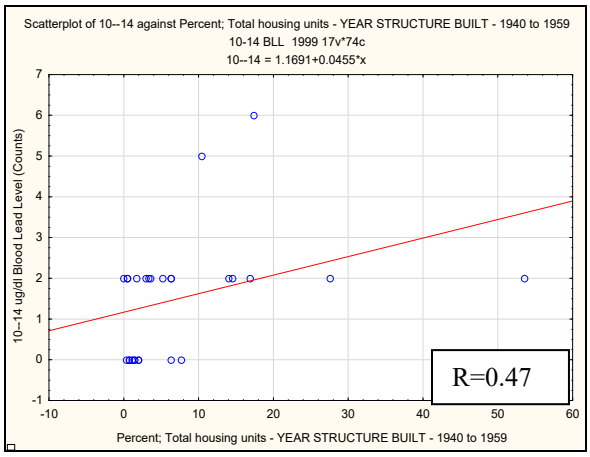
Located Greater than the 5-mile Radius of the Sampson Horrice Superfund Site,

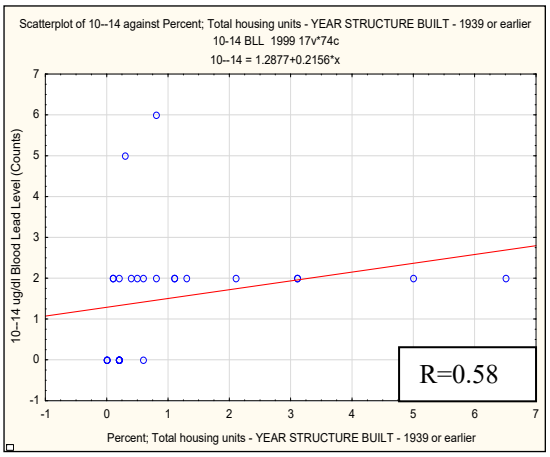
Variable	Spearman Rank Order Correlations (10-14 BLL 1999) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years Below Poverty	Percent; Housing Units-YEAR BUILT - 1970 to 1979	Percent; Housing Units-YEAR BUILT - 1960 to 1969	Percent; Housing Units-YEAR BUILT - 1940 to 1959	Percent; Housing Units-YEAR BUILT-1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.74	0.36	0.70	0.67	0.20	0.32	0.30	0.02	-0.02
Percent; Household Income - Less than $10,000	0.74	1.00	0.48	0.80	0.57	0.20	0.50	0.45	0.14	0.22
Percent; Household Income - $10,000 to $14,999	0.36	0.48	1.00	0.49	0.08	0.30	0.73	0.78	0.50	0.35
Percent; Household Income - $15,000 to $24,999	0.70	0.80	0.49	1.00	0.43	0.25	0.64	0.58	0.16	0.21
Fem Household-No Husband-with Child Less 18 Years-Below Poverty	0.67	0.57	0.08	0.43	1.00	-0.05	0.10	-0.03	-0.11	0.16
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.20	0.20	0.30	0.25	-0.05	1.00	0.49	0.19	-0.10	-0.16
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.32	0.50	0.73	0.64	0.10	0.49	1.00	0.87	0.34	0.33
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.30	0.45	0.78	0.58	-0.03	0.19	0.87	1.00	0.67	0.47
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.02	0.14	0.50	0.16	-0.11	-0.10	0.34	0.67	1.00	0.58
10--14 ug/dl (Counts) Blood Lead Level	-0.02	0.22	0.35	0.21	0.16	-0.16	0.33	0.47	0.58	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there is a weak significant relationship between the counts of children with the elevated blood lead level of 10-14 µg/dl and percentage of housing units that were constructed in the Year 1940 to Year 1959 and the percentage of housing units constructed Year 1939 or earlier. These weak relationships indicate that older housing units, constructed before the Year 1970, can result in indoor lead exposure, resulting in elevated blood lead cases, in children. The comparison group's significant R values are lower than the significant R values, for children that reside in zip codes located, within or that intersect, the Sampson Horrice Site's 5-mile radius. This indicates that the significant relationships are stronger, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, than the significant relationships for the children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site. The graphs of the significant variables are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.136- Graph 7.137: Year 1999 Sampson Horrice Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl





Based on the graphs above, as the percentage of housing units constructed before the Year 1970, increase, the counts of the elevated childhood blood lead level of 10-14 µg/dl, increase. Therefore, there is a significant relationship between housing units constructed before the Year 1970, and cases of elevated childhood blood lead level of 10-14 µg/dl.

7.2.6.3 Sampson Horrice Year 1999 Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Level for Children That Reside in Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius.

This analysis consists determining if a significant relationship exists between socioeconomic indicators and the total counts of all elevated blood lead levels, 10-14 µg/dl, 15-19 µg/dl, and = or >20µg/dl, combined. The table showing the socioeconomic indicators and the total counts of elevated childhood blood leads, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.95: Year 1999 Socioeconomic Indicator and Total Counts Blood Lead Levels for Zip Codes, Located Within or that Intersect ,the 5-mile Radius of Sampson Horrice Superfund Site

	Sampson Horrice Year 1999 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75217	19.1	14.3	7.1	17.4	19.5	24.3	33.0	3.3	40.4	69
75227	17.2	12.0	6.8	16.9	16.7	18.1	29.8	3.9	36.6	46
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	41.8	15
75180	10.5	7.3	6.2	13.8	27.3	21.0	17.3	2.1	24.8	7
75253	13.1	9.7	6.1	15.9	15.9	5.9	9.0	2.6	25.9	4
75149	6.6	5.7	4.2	10.0	22.4	16.7	18.6	1.2	25.3	7
									Total	**148**

The zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site are shown on the left side of the table. The socioeconomic indicators and the total counts of elevated blood lead levels, are shown across the top of the table. Based on the table above, there are a total of 148 unduplicated cases of total elevated childhood blood lead levels, for the children that reside in the zip codes, located within or that intersect, the Sampson Horrice Superfund Site's 5-mile radius. The high total counts of elevated of childhood blood lead levels, could be a result of the families moving into housing units constructed before the Year 1970. These children could have been exposed to indoor lead based paint. In addition, these children could have been exposed to the leachate of the Sampson Horrice Site. The highlighted values, in the table, are estimated values from the "<5" values, in the original data set. Additional information regarding the methodology to estimate "<5"values is expounded upon in section 7.2.2.

The Spearman Rank Correlation Matrix was used to analyze the data due to the data set's non normal distribution, as well as, a small number of observations. The correlation matrix for the total counts of elevated childhood blood lead levels, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.96: Year 1999 Sampson Horrice Correlation Matrix for Socioeconomic Indicators vs. Total Counts of Elevated Childhood Blood Lead Levels for the Zip Codes, Located Within or that Intersect , the 5-mile Radius of Sampson Horrice

	Spearman Rank Order Correlations (Samp vs BLL Total 1999 EleMidHI) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.83	0.37	0.43	-0.71	0.03	0.09	0.94	0.94	0.64
Percent; Household Income - Less than $10,000	0.83	1.00	0.77	0.83	-0.43	0.37	0.49	0.77	0.77	0.81
Percent; Household Income - $10,000 to $14,999	0.37	0.77	1.00	0.94	0.14	0.71	0.60	0.31	0.20	0.64
Percent; Household Income - $15,000 to $24,999	0.43	0.83	0.94	1.00	-0.09	0.49	0.49	0.37	0.31	0.55
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.71	-0.43	0.14	-0.09	1.00	0.66	0.43	-0.77	-0.77	-0.06
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.03	0.37	0.71	0.49	0.66	1.00	0.83	-0.09	-0.09	0.67
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.09	0.49	0.60	0.49	0.43	0.83	1.00	0.03	0.14	0.81
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.94	0.77	0.31	0.37	-0.77	-0.09	0.03	1.00	0.89	0.58
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.94	0.77	0.20	0.31	-0.77	-0.09	0.14	0.89	1.00	0.64
Total (Counts) of Blood Lead Level	0.64	0.81	0.64	0.55	-0.06	0.67	0.81	0.58	0.64	1.00

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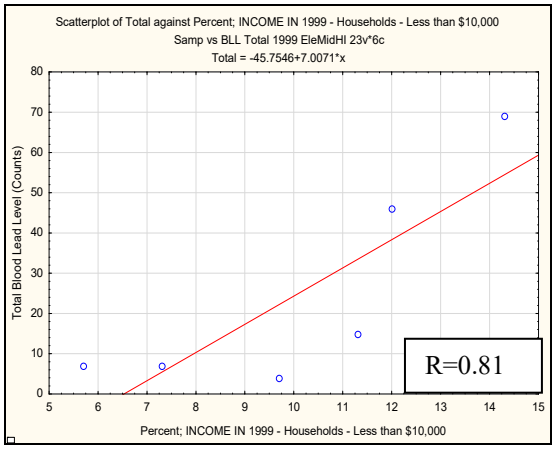
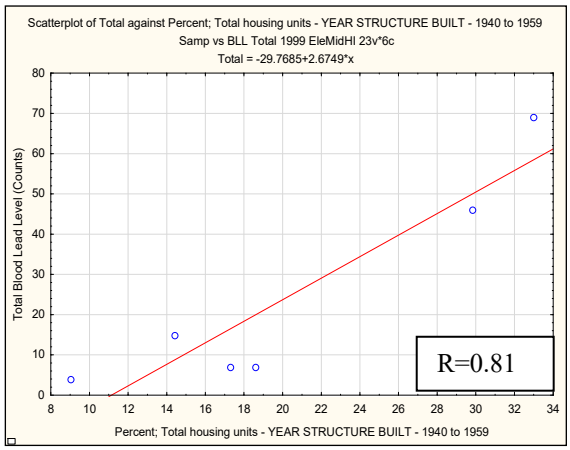
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the total counts of children with elevated blood lead levels, and the percentage

of households with income less than $10,000 per year and the percentage of housing units constructed from the Year 1940 to the Year 1959. The significant relationships could be a result of low income households, residing in cheaper homes that were constructed before the Year 1970. As a result, there are a high quantity of cases of elevated childhood blood lead, due to indoor lead exposure, as well as, possible exposure of children to the leachate from the Sampson Horrice Site. The graphs of the significant variable are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.138- Graph 7.139: Year 1999 Sampson Horrice Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels





Based on the graphs above, as the percentage of households with income less than $10,000 per year and the percentage housing units constructed from the Year 1940 to Year 1959 increase, the total counts of elevated childhood blood lead levels, increase. This shows that low income households and housing units constructed before the Year 1970 contribute to the total counts of elevated childhood blood lead exposure.

7.2.6.4 Sampson Horrice Year 1999 Comparison of Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Children that Reside in Zip codes Located Greater than the Sampson Horrice Site's 5- Mile Radius (Comparison Group)

The purpose of the comparison analysis is to identify trends in the data by comparing the data from the children that reside within zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, with the data from the children that reside within zip codes, located greater than the 5-mile radius of the Sampson Horrice Site. The table of the socioeconomic indicators and the total counts of elevated childhood blood lead levels, for children that reside in zip codes located greater than the 5-mile of the Sampson Horrice Superfund Site, is shown below.

Table 7.97: Year 1999 Comparison of Socioeconomic Indicators and Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes Located Greater than the Sampson Horrice Site's 5-Mile Radius

	Year 1999 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from Sampson H. Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75006	5.7	3.6	3.1	9.7	17.3	31.2	13.8	7.6	0.6	0
75007	2.8	2.2	1.4	4.5	8.7	25.3	2.3	0.3	0.2	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	4
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	4
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	2
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	2
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	7
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	0
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	4
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	47

The zip codes that are located greater than the 5-mile radius of the Sampson Horrice Site are located on the left side of the table. The socioeconomic indicators and the total counts of childhood elevated blood lead levels, are shown across the top of the table. The highlighted values in the table are estimated values. Further information on the estimation process is explained in section7.2.2.

Based on the above table, there are a total of 47 unduplicated counts of elevated childhood blood lead. The total counts are significantly lower, than 148 cases of elevated blood lead, in children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. The lower counts of elevated blood lead levels, for children that reside in zip codes located greater than the 5-mile radius of the Sampson Horrice Site, could be due to a lower percentage of housing units constructed before the Year 1970 and due to a lower percentage of low income households.

The Spearman Rank Correlation Matrix was utilized to analyze the data , due to the data set not having a normal data distribution, and due to a low number of observations. The correlation matrix, for the socioeconomic indicators vs. the total counts of elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site, is shown below.

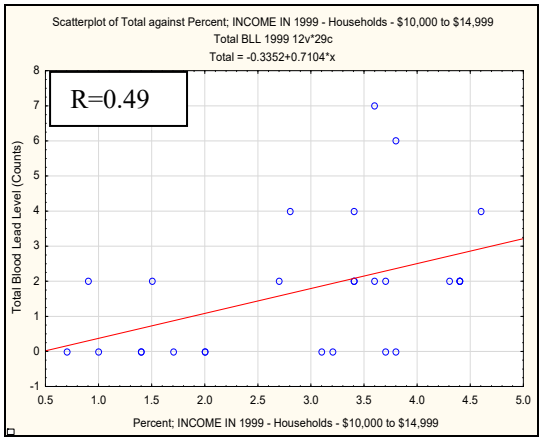
Table 7.98: Year 1999 Comparison Correlation Matrix for Zip Codes Located Greater than the 5-mile Radius Sampson Horrice Superfund Site

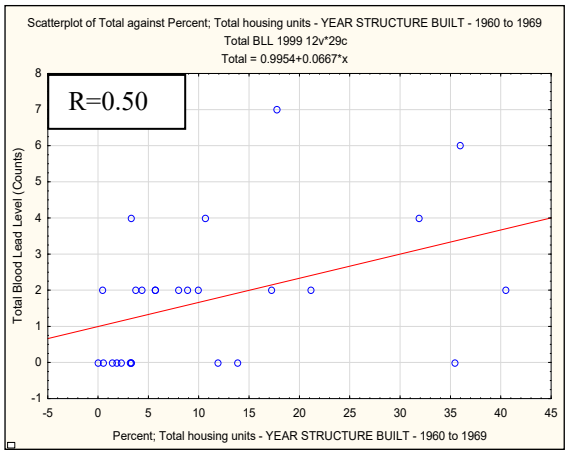
	Spearman Rank Order Correlations (Total BLL 1999) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.74	0.36	0.70	0.67	0.20	0.32	0.30	0.02	0.12
Percent; Household Income - Less than $10,000	0.74	1.00	0.48	0.80	0.57	0.20	0.50	0.45	0.14	0.34
Percent; Household Income - $10,000 to $14,999	0.36	0.48	1.00	0.49	0.08	0.30	0.73	0.78	0.50	0.49
Percent; Household Income - $15,000 to $24,999	0.70	0.80	0.49	1.00	0.43	0.25	0.64	0.58	0.16	0.34
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.67	0.57	0.08	0.43	1.00	-0.05	0.10	-0.03	-0.11	0.03
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.20	0.20	0.30	0.25	-0.05	1.00	0.49	0.19	-0.10	0.11
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.32	0.50	0.73	0.64	0.10	0.49	1.00	0.87	0.34	0.50
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.30	0.45	0.78	0.58	-0.03	0.19	0.87	1.00	0.67	0.59
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.02	0.14	0.50	0.16	-0.11	-0.10	0.34	0.67	1.00	0.52
Total (Counts) of Blood Lead Level	0.12	0.34	0.49	0.34	0.03	0.11	0.50	0.59	0.52	1.00

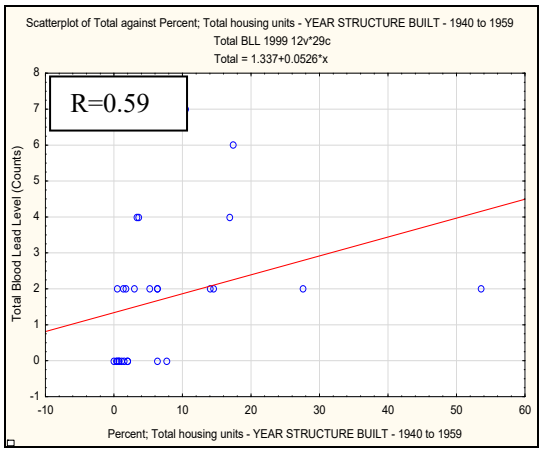
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site.

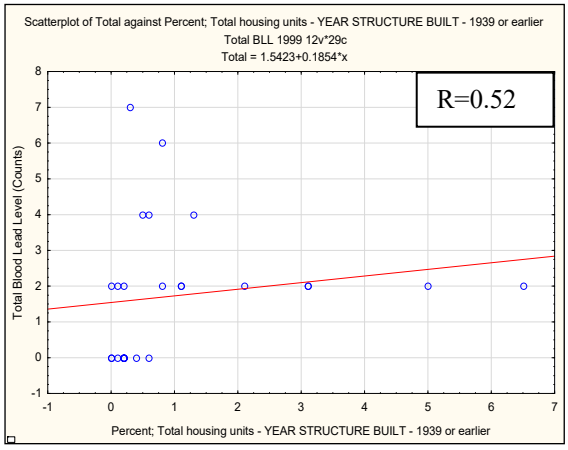
Based upon the correlation matrix, above, there are weak to moderate significant relationships between the total counts of children with elevated blood lead levels and the percentage of households with income between $10,000 to $14,999 per year, and the percentage of housing units constructed the Year 1960 to the Year 1969, the Year 1940 to the Year 1959, and the Year 1939 and earlier. Based on the correlation matrix, it seems that households that have low income and that housing units there built before 1970, contribute to the cases of elevated blood lead in children. Compared to the significant relationships of the children that reside in zip codes, located within or that intersect, the Sampson Horrice Site's 5-mile radius, the significant R values are lower, than the significant R values for the children that reside in zip codes, located within or that intersect, the Sampson Horrice Site's 5-mile radius. This indicates that the effects of the socioeconomic indicators and the counts of elevated blood lead are stronger for the children that reside in close proximity of the Sampson Horrice Site, than the children that do not reside in close proximity of the Sampson Horrice Site. The graphs of the significant variables are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.140- Graph 7.143: Year 1999 Sampson Horrice Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels









Based on the graphs above, as the percentage of households with income between $10,000 to $14,999 per year, and the percentage of housing units constructed before 1970,increase, the counts of total counts of elevated childhood blood lead levels, increase. This shows that low income and older housing units contribute to elevated childhood blood lead exposure.

7.2.6.5 Sampson Horrice Year 2000 Socioeconomic Indicators vs. Elevated Childhood Blood Lead Level Analysis for Children that reside in Zip Codes, Located Within or that Intersect, the 5-Mile Radius of the Sampson Horrice Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the counts of elevated childhood blood lead level of 10-14 µg/dl. The table of the socioeconomic indicators and the counts of 10-14 µg/dl concentration blood lead level, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice State Superfund Site, is shown below.

Table 7.99: Year 2000 Socioeconomic Indicators and 10-14 µg/dl concentration of Blood Lead Levels for Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-Mile Radius

	Sampson Horrice Year 2000 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75217	19.1	14.3	7.1	17.4	19.5	24.3	33.0	3.3	40.4	26
75227	17.2	12.0	6.8	16.9	16.7	18.1	29.8	3.9	36.6	19
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	41.8	5
75180	10.5	7.3	6.2	13.8	27.3	21.0	17.3	2.1	24.8	0
75253	13.1	9.7	6.1	15.9	15.9	5.9	9.0	2.6	25.9	2
75149	6.6	5.7	4.2	10.0	22.4	16.7	18.6	1.2	25.3	5
									Total	**57**

Based on the table, the zip codes that are located within, or that intersect, the 5-mile radius of the Sampson Horrice Site are shown on the left side of the table. The socioeconomic indicators and the counts of children with the elevated blood lead of level 10- 14 µg/dl are shown cross the top of the table. The highlighted values in the table represent estimated values. Explanation on the methodology to estimate these values are in section 7.2.2.

The total unduplicated counts of the elevated childhood blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Superfund Site is of 57. The high counts could be the result of a high percentage of low income families, families below poverty level, and housing units constructed before the Year 1970. In addition, the high counts could be a result of the prospective students being exposed to the leachate from the gravel pit from the Sampson Horrice Site. These sources of lead can result in increased counts of elevated childhood blood lead exposure.

The Spearman Rank Correlation Matrix was utilized to analyze the data due to the data set's distribution that is not normal and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the counts of 10-14 µg/dl concentration blood lead level, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.100: Year 2000 Correlation Matrix of Socioeconomic Indicators and the 10-14 µg/dl BLL Year 2000 for Children that Reside in Zip Codes, Located Within or that Intersect, the Sampson Horrice Site 5-mile Radius.

Variable	Spearman Rank Order Correlations (Samp vs BLL 10-14 2000 ElemMidH) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.83	0.37	0.43	-0.71	0.03	0.09	0.94	0.94	0.52
Percent; Household Income - Less than $10,000	0.83	1.00	0.77	0.83	-0.43	0.37	0.49	0.77	0.77	0.75
Percent; Household Income - $10,000 to $14,999	0.37	0.77	1.00	0.94	0.14	0.71	0.60	0.31	0.20	0.46
Percent; Household Income - $15,000 to $24,999	0.43	0.83	0.94	1.00	-0.09	0.49	0.49	0.37	0.31	0.52
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.71	-0.43	0.14	-0.09	1.00	0.66	0.43	-0.77	-0.77	-0.20
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.03	0.37	0.71	0.49	0.66	1.00	0.83	-0.09	-0.09	0.41
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.09	0.49	0.60	0.49	0.43	0.83	1.00	0.03	0.14	0.78
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.94	0.77	0.31	0.37	-0.77	-0.09	0.03	1.00	0.89	0.46
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.94	0.77	0.20	0.31	-0.77	-0.09	0.14	0.89	1.00	0.67
10--14 ug/dl (Counts) Blood Lead Level	0.52	0.75	0.46	0.52	-0.20	0.41	0.78	0.46	0.67	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of the elevated blood lead level of 10-14 µg/dl , for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there are no significant relationships between the socioeconomic indicators and the elevated childhood blood lead level of 10-14 µg/dl. The no significant relationships could be the result of lead exposed prospective students moving outside of the 5-mile radius of the Sampson Horrice Site.

7.2.6.6 Year 2000 Comparison Analysis for Sampson Horrice Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Levels for Zip Codes Located Greater than the 5-mile Radius of the Sampson Horrice Site.

The purpose of the comparison analysis is to identify trends in the data by comparing the data from the children that reside within zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, with the data from the children that reside within zip codes, located greater than the 5-mile radius of the Sampson Horrice Site. However, no comparison analysis was conducted, for the Year 2000, because there were no significant relationships between the socioeconomic indicators and the counts of 10-14 µg/dl elevated childhood blood lead level, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site.

7.2.6.7 Year 2000 Socioeconomic Indicators and the Total Elevated Childhood Blood Lead Level Counts for Children Residing in Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5 Mile Radius

The purpose of this analysis is determine if a significant relationship exists between the socioeconomic indicators and the total counts of elevated childhood blood lead levels 10-14 µg/dl, 15-19 µg/dl, and => 20 µg/dl, combined. The table depicting the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.101: Year 2000 Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels for Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius.

	Sampson Horrice Year 2000 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75217	19.1	14.3	7.1	17.4	19.5	24.3	33.0	3.3	40.4	37
75227	17.2	12.0	6.8	16.9	16.7	18.1	29.8	3.9	36.6	24
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	41.8	6
75180	10.5	7.3	6.2	13.8	27.3	21.0	17.3	2.1	24.8	2
75253	13.1	9.7	6.1	15.9	15.9	5.9	9.0	2.6	25.9	2
75149	6.6	5.7	4.2	10.0	22.4	16.7	18.6	1.2	25.3	6
									Total	**77**

In the table, the zip codes that are located within, or that intersect, the 5-mile radius of the Sampson Horrice Site are shown on the left side of the table. The socioeconomic indicators and the total counts of elevated childhood blood levels are located across the top of the table. There are a total of 77 unduplicated cases of elevated blood lead levels, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. The high elevated blood lead counts could be due to a high percentage of housing units constructed before the Year 1970 and a high percentage of low income families that are below the poverty level . In addition, the high counts could be a result of residing in close proximity of the Sampson Horrice Site.

The Spearman Rank Correlation Matrix was used to analyze the data due to the low quantity of observations and due to the data set not having a normal distribution. The correlation matrix for the socioeconomic indicators and the total counts of elevated childhood blood lead levels, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

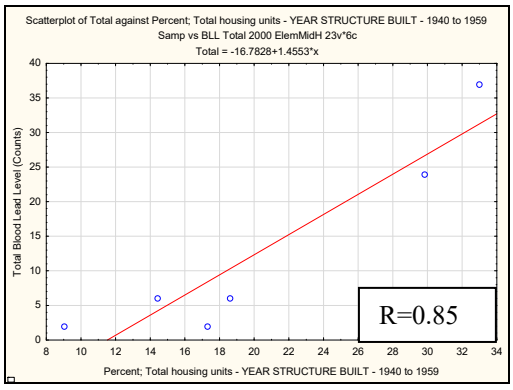
Table 7.102: Year 2000 Sampson Horrice Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Total Counts of Elevated Blood Lead for Children that Reside in Zip Codes, Located Within or that Intersect, the Sampson Horrice Site 5- Mile Radius.

Variable	Spearman Rank Order Correlations (Samp vs BLL Total 2000 ElemMidH) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.83	0.37	0.43	-0.71	0.03	0.09	0.94	0.94	0.50
Percent; Household Income - Less than $10,000	0.83	1.00	0.77	0.83	-0.43	0.37	0.49	0.77	0.77	0.74
Percent; Household Income - $10,000 to $14,999	0.37	0.77	1.00	0.94	0.14	0.71	0.60	0.31	0.20	0.50
Percent; Household Income - $15,000 to $24,999	0.43	0.83	0.94	1.00	-0.09	0.49	0.49	0.37	0.31	0.50
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.71	-0.43	0.14	-0.09	1.00	0.66	0.43	-0.77	-0.77	-0.09
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.03	0.37	0.71	0.49	0.66	1.00	0.83	-0.09	-0.09	0.53
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.09	0.49	0.60	0.49	0.43	0.83	1.00	0.03	0.14	0.85
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.94	0.77	0.31	0.37	-0.77	-0.09	0.03	1.00	0.89	0.44
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.94	0.77	0.20	0.31	-0.77	-0.09	0.14	0.89	1.00	0.62
Total (Counts) of Blood Lead Level	0.50	0.74	0.50	0.50	-0.09	0.53	0.85	0.44	0.62	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of the elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the total counts of elevated childhood blood lead levels and the percentage of housing units built the Year 1940 to Year 1959. Based on the correlation matrix, it seems that there is a link between older housing units that were constructed before the Year 1970, and total counts of elevated childhood blood lead levels, in children that reside in close proximity of the Sampson Horrice Site. In addition, the significant relationship could be result of a high percentage of housing units that were constructed before the Year 1970. The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.144: Year 2000 Sampson Horrice Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels



Based on the above graph, as the percentage of housing units constructed from the Year 1940 to the Year 1959 increase, the number of cases of elevated childhood blood lead level, increases.

7.2.6.8 Year 2000 Sampson Horrice Comparison Analysis for Socioeconomic Indicators and Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes Greater than the 5-mile Radius of the Sampson Horrice Site's 5-mile Radius (Comparison Group).

The purpose of the comparison analysis is to identify trends in the data by comparing the data from the children that reside within zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, with the data from the children that reside within zip codes, located greater than the 5-mile radius of the Sampson Horrice Site. The table of the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in the zip codes that are located greater than the 5-mile radius of the Sampson Horrice Superfund Site, is shown below.

Table 7.103: Year 2000 Comparison Socioeconomic Indicators and Total Counts Blood Lead Levels for Zip Codes Located Greater Than the 5-mile Radius of the Sampson Horrice Superfund Site

	Year 2000 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from Sampson H. Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	4
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	4
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	4
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	4
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	0
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	5
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	8
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	2
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	6
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	4
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	4
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	55

The total counts of elevated childhood blood lead levels are much less, in the table, than the total counts of elevated blood lead levels, for the children that reside in zip codes, located within or that intersect, the Sampson Horrice Site's 5-mile radius. The total counts of elevated childhood blood lead level cases is 55, for children that reside in zip codes located greater than the 5-mile radius of the Sampson Horrice Site, and the total counts of elevated childhood blood lead levels, is 77, for children that reside in zip codes, located within or that intersect, of the Sampson Horrice Site's 5-mile radius. The lower total counts of elevated childhood blood lead levels, for the children that reside in zip codes located greater than the 5-mile radius of the Sampson Horrice Site, might be due to a lower quantity of families below the poverty level, a lower quantity of families with low income, and a lower quantity of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data due to the data set not having a normal data distribution and due to a low quantity of observations. The correlation matrix for the socioeconomic indicators and the total counts of elevated childhood blood lead levels, for children that reside in zip codes located greater than the Sampson Horrice Site's 5 mile radius, is shown below.

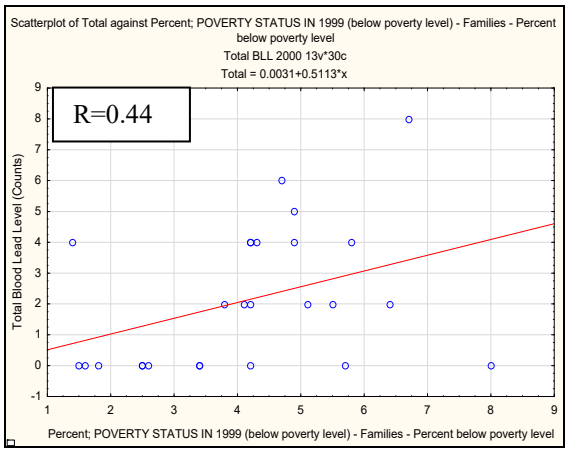
Table 7.104:Year 2000 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes Located Greater than the 5-mile Radius of Sampson Horrice Site.

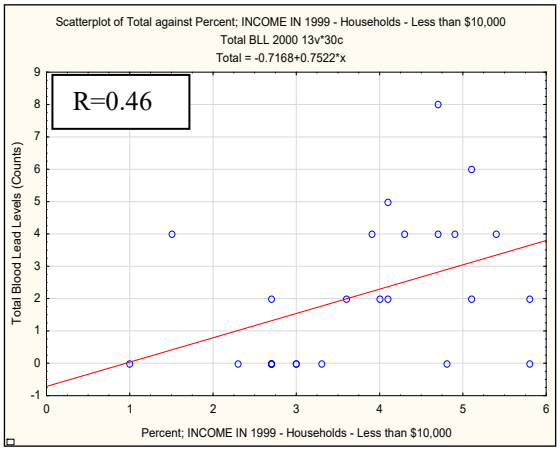
Variable	Spearman Rank Order Correlations (Total BLL 2000) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.44
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.46
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.25
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.49
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.37
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.07
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.43
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.40
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	0.28
Total (Counts) of Blood Lead Level	0.44	0.46	0.25	0.49	0.37	0.07	0.43	0.40	0.28	1.00

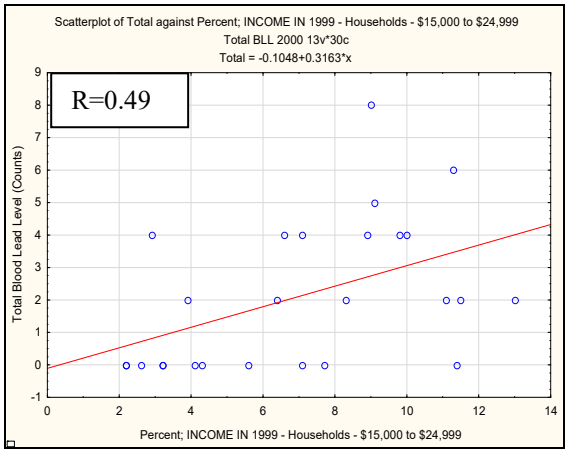
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of the elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site.

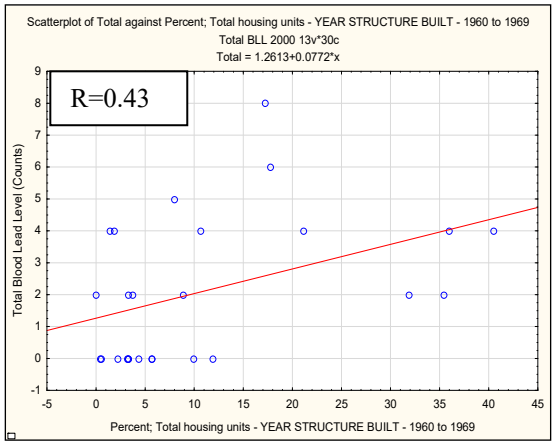
Based upon the correlation matrix, above, there is a weak significant relationship between the total counts of elevated blood lead levels and the percentage of families below poverty level, the percentage of households with income less than $10,000 a year, the percentage of households with income between $ 15,000 to $24,999 per year, the percentage of housing units built the Year 1940 to the Year 1959 and the percentage of housing units built the Year 1960 to the Year 1969. Based on the correlation matrix, it seems that families and households that are below poverty level and that have low income, are more likely to have children that are diagnosed with elevated blood lead levels. This may be due to low income families residing in housing units that were constructed before the Year 1970. The significant relationships are weaker, for the children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site, than the significant relationships for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. This may be a result of a lower percentage of low income households and lower percentage of housing units constructed before the Year 1970, that are located outside of the Sampson Horrice Site's 5-mile radius. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

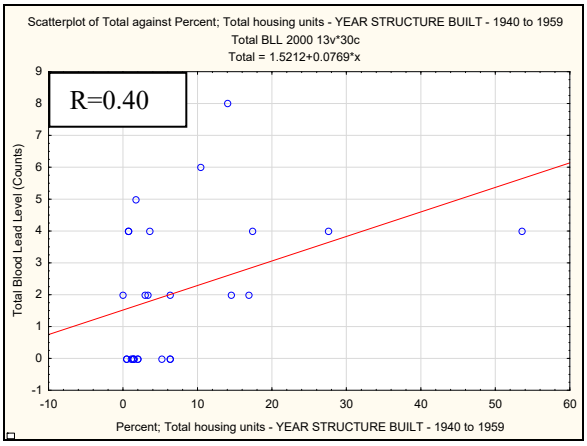
Graph 7.145- Graph 7.149: Year 2000 Sampson Horrice Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels











Based on the graphs above, as the socioeconomic indicators increase, the total cases of elevated childhood blood lead level, increases.

7.2.6.9 Year 2001 Socioeconomic Indicators and the Elevated Childhood Blood Lead Level of 10-14 µg/dl Counts for Children Residing in Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-Mile Radius

The purpose of this analysis is determine if a significant relationship exists between the socioeconomic indicators and the counts of elevated childhood blood lead level of 10-14 µg/dl. The table depicting socioeconomic indicators and the counts of the elevated childhood blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within or that intersect the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.105: Year 2001 Socioeconomic Indicators and the Counts of Elevated Blood Lead Levels of 10-14 µg/dl for Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius.

	Sampson Horrice Year 2001 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units-YEAR BUILT - 1970 to 1979	Percent; Housing Units-YEAR BUILT - 1960 to 1969	Percent; Housing Units-YEAR BUILT - 1940 to 1959	Percent; Housing Units-YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75217	19.1	14.3	7.1	17.4	19.5	24.3	33.0	3.3	40.4	22
75227	17.2	12.0	6.8	16.9	16.7	18.1	29.8	3.9	36.6	18
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	41.8	5
75180	10.5	7.3	6.2	13.8	27.3	21.0	17.3	2.1	24.8	5
75253	13.1	9.7	6.1	15.9	15.9	5.9	9.0	2.6	25.9	2
75149	6.6	5.7	4.2	10.0	22.4	16.7	18.6	1.2	25.3	2
									Total	**54**

The zip codes that are located within, or that intersect, the 5-mile radius of the Sampson Horrice Site are listed on the left side of the table. The socioeconomic indicators and the counts of children with the elevated blood lead of level 10-14 µg/dl are shown across the top of the table. The highlighted numeric values represent estimated values. Further information on the estimation process is explained in Section 7.2.2.

Based on the table, above, there are a total of 54 unduplicated cases of the elevated childhood blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within the 5-mile radius of the Sampson Horrice Site. The high quantity of unduplicated cases of elevated blood lead, could a result of low income families moving into cheap housing units that were constructed before the Year 1970, as well as, the close proximity the children reside to the Sampson Horrice Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data set's non-normal distribution and due to the low number of observations. The correlation matrix for the socioeconomic indicators and the childhood elevated blood lead level of 10 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

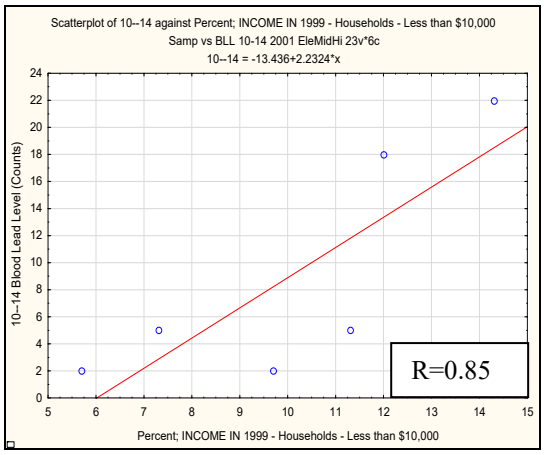
Table 7.106: Year 2001 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10- 14 µg/dl for Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius.

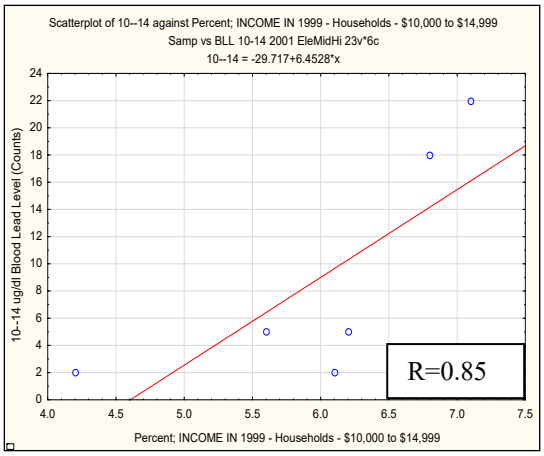
	Spearman Rank Order Correlations (Samp vs BLL 10-14 2001 EleMidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household- No Husband- with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.83	0.37	0.43	-0.71	0.03	0.09	0.94	0.94	0.62
Percent; Household Income - Less than $10,000	0.83	1.00	0.77	0.83	-0.43	0.37	0.49	0.77	0.77	0.85
Percent; Household Income - $10,000 to $14,999	0.37	0.77	1.00	0.94	0.14	0.71	0.60	0.31	0.20	0.85
Percent; Household Income - $15,000 to $24,999	0.43	0.83	0.94	1.00	-0.09	0.49	0.49	0.37	0.31	0.74
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.71	-0.43	0.14	-0.09	1.00	0.66	0.43	-0.77	-0.77	0.03
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.03	0.37	0.71	0.49	0.66	1.00	0.83	-0.09	-0.09	0.77
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.09	0.49	0.60	0.49	0.43	0.83	1.00	0.03	0.14	0.74
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.94	0.77	0.31	0.37	-0.77	-0.09	0.03	1.00	0.89	0.56
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.94	0.77	0.20	0.31	-0.77	-0.09	0.14	0.89	1.00	0.50
10--14 ug/dl (Counts) Blood Lead Level	0.62	0.85	0.85	0.74	0.03	0.77	0.74	0.56	0.50	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of the elevated blood lead level of 10-14µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the counts of the elevated blood lead level of 10-14 µg/dl and percentage of households with income less than $10,000 a year, and the percentage households with income between $10,000 per year to $14,999 per year. Based on the correlation matrix, it seems that low income households are more likely to have children that are diagnosed with elevated blood lead. This may be due to families residing in housing units that are older and cheaper, resulting in indoor lead exposure, as well as, the effects of residing in close proximity to the Sampson Horrice Superfund site. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.150- Graph 7.151: Year 2001 Sampson Horrice Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl





Based on the above graphs as the percentage of households with low income, increase, the counts, of elevated childhood blood lead level cases, increase.

7.2.6.10 Year 2001 Comparison Analysis for Sampson Horrice Socioeconomic Indicators and Counts of Elevated Childhood Blood Lead Level of 10-14 for Zip Codes Located Greater than the 5- mile Radius of the Sampson Horrice Site (Comparison Group).

The purpose of the comparison analysis is to identify trends in the data by comparing the data from the children that reside within zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, with the data from the children that reside within zip codes, located greater than the 5-mile radius of the Sampson Horrice Site. The table of the socioeconomic indicators and the counts of the elevated blood lead level of 10-14 µg/dl, for children that reside in the zip codes, located greater than the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.107: Year 2001 Comparison Socioeconomic Indicators and Counts Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater Than the 5- mile Radius of the Sampson Horrice Superfund Site.

	Year 2001 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from Sampson H. Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	0
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	2
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	2
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	10
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	2
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	2
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	0
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	0
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	2
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	6
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	40

The zip codes located greater than the 5- mile radius of the Sampson Horrice Site are listed along the left side of the table and the socioeconomic indicators and the counts of elevated childhood blood lead level of 10-14 µg/dl are shown cross the top of the table. The highlighted values in the table represent estimated values, to represent "<5" values given in the original data set. More information on the estimation process is located in Section 7.2.2.

Based on the table, there are much lower counts of the elevated childhood blood lead level of 10-14 µg/dl, than the counts of the elevated childhood elevated blood lead level of 10-14 µg/dl for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. The unduplicated counts of childhood elevated blood lead level of 10-14 µg/dl, is 40, in the table, and the unduplicated counts of childhood elevated blood lead level of 10-14 µg/dl, is 54, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. The reason there are fewer counts of elevated childhood blood lead of level of 10-14 µg/dl, for children that reside in zip codes located greater than the 5-mile radius of the Sampson Horrice Site, could be due to a lower percentage of low income families and housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data set not having a normal distribution and due to the low quantity of observations. The correlation matrix for the socioeconomic indicators and the counts of the elevated

childhood blood lead level of 10-14 µg/dl, for children that reside in zip codes, located greater than the Sampson Horrice Site's 5-mile radius, is shown below.

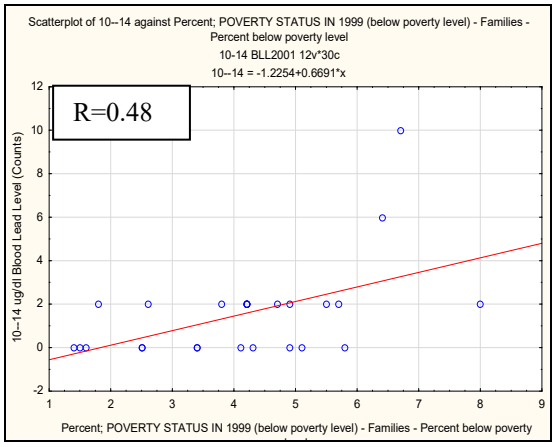
Table 7.108:Year 2001 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Counts of Elevated Blood Lead Levels of 10-14 µg/dl for the Zip Codes Located Greater than the Sampson Horrice Site's 5-mile Radius.

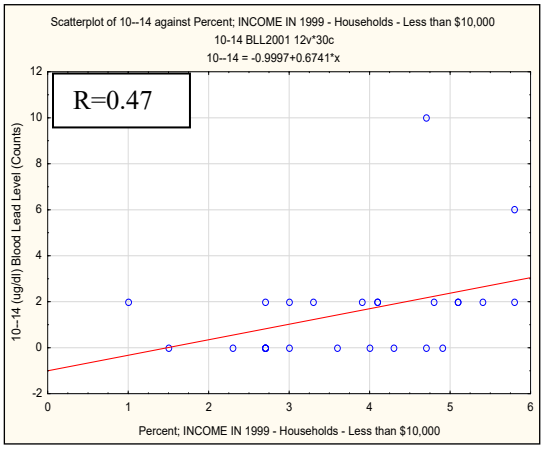
	Spearman Rank Order Correlations (10-14 BLL2001) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.48
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.47
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.12
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.59
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.35
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.33
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.29
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.23
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	-0.10
10--14 ug/dl (Counts) Blood Lead Level	0.48	0.47	0.12	0.59	0.35	0.33	0.29	0.23	-0.10	1.00

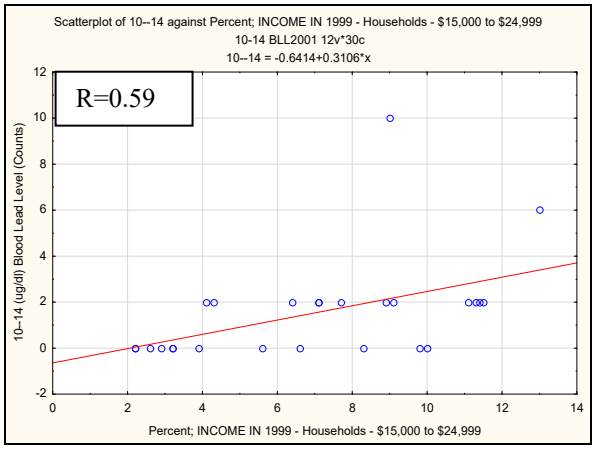
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of the elevated blood lead level of 10-14µg/dl, for children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there is a weak to moderate significant relationship between the counts of the elevated blood lead level of 10-14 µg/dl and percentage of families below poverty level, the percentage of households with income less than $10,000 a year, and the percentage of households with income between $10,000 to $15,000 a year. Based on the correlation matrix, it seems that families and households that are below poverty and that have extremely low income, are more likely to have children that are diagnosed with elevated blood lead. The significant relationships, for the children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site, are much weaker than the significant relationships, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. The plots of the significant bivariate regressions are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.152- Graph 7.154: Year 2001 Sampson Horrice Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl







Based on the graphs, above, as the percentage of families below poverty level, and percentage of households with low income, increase, the counts of elevated childhood blood lead level of 10-14 µg/dl, increases.

7.2.6.11 Year 2001 Socioeconomic Indicators and the Total Elevated Childhood Blood Lead Level Counts for Children Residing in Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the total counts of childhood blood lead levels for all 3 blood levels; 10-14 µg/dl, 15-19 µg/dl and >= 20 µg/dl, combined. The table of the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.109: Year 2001 Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels for Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius.

	Sampson Horrice Year 2001 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75217	19.1	14.3	7.1	17.4	19.5	24.3	33.0	3.3	40.4	28
75227	17.2	12.0	6.8	16.9	16.7	18.1	29.8	3.9	36.6	22
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	41.8	6
75180	10.5	7.3	6.2	13.8	27.3	21.0	17.3	2.1	24.8	6
75253	13.1	9.7	6.1	15.9	15.9	5.9	9.0	2.6	25.9	4
75149	6.6	5.7	4.2	10.0	22.4	16.7	18.6	1.2	25.3	4
									Total	**70**

In the table above, the zip codes that are located within the Sampson Horrice Site's 5-mile radius are listed on the left side, of the table. The socioeconomic indicators and the total counts of childhood elevated blood lead cases are located across the top of the table. The highlighted numeric values were estimated. Further explanation of the estimation processes is expounded upon in Section 7.2.2.

There are a total of 70 total unduplicated cases of elevated childhood blood lead, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. The high counts could be due to low income families moving into cheap housing units, that were constructed before the Year 1970. In addition, children could have been exposed to the leachate from the gravel pit that illegally accepted hazardous and solid waste of the Sampson Horrice Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data set not having a normal distribution and due to a low number of observations. The correlation matrix of the socioeconomic indicators and the total counts of childhood elevated blood lead levels, for the children that reside within zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

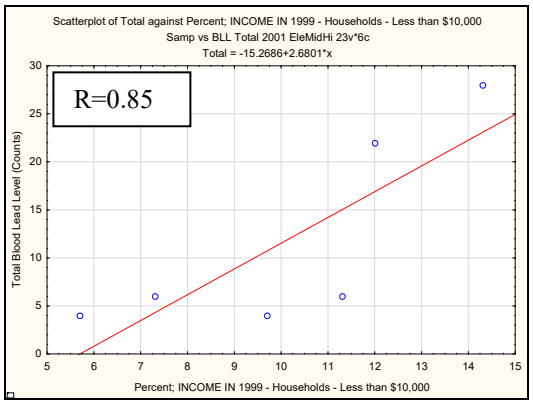
Table 7.110: Year 2001 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for the Zip Codes, Located Within or that Intersect, the 5-mile Radius of the Sampson Horrice Site.

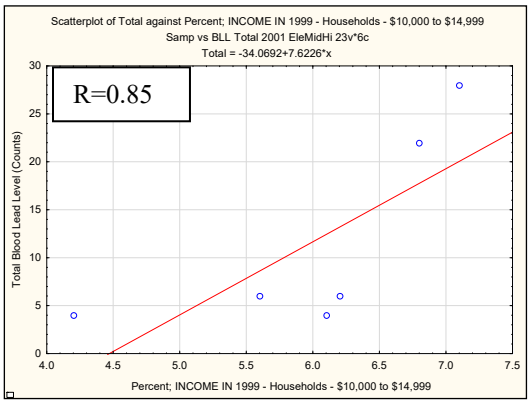
Variable	Spearman Rank Order Correlations (Samp vs BLL Total 2001 EleMidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.83	0.37	0.43	-0.71	0.03	0.09	0.94	0.94	0.62
Percent; Household Income - Less than $10,000	0.83	1.00	0.77	0.83	-0.43	0.37	0.49	0.77	0.77	0.85
Percent; Household Income - $10,000 to $14,999	0.37	0.77	1.00	0.94	0.14	0.71	0.60	0.31	0.20	0.85
Percent; Household Income - $15,000 to $24,999	0.43	0.83	0.94	1.00	-0.09	0.49	0.49	0.37	0.31	0.74
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.71	-0.43	0.14	-0.09	1.00	0.66	0.43	-0.77	-0.77	0.03
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.03	0.37	0.71	0.49	0.66	1.00	0.83	-0.09	-0.09	0.77
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.09	0.49	0.60	0.49	0.43	0.83	1.00	0.03	0.14	0.74
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.94	0.77	0.31	0.37	-0.77	-0.09	0.03	1.00	0.89	0.56
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.94	0.77	0.20	0.31	-0.77	-0.09	0.14	0.89	1.00	0.50
Total (Counts) of Blood Lead Level	0.62	0.85	0.85	0.74	0.03	0.77	0.74	0.56	0.50	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of the elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the total counts of elevated blood lead levels and the percentage of households with income less than $10,000 per year and the percentage of households with income from $10,000 per year to $ 14,999 per year. Based on the correlation matrix, it seems that households that have extremely low income are more likely to have children that are diagnosed with elevated blood lead. This may be due to low income families residing in older housing units, that resulted in indoor lead exposure, as well as, the effects of residing in close proximity to the Sampson Horrice Superfund site. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.155- Graph 7.156: Year 2001 Sampson Horrice Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels





Based on the above graphs, as the percentage of low income households, increase, the greater the numbers of cases of childhood elevated blood lead.

7.2.6.12 Year 2001 Comparison Analysis for Sampson Horrice Socioeconomic Indicators and Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes Located Greater than the 5-mile Radius of the Sampson Horrice Site.

The purpose of the comparison analysis is to identify trends in the data by comparing the data from the children that reside within zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, with the data from the children that reside within zip codes, located greater than the 5-mile radius of the Sampson Horrice Site. The table of the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in the zip codes that are located greater than the 5-mile radius of the Sampson Horrice Superfund Site, is shown below.

Table 7.111: Year 2001 Comparison Socioeconomic Indicators and Total Counts Blood Lead Levels for Zip Codes Located Greater Than the 5-mile Radius of the Sampson Horrice Superfund Site

	Year 2001 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from Sampson H.Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	4
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	4
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	10
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	2
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	4
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	4
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	2
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	0
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	4
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	7
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	55

The zip codes that are located greater than the 5-mile radius of the Sampson Horrice Site are listed on the left side of the table. The socioeconomic indicators and the total counts of elevated blood lead levels are shown across the top of the table. The highlighted numeric values in the table represented estimated values. The estimation methodology is explained further in Section 7.2.2.

The total counts of elevated childhood blood lead levels, in the table, are lower than the total counts of elevated childhood blood lead levels, for the children that reside in the zip codes, located within or that intersect, Sampson Horrice Site's 5-mile radius. The total counts of elevated childhood blood lead levels, for children that reside in zip codes greater than the 5- mile radius of the Sampson Horrice Site, is 55 and the total counts of elevated childhood blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is 70. The total counts of elevated childhood blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site, may be lower due to a lower percentage households and a lower percentage of older housing units, located outside of the Sampson Horrice Site's 5-mile radius.

The Spearman Rank correlation matrix was used to analyze the data, due to the data set not having a normal distribution and due to the low number of observations. The correlation matrix for the socioeconomic indicators and the total counts of childhood elevated blood lead levels, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

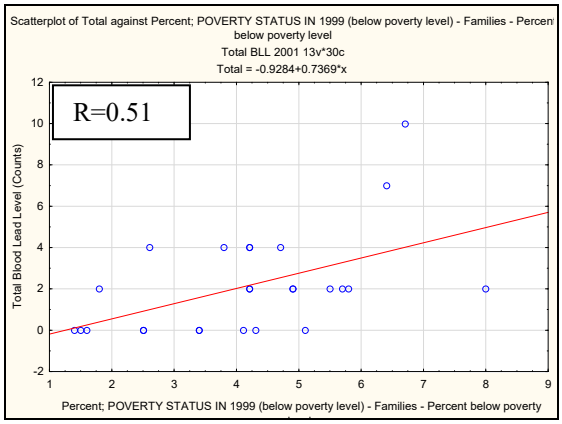
Table 7.112:Year 2001 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes Located Greater than the 5- Mile Radius of the Sampson Horrice Site.

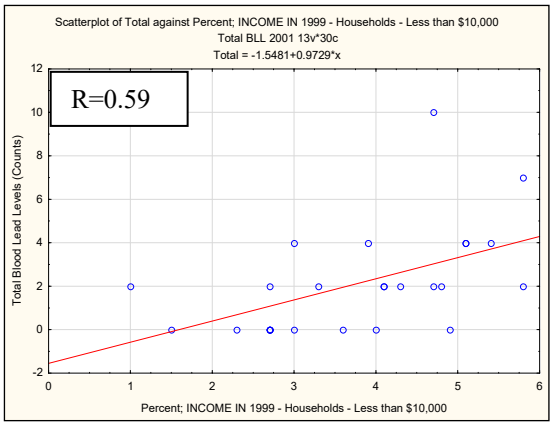
	Spearman Rank Order Correlations (Total BLL 2001) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.51
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.59
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.18
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.67
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.32
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.32
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.43
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.41
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	0.11
Total (Counts) of Blood Lead Level	0.51	0.59	0.18	0.67	0.32	0.32	0.43	0.41	0.11	1.00

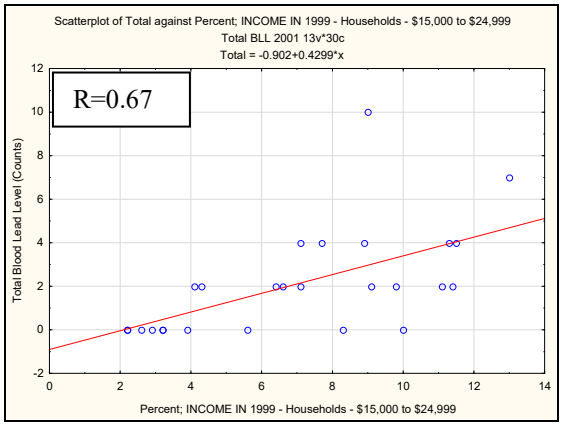
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of the elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site.

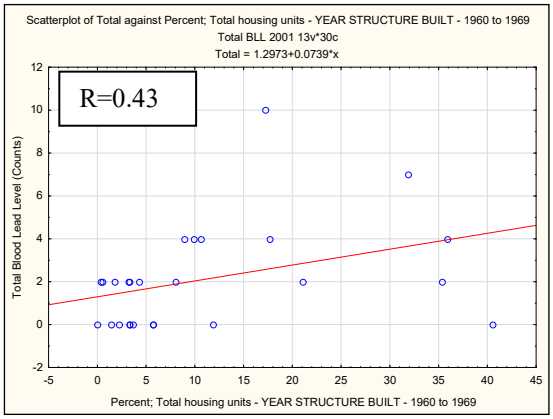
Based upon the correlation matrix, above, there is a weak to moderate significant relationship between the total counts of the elevated blood lead levels and the percentage of families below poverty level, the percentage of households with income less than $10,000 a year, the percentage of households with income between $15,000 to $24,999 per year, the percentage of housing units built the Year 1940 to the Year 1959, and the percentage of households constructed from the Year 1960 to the Year 1969. Based on the correlation matrix, it seems that families and households that have extremely low income and that are below poverty level, are more likely to have children that are diagnosed with elevated blood lead. This may be the result of low income families residing in housing units constructed before the Year 1970. In addition, the significant relationships for the children that reside in zip codes, located greater than the 5- mile radius of the Sampson Horrice Site are much weaker, than the significant relationships for the children that reside in zip codes, located within or that intersect, the 5 mile radius of the Sampson Horrice Site. This may be due to a lower percentage of low income families and housing units constructed before the Year 1970, located outside of the Sampson Horrice Site's 5-mile radius. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

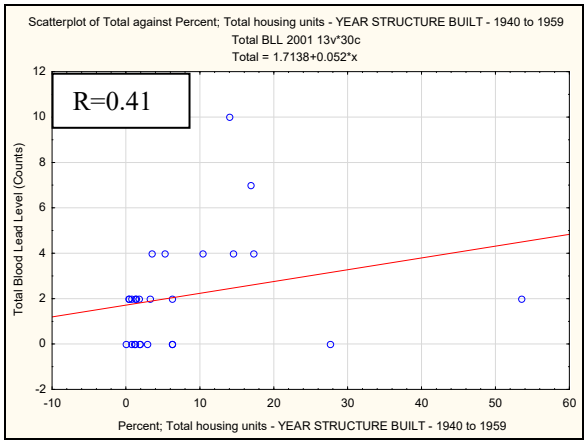
Graph 7.157- Graph 7.161: Year 2001 Sampson Horrice Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels











Based on the graphs, above, as the percentage of socioeconomic indicators increase, the total counts of elevated childhood blood lead levels, increase.

7.2.6.13 Year 2002 Socioeconomic Indicators and the Elevated Childhood Blood Lead Level of 10-14 µg/dl Counts for Children Residing in Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-Mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the counts of the elevated childhood blood lead level of 10-14 µg/dl. The table of the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.113: Year 2002 Socioeconomic Indicators and Counts of Elevated Blood Lead Levels of 10-14 µg/dl for Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius.

	Sampson Horrice Year 2002 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75217	19.1	14.3	7.1	17.4	19.5	24.3	33.0	3.3	40.4	43
75227	17.2	12.0	6.8	16.9	16.7	18.1	29.8	3.9	36.6	25
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	41.8	4
75180	10.5	7.3	6.2	13.8	27.3	21.0	17.3	2.1	24.8	5
75253	13.1	9.7	6.1	15.9	15.9	5.9	9.0	2.6	25.9	8
75149	6.6	5.7	4.2	10.0	22.4	16.7	18.6	1.2	25.3	4
									Total	**89**

Based on the table above, there are a total of 89 unduplicated cases of the elevated childhood blood lead level of 10-14 µg/dl. The high counts may be due to a high percentage of low income families residing within cheap housing units that were constructed before the Year 1970. The high counts of the elevated childhood blood level of 10-14 µg/dl could also be a result of exposure the leachate from the gravel pit of the Sampson Horrice Site.

The Spearman Rank Correlation Matrix was used to analyze the data, due the data set's distribution not being normal and due to the low number of observations. The correlation matrix for the socioeconomic indicators and the childhood elevated blood lead level of 10 µg/dl, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

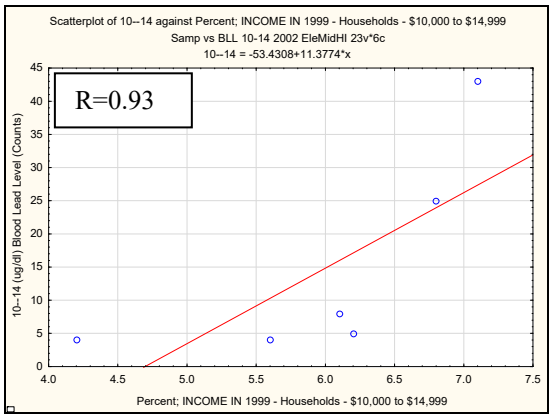
Table 7.114: Year 2002 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10- 14 µg/dl for Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius

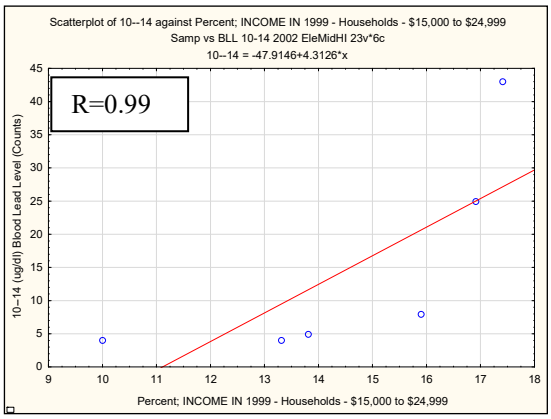
Variable	Spearman Rank Order Correlations (Samp vs BLL 10-14 2002 EleMidHl) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.83	0.37	0.43	-0.71	0.03	0.09	0.94	0.94	0.29
Percent; Household Income - Less than $10,000	0.83	1.00	0.77	0.83	-0.43	0.37	0.49	0.77	0.77	0.75
Percent; Household Income - $10,000 to $14,999	0.37	0.77	1.00	0.94	0.14	0.71	0.60	0.31	0.20	0.93
Percent; Household Income - $15,000 to $24,999	0.43	0.83	0.94	1.00	-0.09	0.49	0.49	0.37	0.31	0.99
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.71	-0.43	0.14	-0.09	1.00	0.66	0.43	-0.77	-0.77	0.03
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.03	0.37	0.71	0.49	0.66	1.00	0.83	-0.09	-0.09	0.52
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.09	0.49	0.60	0.49	0.43	0.83	1.00	0.03	0.14	0.55
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.94	0.77	0.31	0.37	-0.77	-0.09	0.03	1.00	0.89	0.23
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.94	0.77	0.20	0.31	-0.77	-0.09	0.14	0.89	1.00	0.20
10--14 ug/dl (Counts) Blood Lead Level	0.29	0.75	0.93	0.99	0.03	0.52	0.55	0.23	0.20	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of the elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the counts of the elevated blood lead level of 10-14 µg/dl and percentage of households with income between $10,000 to $14,999 per year, and the percentage of households with income from $15,000 per year to the Year $24,999 per year. Based on the correlation matrix, it seems that households that have an extremely low income, are more likely to have children that are diagnosed with elevated blood lead. This may be due to low income families, residing in housing units that were constructed before the Year 1970, as well as, residing in close proximity to the Sampson Horrice Superfund Site. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.162- Graph 7.163: Year 2002 Sampson Horrice Plots of Significant Relationships between the Socioeconomic Indicators vs. the of Elevated Blood Lead Level 10-14 µg/dl





Based on the above graphs, as the percentage of households with low income increases, the greater the numbers of cases of childhood blood lead level diagnoses.

7.2.6.14 Year 2002 Comparison Analysis for Sampson Horrice Socioeconomic Indicators and Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater than the 5-mile Radius of the Sampson Horrice Site. (Comparison Group)

The purpose of the comparison analysis is to identify trends in the data by comparing the data from the children that reside within zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, with the data from the children that reside within zip codes, located greater than the 5-mile radius of the Sampson Horrice Site. The table of the socioeconomic indicators and the counts of the elevated blood lead level of 10-14 µg/dl, for children that reside in the zip codes that are located greater than the 5-mile radius of the Sampson Horrice Superfund Site, is shown below.

Table 7.115:Year 2002 Comparison Socioeconomic Indicators and Counts Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater Than the 5-mile Radiu of the Sampson Horrice Superfund Site

	Year 2002 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from Sampson H. Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	2
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	2
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	3
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	0
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75125	8.5	6.4	4.8	12.0	18.8	11.8	11.4	9.5	9.4	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	2
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	6
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	8
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	3
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	4
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	2
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	6
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	54

The zip codes that located greater than the 5-mile radius of the Sampson Horrice Site are shown on the left side of the table. The socioeconomic indictors and the counts of elevated childhood blood lead level of 10-14 µg/dl are shown cross the top of the table. The highlighted values in the table are estimated values that replaced the "<5" values, given in the original data set. Additional information on the estimation process is in Section 7.2.2.

The counts of elevated childhood blood lead level of 10-14 µg/dl are much less, than the 10-14 µg/dl counts, for the children that reside in the zip codes, located within or that intersect, the Sampson Horrice Site's 5-mile radius. The unduplicated counts of elevated childhood blood lead of level 10-14 µg/dl, is 54, in the table, and the unduplicated counts of elevated childhood blood lead of level 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the Sampson Horrice Site's 5-mile radius is 89. The reason the cases of elevated childhood blood lead are much lower, for the children that reside in zip codes located greater than the Sampson Horrice Site's 5-mile radius, could be due to a lower percentage of low income families and a low percentage of housing units constructed before the Year 1970, located outside of the Sampson Horrice Site's 5-mile radius.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data distribution of the data set not being normal and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the counts of childhood

elevated blood lead level of 10-14 µg/dl, for the children that reside in zip codes located greater than the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.116: Year 2002 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater than the 5-mile Radius of the Sampson Horrice Site.

	Spearman Rank Order Correlations (10-14 BLL 2002) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.79	0.48	0.75	0.68	0.19	0.39	0.37	0.13	0.29
Percent; Household Income - Less than $10,000	0.79	1.00	0.57	0.83	0.60	0.19	0.53	0.51	0.24	0.41
Percent; Household Income - $10,000 to $14,999	0.48	0.57	1.00	0.56	0.16	0.29	0.75	0.78	0.54	0.25
Percent; Household Income - $15,000 to $24,999	0.75	0.83	0.56	1.00	0.49	0.24	0.65	0.60	0.23	0.48
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.60	0.16	0.49	1.00	-0.05	0.14	0.03	-0.04	0.17
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.19	0.19	0.29	0.24	-0.05	1.00	0.49	0.19	-0.10	0.27
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.39	0.53	0.75	0.65	0.14	0.49	1.00	0.87	0.36	0.43
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.37	0.51	0.78	0.60	0.03	0.19	0.87	1.00	0.68	0.40
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.13	0.24	0.54	0.23	-0.04	-0.10	0.36	0.68	1.00	0.19
10--14 ug/dl (Counts) Blood Lead Level	0.29	0.41	0.25	0.48	0.17	0.27	0.43	0.40	0.19	1.00

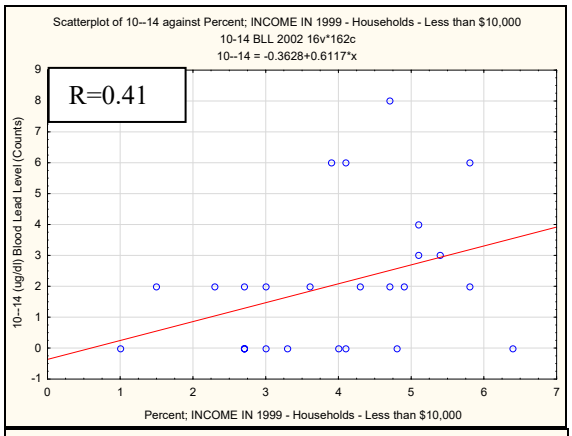
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of the elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site.

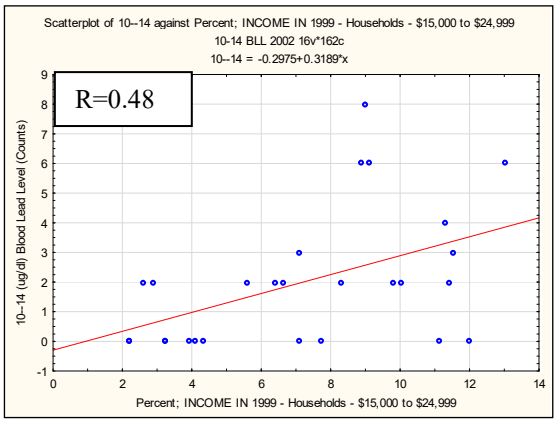
Based upon the correlation matrix, above, there is a weak significant relationship between the counts of the elevated blood lead level of 10-14 µg/dl and the percentage of households with income less than $10,000 a year, the percentage of households with income between $15,000 to $14,999 per year, the percentage of housing units built the Year 1940 to the Year 1959, and the housing units built between the Year 1960 to the Year 1969. These significant relationships are weaker than the significant relationships, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. This may be due to a lower percentage of low income families and a lower percentage of housing units constructed before the Year 1970, located outside the 5-mile radius of the Sampson Horrice Site.

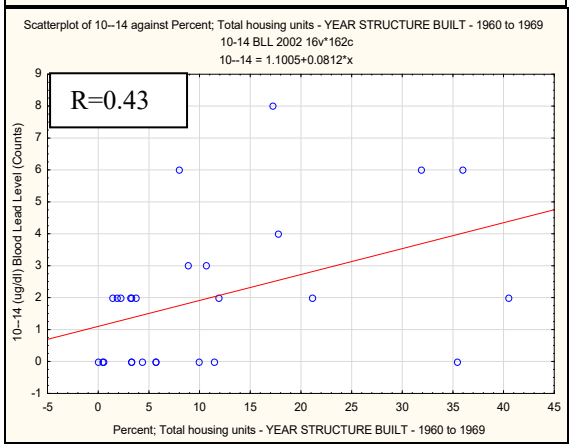
Based on the correlation matrix, it seems that households that have extremely low income and housing units that were constructed before the Year 1970, are more likely to have children that are diagnosed with elevated blood lead. This may be the result of low income families, residing in older housing units, thus making exposure to indoor lead a direct source of lead exposure. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the

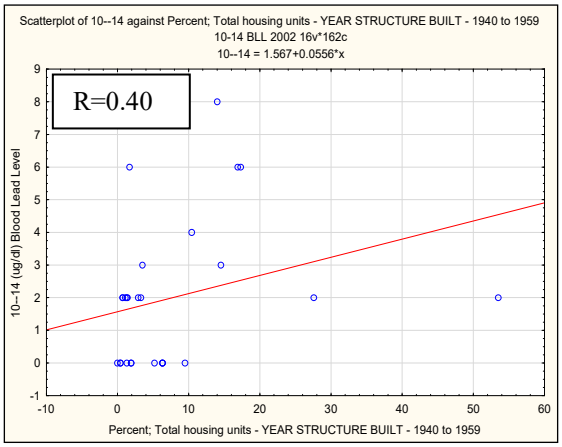
significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.164- Graph 7.167: Year 2002 Sampson Horrice Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the of Elevated Blood Lead Level 10-14 µg/dl









Based on the graphs above, as the percentage of households with income less than $10,000 per year, the percentage of households with income between $15,000 per year and $24,000 per year, the percentage of housing units constructed from the Year 1960 to the Year 1969, and the percentage of housing units constructed from the Year 1940 to the Year 1959, increase, the counts of the elevated blood lead level of 10-14 µg/dl, increase.

7.2.6.15 Year 2002 Socioeconomic Indicators and the Total Counts of Elevated Childhood Blood Lead Levels for Children Residing in Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the total counts of elevated childhood blood lead levels for all three blood lead concentrations, combined. The table of the socioeconomic indicators and the total counts of elevated blood lead levels, for the children that reside in zip codes,

located within or that intersect, the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.117: Year 2002 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes, Located Within or that Intersect, the Sampson Horrice Site's 5-mile Radius.

	Sampson Horrice Year 2002 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75217	19.1	14.3	7.1	17.4	19.5	24.3	33.0	3.3	40.4	63
75227	17.2	12.0	6.8	16.9	16.7	18.1	29.8	3.9	36.6	35
75204	22.5	11.3	5.6	13.3	11.6	10.3	14.4	8.7	41.8	9
75180	10.5	7.3	6.2	13.8	27.3	21.0	17.3	2.1	24.8	10
75253	13.1	9.7	6.1	15.9	15.9	5.9	9.0	2.6	25.9	13
75149	6.6	5.7	4.2	10.0	22.4	16.7	18.6	1.2	25.3	6
									Total	**136**

The zip codes that are located within the Sampson Horrice Site's 5-mile radius are listed on the left side of the table. The socioeconomic indicators and the total unduplicated counts of elevated childhood blood lead level are shown cross the top of the table.

Based on the table above, there is a large quantity of total counts of childhood elevated blood lead cases in children that reside in close proximity of the Sampson Horrice Site. The total unduplicated counts of elevated childhood blood lead levels is 136. The high counts could be a result of a high percentage of low income families residing in housing units constructed before the Year 1970. In addition, children could have been exposed to the leachate of the gravel pit of the Sampson Horrice Site.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data set not having a normal distribution and due to a low quantity of observations. The correlation matrix for the socioeconomic indicators and the total counts of childhood elevated blood lead levels, is shown below.

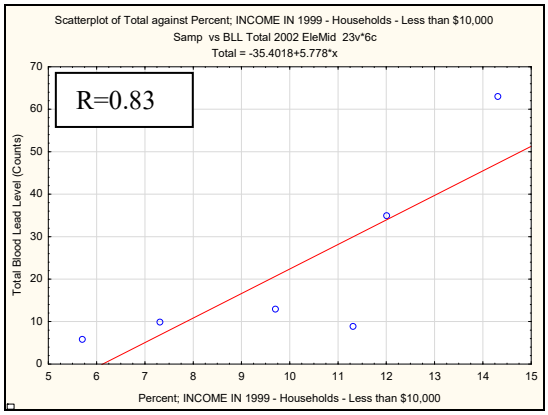
Table 7.118:Year 2002 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Total Counts of Elevated Blood Lead Level Zip Codes, Located Within or that Intersect, the 5-mile Radius of the Sampson Horrice Site.

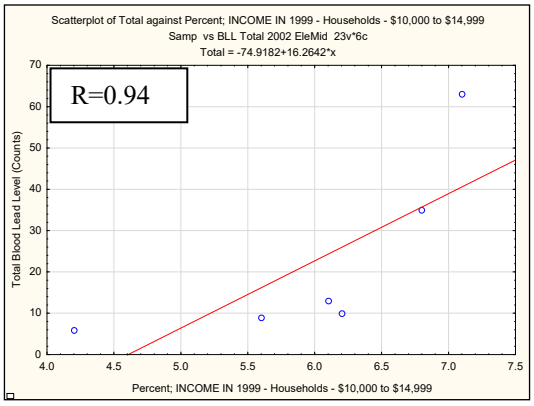
	Spearman Rank Order Correlations (Samp vs BLL Total 2002 EleMid) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.83	0.37	0.43	-0.71	0.03	0.09	0.94	0.94	0.43
Percent; Household Income - Less than $10,000	0.83	1.00	0.77	0.83	-0.43	0.37	0.49	0.77	0.77	0.83
Percent; Household Income - $10,000 to $14,999	0.37	0.77	1.00	0.94	0.14	0.71	0.60	0.31	0.20	0.94
Percent; Household Income - $15,000 to $24,999	0.43	0.83	0.94	1.00	-0.09	0.49	0.49	0.37	0.31	1.00
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.71	-0.43	0.14	-0.09	1.00	0.66	0.43	-0.77	-0.77	-0.09
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.03	0.37	0.71	0.49	0.66	1.00	0.83	-0.09	-0.09	0.49
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.09	0.49	0.60	0.49	0.43	0.83	1.00	0.03	0.14	0.49
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.94	0.77	0.31	0.37	-0.77	-0.09	0.03	1.00	0.89	0.37
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.94	0.77	0.20	0.31	-0.77	-0.09	0.14	0.89	1.00	0.31
Total (Counts) of Blood Lead Level	0.43	0.83	0.94	1.00	-0.09	0.49	0.49	0.37	0.31	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of the elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the total counts of elevated blood lead levels and the percentage of households with income less than $10,000 per year and the percentage of households with income from $10,000 per year to $14,999. Based on the correlation matrix, it seems that there is a direct link of households with low income and total cases of elevated childhood blood lead level. These families could reside in housing units that were constructed before the Year 1970 and could have been exposed in indoor lead based paint. In addition, the children could have been exposed to the leachate from the Sampson Horrice Site. The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.168- Graph 7.169: Year 2002 Sampson Horrice Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels





Based on the above graphs above, as the percentage of households with low income increases, the total counts of elevated childhood blood lead level, increases. As previously stated, the cases of elevated childhood blood lead could be due to indoor lead exposure, as well as, close proximity of the Sampson Horrice Site.

7.2.6.16 Year 2002 Comparison Analysis for Sampson Horrice Socioeconomic Indicators and the Total Counts of Elevated Childhood Blood Lead Level for Zip Codes Located Greater than the 5-mile Radius of the Sampson Horrice Site (Comparison Group).

The purpose of the comparison analysis is to identify trends in the data by comparing the data from the children that reside within zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, with the data from the children that reside within zip codes, located greater than the 5-mile radius of the Sampson Horrice Site. The table of the socioeconomic indicators and the total counts of elevated blood lead levels for children that reside in the zip codes that are located greater than the 5-mile radius of the Sampson Horrice Superfund Site, is shown below.

Table 7.119: Year 2002 Comparison of Socioeconomic Indicators and the Total Counts Blood Lead Levels for Zip Codes Located Greater Than the 5- mile Radius of the Sampson Horrice Superfund Site

	Year 2002 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from Sampson H. Site									
Zip	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	4
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	4
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	2
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	4
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	5
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	4
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75125	8.5	6.4	4.8	12.0	18.8	11.8	11.4	9.5	9.4	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	2
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	9
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	11
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	5
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	8
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	4
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	11
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	89

The zip codes, that are located greater than the 5-mile radius of the Sampson Horrice Site are shown along the left side of the table and the socioeconomic indicators and the total counts of elevated childhood blood lead levels are shown across the top of the table. The highlighted values are estimated values. Further information on the estimation methodology, please refer to Section 7.2.2.

The total unduplicated counts of elevated childhood blood lead levels for children that reside in zip codes located greater than the 5-mile radius of the Sampson Horrice Site is

89. These unduplicated counts are much less, than the total counts in the zip codes, located within or that intersect, the Sampson Horrice Site's 5-mile radius. The total unduplicated counts of elevated childhood blood lead are 136 for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. The low total counts of elevated childhood blood lead levels for children that reside in zip codes located greater than the 5-mile radius of the Sampson Horrice Site, may be due to lower percentages of low income families living in housing units constructed before the Year 1970 and due to the children not being impacted by the Sampson Horrice Site.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the low number of observations and due to the data set not having a normal distribution. The correlation matrix for the socioeconomic indicators and the total counts of elevated childhood blood lead levels, for children from the age of 0 to 14yrs. that reside in zip codes located greater than the Sampson Horrice Site's 5-mile radius, is shown below.
Table 7.120: Year 2002 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes Located Greater than the 5- mile Radius of the Sampson Horrice Site.

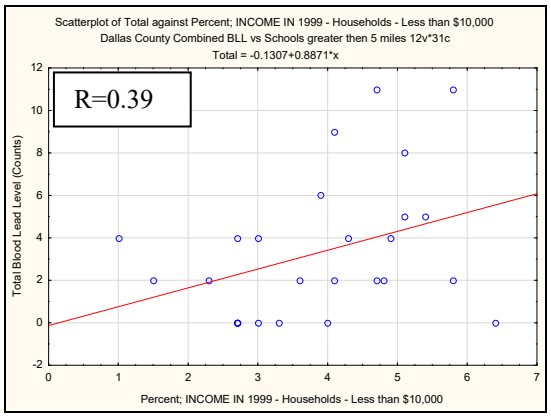
	Spearman Rank Order Correlations (Total BLL 2002) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.79	0.48	0.75	0.68	0.19	0.39	0.37	0.13	0.30
Percent; Household Income - Less than $10,000	0.79	1.00	0.57	0.83	0.60	0.19	0.53	0.51	0.24	0.39
Percent; Household Income - $10,000 to $14,999	0.48	0.57	1.00	0.56	0.16	0.29	0.75	0.78	0.54	0.17
Percent; Household Income - $15,000 to $24,999	0.75	0.83	0.56	1.00	0.49	0.24	0.65	0.60	0.23	0.52
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.60	0.16	0.49	1.00	-0.05	0.14	0.03	-0.04	0.17
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.19	0.19	0.29	0.24	-0.05	1.00	0.49	0.19	-0.10	0.34
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.39	0.53	0.75	0.65	0.14	0.49	1.00	0.87	0.36	0.44
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.37	0.51	0.78	0.60	0.03	0.19	0.87	1.00	0.68	0.32
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.13	0.24	0.54	0.23	-0.04	-0.10	0.36	0.68	1.00	-0.02
Total (Counts) of Blood Lead Level	0.30	0.39	0.17	0.52	0.17	0.34	0.44	0.32	-0.02	1.00

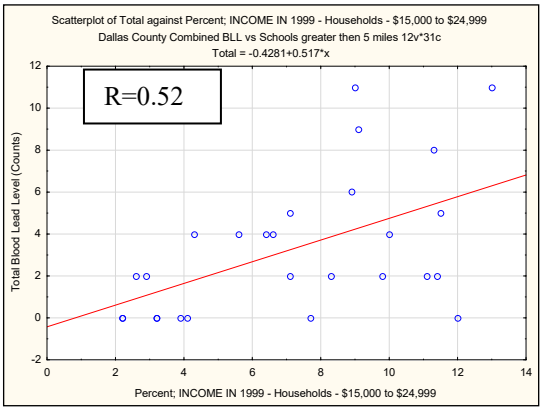
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of the elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there is a weak to moderate significant relationship between the total counts of elevated childhood blood lead levels and the percentage of households with income less than $10,000 per year, the percentage of households with income between $15,000 to $24,000 per year, and the percentage of housing units built the Year 1960 to Year 1969. Based on the correlation matrix, it seems

that there is a direct link of households with low income and older housing units that were constructed between Year 1960 and 1969, and total counts of elevated blood lead levels. The R values in the correlation matrix above are much lower than the R values for the zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site. The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.170- Graph 7.172: Year 2002 Sampson Horrice Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels





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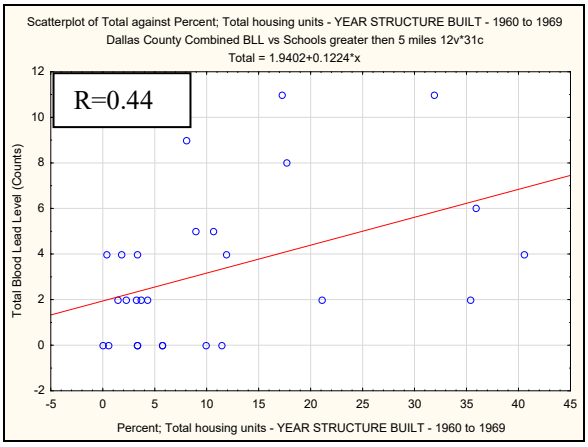
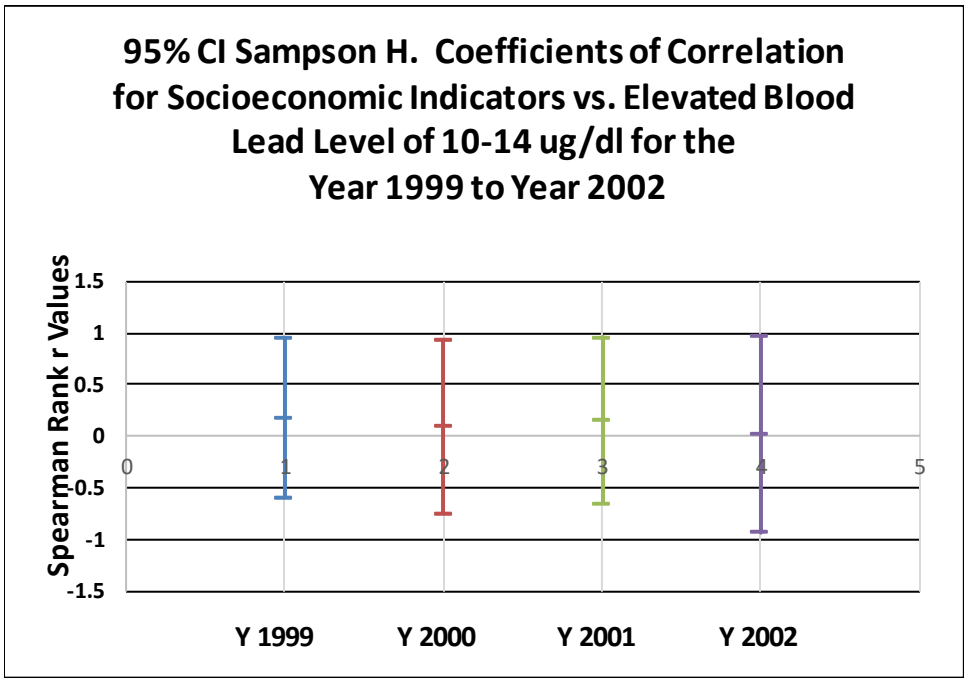


Based on the above graphs, as the percentage of households with low income increase, and the percentage of housing units constructed between the Year 1960 to Year 1999, increases, the total counts of elevated childhood blood levels cases, increase. It could be a result of indoor lead based paint in the older housing units, as well as, low income families possibly living in the older, cheaper housing units.

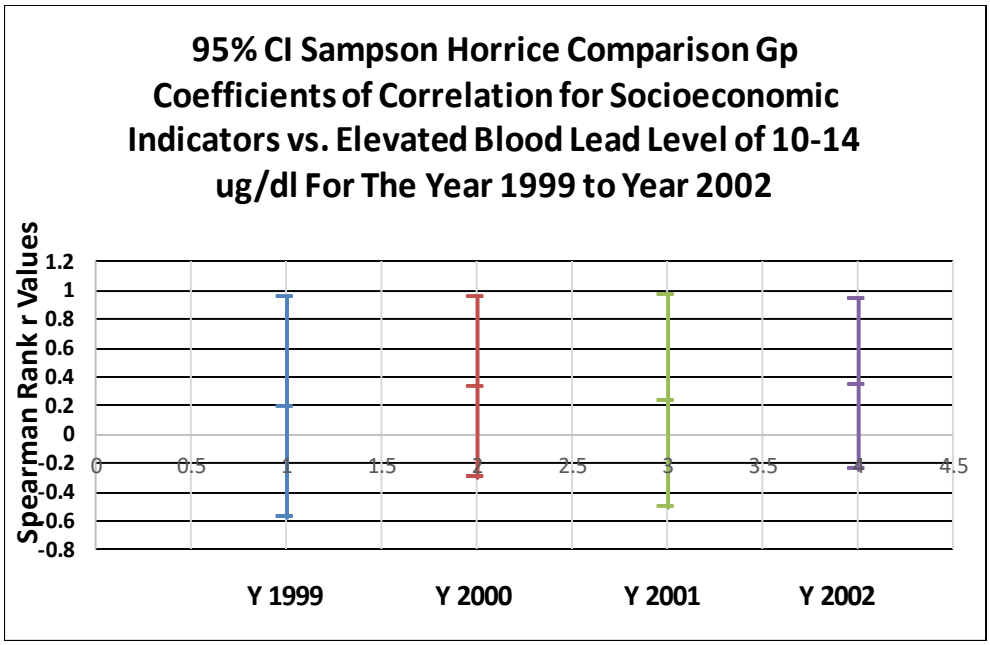
Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1999 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals

were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for the socioeconomic indicators vs. the elevated blood lead level of 10-14 µg/dl and the total counts of elevated blood lead levels, for children that reside in zip codes, located within and greater than, the 5-mile radius of the Sampson Horrice Superfund Site, are shown below.

