AIR QUALITY ANALYSIS

YOLO MUTUAL HOUSING ASSOCIATION AND SACRAMENTO MUTUAL HOUSING ASSOCIATION PROJECT

DAVIS, CALIFORNIA

LSA

June 2008

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DAVIS, CALIFORNIA

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TABLE OF CONTENTS

FIGURES

TABLES

1.0 EXECUTIVE SUMMARY

This Air Quality Impact Analysis has been prepared to assess the potential air quality impacts associated with the proposed Yolo Mutual Housing Association and Sacramento Mutual Housing Association development in Davis, California. The proposed project would develop multi-family residential units on parcels located south of Cowell Boulevard and west of Drummond Avenue, and develop office/ commercial units on parcels north of Cowell Boulevard and west of Chiles Road. The parcels are located along the south side of Interstate-80 (I-80).

This analysis has been prepared using methods and assumptions recommended in the air quality impact assessment guidelines of the Yolo-Solano Air Quality Management District (AQMD).[1] In keeping with these guidelines, this assessment describes existing air quality, and the potential impacts of traffic generated by the proposed project on local carbon monoxide levels, emissions generated from project related stationary sources and regional air pollution.

The air quality assessment includes estimating emissions associated with short-term construction and long-term operation of the proposed project. Criteria pollutants with regional impacts would be emitted by stationary or area (direct) sources and mobile (indirect) sources associated with the proposed project. Long-term stationary or area sources emissions include electricity and natural gas usage. Long-term mobile sources emissions include vehicle trips associated with the proposed project. In addition, localized air quality impacts, i.e., higher carbon monoxide concentrations (CO hot spots) near intersections or roadway segments in the project vicinity would potentially occur due to project generated vehicle trips. The air quality assessment also includes an evaluation of the increased health risk to future residents of the project site due to emissions from Interstate 80 (I-80) located adjacent to the project site.

Air quality modeling was performed for the project. Results of the analysis indicate the proposed project would not generate significant construction emissions or long term regional emissions. A heath risk analysis indicates that future residents of the project site would not be exposed to a significant health risk due to emissions from vehicles on I-80.

[1] Yolo-Solano Air Quality Management District, 2007. *Handbook for Assessing and Mitigating Air Quality Impacts.* July

2.0 INTRODUCTION

This Air Quality Impact Assessment has been prepared using methods and assumptions recommended in the air quality impact assessment guidelines of the Yolo-Solano Air Quality Management District (AQMD).[2] In keeping with these guidelines, this assessment describes existing air quality, and the potential impacts of traffic generated by the proposed project on local carbon monoxide levels, emissions generated from project related stationary sources and regional air pollution. Mitigation measures to reduce or eliminate significant air quality impacts are identified, where appropriate.

2.1 PROJECT LOCATION

The project site lies within the City of Davis on Cowell Boulevard. The City of Davis lies within Yolo County which is under the air quality jurisdiction of the Yolo-Solano Air Quality Management District. The project site consists of four undeveloped parcels located southeast of I-80 and west of Drummond Avenue/Chiles Road at the intersection with Cowell Boulevard. The project site's regional location is shown in Figure 1.

2.2 PROJECT SITE EXISTING SETTING

The two parcels that lie south of Cowell Boulevard consist of approximately 3.31 gross acres with 3.08 acres available for development. The two parcels that lie north of Cowell Boulevard and Chiles Road consist of approximately 1.09 acres each; the acreage available for development on these northern parcels is pending engineering survey and investigation. The General Plan designation for these parcels is Business Park; the current zoning is PD 12-87 Industrial Research (I-R).

The project site is bounded on the west by a commercial/business park, in which the nearest facility is the UC Davis bookstore warehouse. To the south of the project site lies the Owendale Community apartment complex on Albany Avenue. Additional undeveloped land bound the project site on the opposite side of Drummond Avenue/Chiles Road. Some of these parcels nonadjacent to and west of the project site between Chiles Road and Cowell Boulevard are planned for single family residential development. Land uses north of I-80 across from the project site consist of undeveloped and commercial land uses, including office park, retail, theater, and indoor fitness center facilities.