Graph 7.173 Sampson Horrice Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Elevated Blood Lead Level 10-14 µg/dl from the Year 1999 to the Year 2002.

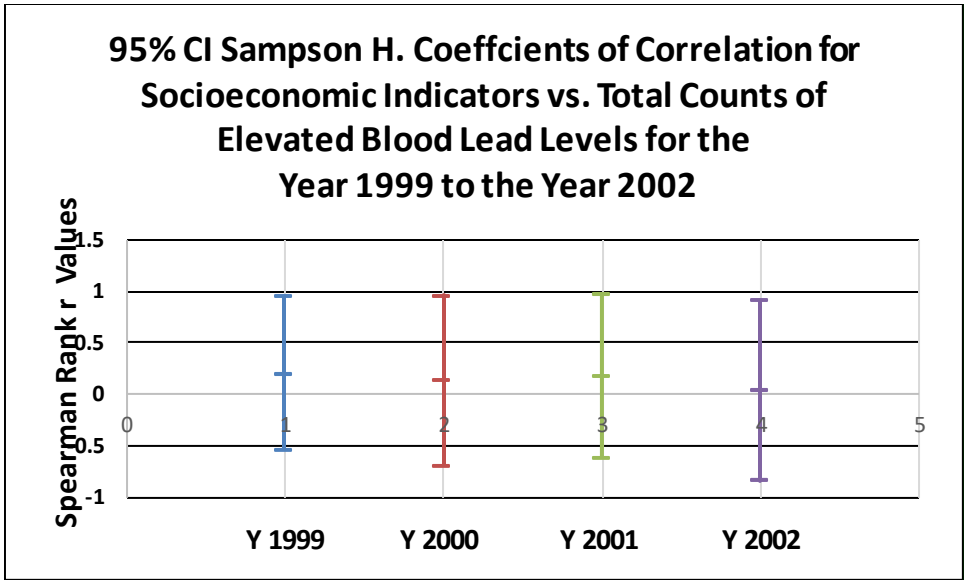


Graph 7.174: Sampson Horrice Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Elevated Blood Lead Level 10-14 µg/dl Schools from the Year 1999 to the Year 2002.

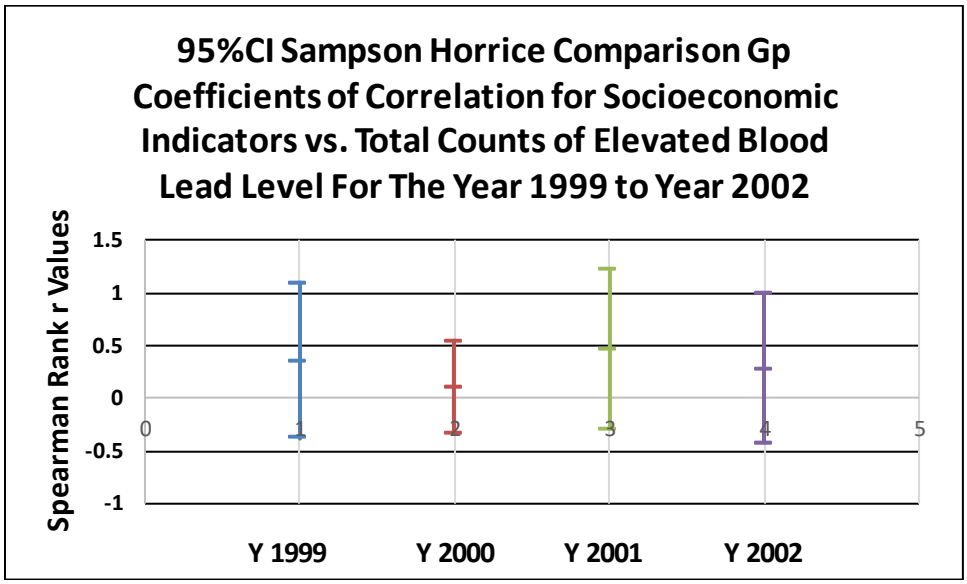


Based on the confidence interval graphs, for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Sampson Horrice Site, the confidence intervals, for every year, have significant coefficients of correlations, except for the Year 2000. For the comparison group confidence interval graph, all years have significant coefficients of correlations.

Graph 7.175 Sampson Horrice Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Total Counts of Elevated Blood Lead Levels from the Year 1999 to the Year 2002.



Graph 7.176: Sampson Horrice Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Total Counts of Elevated Blood Lead Levels from the Year 1999 to the Year 2002.



Based on both confidence interval graphs, there are significant coefficients of correlations, in the confidence intervals, for each year, for children that reside, within and greater than, the 5-mile radius of the Sampson Horrice Site.

7.2.7 Sampson Horrice Socioeconomic Indicators vs. the Test Passing Rate Analysis

The Sampson Horrice socioeconomic indicators vs. the test passing rate analysis determines if there is a significant relationship between the socioeconomic indicators, and the standardized test passing rates for elementary, middle, and high schools. This is analysis covered the Year 1999 to the Year 2002. The Year 2003 to the Year 2011 was not included in the Study because the standardized test was changed, by the Texas Education Agency, in the Year 2003. The test change resulted in a significant reduction in the standardized test passing rates for schools across Dallas County.

For the socioeconomic indicators vs. the test passing rate analysis, the middle and high schools were separated from the elementary schools, due to the prospective middle and high schools students, having a higher possibility, of being impacted by the Sampson Horrice Site's illegal gravel pit/ landfill, given that the students didn't move out of the area. In the Sampson Horrice socioeconomic indicators vs. test passing rate analysis, distance to the site is included, to determine if socioeconomic indicators, as well as distance, effect the student standardized test passing rates, for in schools located within the 5 –mile radius, and the schools located greater than the 5-mile radius, of the Sampson Horrice Site.

The socioeconomic indicators evaluated are listed below;

- percentage of families that are below poverty level;
- percentage of female householder with children less than 18 years of age that are below poverty level;

- percentage of households with income less than $10,000 per year;
- percentage of households with income between $10,000 to $14,999;
- percentage of households with income between $15,000 to $24,999;
- percentage of housing units built the Year 1939 or earlier;
- percentage of housing units built between the Year 1940 to 1959;
- percentage of housing units constructed between the Year 1960 to Year 1969;
- percentage of housing units built between Year 1970 to Year 1979.

The socioeconomic indicator data was obtained, from the Year 2000 Census Data, from the uscensus.gov website. The student standardized test passing rate data was obtained from the Texas Education Agency. The housing units built dates were included in the Study, due to the use of lead based paint in homes constructed the Year 1970. The housing units built dates will provide an indication of whether indoor lead contamination, other socioeconomic indicators, and the gravel pit/ landfill are the source of elevated blood lead in children.

7.2.7.1 Year 1999 Sampson Horrice Socioeconomic Indicators vs. the Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the Sampson Horrice Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the 5-mile radius of the Sampson Horrice Site. During this analysis, there were no significant relationships, for middle and high schools, located within the Sampson Horrice Site's 5-mile radius. So the analysis and comparison could not be completed. The table of the middle and high schools located within the 5-mile radius of the Sampson Horrice Site, for the Year 1999 to the Year 2002, is shown below.

TABLE 7.121-Table 7.124 Year 1999- Year 2002 Socioeconomic Indicators vs. Test Passing Rates for Middle and High Schools Located Within the Sampson Horrice Superfund Site's 5-Mile Radius

	Sampson Horrice Year 1999 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR1999
DALLAS ISD	H GRADY SPRUCE HS	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33	3.3	44.6
DALLAS ISD	EB COMSTOCK MIDDLE	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33	3.3	40.2
DALLAS ISD	FRED F FLORENCE (Middle)	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33	3.3	33.1
DALLAS ISD	WW SAMUELL HS	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33	3.3	41.3
DALLAS ISD	JOHN B HOOD MIDDLE	75227	17.2	12	6.8	16.9	36.6	16.7	18.1	29.8	3.9	24.3
											Average	**36.7**

	Sampson Horrice Year 2000 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2000
DALLAS ISD	H GRADY SPRUCE HS	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	53.8
DALLAS ISD	EB COMSTOCK MIDDLE	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	42.3
DALLAS ISD	FRED F FLORENCE (Middle)	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	35.1
DALLAS ISD	WW SAMUELL HS	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	51.0
DALLAS ISD	JOHN B HOOD MIDDLE	75227	12.0	6.8	16.9	17.2	36.6	16.7	18.1	29.8	3.9	41.6
											Average	**44.8**

	Sampson Horrice Year 2001 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2001
DALLAS ISD	H GRADY SPRUCE HS	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	58.3
DALLAS ISD	EB COMSTOCK MIDDLE	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	52.8
DALLAS ISD	FRED F FLORENCE (Middle)	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	31.0
DALLAS ISD	WW SAMUELL HS	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	53.5
DALLAS ISD	JOHN B HOOD MIDDLE	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	36.6
											Average	**46.4**

	Sampson Horrice Year 2002 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2002
DALLAS ISD	H GRADY SPRUCE HS	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33	3.3	62.5
DALLAS ISD	EB COMSTOCK MIDDLE	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33	3.3	63.6
DALLAS ISD	FRED F FLORENCE (Middle)	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33	3.3	43.9
DALLAS ISD	WW SAMUELL HS	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33	3.3	58.1
DALLAS ISD	JOHN B HOOD MIDDLE	75227	17.2	12	6.8	16.9	36.6	16.7	18.1	29.8	3.9	42.1
											Average	**54.0**

The school district name, the school name, and the zip codes the schools are located in are shown on the left side of the tables and the socioeconomic indicators and the standardized test passing rates are shown across the top of the tables. Based on the above table, the average standardized test passing rates for the middle and high schools for the Year 1999 to the Year 2002 are 36.7%, 44.8%, 46.4%, and 54.0%, respectively. The average test passing rates could be low due to the prospective students residing in housing units constructed before the Year 1970, resulting in indoor lead exposure.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data set's data distribution not being normal and due to a low quantity of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for the middle and high schools located within the 5-mile radius of the Sampson Horrice Site, for the Year 1999 to the Year 2002, is shown below.

Table 7.125- Table 7.128: Year 1999- Year 2002 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Within the 5-Mile Radius of the Sampson Horrice Site.

Variable	Spearman Rank Order Correlations (Samp vs Test PR 1999 MidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 1999
Percent; Families - Percent Below Poverty Level	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Household Income - Less than $10,000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Household Income - $10,000 to $14,999	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Household Income - $15,000 to $24,999	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Housing Units- YEAR BUILT - 1970 to 1979	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Housing Units- YEAR BUILT - 1960 to 1969	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Housing Units- YEAR BUILT - 1940 to 1959	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Housing Units- YEAR BUILT- 1939 or earlier	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	1.00	-0.71
Percent; Standardized Test Passing Rate for Year 1999	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	-0.71	1.00

Variable	Spearman Rank Order Correlations (Samp vs TEst PR 2000 MidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2000
Percent; Household Income - Less than $10,000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Household Income - $10,000 to $14,999	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Household Income - $15,000 to $24,999	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Families - Percent Below Poverty Level	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Housing Units- YEAR BUILT - 1970 to 1979	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Housing Units- YEAR BUILT - 1960 to 1969	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Housing Units- YEAR BUILT - 1940 to 1959	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Housing Units- YEAR BUILT- 1939 or earlier	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	1.00	-0.35
Percent; Standardized Test Passing Rate for Year 2000	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	-0.35	1.00

Variable	Spearman Rank Order Correlations (Samp vs Test PR 2001 MidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2001
Percent; Families - Percent Below Poverty Level	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Household Income - Less than $10,000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Household Income - $10,000 to $14,999	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Household Income - $15,000 to $24,999	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Housing Units- YEAR BUILT - 1970 to 1979	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Housing Units- YEAR BUILT - 1960 to 1969	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Housing Units- YEAR BUILT - 1940 to 1959	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.35
Percent; Housing Units- YEAR BUILT- 1939 or earlier	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	1.00	-0.35
Percent; Standardized Test Passing Rate for Year 2001	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	-0.35	1.00

Variable	Spearman Rank Order Correlations (Samp vs Test PR 2002 MidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2002
Percent; Families - Percent Below Poverty Level	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Household Income - Less than $10,000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Household Income - $10,000 to $14,999	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Household Income - $15,000 to $24,999	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Housing Units- YEAR BUILT - 1970 to 1979	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Housing Units- YEAR BUILT - 1960 to 1969	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Housing Units- YEAR BUILT - 1940 to 1959	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-1.00	0.71
Percent; Housing Units- YEAR BUILT- 1939 or earlier	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	1.00	-0.71
Percent; Standardized Test Passing Rate for Year 2002	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	-0.71	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrices, above, there are no significant relationship between the socioeconomic indicators and the student standardized test passing rates for middle and high schools, located within the Sampson Horrice Site's 5-mile radius.

7.2.7.2 Sampson Horrice Comparison Group Socioeconomic Indicators vs Standardized Test Passing Rate Analysis for Middle and High Schools Located Greater than the Sampson Horrice Site 5-mile Radius (Comparison Group).

The purpose of the comparison analysis is to identify trends in the data by comparing the standardized test passing rates for the middle and high schools located within the 5-mile radius of the Sampson Horrice Site, to the standardized test passing rates, for the middle and high schools, located greater than the 5-mile radius of the Sampson Horrice Site.

Unfortunately, this analysis could not be completed due to no significant relationships between the socioeconomic indicators and the standardized test passing rate for middle and high schools located within the Sampson Horrice Site's 5-mile radius.

7.2.7.3 Sampson Horrice Socioeconomic Indicators vs. the Test Passing Rate Analysis for Elementary Schools

The Sampson Horrice socioeconomic indicators vs. the test passing rate analysis determines if there is a significant relationship between the socioeconomic indicators, and the standardized test passing rates for elementary, middle, and high schools. This is analysis covered the Year 1999 to the Year 2002. The Year 2003 to the Year 2011 was

not included in the Study because the standardized test was changed, by the Texas Education Agency, in the Year 2003. The test change resulted in a significant reduction in the standardized test passing rates for schools across Dallas County.

For the socioeconomic indicators vs. the test passing rate analysis, the middle and high schools were separated from the elementary schools, due to the prospective middle and high schools students, having a higher possibility, of being impacted by the Sampson Horrice Site's illegal gravel pit/ landfill, given that the students didn't move out of the area. In the Sampson Horrice socioeconomic indicators vs. test passing rate analysis, distance to the site is included, to determine if socioeconomic indicators, as well as distance, effect the student standardized test passing rates, for in schools located within the 5 –mile radius, and the schools located greater than the 5-mile radius, of the Sampson Horrice Site.

The socioeconomic indicators evaluated are listed below;

- percentage of families that are below poverty level;
- percentage of female householder with children less than 18 years of age that are below poverty level;
- percentage of households with income less than $10,000 per year;
- percentage of households with income between $10,000 to $14,999;
- percentage of households with income between $15,000 to $24,999;
- percentage of housing units built the Year 1939 or earlier;
- percentage of housing units built between the Year 1940 to 1959;
- percentage of housing units constructed between the Year 1960 to Year 1969;
- percentage of housing units built between Year 1970 to Year 1979.

The socioeconomic indicator data was obtained, from the Year 2000 Census Data, from the uscensus.gov website. The student standardized test passing rate data was obtained from the Texas Education Agency. The housing units built dates were included in the Study, due to the use of lead based paint in homes constructed the Year 1970. The housing units built dates will provide an indication of whether indoor lead contamination, other socioeconomic indicators, and the gravel pit/ landfill are the source of elevated blood lead in children.

A table that depicts the ages of the prospective students and the years the prospective students would take the standardized test, in relation to the operation, closure, and cleanup activities of the Sampson Horrice Site is shown below.

7.129: Children's Grade and Ages in Reference to the Sampson Horrice Site

Students Born 4 years before Sampson Horrice operated		
Grade	Age(yrs)	Year
Born	0	1979
Pre-K	5	1984
5th	11	1990
6th	12	1991
8th	14	1993
9th	15	1994
12th	18	1997

Students Born 3 years before Sampson Horrice operated		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born 2 years before Sampson Horrice operated		
Grade	Age(yrs)	Year
Born	0	1981
Pre-K	5	1986
5th	11	1992
6th	12	1993
8th	14	1995
9th	15	1996
12th	18	1999

Students Born 1 yr before Sampson Horrice Closed		
Grade	Age(yrs)	Year
Born	0	1982
Pre-K	5	1987
5th	11	1993
6th	12	1994
8th	14	1996
9th	15	1997
12th	18	2000

Sampson Horrice started operation		
Grade	Age(yrs)	Year
Born	0	1983
Pre-K	5	1988
5th	11	1994
6th	12	1995
8th	14	1997
9th	15	1998
12th	18	2001

Students Born the year Sampson Horrice Closed		
Grade	Age(yrs)	Year
Born	0	1984
Pre-K	5	1989
5th	11	1995
6th	12	1996
8th	14	1998
9th	15	1999
12th	18	2002

Students Born 1 year after Sampson Horrice closed		
Grade	Age(yrs)	Year
Born	0	1985
Pre-K	5	1990
5th	11	1996
6th	12	1997
8th	14	1999
9th	15	2000
12th	18	2003

Students Born 1 year before the Year Sampson Horrice Clean -Up Start date		
Grade	Age(yrs)	Year
Born	0	1998
Pre-K	5	2003
5th	11	2009
6th	12	2010
8th	14	2012
9th	15	2013
12th	18	2016

Students Born the Year Sampson Horrice Clean -Up Start date		
Grade	Age(yrs)	Year
Born	0	1999
Pre-K	5	2004
5th	11	2010
6th	12	2011
8th	14	2013
9th	15	2014
12th	18	2017

Students Born the Year Sampson Horrice Clean -Up End date		
Grade	Age(yrs)	Year
Born	0	2000
Pre-K	5	2005
5th	11	2011
6th	12	2012
8th	14	2014
9th	15	2015
12th	18	2018

Students Born 1 year after Sampson Horrice Clean -Up End date		
Grade	Age(yrs)	Year
Born	0	2001
Pre-K	5	2006
5th	11	2012
6th	12	2013
8th	14	2015
9th	15	2016
12th	18	2019

7.2.7.4 Year 1999 Socioeconomic Indicators vs the Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Sampson Horrice Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for elementary schools located within the 5-mile radius of the Sampson Horrice Site. For the Year 1999, there were no significant relationships for elementary schools located within the Sampson Horrice Site's 5-mile radius. Therefore, a comparison analysis was not conducted. The table and the correlation matrix for the elementary schools located within the Sampson Horrice Site's 5-mile radius are shown below.

Table 7.130: Year 1999 Sampson Horrice Socioeconomic Indicators vs. Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Superfund Site's 5-Mile Radius

	Sampson Horrice Year 1999 Socioeconomic Indicators and Elementary School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units-YEAR BUILT - 1970 to 1979	Percent; Housing Units-YEAR BUILT - 1960 to 1969	Percent; Housing Units-YEAR BUILT - 1940 to 1959	Percent; Housing Units-YEAR BUILT-1939 or earlier	Test PR1999
DALLAS ISD	WA BLAIR EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	54.1
DALLAS ISD	JULIUS DORSEY EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	43.5
DALLAS ISD	FREDERICK DOUGLASS	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	71.3
DALLAS ISD	BH MACON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	68.4
DALLAS ISD	NANCY MOSELEY EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	74.6
DALLAS ISD	WILLIAM M ANDERSON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	51.2
DALLAS ISD	RICHARD LAGOW EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	62.1
DALLAS ISD	GILBERT CUELLAR SR EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	58.8
DALLAS ISD	RUFUS C BURLESON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	71.2
DALLAS ISD	JQ ADAMS EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	57.8
DALLAS ISD	HB GONZALEZ EL	75204	22.5	11.3	5.6	13.3	41.8	11.6	10.3	14.4	8.7	
DALLAS ISD	PLEASANT GROVE EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	76.3
DALLAS ISD	NATHANIEL HAWTHORNE	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	75.6
DALLAS ISD	JOHN IRELAND EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	65.3
DALLAS ISD	EDISON RUNYON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	48.0
MESQUITE ISD	FLOYD EL	75180	10.5	7.3	6.2	13.8	24.8	27.3	21.0	17.3	2.1	65.2
DALLAS ISD	ANNIE WEBB BLANTON EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	58.1
DALLAS ISD	EDWARD TITCHE EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	45.5
DALLAS ISD	KLEBERG EL	75253	13.1	9.7	6.1	15.9	25.9	15.9	5.9	9.0	2.6	67.6
DALLAS ISD	SAN JACINTO EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	67.3
MESQUITE ISD	GRAY ELEMENTARY	75180	10.5	7.3	6.2	13.8	24.8	27.3	21.0	17.3	2.1	
MESQUITE ISD	HODGES EL	75180	10.5	7.3	6.2	13.8	24.8	27.3	21.0	17.3	2.1	84.4
MESQUITE ISD	MCWHORTER EL	75149	6.6	5.7	4.2	10.0	25.3	22.4	16.7	18.6	1.2	55.7
DALLAS ISD	CA TATUMJR EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	
											Average	63.0

The school district name, the school name, and the zip codes that the schools are located in are shown on the left side of the table. The socioeconomic indicators and the standardized test passing rates are shown across the top of the table. The parts of the table that do not show a standardized passing rate, represent schools that were either not open, or schools that were repurposed. Based on the above table, the average standardized test passing the elementary schools, for the Year 1999, is 63.0%. The average test passing rate could be low due to the prospective students living in close proximity of the Sampson Horrice Site, when they were young children. In addition, socioeconomic indicators may also contribute to low standardized test passing rates.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data distribution of the data set not being normal and due to a low quantity of observations.

The correlation matrix for the socioeconomic indicators and the standardized test passing rates for the elementary schools located within the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.131: Year 1999 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Sampson Horrice Site.

Variable	Spearman Rank Order Correlations (Samp vs Test PR 1999 Elem) MD pairwise deleted Marked correlations are significant at p <.05000 Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 1999
Percent; Families - Percent Below Poverty Level	1.00	0.82	0.73	0.74	0.99	-0.20	0.64	0.71	0.39	-0.08
Percent; Household Income - Less than $10,000	0.82	1.00	0.98	0.99	0.81	-0.01	0.88	0.97	0.21	-0.08
Percent; Household Income - $10,000 to $14,999	0.73	0.98	1.00	0.99	0.72	0.13	0.93	0.98	0.12	-0.07
Percent; Household Income - $15,000 to $24,999	0.74	0.99	0.99	1.00	0.73	0.06	0.90	0.97	0.12	-0.08
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.99	0.81	0.72	0.73	1.00	-0.21	0.62	0.72	0.38	-0.11
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.20	-0.01	0.13	0.06	-0.21	1.00	0.45	0.16	-0.81	0.08
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.64	0.88	0.93	0.90	0.62	0.45	1.00	0.92	-0.17	-0.01
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.71	0.97	0.98	0.97	0.72	0.16	0.92	1.00	0.10	-0.12
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.39	0.21	0.12	0.12	0.38	-0.81	-0.17	0.10	1.00	-0.13
Percent; Standardized Test Passing Rate for Year 1999	-0.08	-0.08	-0.07	-0.08	-0.11	0.08	-0.01	-0.12	-0.13	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for elementary schools, located within the 5-mile radius of the Sampson Horrice Site.

Based upon the correlation matrix, above, there are no significant relationships between the socioeconomic indicators and the standardized test passing rates. This indicates that the socioeconomic indicators do not negatively impact the standardized test passing rates. In addition, prospective students may have not had exposure to the Sampson Horrice Site, since the site was not in operation since the Year 1984.

7.2.7.5 Year 1999 Sampson Horrice Comparison Group Socioeconomic Indicators vs. Standardized Test Passing Rate Analysis for Elementary Schools Located Greater than the Sampson Horrice Site's 5-mile Radius (Comparison Analysis).

The comparison group analysis identifies trends in the data, for the elementary schools, located within the Sampson Horrice Site's 5-mile radius, by comparing this data to the data, of the elementary schools located greater than the 5- mile radius of the Sampson Horrice Site. However, no comparison analysis was conducted for the Year 1999 because there were no significant relationships for any of the elementary schools located within the 5-mile radius of the Sampson Horrice Site.

7.2.7.6 Year 2000 Elementary Schools Socioeconomic Indicators vs. the Test Passing Rates for Schools Located Within the 5-mile Radius of the Sampson Horrice Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for elementary schools located within the 5-mile radius of the Sampson Horrice Site. The table of the elementary schools located within the 5-mile radius of the Sampson Horrice Site is located below.

TABLE 7.132:Year 2000 Sampson Horrice Socioeconomic Indicators vs. Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Superfund Site's 5-mile Radius

	Sampson Horrrice Year 2000 Socioeconomic Indicators and Elementary School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2000
DALLAS ISD	WA BLAIR EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	63.8
DALLAS ISD	JULIUS DORSEY EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	52.1
DALLAS ISD	FREDERICK DOUGLASS	75227	12.0	6.8	16.9	17.2	36.6	16.7	18.1	29.8	3.9	61.2
DALLAS ISD	BH MACON EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	68.1
DALLAS ISD	NANCY MOSELEY EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	52.2
DALLAS ISD	WILLIAM M ANDERSON EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	61.0
DALLAS ISD	RICHARD LAGOW EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	55.8
DALLAS ISD	GILBERT CUELLAR SR EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	59.2
DALLAS ISD	RUFUS C BURLESON EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	65.5
DALLAS ISD	JQ ADAMS EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	58.3
DALLAS ISD	HB GONZALEZ EL	75204	11.3	5.6	13.3	22.5	41.8	11.6	10.3	14.4	8.7	
DALLAS ISD	PLEASANT GROVE EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	76.4
DALLAS ISD	NATHANIEL HAWTHORNE	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	71.2
DALLAS ISD	JOHN IRELAND EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	71.4
DALLAS ISD	EDISON RUNYON EL	75217	14.3	7.1	17.4	19.1	40.4	19.5	24.3	33.0	3.3	45.5
MESQUITE ISD	FLOYD EL	75180	7.3	6.2	13.8	10.5	24.8	27.3	21.0	17.3	2.1	87.0
DALLAS ISD	ANNIE WEBB BLANTON EL	75227	12.0	6.8	16.9	17.2	36.6	16.7	18.1	29.8	3.9	67.1
DALLAS ISD	EDWARD TITCHE EL	75227	12.0	6.8	16.9	17.2	36.6	16.7	18.1	29.8	3.9	64.9
DALLAS ISD	KLEBERG EL	75253	9.7	6.1	15.9	13.1	25.9	15.9	5.9	9.0	2.6	57.7
DALLAS ISD	SAN JACINTO EL	75227	12.0	6.8	16.9	17.2	36.6	16.7	18.1	29.8	3.9	78.2
MESQUITE ISD	GRAY ELEMENTARY	75180	7.3	6.2	13.8	10.5	24.8	27.3	21.0	17.3	2.1	78.4
MESQUITE ISD	HODGES EL	75180	7.3	6.2	13.8	10.5	24.8	27.3	21.0	17.3	2.1	80.6
MESQUITE ISD	MCWHORTER EL	75149	5.7	4.2	10.0	6.6	25.3	22.4	16.7	18.6	1.2	76.6
DALLAS ISD	CA TATUMJR EL	75227	12.0	6.8	16.9	17.2	36.6	16.7	18.1	29.8	3.9	
											Average	66.0

The school district name, the campus name, and the zip codes that the schools are located in, are shown on the left side of the table. The socioeconomic indicators and standardized test passing rates are shown across the top of the table. Based on the table, above, the average standardized test passing rate for the elementary schools is 66.0%. The parts of the table that do not have a standardized passing rate, represent schools that were either not open during the specified year or schools that were repurposed. The average standardized test passing rate is not extremely low, but not high. The low average standardized test passing rate may be due the prospective elementary students being exposed to the leachate from the gravel pit that illegally accepted hazardous and solid waste, after the site was closed in the Year 1984 and before the Sampson Horrice site was closed in the Year 2000. In addition , socioeconomic factors could contribute to low standardized test passing rates.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data set not having a normal distribution and due to a few number of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing

rates for the elementary schools located within the 5-mile radius of the Sampson Horrice site, is shown below.

Table 7.133:Year 2000 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Sampson Horrice Site.

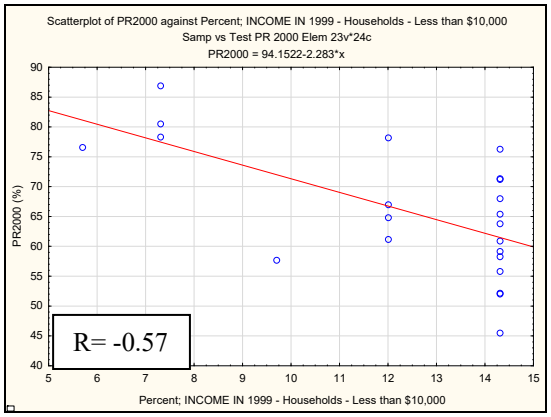
	Spearman Rank Order Correlations (Samp vs Test PR 2000 Elem) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2000
Percent; Household Income - Less than $10,000	1.00	0.98	0.99	0.82	0.81	-0.01	0.88	0.97	0.21	-0.57
Percent; Household Income - $10,000 to $14,999	0.98	1.00	0.99	0.73	0.72	0.13	0.93	0.98	0.12	-0.51
Percent; Household Income - $15,000 to $24,999	0.99	0.99	1.00	0.74	0.73	0.06	0.90	0.97	0.12	-0.57
Percent; Families - Percent Below Poverty Level	0.82	0.73	0.74	1.00	0.99	-0.20	0.64	0.71	0.39	-0.57
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.81	0.72	0.73	0.99	1.00	-0.21	0.62	0.72	0.38	-0.58
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.01	0.13	0.06	-0.20	-0.21	1.00	0.45	0.16	-0.81	0.41
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.88	0.93	0.90	0.64	0.62	0.45	1.00	0.92	-0.17	-0.37
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.97	0.98	0.97	0.71	0.72	0.16	0.92	1.00	0.10	-0.50
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.21	0.12	0.12	0.39	0.38	-0.81	-0.17	0.10	1.00	-0.29
Percent; Standardized Test Passing Rate for Year 2000	-0.57	-0.51	-0.57	-0.57	-0.58	0.41	-0.37	-0.50	-0.29	1.00

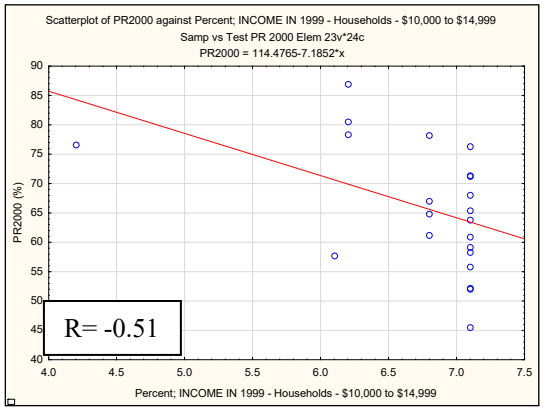
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for elementary schools, located within the 5-mile radius of the Sampson Horrice Site.

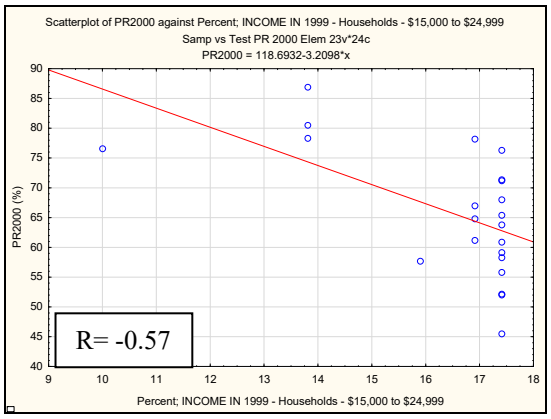
Based upon the correlation matrix, above, there are moderate negative significant relationships between the percentage standardized test passing rates and the percentage of households with income less than $10,000 per year, the percentage of households with income between $10,000 to $14,999per year, the percentage of households with income between $15,000 to $24,999 per year, the percentage of families blow poverty level, the percentage of female householders with children under18 years of age, and the percentage of housing units constructed between Year 1940 to Year 1959. It seems that there is a direct link of households with low income, families below poverty level, and single mother households and low standardized test passing rates. In the event, the prospective students did not move out of the area or if prospective students moved into the area, then there is a strong possibility that the prospective students could have come in contact with the leachate of the Sampson Horrice Site, in their young childhood, and could have had their cognitive abilities compromised. In addition, housing units constructed before the year 1970 may contribute to low standardized test passing rates, due to indoor lead exposure.

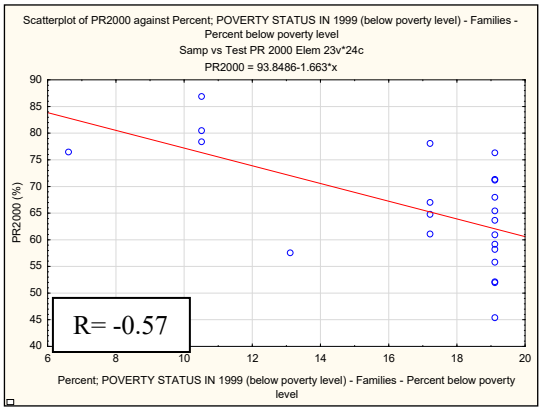
The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

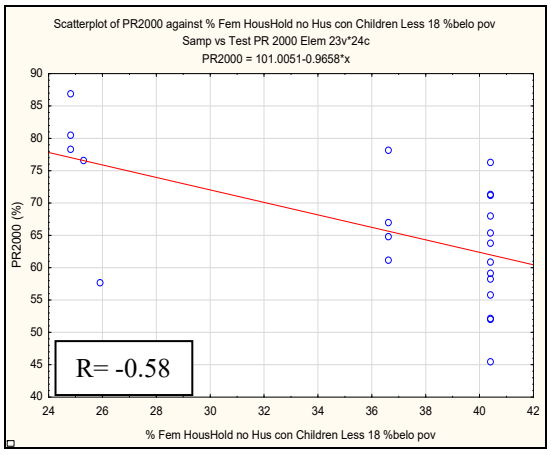
Graph 7.177- Graph 7.182: Year 2000 Sampson Horrice Plots of Significant Relationships between the Socioeconomic Indicators vs. the Standardized Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Site's 5-Mile Radius

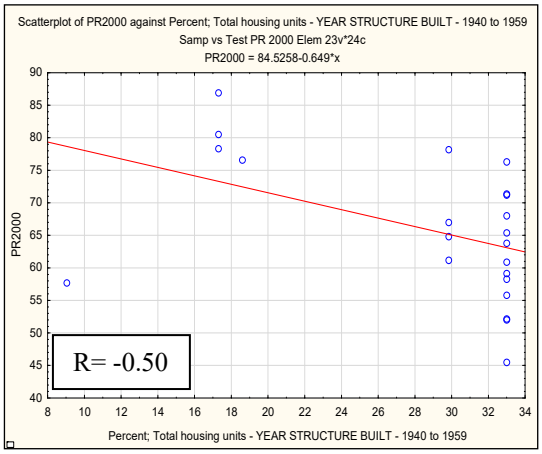












Based upon the graphs above, as the percentages of households with income less than $10,000 year, the percentage households with income between $10,000 to $14,999 per year, the percentage of households that have income between $15,000 to $24,999 per year, the percentage of families below poverty, the percentage of female householders with children under the age of 18, and the percentage of housing units constructed

between the Year 1940 to Year 1959, increase, the percentage of the standardized test passing rates, decrease.

7.2.7.7 Year 2000 Comparison Analysis for Sampson Horrice Socioeconomic Indicators and the Standardized Test Passing Rates for Elementary Schools Located Greater than the 5-mile Radius of the Sampson Horrice Site (Comparison Group).

The comparison group analysis identifies trends in the data, for the elementary schools, located within the Sampson Horrice Site's 5-mile radius, by comparing this data to the data, of the elementary schools located greater than the 5- mile radius of the Sampson Horrice Site. The table of the socioeconomic indicators and standardized test passing rates for children that attend elementary schools located greater than the 5-mile radius of the Sampson Horrice Site, is shown below.

Table 7.134: Year 2000 Comparison Socioeconomic Indicators and Standardized Test Passing Rate for Elementary Schools Located Greater Than the 5-mile Radius of the Sampson Horrice Superfund Site.

	Year 2000 Socioeconomic Indicators and Standardized Test Passing Rate for Elementary Schools Greater than 5 Miles from Sampson H. Site											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2000
CARROLLTON-FARMERS BRANCH ISD	BLAIR EL	75234	4.9	4.3	10.0	4.3	17.4	16.0	40.5	27.6	1.1	47.8
CARROLLTON-FARMERS BRANCH ISD	KENT EL	75007	2.2	1.4	4.5	2.8	8.7	25.3	2.3	0.3	0.2	97.8
CEDAR HILL ISD	LAKERIDGE EL	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	
CEDAR HILL ISD	WATERFORD OAKS EL	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	73.4
COPPELL ISD	DENTON CREEK EL	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	96.0
COPPELL ISD	LAKESIDE EL	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	96.4
DALLAS ISD	VICTOR H HEXTER EL	75218	4.7	4.4	9.8	4.9	17.5	8.0	21.1	53.5	6.5	73.1
DESOTO ISD	RUBY YOUNG EL	75115	5.4	3.4	7.1	4.2	20.8	20.6	10.6	3.5	0.6	86.2
DESOTO ISD	AMBER TERRACE EL	75115	5.4	3.4	7.1	4.2	20.8	20.6	10.6	3.5	0.6	76.3
DUNCANVILLE ISD	WILLIAM LEE HASTINGS EL	75116	4.7	4.6	13.0	5.2	8.3	40.7	28.8	10.0	1.6	76.3
DUNCANVILLE ISD	CJ & ANNE HYMAN EL	75249	4.8	2.7	7.1	5.7	14.1	42.0	4.3	1.3	0.0	
FERRIS ISD	LUCY MAE MCDONALD EL	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	
FERRIS ISD	HAZEL INGRAM EL	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	
GARLAND ISD	STEADHAM EL	75089	2.3	1.1	2.6	1.5	9.7	13.5	2.2	1.3	0.3	90.2
GARLAND ISD	ROBERT B SEWELL EL	75048	2.7	2.0	3.2	3.4	9.3	11.1	3.3	1.9	0.2	86.8
GRAND PRAIRIE ISD	SUZANNA DICKINSON EL	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	86.3
GRAND PRAIRIE ISD	MIKE MOSELEY EL	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	
IRVING ISD	DAVIS EL	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	77.7
IRVING ISD	JACKIE MAE TOWNSELL EL	75038	5.8	3.7	11.4	8.0	18.3	17.5	3.2	1.4	0.2	
LANCASTER ISD	ROLLING HILLS EL	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	59.7
LANCASTER ISD	LANCASTER EL	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	66.2
LEWISVILLE ISD	BLUEBONNET ELEMENTARY	75028										
LEWISVILLE ISD	LEWISVILLE EL	75067										
MESQUITE ISD	PRICE EL	75043	4.1	3.6	9.1	4.9	18.4	40.2	8.0	1.7	0.2	92.2
MESQUITE ISD	CANNADAY EL	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	92.6
PLANO ISD	ROSE HAGGAR EL	75252	4.7	2.6	8.3	3.5	9.6	6.2	1.1	0.2	0.1	
RED OAK ISD	RED OAK INT	75154	3.6	3.7	8.3	5.1	20.5	16.5	3.7	2.9	2.1	89.7
RED OAK ISD	EASTRIDGE EL	75154	3.6	3.7	8.3	5.1	20.5	16.5	3.7	2.9	2.1	75.5
RED OAK ISD	SHIELDS EL	75154	3.6	3.7	8.3	5.1	20.5	16.5	3.7	2.9	2.1	85.8
RICHARDSON ISD	SPRING CREEK EL	75248	3.0	3.2	5.6	1.6	10.9	45.7	11.9	1.1	0.0	92.9
RICHARDSON ISD	LAKE HIGHLANDS EL	75238	5.8	4.6	13.0	6.4	19.0	21.9	31.9	16.9	0.5	89.8
WYLIE ISD	DON WHITT EL	75048	2.7	2.0	3.2	3.4	9.3	11.1	3.3	1.9	0.2	
WYLIE ISD	DR AL DRAPER INTERMED	75098	2.9	3.6	8.1	2.8	8.4	15.2	6.0	4.6	1.7	
WYLIE ISD	CHERI COX EL	75048	2.7	2.0	3.2	3.4	9.3	11.1	3.3	1.9	0.2	
											Average	82.2

The school district name, campus name and the zip codes the elementary schools are located in are shown on the left side of the table and the socioeconomic indicators and the standardized test passing rates for the Year 2000 are shown across the top of the table. The grey areas on the table represent schools that may have not been opened during that

year or schools that were repurposed. The grey shaded areas also indicate that no socioeconomic indicator information was available for the specified zip code by the uscensus website. The average standardized test passing rate for schools located greater than the 5-mile radius of the Sampson Horrice State Superfund Site is 82.2% and the standardized test passing rate for the elementary schools located within the Sampson Horrice Site's 5-mile radius is 66.0%. There is approximately a 24 point difference between the average standardized test passing rate for the elementary schools located wihtin the Sampson Horrice Site's 5-mile radius and the elementary schools located greater than the Sampson Horrice Site's 5-mile radius. The difference could be due to the elementary schools located greater than the Sampson Horrice Site's 5-mile radius, not being impacted by the Sampson Horrice Site, as well as, lower percentages of low income families and lower percentages of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matric was utilized to analyze the data, due to a low quantity of observations and due to the data set not having a normal distribution. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for elementary schools, is shown below.

Table 7.135:Year 2000 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Greater than the 5-mile Radius of the Sampson Horrice Site.

	Spearman Rank Order Correlations (Socio Ind vs Test PR 2000 Eleme) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2000
Percent; Household Income - Less than $10,000	1.00	0.79	0.86	0.79	0.58	0.29	0.68	0.63	0.45	-0.51
Percent; Household Income - $10,000 to $14,999	0.79	1.00	0.89	0.86	0.63	0.19	0.75	0.75	0.67	-0.49
Percent; Household Income - $15,000 to $24,999	0.86	0.89	1.00	0.80	0.40	0.27	0.70	0.71	0.60	-0.54
Percent; Families - Percent Below Poverty Level	0.79	0.86	0.80	1.00	0.72	0.26	0.54	0.56	0.50	-0.41
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.58	0.63	0.40	0.72	1.00	0.20	0.39	0.36	0.36	-0.24
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.29	0.19	0.27	0.26	0.20	1.00	0.43	0.02	-0.11	0.12
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.68	0.75	0.70	0.54	0.39	0.43	1.00	0.78	0.49	-0.45
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.63	0.75	0.71	0.56	0.36	0.02	0.78	1.00	0.76	-0.75
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.45	0.67	0.60	0.50	0.36	-0.11	0.49	0.76	1.00	-0.83
Percent; Standardized Test Passing Rate for Year 2000	-0.51	-0.49	-0.54	-0.41	-0.24	0.12	-0.45	-0.75	-0.83	1.00

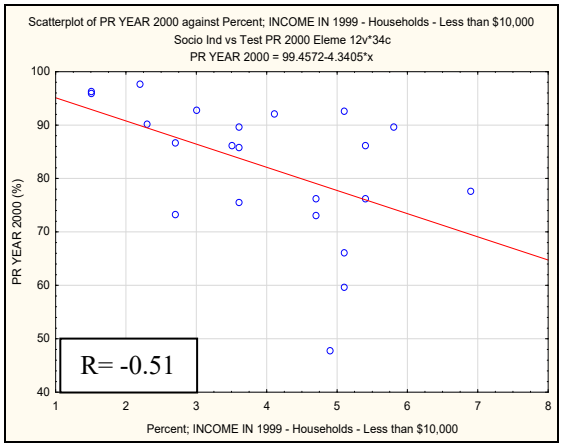
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for elementary schools, located greater than the 5-mile radius of the Sampson Horrice Site.

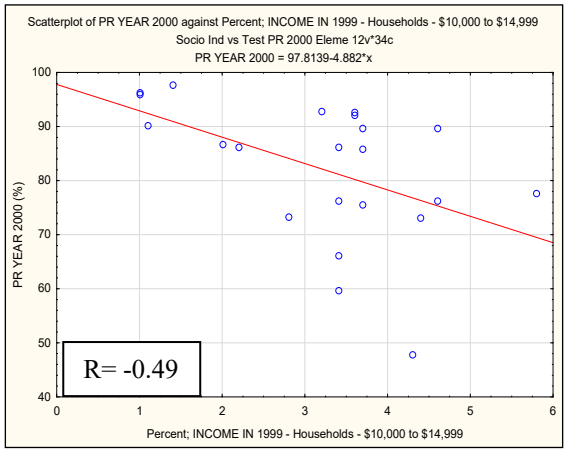
Based upon the correlation matrix, above, there are significant relationships between the standardized test passing rates and the percentage of households with income less than $10,000 per year, the percentage households with income between $10,000 to $14,999

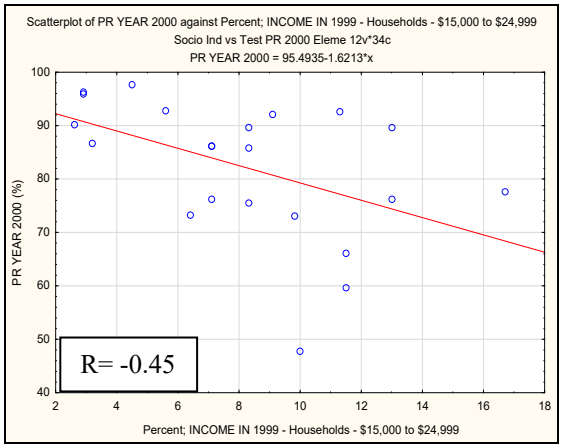
per year, the percentage households with income between $15,000 to $24,999 per year, as well as, the percentage of housing units constructed between Year 1960 to the Year 1969, Year 1940 to the Year 1959, and the Year 1939 or earlier. Based on the correlation matrix, it seems that there is a direct link of the socioeconomic indicators and the lower standardized test passing rates for elementary students.

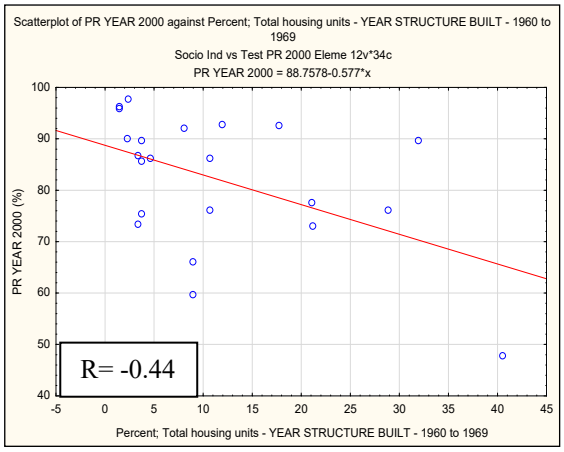
The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

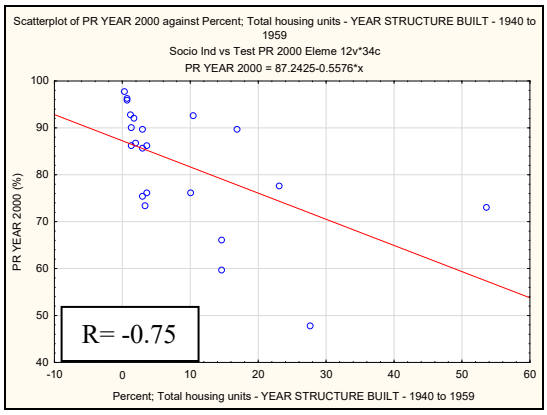
Graph 7.183- Graph 7.188: Year 2000 Sampson Horrice Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Standardized Test Passing Rates for Elementary Schools

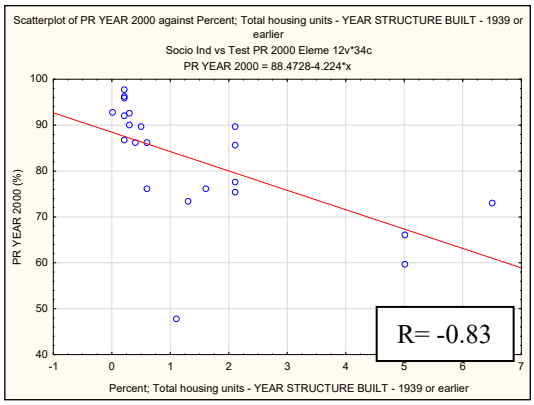












Based on the graphs, as the socioeconomic indicators associated with low income and with housing units built before the Year 1970, increase, the standardized test passing rates, decrease.

7.2.7.8 Year 2001 Socioeconomic Indicators vs the Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Sampson Horrice Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for elementary schools located within the 5-mile radius of the Sampson Horrice Site. The table of the elementary schools located within the 5-mile radius of the Sampson Horrice Site is located below.

Table 7.136: Year 2001 Socioeconomic Indicators vs. Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Superfund Site's 5-Mile Radius

	Sampson Horrice Year 2001 Socioeconomic Indicators and Elementary School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2001
DALLAS ISD	WA BLAIR EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	51.1
DALLAS ISD	JULIUS DORSEY EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	63.0
DALLAS ISD	FREDERICK DOUGLASS	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	57.0
DALLAS ISD	BH MACON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	68.7
DALLAS ISD	NANCY MOSELEY EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	54.7
DALLAS ISD	WILLIAM M ANDERSON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	64.7
DALLAS ISD	RICHARD LAGOW EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	65.8
DALLAS ISD	GILBERT CUELLAR SR EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	58.7
DALLAS ISD	RUFUS C BURLESON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	63.2
DALLAS ISD	JQ ADAMS EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	54.2
DALLAS ISD	HB GONZALEZ EL	75204	22.5	11.3	5.6	13.3	41.8	11.6	10.3	14.4	8.7	
DALLAS ISD	PLEASANT GROVE EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	75.4
DALLAS ISD	NATHANIEL HAWTHORNE	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	76.1
DALLAS ISD	JOHN IRELAND EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	55.3
DALLAS ISD	EDISON RUNYON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	50.9
MESQUITE ISD	FLOYD EL	75180	10.5	7.3	6.2	13.8	24.8	27.3	21.0	17.3	2.1	93.8
DALLAS ISD	ANNIE WEBB BLANTON EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	45.2
DALLAS ISD	EDWARD TITCHE EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	60.4
DALLAS ISD	KLEBERG EL	75253	13.1	9.7	6.1	15.9	25.9	15.9	5.9	9.0	2.6	71.6
DALLAS ISD	SAN JACINTO EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	78.9
MESQUITE ISD	GRAY ELEMENTARY	75180	10.5	7.3	6.2	13.8	24.8	27.3	21.0	17.3	2.1	70.1
MESQUITE ISD	HODGES EL	75180	10.5	7.3	6.2	13.8	24.8	27.3	21.0	17.3	2.1	84.6
MESQUITE ISD	MCWHORTER EL	75149	6.6	5.7	4.2	10.0	25.3	22.4	16.7	18.6	1.2	74.1
DALLAS ISD	CA TATUMJR EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	
											Average	65.3

The name of the school district, the campus name, and the zip codes the schools are located in, are shown along the left side of the table. The socioeconomic indicators and the test passing rates are shown across the top portion of the table. The "grey part of the tables represents schools that were not open yet or schools that were repurposed.

Based on the above table, the average standardized test passing rate of the elementary schools is 66.3%. The low average standardized test passing rate could be a result of the exposure of the prospective students to the leachate from the gravel pit that illegally accepted hazardous and solid waste, of the Sampson Horrice Site. Socioeconomic factors also could also negatively affect prospective student standardized test passing rates.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data not having a normal distribution and due to the few number of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for the elementary schools located within the 5-mile radius of the Sampson Horrice site, is shown below.

Table 7.137:Year 2001 Sampson Horrice Correlation Matrix for Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Within the 5-Mile Radius of the Sampson Horrice Site.

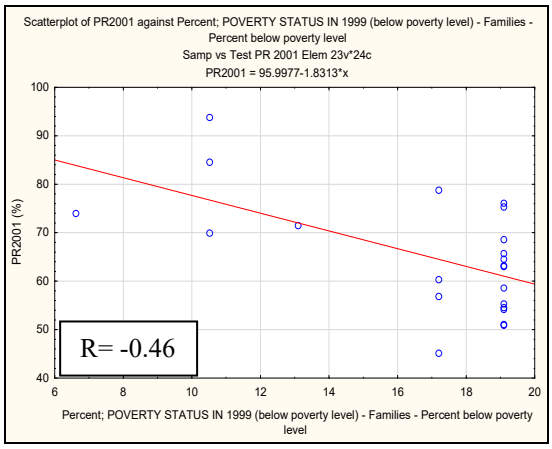
Variable	Spearman Rank Order Correlations (Samp vs Test PR 2001 Elem) MD pairwise deleted Marked correlations are significant at p <.05000 Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2001
Percent; Families - Percent Below Poverty Level	1.00	0.82	0.73	0.74	0.99	-0.20	0.64	0.71	0.39	-0.46
Percent; Household Income - Less than $10,000	0.82	1.00	0.98	0.99	0.81	-0.01	0.88	0.97	0.21	-0.46
Percent; Household Income - $10,000 to $14,999	0.73	0.98	1.00	0.99	0.72	0.13	0.93	0.98	0.12	-0.45
Percent; Household Income - $15,000 to $24,999	0.74	0.99	0.99	1.00	0.73	0.06	0.90	0.97	0.12	-0.46
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.99	0.81	0.72	0.73	1.00	-0.21	0.62	0.72	0.38	-0.47
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.20	-0.01	0.13	0.06	-0.21	1.00	0.45	0.16	-0.81	0.35
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.64	0.88	0.93	0.90	0.62	0.45	1.00	0.92	-0.17	-0.29
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.71	0.97	0.98	0.97	0.72	0.16	0.92	1.00	0.10	-0.45
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.39	0.21	0.12	0.12	0.38	-0.81	-0.17	0.10	1.00	-0.48
Percent; Standardized Test Passing Rate for Year 2001	-0.46	-0.46	-0.45	-0.46	-0.47	0.35	-0.29	-0.45	-0.48	1.00

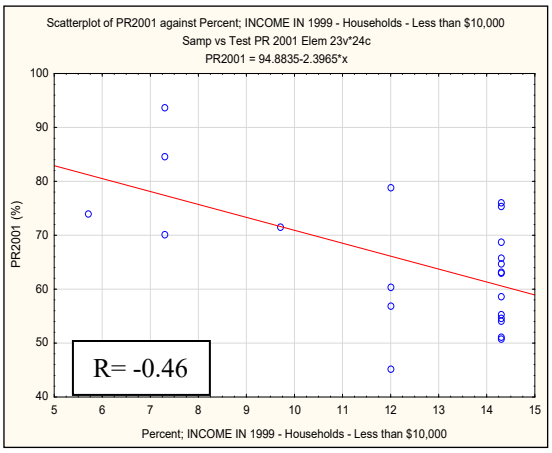
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for elementary schools, located within the 5-mile radius of the Sampson Horrice Site.

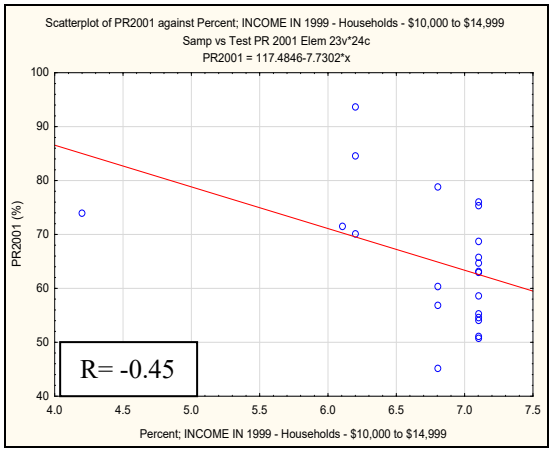
Based upon the correlation matrix, above, there is a weak significant relationship between the percentage standardized test passing rates and the percentage of families below poverty level, the percentage of households with income less than $10,000 per year, the percentage of households with income between $10,000 to $14,999 per year, the percentage of households with income from $15,000 to $24,999 per year, the percentage of female householders with no husband present with children less than 18 years of age, the percentage housing units constructed between Year 1940 to Year 1959, and the percentage of housing units constructed in the Year 1939 or earlier. Based on the correlation matrix, it seems that there is a direct link of low income households and older housing units contributing to lower standardized test passing rates. The significant relationships are weaker, in the Year 2001, indicating that effects from the cleanup activities that ended in the Year 2000, helped reduce the effects of the Sampson Horrice Site on standardized test passing rates. The significant relationships here, most likely are a result of socioeconomic indicators.

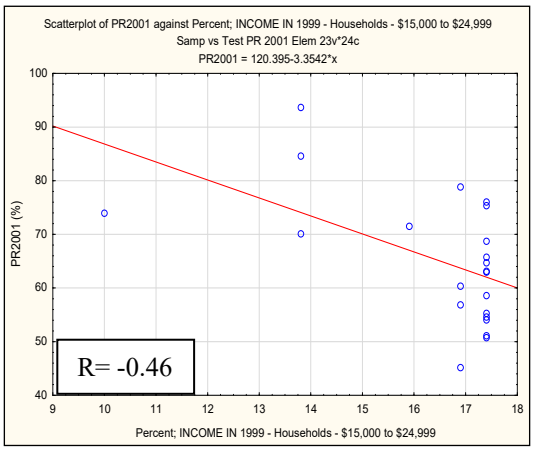
The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

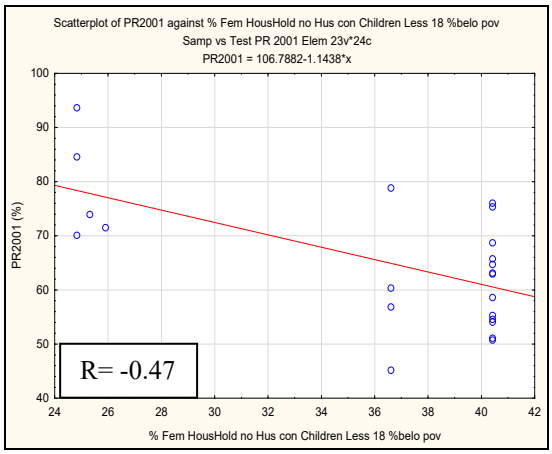
Graph 7.189- Graph 7.195: Year 2001 Sampson Horrice Plots of Significant Relationships between the Socioeconomic Indicators vs. the Standardized Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Site's 5-Mile Radius

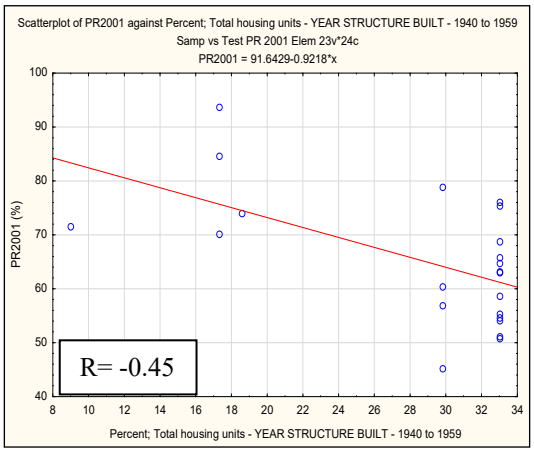

Scatterplot of PR2001 against Percent; POVERTY STATUS IN 1999 (below poverty level) - Families - Percent below poverty level
Samp vs Test PR 2001 Elem 23v*24c
PR2001 = 95.9977-1.8313*x
PR2001 (%)
R= -0.46
Percent; POVERTY STATUS IN 1999 (below poverty level) - Families - Percent below poverty level

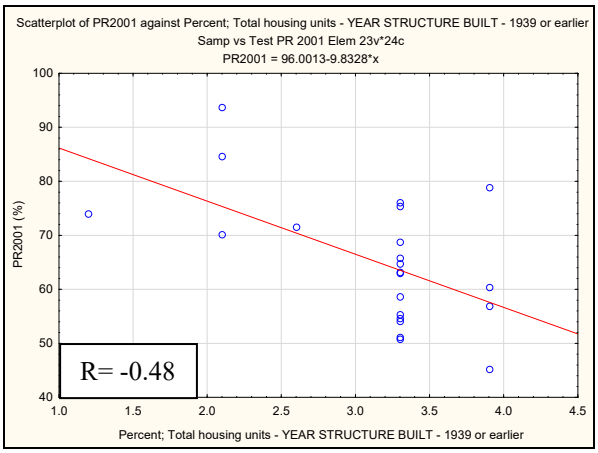

Scatterplot of PR2001 against Percent; INCOME IN 1999 - Households - Less than $10,000
Samp vs Test PR 2001 Elem 23v*24c
PR2001 = 94.8835-2.3965*x
PR2001 (%)
R= -0.46
Percent; INCOME IN 1999 - Households - Less than $10,000


Scatterplot of PR2001 against Percent; INCOME IN 1999 - Households - $10,000 to $14,999
Samp vs Test PR 2001 Elem 23v*24c
PR2001 = 117.4846-7.7302*x
PR2001 (%)
R= -0.45
Percent; INCOME IN 1999 - Households - $10,000 to $14,999


Scatterplot of PR2001 against Percent; INCOME IN 1999 - Households - $15,000 to $24,999
Samp vs Test PR 2001 Elem 23v*24c
PR2001 = 120.395-3.3542*x
PR2001 (%)
R= -0.46
Percent; INCOME IN 1999 - Households - $15,000 to $24,999


Scatterplot of PR2001 against % Fem HousHold no Hus con Children Less 18 %belo pov
Samp vs Test PR 2001 Elem 23v*24c
PR2001 = 106.7882-1.1438*x
PR2001 (%)
R= -0.47
% Fem HousHold no Hus con Children Less 18 %belo pov


Scatterplot of PR2001 against Percent; Total housing units - YEAR STRUCTURE BUILT - 1940 to 1959
Samp vs Test PR 2001 Elem 23v*24c
PR2001 = 91.6429-0.9218*x
PR2001 (%)
R= -0.45
Percent; Total housing units - YEAR STRUCTURE BUILT - 1940 to 1959



Based on the tables above, as the percentage of families below poverty level, the percentage of families with female householders with children under the year 18, the percentage of households income less than 10,000 per year, the percentage households with income between 10,000 to 14,999 per year, the percentage of households with income from $15,000 to $24,999 per year, the percentage of housing units constructed from the Year 1940 to the Year 1959, and the percentage of housing units constructed the Year 1939 or earlier, increase, the standardized test passing rates decrease. These graphs show that low income and housing units constructed before the Year 1970 have a negative impact on standardized test passing rates.

7.2.7.9 Year 2001 Comparison Analysis for Sampson Horrice Socioeconomic Indicators and the Standardized Test Passing Rates for Elementary Schools Located Greater than the 5-mile radius of the Sampson Horrice Site (Comparison Group).

The comparison group analysis identifies trends in the data, for the elementary schools, located within the Sampson Horrice Site's 5-mile radius, by comparing this data to the data, of the elementary schools located greater than the 5- mile radius of the Sampson Horrice Site. The table of the socioeconomic indicators and standardized test passing rates for children that attend the elementary schools located greater than the 5-mile radius of the Sampson Horrice Superfund Site, is shown below.

Table 7.138: Year 2001 Comparison Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Greater Than the 5-mile Radius of the Sampson Horrice Superfund Site.

	Year 2001 Socioeconomic Indicators and Standardized Test Passing Rate for Elementary Schools Greater than 5 Miles from Sampson H. Site											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2001
CARROLLTON-FARMERS BRANCH ISD	BLAIR EL	75234	4.9	4.3	10.0	4.3	17.4	16.0	40.5	27.6	1.1	51.1
CARROLLTON-FARMERS BRANCH ISD	KENT EL	75007	2.2	1.4	4.5	2.8	8.7	25.3	2.3	0.3	0.2	96.3
CEDAR HILL ISD	LAKERIDGE EL	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	
CEDAR HILL ISD	WATERFORD OAKS EL	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	60.5
COPPELL ISD	DENTON CREEK EL	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	98.2
COPPELL ISD	LAKESIDE EL	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	96.7
DALLAS ISD	VICTOR H HEXTER EL	75218	4.7	4.4	9.8	4.9	17.5	8.0	21.1	53.5	6.5	74.9
DESOTO ISD	RUBY YOUNG EL	75115	5.4	3.4	7.1	4.2	20.8	20.6	10.6	3.5	0.6	92.6
DESOTO ISD	AMBER TERRACE EL	75115	5.4	3.4	7.1	4.2	20.8	20.6	10.6	3.5	0.6	86.5
DUNCANVILLE ISD	WILLIAM LEE HASTINGS EL	75116	4.7	4.6	13.0	5.2	8.3	40.7	28.8	10.0	1.6	82.9
DUNCANVILLE ISD	CJ & ANNE HYMAN EL	75249	4.8	2.7	7.1	5.7	14.1	42.0	4.3	1.3	0.0	
FERRIS ISD	LUCY MAE MCDONALD EL	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	
FERRIS ISD	HAZEL INGRAM EL	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	
GARLAND ISD	STEADHAM EL	75089	2.3	1.1	2.6	1.5	9.7	13.5	2.2	1.3	0.3	89.8
GARLAND ISD	ROBERT B SEWELL EL	75048	2.7	2.0	3.2	3.4	9.3	11.1	3.3	1.9	0.2	86.8
GRAND PRAIRIE ISD	SUZANNA DICKINSON EL	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	80.3
GRAND PRAIRIE ISD	MIKE MOSELEY EL	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	
IRVING ISD	DAVIS EL	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	79.6
IRVING ISD	JACKIE MAE TOWNSELL EL	75038	5.8	3.7	11.4	8.0	18.3	17.5	3.2	1.4	0.2	
LANCASTER ISD	ROLLING HILLS EL	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	68.7
LANCASTER ISD	LANCASTER EL	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	71.6
LEWISVILLE ISD	BLUEBONNET ELEMENTARY	75028										
LEWISVILLE ISD	LEWISVILLE EL	75067										
MESQUITE ISD	PRICE EL	75043	4.1	3.6	9.1	4.9	18.4	40.2	8.0	1.7	0.2	89.1
MESQUITE ISD	CANNADAY EL	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	92.2
PLANO ISD	ROSE HAGGAR EL	75252	4.7	2.6	8.3	3.5	9.6	6.2	1.1	0.2	0.1	
RED OAK ISD	RED OAK INT	75154	3.6	3.7	8.3	5.1	20.5	16.5	3.7	2.9	2.1	84.4
RED OAK ISD	EASTRIDGE EL	75154	3.6	3.7	8.3	5.1	20.5	16.5	3.7	2.9	2.1	75.4
RED OAK ISD	SHIELDS EL	75154	3.6	3.7	8.3	5.1	20.5	16.5	3.7	2.9	2.1	84.1
RICHARDSON ISD	SPRING CREEK EL	75248	3.0	3.2	5.6	1.6	10.9	45.7	11.9	1.1	0.0	95.7
RICHARDSON ISD	LAKE HIGHLANDS EL	75238	5.8	4.6	13.0	6.4	19.0	21.9	31.9	16.9	0.5	87.5
WYLIE ISD	DON WHITT EL	75048	2.7	2.0	3.2	3.4	9.3	11.1	3.3	1.9	0.2	
WYLIE ISD	DR AL DRAPER INTERMED	75098	2.9	3.6	8.1	2.8	8.4	15.2	6.0	4.6	1.7	
WYLIE ISD	CHERI COX EL	75048	2.7	2.0	3.2	3.4	9.3	11.1	3.3	1.9	0.2	
											Average	83.0

The school district name, the campus name, and zip codes the schools are located in is shown on the left side of the table and the socioeconomic indicators and the standardized test passing rates are shown across the top section of the table.
The grey areas on the table, represent schools that were not opened yet, or schools that were repurposed. In addition, the grey socioeconomic indicator data represent data that was not available from the uscensus. The average standardized test passing rate for schools located greater than the 5-mile radius of Sampson Horrice Superfund Site is 83.0% and the average standardized test passing rate is 66.3% for the elementary schools located within the 5- mile radius of the Sampson Horrie Site. There is a approximately 17 point difference for the average standardized test passing rate for elementary schools located inside the Sampson Horrice Site's 5-mile radius and the elementary schools located greater than the Sampson Horrice Site's 5-mile radius. This could be due to a lower percentages of low income families and households, as well as, a low percentage of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data, due to a low quantity of observations and due to the data set not having a normal distribution. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for elementary schools, is shown below.

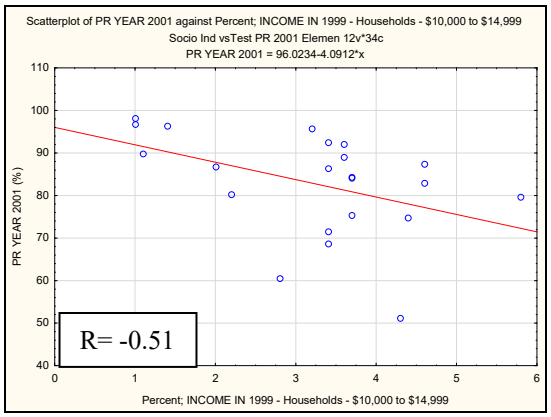
Table 7.139:Year 2001 Correlation Matrix for Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Greater than the 5-Mile Radius of the Sampson Horrice Site.

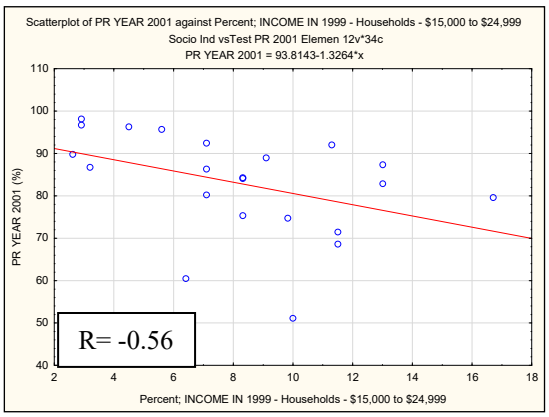
	Spearman Rank Order Correlations (Socio Ind vsTest PR 2001 Elemen) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2001
Percent; Household Income - Less than $10,000	1.00	0.79	0.86	0.79	0.58	0.29	0.68	0.63	0.45	-0.39
Percent; Household Income - $10,000 to $14,999	0.79	1.00	0.89	0.86	0.63	0.19	0.75	0.75	0.67	-0.51
Percent; Household Income - $15,000 to $24,999	0.86	0.89	1.00	0.80	0.40	0.27	0.70	0.71	0.60	-0.56
Percent; Families - Percent Below Poverty Level	0.79	0.86	0.80	1.00	0.72	0.26	0.54	0.56	0.50	-0.45
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.58	0.63	0.40	0.72	1.00	0.20	0.39	0.36	0.36	-0.21
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.29	0.19	0.27	0.26	0.20	1.00	0.43	0.02	-0.11	0.11
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.68	0.75	0.70	0.54	0.39	0.43	1.00	0.78	0.49	-0.39
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.63	0.75	0.71	0.56	0.36	0.02	0.78	1.00	0.76	-0.68
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.45	0.67	0.60	0.50	0.36	-0.11	0.49	0.76	1.00	-0.80
Percent; Standardized Test Passing Rate for Year 2001	-0.39	-0.51	-0.56	-0.45	-0.21	0.11	-0.39	-0.68	-0.80	1.00

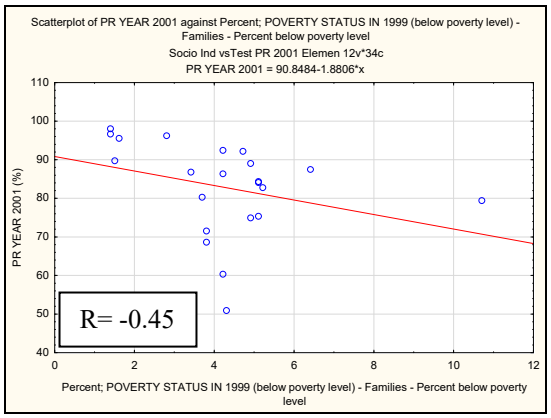
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for elementary schools, located greater than the 5-mile radius of the Sampson Horrice Site.

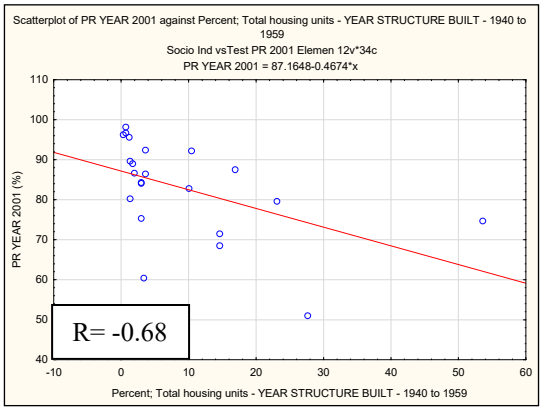
Based upon the correlation matrix, above, there is are significant relationships between the standardized test passing rates and the percentage of households with income between $10,000 per year to $14,999 per year, the percentage of households with income between $15,000 to $24,000 per year, the percentage of families below poverty level, the percentage of housing units constructed between the Year 1940 to 1959, and the percentage of housing units constructed in the Year 1939 or earlier. Based on the correlation matrix, it seems that there is a direct link of households with low income, families below poverty level, and housing units constructed before the Year 1970, and lower standardized test passing rates for elementary schools. The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

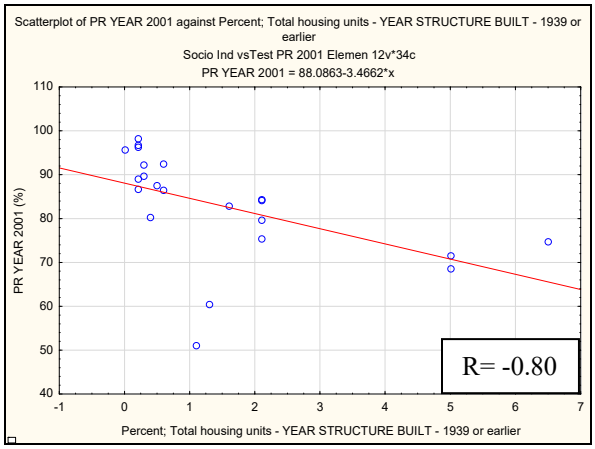
Graph 7.196- Graph 7.200: Year 2001 Sampson Horrice Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Standardized Test Passing Rates for Elementary Schools











Based on the graphs above, as the percentages of households with low income, the percentage of families below poverty level, the percentage of housing units constructed before the Year 1970 increase, the standardized test passing rates, decrease.

7.2.7.10 Year 2002 Socioeconomic Indicators vs the Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Sampson Horrice Site.

The elementary schools socioeconomic indicators vs the student standardized test passing rate analysis, for schools located within the 5 mile radius of the Sampson Horrice Site is conducted to determine if there are socioeconomic factors that impact standardized student passing rates as well as distance to the Sampson Horrice Site. The table of the elementary schools located within the 5 mile radius of the Sampson Horrice site is located below.

Table 7.140: Year 2002 Socioeconomic Indicators vs. Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Superfund Site's 5-mile Radius

	Sampson Horrice Year 2002 Socioeconomic Indicators and Elementary School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2002
DALLAS ISD	WA BLAIR EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	59.7
DALLAS ISD	JULIUS DORSEY EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	70.6
DALLAS ISD	FREDERICK DOUGLASS	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	90.7
DALLAS ISD	BH MACON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	74.5
DALLAS ISD	NANCY MOSELEY EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	70.7
DALLAS ISD	WILLIAM M ANDERSON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	62.5
DALLAS ISD	RICHARD LAGOW EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	76.5
DALLAS ISD	GILBERT CUELLAR SR EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	69.5
DALLAS ISD	RUFUS C BURLESON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	68.9
DALLAS ISD	JQ ADAMS EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	66.5
DALLAS ISD	HB GONZALEZ EL	75204	22.5	11.3	5.6	13.3	41.8	11.6	10.3	14.4	8.7	
DALLAS ISD	PLEASANT GROVE EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	86.1
DALLAS ISD	NATHANIEL HAWTHORNE	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	87.8
DALLAS ISD	JOHN IRELAND EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	74.0
DALLAS ISD	EDISON RUNYON EL	75217	19.1	14.3	7.1	17.4	40.4	19.5	24.3	33.0	3.3	61.2
MESQUITE ISD	FLOYD EL	75180	10.5	7.3	6.2	13.8	24.8	27.3	21.0	17.3	2.1	98.3
DALLAS ISD	ANNIE WEBB BLANTON EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	61.1
DALLAS ISD	EDWARD TITCHE EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	68.8
DALLAS ISD	KLEBERG EL	75253	13.1	9.7	6.1	15.9	25.9	15.9	5.9	9.0	2.6	90.9
DALLAS ISD	SAN JACINTO EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	72.0
MESQUITE ISD	GRAY ELEMENTARY	75180	10.5	7.3	6.2	13.8	24.8	27.3	21.0	17.3	2.1	78.2
MESQUITE ISD	HODGES EL	75180	10.5	7.3	6.2	13.8	24.8	27.3	21.0	17.3	2.1	84.3
MESQUITE ISD	MCWHORTER EL	75149	6.6	5.7	4.2	10.0	25.3	22.4	16.7	18.6	1.2	92.3
DALLAS ISD	CA TATUMJR EL	75227	17.2	12.0	6.8	16.9	36.6	16.7	18.1	29.8	3.9	
											Average	75.7

The school district name, the campus name, the zip codes the schools are located are shown on the left side of the table and the socioeconomic indicators and the standardized test passing rate are shown across the top of the table. The grey areas represent schools that were not opened yet or schools that ere repurposed. Based on the above table, the average standardized test passing for the elementary schools is 75.7%. This is the highest student standardized test passing rate from the Year 1999 to the Year 2002. The increase in standardized test passing rates could be due to the impacts of the Sampson Horrice Site on prospective student cognitive an ability being reduced due to the prospective students being born after the Sampson Horrice Site was cleaned up (Year 2000).

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not having a normal distribution and due to a few number of observations. The correlation matrix for the socioeconomic indicators and the school standardized test passing rates for the elementary schools located within the 5 mile radius of the Sampson Horrice site, for the Year 2002 is shown below.

Table 7.141:Year 2002 Correlation Matrix Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Sampson Horrice Site.

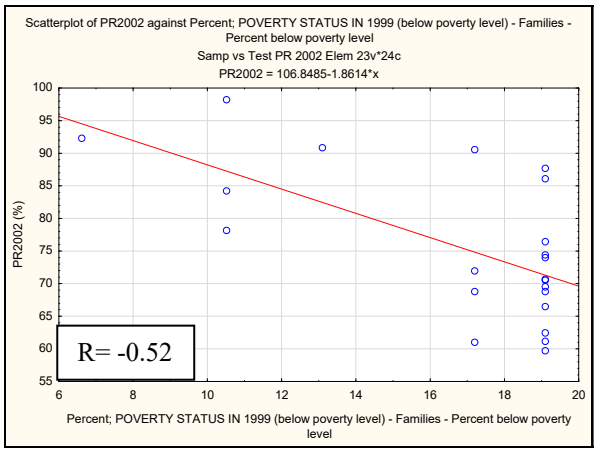
Variable	Spearman Rank Order Correlations (Samp vs Test PR 2002 Elem) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2002
Percent; Families - Percent Below Poverty Level	1.00	0.82	0.73	0.74	0.99	-0.20	0.64	0.71	0.39	-0.52
Percent; Household Income - Less than $10,000	0.82	1.00	0.98	0.99	0.81	-0.01	0.88	0.97	0.21	-0.52
Percent; Household Income - $10,000 to $14,999	0.73	0.98	1.00	0.99	0.72	0.13	0.93	0.98	0.12	-0.53
Percent; Household Income - $15,000 to $24,999	0.74	0.99	0.99	1.00	0.73	0.06	0.90	0.97	0.12	-0.52
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.99	0.81	0.72	0.73	1.00	-0.21	0.62	0.72	0.38	-0.51
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.20	-0.01	0.13	0.06	-0.21	1.00	0.45	0.16	-0.81	0.26
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.64	0.88	0.93	0.90	0.62	0.45	1.00	0.92	-0.17	-0.40
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.71	0.97	0.98	0.97	0.72	0.16	0.92	1.00	0.10	-0.52
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.39	0.21	0.12	0.12	0.38	-0.81	-0.17	0.10	1.00	-0.51
Percent; Standardized Test Passing Rate for Year 2002	-0.52	-0.52	-0.53	-0.52	-0.51	0.26	-0.40	-0.52	-0.51	1.00

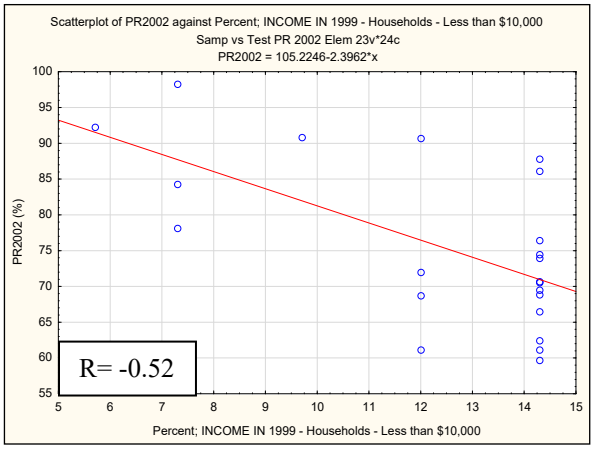
In the correlation matrix, each variable for socioeconomic indicators and the standardized test passing rates, is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the socioeconomic indicators and the standardized test passing rates, from the Year 2002, were evaluated.

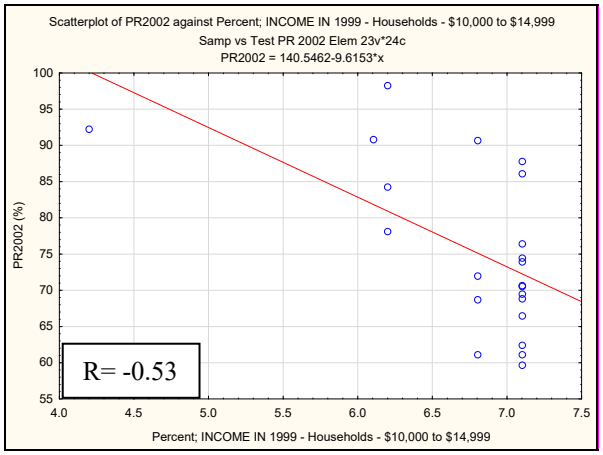
Based upon the correlation matrix, above, there is a medium correlation between the percentage standardized test passing rates and the percentage of families below poverty level the percentage of households with income less than $10,000 per year, the percentage of households with income between $10,000 to $14,999, the percentage of households with income from $15,000 per year to $24,999 per year, percentage of female householder with children less than 18 years of age, percentage housing units constructed between Year 1940 to the Year 1959 and the percentage of housing units constructed the Year 1939 or earlier. Based on the correlation matrix, it seems that there is a direct link of low income households, families below poverty and female households with children below the age 18, and older housing units that were constructed between the Year 1939 or earlier having a direct, negative impact on the student standardized test passing rate. This could be a result of low income households living in cheaper and older housing units that were constructed before the Year 1970. The prospective students could have been exposed to indoor lead paint. In addition, some impacts from the Sampson Horrice Site could have also affected the prospective student's cognitive abilities, which resulted in lower standardized test passing rates.

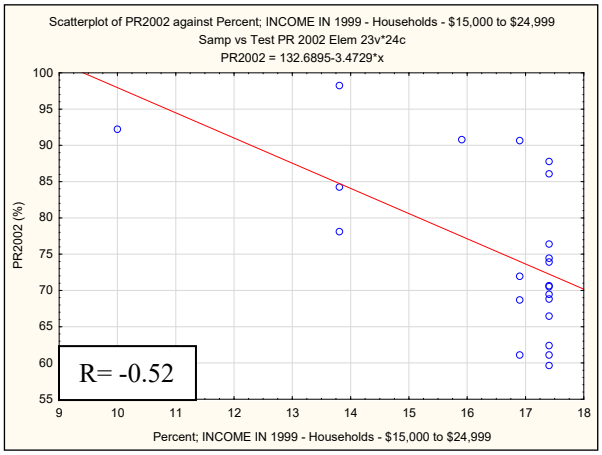
The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

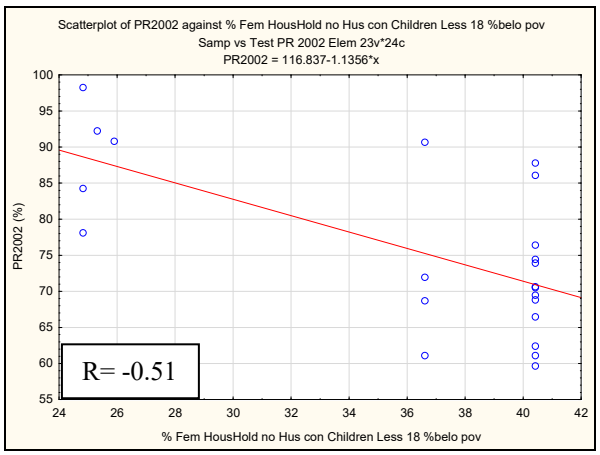
Graph 7.201- Graph 7.207: Year 2002 Sampson Horrice Plots of Significant Relationships between the Socioeconomic Indicators vs. the Standardized Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Site's 5-mile Radius

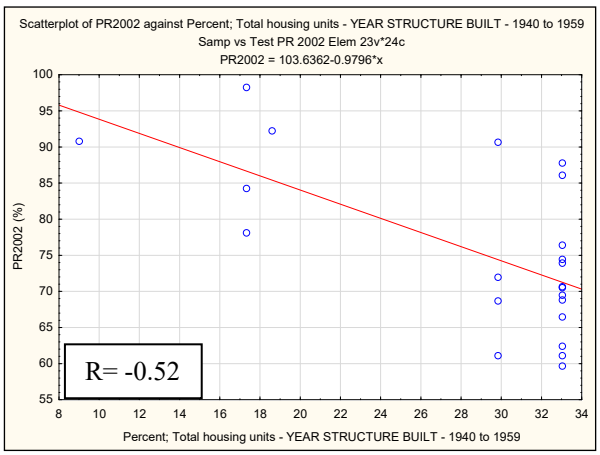


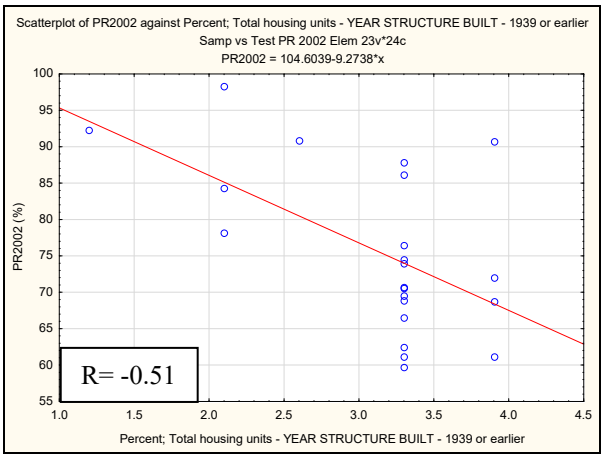












Based on the graphs above, as the percentage families below poverty, the percentage of female householders with children under the age of 18, the percentage of households with low income, the percentage of housing units constructed between the Year 1940 to the Year 1959 and the percentage of housing units constructed the Year 1939 or earlier, increases, the student standardized test passing rates decreases for the elementary students that attend schools located within the Sampson Horrice 5 mile radius.

7.2.7.11 Year 2002 Comparison Analysis for Sampson Horrice Socioeconomic Indicators and the Standardized Test Passing Rates for Elementary Schools Located Greater than the 5-mile Radius of the Sampson Horrice Site.

The comparison group analysis was conducted to identify trends in the elementary school data for schools located within the 5 mile radius of the Sampson Horrice Site by comparing the data with the data for the elementary schools located greater than 5 miles from the Sampson Horrice site. The table of the socioeconomic indicators and standardized test passing rates for children that attend schools located greater than 5 miles from the Sampson Horrice State Superfund Site for the Year 2002 is shown below.

Table 7.142: Year 2002 Comparison Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Greater Than the 5-mile Radius of the Sampson Horrice Superfund Site.

	Year 2002 Socioeconomic Indicators and Standardized Test Passing Rate for Elementary Schools Greater than 5 Miles from Sampson H. Site											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2002
CARROLLTON-FARMERS BRANCH ISD	BLAIR EL	75234	4.9	4.3	10.0	4.3	17.4	16.0	40.5	27.6	1.1	59.7
CARROLLTON-FARMERS BRANCH ISD	KENT EL	75007	2.2	1.4	4.5	2.8	8.7	25.3	2.3	0.3	0.2	98.9
CEDAR HILL ISD	LAKERIDGE EL	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	
CEDAR HILL ISD	WATERFORD OAKS EL	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	75.0
COPPELL ISD	DENTON CREEK EL	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	98.1
COPPELL ISD	LAKESIDE EL	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	97.7
DALLAS ISD	VICTOR H HEXTER EL	75218	4.7	4.4	9.8	4.9	17.5	8.0	21.1	53.5	6.5	82.9
DESOTO ISD	RUBY YOUNG EL	75115	5.4	3.4	7.1	4.2	20.8	20.6	10.6	3.5	0.6	88.2
DESOTO ISD	AMBER TERRACE EL	75115	5.4	3.4	7.1	4.2	20.8	20.6	10.6	3.5	0.6	86.5
DUNCANVILLE ISD	WILLIAM LEE HASTINGS EL	75116	4.7	4.6	13.0	5.2	8.3	40.7	28.8	10.0	1.6	83.9
DUNCANVILLE ISD	CJ & ANNE HYMAN EL	75249	4.8	2.7	7.1	5.7	14.1	42.0	4.3	1.3	0.0	
FERRIS ISD	LUCY MAE MCDONALD EL	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	
FERRIS ISD	HAZEL INGRAM EL	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	
GARLAND ISD	STEADHAM EL	75089	2.3	1.1	2.6	1.5	9.7	13.5	2.2	1.3	0.3	94.4
GARLAND ISD	ROBERT B SEWELL EL	75048	2.7	2.0	3.2	3.4	9.3	11.1	3.3	1.9	0.2	79.3
GRAND PRAIRIE ISD	SUZANNA DICKINSON EL	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	87.9
GRAND PRAIRIE ISD	MIKE MOSELEY EL	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	
IRVING ISD	DAVIS EL	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	85.6
IRVING ISD	JACKIE MAE TOWNSELL EL	75038	5.8	3.7	11.4	8.0	18.3	17.5	3.2	1.4	0.2	
LANCASTER ISD	ROLLING HILLS EL	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	63.9
LANCASTER ISD	LANCASTER EL	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	75.1
LEWISVILLE ISD	BLUEBONNET ELEMENTARY	75028										
LEWISVILLE ISD	LEWISVILLE EL	75067										
MESQUITE ISD	PRICE EL	75043	4.1	3.6	9.1	4.9	18.4	40.2	8.0	1.7	0.2	89.6
MESQUITE ISD	CANNADAY EL	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	89.4
PLANO ISD	ROSE HAGGAR EL	75252	4.7	2.6	8.3	3.5	9.6	6.2	1.1	0.2	0.1	
RED OAK ISD	RED OAK INT	75154	3.6	3.7	8.3	5.1	20.5	16.5	3.7	2.9	2.1	89.0
RED OAK ISD	EASTRIDGE EL	75154	3.6	3.7	8.3	5.1	20.5	16.5	3.7	2.9	2.1	73.0
RED OAK ISD	SHIELDS EL	75154	3.6	3.7	8.3	5.1	20.5	16.5	3.7	2.9	2.1	90.8
RICHARDSON ISD	SPRING CREEK EL	75248	3.0	3.2	5.6	1.6	10.9	45.7	11.9	1.1	0.0	94.9
RICHARDSON ISD	LAKE HIGHLANDS EL	75238	5.8	4.6	13.0	6.4	19.0	21.9	31.9	16.9	0.5	86.0
WYLIE ISD	DON WHITT EL	75048	2.7	2.0	3.2	3.4	9.3	11.1	3.3	1.9	0.2	
WYLIE ISD	DR AL DRAPER INTERMED	75098	2.9	3.6	8.1	2.8	8.4	15.2	6.0	4.6	1.7	
WYLIE ISD	CHERI COX EL	75048	2.7	2.0	3.2	3.4	9.3	11.1	3.3	1.9	0.2	
											Average	85.0

The district name, the campus name and the zip codes that the schools are located in are shown on the left side of the table. The socioeconomic indicators and the student standardized test passing rate for the Year 2002 are shown across the top of the table. The grey areas on the table, where test passing rates should be, represent schools that were not opened, or schools that were repurposed. In addition, the socioeconomic data that is grey in the table represents data that was not available from the census.gov website. The average standardized test passing rate for elementary schools located outside of the Sampson Horrice State Superfund Site for the Year 2002 is 85.0% and the standardized test passing rate for elementary schools located within the Sampson Horrice 5 mile radius is 75.7%. There is about a 9 point difference in student standardized test passing rates for elementary schools located within and outside of the Sampson Horrice Site. The standardized test difference is the lowest difference in standardized test passing rates from the Year 1999 to the Year 2002. This may be due to the effects of the Sampson Horrice Site on the prospective student's cognitive abilities being reduced due to the cleanup activities ending at the Sampson Horrice Site in the Year 2000.

The Spearman Rank Correlation Matrix was utilized to analyze the data as an effort to use consist data analysis methods and due to the data set not being normal. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for elementary schools is shown below.

Table 7.143:Year 2002 Correlation Matrix for Sampson Horrice Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Greater than the 5-mile Radius of the Sampson Horrice Site.

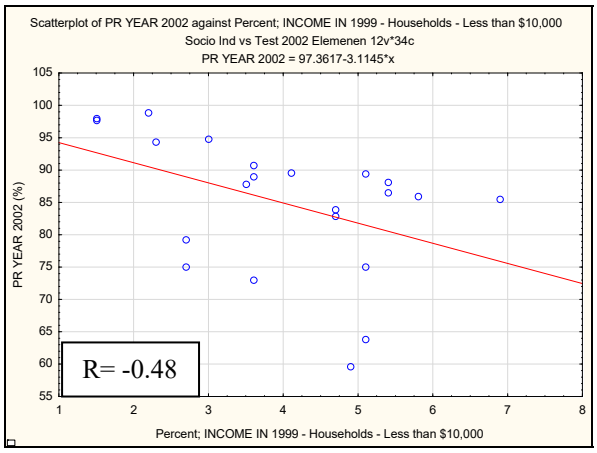
	Spearman Rank Order Correlations (Socio Ind vs Test 2002 Elemenen) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2002
Percent; Household Income - Less than $10,000	1.00	0.79	0.86	0.79	0.58	0.29	0.68	0.63	0.45	-0.48
Percent; Household Income - $10,000 to $14,999	0.79	1.00	0.89	0.86	0.63	0.19	0.75	0.75	0.67	-0.47
Percent; Household Income - $15,000 to $24,999	0.86	0.89	1.00	0.80	0.40	0.27	0.70	0.71	0.60	-0.55
Percent; Families - Percent Below Poverty Level	0.79	0.86	0.80	1.00	0.72	0.26	0.54	0.56	0.50	-0.41
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.58	0.63	0.40	0.72	1.00	0.20	0.39	0.36	0.36	-0.17
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.29	0.19	0.27	0.26	0.20	1.00	0.43	0.02	-0.11	0.12
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.68	0.75	0.70	0.54	0.39	0.43	1.00	0.78	0.49	-0.45
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.63	0.75	0.71	0.56	0.36	0.02	0.78	1.00	0.76	-0.73
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.45	0.67	0.60	0.50	0.36	-0.11	0.49	0.76	1.00	-0.66
Percent; Standardized Test Passing Rate for Year 2002	-0.48	-0.47	-0.55	-0.41	-0.17	0.12	-0.45	-0.73	-0.66	1.00

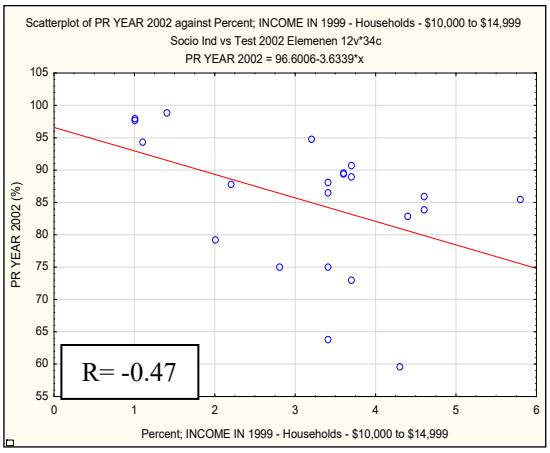
In the correlation matrix, each variable for socioeconomic indicators and the standardized test passing rates, is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the socioeconomic indicators and the standardized test passing rates, from the Year 2002, were evaluated.

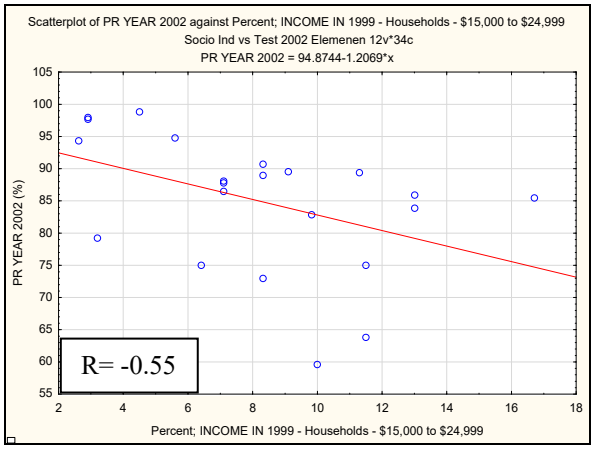
Based upon the correlation matrix, above, there is a weak, significant negative correlation between the standardized test passing rates and the percentage of households with income less than $10,000 per year, the percentage of households with income from$10,000 per year to $14,999 per year, percentage of households with income between $15,000 to $24,000, and housing units constructed between the Year 1960 to Year 1969, the Year 1940 to 1959, the Year 1940 to 1959. Based on the correlation matrix, it seems that there is a direct link of households with low income, and housing units constructed for the Year 1970, and lower standardized test passing rates for elementary school aged students. In addition, the majority of the significant R values are lower for the schools located outside of the 5 mile radius than the schools located inside of the Sampson Horrice 5 mile radius.

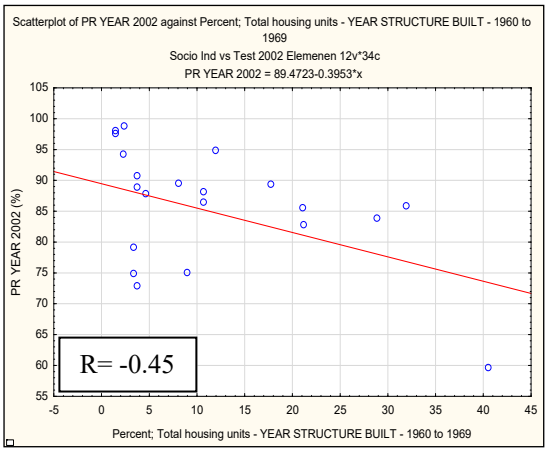
The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

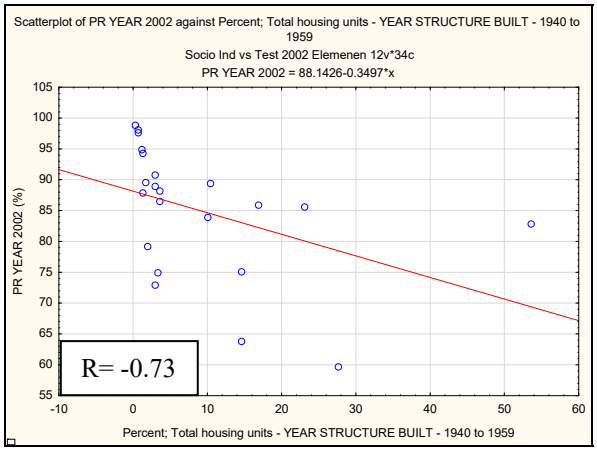
Graph 7.208- Graph 7.213: Year 2002 Sampson Horrice Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Standardized Test Passing Rates for Elementary Schools

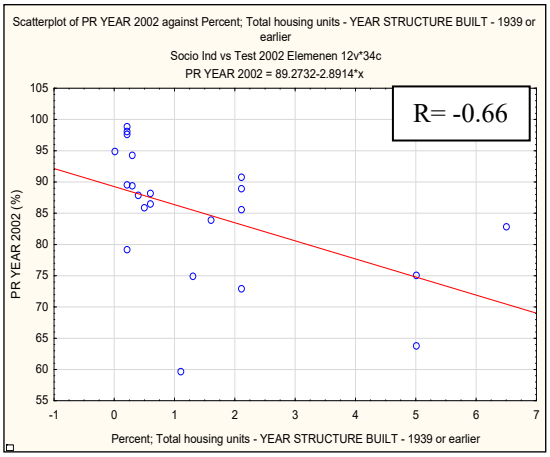








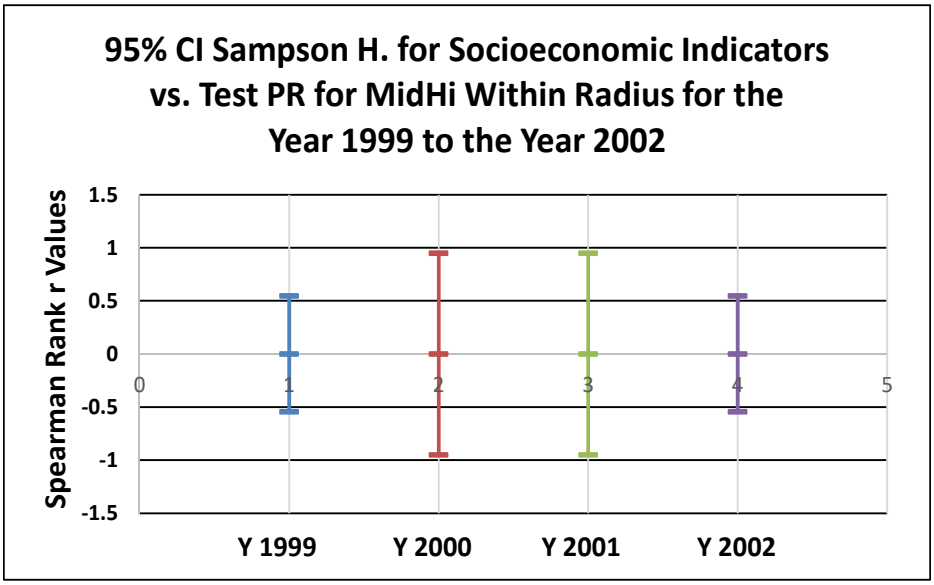




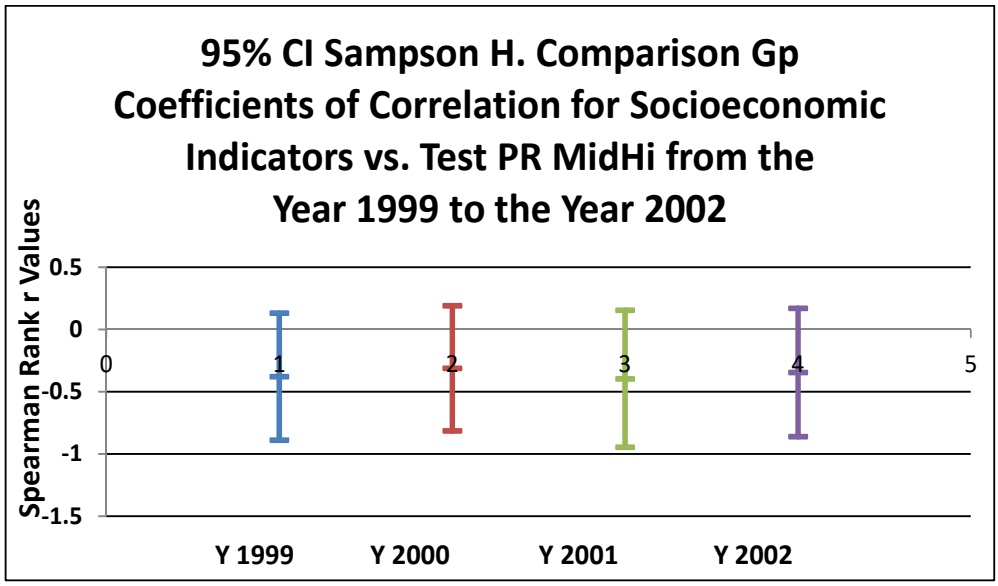
Based on the graphs above, as the percentage of households with low income and the percentage of housing units constructed before the Year 1970 increase, the student standardized test passing rate for elementary school decreases. These relationships indicate that socioeconomic indicators do negatively affect the student standardized test passing rate, excluding any impacts from lead contaminated Superfund Sites.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1999 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for the socioeconomic indicators vs. the standardized test passing rates, for the middle and high schools and elementary schools, located within and greater than, the 5-mile radius of the Sampson Horrice Superfund Site, are shown below.

Graph 7.214 Sampson Horrice Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Standardized Test Passing Rate for Middle and High Schools from the Year 1999 to the Year 2002.

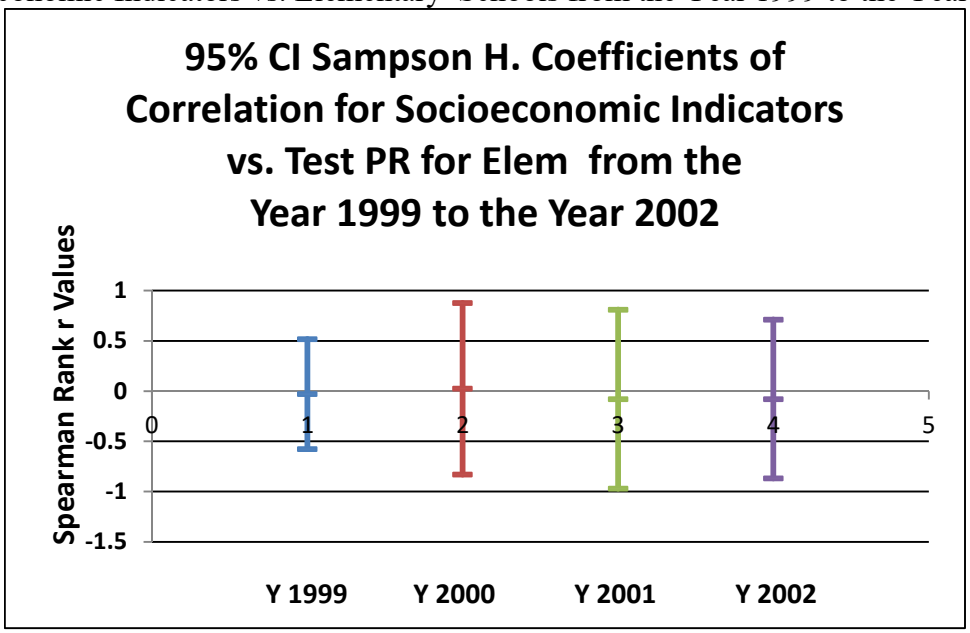


Graph 7.215: Sampson Horrice Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Standardized Test Passing Rate for Middle and High Schools from the Year 1999 to the Year 2002.

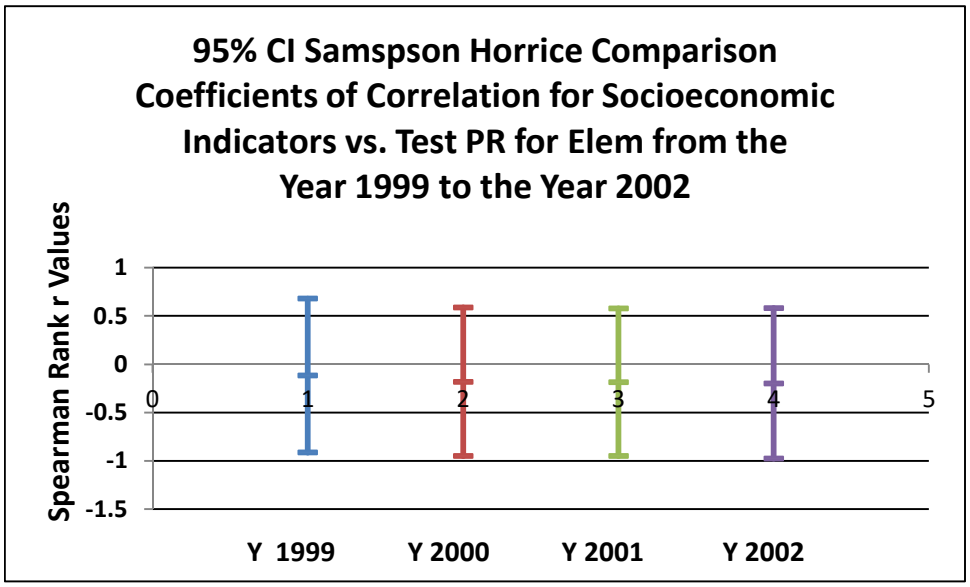


Based on the confidence interval graphs, there were no significant coefficients of correlations, in the confidence intervals, for the middle and high schools, located within the 5-mile radius of the Sampson Horrice Site. There were significant coefficients of correlations, in the confidence intervals, for the comparison group, for every year, except for the Year 2000.

Graph 7.216 Sampson Horrice Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Elementary Schools from the Year 1999 to the Year 2002.



Graph 7.217: Sampson Horrice Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Total Counts of Elevated Blood Lead Levels from the Year 1999 to the Year 2002.



In the confidence interval graphs, there were significant coefficients of correlations, for every year, except the Year 1999, in the confidence intervals, for the middle and high schools, located within the 5-mile radius of the Sampson Horrice Site. There were significant coefficients of correlations, in the confidence intervals, for the comparison group, for every year, from the Year 1999 to the Year 2002.

7.2.8 Sampson Horrice Childhood Blood Lead Level vs. Test Passing Rate Analysis

The childhood blood lead level vs. standardized test passing rate analysis does not include the socioeconomic indicators, but examines if there is a significant relationship between elevated childhood blood level and student standardized test passing rates.

The elevated childhood blood level was examined, for children from ages 0 yrs to 14 yrs that reside within the Sampson Horrice Site's 5-mile radius, for the Year 1999 to the Year 2002. The elevated childhood blood lead levels, that were examined, was the 10 -14 µg/dl concentration and the total overall counts (10-14 µg/dl, 15-19 µg/dl, and = or > 20 µg/dl), of elevated childhood blood lead. Other elevated childhood blood levels that were not included in the Study, individually, due extremely low quantity of counts, were the 15-19 µg/dl, and the = or > 20 µg/dl concentrations. The elevated childhood blood lead level results were evaluated from the Year 1999 to the Year 2002.

The student standardized test passing rates were evaluated from the Year 1999 to the Year 2002, for consistency with the childhood blood lead level analysis. Since the blood lead level analysis is zip code based, the standardized test passing rates were averaged per school type, per zip code, since there can be multiple schools located within a single zip code. The analysis was separated into four groups the 10-14 µg/dl counts and

the total counts, of elevated blood lead levels, with the test passing rates for middle and high schools, as well as, the test passing rates for elementary schools.

A direct comparison of the unduplicated counts of elevated blood lead levels and the standardized test passing rates, could not be completed because the unduplicated total counts are measured, per zip code, per year, and the standardized test passing rates are used to measure the impacts, of lead exposure, from the earlier years of children. Therefore, an indirect comparison can be completed, under the assumption that the unduplicated counts , of elevated childhood blood lead data, from the Year 1999 to the Year 2002, are similar to the unduplicated counts, before the Year 1999. A comparison analysis was completed to compare the same data, for zip codes and schools, located greater than the Sampson Horrice Site 5-mile radius.

7.2.8.1 Sampson Horrice Year 1999 to Year 2002 Elevated Childhood Blood Lead Level 10 -14 μg/dl and Total Counts of Elevated Childhood Blood Lead Levels vs Test Passing Rates for Middle and High Schools, Located Within the Sampson Horrice Site's 5-Mile Radius.

The elevated childhood blood lead level vs the student standardized test passing rate for middle and high schools analysis was conducted to determine if there is a direct effect of elevated childhood blood lead levels on student standardized test passing rates. Unfortunately, the analysis could not be completed due to a significant lack of the number of observations. Many of the middle and high schools, located within the Sampson Horrice 5 mile radius, are located within one to two zip codes. In addition, these zip codes cover a large surface area. As a result, there were only two observations for middle and high schools located within the Sampson Horrice Site 5 mile radius.

The tables of the elevated childhood blood lead levels and student standardized test passing rates, for middle schools and high schools, located within the Sampson Horrice Site 5 mile radius, are shown below.

Table 7.144-Table 7.145: Year 1999 to Year 2002 Sampson Horrice Elevated Childhood Blood Lead Level of 10-14 μg/dl and Total Counts of Elevated Childhood Blood Lead Levels and the Standardized Test Passing Rates for Middle and High Schools Located Within the Sampson Horrice Superfund Site's 5-mile Radius

	Sampson H. 10-14 ug/dl Counts of Blood Lead Levels vs Percentage Middle and High School Test Passing Rates							
Zip Code	10--14 BLL 1999 (#)	10--14 BLL 2000 (#)	10--14 BLL 2001 (#)	10--14 BLL 2002 (#)	PR1999 (%)	PR2000 (%)	PR2001 (%)	PR2002 (%)
75217	55	26	22	43	39.8	45.6	48.9	57.0
75227	38	19	18	25	24.3	41.6	36.6	42.1
Sum/Average	**93**	**45**	**40**	**68**	**32.1**	**43.6**	**42.8**	**49.6**

	Sampson H. Total Counts Blood Lead Levels vs Percentage Middle and High School Test Passing Rates							
Zip Code	Total BLL 1999 (#)	Total BLL 2000 (#)	Total BLL 2001 (#)	Total BLL 2002 (#)	PR1999 (%)	PR2000 (%)	PR2001 (%)	PR2002 (%)
75217	69	37	28	63	39.8	45.6	48.9	57.0
75227	46	24	22	35	24.3	41.6	36.6	42.1
Sum/Average	**115**	**61**	**50**	**98**	**32.1**	**43.6**	**42.8**	**49.6**

The zip codes that the schools are located are shown on the left side of the table and the elevated counts of elevated blood lead level of 10-14 μg/dl and the total counts of elevated blood lead level for the Year 1999 to the Year 2000, and the student

standardized test passing rate for middle and high schools students for the Year 1999 to the Year 2002 are shown across the top of the tables**.** Based on the above tables, the counts of elevated blood lead level of 10-14 μg/dl and the total counts of elevated childhood blood lead level are shown at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate is shown at the bottom of the table, as well, for the Year 1999 to the Year 2002.

For the blood lead level and the standardized test passing rate analysis, the data sets cannot be directly compared together, but indirectly together, assuming that the unduplicated counts from the Year 1999 to the Year 2002 are similar to the counts of elevated childhood blood lead data from the year before the Year 1999. In the event that the elevated counts of childhood blood lead of 10-14 μg/dl and the total counts of elevated blood lead level are similar to the counts from the Years before 1999, then the counts could be a result of exposure to the leachate from the Sampson Horrice Site's gravel pit. The increasing standardized test passing rates could be due to negative cognitive effects from exposure to the leachate from the Sampson Horrice Site, when the prospective middle and high school student were young children, as well as socioeconomic indicators.

The Spearman Rank correlation matrix could not be utilized to analysis the data because it is difficult to determine the shape of a two observations regression and determine if the regression is significant. Therefore, no trends or relationships in the 10-14 counts of elevated blood lead level and no total counts of elevated childhood data could be determined for the middle and high schools standardized test passing rate for schools located within the Sampson Horrice 5 mile radius for the Year 1999 to the Year 2002.

7.2.8.2 Sampson Horrice Year 1999 to the Year 2002 Comparison Analysis of Elevated Childhood Blood Lead Level of 10-14 μg/dl and Total Counts of Elevated Childhood Blood Lead Levels vs. Test Passing Rates for Middle and High Schools Located Greater Than the 5-mile Radius of the Sampson Horrice Site (Comparison Group)

This analysis could not be completed because an analysis could not be completed for the childhood elevated blood lead level counts of 10-14 μg/dl and the total counts of elevated childhood blood lead level vs the standardized test passing rate for the Year 1999 to the Year 2002, for the middle and high schools located within the Sampson Horrice Site's 5 mile radius. Since that analysis could not be completed due to the lack of a significant number of observations, the comparison analysis could not be completed because there is no data to compare to.

7.2.8.3 Sampson Horrice Year 1999 to the Year 2002 Elevated Childhood Blood Lead Level 10 -14 μg/dl vs Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Site's 5-mile Radius.

The elevated childhood blood lead level vs the student standardized test passing rate for elementary schools analysis was conducted to determine if there is a direct effect of

elevated childhood blood lead levels on student standardized test passing rates. The table of the elevated childhood blood lead levels for 10-14 µg/dl and student standardized test passing rates, for elementary schools, located within the Sampson Horrice Site 5 mile radius, are shown below.

Table 7.146: Year 1999 to the Year 2002 Sampson Horrice Elevated Childhood Blood Lead Level of 10-14 µg/dl and the Standardized Test Passing Rates for Elementary Schools are Located Within the Sampson Horrice Superfund Site's 5-mile Radius

	Sampson H. 10-14 ug/dl Counts of Blood Lead Levels vs Percentage Elementary School Test Passing Rates							
Zip Code	10--14 BLL 1999 (#)	10--14 BLL 2000 (#)	10--14 BLL 2001 (#)	10--14 BLL 2002 (#)	PR1999 (%)	PR2000 (%)	PR2001 (%)	PR2002 (%)
75217	55	26	22	43	62.1	61.6	61.7	71.4
75227	38	19	18	25	60.6	67.9	60.4	73.2
75204	8	5	5	4				
75180	4	0	5	5	74.8	82.0	82.8	86.9
75253	0	2	3	8	67.6	57.7	71.6	90.9
75149	4	5	2	1	55.7	76.6	74.1	92.3
Sum/ Average	**109**	**57**	**55**	**86**	**64.2**	**69.2**	**70.1**	**82.9**

The zip codes that the schools are located are shown on the left side of the table and the elevated counts of elevated blood lead level of 10-14 µg/dl for the Year 1999 to the Year 2000, and the student standardized test passing rate for the elementary school students for the Year 1999 to the Year 2002 are shown across the top of the tables**.** Based on the above tables, the counts of elevated blood lead level of 10-14 µg/dl for the Year 2002. The student average standardized test passing rate is shown at the bottom of the table, as well, for the Year 1999 to the Year 2002.

For the blood lead level and the standardized test passing rate analysis, the data sets cannot be directly compared together, but indirectly together, assuming that the unduplicated counts from the Year 1999 to the Year 2002 are similar to the counts of elevated childhood blood lead data from the year before the Year 1999. In the event that the elevated counts of childhood blood lead of 10-14 µg/dl are similar to the counts from the Years before 1999, then the counts could be a result of exposure to the leachate from the Sampson Horrice Site's gravel pit as well as socioeconomic factors. The increasing standardized test passing rates could be due to negative cognitive effects from exposure to the leachate from the Sampson Horrice Site, when the prospective elementary school student were young children, as well as socioeconomic indicators.

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not being normal as well as there being a few number of observations in the data set. The Spearman Rank correlation matrix for elementary students located within the Sampson Horrice 5 mile radius for the Year 1999 to the Year 2002, is shown below.

Table 7.147: Year 1999 to the Year 2002 Sampson Horrice Correlation Matrix of Elevated Blood Lead Level of 10-14 µg/dl vs. Standardized Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Superfund Site's 5-mile Radius

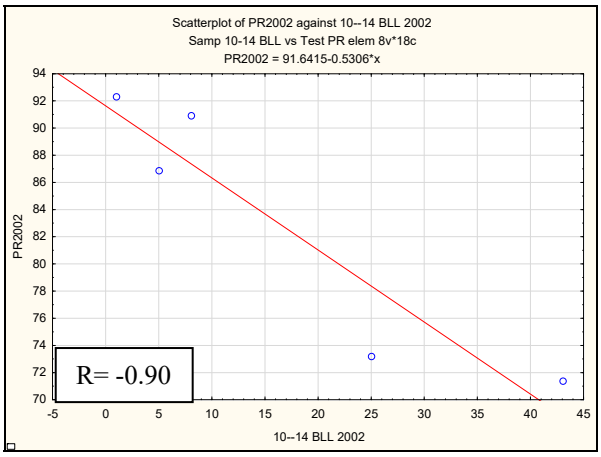
Variable	Spearman Rank Order Correlations (Samp 10-14 BLL vs Test PR elem) MD pairwise deleted Marked correlations are significant at p <.05000 10--14 BLL 1999	10--14 BLL 2000	10--14 BLL 2001	10--14 BLL 2002	PR1999	PR2000	PR2001	PR2002
10--14 BLL 1999	1.00	0.87	0.87	0.55	-0.31	0.05	-0.56	-0.82
10--14 BLL 2000	0.87	1.00	0.63	0.52	-0.60	-0.40	-0.80	-0.60
10--14 BLL 2001	0.87	0.63	1.00	0.81	0.20	-0.20	-0.60	-1.00
10--14 BLL 2002	0.55	0.52	0.81	1.00	0.10	-0.60	-0.80	-0.90
PR1999	-0.31	-0.60	0.20	0.10	1.00	0.00	0.40	-0.20
PR2000	0.05	-0.40	-0.20	-0.60	0.00	1.00	0.60	0.20
PR2001	-0.56	-0.80	-0.60	-0.80	0.40	0.60	1.00	0.60
PR2002	-0.82	-0.60	-1.00	-0.90	-0.20	0.20	0.60	1.00

In the correlation matrix, each variable for elevated blood led level and the standardized test passing rates, is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the elevated blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

Based upon the correlation matrix, above, there is a strong negative correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl l for the Year 2002 and the percentage of standardized test passing rates for the Year 2002. In the event that the elevated counts of childhood blood lead of 10-14 µg/dl are similar to the counts from the Years before 1999, since there is no direct relationship between the variables, but an indirect relationship, then the significant relationship could be a result of exposure to the leachate from the Sampson Horrice Site's gravel pit, before the site was cleaned up (before the Year 2002), as well as socioeconomic factors that negatively impacted the prospective elementary students cognitive abilities. The R value for the significant bivariate relationship is -0.90. Therefore, it is highly likely that prospective elementary students could have been exposed to the leachate, from the Sampson Horrice gravel pit, when they were small children and the lead in the leachate compromised their cognitive abilities, resulting in lower student standardizes test passing rates.

A graph of the significant bivariate regression is shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.218: Year 1999 to Year 2002 Sampson Horrice Plots of Significant Relationships between the Elevated Blood Lead Level 10-14 µg/dl vs. the Standardized Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Site's 5-Mile Radius



Based on the graph above, assuming that the 10-14 µg/dl counts of elevated childhood blood lead level counts, for the Year 2002, are similar to the 10-14 µg/dl counts of elevated childhood blood lead levels before the Year 1999, as the 10-14 µg/dl elevated childhood blood lead levels increases, the student standardized test passing rates decreases. This chart indicates that counts of childhood elevated blood lead level negatively affects prospective student's standardized test passing rates.

7.2.8.4 Sampson Horrice Year 1999 to the Year 2002 Comparison Analysis Elevated Childhood Blood Lead Level of 10-14 µg/dl vs Test Passing Rates for Elementary Schools Located Greater Than the 5-mile Radius of the Sampson Horrice Site (Comparison Group)

The comparison group of childhood blood lead level vs student standardized test passing rate analysis is used to identify any trends in the data for elementary schools located within the Sampson Horrice Site 5 mile radius by comparing it to childhood elevated blood lead level vs the student standardized test passing rate for the for elementary schools located greater than 5 miles from the Sampson Horrice Site. The table depicting the total counts of elevated childhood blood lead level vs student standardized test passing rate for the elementary schools located greater than 5 miles from the Sampson Horrice Site is shown below.

Table 7.148: Year 1999 to the Year 2002 Sampson Horrice Comparison Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl and Standardized Test Passing Rates for Elementary Schools Located Greater Than the 5-mile Radius of the Sampson Horrice Site

	Dallas County 10-14 ug/dl Counts of Blood Lead Levels vs Percentage Elementary School Test Passing Rates Greater than 5 Mile Radius							
Zip Code	10--14 BLL 1999 (#)	10--14 BLL 2000 (#)	10--14 BLL 2001 (#)	10--14 BLL 2002 (#)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
75234	2	2	0	2	54.1	47.8	51.1	59.7
75104	2	2	2	2	63.0	73.4	60.5	75.0
75019	0	0	0	2	96.6	96.2	97.5	97.9
75248	0	0	0	2	96.4	92.9	95.7	94.9
75218	2	2	0	2	83.5	73.1	74.9	82.9
75115	2	2	2	3	83.2	81.3	89.6	87.4
75089		0	0	2		90.2	89.8	94.4
75043	2	5	2	6	90.9	92.2	89.1	89.6
75146	2	2	2	3	64.4	63.0	70.2	75.1
75150	5	5	2	4	86.9	92.6	92.2	89.4
75154	2	0	0	2	79.9	83.7	81.3	84.3
75238	2	2	6	6	92.5	89.8	87.5	86.0
Sum/ Average	**21**	**22**	**16**	**36**	**81.0**	**81.3**	**81.6**	**84.7**

The zip codes the schools are located are shown on the left side of the table and the total counts of elevated blood lead level of 10-14 µg/dl for the Year 1999 to the Year 2002, and the student standardized test passing rate for elementary school students for the Year 1999 to the Year 2002 are shown across the top of the table. The grey areas represent schools that were not opened yet or schools that were repurposed. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section 7.2.2.

For the childhood blood lead level vs. the student standardized test passing rate analysis, it is impossible to directly compare the unduplicated counts of elevated childhood blood lead level, per each specified year and student standardized test passing rates because the standardized test passing rates measure the effects of childhood lead exposure hen the prospective s small children. An indirect comparison of the explanatory and the response variables can be conducted if the counts of 10-14 elevated blood lead levels, for the Year 1999 to the Year 2002, are assumed to be similar to the counts of elevated blood lead level of 10-14 µg/dl in the years prior to the Year 1999. Unfortunately, childhood blood lead data is not available from before the Year 1999 from the Texas Department of Health. Based on the table above, the counts of elevated childhood blood lead level of 10-14 µg/dl are significantly lower than the counts of elevated childhood blood lead level for the elementary schools that are located within the Sampson Horrice Site 5 mile radius. The significant difference in the counts of elevated childhood blood lead level of 10-14 µg/dl could be due a lower percentage of low income households, a lower percentage of families below poverty level, as well as a lower percentage of housing units constructed before the Year 1970. These lower percentages in these socioeconomic indicators result in fewer cases in childhood elevated blood lead exposure.

In addition, the student standardized test passing rates are significantly higher, for elementary schools located greater than the 5 mile radius of the Sampson Horrice Site, than the student standardized test passing rate for elementary schools located within the 5 mile radius of the Sampson Horrice Site. The difference could be due to lower percentages of housing units constructed before the Year 1970, which reduces the amount of prospective students exposed to indoor lead, as well as these schools not being located in close proximity to the Sampson Horrice Site.

The Spearman Rank correlation matrix was utilized to analyze the data as an effort to provide consistent data analysis methods and due to the data set not having a normal distribution. The correlation matrix for the total counts of elevated childhood blood lead

level and the percentage of student standardized test passing rates for the elementary schools located greater than 5 miles from the Sampson Horrice Site is shown below.

Table 7.149: Year 1999 to the Year 2002 Sampson Horrice Comparison Correlation Matrix for Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl vs Standardized Test Passing Rates for Elementary Schools Located Greater Than The 5-mile Radius from the Sampson Horrice Site.

Variable	**Spearman Rank Order Correlations (10-14 BLL vs Test PR elem) MD pairwise deleted Marked correlations are significant at p <.05000**							
	10--14 BLL 1999	10--14 BLL 2000	10--14 BLL 2001	10--14 BLL 2002	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
10--14 BLL 1999	1.00	0.77	0.50	0.49	-0.47	-0.37	-0.37	-0.42
10--14 BLL 2000	0.77	1.00	0.68	0.72	-0.20	-0.24	-0.30	-0.34
10--14 BLL 2001	0.50	0.68	1.00	0.85	-0.01	-0.07	-0.14	-0.18
10--14 BLL 2002	0.49	0.72	0.85	1.00	0.24	0.13	0.09	0.08
PR YEAR 1999	-0.47	-0.20	-0.01	0.24	1.00	0.88	0.87	0.91
PR YEAR 2000	-0.37	-0.24	-0.07	0.13	0.88	1.00	0.92	0.93
PR YEAR 2001	-0.37	-0.30	-0.14	0.09	0.87	0.92	1.00	0.97
PR YEAR 2002	-0.42	-0.34	-0.18	0.08	0.91	0.93	0.97	1.00

In the correlation matrix, each variable for elevated blood led level and the standardized test passing rates, is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the elevated blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

Based upon the correlation matrix, above, there is no correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl and the percentage of standardized test passing rates for elementary schools. This may be due to lower percentages of households with low income and that are below the poverty level, as well as a lower percentage of housing units constructed before the Year 1970, which resulted in few cases of indoor lead exposure and higher standardized test passing rates.

7.2.8.5 Sampson Horrice Total Counts of Elevated Childhood Blood Lead Level vs Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Site's 5-mile Radius.

The elevated childhood blood lead level vs the student standardized test passing rate for the elementary schools analysis was conducted to determine if there is a direct effect of elevated childhood blood lead levels on student standardized test passing rates. The table of the elevated childhood blood lead levels and student standardized test passing rates, for elementary schools, located within the Sampson Horrice Site 5 mile radius, are shown below.

TABLE 7.150: Sampson Horrice Total Counts of Elevated Childhood Blood Lead Level and the Standardized Test Passing Rate for Elementary Schools Located Within the Sampson Horrice Superfund Site's 5-mile Radius

	Sampson H. Total Counts Blood Lead Levels vs Percentage Elementary School Test Passing Rates							
Zip Code	Total BLL 1999 (#)	Total BLL 2000 (#)	Total BLL 2001 (#)	Total BLL 2002 (#)	PR1999 (%)	PR2000 (%)	PR2001 (%)	PR2002 (%)
75217	69	37	28	63	62.1	61.6	61.7	71.4
75227	46	24	22	35	60.6	67.9	60.4	73.2
75204	15	6	6	9				
75180	7	2	6	10	74.8	82.0	82.8	86.9
75253	4	2	4	13	67.6	57.7	71.6	90.9
75149	7	6	4	6	55.7	76.6	74.1	92.3
Sum/ Average	**148**	**77**	**70**	**136**	**64.1**	**69.1**	**70.1**	**82.9**

The zip codes the schools are located are shown on the left side of the table and the elevated total counts of elevated blood lead level for the Year 1999 to the Year 2000, and the student standardized test passing rate for elementary school students for the Year 1999 to the Year 2002 are shown across the top of the table. The grey areas represent schools that were not opened yet or schools that ere repurposed. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section 7.2.2. Based on the above table, the total counts of total elevated blood lead level are shown at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate is shown at the bottom of the table, as well, for the Year 1999 to the Year 2002.

A direct comparison of these variables cannot be conducted, due to the nature of the data, but an indirect comparison can be conducted, if it is assumed that the total counts of elevated blood lead level from the Year 1999 to the Year 2002, are similar to the actual counts of total childhood blood lead levels for the years before the Year 1999. Prior Year data was not available from the Texas Department of Health. Overall, the total counts of elevated childhood blood lead level decreases from the Year 1999 to the Year 2002 and the average student standardized test passing increases from the Year 1999 to the Year 2002. The decrease in the unduplicated total counts of childhood elevated blood lead level, over time, may be due reduced contact of prospective elementary student with the leachate from the Sampson Horrice Site. In addition, it could be due to less indoor lead exposure. The increasing standardized test passing rates may be due to fewer impacts of the prospective students to the leachate of the Sampson Horrice Site or due to new prospective students, moving into the area after the Sampson Horrice Site was cleaned up (Year 2000).

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not having a normal distribution and due to a few number of observations. The correlation matrix for the total counts of elevated childhood blood lead level and the student standardized test passing rates for the elementary schools located within the 5 mile radius of the Sampson Horrice site is shown below.

Table 7.151: Year 1999 to Year 2002 Sampson Horrice Correlation Matrix for Elevated Childhood Blood Lead Levels vs and Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Sampson Horrice Site.

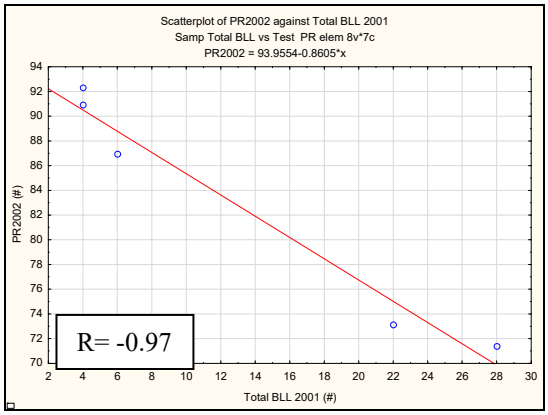
	Spearman Rank Order Correlations (Samp Total BLL vs Test PR elem) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	Total BLL 1999	Total BLL 2000	Total BLL 2001	Total BLL 2002	PR1999	PR2000	PR2001	PR2002
Total BLL 1999	1.00	0.93	0.93	0.55	-0.31	0.05	-0.56	-0.82
Total BLL 2000	0.93	1.00	0.76	0.50	-0.56	-0.21	-0.72	-0.67
Total BLL 2001	0.93	0.76	1.00	0.74	0.05	-0.05	-0.56	-0.97
Total BLL 2002	0.55	0.50	0.74	1.00	0.10	-0.60	-0.80	-0.90
PR1999	-0.31	-0.56	0.05	0.10	1.00	0.00	0.40	-0.20
PR2000	0.05	-0.21	-0.05	-0.60	0.00	1.00	0.60	0.20
PR2001	-0.56	-0.72	-0.56	-0.80	0.40	0.60	1.00	0.60
PR2002	-0.82	-0.67	-0.97	-0.90	-0.20	0.20	0.60	1.00

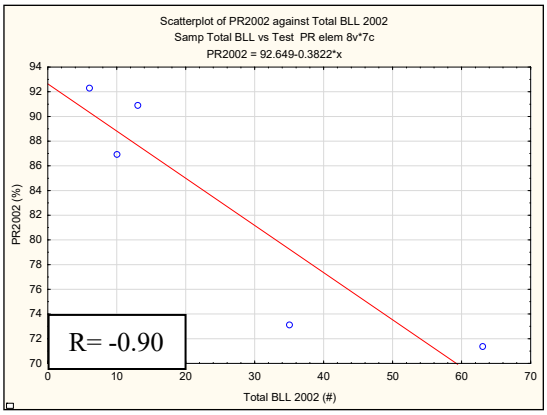
In the correlation matrix, each variable for elevated blood led level and the standardized test passing rates, is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the elevated blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

Based upon the correlation matrix, above, there is a strong negative correlation between the total counts of elevated childhood blood lead level, for the Year 2001 and the percentage of standardized test passing rates for the Year 2002. In addition, there is a strong negative correlation between the total counts of elevated childhood blood lead level for the Year 2002 and the student standardized passing rate for the Year 2002. The negative R values of -0.97 and -0.90 represent the significant bivariate regressions. With the nature of this data, there cannot be a direct comparison because the unduplicated total counts of childhood blood lead level are measured on yearly basis and the student standardized test passing rates are measured by back dating prospective student's age in reference to the Superfund Site to determine if there was possible lead exposure. Therefore, and indirect comparison can be conducted with both variables, if it is assumed that the total counts of elevated blood lead level, from the Year 1999 to the Year 2000, is similar to the total counts of childhood elevated blood lead level for year before the Year 1999. Prior year's elevated childhood blood lead level data was not available from the Texas Department of Health. In the event that the unduplicated total counts of childhood blood lead level are similar throughout all years, then there is a strong possibility that the leachate from the Sampson Horrice gravel pit, that illegally accepted hazardous and solid waste, could have contacted and negatively impacted prospective elementary students, when they were young children, and impacted their performance on their standardized tests.

The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.219- Graph 7.220: Year 1999 to Year 2002 Sampson Horrice Plots of Significant Relationships between the Total Counts of Elevated Blood Lead Levels vs. the Standardized Test Passing Rates for Elementary Schools Located Within the Sampson Horrice Site's 5-Mile Radius





Based on the above graphs, as the total counts of childhood elevated blood lead level increases, the percentage student standardized test passing rates decreases. Therefore, there is a negative impact on the student standardized test passing rates with high counts of unduplicated total counts of elevated childhood blood lead cases.

7.2.8.6 Sampson Horrice Year 1999 to the Year 2002 Comparison Analysis of Total Counts of Elevated Childhood Blood Lead Level vs Test Passing Rates for Elementary Schools Located Greater Than the 5-mile Radius of the Sampson Horrice Site (Comparison Group)

The comparison group of childhood blood lead level vs student standardized test passing rate analysis is used to identify any trends in the data for elementary schools located within the Sampson Horrice Site 5 mile radius by comparing it to childhood elevated blood lead level vs the student standardized test passing rate for the for elementary schools located greater than 5 miles from the Sampson Horrice Site. The table depicting the total counts of elevated childhood blood lead level vs student standardized test passing rate for the elementary schools located greater than 5 miles from the Sampson Horrice Site is shown below.

Table 7.152: Year 1999 to the Year 2002 Sampson Horrice Comparison of Elevated Childhood Blood Lead Level and Standardized Test Passing Rates for Elementary Schools Located Greater Than 5-mile Radius of the Sampson Horrice Site

	Dallas County Total Counts Blood Lead Levels vs Percentage Elementary School Test Passing Rates Greater than 5 mile Radius							
Zip Code	Total BLL 1999 (#)	Total BLL 2000 (#)	Total BLL 2001 (#)	Total BLL 2002	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
75234	2	4	0	4	54.1	47.8	51.1	59.7
75104	4	2	2	4	63.0	73.4	60.5	75.0
75019	0	4	0	2	96.6	96.2	97.5	97.9
75248	0	0	0	4	96.4	92.9	95.7	94.9
75218	2	4	2	2	83.5	73.1	74.9	82.9
75115	4	4	4	5	83.2	81.3	89.6	87.4
75089		0	0	2		90.2	89.8	94.4
75043	2	5	2	9	90.9	92.2	89.1	89.6
75146	2	2	4	5	64.4	63.0	70.2	69.5
75150	7	6	4	8	86.9	92.6	92.2	89.4
75154	2	2	0	2	79.9	83.7	81.3	84.3
75238	4	2	7	11	92.5	89.8	87.5	86.0
Sum/ Average	**29**	**35**	**25**	**58**	**81.0**	**81.3**	**81.6**	**84.2**

The zip codes the schools are located are shown on the left side of the table and the elevated total counts of elevated blood lead level for the Year 1999 to the Year 2000, and the student standardized test passing rate for the elementary students for the Year 1999 to the Year 2002 are shown across the top of the table. The grey areas represent schools that were not opened yet or schools that ere repurposed. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section 7.2.2. Based on the above table, the total counts of total elevated blood lead level are shown at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate is shown at the bottom of the table, as well, for the Year 1999 to the Year 2002.

The total counts of elevated childhood blood lead level slowly increases from the Year 1999 to the Year 2002 and the average student standardized test passing increases from the Year 1999 to the Year 2002. The unduplicated total counts of childhood elevated blood lead level, over time, may be due to indoor lead exposure as a result low income families or families that are below poverty level that moved into cheap houses constructed before the Year 1970. The high student standardized test passing rates could be due to reduced or no impacts of the Sampson Horrice Site on prospective student cognitive abilities for the students that attend elementary schools located greater than 5 miles from the Sampson Horrice Site. The total counts of childhood elevated blood lead level, for the elementary schools located greater than 5 miles from the Sampson Horrice Site, are significantly lower than the total counts of childhood elevated blood lead level of, for the elementary schools located within the Sampson Horrice Site 5 mile radius. The significant difference could be a result of the elementary schools located at a greater than 5 miles from the Sampson Horrice Site, thus having no impact from the Sampson Horrice Site. In addition, the average standardized test passing rates, for elementary schools located greater than 5 miles from the Sampson Horrice Site, are significantly higher than the average standardized test passing rates for elementary schools located within the Sampson Horrice Site's 5 mile radius. The higher childhood average test passing rate may be a result of the students attending elementary schools not being impacted by the Sampson Horrice Site.

The Spearman Rank correlation matrix was utilized to analyze the data as an effort to provide consistent data analysis methods and due to the data set not having a normal distribution. The correlation matrix for the total counts of elevated childhood blood lead level and the student standardized test passing rates for the elementary schools located greater than 5 miles from the Sampson Horrice Site is shown below.

Table 7.153: Year 1999 to the Year 2002 Comparison Sampson Horrice Correlation Matrix for Sampson Horrice Total Counts Elevated Childhood Blood Lead Levels vs and Standardized Test Passing Rates for Elementary Schools Located Greater Than The 5-mile Radius of the Sampson Horrice Site.

	Spearman Rank Order Correlations (Total BLL vs Test PR elem) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	Total BLL 1999	Total BLL 2000	Total BLL 2001	Total BLL 2000	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
Total BLL 1999	1.00	0.29	0.75	0.57	-0.32	-0.04	-0.21	-0.27
Total BLL 2000	0.29	1.00	0.29	0.32	0.06	-0.05	0.03	-0.03
Total BLL 2001	0.75	0.29	1.00	0.77	-0.01	0.05	-0.15	-0.27
Total BLL 2000	0.57	0.32	0.77	1.00	0.12	0.23	-0.04	-0.09
PR YEAR 1999	-0.32	0.06	-0.01	0.12	1.00	0.88	0.87	0.90
PR YEAR 2000	-0.04	-0.05	0.05	0.23	0.88	1.00	0.79	0.80
PR YEAR 2001	-0.21	0.03	-0.15	-0.04	0.87	0.79	1.00	0.96
PR YEAR 2002	-0.27	-0.03	-0.27	-0.09	0.90	0.80	0.96	1.00

In the correlation matrix, each variable for elevated blood led level and the standardized test passing rates, is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the elevated blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

Based upon the correlation matrix, above, there is no correlation or significant relationship between the total unduplicated counts of elevated blood lead level and the student standardized test passing rates from the Year 1999 to the Year 2002. In the event that total counts of elevated childhood blood lead level cases, for the Year 1999 to the Year 2002, are similar to the counts for the year before the Year 1999, there will still be no significant relationship between both variables. This may be due to the comparison group schools not being impacted by the leachate from the Sampson Horrice Site.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1999 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for the elevated blood lead level of 10-14 µg/dl and total counts of elevated blood lead levels vs. the standardized test passing rates, for the middle and high schools and elementary schools, located within and greater than, the 5-mile radius of the Sampson Horrice Superfund Site, are shown below.

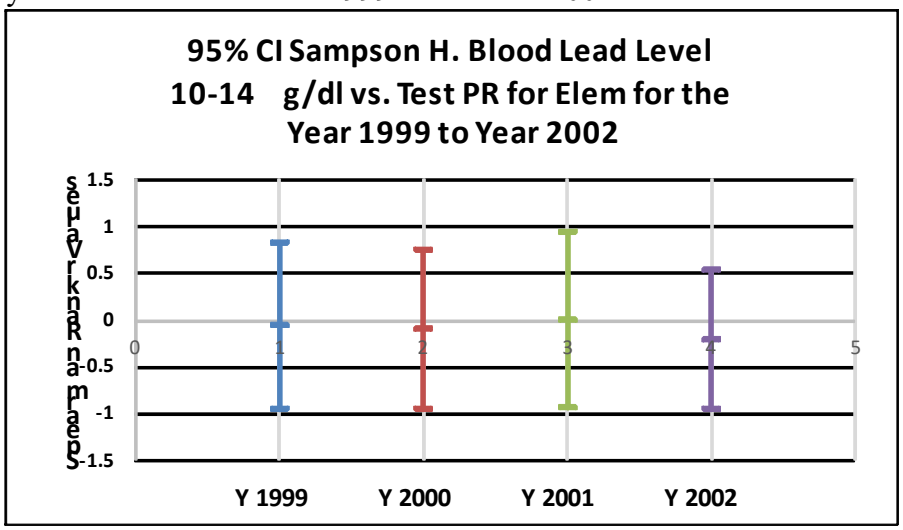
Graph 7.221 Sampson Horrice Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rate for Middle and High Schools from the Year 1999 to the Year 2002.
There were not enough observations to construct this confidence interval graph.

Graph 7.222: Sampson Horrice Comparison Group Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rate for Middle and High Schools from the Year 1999 to the Year 2002.
No comparison could be made to construct this confidence interval graph.

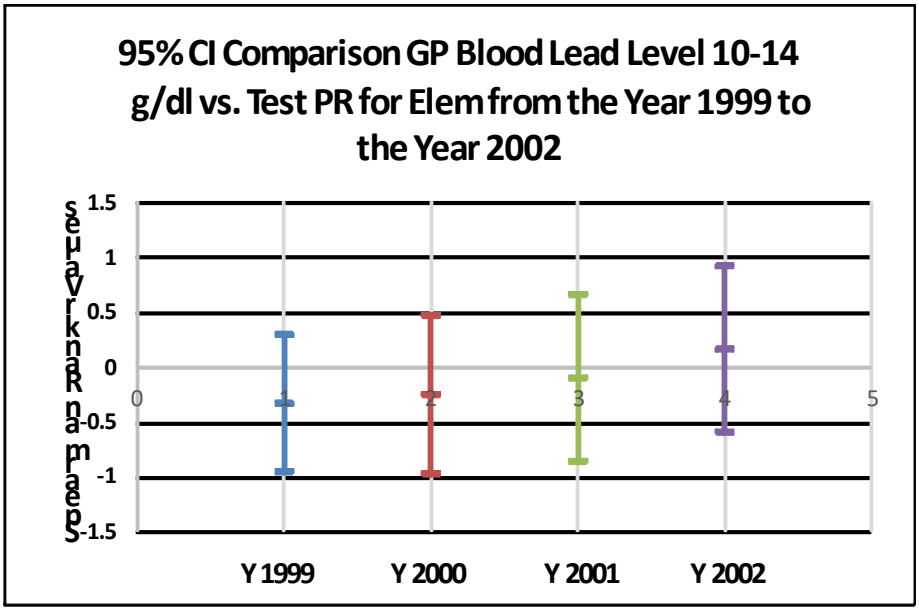
Graph 7.223 Sampson Horrice Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.
There were not enough observations to construct this confidence interval graph.

Graph 7.224: Sampson Horrice Comparison Group Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.
No comparison could be made to construct this confidence interval graph.

Graph 7.225 Sampson Horrice Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rate for Elementary Schools from the Year 1999 to the Year 2002.

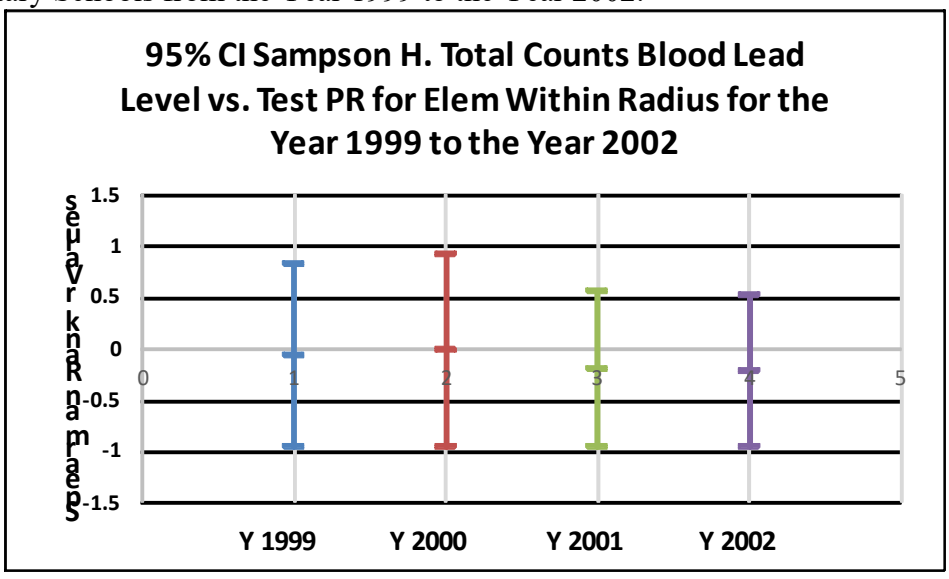


Graph 7.226: Sampson Horrice Comparison Group Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rate for Elementary Schools from the Year 1999 to the Year 2002.

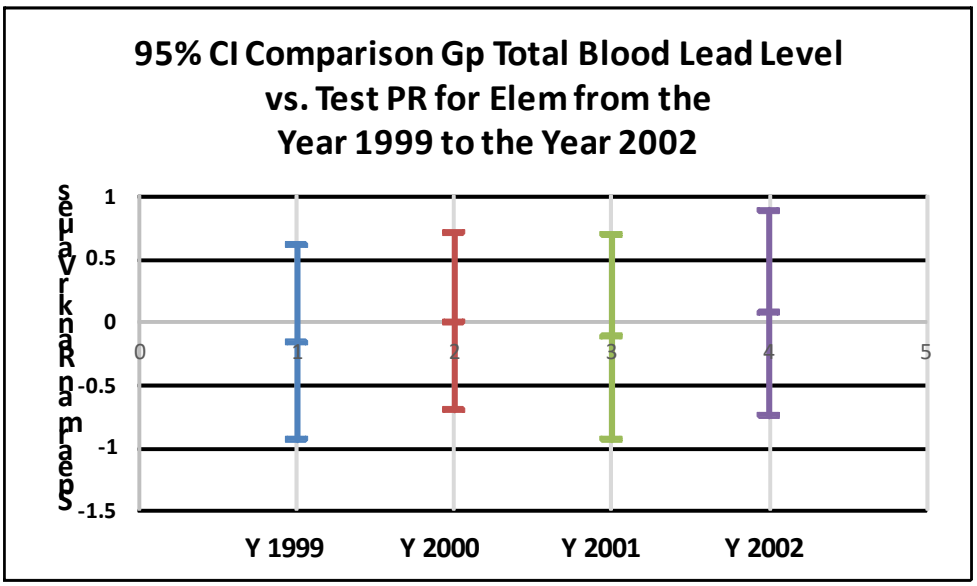


In the confidence interval graphs, there are indirect significant coefficient of correlation, in the confidence interval for the Year 2002, for the middle and high schools located within the 5-mile radius of the Sampson Horrice Site. In the comparison group, there were no indirect significant coefficients of correlations, in the confidence intervals for all four years.

Graph 7.227 Sampson Horrice Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.



Graph 7.228: Sampson Horrice Comparison Group Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.



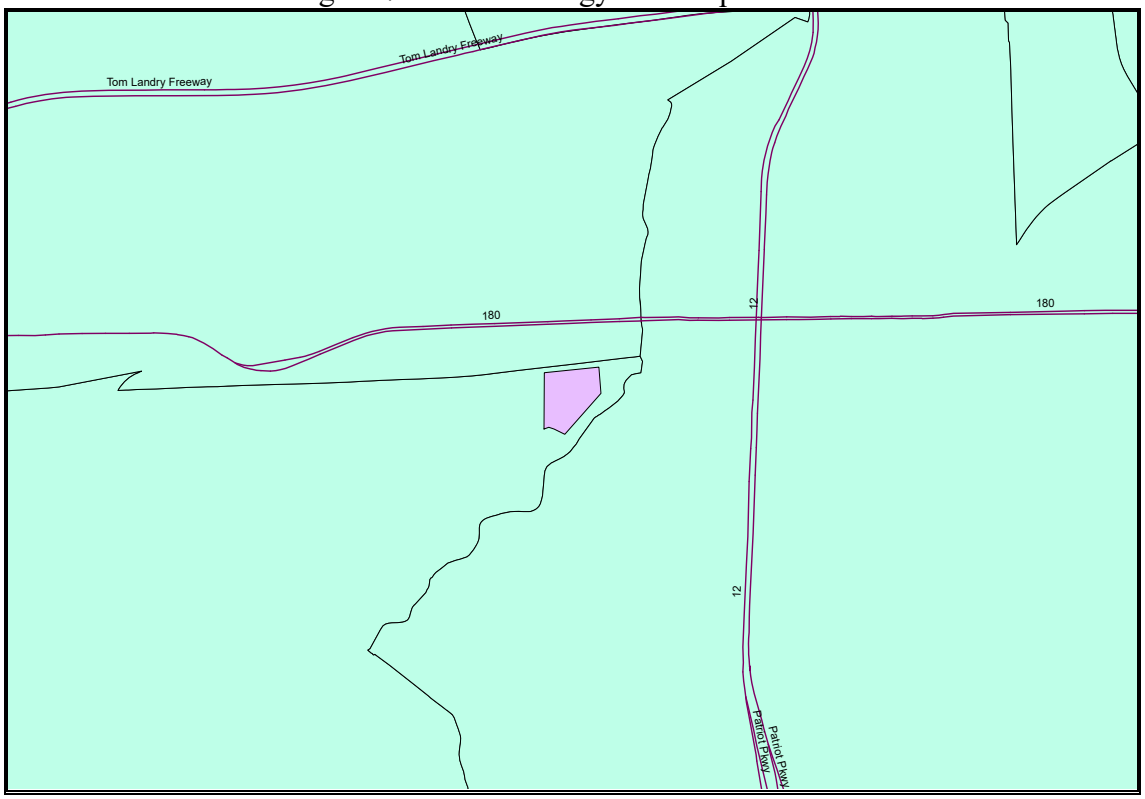
In the confidence interval graphs, there are indirect significant coefficient of correlation, in the confidence interval for the Year 2002, for the middle and high schools located within the 5-mile radius of the Sampson Horrice Site. In the comparison group, there were no indirect significant coefficients of correlations, in the confidence intervals for all four years.

7.2.9 Bio-Ecology Superfund Site and Distance Analysis

The Bio-Ecology Superfund Site consists of 11.2-acre tracts of land located in east Grand Prairie. The site is bounded on the north, east, south, and west by private property. In addition, tributaries of Old Mountain Creek are located on the south and the east of the site.

The Bio-Ecology Site was an industrial solid waste facility that disposed of class 1 waste (industrial nonhazardous waste). According to the EPA, facility operations consisted of the, "1) incineration of combustible liquids, slurries, and sludge 2) chemical treatment of acids, caustics, and other waste chemical solutions that include heavy metals 3) biological oxidation of wastewaters resulting from separation of mud-water and oil-water mixtures and from chemical treatment of other wastes 4) a modified landfill of solids resulting from the other treatment processes." The contaminants of concern, arsenic, lead, cyanide, methylene chloride, benzene, naphthalene, toluene, and tricholorethylene, contaminated the soil, the surface water, and the groundwater in the surrounding areas. The facility operated from the Year 1972 to the Year 1978. The clean-up activities commenced in the Year 1983 and the clean-up activities ended in the Year 1988. The facility was listed on the National Priorities List, but after site cleanup activities were completed, the site was delisted from the National Priorities List. A map of the Bio-Ecology Site is shown below in Figure 7.24.

Figure 7.24 Bio-Ecology Site Map



The Bio-Ecology Site is the digitized pink polygon, in the center of the map, created in ArcGIS. A table providing detailed site information of the Bio-Ecology Superfund Site is shown below.

Table 7.154: Bio-Ecology Superfund Site Table of Brief Synopsis

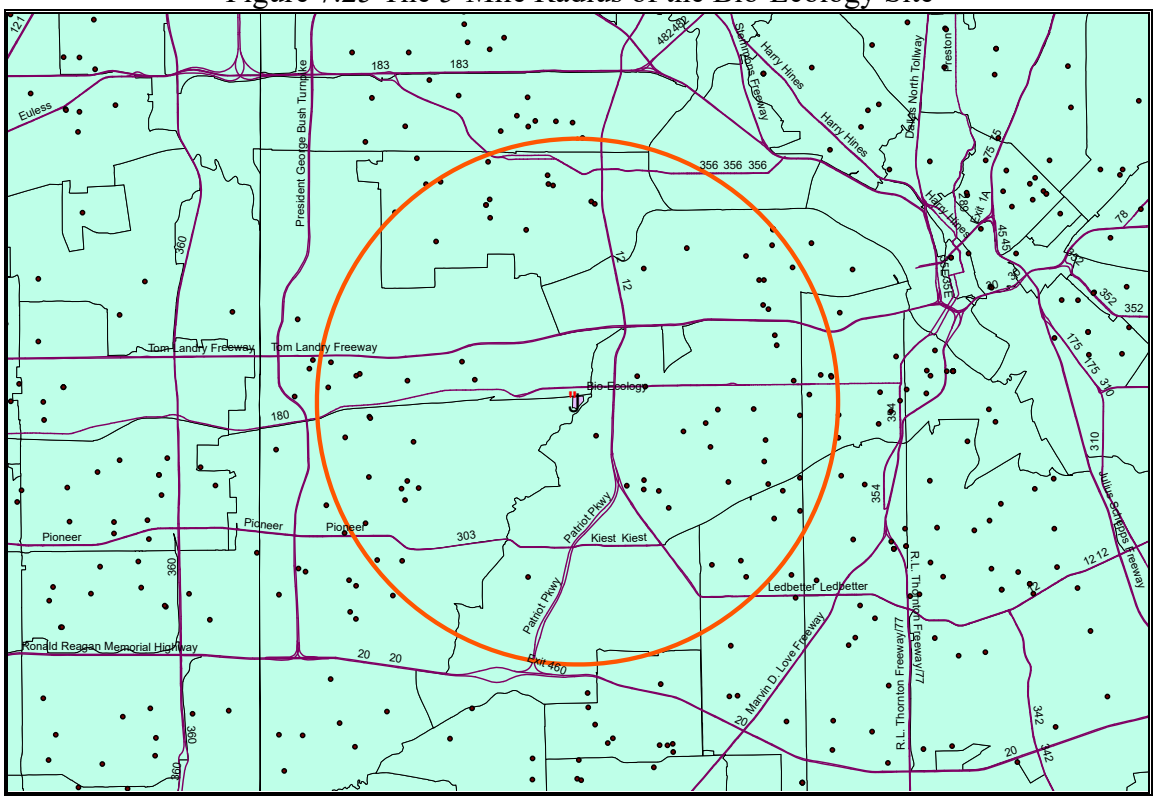
Site Name and Location	Type of Superfund Site	Type of Facility	Size of facility	List of operations	Dates of Operation	List of contaminants	Media of contamination	Clean up start date	Clean up end date
Bio-Ecology Grand Prairie, TX (Dallas County)	Federal	Class 1 Industrial Solid waste (disposal) facility	11.2 acres	1) incineration of combustible liquids, slurries, and sludge 2)chemical treatment of acids, caustics, and other waste chemical solutions that include heavy metals 3)biological oxidation of waste waters resulting from separation of mud-water and oil-water mixtures and from chemical treatment of other wastes 4)a modified landfill of solids resulting from the other treatment processes	Year 1972 to Year 1978	Arsenic, lead, Cyanide, METHYLENE CHLORIDE, Benzene, NAPHTHALENE, TOLUENE, TRICHLOROETHYLENE	soil, surface water, groundwater	Year 1980	Year 1988

7.2.9.1 Schools

During the analysis of the Bio-Ecology Site, ArcGIS was utilized to identify all elementary, middle, and high schools, located within or that intersect, the 5-mile radius of the Bio-Ecology Superfund Site. Not all of the schools located within the Bio-Ecology Site's 5-mile radius were used, in the Study, due to the removal of all magnet and private schools. The magnet and private schools have an academic advantage, over public

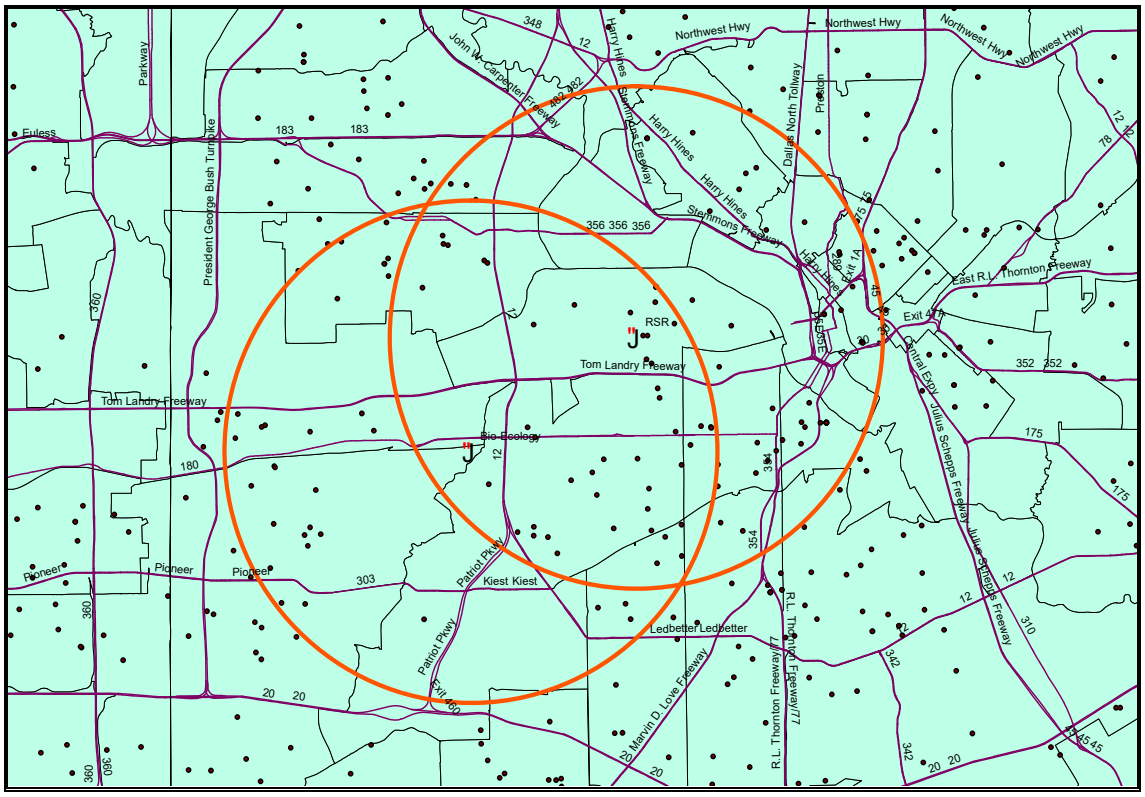
schools, since the students must "test into" or pay money into these schools. In addition, the students that attend these schools usually do not reside in close proximity of the private or magnet school. There are a total of 25 public schools located within the 5-mile radius of the Bio-Ecology Site; 13 elementary, 7 middle and 5 high schools. A map displaying the 5-mile radius buffer and the schools located within the buffer is shown in Figure 7.6.

Figure 7.25 The 5-Mile Radius of the Bio-Ecology Site



The schools are shown as the dark circles in the map. As previously mentioned for the RSR Site, the 5-mile radius buffer for the RSR Site and the 5-mile radius buffer for the Bio-Ecology Site overlap. Approximately half of the schools are shared between each site. During the analysis, it was determined that the RSR Superfund Site had a greater impact on the residents, located within both 5-mile radius buffers, due to the long duration of operations of the RSR Site, than the Bio-Ecology Site, and due to the air dispersion of emissions from the smoke stack, of the RSR Site. In addition, the RSR Site had a greater impact on the residents located within both the RSR and the Bio-Ecology's 5-mile radius buffers because the RSR Site's cleanup activities, covered a larger surface area, than the Bio-Ecology Site. A map showing the overlap of the RSR Site's and the Bio-Ecology Site's 5-mile radius buffers is shown below.

Figure 7.26: The-5 Mile-Radius Overlap between the RSR and Bio-Ecology Site



The map was created by ArcGIS software.

7.2.9.2 Bio-Ecology Distance Analysis

In the distance analysis, the standardized test passing rates, from the schools located within the 5-mile radius, of the Bio-Ecology Site, are compared to the standardized test passing rates, of schools located greater than the 5-mile radius of the Bio-Ecology Site. The distance analysis determines if proximity from the lead contaminated Superfund site has a significant relationship on each school's standardized test passing rates.

There are a total of 25 schools located within the 5-mile radius of the Bio-Ecology Site. There are 13 elementary, 7 middle and 5 high schools located within a 5 mile radius of the site. These numbers do not reflect the total number of schools located within the Bio-Ecology Site's 5-mile radius because all magnet and private schools were removed from the Study.

The students, in Texas schools, take the standardized test in the 3rd grade, the 4th grade, the 5th grade, the 7th grade, the 8th grade, and the 10th grade. Students that do not initially pass the test are required to retest later the same year or the following year, until the student passes the standardized test.

The table below shows the year born, the grade, the age and year that prospective students, attending the schools located within the Bio-Ecology Site's 5-mile radius, would have taken the standardized test. The table "back dates", the prospective

elementary, middle, and high school students, back to the year the prospective students were born, the ages, and the grades, they were in, in reference to the time frame the Bio-Ecology Site was in operation, was closed, and was cleaned up. The table helps identify possible exposure, of prospective students, to the Bio-Ecology Site, that might have occurred when the prospective students were young children, and possibly had their cognitive abilities compromised, assuming that the prospective students did not move out of the area.

Table 7.155: Prospective Students Possibly Affected by the Bio-Ecology Site

Students Born 4 years before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1968
Pre-K	5	1973
5th	11	1979
6th	12	1980
8th	14	1982
9th	15	1983
12th	18	1986

Students Born 3 years before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1969
Pre-K	5	1974
5th	11	1980
6th	12	1981
8th	14	1983
9th	15	1984
12th	18	1987

Students Born 2 years before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1970
Pre-K	5	1975
5th	11	1981
6th	12	1982
8th	14	1984
9th	15	1985
12th	18	1988

Students Born 1 yr before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1971
Pre-K	5	1976
5th	11	1982
6th	12	1985
8th	14	1987
9th	15	1988
12th	18	1991

Students born the Year Bio-Ecology started operation		
Grade	Age(yrs)	Year
Born	0	1972
Pre-K	5	1977
5th	11	1983
6th	12	1984
8th	14	1986
9th	15	1987
12th	18	1990

Students Born the year Bio-Ecology Closed		
Grade	Age(yrs)	Year
Born	0	1978
Pre-K	5	1983
5th	11	1989
6th	12	1990
8th	14	1992
9th	15	1993
12th	18	1996

Students Born 1 year after Bio-Ecology closed		
Grade	Age(yrs)	Year
Born	0	1979
Pre-K	5	1984
5th	11	1990
6th	12	1991
8th	14	1993
9th	15	1994
12th	18	1997

Bio_Ecology Clean -Up Start date SEE STUDENTS BOR 1 year after Bio-Ecology closed		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born the Year Bio-Ecology Clean -Up End date		
Grade	Age(yrs)	Year
Born	0	1983
Pre-K	5	1988
5th	11	1994
6th	12	1995
8th	14	1997
9th	15	1998
12th	18	2001

The Bio-Ecology Superfund Site was in operation from the Year 1972 to the Year 1978. The cleanup activities for the Bio-Ecology Site commenced in the Year 1980 and ended in the Year 1988. Based on the above table, prospective students born approximately 6 years before the Bio-Ecology Site started operation in the Year 1972 and until the Bio-

Ecology Site closed (Year 1978), could have had exposure to the contaminated soils, surface, and groundwater from the Bio-Ecology Site. The contaminants from the industrial solid waste facility were stored leaking drums that leaked into a tributary of Mountain Creek, a creek that is located near the southern edge of the property boundary. The leaked waste contents, from the site, affected the soil, the surface, and the groundwater. The prospective students could have been exposed to the contaminants if they lived and/or played near or around the property or played near or around Mountain Creek. In addition, prospective students could have been directly affected by the leaked content from the class 1 waste facility, if their families obtained their drinking water from a water well and not from their municipality.

The prospective students, born before the Bio-Ecology Site was in operation until the Bio-Ecology Site's closure in the Year 1978, would have been in middle or high school, or have already graduated high school, assuming that the prospective students did not move outside of the Bio-Ecology Site's 5-mile radius. Prospective middle school students born before the Bio-Ecology Site closed, would have taken the standardized test before the Year 1991, and prospective high school students born before the Bio-Ecology Site was in operation until the Bio-Ecology Site was closed, would have taken the standardized test before and including the Year 1994, for the first time. Therefore, there is a possibility that the standardized test passing rates may have been negatively impacted by the leachate from class 1 waste facility. Unfortunately, the majority of the standardized test passing rate data, for this time frame, was not available.

In addition to prospective students that were born before and until the year that the Bio-Ecology Site closed (Year 1978) being possibly effected by the Bio-Ecology Site, the prospective students born after the Bio-Ecology Site was closed (Year 1979) until the Bio-Ecology Site was clean up (Year 1983), could have also been exposed to the leachate from the Bio-Ecology Site, resulting in lower standardized test passing rates. The prospective middle and high students born after the Bio-Ecology Site was closed until the Bio-Ecology Site was cleaned up, would have taken the standardized test from the Year 1992 to the Year 1998, for middle school students, and from the Year 1995 to the Year 1999, for high school students.

The distance analysis was separated into two groups; middle and high schools, and elementary schools. The separation was made to capture the standardized test passing rates of the older prospective students that are more likely to have been directly affected by the Bio-Ecology Site, from the prospective elementary students that may have not been effected by the Bio-Ecology Site.

The Year 2003 to Year 2011 was omitted from the study, due to the introduction of the TAKS test, during the Year 2003. The majority of schools located within the 5-mile radius of the Superfund sites and the schools located greater than the 5-mile of each Superfund Site, had a drastic decrease in test passing rates, due to the introduction of the TAKS test in the Year 2003.

7.2.9.3 Bio-Ecology Middle and High School Distance Analysis

The purpose of the distance analysis is to determine if a significant relationship exists between the distance the middle and high schools are located from the Bio-Ecology Site and the standardized test passing rates of those schools. The results were compared to a comparison group of middle and high schools, located greater than the 5-mile radius of the Bio-Ecology Superfund Site, to determine if there are any trends in the original data set. A table of all of the middle and high schools located within the 5-mile radius of the Bio-Ecology Superfund Site is shown below.

Table 7.156: Bio-Ecology Distance and Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Site's 5-mile Radius

			Bio-Ecology Distance and Middle and High School Test Passing Rates									
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998(%)	PR Year 1999 (%)	PR Year 2000 (%)	PR Year 2001 (%)	PR Year 2002 (%)
GRAND PRAIRIE ISD	FANNIN MIDDLE	75050	2.0	56.0	73.5	40.6	87.9	75.0	84.3	64.4	66.7	75.9
DALLAS ISD	MOISES MOLINA H S	75211	2.1					58.1	63.6	61.1	61.9	73.9
IRVING ISD	NIMITZ HS	75060	3.4	70.8	73.5	70.0	72.0	80.8	81.3	84.9	85.0	86.5
DALLAS ISD	RAUL QUINTANILLA MIDDLE	75211	4.0					55.4	55.7	53.8	67.1	78.9
DALLAS ISD	LV STOCKARD MIDDLE	75211	4.0	32.3	34.5	45.1	47.2	52.1	61.4	56.4	62.7	66.8
DALLAS ISD	EDISON LEARNONG CENTER	75212	4.3	21.7	22.4	39.0	41.2	46.9	52.8	56.6	62.4	71.2
IRVING ISD	BOWIE MIDDLE	75060	4.3	63.6	59.3	62.1	69.2	74.4	78.1	77.4	78.0	80.1
DALLAS ISD	JUSTIN F KIMBALL HS	75233	4.4	20.4	26.1	30.1	58.5	61.5	64.3	74.2	76.4	80.2
DALLAS ISD	TW BROWNE MIDDLE	75233	4.7	24.2	25.7	37.1	45.5	53.4	55.1	52.1	62.5	67.7
DALLAS ISD	LG PINKSTON HS	75212	4.9	28.3	34.5	44.3	30.5	61.4	65.6	71.8	74.1	82.7
			Average	**39.7**	**43.7**	**46.0**	**56.5**	**61.9**	**66.2**	**65.3**	**69.7**	**76.4**

In the table, the middle and high schools that are located within the 5-mile radius of the Bio-Ecology Site are shown on the left side of the table. The standardized test passing rates and the distance are shown across the top of the table. The shaded grey cells in the table denote years that the school was not opened, or years that the school as repurposed. As the years increase, the test passing rates for the middle and high schools gradually increase. The standardized test passing rates range from 39.7%, in the Year 1994, to 76.4%, in the Year 2002.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data not having a normal distribution and due to the low number of observations The correlation matrix for the distance vs. the standardized test passing rates, is shown below.