2.3 PROJECT DESCRIPTION

The project would seek rezoning of the project site parcels to Multi-Family. This redesignation would allow for the development of multi-family residential units on the two parcels located south of Cowell Boulevard (described as residential parcels throughout the rest of this report). It would also permit the

[2] Yolo-Solano Air Quality Management District, 1996. *Air Quality Handbook – Guidelines for Determining Air Quality Thresholds of Significance and Mitigation Measures for Proposed Development Projects that Generate Emissions from Motor Vehicles.* May. (Revised 2002)

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FIGURE 1

N

LEGEND

PROJECT AREA

0 660 1320

FEET

Sacramento Mutual Housing Project

Project Location Map

SOURCE: GLOBEXPLORER, MAY 2006; LSA ASSOCIATES, INC., 2007

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development of the two parcels north of Cowell Boulevard (described as office parcels throughout the rest of this report) as an office space land use.

The project proposes the development of approximately 77,000 square feet of residential development, to be constructed in three or four story units on the residential parcels south of Cowell Boulevard. Parking for at least 100 cars is planned for the north portion of these parcels, which may include covered car-ports. The City would require minimum setbacks for development from Cowell Boulevard and Drummond Avenue; the exact amounts have not been determined at the time of this report. To the south of the residential units the project plans to include as much open space as possible. This portion of the project would also include a community building of approximately 2,000 square feet, the location of which is yet to be determined. Access to the residential parcels would be provided via Drummond Avenue.

The project would develop one or, possibly, two buildings on the office parcels adjacent to I-80, along with associated surface parking. The City would require a minimum setback for development along Chiles Road of approximately 50 feet. Access to the office parcels would be via Cowell Boulevard and Chiles Road.

3.0 EXISTING CONDITIONS

3.1 AFFECTED ENVIRONMENT

3.1.1 Air Pollution Climatology

Air pollution in the project area is from a combination of natural and man-made sources. Natural and man-made sources of air pollution consist of windblown dust, agricultural operations, fires from prescribed burning and agricultural burning, hydrocarbons emitted from natural vegetation, and other pollutants from mobile and stationary sources. The amount of a given pollutant in the atmosphere is determined by the amount of a pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major determinants of transport and dilution are wind, atmospheric stability, terrain, and for photochemical pollutants, sunshine.

A region's topographic features have a direct correlation with air pollution flow and therefore are used to determine the boundary of air basins. A local air district is then assigned to each air basin and is responsible for providing air quality strategies to bring the air basin into compliance with the National Ambient Air Quality Standards (NAAQS). The proposed project is located in the Sacramento Valley Air Basin (SVAB), which encompasses eleven counties including all of Shasta, Tehma, Glenn, Colusa, Butte, Sutter, Yuba, Sacramento, and Yolo Counties, the westernmost portion of Placer County and the northeastern half of Solano County. The SVAB is bounded by the North Coast Ranges on the west and Northern Sierra Nevada Mountains on the east. The intervening terrain is relatively flat.

The Yolo-Solano AQMD is located within the boundaries of the SVAB. Hot dry summers and mild rainy winters characterize the Mediterranean climate of the SVAB. During the year the temperature may range from 20 to 115 degrees Fahrenheit with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches, with about 75 percent of the rain occurring during the rainy season generally from November through March. The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north.[3]

Surface or radiation inversions are formed when the ground surface becomes cooler than the air above it during the night. The earth's surface goes through a radiative process on clear nights, where heat energy is transferred from the ground to a cooler night sky. As the earth's surface cools during the evening hours, the air directly above it also cools, while air higher up remains relatively warm. The inversion is destroyed when heat from the sun warms the ground, which in turn heats the lower layers of air; this heating stimulates the ground level air to float up through the inversion layer. Inversions create high levels of surface concentrations of pollutants during the autumn and early winter when large high-pressure cells lie over the Sacramento Valley.

[3] Ibid.

The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high wind speeds, ambient air pollutant concentrations are lowest. Periods of low inversions and low wind speeds are conditions favorable to high concentrations of CO and PM_{10}. In the winter, the greatest pollution problems are carbon monoxide and PM_{10} because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and oxides of nitrogen to form photochemical smog.

3.1.2 Ambient Air Quality Standards

Both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (ARB) have established ambient air quality standards for common pollutants. These ambient air quality standards are levels of contaminants which represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Health effects of criteria pollutants and their potential sources are described below and are summarized in Table A. The standards would have to be exceeded by a large margin or for a prolonged period of time for the health effects to occur. Table B shows both federal and State standards for these criteria pollutants. The State Ambient Air Quality Standard (AAQS) is more stringent than the federal AAQS.

Ozone. Ozone (smog) is formed by photochemical reactions between oxides of nitrogen and reactive organic gases, rather than being directly emitted. Ozone is a pungent, colorless gas. Elevated ozone concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in sensitive receptors such as the sick, elderly, and young children. Ozone levels peak during the summer and early fall months.