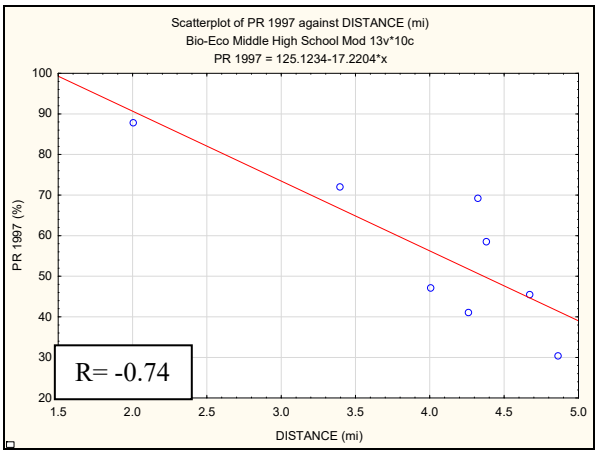
Table 7.157: Bio-Ecology Correlation Matrix for Middle and High Schools Located Within the 5-mile Radius of Bio-Ecology Site

Variable	Spearman Rank Order Correlations (Bio-Eco Middle High School Mod) MD pairwise deleted Marked correlations are significant at p <.05000 Distance (mi)	PR Year 1994	Pr Year 1995	PR Year 1996	PR Year 1997	PR Year 1998	PR Year 1999	PR Year 2000	PR Year 2001	PR Year 2002
Distance (mi)	1.00	-0.55	-0.58	-0.40	-0.74	-0.26	-0.32	-0.05	0.19	0.13
PR Year 1994	-0.55	1.00	0.88	0.90	0.62	0.67	0.74	0.48	0.57	0.29
PR Year 1995	-0.58	0.88	1.00	0.71	0.77	0.86	0.95	0.59	0.70	0.46
PR Year 1996	-0.40	0.90	0.71	1.00	0.33	0.43	0.52	0.50	0.55	0.31
PR Year 1997	-0.74	0.62	0.77	0.33	1.00	0.81	0.76	0.48	0.55	0.21
PR Year 1998	-0.26	0.67	0.86	0.43	0.81	1.00	0.94	0.82	0.73	0.77
PR Year 1999	-0.32	0.74	0.95	0.52	0.76	0.94	1.00	0.79	0.65	0.65
PR Year 2000	-0.05	0.48	0.59	0.50	0.48	0.82	0.79	1.00	0.75	0.81
PR Year 2001	0.19	0.57	0.70	0.55	0.55	0.73	0.65	0.75	1.00	0.83
PR Year 2002	0.13	0.29	0.46	0.31	0.21	0.77	0.65	0.81	0.83	1.00

Based on the correlation matrix, variable one, the distance, and variable two, the standardized test passing rates, are shown across the sides and top of the matrix. The numeric values, in the center of the table, represent the coefficient of correlations, the R values. These values represent the strength of relationship between two corresponding variables. The significant relationships are shown in red. In this Study, the significant relationships, between the distance and the standardized test passing rates, for the middle and high schools, located within the 5-mile radius of the Bio-Ecology Site, were evaluated.

Based on the correlation matrix above, the there is a strong negative significant relationship between the distance to the Bio-Ecology Site and the standardized test passing rate for the Year 1997. There is a great possibility that the prospective middle and high school students could have been negatively impacted by the RSR site more than the Bio-Ecology Site, since the relationship is negative. Even though the RSR Site was cleaned up in the Year 1994, the prospective students would have been effected before the RSR Site was cleaned up (Year 1994). The significant bivariate plot for the linear distance vs. the standardized test passing rate, for the Year 1997, is shown below. A trend line was included in the graph to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.229: Year 1994 to Year 2002 Bio-Ecology Plots of Significant Relationships between the Distance vs. the Standardized Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Site's 5-Mile Radius



Based on the graph, there is a negative relationship between the linear distance from the Bio-Ecology Superfund Site and the standardized test passing rate. As the linear distance of the schools from the Bio-Ecology Site increase, the standardized test passing rate, decrease. This is an opposite effect of what theoretically should occur. This most likely due to impacts of the RSR Site.

7.2.9.4 Bio-Ecology Comparison Distance Analysis for Middle and High Schools Located Greater than the 5-mile Radius of the Bio-Ecology Site (Comparison Group)

The comparison group of middle and high schools, located greater than the Bio-Ecology Site's 5-mile radius, is used to compare with the schools, located in close proximity of the Bio-Ecology Site, to determine if the standardized test passing rates are lower for schools located in close proximity of the Bio-Ecology Site, than the standardized test passing rates for middle and high schools, located greater than 5-mile radius of the Bio-Ecology Site. A table of the distance and the standardized test passing rates for the middle and high schools located greater than the 5-mile radius of the Bio-Ecology Site is shown below.

7.158: Bio-Ecology Middle and High Schools Located Greater than the 5-Mile radius of the Bio-Ecology Site.

	Bio-Ecology Distance and Middle and High School Test Passing Rates for Schools Greater than 5 miles											
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
CARROLLTON-FARMERS BRANCH ISD	SMITH H S	75006	16.3	67.6	74.1	81.5	80.9	84.5	79.9	81.1	85.4	88.1
CARROLLTON-FARMERS BRANCH ISD	LONG MIDDLE	75287	17.7	77.2	80.0	84.9	84.1	88.9	87.6	91.2	85.7	86.8
CEDAR HILL ISD	CEDAR HILL H S	75104	11.4	60.7	59.7	67.2	75.8	72.7	76.6	79.2	85.1	91.2
DUNCANVILLE ISD	J HERMAN REED MIDDLE	75116	6.9	62.0	56.3	59.6	64.5	67.1	71.3	69.3	72.7	77.2
COPPELL ISD	COPPELL MIDDLE WEST	75019	13.8	83.5	83.7	82.8	85.9	92.8	87.2	90.1	92.3	91.5
COPPELL ISD	COPPELL H S	75019	16.3	79.1	84.6	80.7	86.7	90.5	87.6	92.1	90.5	91.5
DALLAS ISD	W T WHITE H S	75244	13.1	55.3	47.2	60.3	61.3	65.1	71.5	74.4	80.0	87.8
DUNCANVILLE ISD	WILLIAM H BYRD MIDDLE SCH	75137	6.8	66.1	59.7	65.2	72.0	69.6	68.7	66.2	75.6	79.2
DUNCANVILLE ISD	DUNCANVILLE H S	75116	5.8	60.7	56.7	65.1	64.5	70.0	79.6	87.0	86.1	89.6
GRAND PRAIRIE ISD	HARRY S TRUMAN MIDDLE	75052	8.3	72.2	72.4	83.3	85.6	87.4	85.2	84.4	87.4	84.8
IRVING ISD	LAMAR MIDDLE	75060	5.5	67.9	68.0	73.5	77.4	85.1	83.5	84.4	89.5	89.5
LANCASTER ISD	LANCASTER H S	75134	13.3	52.9	57.9	43.5	51.1	58.9	77.9	75.6	78.9	79.8
LANCASTER ISD	LANCASTER MIDDLE	75146	14.1	56.9	39.3	50.8	57.3	55.5	51.6	56.0	62.7	66.8
MESQUITE ISD	NORTH MESQUITE H S	75150	18.1	59.4	59.7	57.3	71.1	77.2	78.0	79.3	78.0	83.5
MESQUITE ISD	VANSTON MIDDLE	75150	17.5	58.9	59.2	68.6	68.4	69.7	69.2	73.9	78.0	74.1
PLANO ISD	FRANKFORD MIDDLE	75252	19.6						92.1	94.6	94.7	95.3
RICHARDSON ISD	RICHARDSON H S	75080	17.3	61.2	56.7	57.7	69.5	72.9	76.4	77.1	82.3	80.8
RICHARDSON ISD	RICHARDSON NORTH J H	75080	19.2	78.7	75.3	85.3	81.4	88.3	79.7	81.9	83.4	87.5
DALLAS ISD	Bryan Adams H S	75231	15.6	58.6	50.6	55.6	61.1	65.8	55.6	79.1	74.6	77.7
IRVING ISD	Irving H S	75061	5.5	59.3	66.1	62.0	67.9	68.9	75.0	79.8	76.4	85.3
		Average	**13.1**	**65.2**	**63.5**	**67.6**	**71.9**	**75.3**	**76.7**	**79.8**	**82.0**	**84.4**

The district name, the campus name, and the zip codes the schools are located in, are shown on the left side of the table. The distance and the standardized test passing rates are shown across the top of the table. The dark grey shaded cells, in the table, denote years that the school was not opened or year the school may have been repurposed.

The average standardized test passing rates range from 65.2%, for the Year 1994, to 84.4%, for Year 2002. These ranges for the overall standardized test passing rate are significantly higher than the standardized test passing rates for the middle and high schools located within the Bio-Ecology Site's 5-mile radius. The average standardized test passing rates for the Year 1994 and for the Year 2002, for middle and high schools located within the 5-mile radius of the Bio-Ecology Site is 39.7% and 76.4.0%, respectively. The significant difference could due to the no exposure of prospective students to the leachate from the Bio-Ecology Site, for the middle and the high schools located greater than the Bio-Ecology Site's 5-mile radius.

The Spearman Rank Correlation Matrix was used to analyze the data, due the data, not having a normal distribution and due to a low number of observations. The correlation matrix for the distance vs. the standardized test passing rates for the middle and high schools located greater than the 5-mile radius of the Bio-Ecology Site is shown below.

Table 7.159: Bio-Ecology Distance Analysis Correlation Matrix for Middle and High Schools Located Greater than the 5-mile Radius of the Bio-Ecology Site.

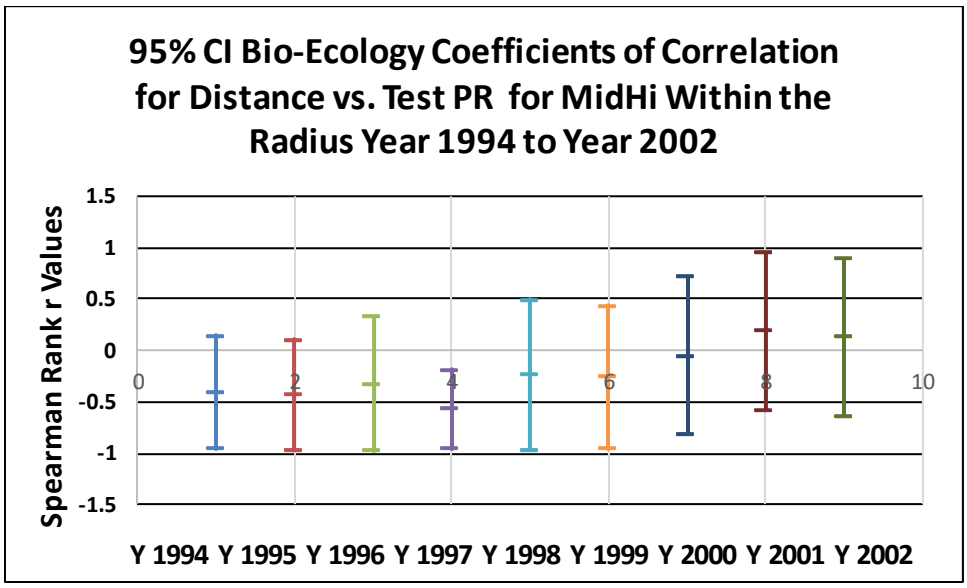
Variable	Spearman Rank Order Correlations (Middle and High School FIN) MD pairwise deleted Marked correlations are significant at p <.05000 Distance (mi)	PR Year 1994	PR Year 1995	PR Year 1996	PR Year 1997	PR Year 1998	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
Distance (mi)	1.00	0.13	0.21	0.15	0.23	0.32	0.28	0.22	0.15	0.04
PR Year 1994	0.13	1.00	0.83	0.83	0.92	0.91	0.75	0.70	0.69	0.55
PR Year 1995	0.21	0.83	1.00	0.83	0.91	0.89	0.83	0.78	0.71	0.62
PR Year 1996	0.15	0.83	0.83	1.00	0.87	0.83	0.71	0.67	0.70	0.56
PR Year 1997	0.23	0.92	0.91	0.87	1.00	0.95	0.79	0.72	0.75	0.61
PR Year 1998	0.32	0.91	0.89	0.83	0.95	1.00	0.87	0.83	0.82	0.65
PR YEAR 1999	0.28	0.75	0.83	0.71	0.79	0.87	1.00	0.93	0.92	0.78
PR YEAR 2000	0.22	0.70	0.78	0.67	0.72	0.83	0.93	1.00	0.88	0.81
PR YEAR 2001	0.15	0.69	0.71	0.70	0.75	0.82	0.92	0.88	1.00	0.87
PR YEAR 2002	0.04	0.55	0.62	0.56	0.61	0.65	0.78	0.81	0.87	1.00

Based on the correlation matrix, variable one, the distance, and variable two, the standardized test passing rates, are shown across the sides and top of the matrix. The numeric values, in the center of the table, represent the coefficient of correlations, the R values. These values represent the strength of relationship between two corresponding variables. The significant relationships are shown in red. In this Study, the significant relationships, between the distance and the standardized test passing rates, for the middle and high schools, located greater than the 5-mile radius of the Bio-Ecology Site, were evaluated.

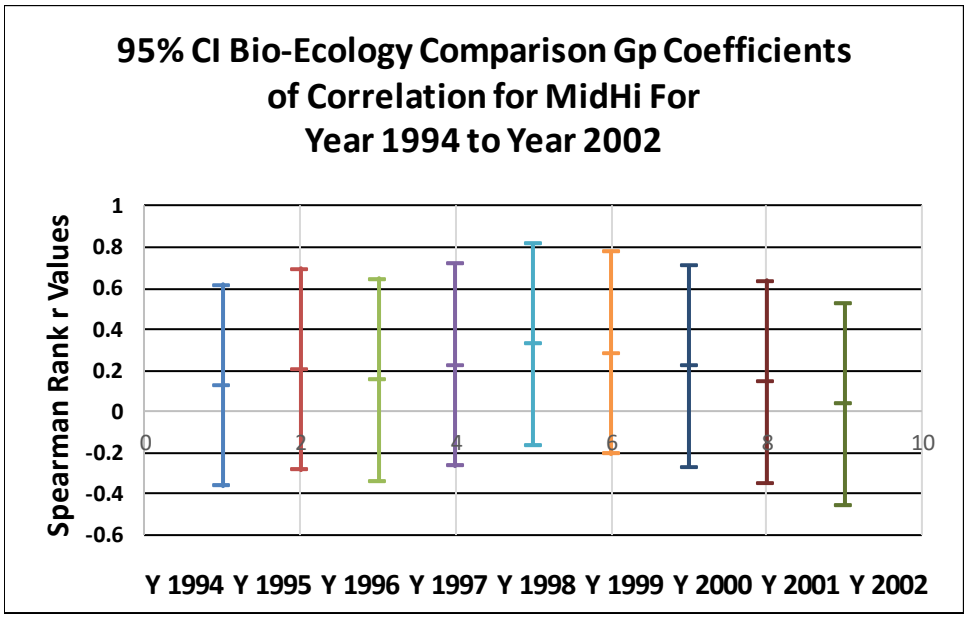
Based on the matrix above, there are no significant relationships between the linear distance and the standardized test passing rates, for the middle and high schools located greater than the 5- mile radius of the Bio-Ecology Site. This result is reasonable since these middle and high schools are located at a much greater distance from the Bio-Ecology Site, than the middle and high schools located within the 5-mile radius of the Bio-Ecology Site. These schools were not impacted by the RSR and the Bio-Ecology Sites.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1994 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for middle and high schools, located within and greater than, the 5-mile radius of the Bio-Ecology Superfund Site, are shown below.

Graph 7.230 Bio-Ecology Coefficient of Correlation Confidence Interval Graph for Distance vs. Standardized Test Passing Rate for Middle and High Schools from the Year 1994 to the Year 2002.



Graph 7.231: Bio-Ecology Comparison Group Coefficient of Correlation Confidence Interval Graph for Distance vs. Standardized Test Passing Rate for Middle and High Schools from the Year 1994 to the Year 2002.



Based on the confidence interval graphs, the significant coefficient of correlation, for the Year 1997, has the smallest confidence interval, for the middle and high schools located within the 5-mile radius of the Bio-Ecology Site. The other coefficients of correlation

were not significant for the other years, except for the Year 1997. There were no significant Spearman Rank r Values for the Comparison Group confidence interval graph.

7.2.9.5 Bio-Ecology Distance Analysis for Elementary Schools Located Within the Bio-Ecology Site's 5-Mile Radius

The purpose of distance analysis for the elementary schools, located within the 5- mile radius of the Bio-Ecology Site, is to determine if prospective students, born the year after the Bio-Ecology site closed (Year 1978) until the year the Bio-Ecology Site was cleaned (Year 1983) had any negative cognitive impacts from the leachate from the class 1 waste facility, resulting in lower standardized test passing rates. A table of all of the elementary schools located within the Bio-Ecology Site's 5-mile radius is shown below.

Table 7.160: Bio-Ecology Distance Analysis Elementary Schools Located Within the Bio-Ecology Site's 5-mile Radius

			Bio-Ecology Distance and Elementary School Test Passing Rates									
District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR Year 1999 (%)	PR Year 2000 (%)	PR Year 2001 (%)	PR Year 2002 (%)
DALLAS ISD	MARY MELEOD BETHUNE EL	75211	2.0				80.4	74.7	82.1	73.1	86.7	92.7
GRAND PRAIRIE ISD	HECTOR P GARCIA EL	75050	2.3							59.4	76.3	68.0
DALLAS ISD	LESLIE A STEMMONS EL	75211	2.7	44.3	52.4	69.1	69.9	71.0	71.6	68.3	80.8	79.2
DALLAS ISD	L O DONALD EL	75211	2.7	48.0	43.1	44.4	30.6	55.2	60.2	54.0	67.6	70.5
DALLAS ISD	ANSON JONES EL	75211	2.7	36.0	23.2	50.0	48.3	54.2	66.2	62.7	79.8	81.5
DALLAS ISD	GABE P ALLEN EL	75212	2.8	50.0	47.4	66.7	68.4	91.8	86.4	80.3	73.2	60.0
GRAND PRAIRIE ISD	CROCKETT 5TH GRADE CENTER	75051	3.2	60.4	76.7	59.0	48.1	66.2	79.5	62.5	78.3	89.5
DALLAS ISD	GEORGE PEABODY EL	75211	3.4	39.7	63.1	64.9	80.2	81.3	75.8	74.5	80.3	84.5
DALLAS ISD	STEVENS PARK EL	75211	4.0	42.2	49.2	60.2	44.9	56.8	52.1	46.8	57.0	64.9
IRVING ISD	BRITAIN EL	75060	4.2	55.3	68.4	70.1	86.9	80.8	74.6	58.5	75.7	75.7
DALLAS ISD	AMELIA EARHART	75212	4.3	30.8	35.8	35.5	47.0	59.7	61.4	59.9	54.4	71.7
GRAND PRAIRIE	BOWIE EL	75051	4.5	55.4	62.4	76.8	60.8	66.5	75.1	65.4	59.8	80.5
DALLAS ISD	ROSEMONT EL	75208	4.9	40.9	46.7	54.3	59.9	70.5	67.1	67.7	68.4	75.5
			Average	**45.7**	**51.7**	**59.2**	**60.5**	**69.1**	**71.0**	**64.1**	**72.2**	**76.5**

There are a total of 13 elementary schools located within the Bio-Ecology Site 5-mile radius. The school district name, the campus name, and the zip codes the schools are located in are shown on the left side of the table. The distance and the standardized test passing rates are shown across the top of the table. The distance is measured in miles and the standardized test passing rates are measured in percentage, for each school. The dark grey shaded cells, in the table, denote years that the school was not opened or year the school may have been repurposed.

Based on the table, the average standardized test passing rate range from 45.7%, for the Year 1994 to 76.5%, for the Year 2002. As the years progress, overall, the standardized test passing rates increase gradually. The increase may be due to lower impacts of the leaked contents from the class 1 waste facility, on prospective students, after the Bio-Ecology Site was cleaned up.

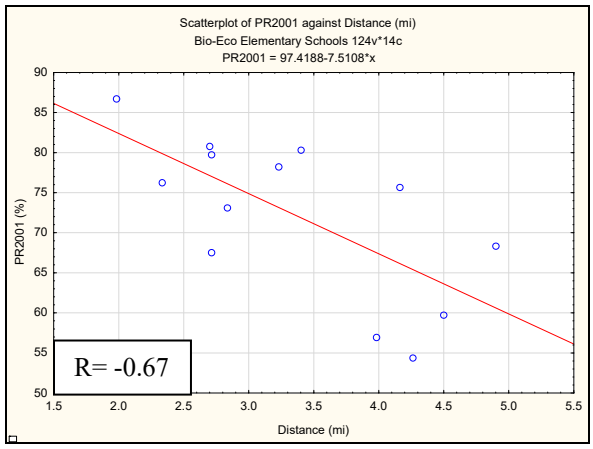
The Spearman Rank Correlation Matrix was used to analyze the data, due to a low quantity of observations and the non-normal data set. The correlation matrix for the distance vs. the standardized test passing rates for the elementary schools located within the5-mile radius of the Bio-Ecology Site, is shown below.
Table 7.161: Bio-Ecology Distance Analysis Correlation Matrix for Elementary Schools Located Within the Bio-Ecology Site's 5- Mile Radius

Variable	Spearman Rank Order Correlations (Bio-Eco Elementary Schools) MD pairwise deleted Marked correlations are significant at p <.05000 Distance (mi)	PR Year 1994	Pr Year 1995	PR Year 1996	PR Year 1997	PR Year 1998	PR Year 1999	PR Year 2000	PR Year 2001	PR Year 2002
Distance (mi)	1.00	-0.02	0.13	0.09	-0.14	0.00	-0.22	-0.13	-0.67	-0.13
PR Year 1994	-0.02	1.00	0.68	0.59	0.17	0.26	0.53	-0.05	0.05	0.11
PR Year 1995	0.13	0.68	1.00	0.69	0.52	0.54	0.62	0.10	0.35	0.46
PR Year 1996	0.09	0.59	0.69	1.00	0.75	0.65	0.56	0.35	0.29	0.15
PR Year 1997	-0.14	0.17	0.52	0.75	1.00	0.83	0.68	0.62	0.66	0.43
PR Year 1998	0.00	0.26	0.54	0.65	0.83	1.00	0.76	0.71	0.43	0.10
PR Year 1999	-0.22	0.53	0.62	0.56	0.68	0.76	1.00	0.76	0.56	0.46
PR Year 2000	-0.13	-0.05	0.10	0.35	0.62	0.71	0.76	1.00	0.53	0.37
PR Year 2001	-0.67	0.05	0.35	0.29	0.66	0.43	0.56	0.53	1.00	0.65
PR Year 2002	-0.13	0.11	0.46	0.15	0.43	0.10	0.46	0.37	0.65	1.00

Based on the correlation matrix, variable one, the distance, and variable two, the standardized test passing rates, are shown across the sides and top of the matrix. The numeric values, in the center of the table, represent the coefficient of correlations, the R values. These values represent the strength of relationship between two corresponding variables. The significant relationships are shown in red. In this Study, the significant relationships, between the distance and the standardized test passing rates, for the elementary schools, located within the 5-mile radius of the Bio-Ecology Site, were evaluated.

Based on the correlation matrix, there is a moderate negative significant relationship between the linear distance of the elementary schools from the Bio-Ecology Site and the standardized test passing rate for the Year 2001. This effect is most likely due to the RSR Site than the Bio-Ecology Site, since the relationship is negative. In the event that the prospective students were exposed to the effects of the lead smelter before cleanup activities started and while cleanup activities were on going (Year 1991 to the Year 1994), there is a possibility that the students could have been negatively impacted by the RSR Site, resulting in lower standardized test passing rates. The significant bivariate plot is shown below. A trend line was included in the graph to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.232: Year 1994 to Year 2002 Bio-Ecology Plots of Significant Relationships between the Distance vs. the Standardized Test Passing Rates for Elementary Schools Located Within the Bio-Ecology Site's 5-Mile Radius



Based on the graph above, as the linear distance of the elementary schools from the Bio-Ecology Site, increase, the standardized test passing rates, decrease. This result is similar to the middle and high schools located within the 5-mile radius of the Bio-Ecology Site and it is opposite of what would be a theoretical result. The negative relationship is due to the effects of the RSR Site and not the Bio-Ecology Site.

7.2.9.6 Bio-Ecology Site Comparison Distance Analysis for Elementary Schools Located Greater than the Bio-Ecology Site's 5-mile Radius (Comparison Group).

The comparison group of elementary schools, located greater than the Bio-Ecology Site's 5-mile radius, is used to compare with the schools, located in close proximity of the Bio-Ecology Site, to determine if the standardized test passing rates are lower for schools located in close proximity of the Bio-Ecology Site, than the standardized test passing rates for elementary schools, located greater than 5-mile radius of the Bio-Ecology Site. A table of the distance and the standardized test passing rates for the elementary schools located greater than the 5-mile radius of the Bio-Ecology Site, is shown below.
Table 7.162: Elementary Schools Located Greater than the 5- mile Radius of the Bio-Ecology Site

District Name	Campus Name	Zip Code	Distance (mi)	PR Year 1994 (%)	PR Year 1995 (%)	PR Year 1996 (%)	PR Year 1997 (%)	PR Year 1998 (%)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
CARROLLTON-FARMERS BRANCH ISD	BLAIR EL	75234	13.5	26.9	34.2	42.9	45.3	55.6	54.1	47.8	51.1	59.7
CARROLLTON-FARMERS BRANCH ISD	KENT EL	75007	17.5	83.3	90.2	91.9	92.9	96.0	97.9	97.8	96.3	98.9
CEDAR HILL ISD	WATERFORD OAKS EL	75104	10.5	56.6	65.5	67.2	71.9	72.6	63.0	73.4	60.5	75.0
COPPELL ISD	PINKERTON EL	75019	14.5	81.1	78.8	92.6	95.2	97.6	96.8	99.4	99.4	98.4
COPPELL ISD	LAKESIDE EL	75019	15.7	81.2	86.2	94.0	96.2	97.5	94.9	96.4	96.7	97.7
DALLAS ISD	VICTOR H HEXTER EL	75218	14.8	82.6	80.7	86.4	87.1	85.2	83.5	73.1	74.9	82.9
DESOTO ISD	RUBY YOUNG EL	75115	10.7	69.9	78.4	68.3	81.0	84.8	88.4	86.2	92.6	88.2
DESOTO ISD	AMBER TERRACE EL	75115	12.4	60.7	64.3	62.3	73.4	78.7	78.0	76.3	86.5	86.5
DUNCANVILLE ISD	WILLIAM LEE HASTINGS EL	75116	6.5	66.4	68.7	65.5	71.2	75.1	81.6	76.3	82.9	83.9
DUNCANVILLE ISD	MERRIFIELD ELEMENTARY	75137	7.1	59.7	66.5	76.7	75.5	76.3	82.4	74.0	82.0	81.2
GRAND PRAIRIE ISD	SUZANNA DICKINSON EL	75052	8.5	66.5	75.2	75.3	87.8	92.1	86.5	86.3	80.3	87.9
GRAND PRAIRIE ISD	FLORENCE HILL EL	75052	7.1	64.8	72.9	76.5	84.7	84.8	86.9	83.9	83.2	83.8
IRVING ISD	DAVIS EL	75061	6.4	64.1	70.2	76.3	81.5	82.2	81.1	77.7	79.6	85.6
IRVING ISD	LIVELY EL	75061	6.2	67.4	70.8	78.7	87.0	79.9	81.7	83.8	83.9	87.4
LANCASTER ISD	ROLLING HILLS EL	75146	12.3	46.5	61.8	59.8	77.1	70.1	67.2	59.7	68.7	63.9
LANCASTER ISD	LANCASTER EL	75146	14.1	49.0	58.1	63.0	64.3	57.7	61.6	66.2	71.6	75.1
LEWISVILLE ISD	HEBRON VALLEY EL	75010	19.0	72.9	84.7	89.1	94.2	93.6	94.9	90.8	92.8	87.0
LEWISVILLE ISD	CREEKSIDE EL	75067	19.0	76.1	83.0	82.8	82.4	86.0	88.0	83.0	86.6	87.1
MESQUITE ISD	PRICE EL	75043	19.2	73.7	77.8	79.2	83.6	91.2	90.9	92.2	89.1	89.6
MESQUITE ISD	CANNADAY EL	75150	18.7	64.2	64.4	76.0	85.6	89.9	86.9	92.6	92.2	89.4
PLANO ISD	MITCHELL EL	75287	17.9	81.0	92.6	89.8	92.3	91.5	86.1	96.0	94.2	96.9
RED OAK ISD	RED OAK INT	75154	15.4	64.9	61.5	73.0	79.5	86.6	85.4	89.7	84.4	89.0
RED OAK ISD	EASTRIDGE EL	75154	17.3	41.9	57.6	66.1	72.4	79.0	70.7	75.5	75.4	73.0
RED OAK ISD	SHIELDS EL	75154	15.3	62.0	77.4	75.0	82.0	88.0	83.6	85.8	84.1	90.8
RICHARDSON ISD	SPRING CREEK EL	75248	17.1	88.1	91.0	94.7	92.5	98.2	96.4	92.9	95.7	94.9
RICHARDSON ISD	LAKE HIGHLANDS EL	75238	15.7	67.4	82.6	76.0	85.4	90.7	92.5	89.8	87.5	86.0
			Average	**66.1**	**72.9**	**76.1**	**81.6**	**83.9**	**83.1**	**82.6**	**83.5**	**85.4**

In the table, the district name, the campus name, and the zip codes the elementary schools are located is shown on the left side of the table. The linear distance the schools are located from the Bio-Ecology Site and the standardized test passing rates are shown across the top of the table. Based on the table, the average standardized test passing rates range from 66.1%, for the Year 1994, to 85.4%, for the Year 2002. Overall, the standardized test passing rates are higher, than the standardized test passing rates for the elementary schools located inside of the Bio-Ecology Site's 5-mile radius. For the Year 1994, the standardized test passing rate is 45.7%, and for the Year 2002, standardized test passing rate is 76.5%, for the elementary schools located within the 5-mile radius of the Bio-Ecology Site. The standardized test passing rates follow the same general trend of being lower. This could be due to a possible exposure of these students to the lead smelter of the RSR Site.

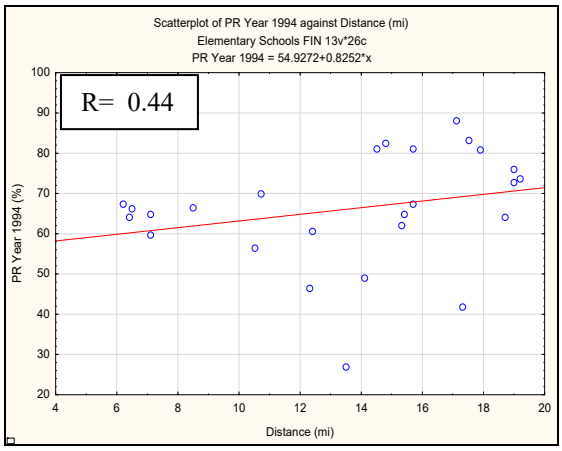
The Spearman Rank Correlation Matrix was used to analyze the data, due to the data set not having a normal distribution and due to a low quantity of observations. The correlation matrix for the distance vs. the standardized test passing rates, for elementary schools located greater than the 5-mile radius of the Bio-Ecology Site, is shown below.
Table 7.163: Bio-Ecology Site Distance Analysis Correlation Matrix for Elementary Schools Located Greater Than the 5-mile Radius of the Bio-Ecology Site.

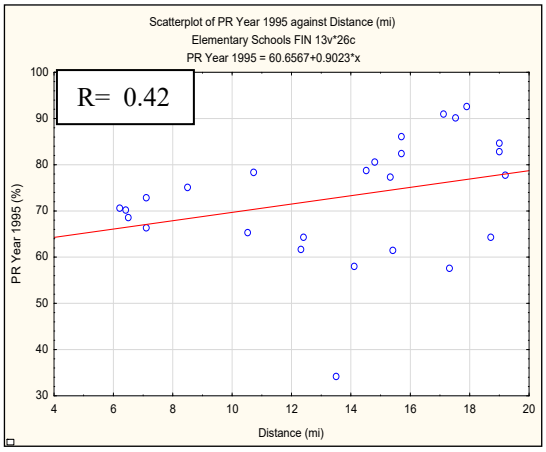
Variable	Spearman Rank Order Correlations (Elementary Schools FIN) MD pairwise deleted Marked correlations are significant at p <.05000 Distance (mi)	PR Year 1994	PR Year 1995	PR Year 1996	PR Year 1997	PR Year 1998	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
Distance (mi)	1.00	0.41	0.42	0.41	0.40	0.57	0.51	0.51	0.54	0.44
PR Year 1994	0.41	1.00	0.90	0.86	0.83	0.81	0.83	0.73	0.76	0.74
PR Year 1995	0.42	0.90	1.00	0.85	0.82	0.80	0.81	0.70	0.74	0.68
PR Year 1996	0.41	0.86	0.85	1.00	0.88	0.81	0.79	0.73	0.72	0.68
PR Year 1997	0.40	0.83	0.82	0.88	1.00	0.90	0.83	0.81	0.74	0.74
PR Year 1998	0.57	0.81	0.80	0.81	0.90	1.00	0.91	0.92	0.84	0.86
PR YEAR 1999	0.51	0.83	0.81	0.79	0.83	0.91	1.00	0.89	0.89	0.79
PR YEAR 2000	0.51	0.73	0.70	0.73	0.81	0.92	0.89	1.00	0.92	0.92
PR YEAR 2001	0.54	0.76	0.74	0.72	0.74	0.84	0.89	0.92	1.00	0.89
PR YEAR 2002	0.44	0.74	0.68	0.68	0.74	0.86	0.79	0.92	0.89	1.00

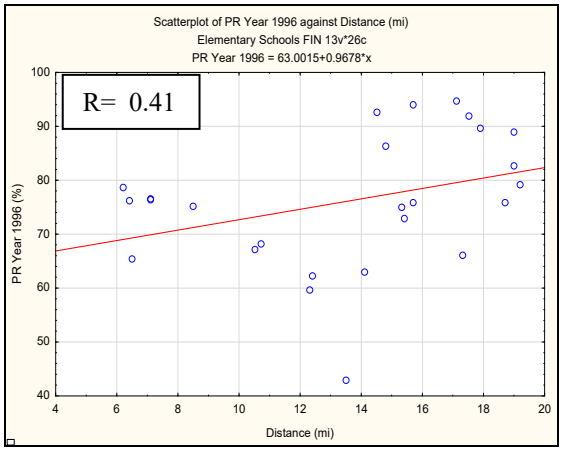
Based on the correlation matrix, variable one, the distance, and variable two, the standardized test passing rates, are shown across the sides and top of the matrix. The numeric values, in the center of the table, represent the coefficient of correlations, the R values. These values represent the strength of relationship between two corresponding variables. The significant relationships are shown in red. In this Study, the significant relationships, between the distance and the standardized test passing rates, for the elementary schools, located greater than the 5-mile radius of the Bio-Ecology Site, were evaluated.

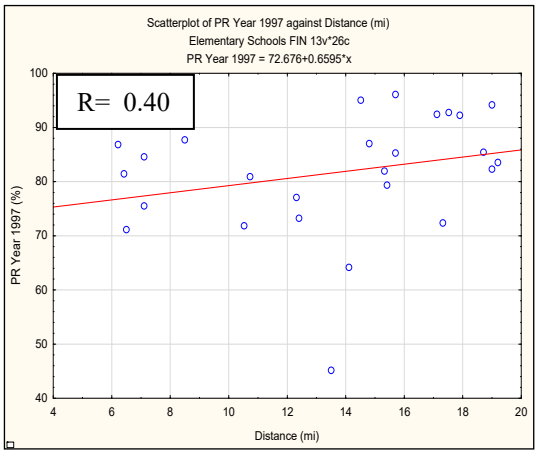
There are weak significant relationships between the linear distance of elementary schools and the standardized test passing rates from the Year 1994 to the Year 2002. These results are unusual and do not follow theoretical results, or even possible effects from the RSR Site. These significant relationships could be the result of underlying socioeconomic indicators. The significant bivariate graphs are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

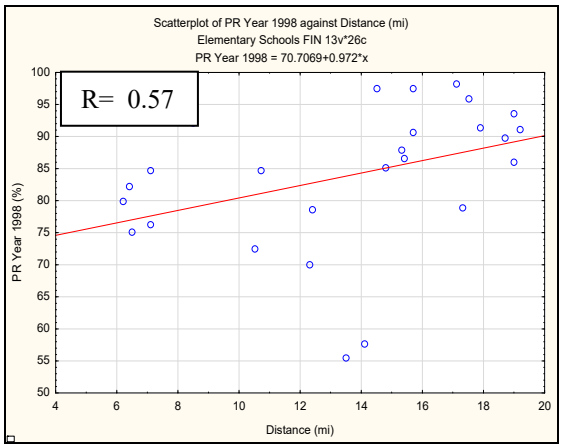
Graph 7.233- Graph 7.241: Year 1994 to Year 2002 Bio-Ecology Comparison Group Plots of Significant Relationships between the Distance vs. the Standardized Test Passing Rates for Elementary Schools

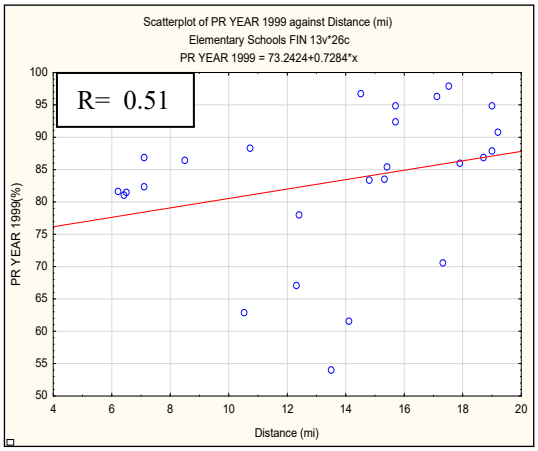

Scatterplot of PR Year 1994 against Distance (mi)
Elementary Schools FIN 13v*26c
PR Year 1994 = 54.9272+0.8252*x
R= 0.44
PR Year 1994 (%)
Distance (mi)

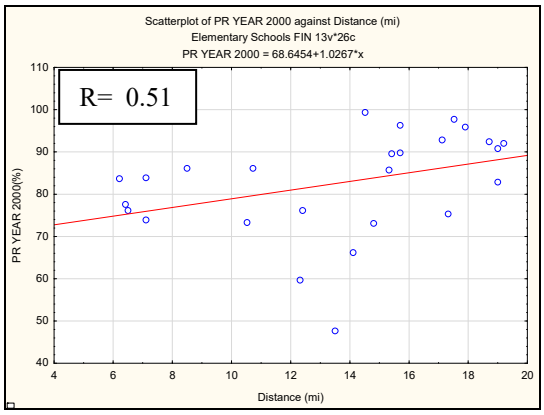

Scatterplot of PR Year 1995 against Distance (mi)
Elementary Schools FIN 13v*26c
PR Year 1995 = 60.6567+0.9023*x
R= 0.42
PR Year 1995 (%)
Distance (mi)

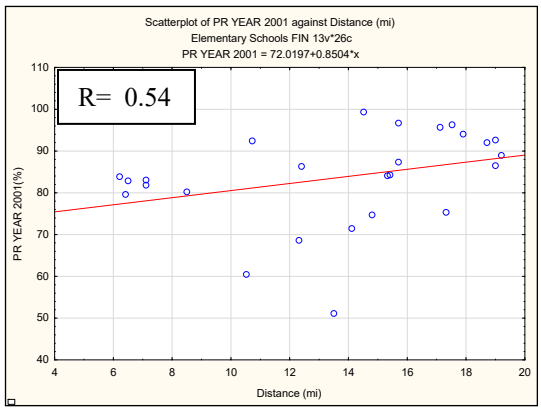

Scatterplot of PR Year 1996 against Distance (mi)
Elementary Schools FIN 13v*26c
PR Year 1996 = 63.0015+0.9678*x
R= 0.41
PR Year 1996 (%)
Distance (mi)

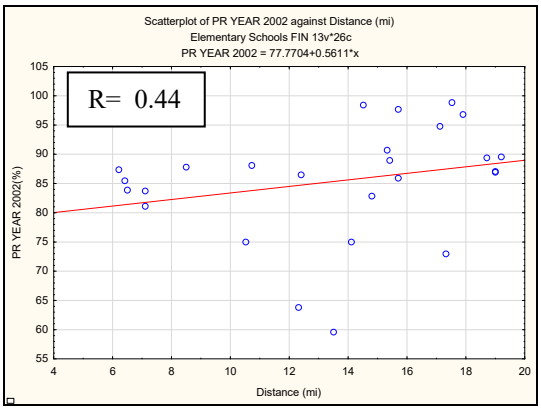

Scatterplot of PR Year 1997 against Distance (mi)
Elementary Schools FIN 13v*26c
PR Year 1997 = 72.676+0.6595*x
R= 0.40
PR Year 1997 (%)
Distance (mi)


Scatterplot of PR Year 1998 against Distance (mi)
Elementary Schools FIN 13v*26c
PR Year 1998 = 70.7069+0.972*x
R= 0.57
PR Year 1998 (%)
Distance (mi)


Scatterplot of PR YEAR 1999 against Distance (mi)
Elementary Schools FIN 13v*26c
PR YEAR 1999 = 73.2424+0.7284*x
R= 0.51
PR YEAR 1999(%)
Distance (mi)



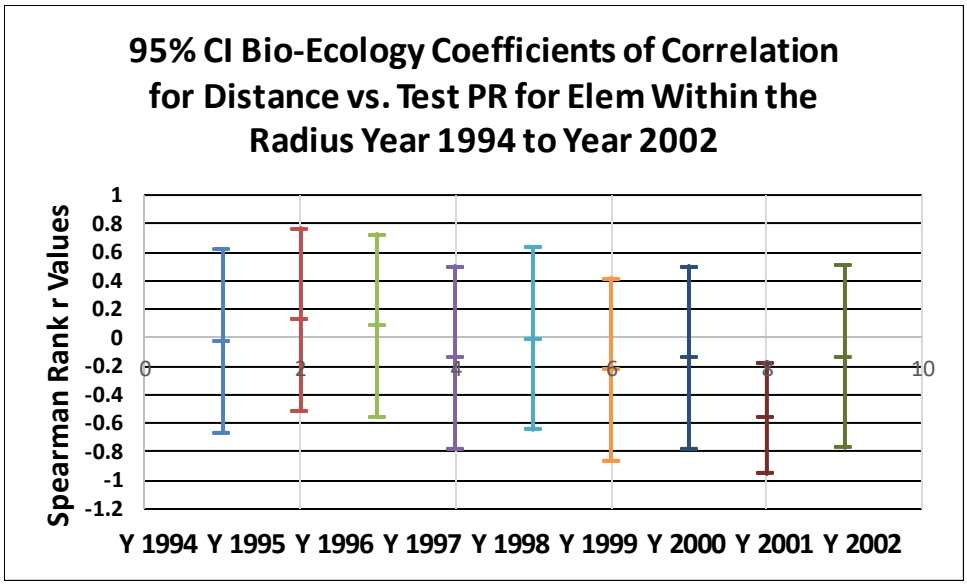




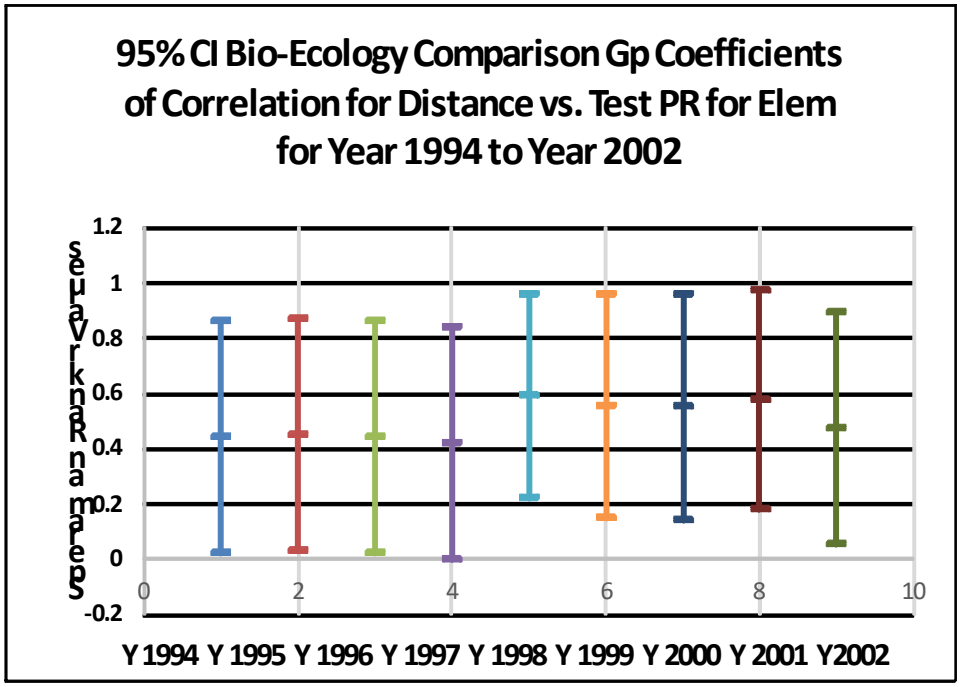
There is an overall trend, that as the distance, to the Bio-Ecology Site, increase, the standardized test passing rates, increase. These could also be the effects of socioeconomic indicators.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1994 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for elementary schools, located within and greater than, the 5-mile radius of the Bio-Ecology Superfund Site, are shown below.

Graph 7.242 Bio-Ecology Coefficient of Correlation Confidence Interval Graph for Distance vs. Standardized Test Passing Rate for Elementary Schools from the Year 1994 to the Year 2002.



Graph 7.243: Bio-Ecology Comparison Group Coefficient of Correlation Confidence Interval Graph for Distance vs. Standardized Test Passing Rate for Elementary Schools from the Year 1994 to the Year 2002.



Based on the graphs, the significant Spearman Rank r Value, for the Year 2001, had the smallest confidence interval, for the elementary schools located within the 5-mile radius of the Bio-Ecology Site. The other Spearman Rank r Values were not significant, except for the Year 2001. For the comparison group confidence interval graph, the coefficients of correlation were significant from the Year 1994 to the Year 2002.

7.2.10 Bio-Ecology Socioeconomic Indicators vs. Elevated Blood Lead Level Analysis

The purpose of the socioeconomic indicators vs. elevated childhood blood lead level analysis is to determine if a significant relationship exists between socioeconomic indictors and the counts of elevated childhood blood lead levels. The socioeconomic indicator data was provided by the Year 2000 Census, from the census.gov website. The elevated childhood blood lead level data was provided by the Texas Department of State Health Services, by zip code, in Dallas County. The childhood elevated blood lead level data , with the socioeconomic indicators data, for children that reside in zip codes, located within, or intersect, the Bio-Ecology Site's 5-mile radius, were compared to the socioeconomic indicator data and the elevated childhood blood lead level data, for children that reside in zip codes located greater than the 5-mile radius of the Bio-Ecology Site.

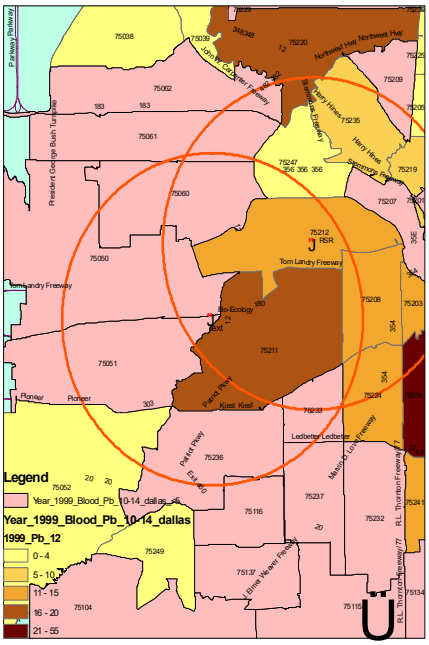
Children and adults, from ages 15 years and older, covered under the Adult Lead Surveillance Program, were not included in the Study, because the elevated blood lead data, for this age group, was not available from the Texas Department of State Health Services. Elevated childhood blood lead level data, for children from 0 years to 14 years of age, covered under the Texas Childhood Lead Poisoning Prevention Program, is used in the socioeconomic indicators vs. elevated blood lead level analysis. The method the Texas Department of State Health (TDSHS) uses to acquire elevated childhood blood lead level data is located in Section 7.1 of the report. The earliest year, that the elevated childhood blood lead data was available, from the TDSHS, for this Study, was the Year 1999. Therefore, the socioeconomic indicators vs elevated childhood blood lead level analysis was conducted from the Year 1999 to the Year 2002, for Dallas County. The analysis ended in the Year 2002 to provide consistency with the standardized test passing rate analysis.

According to the Centers for Disease Control (CDC), the recommended childhood blood lead level for "public health actions to be initiated" is 5 μg/dl. The CDC has a Childhood Lead Poisoning Prevention Program to reduce childhood elevated blood lead levels that are 10 μg/dl and greater. The lowest concentration of elevated childhood blood lead data, provided by the TDSHS, was 10 μg/dl. In the childhood elevated blood lead level data set, there were four categories of elevated blood levels; 10-14 μg/dl (low level), 15-19 μg/dl (medium level), equal to or greater than 20 μg/dl (high level), and the total counts of all elevated childhood blood lead levels, respectively. During the socioeconomic indicators vs elevated childhood blood lead level analysis, the overall counts for the medium level (15-19 μg/dl) and high level (= or > 20 μg/dl), of elevated blood lead levels, had extremely low quantity of counts. Therefore, no analysis was conducted on both elevated childhood blood lead level categories, and both elevated childhood blood lead levels were removed from the Study.

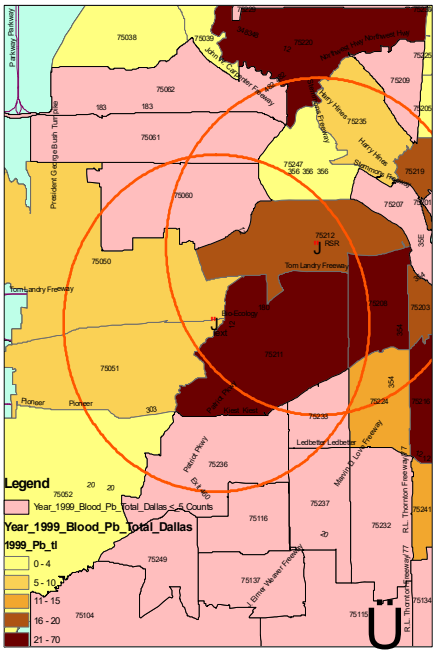
Bio-Ecology Maps, of the elevated childhood blood lead level of 10-14 μg/dl and the total counts are depicted below, by zip code.

Figure 7.27- Figure 7.32: Bio-Ecology Socioeconomic Indicators vs Elevated Childhood Blood Lead Level Maps for 10-14 µg/dl and Total Counts of Elevated Blood Lead Level.

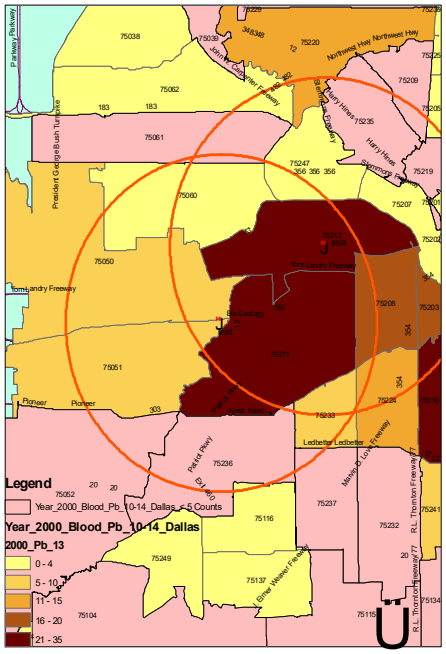
Bio-Ecology Year 1999 Blood Lead Level of 10-14 µg/dl



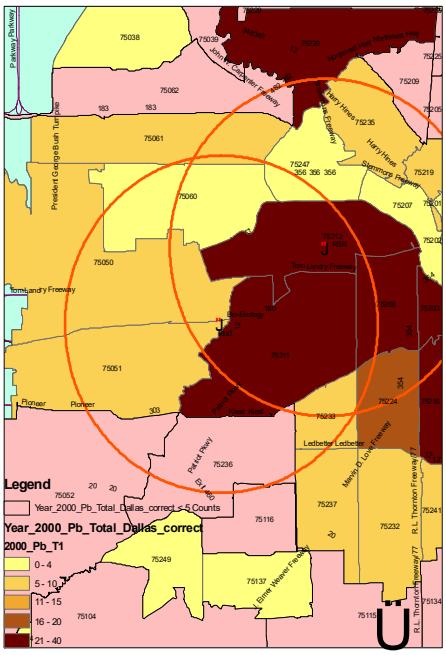
Bio-Ecology Year 1999 Total Blood Lead Levels



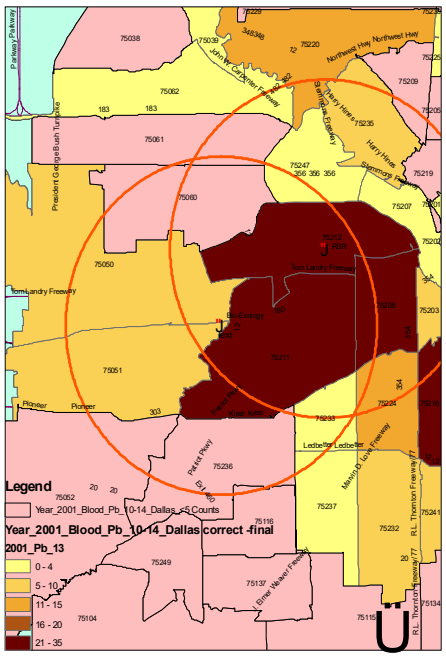
Bio-Ecology Year 2000 Blood Lead Level of 10-14 µg/dl



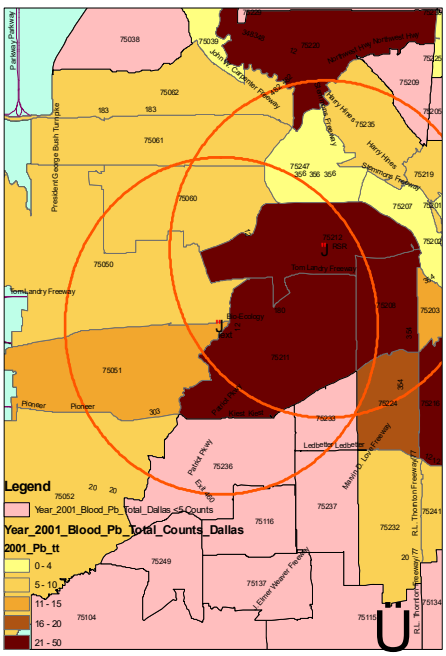
Bio-Ecology Year 2000 Total Blood Lead Levels



Bio-Ecology Year 2001 Blood Lead Level of 10-14 µg/dl



Bio-Ecology Year 2001 Total Blood Lead Levels

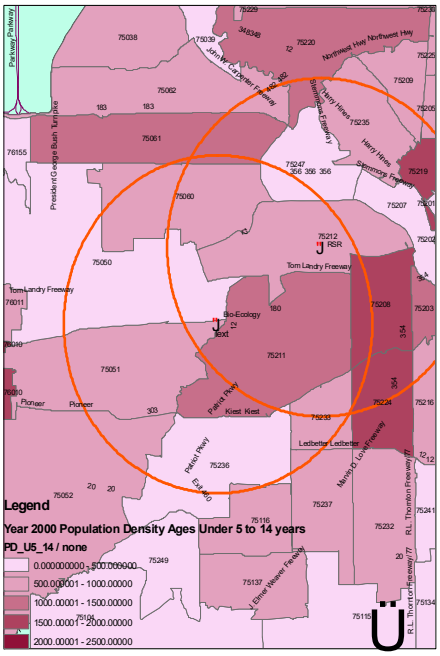


The darker the shading of the maps, the greater quantity of children with the 10-14 µg/dl elevated blood lead level and the total counts (10-14 µg/dl, 15 µg/dl, and = or > 20 µg/dl) of childhood elevated blood lead level. The circle indicates the 5-mile radius of

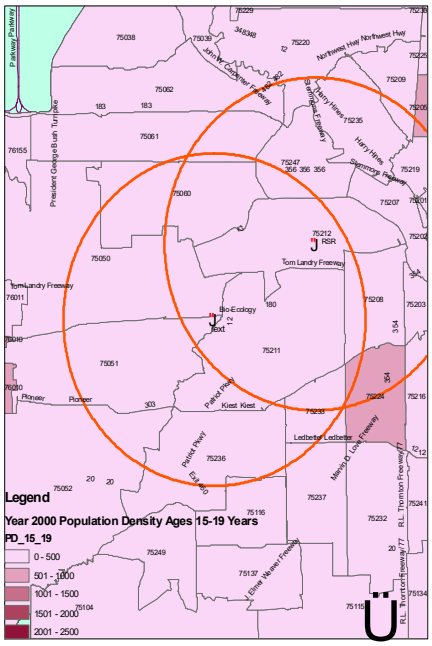
each lead contaminated Superfund Site. The years the map covers are from the Year 1999 to the Year 2001.

The population density maps for the Year 2000, by age range, for the Bio-Ecology Site, are shown below.
Figures 7.33 – Figure 7.35 Bio-Ecology Population Density Maps for Childhood Ages; Under 5 Years to 14 Years, 15 Years to 19 Years, and 20 Years to 24 Years, respectively.

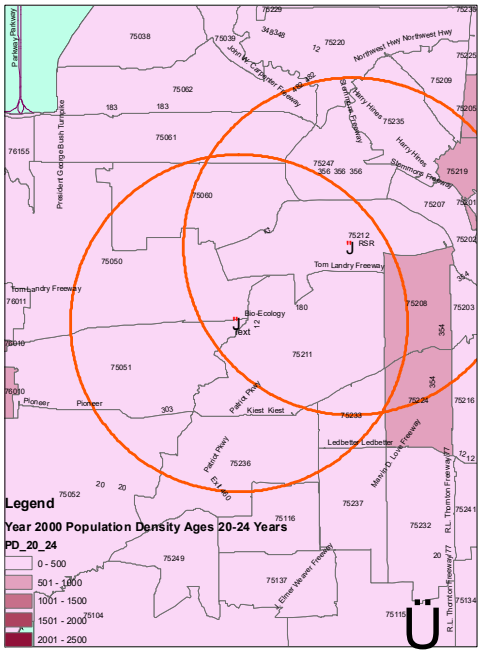
Bio-Ecology Population Density Ages Under 5 to 14 years



Bio-Ecology Population Density Ages 16-19 Years



Bio-Ecology Population Density Ages 20-24 Years



Based on the population maps, the darker the shading, the greater the population density, of the specified age range. The population maps assist to determine if lower elevated childhood blood lead level counts are the result of a lower population density.

In the elevated childhood blood lead level data set, provided by the TDSHS, counts of elevated blood lead that were less than 5, were designated as a "<5" count, in the spreadsheet. The TDSHS could not provide the actual number for "<5". In order to quantify and analyze the unspecified counts, of elevated childhood blood lead level data, an educated, systematic approach was utilized, to provide an educated guess value for the "<5" counts. Table 7.164 below various scenarios of the "<5" count of elevated blood lead level data. Below the table, is the explanation of how the educated guess was computed.

Table 7.164: Scenarios For Estimation of "<5" Values

Dallas County Texas, Unduplicated Children Tested for Lead, 1999-2011*				
	1999			
	Blood Lead Level			
Zip	10--14	15--19	>=20	Total
75039	0	0	0	0
75040	< 5	0	0	< 5
75042	< 5	< 5	< 5	7
75051	< 5	< 5	0	5
75229	< 5	< 5	< 5	< 5
75204	8	6	< 5	15
75211	25	< 5	8	37
75217	55	11	< 5	69
Total	**491**	**121**	**70**	**682**

The table above shows some examples of various cases of unspecified "<5" counts. This table was modified from the original TDSHS spreadsheet. The total counts, at the bottom of the table, depict the actual counts from the original spreadsheet. Based on these values, the highest overall counts are for the 10-14 μg/dl and for the total counts categories, of elevated childhood blood lead. A few zip codes, from Dallas County, are shown on the left side of the table. The four cases of elevated childhood blood lead levels, in μg/dl, are shown at the top of the table, as well as, the year the data was collected. The values, in the center table, represent unduplicated counts, of children that tested positive, for elevated blood lead. The "total" column, represents the total counts of all three concentrations of elevated blood levels.

For the educated guesses, some of the zip codes had no counts of childhood elevated blood lead, as specified for zip code 75039. Some childhood blood lead levels were "<5 for only one specified blood lead level concentration, similar to zip code 75040. Since the actual value, for the unspecified elevated blood lead count of "<5", must be from the number 1 to the number 4, the value of 2 was used for the educated guess, for zip codes that only had a "<5" designation in only one category of blood lead levels. The number 2 is close to the median value, from 1 to 4, that is a conservative value. For educated guesses, for zip codes that had the "<5 designation in more than one blood lead level category, the following process was followed.

For zip code 75042, a designation of the number "4"was assigned for the 10-14 μg/dl category, since the highest, overall total number of counts, for this category, is highest, for Dallas County. The number count of "2" was assigned to the medium range of blood lead level (15-19 μg/dl) and the number "1" was assigned to the high level range of the blood lead level (= or > 20 μg/dl), for zip code 75042. These numbers were assigned to

reflect the overall blood lead category count distribution for Dallas County, as well as, to complete the total count of "7", for the "total counts" category, for the 75042 zip code.

For zip code 75051, there were two categories with the blood lead level designation count of "<5"; 10-14 μg/dl and 15-19 μg/dl, respectively. The total counts of elevated blood lead level, for zip code 75051, is the number "5". In providing an educated guess for the "<5" designation, the number "3" was assigned for the 10-14 μg/dl category and the number "2" was assigned for the 15-19 μg/dl category. The higher blood lead level count was assigned to the 10-14 category, as effort to reflect the overall blood lead category count distribution for Dallas County, as well as, to complete the total count of "5" ,for the "total counts" category, for the 75051 zip code.

For zip code 75229, all childhood elevated blood lead level categories were all "<5". In the event that all blood lead level category counts are "<5", the number "2" was assigned to the 10-14 μg/dl category and the number "1" was assigned for the 15-19 μg/dl and the =or >20 μg/dl. These values add to a total childhood elevated blood lead level of "4", since the total category count is "<5". The strategy provides more counts to the 10-14 μg/dl category, than the other elevated blood lead categories, since the largest number of elevated blood lead level counts for Dallas County is the 10-14 μg/dl blood lead category.

For the 75204, 75211, and 75217 zip codes, simple math was utilized to calculate the one missing count, for each zip code. For each zip code, the "total counts" were subtracted by the given values of elevated blood level counts, in the other categories, to calculate the actual count, for the missing elevated blood lead level value.

The process described above, was the method used to provide an educated guess on all "<5" values, in the original childhood blood lead level data set, provided by the TDSHS. In the analysis below, the highlighted counts, in the tables, represent "<5" values that were assigned an actual number, by the process described above. Section 7.1 provides the information on how the unduplicated counts of elevated blood lead levels data is acquired, by the TDSHS.

7.2.10.1 Year 1999 Bio-Ecology Socioeconomic Indicators vs. Counts of Elevated Blood Lead Level 10-14 μg/dl for Children that Reside in Zip Codes, Located Within or that Intersect, the 5-mile Radius of the Bio-Ecology Site

As previously stated, the socioeconomic indicators vs. elevated childhood blood lead level analysis consists of evaluating if there is a significant relationship between socioeconomic indicators and the childhood elevated blood lead levels, of children from age 0 to 14 yrs, that reside in zip codes, located within or intersect, the 5-mile radius of the Bio-Ecology Site. This data was compared to the socioeconomic indicators vs. childhood elevated blood lead levels data of children, from age 0 to 14 yrs, that reside in zip codes, located greater than the 5- mile radius of the Bio-Ecology Superfund Site.

The socioeconomic indicator data, used to identify whether children that live in zip codes with a high percentage of families with low income and with a high percentage of

housing units constructed before the Year 1970, might increase the number of children with elevated childhood blood lead.

The socioeconomic indicators evaluated, are listed below;

- percentage of families that are below poverty level;
- percentage of female householder with children less than 18 years of age that are below poverty level;
- percentage of households with income less than $10,000 per year;
- percentage of households with income between $10,000 to $14,999;
- percentage of households with income between $15,000 to $24,999;
- percentage of housing units built the Year 1939 or earlier,
- percentage of housing units built between the Year 1940 to 1959;
- percentage of housing units constructed between the Year 1960 to Year 1969;
- percentage of housing units built between Year 1970 to Year 1979.

The socioeconomic indicator data was obtained from the Year 2000 census data, from census.gov website. The blood lead level data was obtained from the TDSHS. The housing units built dates were included in the Study, because housing units constructed before the Year 1970, were most likely painted with lead based paint. The housing units' built dates help indicate possible indoor lead exposure to children residing in the units. In addition, the proximity of the children, residing in zip codes located, within or that intersect, the 5-mile radius, of the Bio-Ecology Site, will also help determine if the source of elevated blood lead, in children, is result of the class 1 waste facility, of the Bio-Ecology Site. The socioeconomic indicator data and the elevated childhood blood lead level data were evaluated from the Year 1999 to the Year 2002 to stay consistent with the socioeconomic indicator vs. the standardized test passing rate analysis. There is no elevated childhood blood lead data available, before the Year 1999, from the TDSHS. Therefore, the socioeconomic indicators and the blood lead level analysis starts the Year 1999. The original TDSHS spreadsheet, of elevated childhood blood lead level data, is located in Appendix A.

During the Study, counts for elevated blood lead levels of 10-14 μg/dl, 15-19 μg/dl, >or =20 μg/dl, and the total counts, were evaluated for children from age 0 years to 14 years. During the evaluation, the quantity of counts for blood lead level of 10-14 μg/dl and the total counts of elevated blood lead levels, were significantly higher than the quantity of counts for blood lead levels 15-19 μg/dl and >or =20 μg/dl. Due to these significantly lower counts, the 15-19 μg/dl and > or =20 μg/dl elevated blood lead levels were removed from the Study. It would be difficult to identify any significant relationships, in these elevated blood lead levels, due to an extremely low number of counts. Therefore, the analysis was conducted for the 10-14 μg/dl and the total counts elevated childhood blood lead levels.

In addition, for this analysis, there was no separation of data, for elementary schools and middle and high schools because the analysis was completed on a zip code basis and because separating the elementary schools from the middle and high schools would result in an extremely low number of observations. The table below shows the socioeconomic

indictors and the 10-14 µg/dl elevated childhood blood lead level for the Year 1999, for the children that reside in zip codes, located within or intersect, the 5-mile radius of the Bio-Ecology Site.

The table below shows the socioeconomic indictors and the 10-14 µg/dl elevated childhood blood lead level, for the zip codes, located within or that intersect, the 5-mile radius, of the Bio-Ecology Site.

Table 7.165: Year 1999 Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Level for Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius

	Bio-Ecology Year 1999 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	20
75050	10.6	7.5	5.9	13.8	17.8	15.9	21.3	1.9	35.7	4
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	13
75051	16.7	13.6	7.1	16.3	26.5	24.2	25.6	3.2	47.4	3
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	2
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	15
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	2
									Total	**59**

On the left side of the table are the zip codes that are located within the Bio-Ecology Site's 5-mile radius. The top of the table shows the socioeconomic indicators, as well as, the counts of the elevated blood lead level 10-14 µg/dl. The highlighted values, in the table, represent the estimated, "<5" count values from the original data set supplied by the TDSHS. For further explanation of how these values were estimated, please refer to section 7.2.2.

Based on the table above, there are a total of 59 unduplicated cases of the elevated childhood blood lead level 10-14 µg/dl for children that reside within the zip codes located within 5-mile radius of the Bio-Ecology Site. The high counts of lead contamination could be a result of the socioeconomic indicators listed above, and the distance, the zip codes are located in, or that intersect, the Bio-Ecology Site.

The Spearman Rank Correlation Matrix as used to analyze the data, due to a low number of observations and due to the data set not having a normal distribution.

Table 7.166: Year 1999 Bio-Ecology Correlation Matrix of the Socioeconomic Indicators and the Blood Lead Level 10-14 µg/dl for the Zip Codes, Located Within or that Intersect, the 5-Mile Radius of the Bio-Ecology Site.

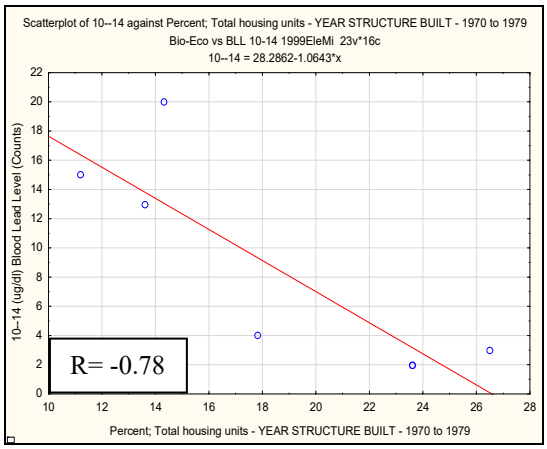
Variable	Spearman Rank Order Correlations (Bio-Eco vs BLL 10-14 1999EleMi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.75	0.86	0.50	-0.67	0.04	0.75	0.54	0.57	0.70
Percent; Household Income - Less than $10,000	0.75	1.00	0.68	0.34	-0.32	-0.11	0.57	0.39	0.75	0.47
Percent; Household Income - $10,000 to $14,999	0.86	0.68	1.00	0.50	-0.49	0.11	0.46	0.18	0.43	0.31
Percent; Household Income - $15,000 to $24,999	0.50	0.34	0.50	1.00	0.06	0.67	0.07	-0.02	0.29	0.25
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.67	-0.32	-0.49	0.06	1.00	0.59	-0.61	-0.74	-0.04	-0.78
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.04	-0.11	0.11	0.67	0.59	1.00	-0.11	-0.43	0.14	-0.34
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.75	0.57	0.46	0.07	-0.61	-0.11	1.00	0.82	0.32	0.61
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.54	0.39	0.18	-0.02	-0.74	-0.43	0.82	1.00	0.00	0.77
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.57	0.75	0.43	0.29	-0.04	0.14	0.32	0.00	1.00	0.36
10--14 ug/dl (Counts) Blood Lead Level	0.70	0.47	0.31	0.25	-0.78	-0.34	0.61	0.77	0.36	1.00

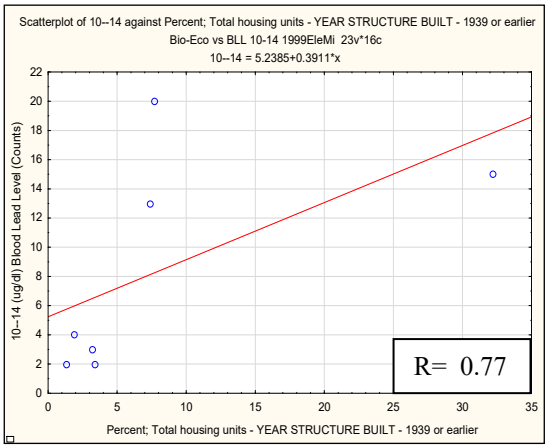
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there is a strong positive significant relationship between the counts of children with elevated blood lead level of 10-14 µg/dl and the percentage of housing units constructed from the Year 1970 to the Year 1979. There is also a strong negative relationship between the counts of the elevated blood lead level of 10-14 µg/dl the percentage of housing units constructed the Year 1939 or earlier. The positive relationship indicates that housing units constructed the Year 1970 to the Year 1979 have lower quantities of lead based paint, resulting in fewer counts of elevated childhood blood lead levels. The negative relationship indicates, the effects of indoor lead exposure, resulting in higher numbers of elevated childhood blood lead level cases.

The bivariate plots of the significant variables are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.244- Graph 7.245: Year 1999 Bio-Ecology Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl





For the negative plot, as the percentage of housing units constructed from the Year 1970 to the Year 1979 increase, the counts of elevated childhood blood lead level of 10-14 µg/dl, decrease. For the positive plot, as the percentage of housing units constructed from the Year 1939 or earlier, increase, the counts of elevated childhood blood lead level of 10-14 µg/dl increase.

7.2.10.2 Year 1999 Comparison Analysis for Bio-Ecology Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Level for Zip Codes Located Greater than the 5-mile Radius of the Bio-Ecology Site (Comparison Analysis).

The comparison group analysis identifies trends in the data, for the children that reside in zip codes, located within or that intersect, the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, for the children that reside in zip codes, located greater than the 5- mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the counts of 10-14 µg/dl elevated childhood blood lead levels for children that reside in the zip codes that are located greater than 5 miles from the Bio-Ecology Superfund Site, is shown below.

Table 7.167: Year 1999 Bio-Ecology Comparison Socioeconomic Indicators and Counts of 10-14 Blood Lead Level for Zip Codes Located Greater Than the 5-mile Radius of the Bio-Ecology Superfund Site

	Year 1999 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from Bio-Ecology Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75006	5.7	3.6	3.1	9.7	17.3	31.2	13.8	7.6	0.6	0
75007	2.8	2.2	1.4	4.5	8.7	25.3	2.3	0.3	0.2	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	2
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	2
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	2
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	2
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	2
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	5
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	0
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	41

The zip codes located greater than the 5-mile radius of the Bio-Ecology Site are shown on the left side of the table. The socioeconomic indicators and counts of elevated childhood blood lead level of 10-14 µg/dl are shown cross the top of the table. The highlighted values were estimated. Please refer to section 7.2.2 for further explanation on the process of estimation for the highlighted values.

The comparison table shows significantly lower counts of childhood elevated blood lead cases than the counts of elevated blood lead cases, for the children in the zip codes located within a 5-mile radius of the Bio-Ecology Superfund Site. The total counts for the elevated blood lead level 10-14 µg/dl is 59, for zip codes located inside the Bio-Ecology Site's 5 mile radius and the total counts of the elevated blood lead level 10-14 µg/dl, for the zip codes located greater than the Bio-Ecology Site 5 mile radius is 41. This is approximately a 20-point difference in elevated childhood blood lead level cases. This might be result of a lower percentage of housing units constructed before the year 1970, for housing units located in zip codes located greater than 5-mile radius of the Bio-Ecology Site.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data set not having a normal distribution and due to the low quantity of observations. The correlation matrix for socioeconomic indicators and the elevated childhood blood lead level of 10-14 µg/dl, is shown below.

Table 7.168 Year 1999 Bio-Ecology Comparison Correlation Matrix of Socioeconomic Indicators and Counts of 10-14 µg/dl Blood Lead Level for Zip Codes Located Greater than the 5- mile Radius of the Bio-Ecology Superfund Site

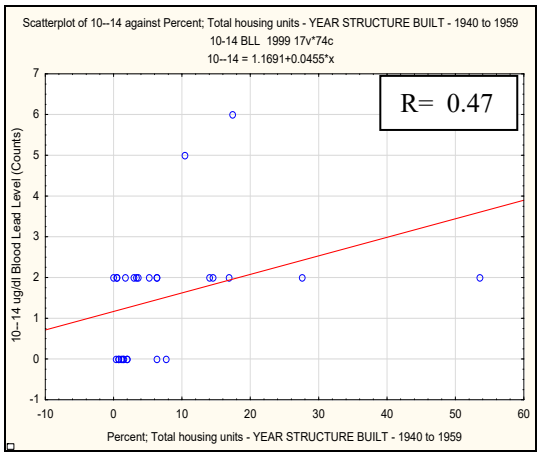
Variable	Spearman Rank Order Correlations (10-14 BLL 1999) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years-Below Poverty	Percent; Housing Units-YEAR BUILT - 1970 to 1979	Percent; Housing Units-YEAR BUILT - 1960 to 1969	Percent; Housing Units-YEAR BUILT - 1940 to 1959	Percent; Housing Units-YEAR BUILT-1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.74	0.36	0.70	0.67	0.20	0.32	0.30	0.02	-0.02
Percent; Household Income - Less than $10,000	0.74	1.00	0.48	0.80	0.57	0.20	0.50	0.45	0.14	0.22
Percent; Household Income - $10,000 to $14,999	0.36	0.48	1.00	0.49	0.08	0.30	0.73	0.78	0.50	0.35
Percent; Household Income - $15,000 to $24,999	0.70	0.80	0.49	1.00	0.43	0.25	0.64	0.58	0.16	0.21
Fem Household-No Husband-with Child Less 18 Years-Below Poverty	0.67	0.57	0.08	0.43	1.00	-0.05	0.10	-0.03	-0.11	0.16
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.20	0.20	0.30	0.25	-0.05	1.00	0.49	0.19	-0.10	-0.16
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.32	0.50	0.73	0.64	0.10	0.49	1.00	0.87	0.34	0.33
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.30	0.45	0.78	0.58	-0.03	0.19	0.87	1.00	0.67	0.47
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.02	0.14	0.50	0.16	-0.11	-0.10	0.34	0.67	1.00	0.58
10--14 ug/dl (Counts) Blood Lead Level	-0.02	0.22	0.35	0.21	0.16	-0.16	0.33	0.47	0.58	1.00

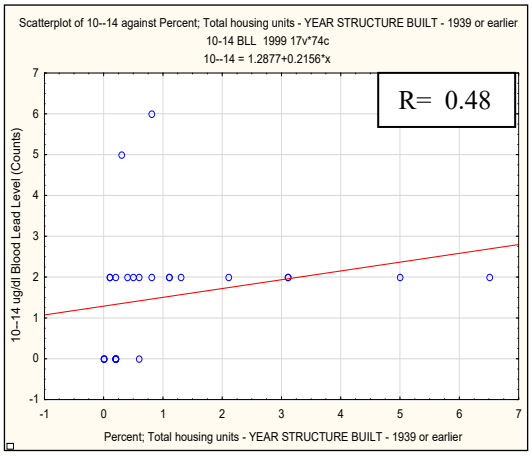
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there is a moderate significant relationship between the number of counts of children with elevated blood lead level of 10-14 µg/dl and the percentage of housing units that were constructed in the Year 1940 to Year 1959 and the percentage of housing units constructed Year 1939. This indicates that there is a link between housing units constructed before the Year 1970 and higher counts of the elevated childhood blood lead levels. The Spearman Rank r values are weaker than the r values for the children that reside in zip codes, located within or that intersect, the 5-mile radius of the Bio-Ecology Site. This may be due to a lower percentage of housing units constructed before the Year 1970, in the comparison group

The graphs of the significant relationships are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.246- Graph 7.247: Year 1999 Bio-Ecology Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl





Based on the tables above, as the percentage of housing units constructed before the Year 1970, increase, the counts of elevated childhood blood lead level of 10-14 µg/dl, increase. Therefore, there is a significant relationship between housing units constructed before the Year 1970 and cases of elevated childhood blood lead level of 10-14 µg/dl. These cases are most likely due to indoor lead exposure.

7.2.10.3 Bio-Ecology Year 1999 Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels for Children That Reside in Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the total counts of childhood elevated blood lead levels. The table showing the socioeconomic indicators and the total counts of elevated childhood blood lead is shown below.

Table 7.169: Year 1999 Socioeconomic Indicators and Total Counts Blood Lead Levels for Zip Codes, Located Within or that Intersect, the 5-mile Radius of the Bio-Ecology Superfund Site.

	Bio-Ecology Year 1999 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units-YEAR BUILT - 1970 to 1979	Percent; Housing Units-YEAR BUILT - 1960 to 1969	Percent; Housing Units-YEAR BUILT - 1940 to 1959	Percent; Housing Units-YEAR BUILT-1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	28
75050	10.6	7.5	5.9	13.8	17.8	15.9	21.3	1.9	35.7	7
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	17
75051	16.7	13.6	7.1	16.3	26.5	24.2	25.6	3.2	47.4	5
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	2
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	21
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	4
									Total	**84**

The zip codes are located on the left side of the table and the socioeconomic indicators and the total counts of elevated blood lead level are shown across the top of the table. The highlighted values, in the table are estimated values from the "<5" values in the original data set. Additional information regarding the methodology to estimate "<5" values is expounded upon in section 7.2.2.

Based on the table above, there are a total of 84 unduplicated cases of total counts of elevated childhood blood lead levels for the children that reside in the zip codes located inside of the Bio-Ecology Superfund Site's 5 mile radius. The high quantity of total counts of elevated of childhood blood lead level, could be a result of the families of children moving into housing units constructed before the Year 1970. The children, in these families, could have been exposed to indoor lead based paint. In addition, it is possible that some of the children could have been exposed to the leachate from the leaking drums of the Bio-Ecology Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to a data distribution that is not normal and due to a small number of observations. The correlation matrix for the total counts of elevated childhood blood lead levels, for zip codes located within the 5 mile radius of the Bio-Ecology Superfund Site is shown below.

Table 7.170: Year 1999 Bio-Ecology Correlation Matrix for Socioeconomic Indicators vs. Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes, Located Within or that Intersect , the 5-mile Radius of Bio-Ecology Site

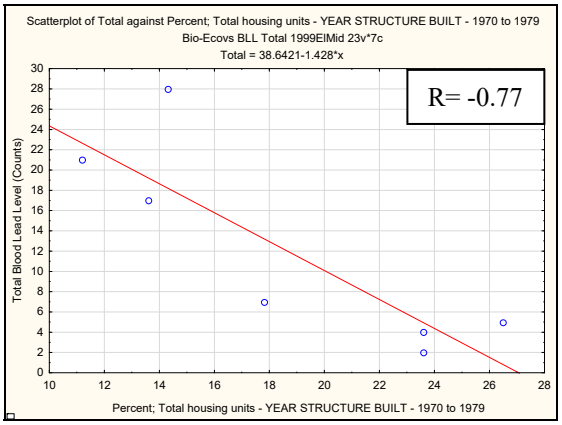
Variable	Spearman Rank Order Correlations (Bio-Ecovs BLL Total 1999ElMid) MD pairwise deleted Marked correlations are significant at p <.05000 Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total Blood Lead Level (Counts)
Percent; Families - Percent Below Poverty Level	1.00	0.75	0.86	0.50	-0.67	0.04	0.75	0.54	0.57	0.75
Percent; Household Income - Less than $10,000	0.75	1.00	0.68	0.34	-0.32	-0.11	0.57	0.39	0.75	0.50
Percent; Household Income - $10,000 to $14,999	0.86	0.68	1.00	0.50	-0.49	0.11	0.46	0.18	0.43	0.39
Percent; Household Income - $15,000 to $24,999	0.50	0.34	0.50	1.00	0.06	0.67	0.07	-0.02	0.29	0.34
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.67	-0.32	-0.49	0.06	1.00	0.59	-0.61	-0.74	-0.04	-0.77
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.04	-0.11	0.11	0.67	0.59	1.00	-0.11	-0.43	0.14	-0.29
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.75	0.57	0.46	0.07	-0.61	-0.11	1.00	0.82	0.32	0.57
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.54	0.39	0.18	-0.02	-0.74	-0.43	0.82	1.00	0.00	0.71
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.57	0.75	0.43	0.29	-0.04	0.14	0.32	0.00	1.00	0.39
Total Blood Lead Level (Counts)	0.75	0.50	0.39	0.34	-0.77	-0.29	0.57	0.71	0.39	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there is a strong negative significant between the total counts of elevated childhood blood lead level and the percentage of housing units constructed from the Year 1970 to the Year 1979. This negative relationship indicates that there are fewer counts of elevated childhood blood lead cases in housing units built after the Year 1970 because there is a reduced possibility if indoor lead exposure.

The graphs of the significant variable are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.248: Year 1999 Bio-Ecology Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels



Based on the graph above, as the percentage of housing units constructed the Year 1970 to the Year 1979, increase, the total counts of elevated childhood blood lead level, decrease. This shows that housing units that do not contain lead bases paint significantly reduce the cases of childhood indoor lead exposure.

7.2.10.4 Bio-Ecology Year 1999 Comparison of Socioeconomic Indicators vs. Total Counts of Elevated Blood Lead Levels for Zip Codes Located Greater than the Bio-Ecology Site's 5- Mile Radius. (Comparison Group)

The comparison group analysis identifies trends in the data, for the children that reside in zip codes, located within or that intersect, the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, for the children that reside in zip codes, located greater than the 5- mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the total childhood elevated blood lead levels, for children that reside in zip codes located greater than 5 mile from the Bio-Ecology Superfund Site ,is shown below.

Table 7.171: Year 1999 Comparison Socioeconomic Indicators and Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes Located Greater than the Bio-Ecology Site's 5-mile Radius

	Year 1999 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from Bio-Ecology Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75006	5.7	3.6	3.1	9.7	17.3	31.2	13.8	7.6	0.6	0
75007	2.8	2.2	1.4	4.5	8.7	25.3	2.3	0.3	0.2	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	4
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	4
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	2
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	2
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	7
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	0
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	4
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	47

The zip codes are located on the left side of the table and the socioeconomic indicators and the total counts of childhood elevated blood lead levels are shown across the top of the table. The highlighted values in the table are estimated values. Further information on the estimation process is explained in section 7.2.2.

Based on the above table, there are a total of 47 unduplicated counts of elevated childhood blood lead. The total counts are significantly lower than 84 cases of total cases of elevated blood lead in children that reside in zip codes located within the 5 mile radius of the Bio-Ecology Site. The lower counts of elevated blood lead levels, for children that reside in zip codes located greater than 5 miles from the Bio-Ecology site, could be a result of lower percentages of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data set not having a normal distribution and due to the le number of observations. The correlation matrix for the socioeconomic indicators and the total counts of elevated blood lead in children from ages 0 to 14, that reside in zip codes located greater than 5 miles from the Bio-Ecology Site, is shown below.

Table 7.172: Year 1999 Comparison Correlation Matrix for the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels for Zip Codes Located Greater than the 5-mile Radius of the Bio-Ecology Superfund Site

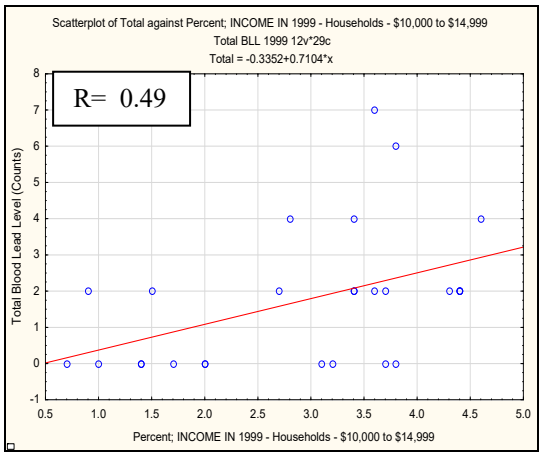
Variable	Spearman Rank Order Correlations (Total BLL 1999) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.74	0.36	0.70	0.67	0.20	0.32	0.30	0.02	0.12
Percent; Household Income - Less than $10,000	0.74	1.00	0.48	0.80	0.57	0.20	0.50	0.45	0.14	0.34
Percent; Household Income - $10,000 to $14,999	0.36	0.48	1.00	0.49	0.08	0.30	0.73	0.78	0.50	0.49
Percent; Household Income - $15,000 to $24,999	0.70	0.80	0.49	1.00	0.43	0.25	0.64	0.58	0.16	0.34
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.67	0.57	0.08	0.43	1.00	-0.05	0.10	-0.03	-0.11	0.03
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.20	0.20	0.30	0.25	-0.05	1.00	0.49	0.19	-0.10	0.11
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.32	0.50	0.73	0.64	0.10	0.49	1.00	0.87	0.34	0.50
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.30	0.45	0.78	0.58	-0.03	0.19	0.87	1.00	0.67	0.59
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.02	0.14	0.50	0.16	-0.11	-0.10	0.34	0.67	1.00	0.52
Total (Counts) of Blood Lead Level	0.12	0.34	0.49	0.34	0.03	0.11	0.50	0.59	0.52	1.00

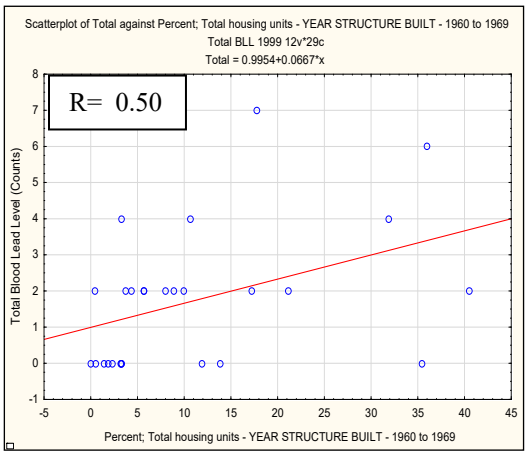
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site.

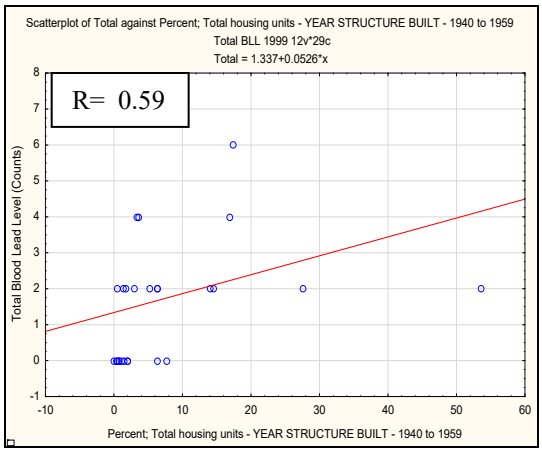
Based upon the correlation matrix, above, there is a moderate significant relationship between the total counts of children with elevated blood lead levels and percentage of households with income between $10,000 to $14,999 per year, as well as, the percentage of housing units constructed from the Year 1960 to the Year 1969, the Year 1940 to the Year 1959, and the Year 1939 and earlier. Based on the correlation matrix, it seems that there is a link between households that have income between $10,000 to $14,999 and housing units built before 1970 and higher quantity of total counts of elevated childhood blood lead levels. In addition, the significant R values are lower, than the R values for the zip codes located within the Bio-Ecology Superfund Site 5 mile radius. This may be a result of the zip codes located greater than 5 miles from the Bio-Ecology Site, having a lower percentage of housing units constructed before the Year 1970, thus resulting a lower quantity of elevated childhood blood lead cases.

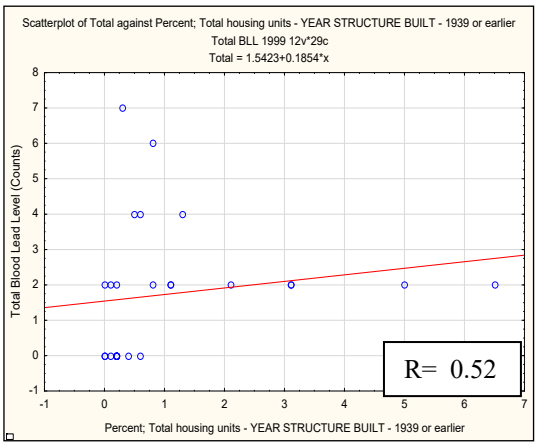
The graphs of the significant variables are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.249- Graph 7.252: Year 1999 Bio-Ecology Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels









Based on the graphs above, as the percentage of household income between $10,000 to $14,999 per year, and the percentage of housing units constructed before 1970,increase, the counts of total elevated childhood blood lead levels, increase. This shows that low income and older housing units may contribute to elevated childhood blood lead exposure.

7.2.10.5 Bio-Ecology Year 2000 Socioeconomic Indicators vs. Elevated Childhood Blood Lead Level Analysis for Children that Reside in Zip Codes, Located Within or that Intersect, the 5-Mile Radius of the Bio-Ecology Site.

This analysis was conducted to determine if there is a significant relationship between the socioeconomic indicators and the counts of elevated childhood blood lead level 10-14 µg/dl. The table of the socioeconomic indicators and the counts of 10-14 µg/dl concentration of blood lead level for the zip codes that are located within the 5 mile radius of the Bio-Ecology Superfund Site, is shown below.

Table 7.173: Year 2000 Socioeconomic Indicators and 10-14 µg/dl concentration Blood Lead Levels for Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-miles Radius

	Bio-Ecology Year 2000 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	25
75050	10.6	7.5	5.9	13.8	17.8	15.9	21.3	1.9	35.7	6
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	32
75051	16.7	13.6	7.1	16.3	26.5	24.2	25.6	3.2	47.4	7
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	0
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	19
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	5
									Total	**94**

Based on the table, the zip codes located within the 5-mile radius are on the left side of the table. The socioeconomic indicators, and the counts, of children between the ages 0-14yrs, with elevated blood lead of level 10- 14 µg/dl are shown across the top of the table. The total unduplicated counts of children, that reside in zip codes located inside the Bio-Ecology Superfund Site 5-mile radius, that have exposure to 10-14 µg/dl of lead in their blood is a total of 57. This could be a result of high percentages of low income families, families below poverty level, and housing units constructed before the Year 1970. In addition, it could be a result of the students being exposed to the leachate from the case 1 waste facility from the Bio-Ecology Site or effects from the RSR Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data distribution that was not normal and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the counts of 10-14 µg/dl concentration of blood lead in children from ages 0 to 14yrs, is shown below.

Table 7.174: Year 2000 Correlation Matrix of Socioeconomic Indicators and the 10-14 µg/dl Blood Lead Level for Children that Reside in Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius.

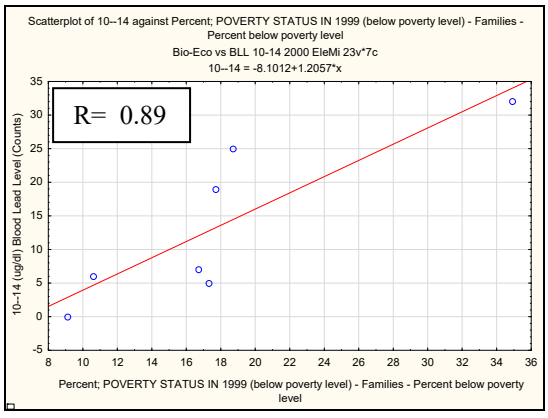
	Spearman Rank Order Correlations (Bio-Eco vs BLL 10-14 2000 EleMi) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.75	0.86	0.50	-0.67	0.04	0.75	0.54	0.57	0.89
Percent; Household Income - Less than $10,000	0.75	1.00	0.68	0.34	-0.32	-0.11	0.57	0.39	0.75	0.82
Percent; Household Income - $10,000 to $14,999	0.86	0.68	1.00	0.50	-0.49	0.11	0.46	0.18	0.43	0.61
Percent; Household Income - $15,000 to $24,999	0.50	0.34	0.50	1.00	0.06	0.67	0.07	-0.02	0.29	0.29
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.67	-0.32	-0.49	0.06	1.00	0.59	-0.61	-0.74	-0.04	-0.67
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.04	-0.11	0.11	0.67	0.59	1.00	-0.11	-0.43	0.14	-0.21
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.75	0.57	0.46	0.07	-0.61	-0.11	1.00	0.82	0.32	0.75
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.54	0.39	0.18	-0.02	-0.74	-0.43	0.82	1.00	0.00	0.64
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.57	0.75	0.43	0.29	-0.04	0.14	0.32	0.00	1.00	0.71
10--14 ug/dl (Counts) Blood Lead Level	0.89	0.82	0.61	0.29	-0.67	-0.21	0.75	0.64	0.71	1.00

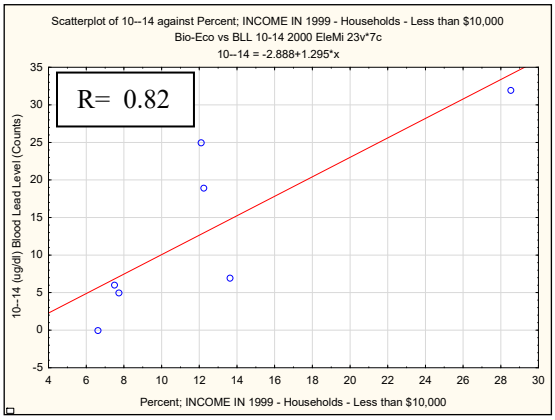
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of elevated blood lead level 10-14 µg/dl, for children that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the elevated childhood blood lead level of 10-14 µg/dl and the percentage of families below poverty level and the percentage of households with income less than $10,000 per year. These significant correlations could be due to families below the poverty level and households with lo income, moving into cheap housing units that were constructed before the Year 1970, which could have resulted in indoor lead exposure. In addition, children in this area could have been exposed to the leachate from the class 1 waste facility and the effects of the RSR Site.

The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.253- Graph 7.254: Year 2000 Bio-Ecology Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl





Based on the graphs above, as the percentage of families below poverty and households with income less than $10,000 per year increases, the counts of elevated childhood blood lead level of 10-14 µg/dl increases. These significant relationships indicate that families below poverty and households with low income have a direct effect on the quantity cases of elevated childhood blood lead.

7.2.10.6 Year 2000 Comparison Analysis for Bio-Ecology Socioeconomic Indicators and Counts of 10-14 μg/dl Blood Lead Levels for Zip Codes Greater than the 5- mile Radius of the Bio-Ecology Site.

The comparison group analysis identifies trends in the data, for the children that reside in zip codes, located within or that intersect, the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, for the children that reside in zip codes, located greater than the 5- mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the elevated blood lead level of 10-14 μg/dl, for zip codes located greater than the 50mile radius of the Bio-Ecology Site, is shown below.

Table 7.175 Year 2000 Bio-Ecology Comparison Socioeconomic Indicators and the Elevated Blood Lead Level of 10-14 μg/dl, for Zip Codes Located Greater than the Bio-Ecology Site's 5-mile Radius

	Year 2000 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from Sampson H. Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	2
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	0
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	5
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	7
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	2
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	5
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	2
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	0
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	2
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	35

The zip codes are located on the left side of the table and the socioeconomic indicators and the total counts of childhood elevated blood lead levels are shown across the top of the table. The highlighted values in the table are estimated values. Further information on the estimation process is explained in section 7.2.2.

Based on the above table, there are a total of 35 unduplicated counts of elevated childhood blood lead level of 10-14 μg/dl. The total counts are significantly lower than 94 cases of total cases of elevated blood lead in children that reside in zip codes located within the 5 mile radius of the Bio-Ecology Site. The lower counts of elevated blood lead levels, for children that reside in zip codes located greater than 5 miles from the Bio-

Ecology site, could be a result of lower percentages of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data distribution that was not normal and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the counts of 10-14 µg/dl, for zip codes located greater than the 5-mile radius of the Bio-Ecology Site, is shown below.

Table 7.176 Year 2000 Bio-Ecology Comparison Correlation Matrix of Socioeconomic Indicators and the Elevated Blood Lead Level of 10-14 µg/dl, for Zip Codes Located Greater Than the 5-mile Radius of the Bio-Ecology Site.

	Spearman Rank Order Correlations (10-14 BLL 2000)									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years-Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.46
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.57
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.24
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.53
Fem Household-No Husband-with Child Less 18 Years-Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.37
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.11
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.42
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.43
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	0.37
10--14 ug/dl (Counts) Blood Lead Level	0.46	0.57	0.24	0.53	0.37	0.11	0.42	0.43	0.37	1.00

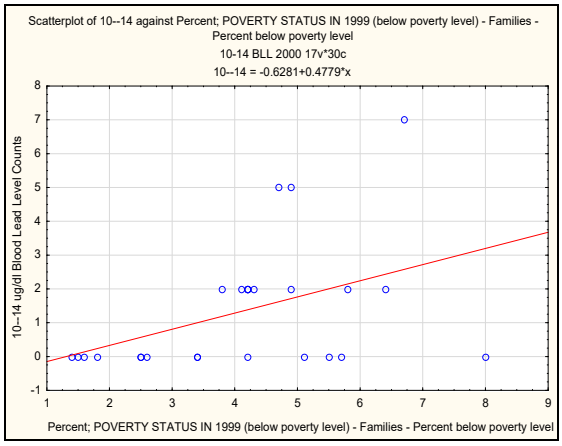
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the elevated blood lead level of 10-14 µg/dl , for children that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site.

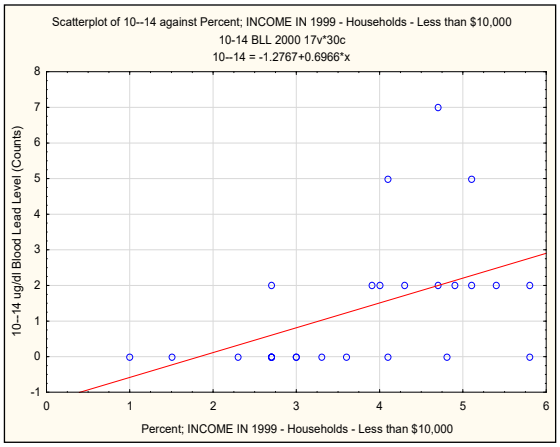
Based upon the correlation matrix, above, there is a weak to moderate significant relationship between the counts of elevated childhood blood lead level of 10-1414 µg/dl and the percentage of families below poverty level, the households with income less than $10,000 per year, percentage of households with income between $15,000 to $24,999 per year, as well as, the percentage of housing units constructed from the Year 1960 to the Year 1969, and the Year 1940 to the Year 1959. Based on the correlation matrix, it seems that there is a link between households that have low income, families below poverty level, and housing units built before 1970, and higher quantity of elevated childhood blood lead levels. In addition, the significant R values are lower, than the R values for the zip codes located within the Bio-Ecology Superfund Site 5 mile radius. This may be a result of the zip codes located greater than 5 miles from the Bio-Ecology Site, having a

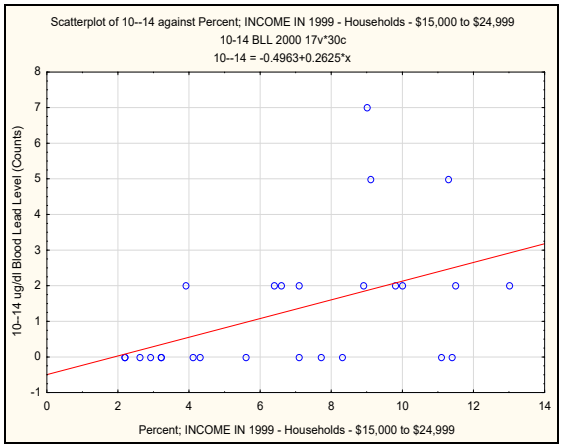
lower percentage of housing units constructed before the Year 1970, thus resulting a lower quantity of elevated childhood blood lead cases.

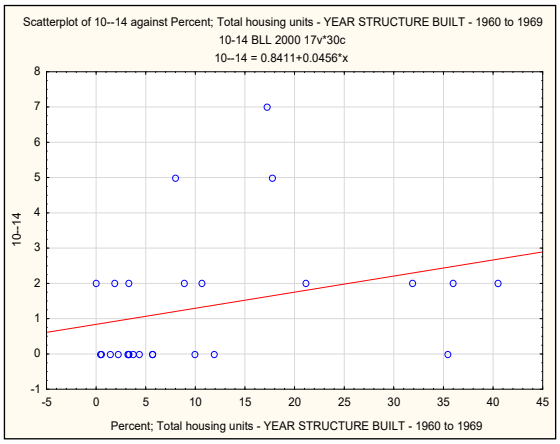
The graphs of the significant variables are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

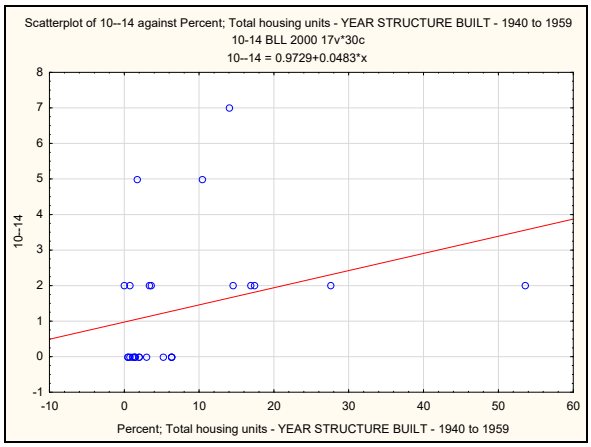
Graph 7.249- Graph 7.252: Year 1999 Bio-Ecology Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels











As the percentage of all the socioeconomic indicators, increase, the counts of the elevated blood lead level of 10-14 µg/dl, increase.

7.2.10.7 Year 2000 Socioeconomic Indicators and the Total Elevated Childhood Blood Lead Level Counts for Children Residing in Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5 Mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the total counts of childhood elevated blood lead levels. This analysis focuses on the total counts of all childhood blood lead levels 10-14 µg/dl, 15-19 µg/dl, and => 20 µg/dl, combined. The table of the socioeconomic indicators and the total counts of elevated blood lead levels for children that reside in zip codes that are located within the 5-mile radius of the Bio-Ecology site is shown below.

Table 7.177: Year 2000 Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels for Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius.

	Bio-Ecology Year 2000 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	37
75050	10.6	7.5	5.9	13.8	17.8	15.9	21.3	1.9	35.7	6
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	38
75051	16.7	13.6	7.1	16.3	26.5	24.2	25.6	3.2	47.4	9
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	0
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	28
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	5
									Total	**123**

In the table, the zip codes that are located within the Bio-Ecology Site 5-mile radius is shown on the left side of the table and the socioeconomic indicators and the total counts of elevated childhood blood levels are located are across the top of the table. There are a

total of 123 unduplicated cases of elevated blood lead levels for the children that reside within the 5-mile radius of the Bio-Ecology Site. This could be due to a high percentage housing units constructed before the Year 1970. In addition, low income households and families that are below the poverty level could also contribute the high counts of elevated blood lead cases. In addition, high counts could be attributed to exposure to the leachate from the class 1 waste facility of the Bio-Ecology Site, as well as, the effects of the RSR Site.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the low number of observations and the data set not having normal distribution. The correlation matrix for the socioeconomic indicators and the total of childhood blood lead level, , for zip codes, located within or that intersect, the 5-mile radius of the Bio-Ecology Site, is shown below.

Table 7.178: Year 2000 Bio-Ecology Correlation Matrix for Socioeconomic Indicators and Total Counts of Elevated Blood Lead for Children that Reside in Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5- Mile Radius.

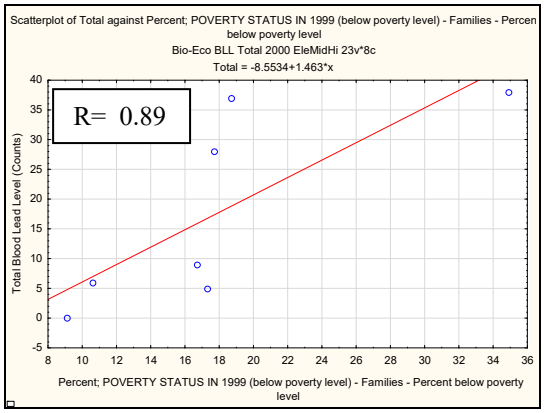
	Spearman Rank Order Correlations (Bio-Eco BLL Total 2000 EleMidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total Blood Lead Level (Counts)
Percent; Families - Percent Below Poverty Level	1.00	0.75	0.86	0.50	-0.67	0.04	0.75	0.54	0.57	0.89
Percent; Household Income - Less than $10,000	0.75	1.00	0.68	0.34	-0.32	-0.11	0.57	0.39	0.75	0.82
Percent; Household Income - $10,000 to $14,999	0.86	0.68	1.00	0.50	-0.49	0.11	0.46	0.18	0.43	0.61
Percent; Household Income - $15,000 to $24,999	0.50	0.34	0.50	1.00	0.06	0.67	0.07	-0.02	0.29	0.29
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.67	-0.32	-0.49	0.06	1.00	0.59	-0.61	-0.74	-0.04	-0.67
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.04	-0.11	0.11	0.67	0.59	1.00	-0.11	-0.43	0.14	-0.21
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.75	0.57	0.46	0.07	-0.61	-0.11	1.00	0.82	0.32	0.75
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.54	0.39	0.18	-0.02	-0.74	-0.43	0.82	1.00	0.00	0.64
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.57	0.75	0.43	0.29	-0.04	0.14	0.32	0.00	1.00	0.71
Total Blood Lead Level (Counts)	0.89	0.82	0.61	0.29	-0.67	-0.21	0.75	0.64	0.71	1.00

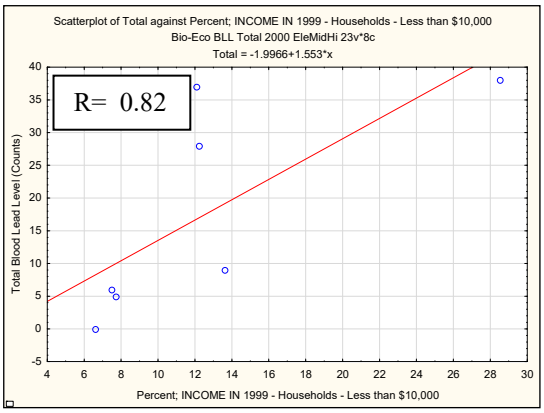
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the total counts of elevated blood lead levels and the percentage of families below poverty level and the percentage of households with income less than $10,000 per year. These significant relationships could be due to families below the poverty level and households with low income, residing in cheap housing units that were constructed before the Year 1970, which could have resulted in indoor lead exposure. In addition, children in this area could have been exposed to the leachate from the class 1 waste facility and the RSR lead smelter.

The bivariate plots of the significant bivariate relationships are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.255- Graph 7.256: Year 2000 Bio-Ecology Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels





Based on the above graphs, as the percentage of families below poverty level and the percentage of households with income below $10,000 per year, increase, the total counts of elevated blood lead levels, increase. The relationship indicates that the socioeconomic indicators directly impact the total counts of elevated childhood blood lead levels.

7.2.10.8 Year Bio-Ecology 2000 Comparison Analysis for Bio-Ecology Socioeconomic Indicators and Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes Greater than the 5-mile Radius of the Bio-Ecology Site (Comparison Group).

The comparison group analysis identifies trends in the data, for the children that reside in zip codes, located within or that intersect, the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, for the children that reside in zip codes, located greater than the 5- mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the total counts of elevated blood lead levels for children that reside in the zip codes, located greater than 5 miles from the Bio-Ecology Superfund Site for the Year 2000 is shown below.

Table 7.179: Year 2000 Comparison Socioeconomic Indicators and Total Counts Blood Lead Levels for Zip Codes Located Greater Than the 5-mile Radius of the Bio-Ecology Superfund Site

	Year 2000 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from Bio-Ecology Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	4
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	4
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	4
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	4
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	0
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	5
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	8
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	0
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	2
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	6
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	4
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	4
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	55

The zip codes that are located greater than the 5 mile radius of the Bio-Ecology are shown the along the left side of the table and the socioeconomic indicators and the total counts of elevated childhood blood lead levels are shown across the top of the table. The total counts of elevated childhood blood lead levels are much less, than the total counts in the zip codes located within the Bio-Ecology Site's 5 mile radius. The total counts of childhood blood lead level unduplicated cases is 55 for children that reside in zip codes located greater than 5-mile radius of the Bio-Ecology Site and the total counts are 123 unduplicated cases of total counts of elevated childhood elevated blood lead level for children that reside in zip codes within the Bio-Ecology Site's 5 mile radius. There is a significant difference from the children that reside in zip codes located within the Bio-Ecology Site's 5-mile radius and the children that reside in zip codes located greater than the 5 mile radius of the Bio-Ecology Site. The lower counts for the children that reside in zip codes located greater than the 5 mile radius of the Bio-Ecology Site may be due to a lower quantity of families below the poverty level and families with low income, as well as, a lower quantity of housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data, due to a lo quantity of observations and due to the non-normality of the data. The correlation matrix for the socioeconomic indicators and the total counts of elevated childhood blood lead levels in children that reside in zip codes located outside of the Bio-Ecology Site 5 mile radius, is shown below is shown below.

Table 7.180:Year 2000 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes Located Greater than the 5-mile Radius of the Bio-Ecology Site

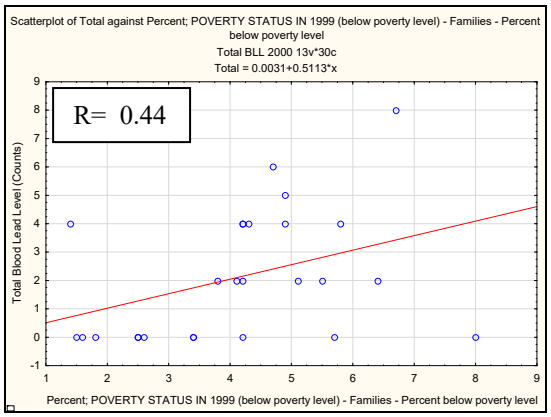
Variable	Spearman Rank Order Correlations (Total BLL 2000) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.44
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.46
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.25
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.49
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.37
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.07
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.43
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.40
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	0.28
Total (Counts) of Blood Lead Level	0.44	0.46	0.25	0.49	0.37	0.07	0.43	0.40	0.28	1.00

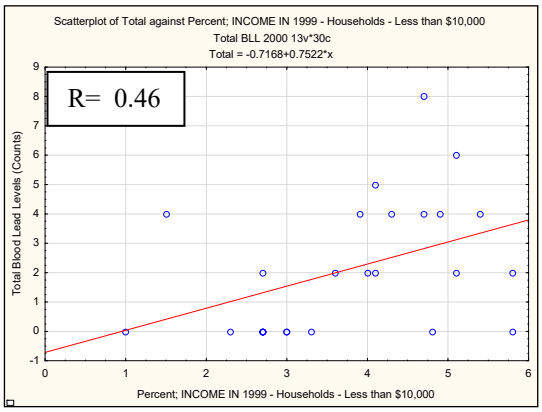
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of elevated blood lead levels, for children that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site.

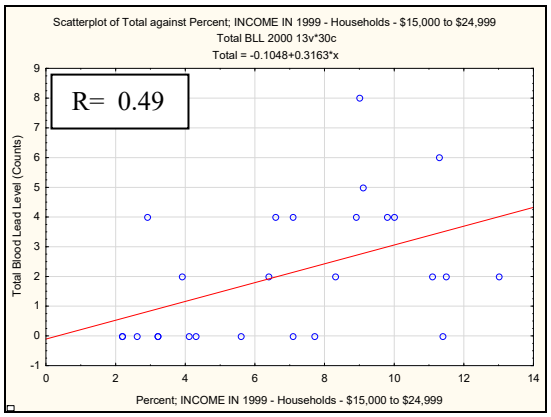
Based upon the correlation matrix, above, there is a weak significant relationship between the total counts of the elevated blood lead levels and the percentage of families below poverty level, the percentage of households with income less than $10,000 a year, the percentage of households with income between $ 15,000 to $24,999 per year, the housing units built the Year 1940 to Year 1959 and housing units built the Year 1960 to the Year 1969. Based on the correlation matrix, it seems that there is link between households with low income, families below poverty level, and housing units constructed before the Year 1970, and increased number of cases of elevated childhood blood level. In addition, the R values in the correlation matrix are much lower than the R values for the zip codes located within the 5 mile radius of the Bio-Ecology Superfund site. This may be a result of a lower percentage of low income families and households, as well as, a lower percentage of housing units constructed before the Year 1970

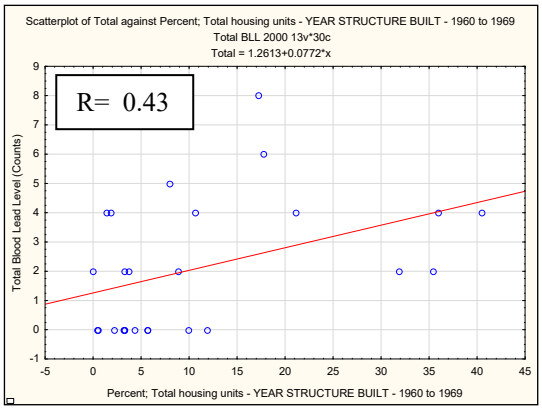
The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

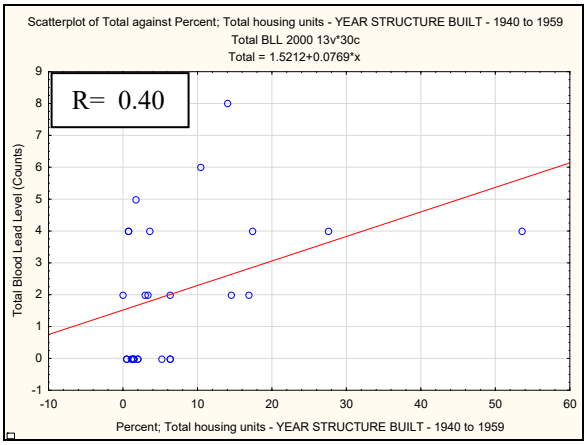
Graph 7.257- Graph 7.261: Year 2000 Bio-Ecology Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels











As the socioeconomic indicators, increase, the total counts of elevated blood lead level, increase.

7.2.10.9 Year 2001 Socioeconomic Indicators and the Elevated Childhood Blood Lead Level of 10-14 µg/dl Counts for Children Residing in Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the counts of the childhood elevated blood lead level of 10-14 µg/dl. The table the socioeconomic indicators and the counts of elevated blood lead level 10-14 µg/dl for children that reside in zip codes that are located within the 5-mile radius of the Bio-Ecology Site is shown below.

Table 7.181: Year 2001 Socioeconomic Indicators and the Counts of Elevated Blood Lead Levels of 10-14 µg/dl for Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius.

	Bio-Ecology Year 2001 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	33
75050	10.6	7.5	5.9	13.8	17.8	15.9	21.3	1.9	35.7	6
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	23
75051	16.7	13.6	7.1	16.3	26.5	24.2	25.6	3.2	47.4	10
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	3
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	21
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	0
									Total	96

The zip codes located within the 5-mile radius of the Bio-Ecology Site are listed on the left side of the table and the socioeconomic indicators and the counts of children with the elevated blood lead of level 10-14 µg/dl are shown across the top of the table. The highlighted numeric values represent estimated values. Further information on the estimation process is explained in Section 7.2.2.

Based on the table above, there are a total of 96 unduplicated cases of elevated childhood blood lead level of 10-14 µg/dl, for the children that reside within the zip codes located within the 5-mile radius of the Bio-Ecology Site. The high quantity of unduplicated cases of elevated blood lead could be a result of low income families moving into cheap housing units that were constructed before the Year 1970, resulting in indoor lead poisoning. It also could be due to children exposed to the leachate from the Bio-Ecology Site, as well as, the effects of lead smelter of the RSR Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data distribution not being normal and due to the low number of observations. The correlation matrix for the socioeconomic indicators and the childhood elevated blood lead level of 10 µg/dl, for children that reside in zip codes located within the 5-mile radius of the Bio-Ecology Site, is shown below.

Table 7.182: Year 2001 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10- 14 µg/dl for Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius.

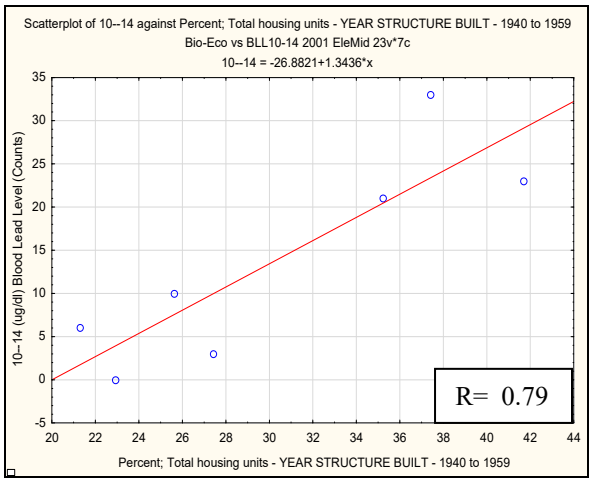
Variable	Spearman Rank Order Correlations (Bio-Eco vs BLL10-14 2001 EleMid) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.75	0.86	0.50	-0.67	0.04	0.75	0.54	0.57	0.75
Percent; Household Income - Less than $10,000	0.75	1.00	0.68	0.34	-0.32	-0.11	0.57	0.39	0.75	0.64
Percent; Household Income - $10,000 to $14,999	0.86	0.68	1.00	0.50	-0.49	0.11	0.46	0.18	0.43	0.32
Percent; Household Income - $15,000 to $24,999	0.50	0.34	0.50	1.00	0.06	0.67	0.07	-0.02	0.29	0.22
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.67	-0.32	-0.49	0.06	1.00	0.59	-0.61	-0.74	-0.04	-0.63
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.04	-0.11	0.11	0.67	0.59	1.00	-0.11	-0.43	0.14	-0.21
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.75	0.57	0.46	0.07	-0.61	-0.11	1.00	0.82	0.32	0.79
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.54	0.39	0.18	-0.02	-0.74	-0.43	0.82	1.00	0.00	0.79
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.57	0.75	0.43	0.29	-0.04	0.14	0.32	0.00	1.00	0.57
10--14 ug/dl (Counts) Blood Lead Level	0.75	0.64	0.32	0.22	-0.63	-0.21	0.79	0.79	0.57	1.00

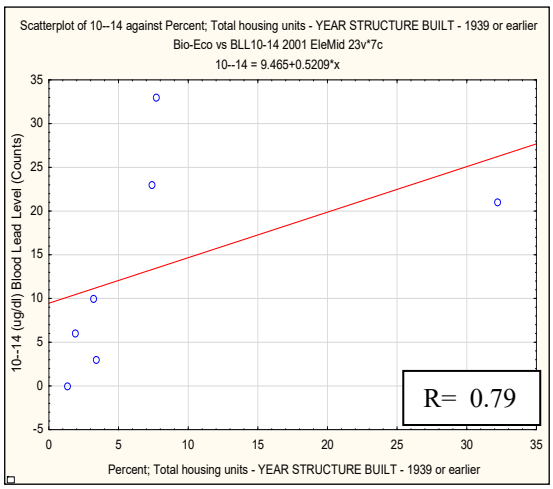
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of the elevated blood lead level 10-14 µg/dl, for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the counts of the elevated blood lead level of 10-14 µg/dl and the percentage of housing units constructed from the Year 1940 to the Year 1959 and the percentage of housing units constructed the Year 1939 and earlier. Based on the correlation matrix, it seems that families that reside in housing units constructed before the Year 1970 have an increased number of cases of elevated childhood blood lead level of 10- 14 µg/dl. These cases might be a result of indoor lead exposure, as well as, the close proximity to the Bio-Ecology Superfund Site and the RSR Site.

The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.262- Graph 7.263: Year 2001 Bio-Ecology Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl





Based on the above graphs, as the percentage of housing units constructed from the Year 1940 to the Year 1959, increases, the counts of elevated childhood blood lead level of 10-14 µg/dl increases. Therefore, the housing units constructed before the Year 1970, that have lead based paint, directly impacts and increase the counts of elevated childhood blood lead level of 10-14 µg/dl.

7.2.10.10 Year 2001 Comparison Analysis for Bio-Ecology Socioeconomic Indicators and Counts of Elevated Childhood Blood Lead Level of 10-14 for Zip Codes Located Greater than the 5-mile Radius of the Bio-Ecology Site (Comparison Group).

The comparison group analysis identifies trends in the data, for the children that reside in zip codes, located within or that intersect, the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, for the children that reside in zip codes, located greater than the 5- mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl, for children that reside in the zip codes that are located greater than the 5-mile radius of the Bio-Ecology Superfund Site, is shown below.

Table 7.183: Year 2001 Comparison Socioeconomic Indicators and Counts Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater Than the 5-mile Radius of the Bio-Ecology Superfund Site.

	Year 2001 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from Bio-Ecology Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	0
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	2
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	2
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	10
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	2
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	2
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	2
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	0
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	0
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	2
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	6
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	40

The zip codes located greater than the 5- mile radius of the Bio-Ecology Site are listed along the left side of the table and the socioeconomic indicators and the counts of elevated childhood blood lead level of 10-14 µg/dl are shown cross the top of the table. The highlighted values in the table represent estimated values, to represent "<5" values given in the original data set. More information on the estimation process is located in Section 7.2.2.

The unduplicated counts of childhood elevated blood lead level 10-14 µg/dl is 40 for children that reside in zip codes located greater than 5-mile radius of the Bio-Ecology Site and the unduplicated counts of childhood elevated blood lead level 10-14 µg/dl is 96, for children that reside in zip codes within the 5 mile radius of the Bio-Ecology Site. The reason there are fewer counts of elevated childhood blood lead of level 10-14 µg/dl for children that reside in zip codes located greater than the 5-mile radius of the Bio-Ecology Site, could be due to a lower percentage of low income families and housing units constructed before the Year 1970. As a result, there are fewer cases of elevated childhood blood lead cases.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data set not having a normal distribution and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the counts of elevated childhood blood lead level of 10-14 µg/dl for the zip codes located outside of the Bio-Ecology Site's 5 mile radius, is shown below is shown below.

Table 7.184:Year 2001 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Counts of Elevated Blood Lead Levels of 10-14 µg/dl for the Zip Codes Located Greater than the Bio-Ecology Site's 5-mile radius.

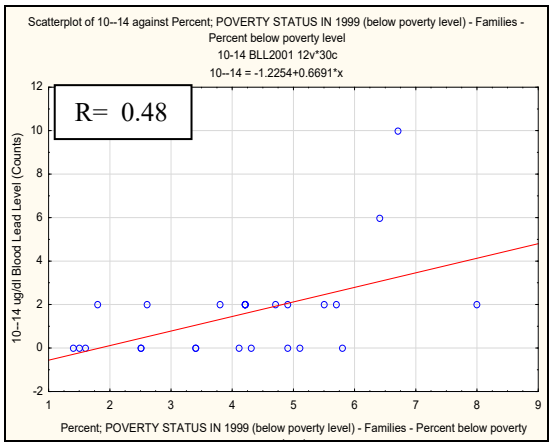
Variable	Spearman Rank Order Correlations (10-14 BLL2001) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.48
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.47
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.12
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.59
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.35
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.33
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.29
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.23
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	-0.10
10--14 ug/dl (Counts) Blood Lead Level	0.48	0.47	0.12	0.59	0.35	0.33	0.29	0.23	-0.10	1.00

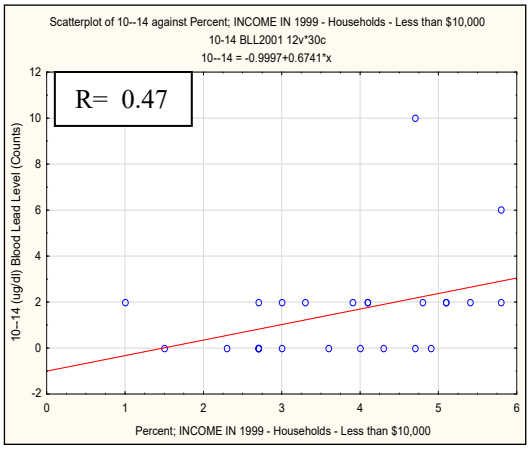
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of the elevated blood lead level 10-14 µg/dl, for children that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site.

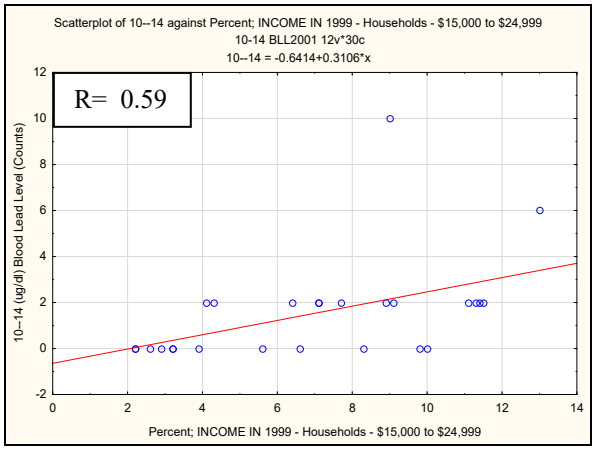
Based upon the correlation matrix, above, there is a moderate correlation between the counts of the elevated blood lead level of 10-14 µg/dl and the percentage of families below poverty level, the percentage of households with income less than $10,000 a year, and the households with income between than $15,000 to $24,999 a year. Based on the correlation matrix, it seems that there that families that are below poverty level and households that have extremely low income are more likely to have children that are diagnosed with elevated blood lead.

The plots of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.264- Graph 7.266: Year 2001 Bio-Ecology Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl







Based on the above tables, as the percentage of families below poverty level, the percentage of households with low income, and the percentage of households that have low income, increase, the counts of elevated childhood blood lead level of 10-14 µg/dl, increase. Therefore, low income and families below poverty level have a direct impact on the number of cases of elevated childhood blood lead exposure.

7.2.10.11 Year 2001 Socioeconomic Indicators and the Total Elevated Childhood Blood Lead Level Counts for Children Residing in Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5- mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the total counts of childhood elevated blood lead levels. The total counts of childhood blood lead level analysis consist of the total counts of all 3 blood levels; 10-14 µg/dl, 15-19 µg/dl and >= 20 µg/dl. The table depicting the data table of the socioeconomic indicators and the total counts of elevated blood lead levels for children that reside in zip codes that are located within the 5-mile radius of the Bio-Ecology Site, is shown below.

Table 7.185: Year 2001 Socioeconomic Indicators and the Total Counts of Elevated Blood Lead Levels for Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius.

	Bio-Ecology Year 2001 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	47
75050	10.6	7.5	5.9	13.8	17.8	15.9	21.3	1.9	35.7	6
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	30
75051	16.7	13.6	7.1	16.3	26.5	24.2	25.6	3.2	47.4	11
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	5
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	31
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	4
									Total	**134**

In the table above, the zip codes located within the Bio-Ecology Site's 5-mile radius are listed on the left side of the table and the socioeconomic indicators and the total counts of childhood elevated blood lead cases are located across the top of the table. The highlighted numeric values were estimated. Further explanation of the estimation processes is expounded upon in Section 7.2.2.

There are a total of 134 total counts of elevated childhood blood lead. The high counts could be due to low income families moving into cheap housing units that were constructed before the Year 1970. In addition, children could have been exposed to the leachate from the leaking drums from the class 1 solid waste facility of the Bio-Ecology Site, as well as, the lead smelter of the RSR Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data set not having a normal distribution and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the total counts of childhood elevated blood lead level, shown below.

Table 7.186: Year 2001 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for the Zip Codes, Located Within or that Intersect, the 5-mile Radius of the Bio-Ecology Site.

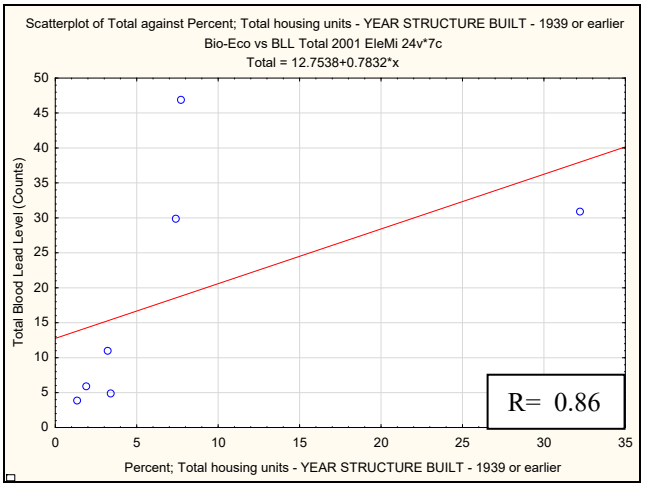
	Spearman Rank Order Correlations (Bio-Eco vs BLL Total 2001 EleMi) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total Blood Lead Level (Counts)
Percent; Families - Percent Below Poverty Level	1.00	0.75	0.86	0.50	-0.67	0.04	0.75	0.54	0.57	0.68
Percent; Household Income - Less than $10,000	0.75	1.00	0.68	0.34	-0.32	-0.11	0.57	0.39	0.75	0.57
Percent; Household Income - $10,000 to $14,999	0.86	0.68	1.00	0.50	-0.49	0.11	0.46	0.18	0.43	0.25
Percent; Household Income - $15,000 to $24,999	0.50	0.34	0.50	1.00	0.06	0.67	0.07	-0.02	0.29	0.25
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.67	-0.32	-0.49	0.06	1.00	0.59	-0.61	-0.74	-0.04	-0.67
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.04	-0.11	0.11	0.67	0.59	1.00	-0.11	-0.43	0.14	-0.29
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.75	0.57	0.46	0.07	-0.61	-0.11	1.00	0.82	0.32	0.71
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.54	0.39	0.18	-0.02	-0.74	-0.43	0.82	1.00	0.00	0.86
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.57	0.75	0.43	0.29	-0.04	0.14	0.32	0.00	1.00	0.39
Total Blood Lead Level (Counts)	0.68	0.57	0.25	0.25	-0.67	-0.29	0.71	0.86	0.39	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of the elevated blood lead levels for children that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there is a strong significant relationship between the total counts of the elevated childhood blood lead levels and the percentage of housing units constructed the Year 1939 and earlier. Based on the correlation matrix, it seems that housing units constructed in the Year 1939 and earlier are more likely to have children that are diagnosed with elevated blood lead. This may be due to indoor lead exposure from lead based paint of housing units constructed before the Year 1970, as well as, the close proximity of the children to the Bio-Ecology and RSR Superfund Sites.

The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.267: Year 2001 Bio-Ecology Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels



Based on the above graph, as the percentage of housing units constructed the Year 1939 and earlier increase, the total counts of elevated childhood blood lead levels increase. Therefore, housing units constructed before the Year 1970, have a direct effect on the total counts of the elevated childhood blood lead level.

7.2.10.12 Year 2001 Comparison Analysis for Bio-Ecology Socioeconomic Indicators and Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes Located Greater than the 5-mile Radius of the Bio-Ecology Site.

The comparison group analysis identifies trends in the data, for the children that reside in zip codes, located within or that intersect, the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, for the children that reside in zip codes, located greater than the 5- mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the total counts of elevated blood lead levels for children that reside in the zip codes that are located greater than 5 miles from the Bio-Ecology Superfund Site, is shown below.

Table 7.187: Year 2001 Comparison Socioeconomic Indicators and Total Counts Blood Lead Levels for Zip Codes Located Greater Than the 5-mile Radius of the Bio-Ecology Superfund Site

	Year 2001 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from Bio-Ecology Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	0
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	0
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	0
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	4
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	4
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	2
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	0
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	2
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	10
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	2
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	4
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	4
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	2
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	0
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	4
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	7
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	55

The zip codes located greater than 5 miles from the Bio-Ecology Site are listed on the left side of the table and the socioeconomic indicators and the total counts of elevated blood lead levels are shown across the top of the table. The highlighted numeric values in the table represented estimated values. The estimation methodology is explained further in Section 7.2.2.

The total counts of elevated childhood blood lead levels are lower than the total counts in the zip codes located within Bio-Ecology site 5 mile radius. The total counts of elevated childhood blood lead levels , for children that reside in zip codes located greater than the

5- mile radius is 55 and the total counts of elevated childhood blood lead level for children that reside in zip codes located within the 5 mile radius of the Bio-Ecology Site is 134 unduplicated cases. The lower total counts of elevated blood lead levels, for the comparison group, could be a result of lower percentages of low income households that reside in housing units that were constructed before the Year 1970. Therefore, resulting in fewer cases of childhood lead exposure.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data set not having a normal distribution and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the total counts of childhood elevated blood lead level, is shown below.

Table 7.188:Year 2001 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Total Counts of Elevated Blood Lead Level for Zip Codes Located Greater than the 5-mile Radius of the Bio-Ecology Site.

	Spearman Rank Order Correlations (Total BLL 2001) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.76	0.42	0.72	0.68	0.25	0.37	0.34	0.03	0.51
Percent; Household Income - Less than $10,000	0.76	1.00	0.52	0.81	0.59	0.24	0.53	0.48	0.16	0.59
Percent; Household Income - $10,000 to $14,999	0.42	0.52	1.00	0.51	0.11	0.36	0.76	0.79	0.48	0.18
Percent; Household Income - $15,000 to $24,999	0.72	0.81	0.51	1.00	0.47	0.29	0.65	0.58	0.15	0.67
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.59	0.11	0.47	1.00	-0.02	0.13	0.00	-0.10	0.32
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.25	0.24	0.36	0.29	-0.02	1.00	0.52	0.23	-0.07	0.32
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.37	0.53	0.76	0.65	0.13	0.52	1.00	0.87	0.35	0.43
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.34	0.48	0.79	0.58	0.00	0.23	0.87	1.00	0.67	0.41
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.03	0.16	0.48	0.15	-0.10	-0.07	0.35	0.67	1.00	0.11
Total (Counts) of Blood Lead Level	0.51	0.59	0.18	0.67	0.32	0.32	0.43	0.41	0.11	1.00

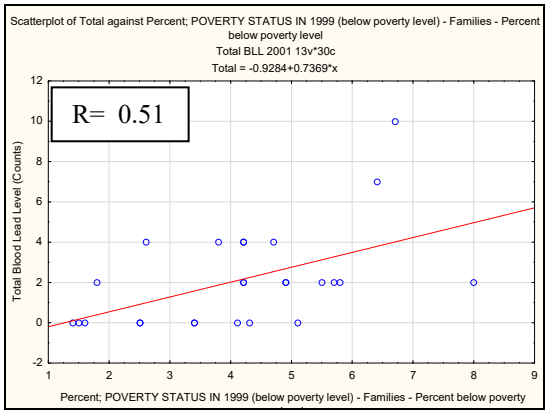
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of the elevated blood lead levels for children that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site.

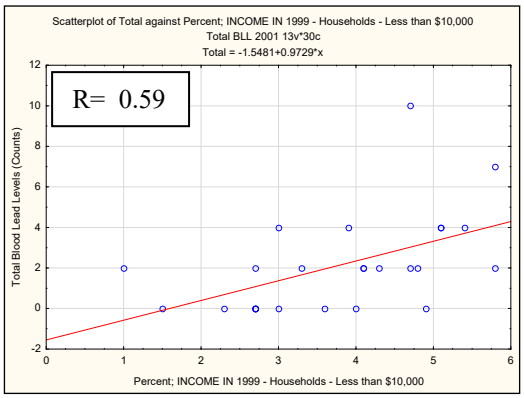
Based upon the correlation matrix, above, there is a weak to moderate significant relationship between the total counts of the elevated blood lead levels and the percentage of families below poverty level, the percentage of households with income less than $10,000 a year, the percentage of households with income between $15,000 to 24,999 a year, and the percentage of housing units built the Year 1940 to Year 1959 and the Year 1960 to the Year 1960. Based on the correlation matrix, it seems that families and households that have extremely low income are more likely to have children that are

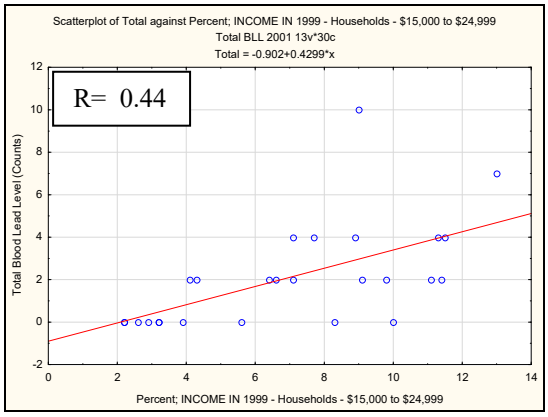
diagnosed with elevated blood lead. This may be due to low income families residing in housing units constructed before the Year 1970, that resulting in indoor lead exposure.

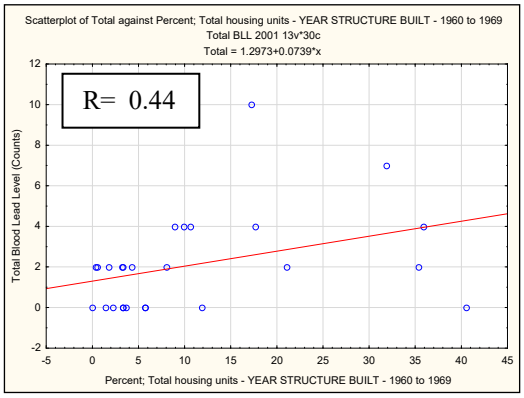
The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

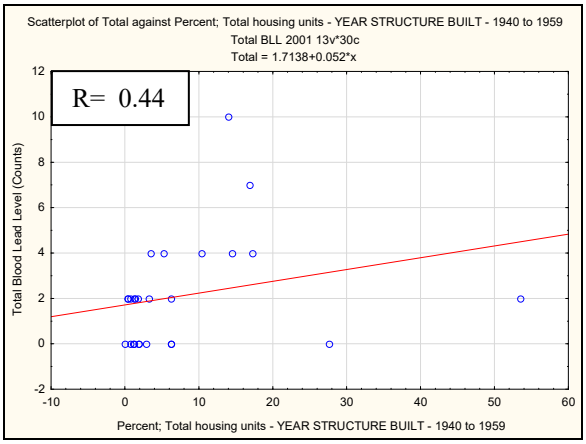
Graph 7.268- Graph 7.272: Year 2001 Bio-Ecology Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels











Based on the graphs above, as the percentage of families below poverty level, the percentage of households with low income, and the percentage of housing units constructed before the Year 1970, increase, the total counts of childhood elevated blood lead levels cases increase.

7.2.10.13 Year 2002 Socioeconomic Indicators and the Elevated Childhood Blood Lead Level of 10-14 µg/dl Counts for Children Residing in Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the counts of childhood elevated blood lead level of 10-14 µg/dl. The table of the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl for children that reside in zip codes that are located within the 5-mile radius of the Bio-Ecology Site, is shown below.

Table 7.189: Year 2002 Socioeconomic Indicators and Counts of Elevated Blood Lead Levels of 10-14 µg/dl for Zip Codes , Located Within or that Intersect , the Bio-Ecology Site's 5-mile Radius.

	Bio-Ecology Year 2002 Socioeconomic Indicators and Counts of Blood Lead Level 10-14 ug/dl EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	35
75050	10.6	7.5	5.9	13.8	17.8	15.9	21.3	1.9	35.7	6
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	28
75051	16.7	13.6	7.1	16.3	26.5	24.2	25.6	3.2	47.4	3
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	10
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	20
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	4
									Total	**106**

There are a total of 106 cases of elevated childhood blood lead for the children that reside in zip codes, located within or that intersect, the 5-mile radius if the Bio-Ecology Site. The high counts may be due to a high percentage of low income families residing within housing units that were constructed before the Year 1970. In addition, the high counts could be due to the children possible exposure to the leachate from the Bio-Ecology Site, as well as the effects of the RSR Site.

The Spearman Rank Correlation Matrix was used to analyze the data, due the data set's distribution not being normal and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the childhood elevated blood lead level of 10-14 µg/dl is shown below.

Table 7.190: Year 2002 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10- 14 µg/dl, for Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius

Variable	Spearman Rank Order Correlations (Bio-Eco vs BLL 10-14 2002 EleMi) MD pairwise deleted Marked correlations are significant at p <.05000									
	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.75	0.86	0.50	-0.67	0.04	0.75	0.54	0.57	0.64
Percent; Household Income - Less than $10,000	0.75	1.00	0.68	0.34	-0.32	-0.11	0.57	0.39	0.75	0.18
Percent; Household Income - $10,000 to $14,999	0.86	0.68	1.00	0.50	-0.49	0.11	0.46	0.18	0.43	0.29
Percent; Household Income - $15,000 to $24,999	0.50	0.34	0.50	1.00	0.06	0.67	0.07	-0.02	0.29	-0.02
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.67	-0.32	-0.49	0.06	1.00	0.59	-0.61	-0.74	-0.04	-0.79
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.04	-0.11	0.11	0.67	0.59	1.00	-0.11	-0.43	0.14	-0.21
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.75	0.57	0.46	0.07	-0.61	-0.11	1.00	0.82	0.32	0.82
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.54	0.39	0.18	-0.02	-0.74	-0.43	0.82	1.00	0.00	0.79
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.57	0.75	0.43	0.29	-0.04	0.14	0.32	0.00	1.00	0.11
10--14 ug/dl (Counts) Blood Lead Level	0.64	0.18	0.29	-0.02	-0.79	-0.21	0.82	0.79	0.11	1.00

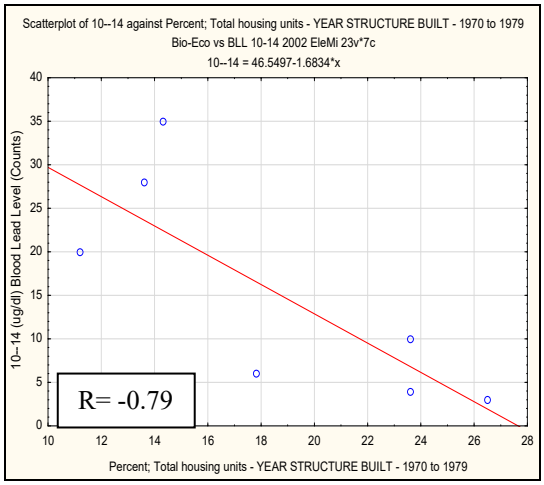
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of the elevated blood lead level 10-14 µg/dl for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Bio-Ecology Site.

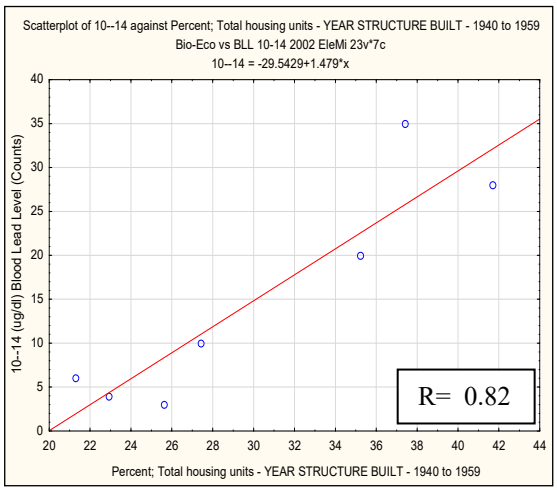
Based upon the correlation matrix, above, there is a strong negative significant relationship between the counts of the elevated blood lead level of 10-14 µg/dl and the percentage of housing units constructed from the Year 1970 to the Year 1979. This negative significant relationship indicates that, housing units constructed after the Year 1970, have a much lower risk of indoor lead exposure, resulting in fewer cases of elevated childhood blood lead.

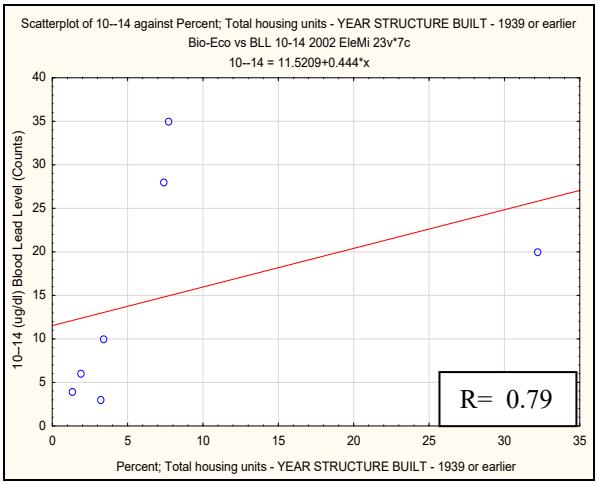
Based upon the correlation matrix, there is a strong significant positive relationship between the counts of the elevated blood lead level of 10-14 µg/dl and the percentage of housing units constructed the Year 1940 to the Year 1959 and the percentage of housing units constructed the Year 1939 or earlier. These negative significant relationships indicate that housing units constructed before the Year 1970 have a greater risk of indoor lead exposure, resulting in a higher counts of elevated childhood blood lead level cases. In addition, higher counts of elevated childhood blood lead, could be due to the effects of the Bio-Ecology and the RSR Sites.

The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.273- Graph 7.275: Year 2002 Bio-Ecology Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl







Based on the graphs, as the percentage of housing units constructed after the Year 1970 , increase, the elevated childhood blood lead level cases, decrease. Therefore, there are fewer elevated childhood blood lead cases due to reduced amounts of lead based painted used in the housing units constructed the Year 1970 and beyond. Also, as the percentage housing units constructed before the Year 1970 increase, the cases of elevated childhood blood lead, increase. Therefore, housing units constructed before the Year 1970 result in higher cases of elevated childhood blood lead level contamination.

7.2.10.14 Year 2002 Comparison Analysis for Bio-Ecology Socioeconomic Indicators and Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater than the 5-mile Radius of the Bio-Ecology Site. (Comparison Group)

The comparison group analysis identifies trends in the data, for the children that reside in zip codes, located within or that intersect, the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, for the children that reside in zip codes, located greater

than the 5- mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the counts of elevated blood lead level of 10-14 µg/dl for children that reside in the zip codes that are located greater than the 5-mile radius of the Bio-Ecology Superfund Site, is shown below.

Table 7.191 Year 2002 Comparison Socioeconomic Indicators and Counts Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater Than 5 miles from the Bio-Ecology Superfund Site

	Year 2002 Socioeconomic Indicators and 10-14 ug/dl BLL for Zip Codes Greater than 5 Miles from Bio-Ecology Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	2
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	2
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	2
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	2
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	0
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	3
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	0
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	0
75125	8.5	6.4	4.8	12.0	18.8	11.8	11.4	9.5	9.4	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	2
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	6
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	8
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	3
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	4
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	2
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	6
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	54

The zip codes located greater than 5 miles from the Bio-Ecology Site are shown on the left side of the table and the socioeconomic indictors and the counts of childhood blood lead level of 10-14 µg/dl are shown cross the top of the table. The highlighted values in the table are estimated values that replaced the "<5" values, given in the original data set. Additional information on the estimation process is in Section7.2.2.

The counts of elevated childhood blood lead level of 10-14 µg/dl are much less, than the 10-14 µg/dl counts in the zip codes located within Bio-Ecology Site's 5 mile radius. The unduplicated counts of elevated childhood blood lead of level 10-14 µg/dl, for children that reside in zip codes located greater the Bio-Ecology Site 5 mile radius, is 54 and the unduplicated counts of elevated childhood blood lead of level 10-14 µg/dl, for children that reside in zip codes located within the Bio-Ecology Site's 5 mile radius, is 106. The reason the cases of elevated childhood blood lead are much lower for zip codes located greater than the Bio-Ecology Site's 5 mile radius could be due to a lower percentage of low income families residing in housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data distribution of the data set not being normal and due to a low quantity of observations. The correlation matrix for the socioeconomic indicators and the childhood elevated blood lead level of counts of elevated blood lead level of 10-14 µg/dl, is shown below.

Table 7.192: Year 2002 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Counts of Elevated Blood Lead Level of 10-14 µg/dl for Zip Codes Located Greater than the 5-mile Radius of the Bio-Ecology Site.

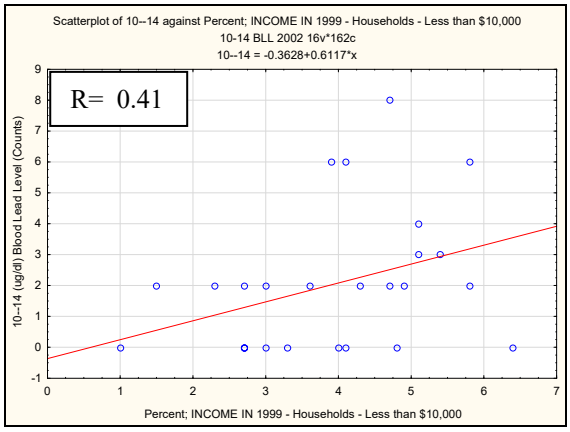
	Spearman Rank Order Correlations (10-14 BLL 2002) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	10--14 ug/dl (Counts) Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.79	0.48	0.75	0.68	0.19	0.39	0.37	0.13	0.29
Percent; Household Income - Less than $10,000	0.79	1.00	0.57	0.83	0.60	0.19	0.53	0.51	0.24	0.41
Percent; Household Income - $10,000 to $14,999	0.48	0.57	1.00	0.56	0.16	0.29	0.75	0.78	0.54	0.25
Percent; Household Income - $15,000 to $24,999	0.75	0.83	0.56	1.00	0.49	0.24	0.65	0.60	0.23	0.48
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.60	0.16	0.49	1.00	-0.05	0.14	0.03	-0.04	0.17
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.19	0.19	0.29	0.24	-0.05	1.00	0.49	0.19	-0.10	0.27
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.39	0.53	0.75	0.65	0.14	0.49	1.00	0.87	0.36	0.43
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.37	0.51	0.78	0.60	0.03	0.19	0.87	1.00	0.68	0.40
Percent; Housing Units- YEAR BUILT- 1939 or earlie	0.13	0.24	0.54	0.23	-0.04	-0.10	0.36	0.68	1.00	0.19
10--14 ug/dl (Counts) Blood Lead Level	0.29	0.41	0.25	0.48	0.17	0.27	0.43	0.40	0.19	1.00

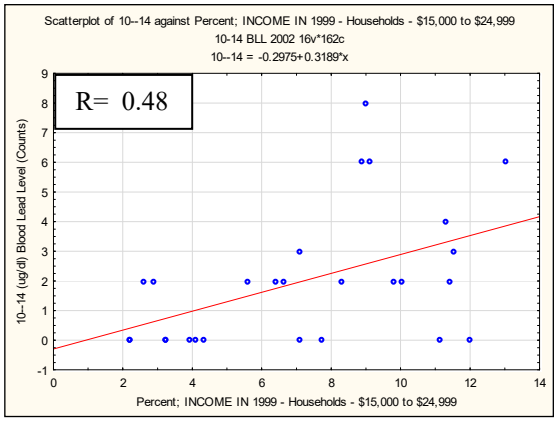
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the counts of the elevated blood lead level 10-14 µg/dl for children that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site.

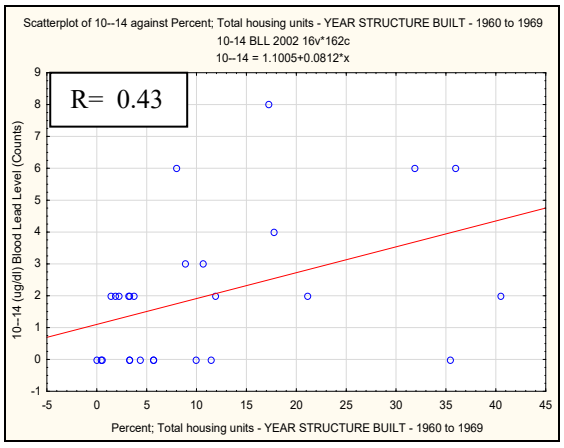
Based upon the correlation matrix, above, there is a weak significant relationship between the counts of the elevated blood lead level of 10-14 µg/dl and the percentage of households with income less than $10,000 a year, and the percentage of households with income between $15,000 to $24,999 per year, the percentage of housing units built the Year 1940 to Year 1959 and the percentage of housing units built between the Year 1960 to Year 1969. In addition, the R values are lower for the comparison group, than the R values of the zip codes located within the 5 mile radius of the Bio-Ecology site. Based on the correlation matrix, it seems that households that have extremely low income and housing units built before the Year 1970, are more likely to have children that are diagnosed with elevated blood lead.

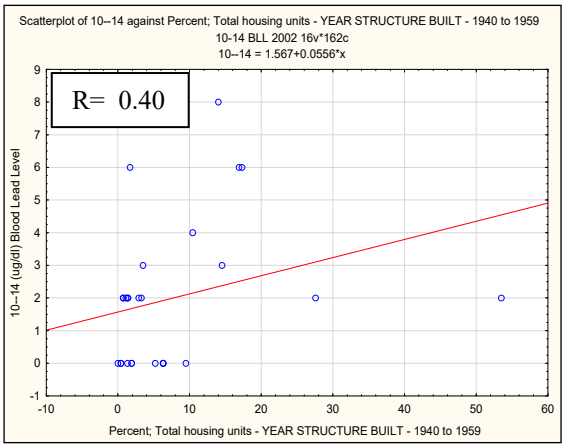
The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.276- Graph 7.279: Year 2002 Bio-Ecology Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Elevated Blood Lead Level 10-14 µg/dl









Based on the graphs, as the percentage of households with low income, and the percentage of housing units built before the Year 1970, increase, the cases of elevated childhood blood lead, increase.

7.2.10.15 Year 2002 Socioeconomic Indicators and the Total Counts of Elevated Childhood Blood Lead Levels for Children Residing in Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the total counts of childhood elevated blood lead levels. The table of the socioeconomic indicators and the total counts of elevated blood lead levels for children that reside in zip codes that are located within the 5 mile radius of the Bio-Ecology Site, is shown below.

Table 7.193: Year 2002 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes, Located Within or that Intersect, the Bio-Ecology Site's 5-mile Radius.

	Bio-Ecology Year 2002 Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels EleMidHi									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total (Counts) of Blood Lead Level
75211	18.7	12.1	7.3	16.8	14.3	24.3	37.4	7.7	42.9	47
75050	10.6	7.5	5.9	13.8	17.8	15.9	21.3	1.9	35.7	10
75212	34.9	28.5	10.7	14.5	13.6	18.2	41.7	7.4	63.2	37
75051	16.7	13.6	7.1	16.3	26.5	24.2	25.6	3.2	47.4	5
75060	9.1	6.6	5.3	12.5	23.6	21.6	27.4	3.4	19.1	21
75208	17.7	12.2	7.9	16.1	11.2	11.9	35.2	32.2	28.3	42
75233	17.3	7.7	8.8	16.8	23.6	38.1	22.9	1.3	31.2	6
									Total	**168**

The zip codes located within the Bio-Ecology Site's 5-mile radius are listed on the left side of the table. The socioeconomic indicators and the total unduplicated counts of elevated childhood blood lead level are shown cross the top of the table. The total unduplicated counts of elevated childhood blood lead are 168, for the Year 2002. The high counts could be the result of higher percentages of low income families residing in housing units constructed before the Year 1970. In addition, children could have been exposed to lead from the leachate from the leaking drums of the Bio-Ecology Site and the lead smelter of the RSR Superfund Site.

The Spearman Rank Correlation Matrix was used to analyze the data due to the data set not having a normal distribution and due to a low numbers of observations. The correlation matrix for the socioeconomic indicators and the total counts of childhood elevated blood lead levels, is shown below.

Table 7.194:Year 2002 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Total Counts of Elevated Blood Lead Level for Zip Codes, Located Within or that Intersect, the 5-mile Radius of the Bio-Ecology Site.

	Spearman Rank Order Correlations (Bio-Eco vs BLL Total 2002 Eleml) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Total Blood Lead Level (Counts)
Percent; Families - Percent Below Poverty Level	1.00	0.75	0.86	0.50	-0.67	0.04	0.75	0.54	0.57	0.57
Percent; Household Income - Less than $10,000	0.75	1.00	0.68	0.34	-0.32	-0.11	0.57	0.39	0.75	0.11
Percent; Household Income - $10,000 to $14,999	0.86	0.68	1.00	0.50	-0.49	0.11	0.46	0.18	0.43	0.21
Percent; Household Income - $15,000 to $24,999	0.50	0.34	0.50	1.00	0.06	0.67	0.07	-0.02	0.29	0.02
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.67	-0.32	-0.49	0.06	1.00	0.59	-0.61	-0.74	-0.04	-0.83
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.04	-0.11	0.11	0.67	0.59	1.00	-0.11	-0.43	0.14	-0.29
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.75	0.57	0.46	0.07	-0.61	-0.11	1.00	0.82	0.32	0.75
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.54	0.39	0.18	-0.02	-0.74	-0.43	0.82	1.00	0.00	0.86
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.57	0.75	0.43	0.29	-0.04	0.14	0.32	0.00	1.00	-0.07
Total Blood Lead Level (Counts)	0.57	0.11	0.21	0.02	-0.83	-0.29	0.75	0.86	-0.07	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown

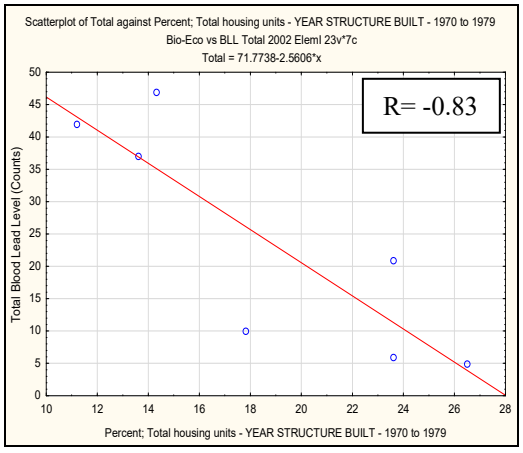
along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of the elevated blood lead levels for children that reside in zip codes, located within or that intersect, the 5-mile radius of the Bio-Ecology Site.

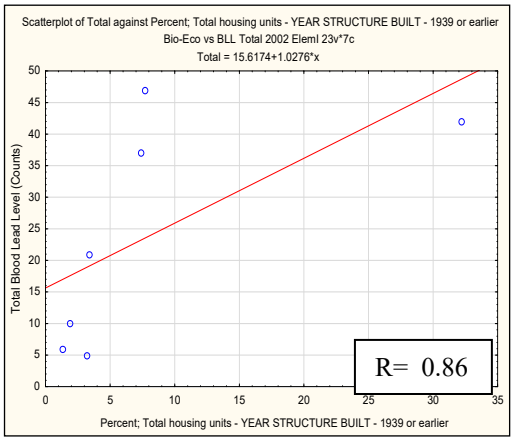
Based upon the correlation matrix, above, there is a strong negative significant relationship between the total counts of the elevated blood lead levels and the percentage of housing units constructed from the Year 1970 to the Year 1979. This negative relationship indicates that housing units constructed after the 1970, have reduced amounts of lead, resulting in fewer elevated childhood blood lead cases.

Based upon the correlation matrix, above, there is a strong positive significant relationship between the total counts of the elevated blood lead levels and the percentage of housing units constructed from the Year 1939 and earlier. Therefore, housing units constructed before the year 1970 have a much higher risk of indoor lead exposure, resulting in a higher quantity of cases of elevated childhood blood lead.

The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.280- Graph 7.281: Year 2002 Bio-Ecology Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels





For the negative relationship, as the percentage of housing units constructed the Year 1970 to the Year 1979, increase, the total counts of elevated childhood blood lead level, decrease. For the positive relationship, as the housing units constructed the Year 1939 and earlier, increase, the total counts of elevated childhood blood lead levels, increases.

Based on both graphs, it is clear that the year the housing units are built can affect the quantity of cases of elevated childhood blood lead.

7.2.10.16 Year 2002 Comparison Analysis for Bio-Ecology Socioeconomic Indicators and the Total Counts of Elevated Childhood Blood Lead Levels for Zip Codes Located Greater than the 5-mile Radius of the Bio-Ecology Site (Comparison Group).

The comparison group analysis identifies trends in the data, for the children that reside in zip codes, located within or that intersect, the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, for the children that reside in zip codes, located greater than the 5- mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the total counts of elevated blood lead levels for children that reside in the zip codes that are located greater than 5 miles from the Bio-Ecology Superfund Site for the Year 2002 is shown below.

Table 7.195: Year 2002 Comparison Socioeconomic Indicators and the Total Counts Blood Lead Levels for Zip Codes Located Greater Than the 5-mile Radius of the Bio-Ecology Superfund Site

	Year 2002 Socioeconomic Indicators and Total Counts of Elevated BLL for Zip Codes Greater than 5 Miles from Bio-Ecology Site									
Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
75234	4.3	4.9	4.3	10.0	17.4	16.0	40.5	27.6	1.1	4
75104	4.2	2.7	2.8	6.4	16.1	15.5	3.3	3.3	1.3	4
75019	1.4	1.5	1.0	2.9	5.1	6.3	1.4	0.7	0.2	2
75248	1.6	3.0	3.2	5.6	10.9	45.7	11.9	1.1	0.0	4
75244	5.5	4.1	3.8	11.1	20.3	33.9	35.4	6.3	0.0	2
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75218	4.9	4.7	4.4	9.8	17.5	8.0	21.1	53.5	6.5	2
75115	4.2	5.4	3.4	7.1	20.8	20.6	10.6	3.5	0.6	5
75137	2.6	3.0	1.5	7.7	13.3	36.2	9.9	5.2	0.8	0
76018	1.8	1.0	0.9	4.3	10.5	2.2	0.4	0.4	0.1	4
75249	5.7	4.8	2.7	7.1	14.1	42.0	4.3	1.3	0.0	2
75125	8.5	6.4	4.8	12.0	18.8	11.8	11.4	9.5	9.4	0
75089	1.5	2.3	1.1	2.6	9.7	13.5	2.2	1.3	0.3	2
75043	4.9	4.1	3.6	9.1	18.4	40.2	8.0	1.7	0.2	9
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
75040	6.7	4.7	3.4	9.0	17.7	27.9	17.2	14.0	1.1	11
75038	8.0	5.8	3.7	11.4	18.3	17.5	3.2	1.4	0.2	2
75063	4.2	3.3	1.4	4.1	20.6	2.4	0.5	0.4	0.1	0
75039	4.1	4.0	0.7	3.9	51.6	4.2	0.0	0.0	0.4	0
75146	3.8	5.1	3.4	11.5	6.2	17.5	8.9	14.5	5.0	5
75150	4.7	5.1	3.6	11.3	15.3	19.6	17.7	10.4	0.3	8
75001	5.8	4.3	1.7	6.6	17.7	18.2	1.8	0.7	0.2	4
75154	5.1	3.6	3.7	8.3	20.5	16.5	3.7	2.9	2.1	2
75080	4.2	3.9	3.8	8.9	12.6	20.3	35.9	17.3	0.8	6
75238	6.4	5.8	4.6	13.0	19.0	21.9	31.9	16.9	0.5	11
75182	2.5	2.7	4.4	2.2	0.0	22.7	5.7	6.3	3.1	0
75048	3.4	2.7	2.0	3.2	9.3	11.1	3.3	1.9	0.2	0
									Sum=	89

The zip codes that are located greater than the 5 mile radius of the Bio-Ecology Site are shown along the left side of the table and the socioeconomic indicators and the total counts of elevated childhood blood lead levels are shown across the top of the table. The

highlighted values are estimated values. Further information on the estimation methodology, please refer to Section 7.2.2.

The total unduplicated counts of elevated childhood blood lead levels for children that reside in zip codes located greater than 5 miles from the Bio-Ecology Site is 89. These unduplicated counts are much less, than the total counts, in the zip codes located within Bio-Ecology Site's 5 mile radius. The total unduplicated counts of elevated childhood blood lead are 168 for the children that reside in zip codes located within the 5 mile radius of the Bio-Ecology Site. The low counts of elevated childhood blood lead levels, for children that reside in zip codes located greater than the 5 mile radius of the Bio-Ecology Site, may be due to lower percentages of low income families living in housing units constructed before the Year 1970 and due to the children not being impacted by the Bio-Ecology Site.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data set not having a normal data distribution and due to a low number of observations. The correlation matrix for the socioeconomic indicators and the total counts of elevated childhood blood lead level, for children reside in zip codes located greater than the Bio-Ecology Site's 5 mile radius, is shown below.

Table 7.196:Year 2002 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Total Counts of Elevated Blood Lead Levels for Zip Codes Located Greater than the 5-mile Radius of the Bio-Ecology Site.

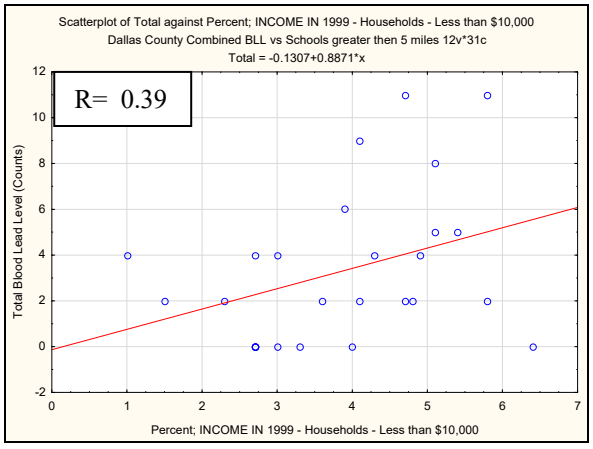
	Spearman Rank Order Correlations (Total BLL 2002) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Total (Counts) of Blood Lead Level
Percent; Families - Percent Below Poverty Level	1.00	0.79	0.48	0.75	0.68	0.19	0.39	0.37	0.13	0.30
Percent; Household Income - Less than $10,000	0.79	1.00	0.57	0.83	0.60	0.19	0.53	0.51	0.24	0.39
Percent; Household Income - $10,000 to $14,999	0.48	0.57	1.00	0.56	0.16	0.29	0.75	0.78	0.54	0.17
Percent; Household Income - $15,000 to $24,999	0.75	0.83	0.56	1.00	0.49	0.24	0.65	0.60	0.23	0.52
Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.68	0.60	0.16	0.49	1.00	-0.05	0.14	0.03	-0.04	0.17
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.19	0.19	0.29	0.24	-0.05	1.00	0.49	0.19	-0.10	0.34
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.39	0.53	0.75	0.65	0.14	0.49	1.00	0.87	0.36	0.44
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.37	0.51	0.78	0.60	0.03	0.19	0.87	1.00	0.68	0.32
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.13	0.24	0.54	0.23	-0.04	-0.10	0.36	0.68	1.00	-0.02
Total (Counts) of Blood Lead Level	0.30	0.39	0.17	0.52	0.17	0.34	0.44	0.32	-0.02	1.00

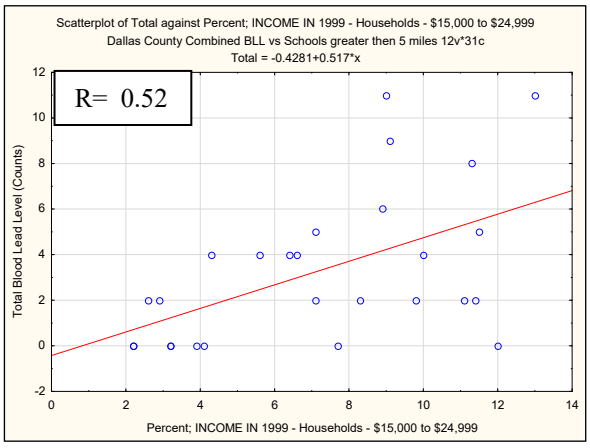
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the counts of elevated blood lead levels, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the total counts of the elevated blood lead levels for children that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site.

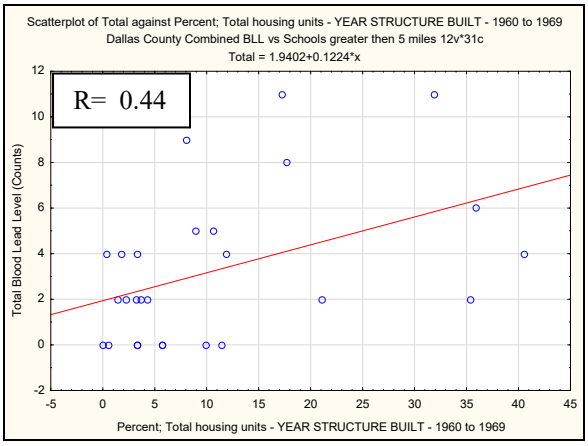
Based upon the correlation matrix, above, there is a weak to moderate significant relationship between the total counts of elevated childhood blood lead levels and the percentage of households with income less than $10,000 per year, the percentage of households with income between $15,000 to $24,000 per year, and the percentage of housing units built the Year 1960 to Year 1969. Based on the correlation matrix, it seems that there is a direct link of households with low income and older housing units that were constructed between Year 1960 and 1969, cases of elevated childhood blood lead level.

The significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.282- Graph 7.284: Year 2002 Bio-Ecology Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Total Counts of Elevated Blood Lead Levels



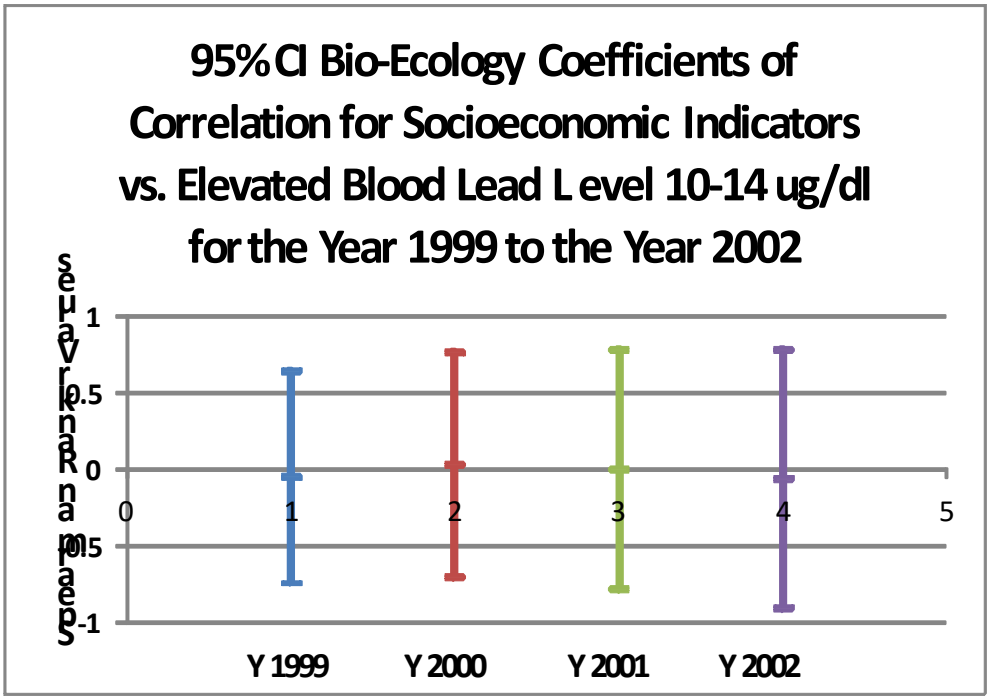




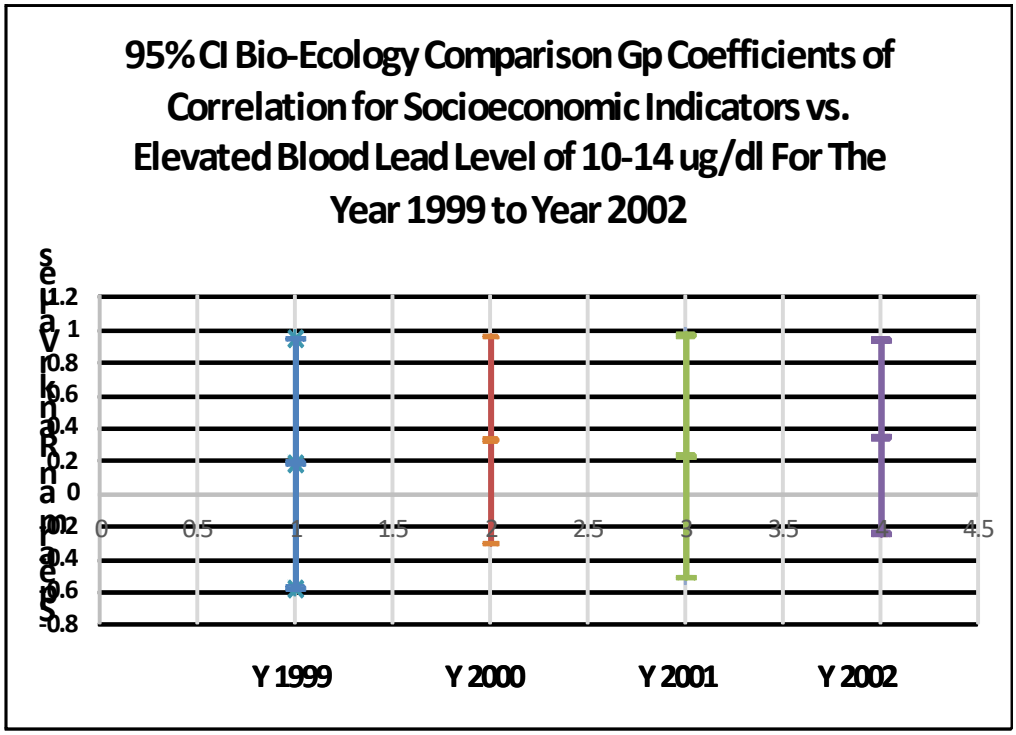
Based on the above graphs, as the percentage of households with low income, and the percentage of housing units built before the Year 1970, increase, the total cases of elevated childhood blood levels, increase.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1999 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for the socioeconomic indicators vs. the elevated blood lead level of 10-14 µg/dl and the total counts of elevated blood lead levels, for children that reside in zip codes, located within and greater than, the 5-mile radius of the Bio-Ecology Superfund Site, are shown below.

Graph 7.285 Bio-Ecology Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Elevated Blood Lead Level of 10-14 µg/dl from the Year 1999 to the Year 2002.

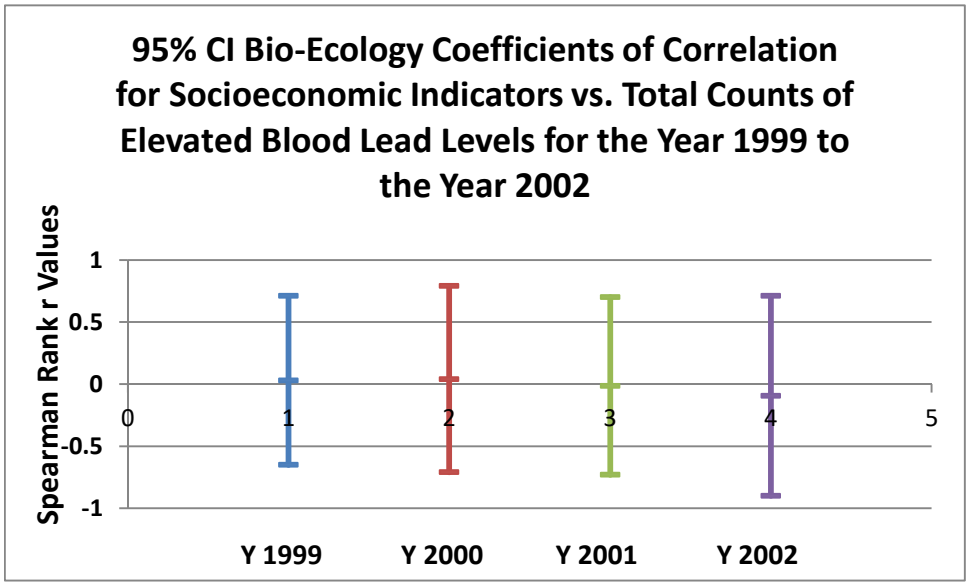


Graph 7.286: Bio-Ecology Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Elevated Blood Lead Level of 10-14 µg/dl from the Year 1999 to the Year 2002.

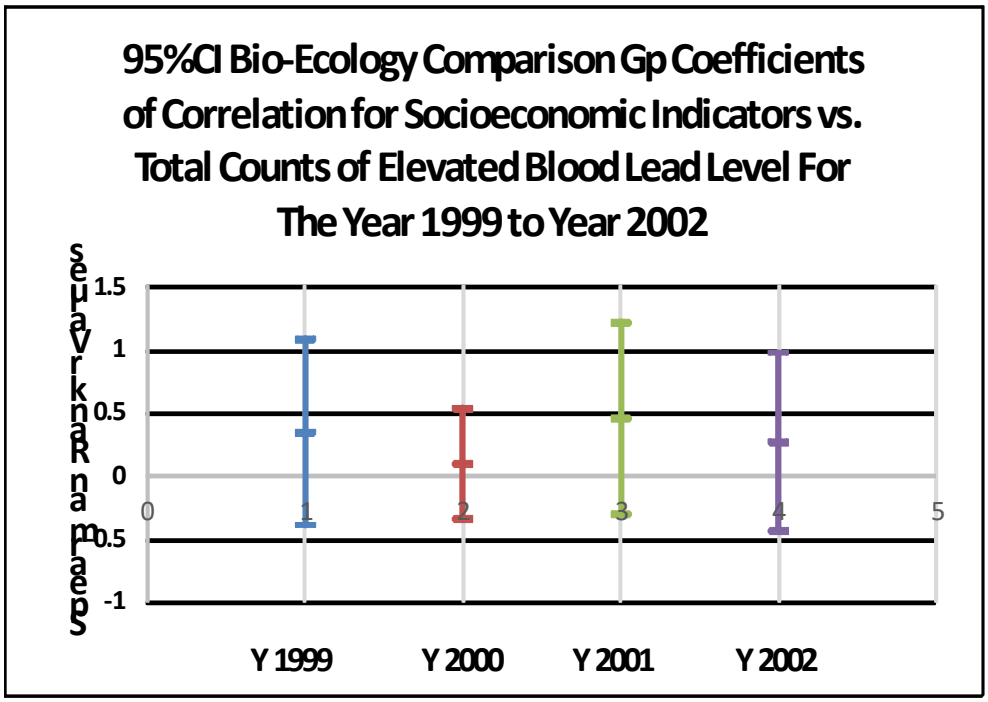


Based on the confidence interval graphs, every confidence interval for every year, have significant coefficients of correlations. This is true for the children that reside in zip codes, located within or greater than, the 5-mile radius of the Bio-Ecology Site.

Graph 7.287 Bio-Ecology Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Total Counts of Elevated Blood Lead Levels from the Year 1999 to the Year 2002.



Graph 7.288: Bio-Ecology Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Total Counts of Elevated Blood Lead Levels from the Year 1999 to the Year 2002.



Based on the confidence interval graphs, every confidence interval for every year, have significant coefficients of correlations. This is true for the children that reside in zip codes, located within and greater than, the 5-mile radius of the Bio-Ecology Site.

7.2.11 Bio-Ecology Socioeconomic Indicators vs. the Test Passing Rate Analysis

The Bio-Ecology socioeconomic indicators vs. the test passing rate analysis determines if there is a significant relationship between the socioeconomic indicators, and the standardized test passing rates for elementary, middle, and high schools. This is analysis covered the Year 1999 to the Year 2002. The Year 2003 to the Year 2011 was not included in the Study because the standardized test was changed, by the Texas Education Agency, in the Year 2003. The test change resulted in a significant reduction in the standardized test passing rates for schools across Dallas County.

For the socioeconomic indicators vs. the test passing rate analysis, the middle and high schools were separated from the elementary schools, due to the prospective middle and high schools students, having a higher possibility, of being impacted by the Bio-Ecology Site's class 1 waste facility, given that the students didn't move out of the area. In the Bio-Ecology socioeconomic indicators vs. test passing rate analysis, distance to the site is included, to determine if socioeconomic indicators, as well as distance, effect the student standardized test passing rates, for in schools located within the 5 –mile radius, and the schools located greater than the 5-mile radius, of the Bio-Ecology Site.

The socioeconomic indicators evaluated are listed below;

- percentage of families that are below poverty level;
- percentage of female householder with children less than 18 years of age that are below poverty level;
- percentage of households with income less than $10,000 per year;
- percentage of households with income between $10,000 to $14,999;
- percentage of households with income between $15,000 to $24,999;
- percentage of housing units built the Year 1939 or earlier;
- percentage of housing units built between the Year 1940 to 1959;
- percentage of housing units constructed between the Year 1960 to Year 1969;
- percentage of housing units built between Year 1970 to Year 1979.

The socioeconomic indicator data was obtained, from the Year 2000 Census Data, from the uscensus.gov website. The standardized test passing rate data was obtained from the Texas Education Agency. The housing units built dates were included in the Study, due to the use of lead based paint in homes constructed before the Year 1970. The housing units built dates will provide an indication of whether indoor lead contamination, other socioeconomic indicators, and the lead smelter are the source of elevated blood lead in children.

A table that depicts the ages, the grades, and the year the prospective students would take the standardized test, in reference to the operation, closure, and cleanup activities of the Bio-Ecology Site is shown below.

Table 7.197 Children's Age and Grade in Reference to the Bio-Ecology Site

Students Born 4 years before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1968
Pre-K	5	1973
5th	11	1979
6th	12	1980
8th	14	1982
9th	15	1983
12th	18	1986

Students Born 3 years before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1969
Pre-K	5	1974
5th	11	1980
6th	12	1981
8th	14	1983
9th	15	1984
12th	18	1987

Students Born 2 years before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1970
Pre-K	5	1975
5th	11	1981
6th	12	1982
8th	14	1984
9th	15	1985
12th	18	1988

Students Born 1 yr before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1971
Pre-K	5	1976
5th	11	1982
6th	12	1985
8th	14	1987
9th	15	1988
12th	18	1991

Students born the Year Bio-Ecology started operation		
Grade	Age(yrs)	Year
Born	0	1972
Pre-K	5	1977
5th	11	1983
6th	12	1984
8th	14	1986
9th	15	1987
12th	18	1990

Students Born the year Bio-Ecology Closed		
Grade	Age(yrs)	Year
Born	0	1978
Pre-K	5	1983
5th	11	1989
6th	12	1990
8th	14	1992
9th	15	1993
12th	18	1996

Students Born 1 year after Bio-Ecology closed		
Grade	Age(yrs)	Year
Born	0	1979
Pre-K	5	1984
5th	11	1990
6th	12	1991
8th	14	1993
9th	15	1994
12th	18	1997

Bio_Ecology Clean -Up Start date SEE STUDENTS BOR 1 year after Bio-Ecology closed		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born the Year Bio-Ecology Clean -Up End date		
Grade	Age(yrs)	Year
Born	0	1983
Pre-K	5	1988
5th	11	1994
6th	12	1995
8th	14	1997
9th	15	1998
12th	18	2001

7.2.11.1 Year 1999 Socioeconomic Indicators vs the Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the Bio-Ecology Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the 5-mile radius of the Bio-Ecology Site. The table of the middle and high schools located within the 5 mile radius of the Bio-Ecology Site, for the Year 1999 is shown below.

Table 7.198: Year 1999 Socioeconomic Indicators vs. Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Superfund Site's 5-mile Radius

	Bio-Ecology Year 1999 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR1999 Percent
GRAND PRAIRIE ISD	FANNIN MIDDLE	75050	10.6	7.5	5.9	13.8	35.7	17.8	15.9	21.3	1.9	84.3
DALLAS ISD	MOISES MOLINA H S	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	63.6
IRVING ISD	NIMITZ HS	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	81.3
DALLAS ISD	RAUL QUINTANILLA MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	55.7
DALLAS ISD	LV STOCKARD MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	61.4
DALLAS ISD	EDISON LEARNONG CENTER	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	52.8
IRVING ISD	BOWIE MIDDLE	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	78.1
DALLAS ISD	JUSTIN F KIMBALL HS	75233	17.3	7.7	8.8	16.8	31.2	23.6	38.1	22.9	1.3	64.3
DALLAS ISD	TW BROWNE MIDDLE	75233	17.3	7.7	8.8	16.8	31.2	23.6	38.1	22.9	1.3	55.1
DALLAS ISD	LG PINKSTON HS	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	65.6
											Average	**66.2**

The school district name, the school name and the zip codes the school are located in are shown on the left side of the table. The socioeconomic indicators and the standardized test passing rates are shown across the top of the table. Based on table, the average standardized test passing for the middle and high schools, located within the 5-mile radius is 66.2%. The average test passing rate could be low due to the prospective students residing in housing units constructed before the Year 1970, resulting in indoor lead exposure. In addition, the prospective students could have been exposed to lead in the leachate of the leaking drums from the class 1 waste facility, when the prospective students were children (before the Year 1978), given that the prospective student did not move out of the area.

The Spearman Rank Correlation Matrix was utilized to analyze the data ,due to the data distribution of the data set not being normal and due to a few number of observations. The correlation matrix for the socioeconomic indicators and the school standardized test passing rates for the middle and high schools located within the 5 mile radius of the Bio-Ecology Site, is shown below.

Table 7.199: Year 1999 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the Bio-Ecology Site

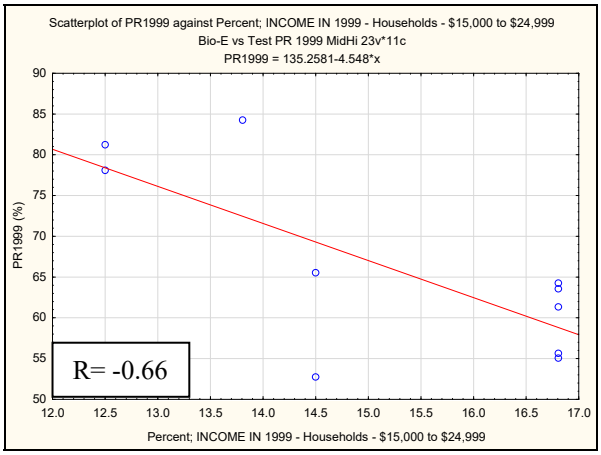
	Spearman Rank Order Correlations (Bio-E vs Test PR 1999 MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 1999
Percent; Families - Percent Below Poverty Level	1.00	1.00	0.77	0.45	0.97	-0.93	-0.07	0.86	0.59	-0.63
Percent; Household Income - Less than $10,000	1.00	1.00	0.77	0.45	0.97	-0.93	-0.07	0.86	0.59	-0.63
Percent; Household Income - $10,000 to $14,999	0.77	0.77	1.00	0.45	0.66	-0.54	0.16	0.47	-0.02	-0.63
Percent; Household Income - $15,000 to $24,999	0.45	0.45	0.45	1.00	0.33	-0.19	0.79	0.13	0.34	-0.66
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.97	0.97	0.66	0.33	1.00	-0.98	-0.26	0.83	0.62	-0.48
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.93	-0.93	-0.54	-0.19	-0.98	1.00	0.38	-0.88	-0.69	0.38
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.07	-0.07	0.16	0.79	-0.26	0.38	1.00	-0.24	-0.03	-0.45
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.86	0.86	0.47	0.13	0.83	-0.88	-0.24	1.00	0.74	-0.45
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.59	0.59	-0.02	0.34	0.62	-0.69	-0.03	0.74	1.00	-0.30
Percent; Standardized Test Passing Rate for Year 1999	-0.63	-0.63	-0.63	-0.66	-0.48	0.38	-0.45	-0.45	-0.30	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there is a strong negative significant relationship between the percentage of households with income from $15,000 to the $24,999 per year and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the Bio-Ecology Site. This indicates that there is a link between families with low income and lower standardized test passing rates. It also indicates that the negative effects of the Bio-Ecology and the RSR Site can contribute to low standardized test passing rates.

The significant bivariate plot is shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.289: Year 1999 Bio-Ecology Plots of Significant Relationships between the Socioeconomic Indicators vs. the Standardized Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Site's 5- Mile Radius



Based on the above plot, as the percentage of households with income between $15,000 to $24,999 per year, increase, the standardized test passing rates, decrease.

7.2.11.2 Bio-Ecology Year 1999 Comparison Group Socioeconomic Indicators vs. Standardized Test Passing Rate Analysis for Middle and High Schools Located Greater than the Bio-Ecology Site's 5-mile Radius (Comparison Analysis).

The comparison group analysis identifies trends in the data, for the middle and high schools, located within the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, of the middle and high schools located greater than the 5- mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the standardized test passing rates, for middle and high schools located within the 5-mile radius of the Bio-Ecology Site, is shown below.

Table 7.200 Year 1999 Comparison of Middle and High Schools of Socioeconomic Indicators vs. Test Passing Rates for Schools Located Greater than Bio-Ecology Superfund Site's 5-mile Radius

	Year 1999 Socioeconomic Indicators and Standardized Test Passing Rate for Middle/High Schools Greater than 5 Miles from Bio-Ecology Site											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units-YEAR BUILT - 1970 to 1979	Percent; Housing Units-YEAR BUILT - 1960 to 1969	Percent; Housing Units-YEAR BUILT - 1940 to 1959	Percent; Housing Units-YEAR BUILT-1939 or earlier	Test PR1999 Percent
CARROLLTON-FARMERS BRANCH ISD	SMITH H S	75006	3.6	3.1	9.7	5.7	17.3	31.2	13.8	7.6	0.6	79.9
CARROLLTON-FARMERS BRANCH ISD	LONG MIDDLE	75287										87.6
CEDAR HILL ISD	CEDAR HILL H S	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	76.6
CEDAR HILL ISD	BESSIE COLEMAN MIDDLE	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	
COPPELL ISD	COPPELL MIDDLE WEST	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	87.2
COPPELL ISD	COPPELL H S	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	87.6
DALLAS ISD	W T WHITE H S	75244	4.1	3.8	11.1	5.5	20.3	33.9	35.4	6.3	0.0	71.5
DUNCANVILLE ISD	WILLIAM H BYRD MIDDLE SCHOOL	75137	3.0	1.5	7.7	2.6	13.3	36.2	9.9	5.2	0.8	68.7
DUNCANVILLE ISD	DUNCANVILLE H S	75116	4.7	4.6	13.0	5.2	8.3	40.7	28.8	10.0	1.6	79.6
FERRIS ISD	FERRIS H S	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	91.0
FERRIS ISD	FERRIS J H	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	74.8
GARLAND ISD	LYLES MIDDLE	75043	4.1	3.6	9.1	4.9	18.4	40.2	8.0	1.7	0.2	67.1
GARLAND ISD	GARLAND H S	75040	4.7	3.4	9.0	6.7	17.7	27.9	17.2	14.0	1.1	70.2
GRAND PRAIRIE ISD	HARRY S TRUMAN MIDDLE	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	85.2
IRVING ISD	LADY BIRD JOHNSON MIDDLE	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	
LANCASTER ISD	LANCASTER H S	75134	7.2	5.3	10.9	9.2	22.1	24.6	17.5	15.1	1.2	77.9
LANCASTER ISD	LANCASTER MIDDLE	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	51.6
LEWISVILLE ISD	FLOWER MOUND H S	75022										
LEWISVILLE ISD	HEDRICK MIDDLE SCHOOL	75067										86.9
MESQUITE ISD	NORTH MESQUITE H S	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	78.0
MESQUITE ISD	VANSTON MIDDLE	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	69.2
PLANO ISD	FRANKFORD MIDDLE	75252	4.7	2.6	8.3	3.5	9.6	6.2	1.1	0.2	0.1	92.1
RICHARDSON ISD	RICHARDSON H S	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	76.4
RICHARDSON ISD	RICHARDSON NORTH J H	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	79.7
SUNNYVALE ISD	SUNNYVALE H S	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
SUNNYVALE ISD	SUNNYVALE MIDDLE	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
RICHARDSON ISD	PARKHILL J H	75248	3.0	3.2	5.6	1.6	10.9	45.7	11.9	1.1	0.0	89.3
DALLAS ISD	BRYAN ADAMS H S	75231	11.1	6.5	21.8	18.0	33.7	43.4	17.1	4.9	0.6	55.6
LEWISVILLE ISD	LEWISVILLE H S	75067										82.2
GRAND PRAIRIE ISD	GRAND PRAIRIE H S	75050	7.5	5.9	13.8	10.6	35.7	17.8	15.9	21.3	1.9	69.4
IRVING ISD	IRVING H S	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	75.0
											Average	77.3

The school district name, the school name, and the zip codes the schools are located in are shown on the left side of the table and the socioeconomic indicators and the standardized test passing rates are shown across the top of the table. Based on the table, the average standardized test passing the middle and high schools, in the comparison group is 77.3%. The average standardized test passing rate for the middle and high schools located within the Bio-Ecology Site 5 mile radius is 66.2%. This is approximately an 11 point difference. The difference might be due to lower percentages of low income families, families below poverty level, and housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was used to analyze the data, due to the data distribution of the data set not being normal and due to a low quantity of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for the middle and high schools located greater than the 5 mile radius of the Bio-Ecology Site, is shown below.

Table 7.201: Year 1999 Comparison Correlation Matrix Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Greater Than the 5-mile Radius of the Bio-Ecology Site.

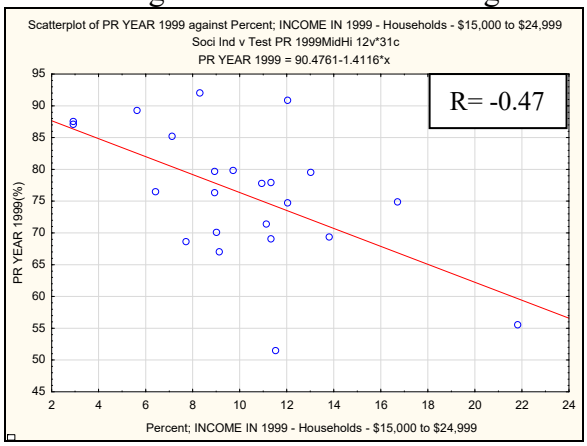
	Spearman Rank Order Correlations (Soci Ind v Test PR 1999MidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 1999
Percent; Household Income - Less than $10,000	1.00	0.75	0.92	0.85	0.73	0.05	0.54	0.63	0.29	-0.40
Percent; Household Income - $10,000 to $14,999	0.75	1.00	0.70	0.76	0.58	0.17	0.60	0.67	0.53	-0.35
Percent; Household Income - $15,000 to $24,999	0.92	0.70	1.00	0.88	0.73	0.07	0.61	0.63	0.30	-0.47
Percent; Families - Percent Below Poverty Level	0.85	0.76	0.88	1.00	0.91	0.12	0.59	0.62	0.34	-0.39
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.73	0.58	0.73	0.91	1.00	0.09	0.44	0.44	0.15	-0.44
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.05	0.17	0.07	0.12	0.09	1.00	0.41	0.03	-0.24	-0.34
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.54	0.60	0.61	0.59	0.44	0.41	1.00	0.77	0.07	-0.25
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.63	0.67	0.63	0.62	0.44	0.03	0.77	1.00	0.54	-0.40
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.29	0.53	0.30	0.34	0.15	-0.24	0.07	0.54	1.00	-0.26
Percent; Standardized Test Passing Rate for Year 1999	-0.40	-0.35	-0.47	-0.39	-0.44	-0.34	-0.25	-0.40	-0.26	1.00

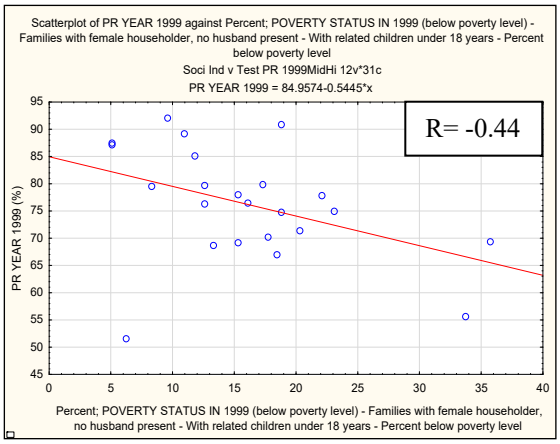
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located greater than the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrices, above, there is a weak negative significant relationship between the standardized test passing rates and the percentage of households with income from $15,000 to the $24,999 per year and the percentage of single mother households. This indicates that households with low income and single mother households contribute to lower standardized test passing rates. The significant relationships are weaker, in the comparison group, than in the middle and high schools located within the 5-mile radius of the Sampson Horrice Site. This may be due to a lower percentage of low income households and a lower percentage of housing units built before the Year 1970.

The significant bivariate graphs are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.290-Graph 7.291: Year 1999 Bio-Ecology Comparison Group Plots of Significant Relationships between the Socioeconomic Indicators vs. the Standardized Test Passing Rates for Middle and High Schools





Based on the bivariate graphs, as the percentage of households with low income and the percentage single mother households increase, the standardized test passing rate, decrease.

7.2.11.3: Year 2000 Socioeconomic Indicators vs. the Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the Bio-Ecology Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the 5-mile radius of the Bio-Ecology Site. The data table of the socioeconomic indicators and the standardized test passing rates, for middle and high schools, located within the 5 mile radius of the Bio-Ecology Site, is depicted below.

Table 7.202: Year 2000 Socioeconomic Indicators vs. Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Superfund Site's 5-mile Radius

			Bio-Ecology Year 2000 Socioeconomic Indicators and Middle and High School Test Passing Rates									
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2000 Percent
GRAND PRAIRIE ISD	FANNIN MIDDLE	75050	7.5	5.9	13.8	10.6	35.7	17.8	15.9	21.3	1.9	64.4
DALLAS ISD	MOISES MOLINA H S	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	61.1
IRVING ISD	NIMITZ HS	75060	6.6	5.3	12.5	9.1	19.1	23.6	21.6	27.4	3.4	84.9
DALLAS ISD	RAUL QUINTANILLA MIDDLE	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	53.8
DALLAS ISD	LV STOCKARD MIDDLE	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	56.4
DALLAS ISD	EDISON LEARNONG CENTER	75212	28.5	10.7	14.5	34.9	63.2	13.6	18.2	41.7	7.4	56.6
IRVING ISD	BOWIE MIDDLE	75060	6.6	5.3	12.5	9.1	19.1	23.6	21.6	27.4	3.4	77.4
DALLAS ISD	JUSTIN F KIMBALL HS	75233	7.7	8.8	16.8	17.3	31.2	23.6	38.1	22.9	1.3	74.2
DALLAS ISD	TW BROWNE MIDDLE	75233	7.7	8.8	16.8	17.3	31.2	23.6	38.1	22.9	1.3	52.1
DALLAS ISD	LG PINKSTON HS	75212	28.5	10.7	14.5	34.9	63.2	13.6	18.2	41.7	7.4	71.8
											Average	**65.3**

The school district name, the school name, and the zip codes the schools are located in are shown on the left side of the table and the socioeconomic indicators and the standardized test passing rates are shown across the top of the table. Based on the table,

the average standardized test passing rate, for middle and high schools, located within the 5-mile radius of Bio-Ecology Site, is 65.3%. The average test passing rate could be low due to the prospective students residing in housing units constructed before the Year 1970, resulting to exposure to indoor lead based paint. In addition, the prospective students could have been exposed to lead in the leachate of the leaking drums from the class 1 waste facility, when the prospective students were children (before the Year 1978). In addition, the prospective students could have been exposed to the lead smelter of the RSR Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data distribution of the data set not being normal and due to a few number of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for the middle and high schools, located within the 5 mile radius of the Bio-Ecology Site, is shown below.

Table 7.203:Year 2000 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the Bio-Ecology Site

	Spearman Rank Order Correlations (Bio-E vs Test PR 2000 MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2000
Percent; Household Income - Less than $10,000	1.00	0.77	0.45	1.00	0.97	-0.93	-0.07	0.86	0.59	-0.51
Percent; Household Income - $10,000 to $14,999	0.77	1.00	0.45	0.77	0.66	-0.54	0.16	0.47	-0.02	-0.42
Percent; Household Income - $15,000 to $24,999	0.45	0.45	1.00	0.45	0.33	-0.19	0.79	0.13	0.34	-0.71
Percent; Families - Percent Below Poverty Level	1.00	0.77	0.45	1.00	0.97	-0.93	-0.07	0.86	0.59	-0.51
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.97	0.66	0.33	0.97	1.00	-0.98	-0.26	0.83	0.62	-0.47
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.93	-0.54	-0.19	-0.93	-0.98	1.00	0.38	-0.88	-0.69	0.36
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.07	0.16	0.79	-0.07	-0.26	0.38	1.00	-0.24	-0.03	-0.35
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.86	0.47	0.13	0.86	0.83	-0.88	-0.24	1.00	0.74	-0.17
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.59	-0.02	0.34	0.59	0.62	-0.69	-0.03	0.74	1.00	-0.30
Percent; Standardized Test Passing Rate for Year 2000	-0.51	-0.42	-0.71	-0.51	-0.47	0.36	-0.35	-0.17	-0.30	1.00

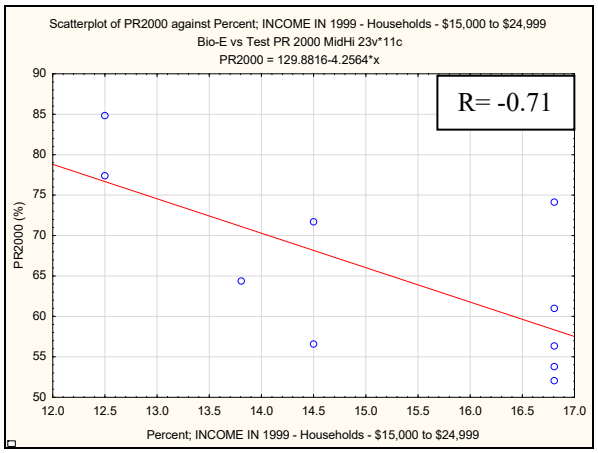
Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there is a strong negative significant relationship between the standardized test passing rates and the percentage of households with income from $15,000 to the $24,999 per year. The negative relationship could be due to socioeconomic indicators negatively affecting the student standardized passing rates for middle and high schools located within the 5 mile radius of the Bio-Ecology

Site. In addition, the negative relationship could be a result of the middle and high schools located in close proximity of the Bio-Ecology Site.

The significant bivariate regression is shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.292: Year 2000 Bio-Ecology Plots of Significant Relationships between the Socioeconomic Indicators vs. the Standardized Test Passing Rates for Middle and High Schools, Located Within the 5-mile Radius of the Bio-Ecology Site



Based on the above regression, as the percentages of households with income between $15,000 to $24,999 increase, the standardized test passing rate decreases. Therefore lo income households could reside cheaper housing units constructed before the Year 1970, resulting in indoor lead poisoning.

7.2.11.4 Bio-Ecology Year 2000 Comparison Group Socioeconomic Indicators vs Standardized Test Passing Rate Analysis for Middle and High Schools Located Greater than the Bio-Ecology Site's 5 Mile Radius (Comparison Group).

The comparison group analysis identifies trends in the data, for the middle and high schools, located within the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, to the middle and high schools located greater than the 5- mile radius of the Bio-Ecology Site. A table depicting the socioeconomic indicators and the standardized test passing rates for middle and high schools located greater than the Bio-Ecology 5 mile radius, is shown below.

Table 7.204: Year 2000 Comparison of Socioeconomic Indicators vs. Test Passing Rates for Middle and High Schools Located Greater than Bio-Ecology Superfund Site's 5-mile Radius

	Year 2000 Socioeconomic Indicators and Standardized Test Passing Rate for Middle/High Schools Greater than 5 Miles from Bio-Ecology Site											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2000 Percent
CARROLLTON-FARMERS BRANCH ISD	SMITH H S	75006	3.6	3.1	9.7	5.7	17.3	31.2	13.8	7.6	0.6	81.1
CARROLLTON-FARMERS BRANCH ISD	LONG MIDDLE	75287										91.2
CEDAR HILL ISD	CEDAR HILL H S	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	79.2
CEDAR HILL ISD	BESSIE COLEMAN MIDDLE	75104	2.7	2.8	6.4	4.2	16.1	15.5	3.3	3.3	1.3	
COPPELL ISD	COPPELL MIDDLE WEST	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	90.1
COPPELL ISD	COPPELL H S	75019	1.5	1.0	2.9	1.4	5.1	6.3	1.4	0.7	0.2	92.1
DALLAS ISD	W T WHITE H S	75244	4.1	3.8	11.1	5.5	20.3	33.9	35.4	6.3	0.0	74.4
DUNCANVILLE ISD	WILLIAM H BYRD MIDDLE SCH	75137	3.0	1.5	7.7	2.6	13.3	36.2	9.9	5.2	0.8	66.2
DUNCANVILLE ISD	DUNCANVILLE H S	75116	4.7	4.6	13.0	5.2	8.3	40.7	28.8	10.0	1.6	87.0
FERRIS ISD	FERRIS H S	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	93.5
FERRIS ISD	FERRIS J H	75125	6.4	4.8	12.0	8.5	18.8	11.8	11.4	9.5	9.4	71.0
GARLAND ISD	LYLES MIDDLE	75043	4.1	3.6	9.1	4.9	18.4	40.2	8.0	1.7	0.2	67.1
GARLAND ISD	GARLAND H S	75040	4.7	3.4	9.0	6.7	17.7	27.9	17.2	14.0	1.1	70.7
GRAND PRAIRIE ISD	HARRY S TRUMAN MIDDLE	75052	3.5	2.2	7.1	3.7	11.8	24.3	4.6	1.3	0.4	84.4
IRVING ISD	LADY BIRD JOHNSON MIDDLE	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	
LANCASTER ISD	LANCASTER H S	75134	7.2	5.3	10.9	9.2	22.1	24.6	17.5	15.1	1.2	75.6
LANCASTER ISD	LANCASTER MIDDLE	75146	5.1	3.4	11.5	3.8	6.2	17.5	8.9	14.5	5.0	56.0
LEWISVILLE ISD	FLOWER MOUND H S	75022										97.0
LEWISVILLE ISD	HEDRICK MIDDLE SCHOOL	75067										84.5
MESQUITE ISD	NORTH MESQUITE H S	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	79.3
MESQUITE ISD	VANSTON MIDDLE	75150	5.1	3.6	11.3	4.7	15.3	19.6	17.7	10.4	0.3	73.9
PLANO ISD	FRANKFORD MIDDLE	75252	4.7	2.6	8.3	3.5	9.6	6.2	1.1	0.2	0.1	94.6
RICHARDSON ISD	RICHARDSON H S	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	77.1
RICHARDSON ISD	RICHARDSON NORTH J H	75080	3.9	3.8	8.9	4.2	12.6	20.3	35.9	17.3	0.8	81.9
SUNNYVALE ISD	SUNNYVALE H S	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
SUNNYVALE ISD	SUNNYVALE MIDDLE	75182	2.7	4.4	2.2	2.5	0.0	22.7	5.7	6.3	3.1	
RICHARDSON ISD	PARKHILL J H	75248	3.0	3.2	5.6	1.6	10.9	45.7	11.9	1.1	0.0	93.2
DALLAS ISD	BRYAN ADAMS H S	75231	11.1	6.5	21.8	18.0	33.7	43.4	17.1	4.9	0.6	79.1
LEWISVILLE ISD	LEWISVILLE H S	75067										86.0
GRAND PRAIRIE ISD	GRAND PRAIRIE H S	75050	7.5	5.9	13.8	10.6	35.7	17.8	15.9	21.3	1.9	74.4
IRVING ISD	IRVING H S	75061	6.9	5.8	16.7	10.7	23.1	17.3	21.0	23.0	2.1	79.8
											Average	80.8

The school district name, the school name, and the zip codes the schools are located in are shown on the left side of the table and the socioeconomic indicators and the standardized test passing rates are shown across the top of the table. Based on the above table, the average standardized test passing rate, for the middle and high schools, located greater than the 5-mile radius of the Bio-Ecology Site is 80.8%. The average standardized test passing rates for the middle and high schools located within the Bio-Ecology Site's 5-mile radius is 65.3%. This is approximately a 16-point difference. The difference might be due to lower percentages of low-income families, families below poverty level, and housing units constructed before the Year 1970.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data distribution of the data set not being normal and due to ta low number of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates, for the middle and high schools located within the 5 mile radius of the Bio-Ecology Site, is shown below.

Table 7.205: Year 2000 Comparison Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Greater Than the 5-mile Radius of the Bio-Ecology Site

	Spearman Rank Order Correlations (Soci Ind vs Test PR 2000 MidHi) MD pairwise deleted Marked correlations are significant at p <.05000									
Variable	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2000
Percent; Household Income - Less than $10,000	1.00	0.75	0.92	0.85	0.73	0.05	0.54	0.63	0.29	-0.28
Percent; Household Income - $10,000 to $14,999	0.75	1.00	0.70	0.76	0.58	0.17	0.60	0.67	0.53	-0.21
Percent; Household Income - $15,000 to $24,999	0.92	0.70	1.00	0.88	0.73	0.07	0.61	0.63	0.30	-0.30
Percent; Families - Percent Below Poverty Level	0.85	0.76	0.88	1.00	0.91	0.12	0.59	0.62	0.34	-0.29
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.73	0.58	0.73	0.91	1.00	0.09	0.44	0.44	0.15	-0.38
Percent; Housing Units- YEAR BUILT - 1970 to 1979	0.05	0.17	0.07	0.12	0.09	1.00	0.41	0.03	-0.24	-0.27
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.54	0.60	0.61	0.59	0.44	0.41	1.00	0.77	0.07	-0.19
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.63	0.67	0.63	0.62	0.44	0.03	0.77	1.00	0.54	-0.41
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.29	0.53	0.30	0.34	0.15	-0.24	0.07	0.54	1.00	-0.27
Percent; Standardized Test Passing Rate for Year 2000	-0.28	-0.21	-0.30	-0.29	-0.38	-0.27	-0.19	-0.41	-0.27	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located greater than the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there are no significant relationships between the socioeconomic indicators and the standardized test passing rates for middle and high schools, locate greater than the 5-mile radius of the Bio-Ecology Site. Therefore, the socioeconomic indicators do not affect the standardized test passing rates.

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Unfortunately, this analysis could not be completed due to no significant relationships between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the Bio-Ecology Sites 5 mile radius.

7.2.11.5 Year 2001 Socioeconomic Indicators vs. the Test Passing Rates for Middle and High Schools Located Within the 5-Mile Radius of the Bio-Ecology Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the 5-mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the standardized test passing rates, for the middle and high schools locates within a 5-mile of the Bio-Ecology Site, is shown below.

Table 7.206: Year 2001 Socioeconomic Indicators vs. Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Superfund Site's 5-mile Radius

	Bio-Ecology Year 2001 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2001 Percent
GRAND PRAIRIE ISD	FANNIN MIDDLE	75050	10.6	7.5	5.9	13.8	35.7	17.8	15.9	21.3	1.9	66.7
DALLAS ISD	MOISES MOLINA H S	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	61.9
IRVING ISD	NIMITZ HS	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	85.0
DALLAS ISD	RAUL QUINTANILLA MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	67.1
DALLAS ISD	LV STOCKARD MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	62.7
DALLAS ISD	EDISON LEARNONG CENTER	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	62.4
IRVING ISD	BOWIE MIDDLE	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	78.0
DALLAS ISD	JUSTIN F KIMBALL HS	75233	17.3	7.7	8.8	16.8	31.2	23.6	38.1	22.9	1.3	76.4
DALLAS ISD	TW BROWNE MIDDLE	75233	17.3	7.7	8.8	16.8	31.2	23.6	38.1	22.9	1.3	62.5
DALLAS ISD	LG PINKSTON HS	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	74.1
											Average	**69.7**

The school district name, the school name, and the zip codes the schools are located in are shown on the left side of the table and the socioeconomic indicators and the standardized test passing rates are shown across the top of the table. Based on the above table, the average standardized test passing rate, for middle and high schools, located within the 5-mile radius of the Bio-Ecology Site, 69.7%. The average test passing rate could be low due to the prospective students residing in housing units constructed before the Year 1970, resulting in indoor lead exposure. In addition, the prospective students could have been exposed to lead in the leachate of the leaking drums from the class 1 waste facility, when the prospective students were children (before the Year 1978).

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data distribution of the data set not being normal and due to a few number of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for the middle and high schools located within the 5 mile radius of the Bio-Ecology Site, is shown below.

Table 7.207:Year 2001 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the Bio-Ecology Site

	Spearman Rank Order Correlations (Bio-E vs Test PR 2001 MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2001
Percent; Families - Percent Below Poverty Level	1.00	1.00	0.77	0.45	0.97	-0.93	-0.07	0.86	0.59	-0.58
Percent; Household Income - Less than $10,000	1.00	1.00	0.77	0.45	0.97	-0.93	-0.07	0.86	0.59	-0.58
Percent; Household Income - $10,000 to $14,999	0.77	0.77	1.00	0.45	0.66	-0.54	0.16	0.47	-0.02	-0.45
Percent; Household Income - $15,000 to $24,999	0.45	0.45	0.45	1.00	0.33	-0.19	0.79	0.13	0.34	-0.55
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.97	0.97	0.66	0.33	1.00	-0.98	-0.26	0.83	0.62	-0.59
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.93	-0.93	-0.54	-0.19	-0.98	1.00	0.38	-0.88	-0.69	0.51
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.07	-0.07	0.16	0.79	-0.26	0.38	1.00	-0.24	-0.03	-0.10
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.86	0.86	0.47	0.13	0.83	-0.88	-0.24	1.00	0.74	-0.27
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.59	0.59	-0.02	0.34	0.62	-0.69	-0.03	0.74	1.00	-0.35
Percent; Standardized Test Passing Rate for Year 2001	-0.58	-0.58	-0.45	-0.55	-0.59	0.51	-0.10	-0.27	-0.35	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the

matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrix, above, there are no significant relationships between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the Bio-Ecology Site's 5-mile radius. Therefore, the socioeconomic indictors in the Year 2001 do not affect the standardized passing rates for the Year 2001. In addition, the proximity of the middle and high schools to the Bio-Ecology Site do not affect the standardized test passing rates.

7.2.11.6 Bio-Ecology Year 2001 Comparison Group Socioeconomic Indicators vs. Standardized Test Passing Rate Analysis for Middle and High Schools Located Greater than the Bio-Ecology Site 5-mile Radius (Comparison Group).

The comparison group analysis identifies trends in the data, for the middle and high schools, located within the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, to the middle and high schools located greater than the 5- mile radius of the Bio-Ecology Site. Unfortunately, this analysis could not be completed due to no significant relationships between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the Bio-Ecology Site's 5 mile radius.

7.2.11.7: Year 2002 Socioeconomic Indicators vs. the Test Passing Rates for Schools Located Within the 5-Mile Radius of the Bio-Ecology Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the 5-mile radius of the Bio-Ecology Site. The table of the socioeconomic indicators and the standardized test passing rates for middle and high schools located within the 5 mile radius of the Bio-Ecology Site, is shown below.

Table 7.208 Year 2002 Socioeconomic Indicators vs. Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Superfund Site's 5-mile Radius

	Bio-Ecology Year 2002 Socioeconomic Indicators and Middle and High School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units-YEAR BUILT - 1970 to 1979	Percent; Housing Units-YEAR BUILT - 1960 to 1969	Percent; Housing Units-YEAR BUILT - 1940 to 1959	Percent; Housing Units-YEAR BUILT- 1939 or earlier	Test PR 2002 Percent
GRAND PRAIRIE ISD	FANNIN MIDDLE	75050	10.6	7.5	5.9	13.8	35.7	17.8	15.9	21.3	1.9	75.9
DALLAS ISD	MOISES MOLINA H S	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	73.9
IRVING ISD	NIMITZ HS	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	86.5
DALLAS ISD	RAUL QUINTANILLA MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	78.9
DALLAS ISD	LV STOCKARD MIDDLE	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	66.8
DALLAS ISD	EDISON LEARNONG CENTER	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	71.2
IRVING ISD	BOWIE MIDDLE	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	80.1
DALLAS ISD	JUSTIN F KIMBALL HS	75233	17.3	7.7	8.8	16.8	31.2	23.6	38.1	22.9	1.3	80.2
DALLAS ISD	TW BROWNE MIDDLE	75233	17.3	7.7	8.8	16.8	31.2	23.6	38.1	22.9	1.3	67.7
DALLAS ISD	LG PINKSTON HS	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	82.7
											Average	**76.4**

The school district name, the school name, and the zip codes the schools are located in are shown on the left side of the table and the socioeconomic indicators and the standardized test passing rates are shown across the top of the table. Based on the table, the average standardized test passing the middle and high schools, located within the 5-mile radius of the Bio-Ecology Site, is 76.4%. The average test passing rate could be low due to the prospective students residing in housing units constructed before the Year 1970, resulting in indoor lead exposure. In addition, the prospective students could have been exposed to the leachate from the Bio-Ecology Site, as well as, the lead smelter of the RSR Site.

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data distribution of the data set not being normal and due to a few number of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for the middle and high schools located within the 5 mile radius of the Bio-Ecology Site, is shown below.

Table 7.209: Year 2002 Correlation Matrix for Bio-Ecology Socioeconomic Indicators and Standardized Test Passing Rates for Middle and High Schools Located Within the 5-mile Radius of the Bio-Ecology Site.

	Spearman Rank Order Correlations (Bio-E vs Test PR 2002 MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2002
Percent; Families - Percent Below Poverty Level	1.00	1.00	0.77	0.45	0.97	-0.93	-0.07	0.86	0.59	-0.32
Percent; Household Income - Less than $10,000	1.00	1.00	0.77	0.45	0.97	-0.93	-0.07	0.86	0.59	-0.32
Percent; Household Income - $10,000 to $14,999	0.77	0.77	1.00	0.45	0.66	-0.54	0.16	0.47	-0.02	-0.22
Percent; Household Income - $15,000 to $24,999	0.45	0.45	0.45	1.00	0.33	-0.19	0.79	0.13	0.34	-0.52
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.97	0.97	0.66	0.33	1.00	-0.98	-0.26	0.83	0.62	-0.32
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.93	-0.93	-0.54	-0.19	-0.98	1.00	0.38	-0.88	-0.69	0.24
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.07	-0.07	0.16	0.79	-0.26	0.38	1.00	-0.24	-0.03	-0.24
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.86	0.86	0.47	0.13	0.83	-0.88	-0.24	1.00	0.74	-0.06
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.59	0.59	-0.02	0.34	0.62	-0.69	-0.03	0.74	1.00	-0.24
Percent; Standardized Test Passing Rate for Year 2001	-0.32	-0.32	-0.22	-0.52	-0.32	0.24	-0.24	-0.06	-0.24	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for middle and high schools, located within the 5-mile radius of the Bio-Ecology Site.

Based upon the correlation matrices, above, there are no significant relationships between the socioeconomic indicators and the standardized test passing rate for middle and high schools located within the Bio-Ecology 5 mile radius.

7.2.11.8 Bio-Ecology Socioeconomic Indicators vs. the Test Passing Rate Analysis for Elementary Schools

The Bio-Ecology socioeconomic indicators vs the test passing rate analysis determines if a significant relationship exists between socioeconomic indicators and the standardized test passing rates for elementary schools located within the Bio-Ecology Site's 5-mile radius. The socioeconomic indicators and the standardized test passing rates were evaluated from Year 1999 to Year 2002. The Year 2003 to the Year 2011 was not included in the Study due to the standardized test changed by the Texas Education Agency, in the Year 2003. The change resulted in a significant reduction in standardized test passing rates across Dallas County.

For the socioeconomic indicators vs the test passing rate analysis, the middle and high schools, were separated from the elementary schools, due to the prospective middle and high schools students having a higher possibility of being impacted by the Bio-Ecology Site's class 1 waste facility, given that the students didn't move out of the area. Elementary schools were expected to have a low possibility of lead exposure from the Bio-Ecology Site, since the site was closed and may have been cleaned up, well before the prospective elementary students would have taken the standardized test. In the Bio-Ecology socioeconomic indicators vs. test passing rate analysis, socioeconomic indicators were also evaluated to determine if socioeconomic indicators, as well as distance, effect the standardized test passing rates

The socioeconomic indicators evaluated are listed below;

- percentage of families that are below poverty level;
- percentage of female householder with children less than 18 years of age that are below poverty level;
- percentage of households with income less than $10,000 per year;
- percentage of households with income between $10,000 to $14,999;
- percentage of households with income between $15,000 to $24,999;
- percentage of housing units built the Year 1939 or earlier;
- percentage of housing units built between the Year 1940 to 1959;
- percentage of housing units built between the Year 1960 to Year 1969;
- percentage of housing units built between Year 1970 to Year 1979.

The socioeconomic indicator data was obtained, from the Year 2000 Census Data, from the uscensus.gov website. The standardized test passing rate data was obtained from the Texas Education Agency. The housing units built dates were included in the Study, due to the use of lead based paint in homes constructed before the Year 1970. The housing units built dates will provide an indication of whether indoor lead contamination, other socioeconomic indicators, and the lead smelter are the source of elevated blood lead in children.

A table that depicts the ages, the grades, and the year the prospective students would take the standardized test, in reference to the operation, closure, and cleanup activities of the Bio-Ecology Site is shown below.

Table 7.210: Prospective Students Grade and Age in Reference to the Bio-Ecology Site

Students Born 4 years before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1968
Pre-K	5	1973
5th	11	1979
6th	12	1980
8th	14	1982
9th	15	1983
12th	18	1986

Students Born 3 years before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1969
Pre-K	5	1974
5th	11	1980
6th	12	1981
8th	14	1983
9th	15	1984
12th	18	1987

Students Born 2 years before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1970
Pre-K	5	1975
5th	11	1981
6th	12	1982
8th	14	1984
9th	15	1985
12th	18	1988

Students Born 1 yr before Bio-Ecology operated		
Grade	Age(yrs)	Year
Born	0	1971
Pre-K	5	1976
5th	11	1982
6th	12	1985
8th	14	1987
9th	15	1988
12th	18	1991

Students born the Year Bio-Ecology started operation		
Grade	Age(yrs)	Year
Born	0	1972
Pre-K	5	1977
5th	11	1983
6th	12	1984
8th	14	1986
9th	15	1987
12th	18	1990

Students Born the year Bio-Ecology Closed		
Grade	Age(yrs)	Year
Born	0	1978
Pre-K	5	1983
5th	11	1989
6th	12	1990
8th	14	1992
9th	15	1993
12th	18	1996

Students Born 1 year after Bio-Ecology closed		
Grade	Age(yrs)	Year
Born	0	1979
Pre-K	5	1984
5th	11	1990
6th	12	1991
8th	14	1993
9th	15	1994
12th	18	1997

Bio_Ecology Clean -Up Start date SEE STUDENTS BOR 1 year after Bio-Ecology closed		
Grade	Age(yrs)	Year
Born	0	1980
Pre-K	5	1985
5th	11	1991
6th	12	1992
8th	14	1994
9th	15	1995
12th	18	1998

Students Born the Year Bio-Ecology Clean -Up End date		
Grade	Age(yrs)	Year
Born	0	1983
Pre-K	5	1988
5th	11	1994
6th	12	1995
8th	14	1997
9th	15	1998
12th	18	2001

7.2.11.9 Year 1999 to Year 2002 Socioeconomic Indicators vs. the Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Bio-Ecology Site.

The purpose of this analysis is to determine if a significant relationship exists between the socioeconomic indicators and the standardized test passing rates for elementary schools located within the 5-mile radius of the Bio-Ecology Site. In this analysis, there were no significant relationships for elementary schools, from the Year 1999 to the Year 2002,. Therefore, a comparison analysis was not conducted. The Year 1999 to the Year 2002

tables and correlation matrices of the socioeconomic indicators and the standardized test passing rates for elementary schools located within the Bio-Ecology Site's 5-mile radius are shown below.

Table 7.211 -Table 7.214: Year 1999 to the Year 2002 Bio-Ecology Socioeconomic Indicators vs. Test Passing Rates for Elementary Schools Located Within the Bio-Ecology Superfund Site's 5-mile Radius

	Bio-Ecology Year 1999 Socioeconomic Indicators and Elementary School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 1999 Percent
DALLAS ISD	MARY MELEOD BETHUNE EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	82.1
GRAND PRAIRIE ISD	HECTOR P GARCIA EL	75050	10.6	7.5	5.9	13.8	35.7	17.8	15.9	21.3	1.9	
DALLAS ISD	LESLIE A STEMMONS EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	71.6
DALLAS ISD	L O DONALD EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	60.2
DALLAS ISD	ANSON JONES EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	66.2
DALLAS ISD	GABE P ALLEN EL	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	86.4
GRAND PRAIRIE ISD	CROCKETT 5TH GRADE CENTER	75051	16.7	13.6	7.1	16.3	47.4	26.5	24.2	25.6	3.2	79.5
DALLAS ISD	GEORGE PEABODY EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	75.8
DALLAS ISD	STEVENS PARK EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	52.1
IRVING ISD	BRITAIN EL	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	74.6
DALLAS ISD	AMELIA EARHART	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	61.4
GRAND PRAIRIE ISD	BOWIE EL	75051	16.7	13.6	7.1	16.3	47.4	26.5	24.2	25.6	3.2	75.1
DALLAS ISD	ROSEMONT EL	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	67.1
											Average	**71.0**

	Bio-Ecology Year 2000 Socioeconomic Indicators and Elementary School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2000 Percent
DALLAS ISD	MARY MELEOD BETHUNE EL	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	73.1
GRAND PRAIRIE ISD	HECTOR P GARCIA EL	75050	7.5	5.9	13.8	10.6	35.7	17.8	15.9	21.3	1.9	59.4
DALLAS ISD	LESLIE A STEMMONS EL	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	68.3
DALLAS ISD	L O DONALD EL	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	54.0
DALLAS ISD	ANSON JONES EL	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	62.7
DALLAS ISD	GABE P ALLEN EL	75212	28.5	10.7	14.5	34.9	63.2	13.6	18.2	41.7	7.4	80.3
GRAND PRAIRIE ISD	CROCKETT 5TH GRADE CENTER	75051	13.6	7.1	16.3	16.7	47.4	26.5	24.2	25.6	3.2	62.5
DALLAS ISD	GEORGE PEABODY EL	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	74.5
DALLAS ISD	STEVENS PARK EL	75211	12.1	7.3	16.8	18.7	42.9	14.3	24.3	37.4	7.7	46.8
IRVING ISD	BRITAIN EL	75060	6.6	5.3	12.5	9.1	19.1	23.6	21.6	27.4	3.4	58.5
DALLAS ISD	AMELIA EARHART	75212	28.5	10.7	14.5	34.9	63.2	13.6	18.2	41.7	7.4	59.9
GRAND PRAIRIE ISD	BOWIE EL	75051	13.6	7.1	16.3	16.7	47.4	26.5	24.2	25.6	3.2	65.4
DALLAS ISD	ROSEMONT EL	75208	12.2	7.9	16.1	17.7	28.3	11.2	11.9	35.2	32.2	67.7
											Average	**64.1**

	Bio-Ecology Year 2001 Socioeconomic Indicators and Elementary School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2001 Percent
DALLAS ISD	MARY MELEOD BETHUNE EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	86.7
GRAND PRAIRIE ISD	HECTOR P GARCIA EL	75050	10.6	7.5	5.9	13.8	35.7	17.8	15.9	21.3	1.9	76.3
DALLAS ISD	LESLIE A STEMMONS EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	80.8
DALLAS ISD	L O DONALD EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	67.6
DALLAS ISD	ANSON JONES EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	79.8
DALLAS ISD	GABE P ALLEN EL	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	73.2
GRAND PRAIRIE ISD	CROCKETT 5TH GRADE CENTER	75051	16.7	13.6	7.1	16.3	47.4	26.5	24.2	25.6	3.2	78.3
DALLAS ISD	GEORGE PEABODY EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	80.3
DALLAS ISD	STEVENS PARK EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	57.0
IRVING ISD	BRITAIN EL	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	75.7
DALLAS ISD	AMELIA EARHART	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	54.4
GRAND PRAIRIE ISD	BOWIE EL	75051	16.7	13.6	7.1	16.3	47.4	26.5	24.2	25.6	3.2	59.8
DALLAS ISD	ROSEMONT EL	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	68.4
											Average	**72.2**

	Bio-Ecology Year 2002 Socioeconomic Indicators and Elementary School Test Passing Rates											
District Name	Campus Name	Zip Code	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Test PR 2002 Percent
DALLAS ISD	MARY MELEOD BETHUNE EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	92.7
GRAND PRAIRIE ISD	HECTOR P GARCIA EL	75050	10.6	7.5	5.9	13.8	35.7	17.8	15.9	21.3	1.9	68.0
DALLAS ISD	LESLIE A STEMMONS EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	79.2
DALLAS ISD	L O DONALD EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	70.5
DALLAS ISD	ANSON JONES EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	81.5
DALLAS ISD	GABE P ALLEN EL	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	60.0
GRAND PRAIRIE ISD	CROCKETT 5TH GRADE CENTER	75051	16.7	13.6	7.1	16.3	47.4	26.5	24.2	25.6	3.2	89.5
DALLAS ISD	GEORGE PEABODY EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	84.5
DALLAS ISD	STEVENS PARK EL	75211	18.7	12.1	7.3	16.8	42.9	14.3	24.3	37.4	7.7	64.9
IRVING ISD	BRITAIN EL	75060	9.1	6.6	5.3	12.5	19.1	23.6	21.6	27.4	3.4	75.7
DALLAS ISD	AMELIA EARHART	75212	34.9	28.5	10.7	14.5	63.2	13.6	18.2	41.7	7.4	71.7
GRAND PRAIRIE ISD	BOWIE EL	75051	16.7	13.6	7.1	16.3	47.4	26.5	24.2	25.6	3.2	80.5
DALLAS ISD	ROSEMONT EL	75208	17.7	12.2	7.9	16.1	28.3	11.2	11.9	35.2	32.2	75.5
											Average	**76.5**

The school district name, the school name, and the zip codes the schools are located in are shown on the left side of the table and the socioeconomic indicators and the standardized test passing rates are shown across the top of the table. Based on the above table, the average standardized test passing the elementary schools for the Year 1999 to the Year 2002 is 71.0%, 64.1%, 72.2%, and 76.5%, respectively. The average test passing rates could be low due to indoor lead exposure from prospective students living in housing units built before the Year 197, as well as the effects of living in close proximity of the Bio-Ecology and RSR Sites. .

The Spearman Rank Correlation Matrix was utilized to analyze the data, due to the data distribution of the data set not being normal and due to a few number of observations. The correlation matrix for the socioeconomic indicators and the standardized test passing rates for the elementary schools located within the 5 mile radius of the Bio-Ecology Site, for the Year 1999 to the Year 2002 is shown below.

Table 7.215- Table 7.218: Year 1999 to Year 2002 Correlation Matrices for Bio-Ecology Socioeconomic Indicators and Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Bio-Ecology Site.

	Spearman Rank Order Correlations (Bio-E vs Test PR 1999 Elem) **MD pairwise deleted** **Marked correlations are significant at p <.05000**									
Variable	Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 1999
Percent; Families - Percent Below Poverty Level	1.00	0.49	0.87	0.38	0.60	-0.73	0.28	0.96	0.45	-0.11
Percent; Household Income - Less than $10,000	0.49	1.00	0.61	-0.10	0.83	-0.35	-0.30	0.36	-0.06	0.24
Percent; Household Income - $10,000 to $14,999	0.87	0.61	1.00	0.17	0.43	-0.93	-0.07	0.83	0.58	-0.13
Percent; Household Income - $15,000 to $24,999	0.38	-0.10	0.17	1.00	0.08	-0.07	0.90	0.30	0.63	-0.22
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.60	0.83	0.43	0.08	1.00	-0.09	0.06	0.47	-0.27	0.26
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.73	-0.35	-0.93	-0.07	-0.09	1.00	0.17	-0.74	-0.67	0.20
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.28	-0.30	-0.07	0.90	0.06	0.17	1.00	0.28	0.41	-0.18
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.96	0.36	0.83	0.30	0.47	-0.74	0.28	1.00	0.49	-0.14
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.45	-0.06	0.58	0.63	-0.27	-0.67	0.41	0.49	1.00	-0.38
Percent; Standardized Test Passing Rate for Year 1999	-0.11	0.24	-0.13	-0.22	0.26	0.20	-0.18	-0.14	-0.38	1.00

Variable	Spearman Rank Order Correlations (Bio-E vs Test PR 2000 Elem) MD pairwise deleted Marked correlations are significant at p <.05000 Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Families - Percent Below Poverty Level	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2000
Percent; Household Income - Less than $10,000	1.00	0.61	-0.10	0.49	0.83	-0.35	-0.30	0.36	-0.06	0.37
Percent; Household Income - $10,000 to $14,999	0.61	1.00	0.17	0.87	0.43	-0.93	-0.07	0.83	0.58	0.40
Percent; Household Income - $15,000 to $24,999	-0.10	0.17	1.00	0.38	0.08	-0.07	0.90	0.30	0.63	0.14
Percent; Families - Percent Below Poverty Level	0.49	0.87	0.38	1.00	0.60	-0.73	0.28	0.96	0.45	0.34
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.83	0.43	0.08	0.60	1.00	-0.09	0.06	0.47	-0.27	0.28
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.35	-0.93	-0.07	-0.73	-0.09	1.00	0.17	-0.74	-0.67	-0.32
Percent; Housing Units- YEAR BUILT - 1960 to 1969	-0.30	-0.07	0.90	0.28	0.06	0.17	1.00	0.28	0.41	0.00
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.36	0.83	0.30	0.96	0.47	-0.74	0.28	1.00	0.49	0.29
Percent; Housing Units- YEAR BUILT- 1939 or earlier	-0.06	0.58	0.63	0.45	-0.27	-0.67	0.41	0.49	1.00	0.22
Percent; Standardized Test Passing Rate for Year 2000	0.37	0.40	0.14	0.34	0.28	-0.32	0.00	0.29	0.22	1.00

Variable	Spearman Rank Order Correlations (Bio-E vs Test PR 2001 Elem) MD pairwise deleted Marked correlations are significant at p <.05000 Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2001
Percent; Families - Percent Below Poverty Level	1.00	0.49	0.87	0.38	0.60	-0.73	0.28	0.96	0.45	-0.10
Percent; Household Income - Less than $10,000	0.49	1.00	0.61	-0.10	0.83	-0.35	-0.30	0.36	-0.06	-0.40
Percent; Household Income - $10,000 to $14,999	0.87	0.61	1.00	0.17	0.43	-0.93	-0.07	0.83	0.58	-0.23
Percent; Household Income - $15,000 to $24,999	0.38	-0.10	0.17	1.00	0.08	-0.07	0.90	0.30	0.63	0.34
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.60	0.83	0.43	0.08	1.00	-0.09	0.06	0.47	-0.27	-0.26
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.73	-0.35	-0.93	-0.07	-0.09	1.00	0.17	-0.74	-0.67	0.18
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.28	-0.30	-0.07	0.90	0.06	0.17	1.00	0.28	0.41	0.39
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.96	0.36	0.83	0.30	0.47	-0.74	0.28	1.00	0.49	-0.10
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.45	-0.06	0.58	0.63	-0.27	-0.67	0.41	0.49	1.00	0.15
Percent; Standardized Test Passing Rate for Year 2001	-0.10	-0.40	-0.23	0.34	-0.26	0.18	0.39	-0.10	0.15	1.00

Variable	Spearman Rank Order Correlations (Bio-E vs Test PR 2002 Elem) MD pairwise deleted Marked correlations are significant at p <.05000 Percent; Families - Percent Below Poverty Level	Percent; Household Income - Less than $10,000	Percent; Household Income - $10,000 to $14,999	Percent; Household Income - $15,000 to $24,999	Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	Percent; Housing Units- YEAR BUILT - 1970 to 1979	Percent; Housing Units- YEAR BUILT - 1960 to 1969	Percent; Housing Units- YEAR BUILT - 1940 to 1959	Percent; Housing Units- YEAR BUILT- 1939 or earlier	Percent; Standardized Test Passing Rate for Year 2002
Percent; Families - Percent Below Poverty Level	1.00	0.49	0.87	0.38	0.60	-0.73	0.28	0.96	0.45	-0.22
Percent; Household Income - Less than $10,000	0.49	1.00	0.61	-0.10	0.83	-0.35	-0.30	0.36	-0.06	-0.06
Percent; Household Income - $10,000 to $14,999	0.87	0.61	1.00	0.17	0.43	-0.93	-0.07	0.83	0.58	-0.29
Percent; Household Income - $15,000 to $24,999	0.38	-0.10	0.17	1.00	0.08	-0.07	0.90	0.30	0.63	0.39
Percent; Fem Household-No Husband-with Child Less 18 Years- Below Poverty	0.60	0.83	0.43	0.08	1.00	-0.09	0.06	0.47	-0.27	-0.01
Percent; Housing Units- YEAR BUILT - 1970 to 1979	-0.73	-0.35	-0.93	-0.07	-0.09	1.00	0.17	-0.74	-0.67	0.38
Percent; Housing Units- YEAR BUILT - 1960 to 1969	0.28	-0.30	-0.07	0.90	0.06	0.17	1.00	0.28	0.41	0.41
Percent; Housing Units- YEAR BUILT - 1940 to 1959	0.96	0.36	0.83	0.30	0.47	-0.74	0.28	1.00	0.49	-0.23
Percent; Housing Units- YEAR BUILT- 1939 or earlier	0.45	-0.06	0.58	0.63	-0.27	-0.67	0.41	0.49	1.00	0.08
Percent; Standardized Test Passing Rate for Year 2002	-0.22	-0.06	-0.29	0.39	-0.01	0.38	0.41	-0.23	0.08	1.00

Based on the correlation matrix, variable number one, the percentage of socioeconomic indicators, and variable number two, the percentage of standardized test passing rates, are shown along the side and across the top of the matrix. The numeric values, within the matrix, are the coefficient of correlations between each variable, or R values. These values indicate the strength of the relationship between each variable. The significant relationships are shown in red. This Study evaluates whether there is a significant relationship between the socioeconomic indicators and the standardized test passing rates for elementary schools, located within the 5-mile radius of the Bio-Ecology Site.

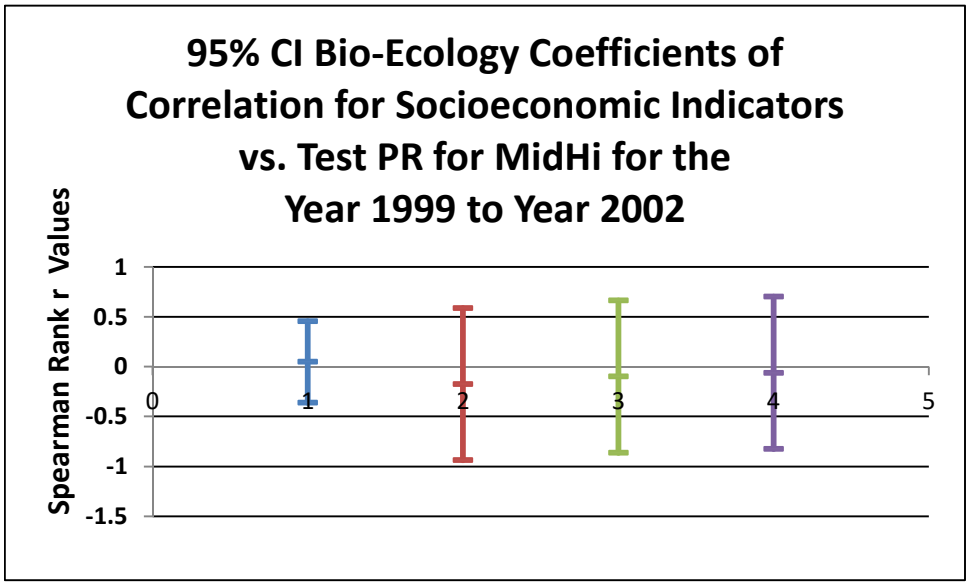
Based upon all of the correlation matrices, above, there are no significant relationships between the socioeconomic indicators and the student standardized test passing rates. This indicates that the socioeconomic indicators do not affect the standardized test passing rates of elementary schools located within the 5-,mile radius of the Bio-Ecology Site. In addition, effects of the RSR Site and the Bio-Ecology Site did not impact the standardized test passing rates.

7.2.11.10 Bio-Ecology Comparison Group Socioeconomic Indicator vs Standardized Test Passing Rate Analysis of Year 1999 to the Year 2002 for Elementary Schools Located Greater than the Bio-Ecology Site 5 Mile Radius (Comparison Analysis).

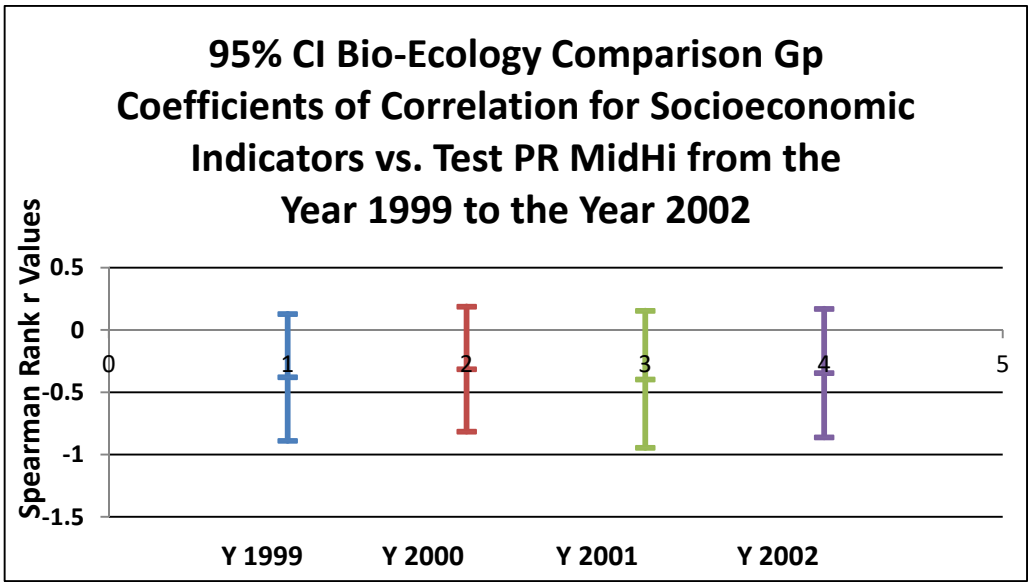
The comparison group analysis identifies trends in the data, for the middle and high schools, located within the Bio-Ecology Site's 5-mile radius, by comparing this data to the data, to the middle and high schools located greater than the 5- mile radius of the Bio-Ecology Site. However, no comparison analysis was conducted for the Year 1999 to the Year 2002 because there were no significant relationships for any of the elementary schools located within the 5 mile radius of the Bio-Ecology Site.

Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1999 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for the socioeconomic indicators vs. the standardized test passing rates, for the middle and high schools and elementary schools, located within and greater than, the 5-mile radius of the Bio-Ecology Superfund Site, are shown below.

Graph 7.293 Bio-Ecology Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.

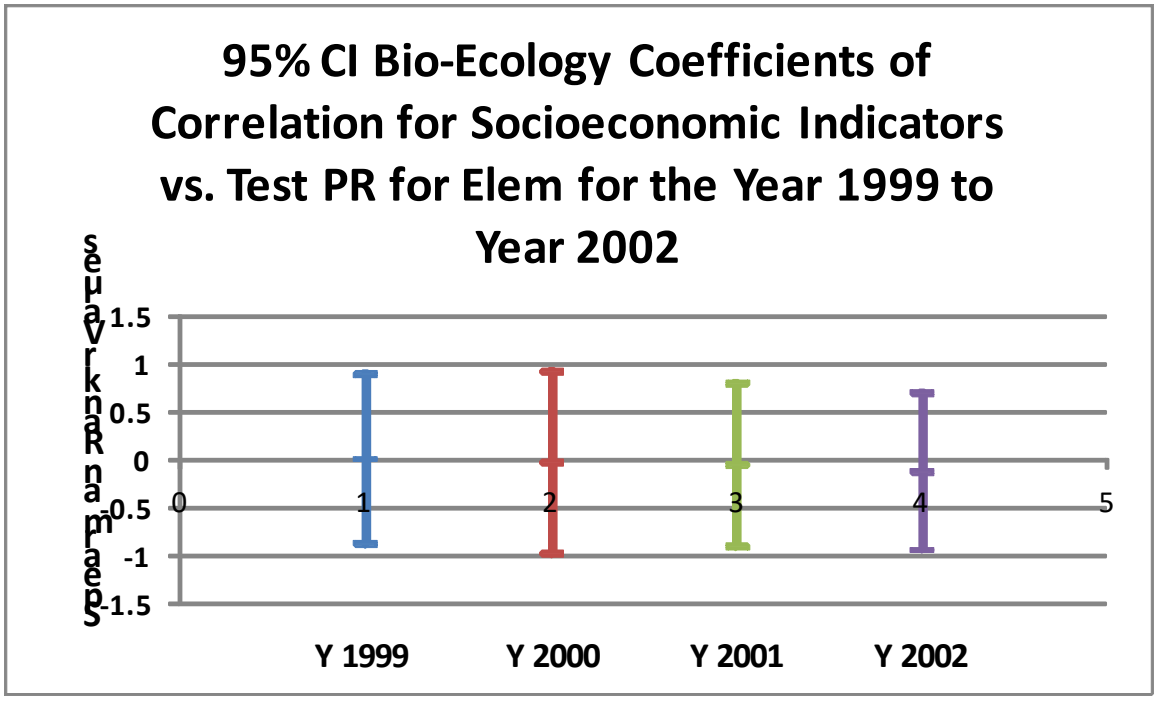


Graph 7.294: Bio-Ecology Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.

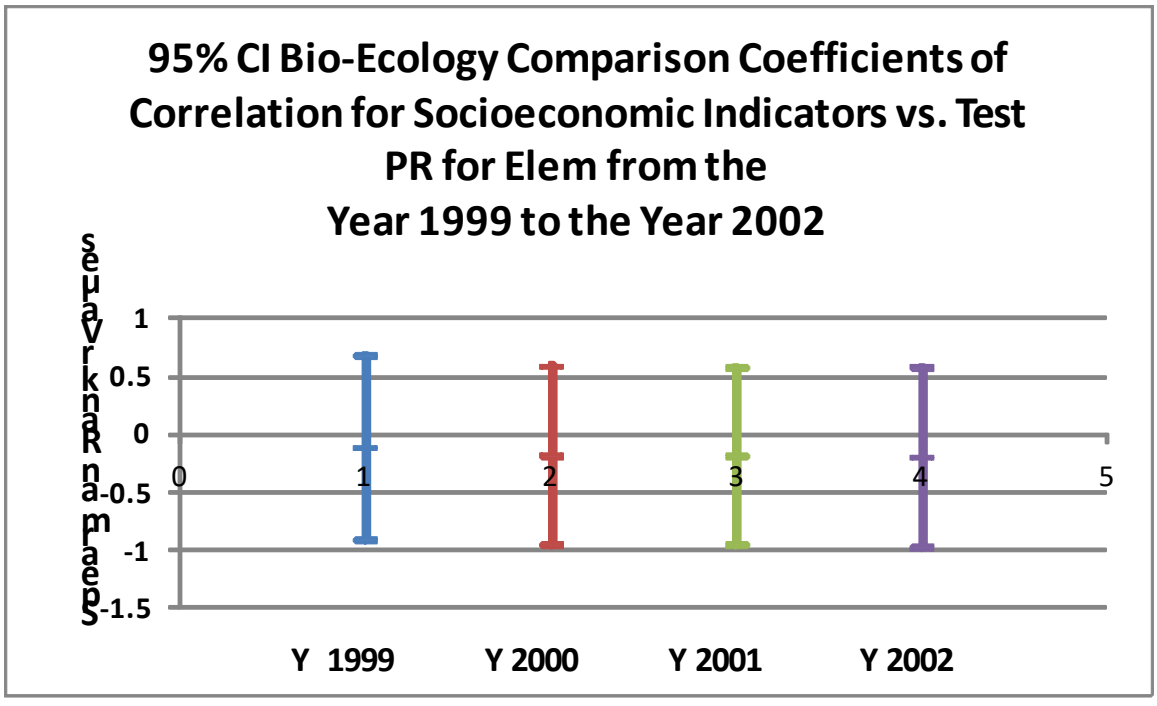


In the confidence interval graphs, there are significant coefficients of correlations, in the confidence intervals, for the Year 1999 to the Year 2000, for the middle and high schools, located within the 5-mile radius of the Bio-Ecology Site. In the comparison group, all years had significant coefficients of correlations, in the confidence intervals, except for the Year 2000.

Graph 7.295 Bio-Ecology Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002



Graph 7.296: Bio-Ecology Comparison Group Coefficient of Correlation Confidence Interval Graph for Socioeconomic Indicators vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.



In the confidence interval graphs, there were no significant coefficients of correlations, in the confidence intervals, for any years, for the middle and high schools, located within the 5-mile radius of the Bio-Ecology Site. In the comparison group, all years had significant coefficients of correlations, in the confidence intervals.

7.2.12 Bio-Ecology Childhood Blood Lead Levels vs Test Passing Rate Analysis

The childhood blood lead level vs. standardized test passing rate analysis does not include the socioeconomic indicators, but examines if there is a significant relationship between elevated childhood blood level and student standardized test passing rates.

The elevated childhood blood level was examined, for children from ages 0 yrs to 14 yrs that reside within the Bio-Ecology Site's 5-mile radius, for the Year 1999 to the Year 2002. The elevated childhood blood lead levels, that were examined, was the 10 -14 μg/dl concentration and the total overall counts (10-14 μg/dl, 15-19 μg/dl, and = or > 20 μg/dl), of elevated childhood blood lead. Other elevated childhood blood levels that were not included in the Study, individually, due extremely low quantity of counts, were the 15-19 μg/dl , and the = or > 20 μg/dl concentrations. The elevated childhood blood lead level results were evaluated from the Year 1999 to the Year 2002.

The student standardized test passing rates were evaluated from the Year 1999 to the Year 2002, for consistency with the childhood blood lead level analysis. Since the blood lead level analysis is zip code based, the standardized test passing rates were averaged per school type, per zip code, since there can be multiple schools located within a single zip code. The analysis was separated into four groups the 10-14 μg/dl counts and the total counts, of elevated blood lead levels, with the test passing rates for middle and high schools, as well as, the test passing rates for elementary schools.

A direct comparison of the unduplicated counts of elevated blood lead levels and the standardized test passing rates, could not be completed because the unduplicated total counts are measured, per zip code, per year, and the standardized test passing rates are used to measure the impacts, of lead exposure, from the earlier years of children. Therefore, an indirect comparison can be completed, under the assumption that the unduplicated counts, of elevated childhood blood lead data, from the Year 1999 to the Year 2002, are similar to the unduplicated counts, before the Year 1999. A comparison analysis was completed to compare the same data, for zip codes and schools, located greater than the Bio-Ecology Site 5-mile radius.

7.2.12.1 Bio-Ecology Year 1999 to the Year 2002 Elevated Childhood Blood Lead Level 10 -14 μg/dl vs. Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Site's 5-mile Radius.

The elevated childhood blood lead level vs the student standardized test passing rate for middle and high schools analysis was conducted to determine if there is a indirect effect of elevated childhood blood lead levels on student standardized test passing rates. The table of the elevated childhood blood lead levels and student standardized test passing rates, for middle schools and high schools, located within the Bio-Ecology Site 5 mile radius, are shown below.

TABLE 7.219 Year 1999 to the Year 2002 Bio-Ecology Elevated Childhood Blood Lead Level of 10-14 µg/dl and the Standardized Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Superfund Site's 5-mile Radius

	Bio-Ecology 10-14 ug/dl Counts of Blood Lead Levels vs Percentage Middle and High School Test Passing Rates							
Zip Code	10--14 BLL 1999 (#)	10--14 2000 (#)	10--14 BLL 2001 (#)	10--14 BLL 2002 (#)	PR1999 (%)	PR2000 (%)	PR2001 (%)	PR2002 (%)
75050	4	6	6	6	84.3	64.4	66.7	75.9
75211	20	25	33	35	60.2	57.1	63.9	73.2
75060	2	0	3	10	79.7	81.2	81.5	83.3
75212	13	32	23	28	59.2	64.2	68.3	77.0
75223	26	5	14	12	59.7	63.2	69.5	74.0
Sum/Average	**65**	**68**	**79**	**91**	**68.6**	**66.0**	**70.0**	**76.7**

The zip codes that the schools are located are shown on the left side of the table and the elevated counts of elevated blood lead level of 10-14 µg/dl and the student standardized test passing rate for middle and high schools students for the Year 1999 to the Year 2002 are shown across the top of the table**.** Based on the above table, the counts of elevated blood lead level of 10-14 µg/dl and the total counts of elevated childhood blood lead level are shown at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate is shown at the bottom of the table, as well, for the Year 1999 to the Year 2002.

For the blood lead level and the standardized test passing rate analysis, the data sets cannot be directly compared together, but indirectly together, assuming that the unduplicated counts from the Year 1999 to the Year 2002 are similar to the counts of elevated childhood blood lead data from the year before the Year 1999. In the event that the elevated counts of childhood blood lead of 10-14 µg/dl are similar to the counts from the Years before 1999, then the counts could be a result of exposure to the leachate from the Bio-Ecology Site's class 1 waste facility. The increasing standardized test passing rates could be due to negative cognitive effects from exposure to the leachate from the Bio-Ecology Site, when the prospective middle and high school student were young children, as well as socioeconomic indicators.

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not having a normal data distribution and due to the lo quantity of observations. The correlation matrix for the middle and high schools located within the Bio-Ecology 5 mile radius is shown below.

Table 7.220 Year 1999 to Year 2002 Correlation Matrix for Blood Lead Level 10-14 µg/dl and Standardized Test Passing Rates for Middle and High Schools Located Within the 5 -mile Radius of the Bio-Ecology Site.

Variable	Spearman Rank Order Correlations (Bio 10-14 BLL vs Test PR MidHi) MD pairwise deleted Marked correlations are significant at p <.05000 10--14 BLL 1999	10--14 2000	10--14 BLL 2001	10--14 BLL 2002	PR1999	PR2000	PR2001	PR2002
10--14 BLL 1999	1.00	0.30	0.70	0.60	-0.60	-0.90	-0.30	-0.80
10--14 2000	0.30	1.00	0.80	0.60	-0.50	-0.50	-0.70	-0.30
10--14 BLL 2001	0.70	0.80	1.00	0.90	-0.60	-0.90	-0.70	-0.70
10--14 BLL 2002	0.60	0.60	0.90	1.00	-0.70	-0.80	-0.40	-0.50
PR1999	-0.60	-0.50	-0.60	-0.70	1.00	0.50	-0.10	0.10
PR2000	-0.90	-0.50	-0.90	-0.80	0.50	1.00	0.60	0.90
PR2001	-0.30	-0.70	-0.70	-0.40	-0.10	0.60	1.00	0.70
PR2002	-0.80	-0.30	-0.70	-0.50	0.10	0.90	0.70	1.00

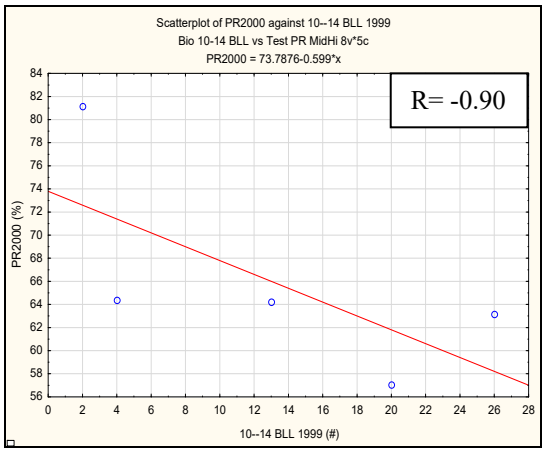
In the correlation matrix, each variable for blood lead levels and the standardized test passing rates is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

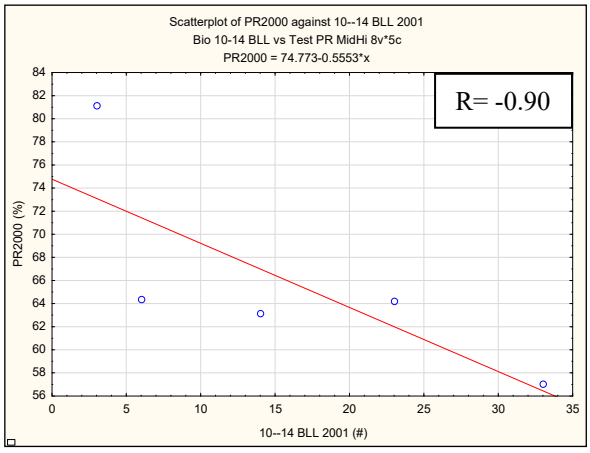
For the blood lead level and the standardized test passing rate analysis, the data sets cannot be directly compared together, but indirectly together, assuming that the unduplicated counts from the Year 1999 to the Year 2002 are similar to the counts of elevated childhood blood lead data from the year before the Year 1999. In the event that the elevated counts of childhood blood lead of 10-14 µg/dl are similar to the counts from the Years before 1999, then the counts could be a result of exposure to the leachate from the Bio-Ecology Site's class 1 waste facility.