Carbon Monoxide. Carbon monoxide (CO) is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions. CO passes through the lungs into the bloodstream, where it interferes with the transfer of oxygen to body tissues.

Nitrogen Oxides. Nitrogen dioxide (NO_2), a reddish-brown gas, and nitric oxide (NO), a colorless, odorless gas, are formed from fuel combustion under high temperature or pressure. These compounds are referred to as nitrogen oxides, or NOx. NOx is a primary component of the photochemical smog reaction. Nitrogen oxides also contribute to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 decreases lung function and may reduce resistance to infection.

Sulfur Dioxide. Sulfur dioxide (SO_2) is a colorless irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels in the region. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

Table A: Health Effects Summary of the Common Pollutants Found in Air

Pollutant	Health Effects	Examples of Sources
Particulate Matter (PM_{10}: less than or equal to 10 microns)	• Increased respiratory disease • Lung damage • Premature death	• Cars and trucks, especially diesels • Fireplaces, wood stoves • Windblown dust from roadways, agriculture, and construction
Ozone (O_3)	• Breathing difficulties • Lung damage	• Formed by chemical reactions of air pollutants in the presence of sunlight; common sources are motor vehicles, industries, and consumer products
Carbon Monoxide (CO)	• Chest pain in heart patients • Headaches, nausea • Reduced mental alertness • Death at very high levels	• Any source that burns fuel such as cars, trucks, construction and farming equipment, and residential heaters and stoves
Nitrogen Dioxide (NO_2)	• Lung damage	• See carbon monoxide sources
Toxic Air Contaminants	• Cancer • Chronic eye, lung, or skin irritation • Neurological and reproductive disorders	• Cars and trucks, especially diesels • Industrial sources such as chrome platers • Neighborhood businesses such as dry cleaners and service stations • Building materials and products

Source: ARB, 2005.

Particulate Matter. Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles are those that are larger than 2.5 microns but smaller than 10 microns, or PM_{10}. $PM_{2.5}$ refers to fine suspended particulate matter with an aerodynamic diameter of 2.5 microns or less that is not readily filtered out by the lungs. Nitrates, sulfates, dust, and combustion particulates are major components of PM_{10} and $PM_{2.5}$. These small particles can be directly emitted into the atmosphere as by-products of fuel combustion, through abrasion, such as tire or brake lining wear, or through fugitive dust (wind or mechanical erosion of soil). They can also be formed in the atmosphere through chemical reactions. Particulates may transport carcinogens and other toxic compounds that adhere to the particle surfaces, and can enter the human body through the lungs.

Reactive Organic Gases. Reactive organic gases (ROG) are not criteria pollutants, but are precursors to ozone formation. They are formed from combustion of fuels and evaporation of organic solvents. ROG is a prime component of the photochemical smog reaction. Consequently, ROG accumulates in the atmosphere much quicker during the winter when sunlight is limited and photochemical reactions are slower.

Table B: Ambient Air Quality Standards (AAQS)

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1-Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	--	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m^3)		0.08 ppm (157 µg/m^3)[8]		
Respirable Particulate Matter (PM_{10})	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		--		
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		--	--	--
Nitrogen Dioxide (NO_2)*	Annual Arithmetic Mean	0.030 ppm (56 µg/m^3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.18ppm (338 µg/m^3)		--		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	--	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	--	Spectrophotometry (Pararosaniline Method)
	24-Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	--	
	3-Hour	--		--	0.5 ppm (1300 µg/m^3)	
	1-Hour	0.25 ppm (655 µg/m^3)		--	--	
Lead[9]	30 Day Average	1.5 µg/m^3	Atomic Absorption	--	--	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	--		1.5 µg/m^3	Same as Primary Standard	
Visibility-Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24-Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[9]	24-Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

*The Nitrogen Dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.30 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

Footnotes:

1 California standards for ozone; carbon monoxide (except Lake Tahoe); sulfur dioxide (1- and 24-hour); nitrogen dioxide; suspended particulate matter, PM_{10}, $PM_{2.5}$; and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2 National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

3 Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25˚C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25˚C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4 Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7 Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.

8 New federal eight-hour ozone and fine particulate matter standards were promulgated by the EPA on July 18, 1997. Contact the EPA for further clarification and current federal policies.

9 The ARB has identified lead and vinyl chloride as ‘toxic air contaminants’ with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Source: ARB, 2007.