Based upon the correlation matrix, above, there is a strong negative correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl for the Year 1999 and the percentage of standardized test passing rates for the Year 2000. In addition, there is a strong negative correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl for the Year 2001 and the standardized test passing rate for the Year 2002. In the event that the elevated counts of childhood blood lead of 10-14 µg/dl are similar to the counts from the Years before 1999, since there is no direct relationship between the variables, but an indirect relationship, then the significant relationship could be a result of exposure to the leachate from the Bio-Ecology Site's class 1 waste facility, before the site was cleaned up (before the Year 1983), as well as socioeconomic factors that negatively impacted the prospective elementary students cognitive abilities. The R value for the significant bivariate relationship for both significant relationship is -0.90. Therefore, it is highly likely that prospective middle and high students could have been exposed to the leachate, from the class 1 waste facility, when they were small children and the lead in the leachate compromised their cognitive abilities, resulting in lower student standardized test passing rates.

A graph of the significant bivariate regression is shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.297- Graph 7.298: Year 1999 to Year 2002 Bio-Ecology Plots of Significant Relationships between the Elevated Blood Lead Level 10-14 µg/dl vs. the Standardized Test Passing Rates for Middle and High Schools, Located Within the 5-mile Radius of the Bio-Ecology Site





Based on the graphs above, as the counts of the elevated blood lead level of 10-14 µg/dl increase, the standardized test passing rates decrease. Therefore, there is a direct link of counts of elevated childhood blood lead level negatively affects standardized test passing rate.

7.2.12.2 Bio-Ecology Comparison Analysis Elevated Childhood Blood Lead Level of 10-14 µg/dl of Elevated Childhood Blood Lead Level vs Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002, for Zip Codes Located Greater Than 5 miles of the Bio-Ecology Site (Comparison Group)

The comparison group of childhood blood lead level vs. student standardized test passing rate analysis is used to identify any trends in the data for middle and high schools located within the Bio-Ecology Site 5 mile radius by comparing it to childhood elevated blood lead level vs. the student standardized test passing rate for the for middle and high schools located greater than 5 miles from the Bio-Ecology Site. The table depicting the total counts of elevated childhood blood lead level vs. student standardized test passing rate for the middle and schools located greater than 5 miles from the Bio-Ecology Site is shown below.

Table 7.221: Year 1999 to the Year 2002 Bio-Ecology Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl and Standardized Test Passing Rate for Middle and High Schools Located Greater Than the 5-mile Radius of the Bio-Ecology Site

	Dallas County 10-14 ug/dl Counts of Blood Lead Levels vs Percentage Middle and High School Test Passing Rates Greater than 5 Mile Radius							
Zip Code	10--14 BLL 1999 (#)	10--14 BLL 2000 (#)	10--14 BLL 2001 (#)	10--14 BLL 2002 (#)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
75287	2	0	0	0	87.6	91.2	85.7	86.8
75104	2	2	2	2	76.6	79.2	85.1	91.2
75019	0	0	0	2	87.4	91.1	91.4	91.5
75248	0	0	0	2	89.3	93.2	96.4	92.2
75244	0	0	2	0	71.5	74.4	80.0	87.8
75137	2	0	2	0	68.7	66.2	75.6	79.2
75043	2	5	2	6	67.1	67.1	66.6	71.6
75040	2	7	10	8	70.2	70.7	71.2	77.8
75146	2	2	2	3	51.6	56.0	62.7	66.8
75150	5	5	2	4	73.6	76.6	78.0	78.8
75080	6	2	2	6	78.1	79.5	82.9	84.2
Total/ Average	**23**	**23**	**24**	**33**	**74.7**	**76.8**	**79.6**	**82.5**

The zip codes the schools are located are shown on the left side of the table and the total counts of elevated blood lead level of 10-14 µg/dl for the Year 1999 to the Year 2002, and the student standardized test passing rate for middle and high school students for the Year 1999 to the Year 2002 are shown across the top of the table. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section XYZ. The counts of elevated blood lead levels range from 23 to 33 and the average test passing rates range from 74.7 % to 82.5%.

For the childhood blood lead level vs. the student standardized test passing rate analysis, it is impossible to directly compare the unduplicated counts of elevated childhood blood lead level, per each specified year and student standardized test passing rates because the standardized test passing rates measure the effects of childhood lead exposure hen the prospective s small children. An indirect comparison of the variables can be conducted if the counts of 10-14 elevated blood lead levels, for the Year 1999 to the Year 2002, are assumed to be similar to the counts of elevated blood lead level of 10-14 µg/dl in the years prior to the Year 1999. Unfortunately, childhood blood lead data is not available from before the Year 1999 from the Texas Department of Health.

Based on the table above, the counts of elevated childhood blood lead level of 10-14 µg/dl are significantly lower than the counts of elevated childhood blood lead level for the middle and high schools that are located within the Bio-Ecology Site 5 mile radius. The significant difference in the counts of elevated childhood blood lead level of 10-14 µg/dl could be due a lower percentage of low income households, a lower percentage of families below poverty level, as well as a lower percentage of housing units constructed before the Year 1970. These lower percentages in these socioeconomic indicators result in fewer cases in childhood elevated blood lead exposure.

In addition, the student standardized test passing rates are significantly higher, for middle and high schools located greater than the 5 mile radius of the Bio-Ecology Site, than the student standardized test passing rate for the middle and high schools located within the 5 mile radius of the Bio-Ecology Site. The difference could be due to lower percentages of housing units constructed before the Year 1970, which reduces the amount of prospective students exposed to indoor lead, as well as these schools not being located in close proximity to the Bio-Ecology Site.

The Spearman Rank correlation matrix was utilized to analyze the data as an effort to provide consistent data analysis methods and due to the data set not having a normal

distribution. The correlation matrix for the total counts of elevated childhood blood lead level and the percentage of student standardized test passing rates for the middle and high schools located greater than 5 miles from the Bio-Ecology Site is shown below.

Table 7.222: Year 1999 to the Year 2002 Bio-Ecology Correlation Matrix for Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl vs. Standardized Test Passing Rates for Middle and High Schools Located Greater Than The 5-mile Radius of the Bio-Ecology Site.

	Spearman Rank Order Correlations (10-14 BLL vs Test PR MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	10--14 BLL 1999	10--14 BLL 2000	10--14 BLL 2001	10--14 BLL 2002	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
10--14 BLL 1999	1.00	0.61	0.46	0.51	-0.20	-0.23	-0.40	-0.57
10--14 BLL 2000	0.61	1.00	0.74	0.88	-0.43	-0.42	-0.62	-0.69
10--14 BLL 2001	0.46	0.74	1.00	0.54	-0.72	-0.72	-0.77	-0.66
10--14 BLL 2002	0.51	0.88	0.54	1.00	-0.27	-0.22	-0.44	-0.54
PR YEAR 1999	-0.20	-0.43	-0.72	-0.27	1.00	0.96	0.92	0.77
PR YEAR 2000	-0.23	-0.42	-0.72	-0.22	0.96	1.00	0.95	0.81
PR YEAR 2001	-0.40	-0.62	-0.77	-0.44	0.92	0.95	1.00	0.95
PR YEAR 2002	-0.57	-0.69	-0.66	-0.54	0.77	0.81	0.95	1.00

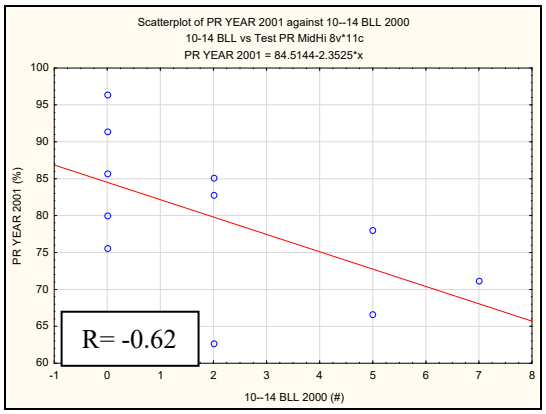
In the correlation matrix, each variable for blood lead levels and the standardized test passing rates is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

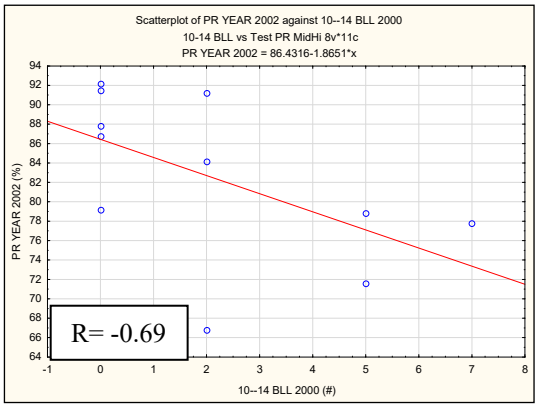
Based upon the correlation matrix, above, there is a strong negative correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl for the Year 2000 and the percentage of standardized test passing rates for the Year 2001 and the Year 2002 for middle and high schools. In addition, there is a strong negative correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl for the Year 2001 and the percentage of standardized test passing rates for the Year 1999, the Year 2000, the Year 2001 and the Year 2002 for middle and high schools. For the childhood blood lead level vs. the student standardized test passing rate analysis, it is impossible to directly compare the unduplicated counts of elevated childhood blood lead level, per each specified year and student standardized test passing rates because the standardized test passing rates measure the effects of childhood lead exposure hen the prospective s small children. An indirect comparison of the explanatory and the response variables can be conducted if the counts of 10-14 elevated blood lead levels, for the Year 1999 to the Year 2002, are

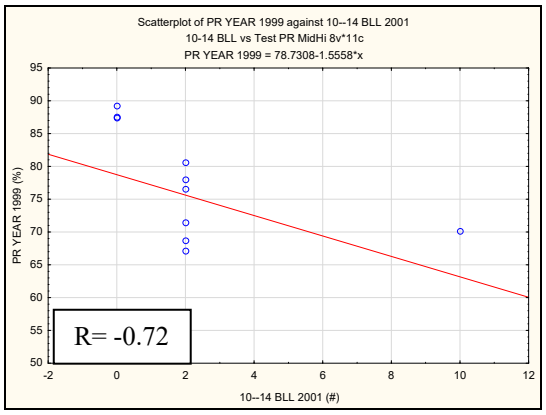
assumed to be similar to the counts of elevated blood lead level of 10-14 µg/dl in the years prior to the Year 1999. In the event that the counts of elevated blood lead level is similar, the significant relationships might be due to lower percentages of households with low income and that are below the poverty level, as well as a lower percentage of housing units constructed before the Year 1970, which resulted in few cases of indoor lead exposure and higher standardized test passing rates.

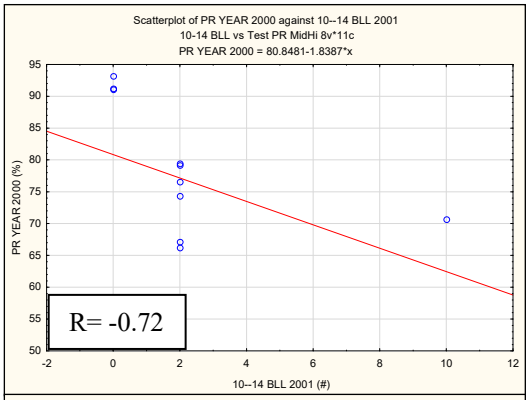
The significant bivariate graphs are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

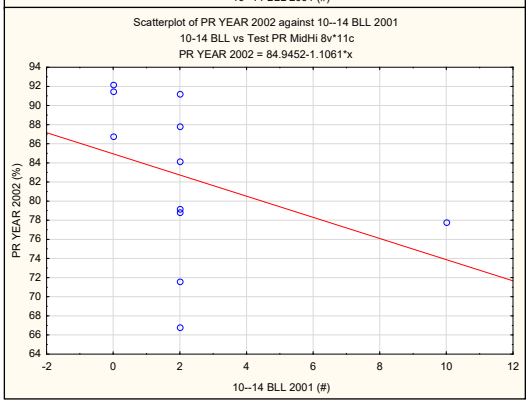
Graph 7.299- Graph 7.304: Year 1999 to Year 2002 Bio-Ecology Comparison Group Plots of Significant Relationships between the Elevated Blood Lead Level 10-14 µg/dl vs. the Standardized Test Passing Rates for Middle and High Schools

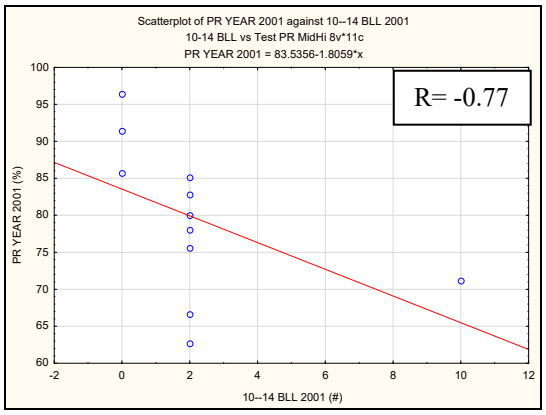












R= -0.66

Based on the graphs above, as the counts of elevated childhood blood lead level of 10-14 µg/dl increases, the standardized test passing rates for middle and high schools decreases. Therefore, counts of blood lead level negatively impacts standardized test passing rates.

7.2.12.3 Bio-Ecology Year 1999 to the Year 2002 Total Counts of Total Counts of Elevated Childhood Blood Lead Level vs. Test Passing Rates for Middle and High Schools, Located Within the Bio-Ecology Site's 5-mile Radius.

The elevated childhood blood lead level vs the student standardized test passing rate for middle and high schools analysis was conducted to determine if there is a direct effect of elevated childhood blood lead levels on student standardized test passing rates. The table of the total counts of elevated childhood blood lead levels and student standardized test passing rates, for elementary schools, located within the Bio-Ecology Site 5 mile radius, are shown below.

TABLE 7.223: Year 1999 to the Year 2002 Bio-Ecology Total Counts Elevated Childhood Blood Lead Level and the Standardized Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Superfund Site's 5-mile Radius

	Bio-Ecology Total Counts Blood Lead Levels vs Percentage Middle and High School Test Passing Rates							
Zip Code	Total BLL 1999(#)	Total BLL 2000 (#)	Total BLL 2001 (#)	Total BLL 2002 (#)	PR1999 (%)	PR2000 (%)	PR2001 (%)	PR2002 (%)
75050	7	6	6	10	84.3	64.4	66.7	75.9
75211	28	37	47	47	60.2	57.1	63.9	73.2
75060	2	0	5	21	79.7	81.2	81.5	83.3
75212	17	38	30	37	59.2	64.2	68.3	77.0
75223	34	5	14	20	59.7	63.2	69.5	74.0
Sum/Average	**88**	**86**	**102**	**135**	**68.6**	**66.0**	**70.0**	**76.7**

The zip codes that the schools are located are shown on the left side of the table and the elevated total counts of elevated blood lead level for the Year 1999 to the Year 2002, and the student standardized test passing rate for the elementary school students for the Year 1999 to the Year 2002 are shown across the top of the table**.** Based on the above table, the total counts of elevated blood lead level from the Year 1999 to the Year 2002 and. the student average standardized test passing rate is shown at the bottom of the table, for the Year 1999 to the Year 2002.

For the blood lead level and the standardized test passing rate analysis, the data sets can not be directly compared together, but indirectly together, assuming that the unduplicated counts from the Year 1999 to the Year 2002 are similar to the counts of elevated childhood blood lead data from the year before the Year 1999. In the event that the elevated total counts of childhood blood lead are similar to the counts from the Years before 1999, then the counts could be a result of exposure to the leachate from the Bio-Ecology Site is leaking drums from the class l waste facility and socioeconomic factors. The increasing standardized test passing rates could be due to negative cognitive effects from exposure to the leachate from the Bio-Ecology Site, when the prospective middle and high school student were young children, as well as socioeconomic indicators.

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not being normal as well as there being a few number of observations in the data set. The Spearman Rank correlation matrix for elementary students located within the Bio-Ecology 5 mile radius for the Year 1999 to the Year 2002, is shown below.

Table 7.224 Year 1999 to the Year 2002 Correlation Matrix of Total Counts of Elevated Childhood Blood Lead Levels vs. Standardized Test Passing Rates for Middle and High Schools Located Within the Bio-Ecology Superfund Site's 5-mile Radius

	Spearman Rank Order Correlations (Bio Total BLL vs Test PR MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	Total BLL 1999	Total BLL 2000	Total BLL 2001	Total BLL 2002	PR1999	PR2000	PR2001	PR2002
Total BLL 1999	1.00	0.30	0.70	0.20	-0.60	-0.90	-0.30	-0.80
Total BLL 2000	0.30	1.00	0.80	0.50	-0.50	-0.50	-0.70	-0.30
Total BLL 2001	0.70	0.80	1.00	0.70	-0.60	-0.90	-0.70	-0.70
Total BLL 2002	0.20	0.50	0.70	1.00	-0.50	-0.50	-0.30	-0.20
PR1999	-0.60	-0.50	-0.60	-0.50	1.00	0.50	-0.10	0.10
PR2000	-0.90	-0.50	-0.90	-0.50	0.50	1.00	0.60	0.90
PR2001	-0.30	-0.70	-0.70	-0.30	-0.10	0.60	1.00	0.70
PR2002	-0.80	-0.30	-0.70	-0.20	0.10	0.90	0.70	1.00

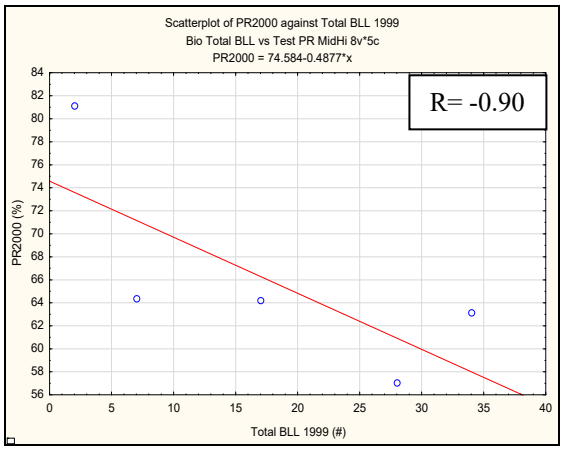
In the correlation matrix, each variable for blood lead levels and the standardized test passing rates is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

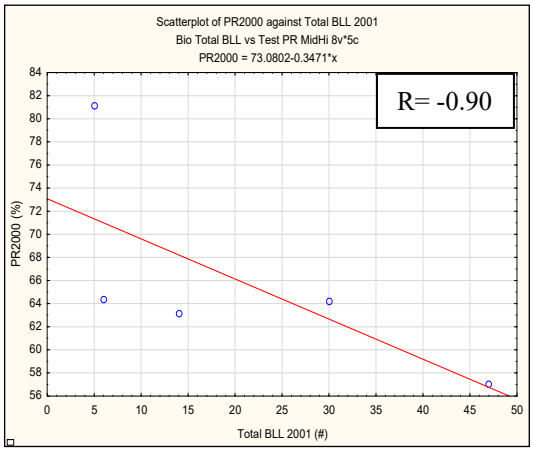
Based upon the correlation matrix, above, there is a strong negative correlation between the total counts of elevated childhood blood lead level for the Year 1999 and the percentage of standardized test passing rates for the Year 2000. In addition, there is a strong negative correlation between the total counts of elevated childhood blood lead level for the Year 2001 and the percentage of standardized test passing rates for the Year 2000. In the event that these elevated total counts of childhood blood lead of are similar

to the counts from the Year before the Year 1999, since there is no direct relationship between the variables, but an indirect relationship, then the significant relationship could be a result of exposure to the leachate from the Bio-Ecology Site's class 1 waste facility, before the site was cleaned up (before the Year 1983), as well as, socioeconomic factors that negatively impacted the prospective middle and high school students cognitive abilities. The R value for both significant bivariate relationships is -0.90. Therefore, it is highly likely that prospective middle and high school students could have been exposed to the leachate, from the Bio-Ecology class 1 waste facility, when they were small children and the lead in the leachate compromised their cognitive abilities, resulting in lower student standardizes test passing rates.

A graph of the significant bivariate regression is shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.305- Graph 7.306: Year 1999 to Year 2002 Bio-Ecology Plots of Significant Relationships between the Total Counts of Elevated Blood Lead Levels vs. the Standardized Test Passing Rates for Middle and High Schools





Based on the graph above, assuming that the total counts of elevated childhood blood lead level counts, for the Year 1999 and the Year 2001, are similar to the total counts of elevated childhood blood lead levels before the Year 1999, as the total counts of elevated childhood blood lead levels increases, the student standardized test passing rates decreases. This chart indicates that counts of childhood elevated blood lead level negatively affect prospective student's standardized test passing rates.

7.2.12.4 Bio-Ecology Year 1999 to the Year 2002 Comparison Analysis of Total Counts of Elevated Childhood Blood Lead Levels vs. Test Passing Rates for Middle and High Schools Located Greater Than the 5-mile Radius of the Bio-Ecology Site (Comparison Group)

The comparison group of childhood blood lead level vs. student standardized test passing rate analysis is used to identify any trends in the data for elementary schools located within the Bio-Ecology Site 5 mile radius by comparing it to childhood elevated blood lead level vs. the student standardized test passing rate for the for middle and high schools located greater than 5 miles from the Bio-Ecology Site. The table depicting the total counts of elevated childhood blood lead level vs. student standardized test passing rate for the middle and high schools located greater than 5 miles from the Bio-Ecology Site is shown below.

Table 7.225: Year 1999 to the Year 2002 Bio-Ecology Total Counts Elevated Childhood Blood Lead Levels and the Standardized Test Passing Rates for Middle and High Schools Located Greater Than the 5- mile Radius of the Bio-Ecology Site

	Dallas County Total Counts Blood Lead Levels vs Percentage Middle and High School Test Passing Rates Greater Than 5 mile Radius							
Zip Code	Total BLL 1999 (#)	Total BLL 2000 (#)	Total BLL 2001 (#)	Total BLL 2002 (#)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
75287	2	0	0	0	87.6	91.2	85.7	86.8
75104	4	2	2	4	76.6	79.2	85.1	91.2
75019	0	4	0	2	87.4	91.1	91.4	91.5
75248	0	0	0	4	89.3	93.2	96.4	92.2
75244	0	2	2	2	71.5	74.4	80.0	87.8
75137	2	0	4	0	68.7	66.2	75.6	79.2
75043	2	5	2	9	67.1	67.1	66.6	71.6
75040	2	8	10	11	70.2	70.7	71.2	77.8
75146	2	2	4	5	51.6	56.0	62.7	66.8
75150	7	6	4	8	73.6	76.6	78.0	78.8
75080	6	4	4	6	78.1	79.5	82.9	84.2
Total/ Average	**27**	**33**	**32**	**51**	**74.7**	**76.8**	**79.6**	**82.5**

The zip codes the schools are located are shown on the left side of the table and the elevated total counts of elevated blood lead level for the Year 1999 to the Year 2002, and the student standardized test passing rate for the middle and high students for the Year 1999 to the Year 2002 are shown across the top of the table. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section XYZ. Based on the above table, the total counts of total elevated blood lead level are shown at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate is shown at the bottom of the table, as well, for the Year 1999 to the Year 2002. The total counts of elevated childhood blood lead level ranges from 27 to 51 and the average test passing rates range from 74.7% to 82.5%.

The unduplicated total counts of childhood elevated blood lead level, over time, may be due to indoor lead exposure as a result low income families or families that are below

poverty level that moved into cheap houses constructed before the Year 1970. The high student standardized test passing rates could be due to reduced or no impacts of the Bio-Ecology Site on prospective student cognitive abilities for the students that attend elementary schools located greater than 5 miles from the Bio-Ecology Site. The total counts of childhood elevated blood lead level, for the middle and high schools located greater than 5 miles from the Bio-Ecology Site, are significantly lower than the total counts of childhood elevated blood lead level of, for the middle and high schools located within the Bio-Ecology Site 5 mile radius. The difference could be a result of the middle and high schools located at a greater than 5 miles from the Bio-Ecology Site, thus having no impact from the Bio-Ecology Site. In addition, the average standardized test passing rates, for middle and high schools located greater than 5 miles from the Bio-Ecology Site, are significantly higher than the average standardized test passing rates for middle and high schools located within the Bio-Ecology Site's 5 mile radius. The higher childhood average test passing rate may be a result of the students attending middle and high schools not being impacted by the Bio-Ecology Site.

The Spearman Rank correlation matrix was utilized to analyze the data as an effort to provide consistent data analysis methods and due to the data set not having a normal distribution. The correlation matrix for the total counts of elevated childhood blood lead level and the student standardized test passing rates for the elementary schools located greater than 5 miles from the Bio-Ecology Site is shown below.
Table 7.226: Year 1999 to the Year 2002 Bio-Ecology Correlation Matrix for Total Counts of Elevated Childhood Blood Lead Levels vs. Standardized Test Passing Rates for Middle and High Schools Located Greater Than the 5-mile Radius of the Bio-Ecology Site.

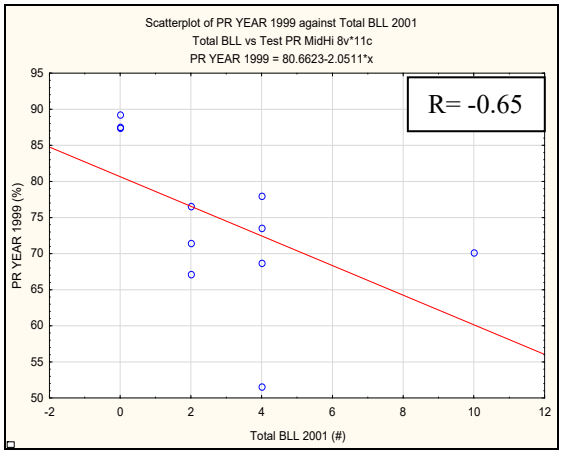
	Spearman Rank Order Correlations (Total BLL vs Test PR MidHi) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	Total BLL 1999	Total BLL 2000	Total BLL 2001	Total BLL 2002	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
Total BLL 1999	1.00	0.36	0.56	0.42	-0.16	-0.16	-0.30	-0.43
Total BLL 2000	0.36	1.00	0.50	0.82	-0.31	-0.25	-0.41	-0.45
Total BLL 2001	0.56	0.50	1.00	0.55	-0.65	-0.69	-0.74	-0.72
Total BLL 2002	0.42	0.82	0.55	1.00	-0.36	-0.28	-0.50	-0.56
PR YEAR 1999	-0.16	-0.31	-0.65	-0.36	1.00	0.99	0.96	0.84
PR YEAR 2000	-0.16	-0.25	-0.69	-0.28	0.99	1.00	0.95	0.81
PR YEAR 2001	-0.30	-0.41	-0.74	-0.50	0.96	0.95	1.00	0.95
PR YEAR 2002	-0.43	-0.45	-0.72	-0.56	0.84	0.81	0.95	1.00

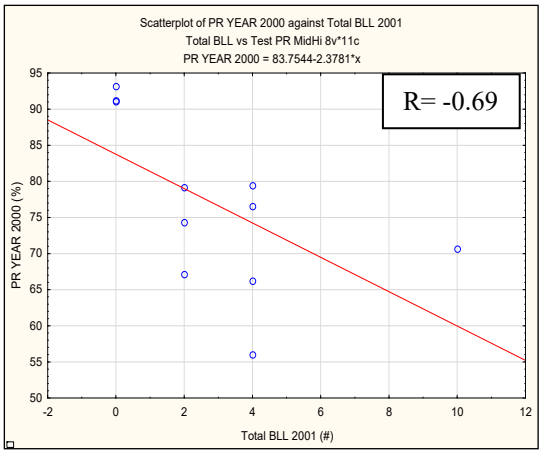
In the correlation matrix, each variable for blood lead levels and the standardized test passing rates is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships

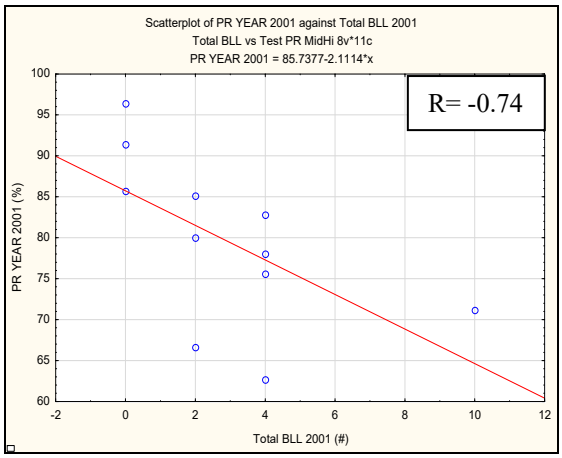
between the blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

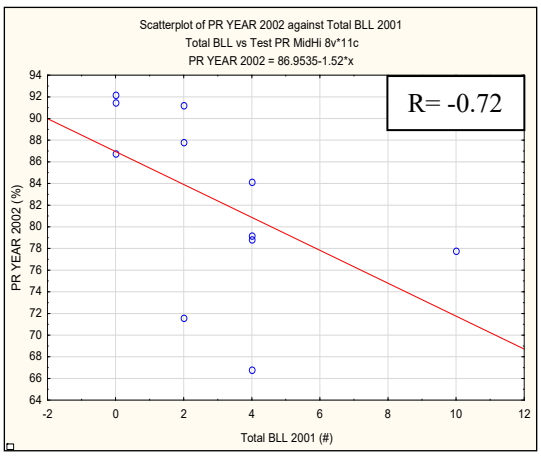
Based upon the correlation matrix, above, there is a strong negative correlation or significant relationship between the total unduplicated counts of elevated blood lead level for the Year 2001 and the student standardized test passing rates from the Year 1999 to the Year 2002. For the childhood blood lead level vs. the student standardized test passing rate analysis, it is impossible to directly compare the unduplicated counts of elevated childhood blood lead level, per each specified year and student standardized test passing rates because the standardized test passing rates measure the effects of childhood lead exposure hen the prospective students were small children. An indirect comparison of the explanatory and the response variables can be conducted if the counts of total counts elevated blood lead levels, for the Year 1999 to the Year 2002, are assumed to be similar to the total counts of elevated blood lead level in the years prior to the Year 1999. In the event that total counts of elevated childhood blood lead level cases, for the Year 1999 to the Year 2002, are similar to the counts for the year before the Year 1999, the significant relationships between both variables might be due to negative effects of total counts of elevated childhood blood lead level and standardized test passing rates. In addition, the R values are lower for the middle and high schools located greater than the 5 mile radius of the Bio-Ecology Site, than the middle and high schools located within the Bio-Ecology 5 mile radius. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

The significant bivariate plots are shown below.
Graph 7.307- Graph 7.310: Year 1999 to Year 2002 Bio-Ecology Comparison Group Plots of Significant Relationships between the Total Counts of Elevated Blood Lead Levels vs. the Standardized Test Passing Rates for Middle and High Schools









Based on the above graphs, as the total counts of childhood blood lead level increases, the standardized test passing rates decreases. Therefore, childhood blood lead has a negative impact on standardized test passing rate.

7.2.12.5 Bio-Ecology Year 1999 to the Year 2002 Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl vs. Test Passing Rates for Elementary Schools Located Within the Bio-Ecology Site's 5-mile Radius.

The elevated childhood blood lead level vs. the student standardized test passing rate for elementary schools analysis was conducted to determine if there is a direct effect of elevated childhood blood lead levels on student standardized test passing rates. The table of the elevated childhood blood lead levels of 10-14 µg/dl and student standardized test passing rates, for elementary schools, located within the Bio-Ecology Site 5 mile radius, are shown below.

TABLE 7.227 Year 1999 to the Year 2002 Bio-Ecology Elevated Childhood Blood Lead Level of 10-14 µg/dl and the Standardized Test Passing Rates for Elementary Schools Located Within the Bio-Ecology Superfund Site's 5-mile Radius

	Bio-Ecology 10-14 ug/dl Counts of Blood Lead Levels vs Percentage Elementary School Test Passing Rates							
Zip Code	10--14 BLL 1999 (#)	10--14 BLL 2000 (#)	10--14 BLL 2001 (#)	10--14 BLL 2002 (#)	PR1999 (%)	PR2000 (%)	PR2001 (%)	PR2002 (%)
75211	20	25	33	35	68.0	63.2	75.4	78.9
75050	4	6	6	6		59.4	76.3	68.0
75212	13	32	23	28	73.9	70.1	63.8	65.9
75051	3	7	10	3	77.3	64.0	69.1	85.0
75060	2	0	3	10	74.6	58.5	75.7	75.7
75208	15	19	21	20	67.1	67.7	68.4	75.5
Sum/ Average	**57**	**89**	**96**	**102**	**72.2**	**63.8**	**71.4**	**74.8**

The zip codes that the schools are located in are shown on the left side of the table and the elevated counts of elevated blood lead level of 10-14 µg/dl for the Year 1999 to the Year 2002, and the student standardized test passing rate for the elementary school students for the Year 1999 to the Year 2002 are shown across the top of the tables**.** Based on the above tables, the counts of elevated blood lead level of 10-14 µg/dl for the Year 1999 to the Year 2002 and the student average standardized test passing rate is shown at

the bottom of the table, as well, for the Year 1999 to the Year 2002. The counts range from 57 to the 102 and the average test passing rates range from 63.8% to 74.8.

For the blood lead level and the standardized test passing rate analysis, the data sets cannot be directly compared together, but indirectly together, assuming that the unduplicated counts from the Year 1999 to the Year 2002 are similar to the counts of elevated childhood blood lead data from the year before the Year 1999. In the event that the elevated counts of childhood blood lead of 10-14 µg/dl are similar to the counts from the Years before 1999, then the counts could be a result of exposure to the leachate from the Bio-Ecology Site's class 1 waste facility as well as socioeconomic factors. The increasing standardized test passing rates could be due to negative cognitive effects from exposure to the leachate from the Bio-Ecology Site, when the prospective elementary school student were young children, as well as socioeconomic indicators.

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not being normal as well as there being a few number of observations in the data set. The Spearman Rank correlation matrix for elementary students located within the Bio-Ecology 5 mile radius for the Year 1999 to the Year 2002, is shown below.

Table 7.228: Year 1999 to the Year 2002 Bio-Ecology Correlation Matrix of Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl vs. Standard Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Bio-Ecology Site

	Spearman Rank Order Correlations (Bio 10-14 BLL vs Test PR elem) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	10--14 BLL 1999	10--14 BLL 2000	10--14 BLL 2001	10--14 BLL 2002	PR1999	PR2000	PR2001	PR2002
10--14 BLL 1999	1.00	0.77	0.89	0.77	-0.80	0.49	-0.37	-0.14
10--14 BLL 2000	0.77	1.00	0.94	0.71	-0.50	0.83	-0.77	-0.26
10--14 BLL 2001	0.89	0.94	1.00	0.77	-0.60	0.66	-0.60	-0.03
10--14 BLL 2002	0.77	0.71	0.77	1.00	-0.70	0.31	-0.37	-0.26
PR1999	-0.80	-0.50	-0.60	-0.70	1.00	-0.30	0.30	0.50
PR2000	0.49	0.83	0.66	0.31	-0.30	1.00	-0.94	-0.31
PR2001	-0.37	-0.77	-0.60	-0.37	0.30	-0.94	1.00	0.20
PR2002	-0.14	-0.26	-0.03	-0.26	0.50	-0.31	0.20	1.00

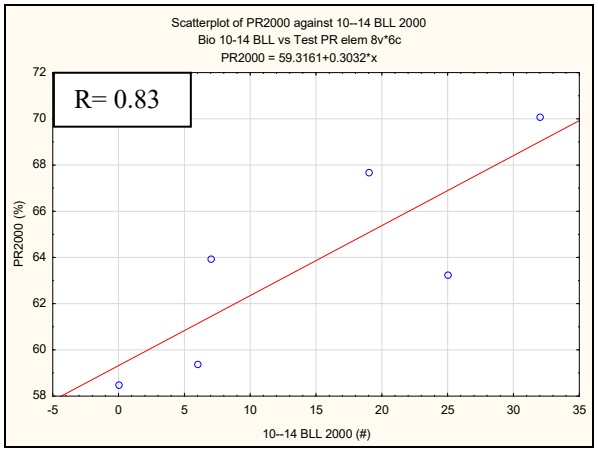
In the correlation matrix, each variable for blood lead levels and the standardized test passing rates is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

Based upon the correlation matrix, above, there is a strong correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl for the Year 2000 and the percentage of standardized test passing rates for the Year 2000. In the event that the

elevated counts of childhood blood lead of 10-14 µg/dl are similar to the counts from the Years before 1999, since there is no direct relationship between the variables, but an indirect relationship, then the significant relationship could be a result of exposure to the leachate from the Bio-Ecology Site's class 1 waste facility, before the site was cleaned up (before the Year 1983), as well as socioeconomic factors that negatively impacted the prospective elementary students cognitive abilities. The R value for the significant bivariate relationship is 0.83. The positive significant relationship between the counts of elevated childhood blood lead level of 10-14 µg/dl and the standardized test passing may be an effect from the RSR Superfund Site.

A graph of the significant bivariate regression is shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.311: Year 1999 to Year 2002 Bio-Ecology Plots of Significant Relationships between the Elevated Blood Lead Level 10-14 µg/dl vs. the Standardized Test Passing Rates for Elementary Schools



Based on the graph above, assuming that the 10-14 µg/dl counts of elevated childhood blood lead level counts, for the Year 2000, are similar to the 10-14 µg/dl counts of elevated childhood blood lead levels before the Year 1999, as the 10-14 µg/dl elevated childhood blood lead levels increases, the student standardized test passing rates increases. Since this chart does not follow the theoretical effects of the lead exposure and standardized test passing rates. The data results might be directly affected by the Bio-Ecology Superfund Site.

7.2.12.6 Bio-Ecology Year 1999 to the Year 2002 Comparison Analysis Elevated Childhood Blood Lead Level of 10-14 µg/dl vs. Test Passing Rates for Elementary Schools Located Greater Than the 5-mile Radius of the Bio-Ecology Site (Comparison Group)

The comparison group of childhood blood lead level vs. student standardized test passing rate analysis is used to identify any trends in the data for elementary schools located

within the Bio-Ecology Site 5 mile radius by comparing it to childhood elevated blood lead level vs. the student standardized test passing rate for the for elementary schools located greater than 5 miles from the Bio-Ecology Site. The table depicting the counts of elevated childhood blood lead level of 10-14 µg/dl vs. student standardized test passing rate for the elementary schools located greater than 5 miles from the Bio-Ecology Site is shown below.

Table 7.229: Year 1999 to the Year 2002 Bio-Ecology Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl and Standardized Test Passing Rates for Elementary Schools Located Greater Than the 5-mile Radius of the Bio-Ecology Site

	Dallas County 10-14 ug/dl Counts of Blood Lead Levels vs Percentage Elementary School Test Passing Rates Greater than 5 Mile Radius							
Zip Code	10--14 BLL 1999 (#)	10--14 BLL 2000 (#)	10--14 BLL 2001 (#)	10--14 BLL 2002 (#)	PR YEAR 1999 (%)	PR YEAR 2000 (%)	PR YEAR 2001 (%)	PR YEAR 2002 (%)
75234	2	2	0	2	54.1	47.8	51.1	59.7
75104	2	2	2	2	63.0	73.4	60.5	75.0
75019	0	0	0	2	96.6	96.2	97.5	97.9
75248	0	0	0	2	96.4	92.9	95.7	94.9
75218	2	2	0	2	83.5	73.1	74.9	82.9
75115	2	2	2	3	83.2	81.3	89.6	87.4
75089		0	0	2		90.2	89.8	94.4
75043	2	5	2	6	90.9	92.2	89.1	89.6
75146	2	2	2	3	64.4	63.0	70.2	75.1
75150	5	5	2	4	86.9	92.6	92.2	89.4
75154	2	0	0	2	79.9	83.7	81.3	84.3
75238	2	2	6	6	92.5	89.8	87.5	86.0
Sum/ Average	**21**	**22**	**16**	**36**	**81.0**	**81.3**	**81.6**	**84.7**

The zip codes the schools are located are shown on the left side of the table and the total counts of elevated blood lead level of 10-14 µg/dl for the Year 1999 to the Year 2002, and the student standardized test passing rate for elementary school students for the Year 1999 to the Year 2002 are shown across the top of the table. The grey areas represent schools that were not opened yet or that have other issues. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section 7.2.2. The counts of elevated childhood blood lead level 10-14 µg/dl ranges from 21 to 36 and the average standardized test passing rate ranges from 81.0% to 84.7%.

For the childhood blood lead level vs. the student standardized test passing rate analysis, it is impossible to directly compare the unduplicated counts of elevated childhood blood lead level, per each specified year and student standardized test passing rates because the standardized test passing rates measure the effects of childhood lead exposure hen the prospective s small children. An indirect comparison of the explanatory and the response variables can be conducted if the counts of 10-14 elevated blood lead levels, for the Year 1999 to the Year 2002, are assumed to be similar to the counts of elevated blood lead level of 10-14 µg/dl in the years prior to the Year 1999. Unfortunately, childhood blood lead data is not available from before the Year 1999 from the Texas Department of Health. Based on the table above, the counts of elevated childhood blood lead level of 10-14 µg/dl are significantly lower than the counts of elevated childhood blood lead level for the elementary schools that are located within the Bio-Ecology Site 5 mile radius. The significant difference in the counts of elevated childhood blood lead level of 10-14 µg/dl could be due a lower percentage of low income households, a lower percentage of families below poverty level, as well as a lower percentage of housing units constructed

before the Year 1970. These lower percentages in these socioeconomic indicators result in fewer cases in childhood elevated blood lead exposure.

In addition, the student standardized test passing rates are significantly higher, for elementary schools located greater than the 5 mile radius of the Bio-Ecology Site, than the student standardized test passing rate for elementary schools located within the 5 mile radius of the Bio-Ecology Site. The difference could be due to lower percentages of housing units constructed before the Year 1970, which reduces the amount of prospective students exposed to indoor lead, as well as these schools not being located in close proximity to the Bio-Ecology Site.

The Spearman Rank correlation matrix was utilized to analyze the data as an effort to provide consistent data analysis methods and due to the data set not having a normal distribution. The correlation matrix for the total counts of elevated childhood blood lead level and the percentage of student standardized test passing rates for the elementary schools located greater than 5 miles from the Bio-Ecology Site is shown below.

Table 7.230 Year 1999 to the Year 2002 Bio-Ecology Correlation Matrix for Counts of Elevated Childhood Blood Lead Level of 10-14 µg/dl vs. Standardized Test Passing Rates for Elementary Schools Located Greater than the 5-mile Radius of the Bio-Ecology Site.

Variable	**Spearman Rank Order Correlations (10-14 BLL vs Test PR elem) MD pairwise deleted Marked correlations are significant at p <.05000**							
	10--14 BLL 1999	10--14 BLL 2000	10--14 BLL 2001	10--14 BLL 2002	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
10--14 BLL 1999	1.00	0.77	0.50	0.49	-0.47	-0.37	-0.37	-0.42
10--14 BLL 2000	0.77	1.00	0.68	0.72	-0.20	-0.24	-0.30	-0.34
10--14 BLL 2001	0.50	0.68	1.00	0.85	-0.01	-0.07	-0.14	-0.18
10--14 BLL 2002	0.49	0.72	0.85	1.00	0.24	0.13	0.09	0.08
PR YEAR 1999	-0.47	-0.20	-0.01	0.24	1.00	0.88	0.87	0.91
PR YEAR 2000	-0.37	-0.24	-0.07	0.13	0.88	1.00	0.92	0.93
PR YEAR 2001	-0.37	-0.30	-0.14	0.09	0.87	0.92	1.00	0.97
PR YEAR 2002	-0.42	-0.34	-0.18	0.08	0.91	0.93	0.97	1.00

In the correlation matrix, each variable for blood lead levels and the standardized test passing rates is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.
For the purposes of this study, the results evaluated are the explanatory variables that are significant with the standardized test passing rates, the response variable.

Based upon the correlation matrix, above, there is no correlation between the counts of elevated childhood blood lead level of 10-14 µg/dl and the percentage of standardized test passing rates for elementary schools. This may be due to lower percentages of households with low income and that are below the poverty level, as well as a lower percentage of housing units constructed before the Year 1970, which resulted in few cases of indoor lead exposure and higher standardized test passing rates.

7.2.12.7 Bio-Ecology Year 1999 to the Year 2002 Total Counts of Elevated Childhood Blood Lead Levels vs. Test Passing Rates for Elementary Schools Located Within the Bio-Ecology Site's 5-mile Radius.

The elevated childhood blood lead level vs. the student standardized test passing rate for the elementary schools analysis was conducted to determine if there is a direct effect of elevated childhood blood lead levels on student standardized test passing rates. The table of the elevated childhood blood lead levels and student standardized test passing rates, for elementary schools, located within the Bio-Ecology Site 5 mile radius, are shown below.

TABLE 7.231: Year 1999 to the Year 2002 Bio-Ecology Total Counts of Elevated Childhood Blood Lead Level and the Standardized Test Passing Rate for Elementary Schools Located Within the Bio-Ecology Superfund Site's 5-mile Radius

	Bio-Ecology Total Counts Blood Lead Levels vs Percentage Elementary School Test Passing Rates							
Zip Code	Total BLL 1999 (#)	Total BLL 2000 (#)	Total BLL 2001 (#)	Total BLL 2002 (#)	PR1999 (%)	PR2000 (%)	PR2001(%)	PR2002 (%)
75211	28	37	47	47	68.0	63.2	75.4	78.9
75050	7	6	6	10		59.4	76.3	68.0
75212	17	38	30	37	73.9	70.1	63.8	65.9
75051	5	9	11	5	77.3	64.0	69.1	85.0
75060	2	0	5	21	74.6	58.5	75.7	75.7
75208	21	28	31	42	67.1	67.7	68.4	75.5
Sum/ Average	**80**	**118**	**130**	**162**	**72.2**	**63.8**	**71.4**	**74.8**

The zip codes the schools are located are shown on the left side of the table and the elevated total counts of elevated blood lead level for the Year 1999 to the Year 2002, and the student standardized test passing rate for elementary school students for the Year 1999 to the Year 2002 are shown across the top of the table. The grey areas represent schools that were not opened yet or schools that ere repurposed. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section 7.2.2. Based on the above table, the total counts of total elevated blood lead level are shown at the bottom of the table, from the Year 1999 to the Year 2002. In addition, the student average standardized test passing rate is shown at the bottom of the table, as well, for the Year 1999 to the Year 2002. The total counts of elevated childhood blood lead level range from 80 to the 162. In addition, the average test passing rates range from 63.8% in 74.8%.

A direct comparison of these variables cannot be conducted, due to the nature of the data, but an indirect comparison can be conducted, if it is assumed that the total counts of elevated blood lead level from the Year 1999 to the Year 2002, are similar to the actual counts of total childhood blood lead levels for the years before the Year 1999. Prior Year data was not available from the Texas Department of Health. Overall, the total counts of elevated childhood blood lead level decreases from the Year 1999 to the Year 2002 and

the average student standardized test passing increases from the Year 1999 to the Year 2002. The decrease in the unduplicated total counts of childhood elevated blood lead level, over time, may be due reduced contact of prospective elementary student with the leachate from the Bio-Ecology Site. In addition, it could be due to less indoor lead exposure. The increasing standardized test passing rates may be due to fewer impacts of the prospective students to the leachate of the Bio-Ecology Site or due to new prospective students, moving into the area after the Bio-Ecology Site was cleaned up (Year 1983).

The Spearman Rank correlation matrix was utilized to analyze the data due to the data set not having a normal distribution and due to a few number of observations. The correlation matrix for the total counts of elevated childhood blood lead level and the student standardized test passing rates for the elementary schools located within the 5 mile radius of the Bio-Ecology site is shown below.

Table 7.232. Year 1999 to the Year 2002 Bio-Ecology Correlation Matrix for Total Counts of Elevated Childhood Blood Lead Levels vs. Standardized Test Passing Rates for Elementary Schools Located Within the 5-mile Radius of the Bio-Ecology Site.

	Spearman Rank Order Correlations (Bio Total BLL vs Test PR elem) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	Total BLL 1999	Total BLL 2000	Total BLL 2001	Total BLL 2002	PR1999	PR2000	PR2001	PR2002
Total BLL 1999	1.00	0.77	0.94	0.83	-0.80	0.49	-0.37	-0.14
Total BLL 2000	0.77	1.00	0.83	0.60	-0.50	0.83	-0.77	-0.26
Total BLL 2001	0.94	0.83	1.00	0.77	-0.80	0.60	-0.54	0.09
Total BLL 2002	0.83	0.60	0.77	1.00	-0.90	0.26	-0.31	-0.14
PR1999	-0.80	-0.50	-0.80	-0.90	1.00	-0.30	0.30	0.50
PR2000	0.49	0.83	0.60	0.26	-0.30	1.00	-0.94	-0.31
PR2001	-0.37	-0.77	-0.54	-0.31	0.30	-0.94	1.00	0.20
PR2002	-0.14	-0.26	0.09	-0.14	0.50	-0.31	0.20	1.00

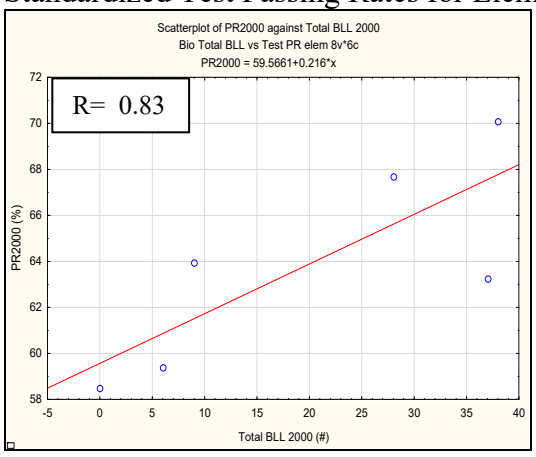
In the correlation matrix, each variable for blood lead levels and the standardized test passing rates is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

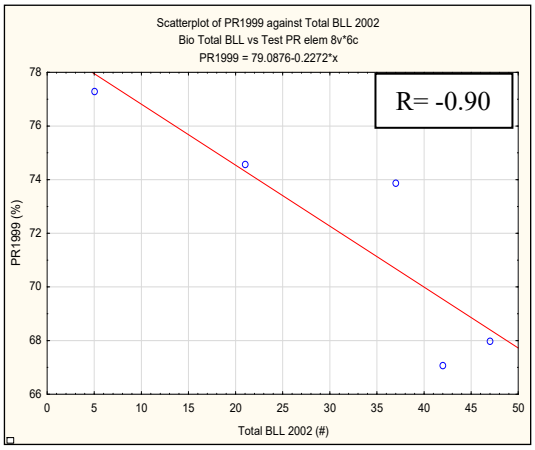
Based upon the correlation matrix, above, there is a strong negative correlation between the total counts of elevated childhood blood lead level, for the Year 2002 and the percentage of standardized test passing rates for the Year 1999. In addition, there is a strong correlation between the total counts of elevated childhood blood lead level for the Year 2000 and the student standardized passing rate for the Year 2000.
The negative R value of -0.90 and the positive R value is 0.83 represent the significant bivariate regressions.

Due to the nature of this data, there cannot be a direct comparison because the unduplicated total counts of childhood blood lead level are measured on yearly basis and the student standardized test passing rates are measured by back dating prospective student's age in reference to the Superfund Site to determine if there was possible lead exposure. Therefore, and indirect comparison can be conducted with both variables, if it is assumed that the total counts of elevated blood lead level, from the Year 1999 to the Year 2002, is similar to the total counts of childhood elevated blood lead level for years before the Year 1999. Prior year's elevated childhood blood lead level data was not available from the Texas Department of Health. In the event that the unduplicated total counts of childhood blood lead level are similar throughout all years, then there is a strong possibility that the leachate from the Bio-Ecology class 1 waste facility, that had leaking drums, could have contacted and negatively affected prospective elementary students, when they were young children, and affected their performance on their standardized tests.

The graphs of the significant bivariate plots are shown below. A trend line was included in the graphs to determine the direction of the significant relationships, and not to determine if a linear relationship exists between the variables.

Graph 7.312- Graph 7.313: Year 1999 to Year 2002 Bio-Ecology Plots of Significant Relationships between the Total Counts of Elevated Blood Lead Levels vs. the Standardized Test Passing Rates for Elementary Schools





Based on the above graphs, as the total counts of childhood elevated blood lead level increases, the percentage student standardized test passing rates increases and decreases. Therefore, for the negative relationship, there is a negative impact on the student standardized test passing rates with high counts of unduplicated total counts of elevated childhood blood lead cases. For the positive relationship, the data does not theoretically make scientific sense. Therefore, the RSR Site might have an effect on the results.

7.2.12.8 Bio-Ecology Year 1999 to the Year 2002 Comparison Analysis of Total Counts of Elevated Childhood Blood Lead Level vs. Test Passing Rates for Elementary Schools Located Greater Than the 5-mile Radius of the Bio-Ecology Site (Comparison Group)

The comparison group of childhood blood lead level vs. student standardized test passing rate analysis is used to identify any trends in the data for elementary schools located within the Bio-Ecology Site 5 mile radius by comparing it to childhood elevated blood lead level vs. the student standardized test passing rate for the for elementary schools located greater than 5 miles from the Bio-Ecology Site. The table depicting the total counts of elevated childhood blood lead level vs. student standardized test passing rate for the elementary schools located greater than 5 miles from the Bio-Ecology Site is shown below.

Table 7.233: Year 1999 to the Year 2002 Bio-Ecology Total Counts of Elevated Childhood Blood Lead Level and Standardized Test Passing Rates for Elementary Schools Located Greater Than the 5-mile Radius of the Bio-Ecology Site

	Dallas County Total Counts Blood Lead Levels vs Percentage Elementary School Test Passing Rates Greater than 5 mile Radius							
Zip Code	Total BLL 1999 (#)	Total BLL 2000 (#)	Total BLL 2001 (#)	Total BLL 2002	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
75234	2	4	0	4	54.1	47.8	51.1	59.7
75104	4	2	2	4	63.0	73.4	60.5	75.0
75019	0	4	0	2	96.6	96.2	97.5	97.9
75248	0	0	0	4	96.4	92.9	95.7	94.9
75218	2	4	2	2	83.5	73.1	74.9	82.9
75115	4	4	4	5	83.2	81.3	89.6	87.4
75089		0	0	2		90.2	89.8	94.4
75043	2	5	2	9	90.9	92.2	89.1	89.6
75146	2	2	4	5	64.4	63.0	70.2	69.5
75150	7	6	4	8	86.9	92.6	92.2	89.4
75154	2	2	0	2	79.9	83.7	81.3	84.3
75238	4	2	7	11	92.5	89.8	87.5	86.0
Sum/ Average	**29**	**35**	**25**	**58**	**81.0**	**81.3**	**81.6**	**84.2**

The zip codes the schools are located are shown on the left side of the table and the elevated total counts of elevated blood lead level for the Year 1999 to the Year 2000, and the student standardized test passing rate for the elementary students for the Year 1999 to the Year 2002 are shown across the top of the table. The grey areas represent schools that were not opened yet or that have other issues. In addition, the highlighted values in the table represent estimated values. Further information on the estimation process is in Section 7.2.2. Based on the above table, the total counts of total elevated blood lead level are shown at the bottom of the table, from the Year 1999 to the Year 2002. The student average standardized test passing rate is shown at the bottom of the table, as well, for the Year 1999 to the Year 2002.

The total counts of elevated childhood blood lead level slowly increases from the Year 1999 to the Year 2002 and the average student standardized test passing increases from the Year 1999 to the Year 2002. The unduplicated total counts of childhood elevated blood lead level, over time, may be due to indoor lead exposure as a result low income families or families that are below poverty level that moved into cheap houses constructed before the Year 1970. The high student standardized test passing rates could be due to reduced or no impacts of the Bio-Ecology Site on prospective student cognitive abilities for the students that attend elementary schools located greater than 5 miles from the Bio-Ecology Site. The total counts of childhood elevated blood lead level, for the elementary schools located greater than 5 miles from the Bio-Ecology Site, are significantly lower than the total counts of childhood elevated blood lead level of, for the elementary schools located within the Bio-Ecology Site 5 mile radius. The significant difference could be a result of the elementary schools located at a greater than 5 miles from the Bio-Ecology Site, thus having no impact from the Bio-Ecology Site. In

addition, the average standardized test passing rates, for elementary schools located greater than 5 miles from the Bio-Ecology Site, are significantly higher than the average standardized test passing rates for elementary schools located within the Bio-Ecology Site's 5 mile radius. The higher childhood average test passing rate may be a result of the students attending elementary schools not being impacted by the Bio-Ecology Site.

The Spearman Rank correlation matrix was utilized to analyze the data as an effort to provide consistent data analysis methods and due to the data set not having a normal distribution. The correlation matrix for the total counts of elevated childhood blood lead level and the student standardized test passing rates for the elementary schools located greater than 5 miles from the Bio-Ecology Site is shown below.
Table 7.234: Year 1999 to the Year 2002 Bio-Ecology Correlation Matrix of Total Counts Elevated Childhood Blood Lead Levels vs. Standardized Test Passing Rates for Elementary Schools Located Greater Than The 5-mile Radius of the Bio-Ecology Site.

	Spearman Rank Order Correlations (Total BLL vs Test PR elem) **MD pairwise deleted** **Marked correlations are significant at p <.05000**							
Variable	Total BLL 1999	Total BLL 2000	Total BLL 2001	Total BLL 2000	PR YEAR 1999	PR YEAR 2000	PR YEAR 2001	PR YEAR 2002
Total BLL 1999	1.00	0.29	0.75	0.57	-0.32	-0.04	-0.21	-0.27
Total BLL 2000	0.29	1.00	0.29	0.32	0.06	-0.05	0.03	-0.03
Total BLL 2001	0.75	0.29	1.00	0.77	-0.01	0.05	-0.15	-0.27
Total BLL 2000	0.57	0.32	0.77	1.00	0.12	0.23	-0.04	-0.09
PR YEAR 1999	-0.32	0.06	-0.01	0.12	1.00	0.88	0.87	0.90
PR YEAR 2000	-0.04	-0.05	0.05	0.23	0.88	1.00	0.79	0.80
PR YEAR 2001	-0.21	0.03	-0.15	-0.04	0.87	0.79	1.00	0.96
PR YEAR 2002	-0.27	-0.03	-0.27	-0.09	0.90	0.80	0.96	1.00

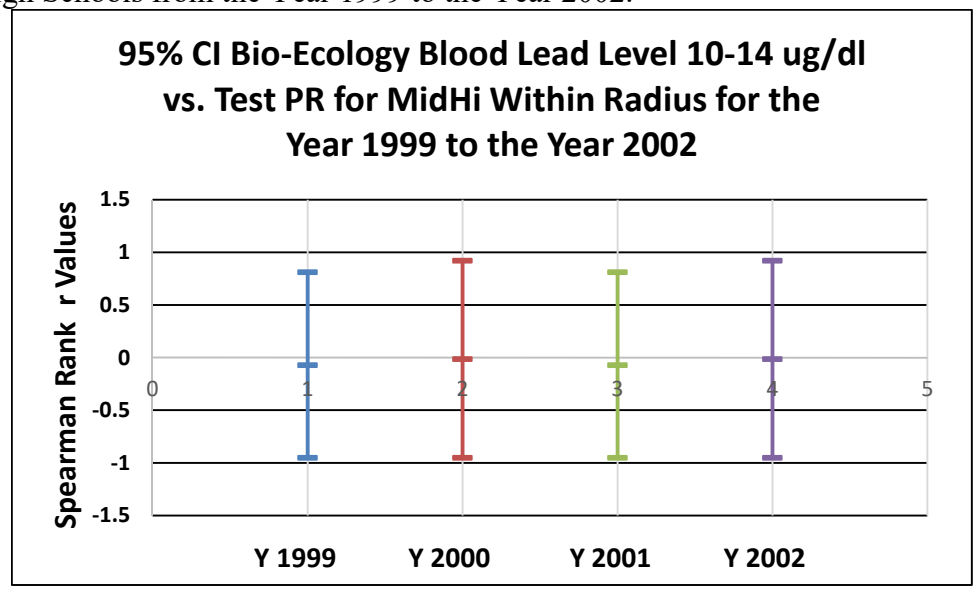
In the correlation matrix, each variable for blood lead levels and the standardized test passing rates is shown at the left side, and across the top of the correlation matrix. The numeric values, in the center of the matrix, represent the Spearman Rank coefficient of correlation, R values. The values shown in red, represent significant relationships, between corresponding variables. The higher the red value in the table, the stronger the significant relationship, between variables. In this Study, significant relationships between the blood lead level and the standardized test passing rates, from the Year 1999 to the Year 2002, were evaluated.

Based upon the correlation matrix, above, there is no correlation or significant relationship between the total unduplicated counts of elevated blood lead level and the student standardized test passing rates from the Year 1999 to the Year 2002. In the event that total counts of elevated childhood blood lead level cases, for the Year 1999 to the Year 2002, are similar to the counts for the year before the Year 1999, there will still be no significant relationship between both variables. This may be due to the comparison group schools not being impacted by the leachate from the Bio-Ecology Site.

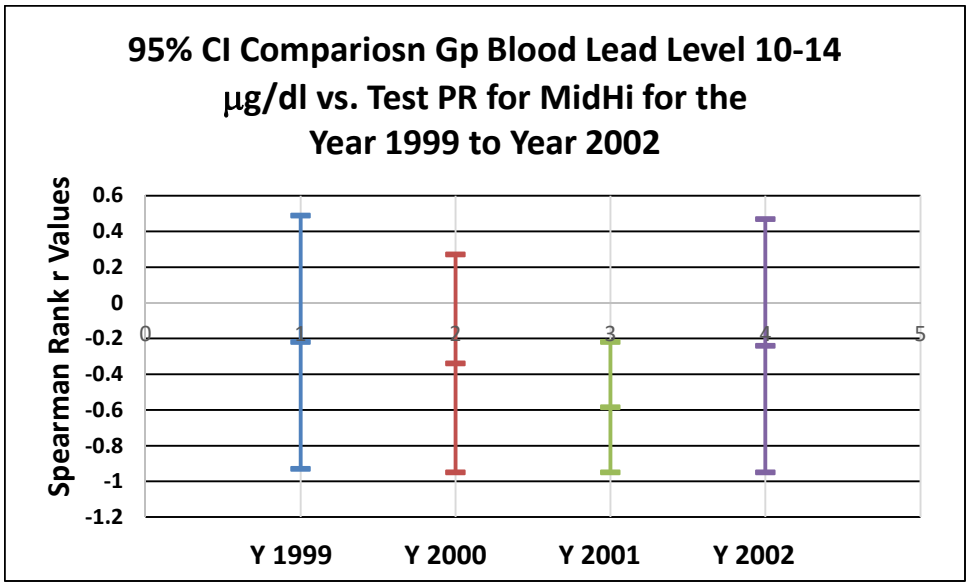
Confidence interval graphs were prepared to show the overall trends in the Spearman Rank r values from the Year 1999 to the Year 2002. The data sets used to calculate the Spearman Rank r values did not have a normal distribution. The confidence intervals

were calculated for the non-normal Spearman Rank r values using the Fisher r to z' transformation. The Spearman rank order with Fieller et al's (1957) and the Spearman rank order with Bonett and Wright's 2000 formulas were used in the Fisher r to z' transformation calculations to compute the estimated standard error in the computation of the confidence intervals. The confidence intervals contain the significant and non-significant Spearman Rank r values. The confidence interval graphs for the Spearman Rank Coefficients of Correlation for the elevated blood lead level of 10-14 µg/dl and total counts of elevated blood lead levels vs. the standardized test passing rates, for the middle and high schools and elementary schools, located within and greater than, the 5-mile radius of the Bio-Ecology Superfund Site, are shown below.

Graph 7.221 Bio-Ecology Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rate for Middle and High Schools from the Year 1999 to the Year 2002.

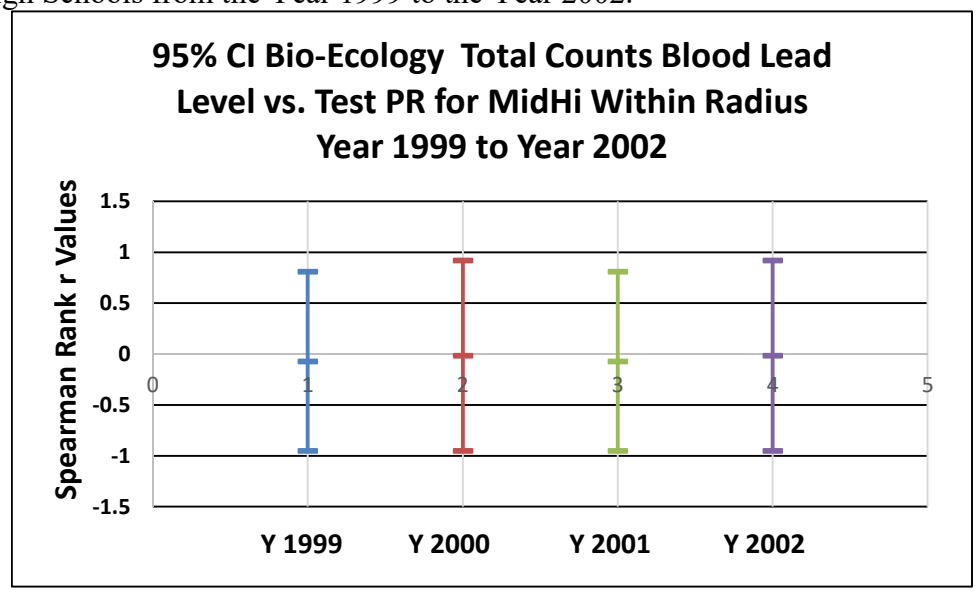


Graph 7.222: Bio-Ecology Comparison Group Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rate for Middle and High Schools from the Year 1999 to the Year 2002.

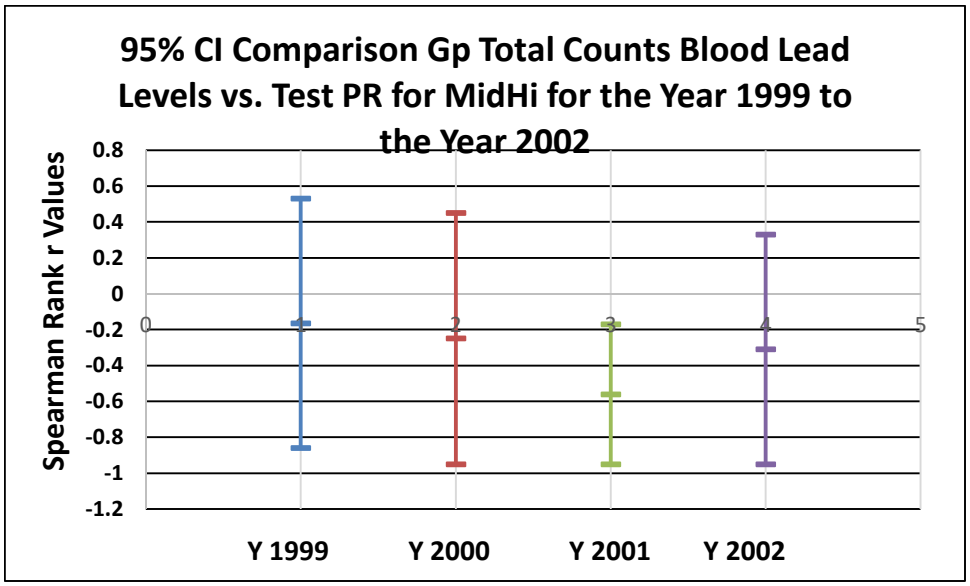


Based on the confidence interval graphs, there were significant coefficients of correlations, in the confidence intervals for the Year 1999 and the Year 2001, for the middle and high schools, located within the 5-mile radius of the Bio-Ecology Site. There were also significant coefficients of correlations, in the confidence intervals, for the comparison group, for the Year 2000 and the Year 2001.

Graph 7.223 Bio-Ecology Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.

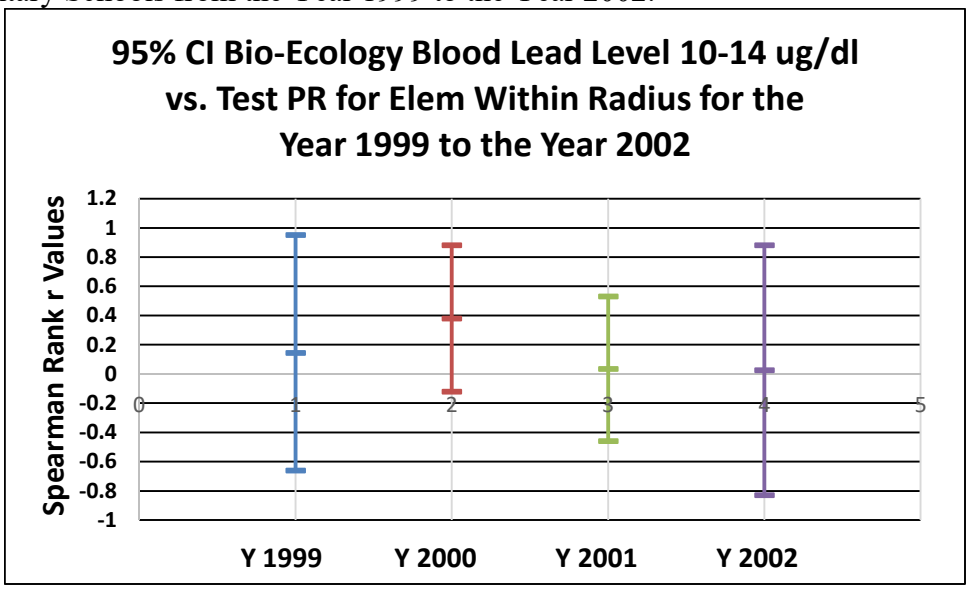


Graph 7.224: Bio-Ecology Comparison Group Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Middle and High Schools from the Year 1999 to the Year 2002.

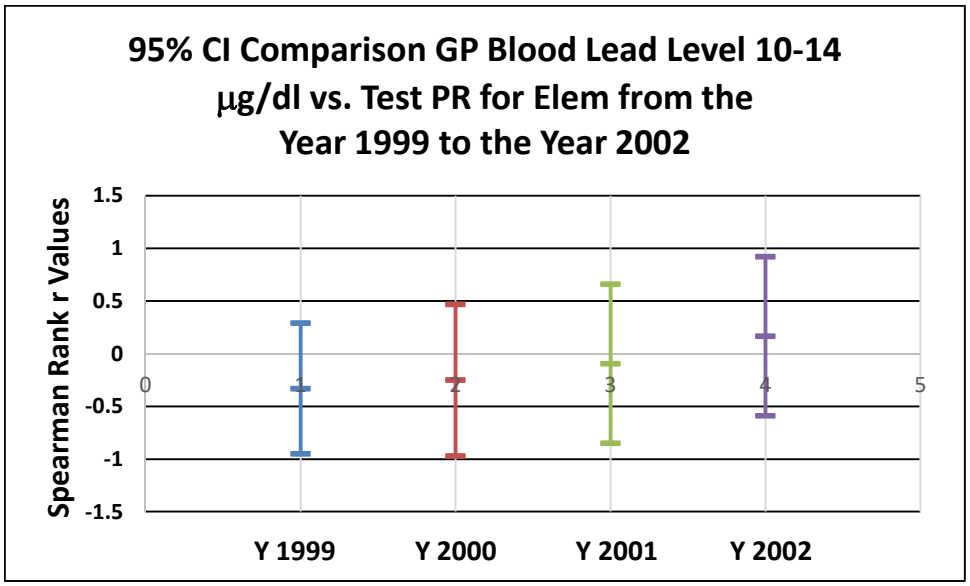


Based on the confidence interval graphs, there were significant coefficients of correlations, in the confidence intervals for the Year 1999 and the Year 2001, for the middle and high schools, located within the 5-mile radius of the Bio-Ecology Site. There were also significant coefficients of correlations, in the confidence intervals, for the comparison group, for the Year 2001.

Graph 7.225 Bio-Ecology Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rate for Elementary Schools from the Year 1999 to the Year 2002.

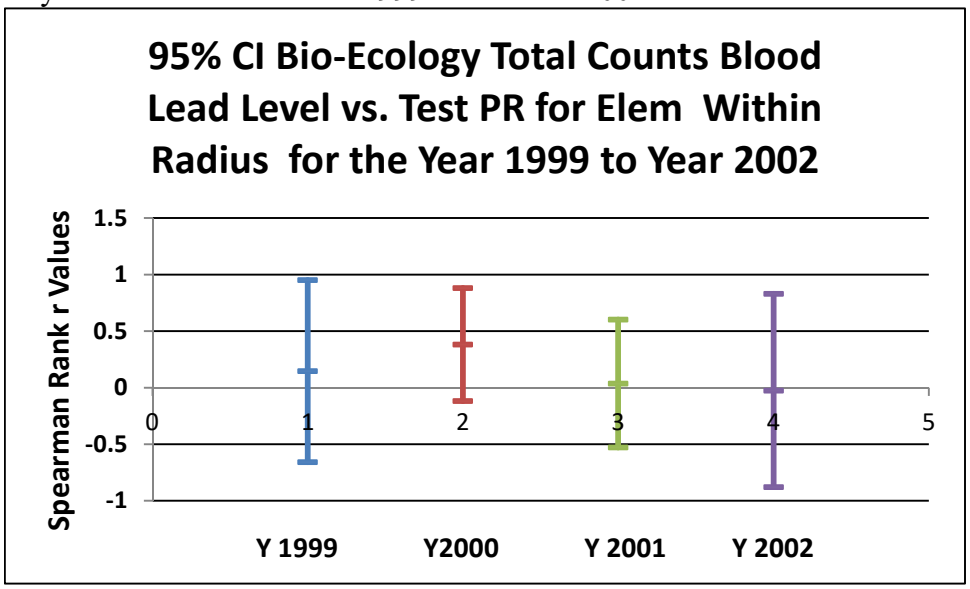


Graph 7.226: Bio-Ecology Comparison Group Coefficient of Correlation Confidence Interval Graph for Elevated Blood Lead Level 10-14 µg/dl vs. Standardized Test Passing Rate for Elementary Schools from the Year 1999 to the Year 2002.

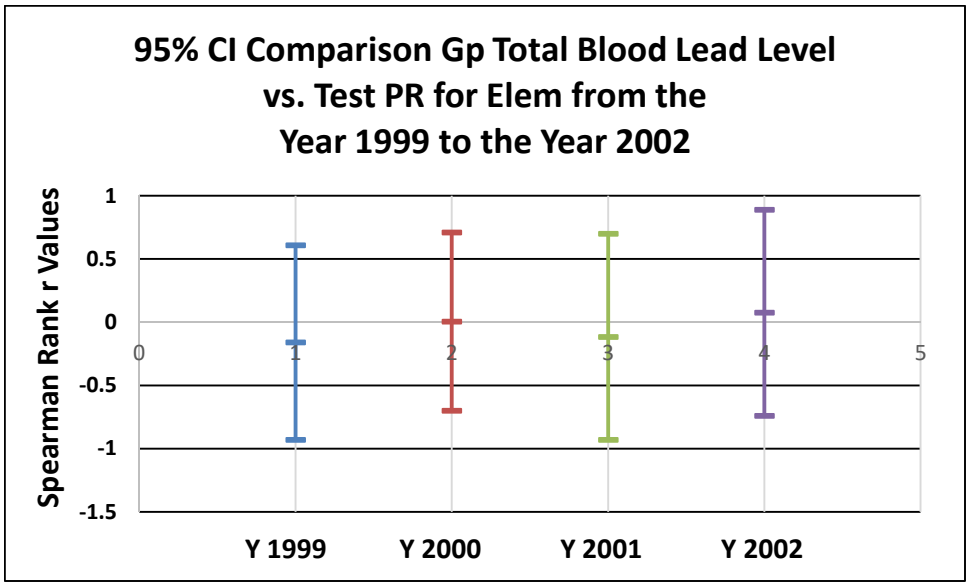


In the confidence interval graphs, there is an indirect significant coefficient of correlation, in the confidence interval for the Year 2000, for the middle and high schools located within the 5-mile radius of the Bio-Ecology Site. In the comparison group, there were no indirect significant coefficients of correlations, in the confidence intervals for all four years.

Graph 7.227 Bio-Ecology Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.



Graph 7.228: Bio-Ecology Comparison Group Coefficient of Correlation Confidence Interval Graph for Total Counts of Elevated Blood Lead Levels vs. Standardized Test Passing Rates for Elementary Schools from the Year 1999 to the Year 2002.



In the confidence interval graphs, there are indirect significant coefficients of correlations, in the confidence interval for the Year 2000 and the Year 2002, for the middle and high schools located within the 5-mile radius of the Bio-Ecology Site. In the comparison group, there were no indirect significant coefficients of correlations, in the confidence intervals for all four years.

8.0 Results

8.1 RSR Superfund Site Results

8.1.1 RSR Superfund Site Distance Analysis

The purpose of the distance analysis is to determine if there is a significant relationship between the proximity of the schools, from the RSR Site, and the school has standardized test passing rates. The table below depicts the results of the RSR Site's Distance Analysis.

Table 8.1 RSR Distance Analysis –Summary of Results

RSR Distance Analysis from the Year 1994 to the Year 2002- Summary Table of Results							
Schools Located within the 5-Mile Radius				**Schools Located Greater than the 5-Mile Radius**			
Middle and High Schools							
Number of Observations			13	Number of Observations			27
Range of standardized test passing rates from the Year 1994 to the Year 2002				Range of standardized test passing rates from the Year 1994 to the Year 2002			
37.0% (Year 1994) to 71.7% (Year 2002)				66.2% (Year 1994) to 88.4 (Year 2002)			
Significant Relationships				**Significant Relationships**			
Distance in Miles vs.			Coeff. Corr	Distance in Miles vs.			Coeff. Corr
	% Test PR Year 1997		0.67		% Test PR Year 1994		0.50
	% Test PR Year 1999		0.61		% Test PR Year 1995		0.51
	% Test PR Year 2000		0.63		% Test PR Year 1996		0.42
	% Test PR Year 2001		0.61		% Test PR Year 1997		0.43
	% Test PR Year 2002		0.58		% Test PR Year 1998		0.53
Elementary Schools							
Number of Observations			37	Number of Observations			27
Range of standardized test passing rates from the Year 1994 to the Year 2002				Range of standardized test passing rates from the Year 1994 to the Year 2002			
40.5% (Year 1994) to 75.9% (Year 2002)				66.0% (Year 1994) to 85.7 % (Year 2002)			
Significant Relationships				**Significant Relationships**			
Distance in Miles vs.			Coeff. Corr	Distance in Miles vs.			Coeff. Corr
	none				% Test PR Year 2000		0.38
					% Test PR Year 2002		0.42

Based on the summary table, there is a 57% difference and a 21% difference, lower, in the standardized test passing rates, for the Year 1994 and the Year 2002, respectively, for the middle and high schools located, within the 5-mile radius of the RSR Site, from the middle and high schools located greater than the 5- mile radius of the RSR Site. In addition, there is a 48% difference and a 12% difference, lower, in the standardized test passing rates, for the Year 1994 and the Year 2002, respectively, for the elementary schools located within the 5-mile radius of the RSR Site, from the elementary schools located greater than the 5-mile radius of the RSR Site. As the years increase, from the Year 1994 to the Year 2002, the percent difference in standardized test passing rates decreases, between the middle and high schools, and the elementary schools, located within and greater than the 5-mile radius of the RSR Site.

There were also significant relationships between the distance, of the middle and high schools, to the RSR Site, and the standardized test passing rates, for the schools located within the 5-mile radius, of the RSR Site. Similar, but weaker significant relationships occurred, with the schools located, greater than the 5-mile radius of the RSR Site.

There were no significant relationships, between proximity of the elementary schools, to the RSR Site, and the standardized test passing rates, for schools located within the 5-

mile radius, of the RSR Site. This might be due to the prospective elementary students, not having exposure to the RSR Site, because the site was closed and /or cleaned up (Year 1984/Year 2004), when the prospective students were small children, given that they did not move out of the RSR Site's 5-mile radius. Based on these results, the school proximity, to the lead smelter of the RSR Site, can result in lower standardized test passing rates.

8.1.2 RSR Socioeconomic Indicators vs. Blood Lead Level –Summary of Results

The purpose of the socioeconomic indicators vs. the blood lead level analysis is to determine if there is a significant relationship between socioeconomic indicators and the counts of elevated childhood blood lead level. The table below depicts the results of the socioeconomic indicators vs. blood lead level analysis.
Table 8.2: RSR Socioeconomic Indicators vs Blood Lead Level-Summary of Results

RSR Socioeconomic Indicators vs. Elevated Childhood Blood Lead Levels Analysis From the Year 1999 to the Year 2002- Summary Table of Results			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Elevated Blood Lead Level of 10-14 g/dl			
Year 1999		**Year 1999**	
Number of Observations	12	Number of Observations	27
Total counts of Elevated BLL 10-14 g/dl	109	Total counts of Elevated BLL 10-14 g/dl	41
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% HH Income < $10,000/yr.	0.83	% Housing Un Year 1940 to Year 1959	0.47
% Housing Un Year 1940 to Year 1959	0.66	% Housing Un Year 1939 or earlier	0.58
Year 2000		**Year 2000**	
Number of Observations	12	Number of Observations	26
Total counts of Elevated BLL 10-14 g/dl	130	Total counts of Elevated BLL 10-14 g/dl	35
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% Families -Below Poverty Level	0.64	% Families -Below Poverty Level	0.46
% HH Income < $10,000/yr.	0.84	% HH Income < $10,000/yr.	0.57
% HH Income Year $10,000 to $14,999/yr.	0.83	% HH Income Year $15,000 to $24,999/yr.	0.53
% Housing Un Year 1940 to Year 1959	0.67	% Housing Un Year 1960 to Year 1969	0.42
		% Housing Un Year 1940 to Year 1959	0.43
Year 2001		**Year 2001**	
Number of Observations	12	Number of Observations	26
Total counts of Elevated BLL 10-14 g/dl	120	Total counts of Elevated BLL 10-14 g/dl	40
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% Families -Below Poverty Level	0.58	% Families -Below Poverty Level	0.48
% HH Income < $10,000/yr.	0.82	% HH Income < $10,000/yr.	0.47
% Housing Un Year 1940 to Year 1959	0.77	% HH Income Year $15,000 to $24,999/yr.	0.59
Year 2002		**Year 2002**	
Number of Observations	12	Number of Observations	27
Total counts of Elevated BLL 10-14 g/dl	147	Total counts of Elevated BLL 10-14 g/dl	54
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% HH Income < $10,000/yr.	0.59	% HH Income < $10,000/yr.	0.41
% HH Income Year $10,000 to $14,999/yr.	0.58	% HH Income Year $15,000 to $24,999/yr.	0.48
% Housing Un Year 1940 to Year 1959	0.72	% Housing Un Year 1960 to Year 1969	0.43
		% Housing Un Year 1940 to Year 1959	0.40

RSR Socioeconomic Indicators vs. Elevated Childhood Blood Lead Levels Analysis From the Year 1999 to the Year 2002- Summary Table of Results					
Total Counts of Elevated Blood Lead Level					
Schools Located within the 5-Mile Radius			**Schools Located Greater than the 5-Mile Radius**		
Year 1999			**Year 1999**		
Number of Observations	12		Number of Observations	27	
Total counts of Elevated BLL	152		Total counts of Elevated BLL	47	
Significant Relationships			**Significant Relationships**		
Total counts of Elevated BLL vs.		Coeff. Corr	Total counts of Elevated BLL vs.		Coeff. Corr
% Families -Below Poverty Level		0.69	% HH Income Year $10,000 to $14,999/yr.		0.49
% HH Income < $10,000/yr.		0.75	% Housing Un Year 1960 to Year 1969		0.50
% HH Income Year $10,000 to $14,999/yr.		0.59	% Housing Un Year 1940 to Year 1959		0.59
			% Housing Un Year 1939 or earlier		0.52
Year 2000			**Year 2000**		
Number of Observations	12		Number of Observations	26	
Total counts of Elevated BLL	181		Total counts of Elevated BLL	55	
Significant Relationships			**Significant Relationships**		
Total counts of Elevated BLL vs.		Coeff. Corr	Total counts of Elevated BLL vs.		Coeff. Corr
% Families -Below Poverty Level		0.59	% Families -Below Poverty Level		0.44
% HH Income < $10,000/yr.		0.81	% HH Income < $10,000/yr.		0.46
% HH Income Year $10,000 to $14,999/yr.		0.72	% HH Income Year $15,000 to $24,999/yr.		0.49
% Housing Un Year 1940 to Year 1959		0.74	% Housing Un Year 1960 to Year 1969		0.43
			% Housing Un Year 1940 to Year 1959		0.40
Year 2001			**Year 2001**		
Number of Observations	12		Number of Observations	26	
Total counts of Elevated BLL	171		Total counts of Elevated BLL	55	
Significant Relationships			**Significant Relationships**		
Total counts of Elevated BLL vs.		Coeff. Corr	Total counts of Elevated BLL vs.		Coeff. Corr
% HH Income < $10,000/yr.		0.80	% Families -Below Poverty Level		0.51
% Housing Un Year 1940 to Year 1959		0.77	% HH Income < $10,000/yr.		0.59
			% HH Income Year $15,000 to $24,999/yr.		0.67
			% Housing Un Year 1960 to Year 1969		0.43
			% Housing Un Year 1940 to Year 1959		0.41
Year 2002			**Year 2002**		
Number of Observations	12		Number of Observations	27	
Total counts of Elevated BLL	228		Total counts of Elevated BLL	89	
Significant Relationships			**Significant Relationships**		
Total counts of Elevated BLL vs.		Coeff. Corr	Total counts of Elevated BLL vs.		Coeff. Corr
% Housing Un Year 1940 to Year 1959		0.64	% HH Income < $10,000/yr.		0.39
			% HH Income Year $15,000 to $24,999/yr.		0.52
			% Housing Un Year 1960 to Year 1969		0.44

Based on the table, there are significantly higher counts, of elevated childhood blood lead level of 10-14 μg/dl and total counts of elevated childhood blood lead, for the children that reside in zip codes, located within the RSR Site's 5-mile radius, than for the children, that reside in zip codes, located greater than the 5-mile radius of the RSR Site. There are also many significant relationships, between the percentage of households with low income, the percentage of families, that are below poverty level, and the percentage of housing units, constructed before the Year 1970; with the counts of childhood elevated blood lead level of 10-14 mg/dl and total counts of elevated childhood blood lead, for the children that reside within zip codes, located within and greater, than the 5-mile radius, of the RSR Site. The coefficients of correlations, of the significant relationships, are stronger for the children that reside within the RSR Site's 5-mile radius, than for the children, that reside in zip codes located greater than the 5-mile radius, of the RSR Site. These results indicate that the proximity to the RSR Site, and the socioeconomic indicators contribute to the counts of elevated blood lead level.

8.1.3 RSR Socioeconomic Indicators vs. Test Passing Rate Analysis –Summary of Results

The purpose of the socioeconomic indicators vs. the standardized test is passing rate analysis is to determine if there is a significant relationship between socioeconomic indicators and the standardized test passing rates for elementary, middle, and high schools. The table below depicts the results of the socioeconomic indicators vs. standardized test passing rates.

Table 8.3: RSR Socioeconomic Indicators vs Standardized Test Passing Rates – Summary of Results

RSR Socioeconomic Indicators vs. Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Middle and High Schools			
Year 1999		**Year 1999**	
Number of Observations	12	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
59.0		77.3	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
% Families -Below Poverty Level	-0.60	% HH Income Year $15,000 to $24,999/yr.	-0.47
% HH Income < $10,000/yr.	-0.72	% Female HH w/ Child < 18 yrs. Of Age	-0.44
% HH Income Year $10,000 to $14,999/yr.	-0.72		
% Housing Un Year 1970 to Year 1979	-0.74		
% Housing Un Year 1940 to Year 1959	-0.61		
	-0.63		
Year 2000		**Year 2000**	
Number of Observations	13	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
61.2		80.8	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
% Families -Below Poverty Level		none	
% HH Income < $10,000/yr.	-0.57		
% HH Income Year $10,000 to $14,999/yr.	-0.58		
% HH Income Year $15,000 to $24,999/yr.	-0.58		
% Housing Un Year 1940 to Year 1959	-0.66		
Year 2001		**Year 2001**	
Number of Observations	12	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
60.4		82.3	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
% Families -Below Poverty Level	-0.63	% HH Income < $10,000/yr.	-0.50
% HH Income < $10,000/yr.	-0.59	% HH Income Year $15,000 to $24,999/yr.	-0.51
% HH Income Year $10,000 to $14,999/yr.	-0.59	% Families -Below Poverty Level	-0.46
% Female HH w/ Child < 18 yrs. of Age	-0.61	% Female HH w/ Child < 18 yrs. of Age	-0.49
% Housing Un Year 1940 to Year 1959	-0.64	% Housing Un Year 1940 to Year 1959	-0.51
Year 2002		**Year 2002**	
Number of Observations	13	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
71.7		84.5	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
% HH Income < $10,000/yr.	-0.62	% HH Income < $10,000/yr.	-0.45
% HH Income Year $10,000 to $14,999/yr.	-0.63	% HH Income Year $15,000 to $24,999/yr.	-0.42
% Housing Un Year 1939 or earlier	-0.63	% Housing Un Year 1940 to Year 1959	-0.43

RSR Socioeconomic Indicators vs. Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results			
Elementary Schools			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Year 1999		**Year 1999**	
Number of Observations	35	Number of Observations	21
Average Standardized Test Passing Rate for the Year (%)	65.6	Average Standardized Test Passing Rate for the Year (%)	82.3
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
none		% HH Income Year $15,000 to $24,999/yr.	-0.50
		% Housing Un Year 1940 to Year 1959	-0.66
		% Housing Un Year 1939 or earlier	-0.77
Year 2000		**Year 2000**	
Number of Observations	36	Number of Observations	22
Average Standardized Test Passing Rate for the Year (%)	60.2	Average Standardized Test Passing Rate for the Year (%)	82.2
Significant Relationships		**Significant Relationships**	
none		Standardized Test Passing Rate (%) vs.	Coeff. Corr
		% HH Income < $10,000/yr.	-0.51
		% HH Income Year $10,000 to $14,999/yr.	-0.49
		% HH Income Year $15,000 to $24,999/yr.	-0.54
		% Housing Un Year 1960 to Year 1969	-0.45
		% Housing Un Year 1940 to Year 1959	-0.75
		% Housing Un Year 1939 or earlier	-0.83
Year 2001		**Year 2001**	
Number of Observations	37	Number of Observations	22
Average Standardized Test Passing Rate for the Year (%)	69.9	Average Standardized Test Passing Rate for the Year (%)	83
Significant Relationships		**Significant Relationships**	
none		Standardized Test Passing Rate (%) vs.	Coeff. Corr
		% HH Income Year $10,000 to $14,999/yr.	-0.51
		% HH Income Year $15,000 to $24,999/yr.	-0.56
		% Families -Below Poverty Level	-0.45
		% Housing Un Year 1940 to Year 1959	-0.68
		% Housing Un Year 1939 or earlier	-0.80
Year 2002		**Year 2002**	
Number of Observations	37	Number of Observations	22
Average Standardized Test Passing Rate for the Year (%)	75.9	Average Standardized Test Passing Rate for the Year (%)	85.0
Significant Relationships		**Significant Relationships**	
none		Standardized Test Passing Rate (%) vs.	Coeff. Corr
		% HH Income < $10,000/yr.	-0.48
		% HH Income Year $10,000 to $14,999/yr.	-0.47
		% HH Income Year $15,000 to $24,999/yr.	-0.55
		% Housing Un Year 1960 to Year 1969	-0.45
		% Housing Un Year 1940 to Year 1959	-0.73
		% Housing Un Year 1939 or earlier	-0.66

Based on the table, there is a 27% difference, 28% difference, 31% difference, and 16% difference, lower, of the standardized test passing rates for the Year 1999, the Year 2000,

the Year 2001, and the Year 2002, respectively, for the middle and schools located within the 5-mile radius, than from the middle and high schools located, greater than the 5-mile radius, of the RSR Site. There are also many significant relationships, between the percentage of households with low income, the percentage of families, that are below poverty level, and the percentage of housing units, constructed before the Year 1970; with the standardized test passing rates for the middle and high schools, located within and greater than, the 5-mile radius, of the RSR Site. The coefficients of correlations, of the significant relationships, are stronger for the middle and high schools, located within the RSR Site's 5-mile radius, than for the middle and high schools located greater than the 5-mile radius, of the RSR Site.

For the elementary schools, there is a 23% difference, a 31% difference, a 17% difference, a 11% difference, lower, of the standardized test passing rates for the Year 1999, the Year 2000, the Year 2001, and the Year 2002, respectively, for the elementary schools located within the 5-mile radius, than from the elementary schools located, greater than the 5-mile radius, of the RSR Site. There were no significant relationships between the socioeconomic indicators and the standardized test passing rates, for elementary schools located within the 5 mile radius of the RSR Site. This result might due no exposure of the prospective students to the RSR Site, when they were young children, due to the RSR Site's closure (Year 1984) and clean up (2004). These results indicate that the proximity to the RSR Site, and the socioeconomic indicators, negatively impact standardized test passing rates.

8.1.4 RSR Blood Lead Level vs. Standardized Test Passing Rate Analysis

The purpose of the blood lead level vs. the standardized test is passing rate analysis is to determine if there is a significant relationship between elevated childhood blood lead levels and the standardized test passing rates for elementary, middle, and high schools. For this analysis, an indirect comparison was conducted, with the assumption that the elevated blood lead level counts, for the Year 1999 to the Year 2002, are similar to the elevated blood lead level, before the Year 1999. The table below depicts the results of the elevated childhood blood lead levels vs. standardized test passing rates.
Table 8.4: RSR Blood Lead Level vs. Standardized Test Passing Rates -Summary of Results

RSR Blood Lead Level vs. Standardized Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results										
Schools Located within the 5-Mile Radius					**Schools Located Greater than the 5-Mile Radius**					
Blood Lead Level 10-14 g/dl and Test Passing Rates for Middle and High Schools										
Number of Observations			8		Number of Observations			11		
Range of blood lead level 10-14 g/dl (#) from the					Range of blood lead level 10-14 g/dl (#) from the					
	Year 1999 to the Year 2002					Year 1999 to the Year 2002				
	83 (#) (Year 1999) to 125 (#) (Year 2002)					23 (#) (Year 1999) to 33 (#) (Year 2002)				
Range of standardized test passing rates from the					Range of standardized test passing rates from the					
	Year 1999 to the Year 2002					Year 1999 to the Year 2002				
	59.1% (Year 1999) to 72.6% (Year 2002)					74.7% (Year 1999) to 82.5% (Year 2002)				
Significant Relationships				Coeff. Corr	**Significant Relationships**					
Year 1999 10-14 BLL (#) vs					Year 2000 10-14 BLL (#) vs					Coeff. Corr
	% Test PR Year 2000			-0.72		% Test PR Year 2001				-0.62
	% Test PR Year 2001			-0.87		% Test PR Year 2002				-0.69
Year 2000 10-14 BLL (#) vs					Year 2001 10-14 BLL (#) vs					
	% Test PR Year 1999			-0.78		% Test PR Year 1999				-0.72
	% Test PR Year 2001			-0.85		% Test PR Year 2000				-0.72
Year 2001 10-14 BLL (#) vs						% Test PR Year 2001				-0.77
	% Test PR Year 2001			-0.88		% Test PR Year 2002				-0.66
Total Counts Blood Lead Level and Test Passing Rates for Middle and High Schools										
Number of Observations			8		Number of Observations			11		
Range of total counts of blood lead level (#) from the					Range of total counts of blood lead level (#) from the					
	Year 1999 to the Year 2002					Year 1999 to the Year 2002				
	116 (#) (Year 1999) to 196 (#) (Year 2002)					27 (#) (Year 1999) to 51 (#) (Year 2002)				
Range of standardized test passing rates from the					Range of standardized test passing rates from the					
	Year 1999 to the Year 2002					Year 1999 to the Year 2002				
	59.1% (Year 1999) to 72.6% (Year 2002)					74.7% (Year 1999) to 82.5 % (Year 2002)				
Significant Relationships					**Significant Relationships**					
Year 1999 Total BLL (#) vs				Coeff. Corr	Year 2001 Total BLL (#) vs					Coeff. Corr
	% Test PR Year 2001			-0.88		% Test PR Year 1999				-0.65
Year 2000 Total BLL (#) vs						% Test PR Year 2000				-0.69
	% Test PR Year 2001			-0.79		% Test PR Year 2001				-0.74
Year 2001 Total BLL (#) vs						% Test PR Year 2002				-0.72
	% Test PR Year 2000			-0.73						
	% Test PR Year 2001			-0.85						

RSR Blood Lead Level vs. Standardized Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results										
Blood Lead Level 10-14 g/dl and Test Passing Rates for Elementary Schools										
Schools Located within the 5-Mile Radius					**Schools Located Greater than the 5-Mile Radius**					
Number of Observations			11		Number of Observations			12		
Range of blood lead level 10-14 g/dl (#) from the					Range of blood lead level 10-14 g/dl (#) from the					
	Year 1999 to the Year 2002					Year 1999 to the Year 2002				
	107 (#) (Year 1999) to 148 (#) (Year 2002)					21 (#) (Year 1999) to 3 (#6) (Year 2002)				
Range of standardized test passing rates from the					Range of standardized test passing rates from the					
	Year 1999 to the Year 2002					Year 1999 to the Year 2002				
	61.6% (Year 1999) to 74.8% (Year 2002)					81.0.% (Year 1999) to 84.7 (Year 2002)				
Significant Relationships				Coeff. Corr	**Significant Relationships**					
none					none					
Total Counts Blood Lead Level and Test Passing Rates for Elementary Schools										
Number of Observations			11		Number of Observations			12		
Range of total counts of blood lead level (#) from the					Range of total counts of blood lead level (#) from the					
	Year 1994 to the Year 2002					Year 1994 to the Year 2002				
	150 (#) (Year 1994) to 228 (#) (Year 2002)					29 (#) (Year 1994) to 58 (#) (Year 2002)				
Range of standardized test passing rates from the					Range of standardized test passing rates from the					
	Year 1994 to the Year 2002					Year 1994 to the Year 2002				
	61.6% (Year 1994) to 74.8% (Year 2002)					81.0% (Year 1994) to 84.2% (Year 2002)				
Significant Relationships				Coeff. Corr	**Significant Relationships**					Coeff. Corr
none					none					

Based on the table, the counts of elevated blood lead levels are higher for the schools located within the 5-mile radius, of the RSR Site, than the schools located greater than 5-mile radius of the RSR Site. In addition, the standardized test passing rates are higher, for schools, located within the 5-mile radius, of the RSR Site, than schools, located greater than the 5-mile radius, of the RSR Site.

There are also many significant relationships, between the counts of elevated childhood blood lead level, and the standardized test passing rates for the middle and high schools, located within, the 5-mile radius, of the RSR Site. The coefficients of correlations, of the significant relationships, are stronger for the middle and high schools, located within the RSR Site's 5-mile radius, than for the middle and high schools located greater than the 5-mile radius, of the RSR Site.

There were no significant relationships between the socioeconomic indicators and the standardized test passing rates, for elementary schools located within the 5 mile radius of the RSR Site. This result might due no exposure of the prospective students to the RSR Site, when they were young children, due to the RSR Site's closure (Year 1984) and

clean up (1994). These results indicate that the proximity to the RSR Site, and the socioeconomic indicators, negatively impact standardized test passing rates.

8.2: Sampson Horrice Superfund Site Results

8.2.1: Sampson Horrice Superfund Site Distance Analysis

The purpose of the distance analysis is to determine if there is a significant relationship between the proximity of the schools, from the Sampson Horrice Site, and the school has standardized test passing rates. The table below depicts the results of the Sampson Horrice Site's Distance Analysis.

Table 8.5: Sampson Horrice Distance Analysis –Summary of Results

Sampson Horrice Distance Analysis from the Year 1994 to the Year 2002- Summary Table of Results							
Schools Located within the 5-Mile Radius				**Schools Located Greater than the 5-Mile Radius**			
Middle and High Schools							
Number of Observations		5		Number of Observations		20	
Range of standardized test passing rates from the				Range of standardized test passing rates from the			
	Year 1994 to the Year 2002				Year 1994 to the Year 2002		
	24.5% (Year 1994) to 54.0% (Year 2002)				62.6% (Year 1994) to 82.0 (Year 2002)		
Significant Relationships				**Significant Relationships**			
Distance in Miles vs.			Coeff. Cor	Distance in Miles vs.			Coeff. Corr
	% Test PR Year 1994		0.97		none		
Elementary Schools							
Number of Observations		22		Number of Observations		17	
Range of standardized test passing rates from the				Range of standardized test passing rates from the			
	Year 1994 to the Year 2002				Year 1994 to the Year 2002		
	39.2% (Year 1994) to 75.7% (Year 2002)				64.5% (Year 1994) to 83.7 % (Year 2002)		
Significant Relationships				**Significant Relationships**			
Distance in Miles vs.			Coeff. Cor	Distance in Miles vs.			Coeff. Corr
	% Test PR Year 1994		0.49		none		
	% Test PR Year 1996		0.69				
	% Test PR Year 2000		0.57				
	% Test PR Year 2001		0.44				

Based on the summary table, there is a 87% difference and a 41% difference, lower, in the standardized test passing rates, for the Year 1994 and the Year 2002, respectively, for the middle and high schools located, within the 5-mile radius of the Sampson Horrice Site, from the middle and high schools located greater than the 5- mile radius of the Sampson Horrice Site. In addition, there is a 49% difference and a 10% difference, lower, in the standardized test passing rates, for the Year 1994 and the Year 2002, respectively, for the elementary schools located within the 5-mile radius of the Sampson Horrice Site, from the elementary schools located greater than the 5-mile radius of the

Sampson Horrice Site. As the years increase, from the Year 1994 to the Year 2002, the percent difference in standardized test passing rates, decreases, between the middle and high schools, and the elementary schools, located within and greater than the 5-mile radius of the Sampson Horrice Site.

There was also a strong significant relationship between the distance, of the middle and high schools, to the Sampson Horrice Site, and the standardized test passing rates, for the Year 1994, for the schools located within the 5-mile radius, of the Sampson Horrice Site. The strong relationship could be due to the prospective students being possibly exposed to the gravel pit that illegally accepted solid and hazardous waste of the Sampson Horrice Site.

There were some moderate to high significant relationships, between the proximity of the elementary schools, to the Sampson Horrice Site, and the standardized test passing rates, for schools located within the 5-mile radius, of the Sampson Horrice Site. This might be due to the prospective elementary students, having exposure to the Sampson Horrice Site, after the site closed, in 1983 and before the clean- up activities started in the Year 1999 and ended in the Year 2000. In addition, socioeconomic indicators, could contribute to the significant relationship, as well. Based on these results, the school proximity, to the gravel pit of the Sampson Horrice, can result in lower standardized test passing rates.

8.2.2 Sampson Horrice Socioeconomic Indicators vs. Blood Lead Level –Summary of Results

The purpose of the socioeconomic indicators vs. the blood lead level analysis is to determine if there is a significant relationship between socioeconomic indicators and the counts of elevated childhood blood lead level. The table below depicts the results of the socioeconomic indicators vs. blood lead level analysis.
Table 8.6: Sampson Horrice Socioeconomic Indicators vs. Blood Lead Level-Summary of Results

Sampson Horrice Socioeconomic Indicators vs. Elevated Childhood Blood Lead Levels Analysis From the Year 1999 to the Year 2002- Summary Table of Results			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Elevated Blood Lead Level of 10-14 g/dl			
Year 1999		**Year 1999**	
Number of Observations	6	Number of Observations	27
Total counts of Elevated BLL 10-14 g/dl	109	Total counts of Elevated BLL 10-14 g/dl	41
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% HH Income < $10,000/yr.	0.81	% Housing Un Year 1940 to Year 1959	0.47
% Housing Un Year 1940 to Year 1959	0.81	% Housing Un Year 1939 or earlier	0.58
Year 2000		**Year 2000**	
Number of Observations	6	Number of Observations	26
Total counts of Elevated BLL 10-14 g/dl	57	Total counts of Elevated BLL 10-14 g/dl	35
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
none		% Families -Below Poverty Level	0.46
		% HH Income < $10,000/yr.	0.57
		% HH Income Year $15,000 to $24,999/yr.	0.53
		% Housing Un Year 1960 to Year 1969	0.42
		% Housing Un Year 1940 to Year 1959	0.43
Year 2001		**Year 2001**	
Number of Observations	6	Number of Observations	26
Total counts of Elevated BLL 10-14 g/dl	54	Total counts of Elevated BLL 10-14 g/dl	40
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% HH Income < $10,000/yr.	0.85	% Families -Below Poverty Level	0.48
% HH Income Year $10,000 to $14,999/yr.	0.85	% HH Income < $10,000/yr.	0.47
		% HH Income Year $15,000 to $24,999/yr.	0.59
Year 2002		**Year 2002**	
Number of Observations	6	Number of Observations	27
Total counts of Elevated BLL 10-14 g/dl	89	Total counts of Elevated BLL 10-14 g/dl	54
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% HH Income Year $10,000 to $14,999/yr.	0.93	% HH Income < $10,000/yr.	0.41
% HH Income Year $15,000 to $24,999/yr.	0.99	% HH Income Year $15,000 to $24,999/yr.	0.48
		% Housing Un Year 1960 to Year 1969	0.43
		% Housing Un Year 1940 to Year 1959	0.40

Sampson Horrice Socioeconomic Indicators vs. Elevated Childhood Blood Lead Levels Analysis From the Year 1999 to the Year 2002- Summary Table of Results			
Total Counts of Elevated Blood Lead Level			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Year 1999		**Year 1999**	
Number of Observations	6	Number of Observations	27
Total counts of Elevated BLL	148	Total counts of Elevated BLL	47
Significant Relationships		**Significant Relationships**	
Total counts of Elevated BLL vs.	Coeff. Corr	Total counts of Elevated BLL vs.	Coeff. Corr
% HH Income < $10,000/yr.	0.81	% HH Income Year $10,000 to $14,999/yr.	0.49
% Housing Un Year 1940 to Year 1959	0.81	% Housing Un Year 1960 to Year 1969	0.50
		% Housing Un Year 1940 to Year 1959	0.59
		% Housing Un Year 1939 or earlier	0.52
Year 2000		**Year 2000**	
Number of Observations	6	Number of Observations	26
Total counts of Elevated BLL	77	Total counts of Elevated BLL	55
Significant Relationships		**Significant Relationships**	
Total counts of Elevated BLL vs.	Coeff. Corr	Total counts of Elevated BLL vs.	Coeff. Corr
% Housing Un Year 1940 to Year 1959	0.85	% Families -Below Poverty Level	0.44
		% HH Income < $10,000/yr.	0.46
		% HH Income Year $15,000 to $24,999/yr.	0.49
		% Housing Un Year 1960 to Year 1969	0.43
		% Housing Un Year 1940 to Year 1959	0.40
Year 2001		**Year 2001**	
Number of Observations	6	Number of Observations	26
Total counts of Elevated BLL	70	Total counts of Elevated BLL	55
Significant Relationships		**Significant Relationships**	
Total counts of Elevated BLL vs.	Coeff. Corr	Total counts of Elevated BLL vs.	Coeff. Corr
% HH Income < $10,000/yr.	0.85	% Families -Below Poverty Level	0.51
% HH Income Year $10,000 to $14,999/yr.	0.85	% HH Income < $10,000/yr.	0.59
		% HH Income Year $15,000 to $24,999/yr.	0.67
		% Housing Un Year 1960 to Year 1969	0.43
		% Housing Un Year 1940 to Year 1959	0.41
Year 2002		**Year 2002**	
Number of Observations	6	Number of Observations	27
Total counts of Elevated BLL	136	Total counts of Elevated BLL	89
Significant Relationships		**Significant Relationships**	
Total counts of Elevated BLL vs.	Coeff. Corr	Total counts of Elevated BLL vs.	Coeff. Corr
% HH Income < $10,000/yr.	0.83	% HH Income < $10,000/yr.	0.39
% HH Income Year $10,000 to $14,999/yr.	0.94	% HH Income Year $15,000 to $24,999/yr.	0.52
		% Housing Un Year 1960 to Year 1969	0.44

Based on the table, there are significantly higher counts, of elevated childhood blood lead level of 10-14 μg/dl and total counts of elevated childhood blood lead, for the children that reside in zip codes, located within the Sampson Horrice Site's 5-mile radius, than for the children, that reside in zip codes, located greater than the 5-mile radius of the Sampson Horrice Site. There are also many significant relationships, between the percentage of households with low income, the percentage of families, that are below poverty level, and the percentage of housing units, constructed before the Year 1970; with the counts of childhood elevated blood lead level of 10-14 mg/dl and total counts of elevated childhood blood lead, for the children that reside within zip codes, located within and greater, than the 5-mile radius, of the Sampson Horrice Site. The coefficients of correlations, of the significant relationships, are stronger for the children that reside within the Sampson Horrice's 5-mile radius, than for the children, that reside in zip codes located greater than the 5-mile radius, of the Sampson Horrice Site. These results indicate that the proximity to the Sampson Horrice Site, and the socioeconomic indicators contribute to the counts of elevated blood lead level.

8.2.3 Sampson Horrice Socioeconomic Indicators vs. Test Passing Rate Analysis – Summary of Results

The purpose of the socioeconomic indicators vs. the standardized test is passing rate analysis is to determine if there is a significant relationship between socioeconomic indicators and the standardized test passing rates for elementary, middle, and high schools. The table below depicts the results of the socioeconomic indicators vs. standardized test passing rates.

Table 8.7: Sampson Horrice Socioeconomic Indicators vs. Standardized Test Passing Rates –Summary of Results

Sampson Horrice Socioeconomic Indicators vs. Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Middle and High Schools			
Year 1999		**Year 1999**	
Number of Observations	5	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
36.7		77.3	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
none		% HH Income Year $15,000 to $24,999/yr.	-0.47
		% Female HH w/ Child < 18 yrs. Of Age	-0.44
Year 2000		**Year 2000**	
Number of Observations	5	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
44.8		80.8	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
none		none	
Year 2001		**Year 2001**	
Number of Observations	5	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
46.4		82.3	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
none		% HH Income < $10,000/yr.	-0.50
		% HH Income Year $15,000 to $24,999/yr.	-0.51
		% Families -Below Poverty Level	-0.46
		% Female HH w/ Child < 18 yrs. of Age	-0.49
		% Housing Un Year 1940 to Year 1959	-0.51
Year 2002		**Year 2002**	
Number of Observations	5	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
54		84.5	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
none		% HH Income < $10,000/yr.	-0.45
		% HH Income Year $15,000 to $24,999/yr.	-0.42
		% Housing Un Year 1940 to Year 1959	-0.43

Sampson Horrice Socioeconomic Indicators vs. Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results			
Elementary Schools			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Year 1999		**Year 1999**	
Number of Observations	21	Number of Observations	21
Average Standardized Test Passing Rate for the Year (%)	63.0	Average Standardized Test Passing Rate for the Year (%)	82.3
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
none		% HH Income Year $15,000 to $24,999/yr.	-0.50
		% Housing Un Year 1940 to Year 1959	-0.66
		% Housing Un Year 1939 or earlier	-0.77
Year 2000		**Year 2000**	
Number of Observations	22	Number of Observations	22
Average Standardized Test Passing Rate for the Year (%)	66	Average Standardized Test Passing Rate for the Year (%)	82.2
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
% HH Income < $10,000/yr.	-0.57	% HH Income < $10,000/yr.	-0.51
% HH Income Year $10,000 to $14,999/yr.	-0.51	% HH Income Year $10,000 to $14,999/yr.	-0.49
% HH Income Year $15,000 to $24,999/yr.	-0.57	% HH Income Year $15,000 to $24,999/yr.	-0.54
% Families -Below Poverty Level	-0.57	% Housing Un Year 1960 to Year 1969	-0.45
% Female HH w/ Child < 18 yrs. of Age	-0.58	% Housing Un Year 1940 to Year 1959	-0.75
% Housing Un Year 1940 to Year 1959	-0.50	% Housing Un Year 1939 or earlier	-0.83
Year 2001		**Year 2001**	
Number of Observations	22	Number of Observations	22
Average Standardized Test Passing Rate for the Year (%)	65.3	Average Standardized Test Passing Rate for the Year (%)	83.0
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
% Families -Below Poverty Level	-0.46	% HH Income Year $10,000 to $14,999/yr.	-0.51
% HH Income < $10,000/yr.	-0.46	% HH Income Year $15,000 to $24,999/yr.	-0.56
% HH Income Year $10,000 to $14,999/yr.	-0.45	% Families -Below Poverty Level	-0.45
% HH Income Year $15,000 to $24,999/yr.	-0.46	% Housing Un Year 1940 to Year 1959	-0.68
% Female HH w/ Child < 18 yrs. of Age	-0.47	% Housing Un Year 1939 or earlier	-0.80
% Housing Un Year 1940 to Year 1959	-0.45		
% Housing Un Year 1939 or earlier	-0.48		
Year 2002		**Year 2002**	
Number of Observations	22	Number of Observations	22
Average Standardized Test Passing Rate for the Year (%)	75.7	Average Standardized Test Passing Rate for the Year (%)	85.0
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
% Families -Below Poverty Level	-0.52	% HH Income < $10,000/yr.	-0.48
% HH Income < $10,000/yr.	-0.52	% HH Income Year $10,000 to $14,999/yr.	-0.47
% HH Income Year $10,000 to $14,999/yr.	-0.53	% HH Income Year $15,000 to $24,999/yr.	-0.55
% HH Income Year $15,000 to $24,999/yr.	-0.52	% Housing Un Year 1960 to Year 1969	-0.45
% Female HH w/ Child < 18 yrs. of Age	-0.51	% Housing Un Year 1940 to Year 1959	-0.73
% Housing Un Year 1940 to Year 1959	-0.52	% Housing Un Year 1939 or earlier	-0.66

Based on the table, there is a 71% difference, 57% difference, 56% difference, and 44% difference, lower, of the standardized test passing rates for the Year 1999, the Year 2000, the Year 2001, and the Year 2002, respectively, for the middle and schools located within the 5-mile radius, than from the middle and high schools located, greater than the 5-mile radius, of the Sampson Horrice Site. There are no significant relationships between the socioeconomic indicators and the standardized test passing rates for the middle and high schools, located within the 5-mile radius of the Sampson Horrice Site. This might be the result of no exposure of the prospective students, being exposed to the Sampson Horrice Site.

For the elementary schools, there is a 27% difference, a 22% difference, a 24% difference, a 12% difference, lower, of the standardized test passing rates for the Year 1999, the Year 2000, the Year 2001, and the Year 2002, respectively, for the elementary schools located within the 5-mile radius, than from the elementary schools located, greater than the 5-mile radius, of the Sampson Horrice Site. There were many significant relationships, between the housing units with low income, families below poverty level, and housing units constructed before the Year 1970, with the standardized test passing rates, for elementary schools located within the 5-mile radius of the Sampson Horrice Site. This result might be due to exposure of the prospective students, to the Sampson Horrice Site's illegal gravel pit, that illegally accepted solid and hazardous waste before the site was cleaned up. The site cleanup activities were from the Year 1999 to the Year 2000. In addition, socioeconomic factors may have a major effect on the lower standardized test passing rates, for the elementary schools, located within the 5-mile radius Sampson Horrice.

8.2.4 Sampson Horrice Blood Lead Level vs. Standardized Test Passing Rate Analysis

The purpose of the blood lead level vs. the standardized test is passing rate analysis is to determine if there is a significant relationship between elevated childhood blood lead levels and the standardized test passing rates for elementary, middle, and high schools. For this analysis, an indirect comparison was conducted, with the assumption that the elevated blood lead level counts, for the Year 1999 to the Year 2002, are similar to the elevated blood lead level, before the Year 1999. The table below depicts the results of the elevated childhood blood lead levels vs. standardized test passing rates.

Table 8.8: Sampson Horrice Socioeconomic Indicators vs. Standardized Test Passing Rates –Summary or Results

Sampson H. Blood Lead Level vs. Standardized Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Blood Lead Level 10-14 g/dl and Test Passing Rates for Middle and High Schools			
Number of Observations	2	Number of Observations	11
Range of blood lead level 10-14 g/dl (#) from the Year 1999 to the Year 2002	93 (#) (Year 1999) to 49.6 (#) (Year 2002)	Range of blood lead level 10-14 g/dl (#) from the Year 1999 to the Year 2002	23 (#) (Year 1999) to 33 (#) (Year 2002)
Range of standardized test passing rates from the Year 1999 to the Year 2002	32.1% (Year 1999) to 49.6.6% (Year 2002)	Range of standardized test passing rates from the Year 1999 to the Year 2002	74.7% (Year 1999) to 82.5% (Year 2002)
Significant Relationships	Coeff. Corr	**Significant Relationships**	
none		Year 2000 10-14 BLL (#) vs	Coeff. Corr
		% Test PR Year 2001	-0.62
		% Test PR Year 2002	-0.69
		Year 2001 10-14 BLL (#) vs	
		% Test PR Year 1999	-0.72
		% Test PR Year 2000	-0.72
		% Test PR Year 2001	-0.77
		% Test PR Year 2002	-0.66
Total Counts Blood Lead Level and Test Passing Rates for Middle and High Schools			
Number of Observations	2	Number of Observations	11
Range of total counts of blood lead level (#) from the Year 1999 to the Year 2002	115 (#) (Year 1999) to 98 (#) (Year 2002)	Range of total counts of blood lead level (#) from the Year 1999 to the Year 2002	27 (#) (Year 1999) to 51 (#) (Year 2002)
Range of standardized test passing rates from the Year 1999 to the Year 2002	32.1% (Year 1999) to 49.6% (Year 2002)	Range of standardized test passing rates from the Year 1999 to the Year 2002	74.7% (Year 1999) to 82.5 % (Year 2002)
Significant Relationships		**Significant Relationships**	
none		Year 2001 Total BLL (#) vs	Coeff. Corr
		% Test PR Year 1999	-0.65
		% Test PR Year 2000	-0.69
		% Test PR Year 2001	-0.74
		% Test PR Year 2002	-0.72

Sampson H. Blood Lead Level vs. Standardized Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results			
Blood Lead Level 10-14 g/dl and Test Passing Rates for Elementary Schools			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Number of Observations	6	Number of Observations	12
Range of blood lead level 10-14 g/dl (#) from the Year 1999 to the Year 2002	109 (#) (Year 1999) to 86 (#) (Year 2002)	Range of blood lead level 10-14 g/dl (#) from the Year 1999 to the Year 2002	21 (#) (Year 1999) to 36 (#) (Year 2002)
Range of standardized test passing rates from the Year 1999 to the Year 2002	64.6% (Year 1999) to 82.9% (Year 2002)	Range of standardized test passing rates from the Year 1999 to the Year 2002	81.0% (Year 1999) to 84.7 (Year 2002)
Significant Relationships	Coeff. Corr	**Significant Relationships**	Coeff. Corr
Year 2002 10-14 BLL (#) vs % Test PR Year 2002	-0.90	none	
Total Counts Blood Lead Level and Test Passing Rates for Elementary Schools			
Number of Observations	6	Number of Observations	12
Range of total counts of blood lead level (#) from the Year 1994 to the Year 2002	148 (#) (Year 1994) to 136 (#) (Year 2002)	Range of total counts of blood lead level (#) from the Year 1994 to the Year 2002	29 (#) (Year 1994) to 58 (#) (Year 2002)
Range of standardized test passing rates from the Year 1994 to the Year 2002	64.1% (Year 1994) to 82.9% (Year 2002)	Range of standardized test passing rates from the Year 1994 to the Year 2002	81.0% (Year 1994) to 82.4% (Year 2002)
Significant Relationships	Coeff. Corr	**Significant Relationships**	Coeff. Corr
Year 2001 Total BLL (#) vs % Test PR Year 2002	-0.97	none	
Year 2002 Total BLL (#) vs % Test PR Year 2002	-0.90		

Based on the table, the counts of elevated blood lead levels are higher for the schools located within the 5-mile radius, of the Sampson Horrice Site, than the schools located greater than 5-mile radius of the Sampson Horrice Site. In addition, the standardized test passing rates are higher, for schools, located within the 5-mile radius, of the Sampson Horrice Site, than schools, located greater than the 5-mile radius, of the Sampson Horrice Site. There were no significant relationships between the socioeconomic indicators and the standardized test passing rates, for middle and high schools located within the 5-mile radius of the Sampson Horrice Site. This result might due no exposure of the prospective students to the Sampson Horrice Site, when they were young children.

There are also a few significant relationships, between the blood lead levels and the standardized test passing rates for the elementary schools, located within and greater than, the 5-mile radius, of the Sampson Horrice Site. These results indicate that there is

an indirect significant relationship between the counts of blood lead level and lower test passing rates.

8.3 Bio-Ecology –Summary of Results

8.3.1: Bio-Ecology Superfund Site Results: Bio-Ecology Superfund Site Distance Analysis

The purpose of the distance analysis is to determine if there is a significant relationship between the proximity of the schools, from the Bio-Ecology Site, and the school's standardized test passing rates. The table below depicts the results of the Bio-Ecology Site's Distance Analysis.

Table 8.9: Bio-Ecology Distance Analysis –Summary of Results

Bio-Ecology Distance Analysis from the Year 1994 to the Year 2002- Summary Table of Results			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Middle and High Schools			
Number of Observations	10	Number of Observations	20
Range of standardized test passing rates from the Year 1994 to the Year 2002	39.7% (Year 1994) to 76.4% (Year 2002)	Range of standardized test passing rates from the Year 1994 to the Year 2002	65.2% (Year 1994) to 84.8%(Year 2002)
Significant Relationships		**Significant Relationships**	
Distance in Miles vs.	Coeff. Corr	Distance in Miles vs.	Coeff. Corr
% Test PR Year 1997	-0.74	none	
Elementary Schools			
Number of Observations	13	Number of Observations	26
Range of standardized test passing rates from the Year 1994 to the Year 2002	45.7% (Year 1994) to 76.5% (Year 2002)	Range of standardized test passing rates from the Year 1994 to the Year 2002	66.1% (Year 1994) to 85.4% (Year 2002)
Significant Relationships		**Significant Relationships**	
Distance in Miles vs.	Coeff. Corr	Distance in Miles vs.	Coeff. Corr
% Test PR Year 2001	-0.67	% Test PR Year 1994	0.41
		% Test PR Year 1995	0.42
		% Test PR Year 1996	0.41
		% Test PR Year 1997	0.40
		% Test PR Year 1998	0.57
		% Test PR Year 1999	0.51
		% Test PR Year 2000	0.51
		% Test PR Year 2001	0.54
		% Test PR Year 2002	0.44

Based on the summary table, there is a 49% difference and a 10% difference, lower, in the standardized test passing rates, for the Year 1994 and the Year 2002, respectively, for the middle and high schools located, within the 5-mile radius of the Bio-Ecology Site, from the middle and high schools located greater than the 5- mile radius of the Bio-

Ecology Site. In addition, there is a 36% difference and a 11% difference, lower, in the standardized test passing rates, for the Year 1994 and the Year 2002, respectively, for the elementary schools located within the 5-mile radius of the Bio-Ecology Site, from the elementary schools located greater than the 5-mile radius of the Bio-Ecology Site. As the years increase, from the Year 1994 to the Year 2002, the percent difference in standardized test passing rates, decreases, between the middle and high schools, and the elementary schools, located within and greater than the 5-mile radius of the Bio-Ecology Site.

There was also a strong significant relationship between the distance, of the middle and high schools, as well as distance of the elementary schools, to the Bio-Ecology Site, and the standardized test passing rates, for the Year 1997 and the Year 2001, respectively, for the schools located within the 5-mile radius, of the Bio-Ecology Site. These relationships are strong, but negative relationships. The negative relationships are probably from the effects of the RSR Site, than the Bio-Ecology Site. The RSR Site and the Bio-Ecology Site's 5-mile radius buffers, significantly overlap. Since, the RSR Site was in operation much longer than the Bio-Ecology Site and the RSR Site dispersed some pollutants into the atmosphere through a smoke stack, the negative coefficients of correlations are most likely due to the effects of the RSR Site, and not the Bio-Ecology Site. Based on these results, the school proximity, to the lead smelter of the RSR Site, and not the Bio-Ecology Site, can result in lower standardized test passing rates.

8.3.2 Bio-Ecology Socioeconomic Indicators vs. Blood Lead Level Analysis– Summary of Results

The purpose of the socioeconomic indicators vs. the blood lead level analysis is to determine if there is a significant relationship between socioeconomic indicators and the counts of elevated childhood blood lead level. The table below depicts the results of the socioeconomic indicators vs. blood lead level analysis.
Table 8.10: Bio-Ecology Site Socioeconomic Indicators vs. Blood Lead Level-Summary of Results

Bio-Ecology Socioeconomic Indicators vs. Elevated Childhood Blood Lead Levels Analysis From the Year 1999 to the Year 2002- Summary Table of Results			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Elevated Blood Lead Level of 10-14 g/dl			
Year 1999		**Year 1999**	
Number of Observations	7	Number of Observations	27
Total counts of Elevated BLL 10-14 g/dl	59	Total counts of Elevated BLL 10-14 g/dl	41
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% Housing Un Year 1970 to Year 1979	-0.78	% Housing Un Year 1940 to Year 1959	0.47
% Housing Un Year 1939 and earlier	0.77	% Housing Un Year 1939 or earlier	0.58
Year 2000		**Year 2000**	
Number of Observations	7	Number of Observations	26
Total counts of Elevated BLL 10-14 g/dl	94	Total counts of Elevated BLL 10-14 g/dl	35
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% Families -Below Poverty Level	0.89	% Families -Below Poverty Level	0.46
% HH Income < $10,000/yr.	0.82	% HH Income < $10,000/yr.	0.57
		% HH Income Year $15,000 to $24,999/yr.	0.53
		% Housing Un Year 1960 to Year 1969	0.42
		% Housing Un Year 1940 to Year 1959	0.43
Year 2001		**Year 2001**	
Number of Observations	7	Number of Observations	26
Total counts of Elevated BLL 10-14 g/dl	96	Total counts of Elevated BLL 10-14 g/dl	40
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% Housing Un Year 1940 to Year 1959	0.79	% Families -Below Poverty Level	0.48
% Housing Un Year 1939 and earlier	0.79	% HH Income < $10,000/yr.	0.47
		% HH Income Year $15,000 to $24,999/yr.	0.59
Year 2002		**Year 2002**	
Number of Observations	7	Number of Observations	27
Total counts of Elevated BLL 10-14 g/dl	106	Total counts of Elevated BLL 10-14 g/dl	54
Significant Relationships		**Significant Relationships**	
Elevated BLL 10-14 g/dl vs.	Coeff. Corr	Elevated BLL 10-14 g/dl vs.	Coeff. Corr
% Housing Un Year 1970 to Year 1979	-0.79	% HH Income < $10,000/yr.	0.41
% Housing Un Year 1940 to Year 1959	0.82	% HH Income Year $15,000 to $24,999/yr.	0.48
% Housing Un Year 1939 and earlier	0.79	% Housing Un Year 1960 to Year 1969	0.43
		% Housing Un Year 1940 to Year 1959	0.40

Bio-Ecology Socioeconomic Indicators vs. Elevated Childhood Blood Lead Levels Analysis From the Year 1999 to the Year 2002- Summary Table of Results			
Total Counts of Elevated Blood Lead Level			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Year 1999		**Year 1999**	
Number of Observations	7	Number of Observations	27
Total counts of Elevated BLL	84	Total counts of Elevated BLL	47
Significant Relationships		**Significant Relationships**	
Total counts of Elevated BLL vs.	Coeff. Corr	Total counts of Elevated BLL vs.	Coeff. Corr
% Housing Un Year 1970 to Year 1979	-0.77	% HH Income Year $10,000 to $14,999/yr.	0.49
		% Housing Un Year 1960 to Year 1969	0.50
		% Housing Un Year 1940 to Year 1959	0.59
		% Housing Un Year 1939 or earlier	0.52
Year 2000		**Year 2000**	
Number of Observations	7	Number of Observations	26
Total counts of Elevated BLL	123	Total counts of Elevated BLL	55
Significant Relationships		**Significant Relationships**	
Total counts of Elevated BLL vs.	Coeff. Corr	Total counts of Elevated BLL vs.	Coeff. Corr
% Families -Below Poverty Level	0.89	% Families -Below Poverty Level	0.44
% HH Income < $10,000/yr.	0.82	% HH Income < $10,000/yr.	0.46
		% HH Income Year $15,000 to $24,999/yr.	0.49
		% Housing Un Year 1960 to Year 1969	0.43
		% Housing Un Year 1940 to Year 1959	0.40
Year 2001		**Year 2001**	
Number of Observations	7	Number of Observations	26
Total counts of Elevated BLL	134	Total counts of Elevated BLL	55
Significant Relationships		**Significant Relationships**	
Total counts of Elevated BLL vs.	Coeff. Corr	Total counts of Elevated BLL vs.	Coeff. Corr
% Housing Un Year 1939 or earlier	0.86	% Families -Below Poverty Level	0.51
		% HH Income < $10,000/yr.	0.59
		% HH Income Year $15,000 to $24,999/yr.	0.67
		% Housing Un Year 1960 to Year 1969	0.43
		% Housing Un Year 1940 to Year 1959	0.41
Year 2002		**Year 2002**	
Number of Observations	7	Number of Observations	27
Total counts of Elevated BLL	168	Total counts of Elevated BLL	89
Significant Relationships		**Significant Relationships**	
Total counts of Elevated BLL vs.	Coeff. Corr	Total counts of Elevated BLL vs.	Coeff. Corr
% Housing Un Year 1970 to Year 1979	-0.83	% HH Income < $10,000/yr.	0.39
% Housing Un Year 1939 or earlier	0.86	% HH Income Year $15,000 to $24,999/yr.	0.52
		% Housing Un Year 1960 to Year 1969	0.44

Based on the table, there are significantly higher counts, of elevated childhood blood lead level of 10-14 μg/dl and total counts of elevated childhood blood lead, for the children that reside in zip codes, located within the Bio-Ecology Site's 5-mile radius, than for the children, that reside in zip codes, located greater than the 5-mile radius of the Bio-Ecology Site. There are also some strong significant relationships, between the percentage of households with low income, the percentage of families, that are below poverty level, and the percentage of housing units, constructed before the Year 1970; with the counts of childhood elevated blood lead level of 10-14 mg/dl and total counts of elevated childhood blood lead, for the children that reside within zip codes, located within and greater, than the 5-mile radius, of the Bio-Ecology Site. The coefficients of correlations, of the significant relationships, are stronger for the children that reside within the Bio-Ecology 5-mile radius, than for the children, that reside in zip codes located greater than the 5-mile radius, of the Bio-Ecology Site. These results indicate that the proximity to the Bio-Ecology and RSR Site, and the socioeconomic indicators contribute to the counts of elevated blood lead level.

8.3.3 : Bio-Ecology Socioeconomic Indicators vs. Test Passing Rate Analysis – Summary of Results

The purpose of the socioeconomic indicators vs. the standardized test is passing rate analysis is to determine if there is a significant relationship between socioeconomic indicators and the standardized test passing rates for elementary, middle, and high schools. The table below depicts the results of the socioeconomic indicators vs. standardized test passing rates.

Table 8.11: Bio-Ecology Socioeconomic Indicators vs. Standardized Test Passing Rates –Summary of Results

Bio-Ecology Socioeconomic Indicators vs. Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Middle and High Schools			
Year 1999		**Year 1999**	
Number of Observations	10	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
66.2		77.3	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
% HH Income Year $15,000 to $24,999/yr.	-0.66	% HH Income Year $15,000 to $24,999/yr.	-0.47
		% Female HH w/ Child < 18 yrs. Of Age	-0.44
Year 2000		**Year 2000**	
Number of Observations	10	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
65.3		80.8	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
% HH Income Year $15,000 to $24,999/yr.	-0.71	none	
Year 2001		**Year 2001**	
Number of Observations	10	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
69.7		82.3	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
none		% HH Income < $10,000/yr.	-0.50
		% HH Income Year $15,000 to $24,999/yr.	-0.51
		% Families -Below Poverty Level	-0.46
		% Female HH w/ Child < 18 yrs. of Age	-0.49
		% Housing Un Year 1940 to Year 1959	-0.51
Year 2002		**Year 2002**	
Number of Observations	10	Number of Observations	23
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
76.4		84.5	
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
none		% HH Income < $10,000/yr.	-0.45
		% HH Income Year $15,000 to $24,999/yr.	-0.42
		% Housing Un Year 1940 to Year 1959	-0.43

Bio-Ecology Socioeconomic Indicators vs. Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results			
Elementary Schools			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Year 1999		**Year 1999**	
Number of Observations	13.0	Number of Observations	21
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
	71.0		82.3
Significant Relationships		**Significant Relationships**	
Standardized Test Passing Rate (%) vs.	Coeff. Corr	Standardized Test Passing Rate (%) vs.	Coeff. Corr
none		% HH Income Year $15,000 to $24,999/yr.	-0.50
		% Housing Un Year 1940 to Year 1959	-0.66
		% Housing Un Year 1939 or earlier	-0.77
Year 2000		**Year 2000**	
Number of Observations	13	Number of Observations	22
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
	64.1		82.2
Significant Relationships		**Significant Relationships**	
none		Standardized Test Passing Rate (%) vs.	Coeff. Corr
		% HH Income < $10,000/yr.	-0.51
		% HH Income Year $10,000 to $14,999/yr.	-0.49
		% HH Income Year $15,000 to $24,999/yr.	-0.54
		% Housing Un Year 1960 to Year 1969	-0.45
		% Housing Un Year 1940 to Year 1959	-0.75
		% Housing Un Year 1939 or earlier	-0.83
Year 2001		**Year 2001**	
Number of Observations	13	Number of Observations	22
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
	72.2		83
Significant Relationships		**Significant Relationships**	
none		Standardized Test Passing Rate (%) vs.	Coeff. Corr
		% HH Income Year $10,000 to $14,999/yr.	-0.51
		% HH Income Year $15,000 to $24,999/yr.	-0.56
		% Families -Below Poverty Level	-0.45
		% Housing Un Year 1940 to Year 1959	-0.68
		% Housing Un Year 1939 or earlier	-0.80
Year 2002		**Year 2002**	
Number of Observations	13	Number of Observations	22
Average Standardized Test Passing Rate for the Year (%)		Average Standardized Test Passing Rate for the Year (%)	
	76.5		85.0
Significant Relationships		**Significant Relationships**	
none		Standardized Test Passing Rate (%) vs.	Coeff. Corr
		% HH Income < $10,000/yr.	-0.48
		% HH Income Year $10,000 to $14,999/yr.	-0.47
		% HH Income Year $15,000 to $24,999/yr.	-0.55
		% Housing Un Year 1960 to Year 1969	-0.45
		% Housing Un Year 1940 to Year 1959	-0.73
		% Housing Un Year 1939 or earlier	-0.66

Based on the table, there is a 15% difference, 21% difference, 17% difference, and 10% difference, lower, of the standardized test passing rates for the Year 1999, the Year 2000, the Year 2001, and the Year 2002, respectively, for the middle and schools located within the 5-mile radius, than from the middle and high schools located greater than the 5-mile radius, of the Bio-Ecology Site. There were a few significant relationships, between the housing units constructed before the Year 1970 and the standardized test passing rates, for middle and high schools, located within the 5-mile radius of the Bio-Ecology Site. This result might be due to exposure of the prospective students to indoor lead exposure from housing units, constructed before the Year 1970 and possible effects from the Bio-Ecology and the RSR Site.

For the elementary schools, there is a 15% difference, a 25% difference, a 14% difference, a 11% difference, lower, of the standardized test passing rates for the Year 1999, the Year 2000, the Year 2001, and the Year 2002, respectively, for the elementary schools located within the 5-mile radius, than from the elementary schools located, greater than the 5-mile radius, of the Bio-Ecology Site. There are no significant relationships between the socioeconomic indicators and the standardized test passing rates for the elementary schools, located within the 5-mile radius of the Bio-Ecology Site. This might be the result of no exposure of the prospective students, being exposed to the Bio-Ecology and the RSR Site.

8.3.4 Bio-Ecology Blood Lead Level vs. Standardized Test Passing Rate Analysis-Summary of Results

The purpose of the blood lead level vs. the standardized test is passing rate analysis is to determine if there is a significant relationship between elevated childhood blood lead levels and the standardized test passing rates for elementary, middle, and high schools. For this analysis, an indirect comparison was conducted, with the assumption that the elevated blood lead level counts, for the Year 1999 to the Year 2002, are similar to the elevated blood lead level, before the Year 1999. The table below depicts the results of the elevated childhood blood lead levels vs. standardized test passing rates.

Table 8.12: Bio-Ecology Blood Lead Level vs. Standardized Test Passing Rates – Summary or Results

Bio-Ecology Blood Lead Level vs. Standardized Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results			
Schools Located within the 5-Mile Radius		**Schools Located Greater than the 5-Mile Radius**	
Blood Lead Level 10-14□ g/dl and Test Passing Rates for Middle and High Schools			
Number of Observations	5	Number of Observations	11
Range of blood lead level 10-14□ g/dl (#) from the Year 1999 to the Year 2002		Range of blood lead level 10-14□ g/dl (#) from the Year 1999 to the Year 2002	
65 (#) (Year 1999) to 91 (#) (Year 2002)		23 (#) (Year 1999) to 33 (#) (Year 2002)	
Range of standardized test passing rates from the Year 1999 to the Year 2002		Range of standardized test passing rates from the Year 1999 to the Year 2002	
68.6% (Year 1999) to 76.7% (Year 2002)		74.7% (Year 1999) to 82.5% (Year 2002)	
Significant Relationships	Coeff. Corr	**Significant Relationships**	
Year 1999 10-14 BLL (#) vs		Year 2000 10-14 BLL (#) vs	Coeff. Corr
% Test PR Year 2000	-0.90	% Test PR Year 2001	-0.62
Year 2001 10-14 BLL (#) vs		% Test PR Year 2002	-0.69
% Test PR Year 2000	-0.90	Year 2001 10-14 BLL (#) vs	
		% Test PR Year 1999	-0.72
		% Test PR Year 2000	-0.72
		% Test PR Year 2001	-0.77
		% Test PR Year 2002	-0.66
Total Counts Blood Lead Level and Test Passing Rates for Middle and High Schools			
Number of Observations	5	Number of Observations	11
Range of total counts of blood lead level (#) from the Year 1999 to the Year 2002		Range of total counts of blood lead level (#) from the Year 1999 to the Year 2002	
88 (#) (Year 1999) to 135 (#) (Year 2002)		27 (#) (Year 1999) to 51 (#) (Year 2002)	
Range of standardized test passing rates from the Year 1999 to the Year 2002		Range of standardized test passing rates from the Year 1999 to the Year 2002	
68.6% (Year 1999) to 76.7% (Year 2002)		74.7% (Year 1999) to 82.5 % (Year 2002)	
Significant Relationships		**Significant Relationships**	
Year 1999 Total BLL (#) vs	Coeff. Corr	Year 2001 Total BLL (#) vs	Coeff. Corr
% Test PR Year 2000	-0.90	% Test PR Year 1999	-0.65
Year 2001 Total BLL (#) vs		% Test PR Year 2000	-0.69
% Test PR Year 2000	-0.90	% Test PR Year 2001	-0.74
		% Test PR Year 2002	-0.72

Bio-Ecology Blood Lead Level vs. Standardized Test Passing Rate Analysis from the Year 1999 to the Year 2002- Summary Table of Results										
Blood Lead Level 10-14 g/dl and Test Passing Rates for Elementary Schools										
Schools Located within the 5-Mile Radius					**Schools Located Greater than the 5-Mile Radius**					
Number of Observations			6		Number of Observations			12		
Range of blood lead level 10-14 g/dl (#) from the					Range of blood lead level 10-14 g/dl (#) from the					
	Year 1999 to the Year 2002					Year 1999 to the Year 2002				
	57 (#) (Year 1999) to 102 (#) (Year 2002)					21 (#) (Year 1999) to 3 (#6) (Year 2002)				
Range of standardized test passing rates from the					Range of standardized test passing rates from the					
	Year 1999 to the Year 2002					Year 1999 to the Year 2002				
	72.2% (Year 1999) to 74.8% (Year 2002)					81.0.% (Year 1999) to 84.7 (Year 2002)				
Significant Relationships			Coeff. Corr		**Significant Relationships**					
Year 2000 10-14 BLL (#) vs					none					
	% Test PR Year 2000		0.83							
Total Counts Blood Lead Level and Test Passing Rates for Elementary Schools										
Number of Observations			6		Number of Observations			12		
Range of total counts of blood lead level (#) from the					Range of total counts of blood lead level (#) from the					
	Year 1994 to the Year 2002					Year 1994 to the Year 2002				
	80(#) (Year 1994) to 162 (#) (Year 2002)					29 (#) (Year 1994) to 58 (#) (Year 2002)				
Range of standardized test passing rates from the					Range of standardized test passing rates from the					
	Year 1994 to the Year 2002					Year 1994 to the Year 2002				
	72.2% (Year 1994) to 74.8% (Year 2002)					81.0% (Year 1994) to 84.2% (Year 2002)				
Significant Relationships			Coeff. Corr		**Significant Relationships**					Coeff. Corr
Year 2000 Total BLL (#) vs					none					
	% Test PR Year 2000		0.83							
Year 2002 Total BLL (#) vs										
	% Test PR Year 1999		-0.90							

Based on the table, the counts of elevated blood lead levels are higher for the schools located within the 5-mile radius, of the Bio-Ecology Site, than the schools located greater than 5-mile radius of the Bio-Ecology Site. In addition, the standardized test passing rates are higher, for schools, located within the 5-mile radius, of the Bio-Ecology Site, than schools, located greater than the 5-mile radius, of the Bio-Ecology Site. There are also a few significant relationships, between the blood lead levels and the standardized test passing rates for middle and high schools, as well as, the elementary schools, located within the 5-mile radius, of the Bio-Ecology Site. . These results indicate that there is an indirect significant relationship between the counts of blood lead level and lower test passing rates.

9.0 Conclusion

Based on the findings of this Study, there is convincing evidence that the proximity that prospective students reside to a lead contaminated Superfund Site, as well as, socioeconomic factors, contribute to higher counts in elevated childhood blood lead levels and lower standardized test passing rates. Based on the results, there is a significant difference, in counts of elevated childhood lead levels and standardized test passing rates, of children that reside in zip codes and schools that are located within, and greater than the 5-mile radius of each Superfund Site. During the Study, it was noted that after the Superfund Sites were cleaned up, the standardized test passing rates, for schools located in close proximity of the Superfund Sites, increased, which indicates that continued negative cognitive effects on children located in close proximity to the Superfund Site will be reduced in the future. Unfortunately, the children that were impacted by the lead from these Superfund Sites will continue to suffer long-term cognitive damage. Further provisions should be enacted, to mitigate the long-term effects of lead exposure on impacted students' standardized tests, to prevent "setbacks", in accomplishing their educational endeavors.

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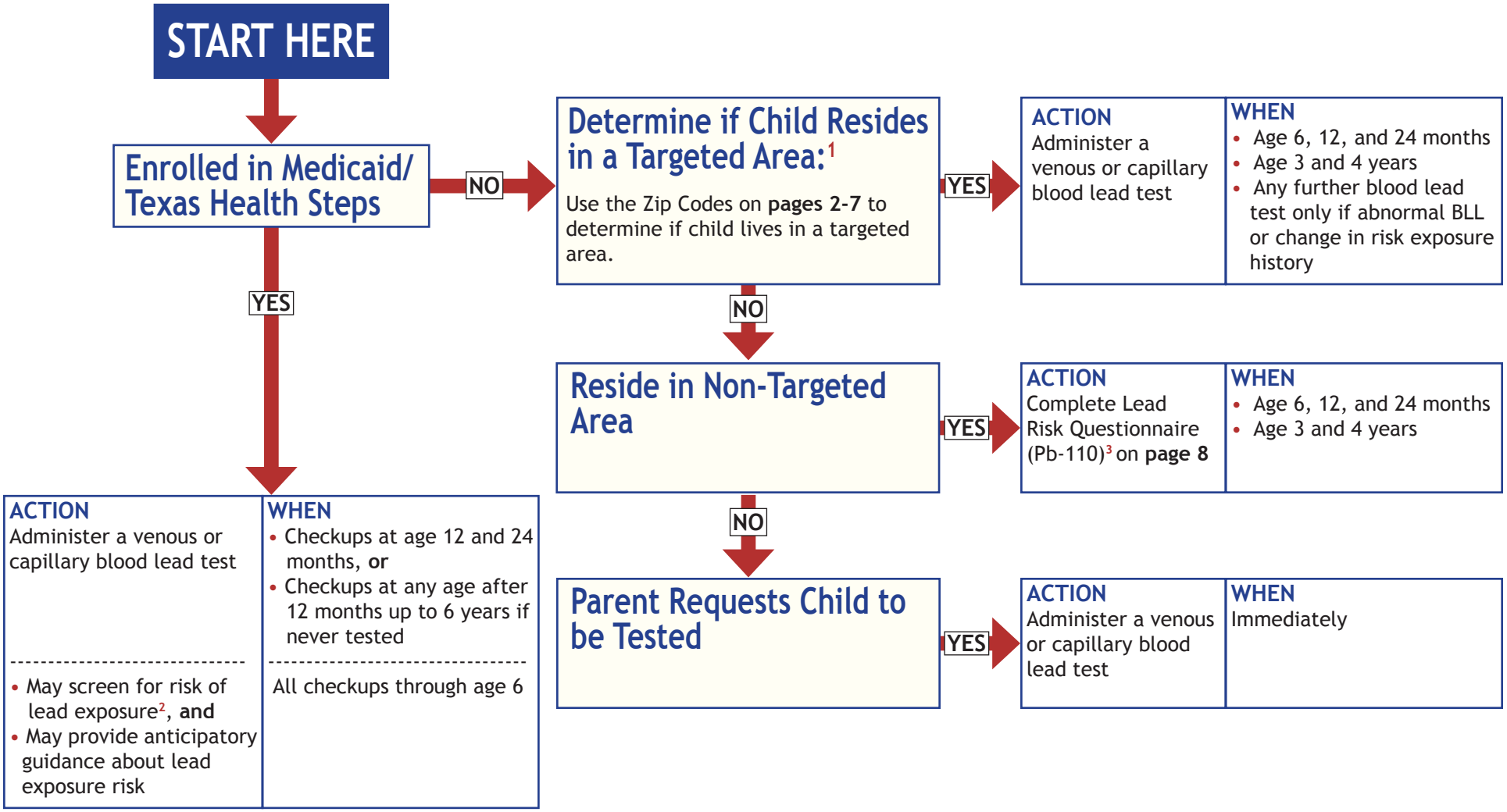
Appendix A

TEXAS Department of State Health Services

Childhood Blood Lead Screening Guidelines

Form Pb-120



NOTE: After a blood lead test is administered and you receive the results; use Pb-109 Form[4], *Reference for Follow-up Testing and Medical Case Management*, to determine if or when follow-up testing and medical case management is necessary.

[1]Following the Centers for Disease Control and Prevention (CDC) recommendations, the following criteria was used to determine targeted areas: (a) Areas with ≥27% of housing built before 1950, and (b) Areas with ≥3% of children tested for lead at ages 1 and 2 with a blood lead level ≥5 µg/dL . [2]**Only for Texas Health Steps Children -** the use of the *Lead Risk Questionnaire* (Pb-110) and child health forms is optional. The child health forms are available online from Texas Health Steps at www.dshs.state.tx.us/thsteps/forms.shtm. [3]The *Lead Risk Questionnaire* (Pb-110) is recommended for children who reside in a non-targeted area. [4]The Pb-109 and other TX CLPPP forms are available online at www.dshs.state.tx.us/lead.

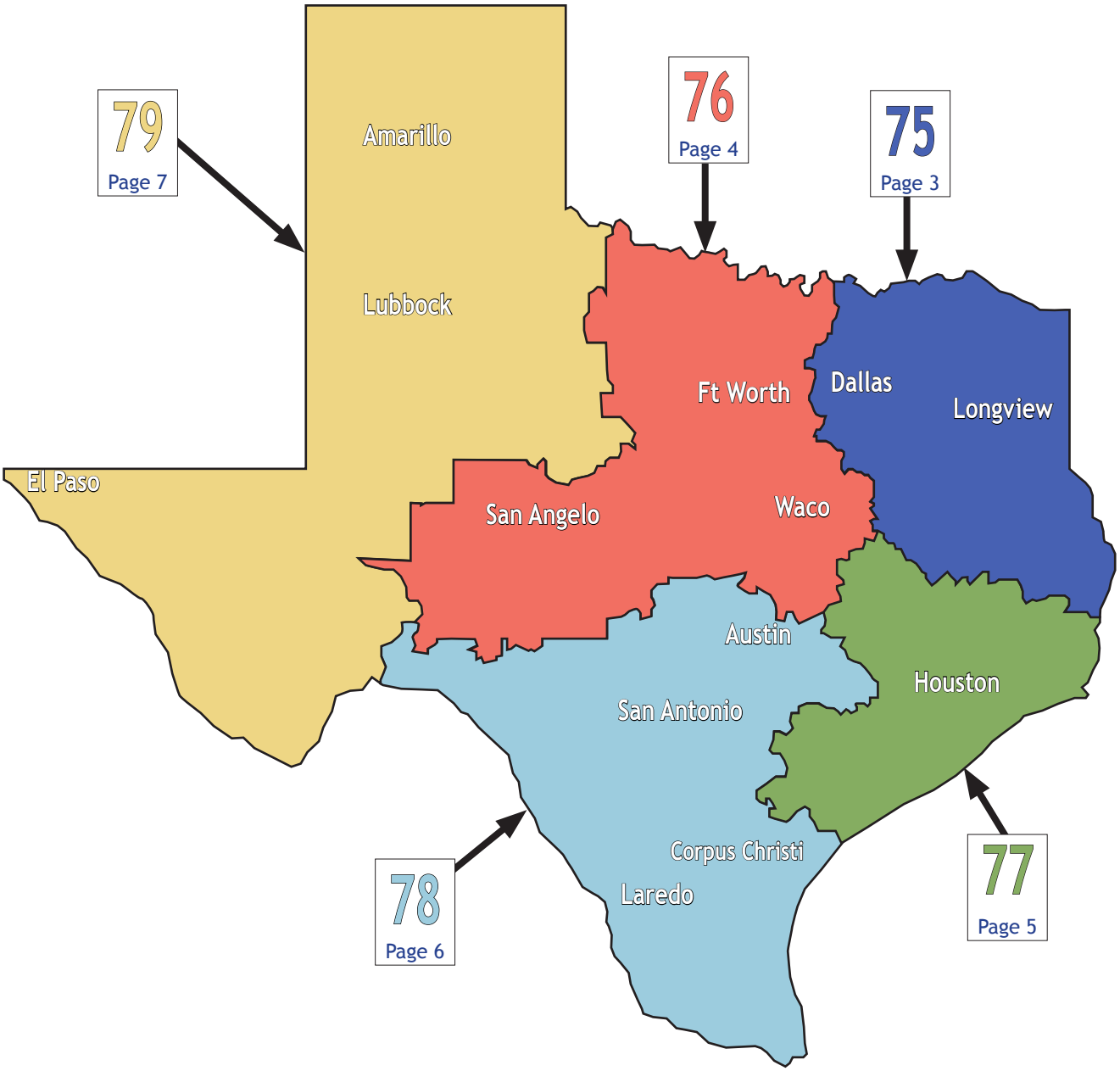
Targeted Areas by Zip Code*

About the Map

- Texas map uses an overlay of zip codes by boundary.
- Each boundary is color coded.
- Major cities listed to help locate an area on the map.

Using the zip code the child lives in:

- Locate the zip code boundary on the map.
- Go to the zip code boundary page.
- Look at the list of zip codes to determine if child's zip code is in a targeted area.



Targeted Areas by Zip Code

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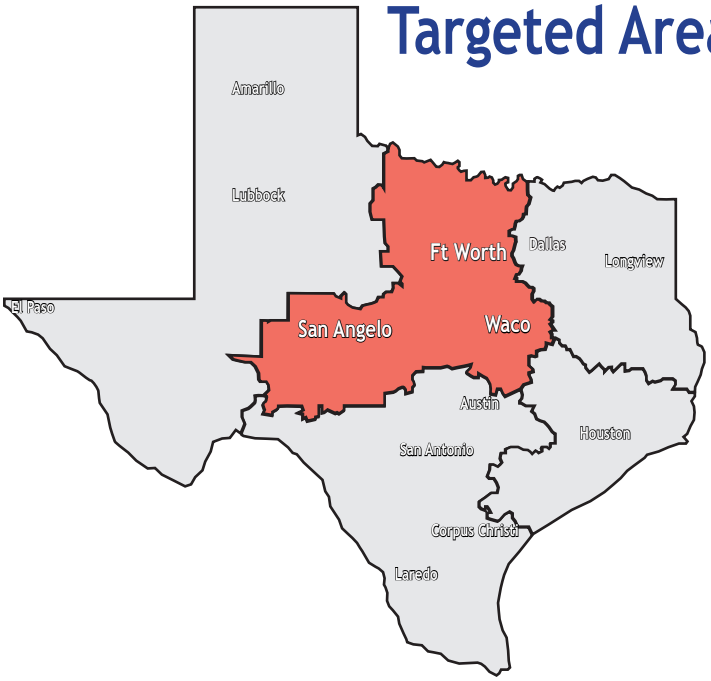
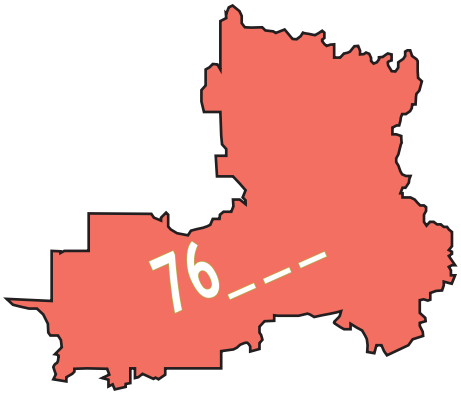
Targeted Areas by Zip Code





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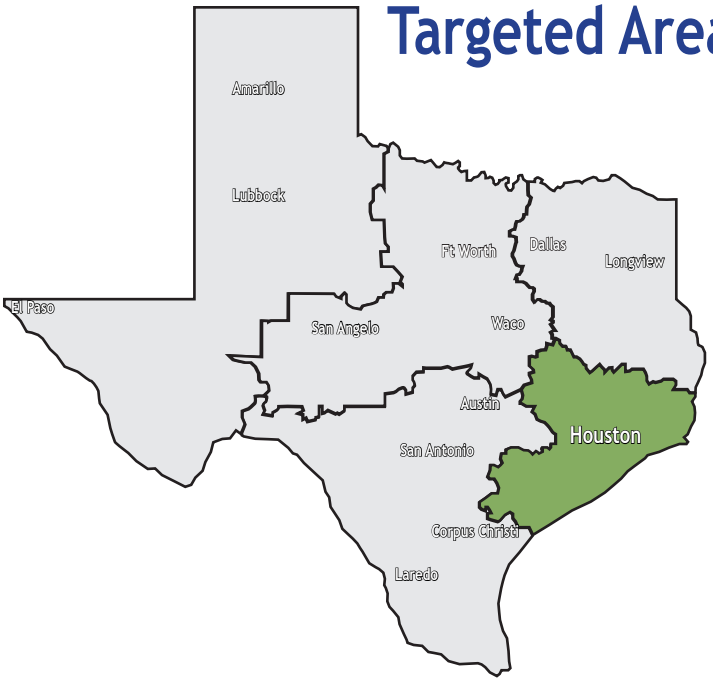
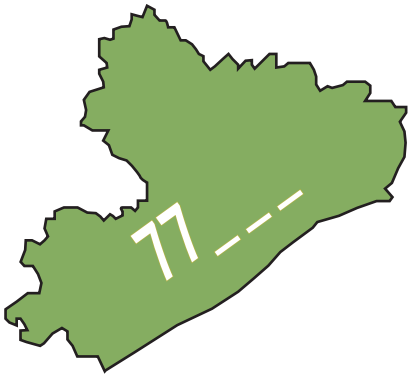
Targeted Areas by Zip Code





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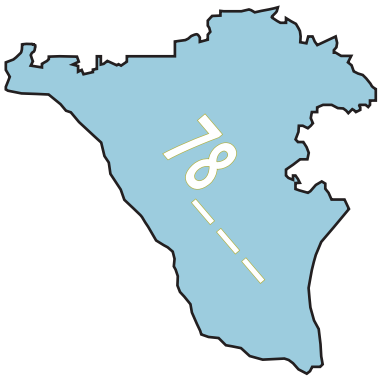
Targeted Areas by Zip Code



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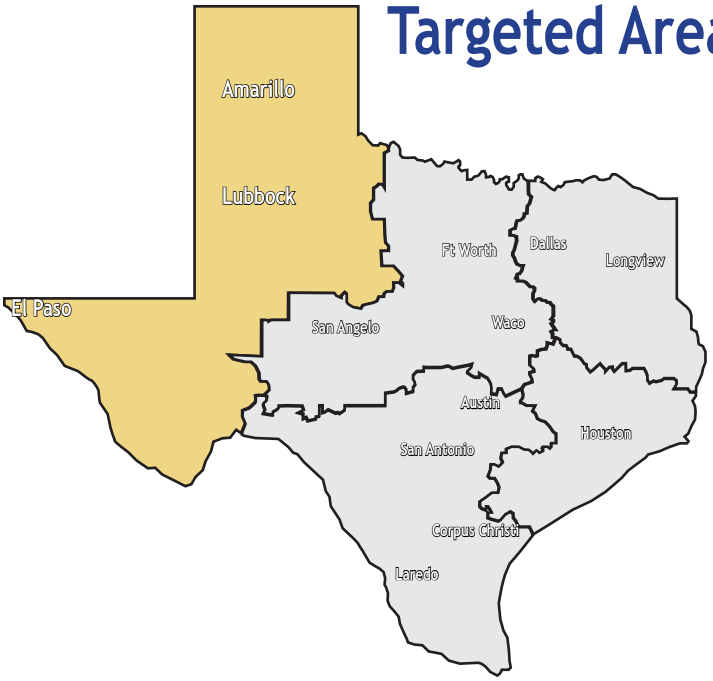
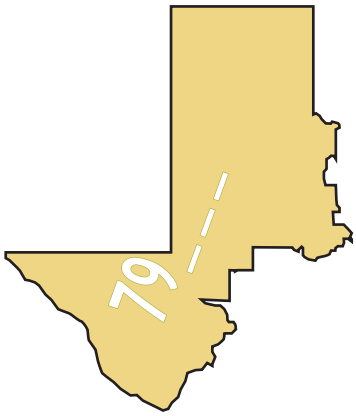
Targeted Areas by Zip Code





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Lead Risk Questionnaire

Form Pb-110

Purpose: To identify children who need to be tested for lead exposure.

Instructions

- If **Yes or Don't Know**, test the child immediately.
- You may administer a blood lead test instead of using this questionnaire.
- For more information, contact the Texas Childhood Lead Poisoning Prevention Program at: 1-800-588-1248.

Patient's Name: _____ **DOB:**_____ **Medicaid #:** _____

Provider's Name: _____ **Administered by:**_____ **Date** _____

Questions	Yes or Don't Know	No
1. Does your child live in or visit a home, day-care or other building built before 1978?	☐	☐
2. Does your child live in or visit a home, day-care or other building with ongoing repairs or remodeling?	☐	☐
3. Does your child eat or chew on non-food things like paint chips or dirt?	☐	☐
4. Does your child have a family member or friend who has or did have an elevated blood lead level?	☐	☐
5. Is your child a newly arrived refugee or foreign adoptee?	☐	☐
6. Does your child come in contact with an adult whose job or hobby involves lead exposure?	☐	☐
7. Does your family use products from other countries such as pottery, health remedies, spices, or food?	☐	☐

Examples (Question 6)

- House construction or repair
- Battery manufacturing or repair
- Burning lead-painted wood
- Automotive repair shop or junk yard
- Going to a firing range or reloading bullets
- Chemical preparation
- Valve and pipe fittings
- Brass/copper foundry
- Refinishing furniture
- Making fishing weights
- Radiator repair
- Pottery making
- Lead smelting
- Welding

Examples (Question 7)

- Traditional medicines such as Ayurvedic, greta, azarcón, alarcón, alkohl, bali goli, coral, ghasard, liga, pay-loo-ah, and rueda
- Cosmetics such as kohl, surma, and sindor
- Imported or glazed pottery, imported candy, and imported nutritional pills other than vitamins.
- Foods canned or packaged outside the U.S.

Test Immediately

Dallas County Texas, Unduplicated Children Tested for Lead, 1999-2011*

1999 Blood Lead Level					2000 Blood Lead Level				
Zip	10--14	15--19	>=20	Total	Zip	10--14	15--19	>=20	Total
75001	0	0	0	0	75001	< 5	< 5	< 5	< 5
75006	0	0	0	0	75019	0	< 5	< 5	< 5
75007	0	0	0	0	75038	0	0	0	0
75019	0	0	0	0	75039	< 5	0	0	< 5
75028	0	0	0	0	75040	7	0	< 5	8
75038	0	0	0	0	75041	< 5	0	< 5	< 5
75039	0	0	0	0	75042	8	< 5	0	10
75040	< 5	0	0	< 5	75043	5	0	0	5
75041	< 5	0	0	< 5	75044	< 5	0	0	< 5
75042	< 5	< 5	< 5	7	75048	0	0	0	0
75043	< 5	0	0	< 5	75050	6	0	0	6
75044	0	0	0	0	75051	7	< 5	< 5	9
75048	0	0	0	0	75052	< 5	0	0	< 5
75050	< 5	< 5	< 5	7	75054	0	0	0	0
75051	< 5	< 5	0	5	75060	0	0	0	0
75052	0	0	0	0	75061	< 5	< 5	< 5	8
75060	< 5	0	0	< 5	75062	0	< 5	< 5	< 5
75061	< 5	0	< 5	< 5	75063	0	0	0	0
75062	< 5	0	0	< 5	75067	0	0	0	0
75063	0	0	0	0	75080	< 5	< 5	0	< 5
75080	6	0	0	6	75081	5	0	0	5
75081	< 5	< 5	0	< 5	75082	0	0	0	0
75082	0	0	0	0	75088	< 5	0	< 5	< 5
75088	0	0	0	0	75089	0	0	0	0
75089	0	0	0	0	75104	< 5	0	0	< 5
75104	< 5	< 5	0	< 5	75115	< 5	0	< 5	< 5
75115	< 5	< 5	0	< 5	75116	0	0	< 5	< 5
75116	< 5	< 5	0	< 5	75134	< 5	0	0	< 5
75134	< 5	0	0	< 5	75137	0	0	0	0
75137	< 5	0	0	< 5	75141	0	0	0	0
75141	0	0	0	0	75146	< 5	0	0	< 5
75146	< 5	0	0	< 5	75149	5	0	< 5	6
75149	< 5	< 5	0	7	75150	5	0	< 5	6
75150	5	< 5	0	7	75154	0	< 5	0	< 5
75154	< 5	0	0	< 5	75159	< 5	0	0	< 5
75159	< 5	0	0	< 5	75172	< 5	0	0	< 5
75172	< 5	0	0	< 5	75180	0	< 5	0	< 5
75180	< 5	< 5	< 5	7	75181	0	0	0	0
75181	0	0	0	0	75182	0	0	0	0
75182	< 5	0	0	< 5	75201	0	0	0	0
75201	< 5	0	0	< 5	75202	0	0	0	0
75203	13	< 5	< 5	17	75203	19	< 5	6	27

75204	8	6	< 5	15	75204	5	< 5	0	6
75205	0	0	0	0	75205	0	< 5	0	< 5
75206	13	< 5	9	25	75206	5	< 5	5	13
75207	< 5	0	0	< 5	75207	0	0	0	0
75208	15	< 5	< 5	21	75208	19	5	< 5	28
75209	< 5	0	< 5	< 5	75209	< 5	0	0	< 5
75210	12	6	< 5	21	75210	15	< 5	< 5	18
75211	20	< 5	< 5	28	75211	25	< 5	8	37
75212	13	< 5	0	17	75212	32	5	< 5	38
75214	8	< 5	< 5	12	75214	9	< 5	< 5	13
75215	52	12	< 5	68	75215	29	5	< 5	35
75216	33	7	< 5	43	75216	30	7	< 5	38
75217	55	11	< 5	69	75217	26	6	5	37
75218	< 5	0	0	< 5	75218	< 5	0	< 5	< 5
75219	10	< 5	< 5	17	75219	< 5	< 5	0	7
75220	18	6	11	35	75220	15	5	< 5	24
75223	26	7	< 5	34	75223	10	< 5	< 5	13
75224	14	0	< 5	15	75224	13	< 5	< 5	18
75225	0	0	0	0	75225	0	< 5	0	< 5
75226	< 5	< 5	0	< 5	75226	7	< 5	0	9
75227	38	5	< 5	46	75227	19	< 5	< 5	24
75228	13	< 5	< 5	18	75228	15	< 5	< 5	20
75229	< 5	< 5	< 5	< 5	75229	< 5	< 5	0	< 5
75230	0	0	0	0	75230	0	0	0	0
75231	14	< 5	< 5	17	75231	23	< 5	< 5	27
75232	< 5	< 5	0	< 5	75232	< 5	< 5	0	6
75233	< 5	< 5	< 5	< 5	75233	5	0	0	5
75234	< 5	0	0	< 5	75234	< 5	< 5	0	< 5
75235	8	< 5	< 5	10	75235	< 5	< 5	0	7
75236	< 5	0	0	< 5	75236	< 5	0	0	< 5
75237	< 5	< 5	0	< 5	75237	< 5	0	< 5	5
75238	< 5	0	< 5	< 5	75238	< 5	0	0	< 5
75240	10	< 5	< 5	15	75240	5	< 5	< 5	8
75241	12	< 5	0	15	75241	6	0	0	6
75243	5	< 5	0	6	75243	7	< 5	< 5	12
75244	0	0	0	0	75244	0	0	< 5	< 5
75246	0	0	0	0	75246	< 5	0	< 5	< 5
75247	0	0	0	0	75247	0	0	0	0
75248	0	0	0	0	75248	0	0	0	0
75249	0	< 5	0	< 5	75249	0	0	0	0
75251	0	0	0	0	75251	0	0	0	0
75252	0	0	0	0	75252	0	0	0	0
75253	0	< 5	< 5	< 5	75253	< 5	0	0	< 5
75254	0	0	0	0	75254	0	0	< 5	< 5
75287	< 5	0	0	< 5	75287	0	0	0	0
76051	< 5	0	0	< 5	76051	0	0	0	0
Total	491	121	70	682	Total	443	89	71	603

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2001 Blood Lead Level					2002 Blood Lead Level				
Zip	10--14	15--19	>=20	Total	Zip	10--14	15--19	>=20	Total
75001	0	< 5	0	< 5	75001	< 5	0	< 5	< 5
75019	0	0	0	0	75019	< 5	0	0	< 5
75038	< 5	0	0	< 5	75038	< 5	0	0	< 5
75039	0	0	0	0	75039	0	0	0	0
75040	10	0	0	10	75040	8	< 5	0	11
75041	< 5	< 5	< 5	8	75041	5	< 5	0	6
75042	5	< 5	0	7	75042	13	5	< 5	21
75043	< 5	0	0	< 5	75043	6	< 5	< 5	9
75044	0	0	0	0	75044	< 5	< 5	0	< 5
75048	0	0	0	0	75048	0	0	0	0
75050	6	0	0	6	75050	6	< 5	< 5	10
75051	10	< 5	0	11	75051	< 5	< 5	0	5
75052	< 5	< 5	< 5	6	75052	< 5	0	< 5	8
75060	< 5	< 5	< 5	5	75060	10	5	6	21
75061	< 5	< 5	< 5	5	75061	8	< 5	< 5	13
75062	0	< 5	< 5	5	75062	< 5	< 5	< 5	< 5
75063	< 5	0	0	< 5	75063	0	0	0	0
75067	0	0	0	0	75067	0	0	0	0
75080	< 5	< 5	< 5	< 5	75080	6	0	0	6
75081	< 5	0	0	< 5	75081	< 5	0	< 5	< 5
75082	0	0	0	0	75082	0	0	0	0
75088	0	0	0	0	75088	0	0	0	0
75089	0	0	0	0	75089	< 5	0	0	< 5
75104	< 5	0	0	< 5	75104	< 5	0	< 5	< 5
75115	< 5	< 5	0	< 5	75115	< 5	0	< 5	5
75116	< 5	0	0	< 5	75116	5	< 5	< 5	7
75134	< 5	< 5	0	< 5	75125	0	0	0	0
75137	< 5	0	< 5	< 5	75134	< 5	0	0	< 5
75141	0	0	0	0	75137	0	0	0	0
75146	< 5	0	< 5	< 5	75141	0	< 5	0	< 5
75149	< 5	0	< 5	< 5	75146	< 5	< 5	0	5
75150	< 5	< 5	< 5	< 5	75149	< 5	< 5	< 5	6
75154	0	0	0	0	75150	< 5	< 5	< 5	8
75159	< 5	0	0	< 5	75154	< 5	0	0	< 5
75172	< 5	0	0	< 5	75159	0	0	0	0
75180	5	< 5	0	6	75172	< 5	0	0	< 5
75181	< 5	0	0	< 5	75180	5	< 5	< 5	10
75182	0	0	0	0	75181	< 5	< 5	0	< 5
75201	0	0	0	0	75182	0	0	0	0
75202	0	0	0	0	75201	0	0	0	0
75203	9	< 5	< 5	12	75202	0	0	0	0
75204	5	0	< 5	6	75203	17	< 5	< 5	22

* Unduplicated counts for given year for children with a blood lead level of 10mcg/dL or higher, capillary, unknown c
Cells with counts less than 5 expressed as "< 5" to protect identity of children.
Data is to be used for analysis and not to be distributed as a table.

Prepared by L.J. Smith, 04/08/13
Texas CLPPP 1-800-588-1248

Appendix B

Site Name and Location	Type of Superfund Site	Type of Facility	Size of facility	List of operations	Dates of Operation	List of contaminants	Media of contamination	Clean up start date	Clean up end date	Other info
Bio-Ecology Grand Prairie, TX (Dallas County)	Federal	Class 1 Industrial Solid waste (disposal)facility	11.2 acres	1) incineration of combustible liquids, slurries, and sludge 2)chemical treatment of acids, caustics, and other waste chemical solutions that include heavy metals 3)biological oxidation of waste waters resulting from separation of mud-water and oil-water mixtures and from chemical treatment of other wastes 4)a modified landfill of solids resulting from the other	June 1972 to June 1978	Arsenic, lead, Cyanide, METHYLENE CHLORIDE, Benzene, NAPHTHALENE, TOLUENE, TRICHLOROETHYLENE	soil, surface water, groundwater	Partial Clean-Up -12/1/1979, Notice to Proceed with construction activities remedial measure-EPA-May 1987	Partial Clean-Up-2/1/1980; Initial remedial measure concluded (clean-up) Sept 1983 (no definite start date), Construction activities for remedial measures ended Aug 1988	1. Site flooded in June 1973 and June 1974 2. Cited for discharging of waste waters into mountain creek and (others) 3.Site was partially closed by court order in Dec 1979
RSR Dallas, TX (Dallas County)	Federal	Lead smelter	13.6 sq miles (they are including the study area)	processed spent car batteries and scrap lead.	1934-1984	ANTIMONY, ARSENIC, CADMIUM, LEAD	soil,air,water	1991	1994	Wind transported lead dust from the smelter into nearby parks, schools and neighborhoods, facility had a smoke stack
Sampson Horrice Dallas, TX (Dallas County)	State	inactive gravel pit that illegally accepted hazardous and solid waste	2-10 acre tracts	inactive gravel pit that illegally accepted hazardous and solid waste	1983-1984	Metals, Organics, Pesticides	soil and surface water, groundwater	Initial removal action-Aug 1999 (drum removal and repackaging)	Initial removal- Jan 2000 (removal of Contaminated soils and drums)	
Hicks Field Fort worth, TX (Tarrant County)	State	Abandoned waste water treatment plant	3.8 acres	Provided wastewater treatment services for Hicks Field business park- one of the tenants in the business park was a metals finishing business that operated from early 1970's to 1981 ; the plant had sludge drying beds	early 1970's -1994	cadmium, chromium, and zinc exceeding the protective concentration levels (PCLs)	soil and sediment	2006	2007	The PCLs were calculated based upon a future commercial/industrial land use.
Pesses Fort worth, TX (Tarrant)	Federal	metals reclamation facility that contain 4 furnaces	4.2 acres	reclaim cadmium and nickel from dry-cell batteries and metal sludge	1979-1981	cadmium, copper, lead, nickel	air sediment and soil- lead	1983	1992	had kilns and furnace emissions, found cadmium in soils 800 ft from the site
Tricon America Crowley, TX (Tarrant County)	State	smelting and casting	5 acres	stockpiled waste from smelting and casting activities	1981-1985	barium, cadmium, chromium, lead and zinc	soil	2000	2001	