3.1.3 Local Air Quality

Air quality monitoring stations are located throughout the nation and maintained by the local air pollution control district and state air quality regulating agencies. Ambient air data collected at permanent monitoring stations are used by the EPA to identify regions as "attainment" or "non-attainment" depending on whether the regions met the requirements stated in the primary NAAQS. Attainment areas are required to maintain their status through moderate, yet effective air quality maintenance plan. Non-attainment areas are imposed with additional restrictions as required by the EPA. In addition, different classifications of attainment such as marginal, moderate, serious, severe, and extreme are used to classify each air basin in the state on a pollutant-by-pollutant basis. Different classifications have different mandated attainment dates and are used as guidelines to create air quality management strategies to improve air quality and comply with the NAAQS by the attainment date.

A region is determined to be unclassified when the data collected from the air quality monitoring stations do not support a designation of attainment or non-attainment, due to lack of information, or a conclusion cannot be made with the available data.

The federal and State ambient standards were developed independently with differing purposes and methods, although both processes aim to prevent health-related effects. As a result, the federal and State standards differ in some cases. In general, the State standards are more stringent. This is particularly true for ozone and particulate matter.

The U.S. Environmental Protection Agency established new national air quality standards for ground-level ozone and for fine particulate matter in 1997. The 1-hour ozone standard was phased out and replaced by an 8-hour standard of 0.08 ppm. Implementation of the 8-hour standard became effective in July 2005. New national standards for fine Particulate Matter (diameter 2.5 microns or less) were adopted for 24-hour and annual averaging periods.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated by the EPA and the ARB despite the absence of criteria documents. Some examples of TACs include: benzene, butadiene, formaldehyde, and hydrogen sulfide. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants.

In 1998, ARB identified particulate matter from diesel-fueled engines as a toxic air contaminant. ARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[4] High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truck stops) were identified as having posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high volume transit centers or schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

3.1.4 Current Air Quality

The Yolo-Solano AQMD monitors air quality at several locations within their jurisdiction in the Sacramento Valley. The closest multi-pollutant monitoring site to the project site is located in Davis and its air quality trends are representative of the ambient air quality in the project area. The one pollutant known to occasionally exceed the State standard in the project area, ozone is a regional pollutant. Ozone is a regional pollutant and is not determined by proximity to individual sources, but show a relative uniformity over a region. Thus, the data shown in Table C for these pollutants provide a good characterization of levels of these pollutants within the project site. The monitored pollutants include CO, O_3, PM_{10}, $PM_{2.5}$, NO_2, and SO_2. Table C summarizes exceedances of State and federal standards at this monitoring site during the period 2004 through 2006.

The ambient air quality data in Table C show that CO, NO_2, and SO_2 levels are well below relevant State and federal standards. $PM_{2.5}$ levels were consistently lower than standards. Ozone and PM_{10}

[4] California Air Resources Board, 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October.

Table C: Ambient Air Quality at the Davis Air Monitoring Station

Pollutant	Standard	2004	2005	2006
Carbon Monoxide (CO)				
Maximum 1 hour concentration (ppm)		1.6	0.9	0.9
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8 hour concentration (ppm)		1.0	0.7	0.5
Number of days exceeded:	State: > 9 ppm	0	0	0
	Federal: > 9 ppm	0	0	0
Ozone (O_3)				
Maximum 1 hour concentration (ppm)		0.092	0.097	0.105
Number of days exceeded:	State: > 0.09 ppm	0	1	3
Maximum 8 hour concentration (ppm)		0.075	0.080	0.094
Number of days exceeded:	State: > 0.07 ppm	0	0	1
	Federal: > 0.08 ppm	0	0	1
Coarse Particulates (PM_{10}) (Woodland-Gibson Road closest monitoring station)				
Maximum 24 hour concentration ($\mu g/m^3$)		169	59	77
Number of days exceeded:	State: > 50 $\mu g/m^3$	13	1	6
	Federal: > 150 $\mu g/m^3$	1	0	0
Annual arithmetic average concentration ($\mu g/m^3$)		35	24	25
Exceeded for the year:	State: > 20 $\mu g/m^3$	Yes	Yes	Yes
	Federal: > 50 $\mu g/m^3$	No	No	No
Fine Particulates ($PM_{2.5}$) (Woodland-Gibson Road closest monitoring station)				
Maximum 24 hour concentration ($\mu g/m^3$)		36	35	44
Number of days exceeded:	Federal: > 65 $\mu g/m^3$	0	0	0
Annual arithmetic average concentration ($\mu g/m^3$)		10.4	8.4	9.3
Exceeded for the year:	State: > 12 $\mu g/m^3$	No	No	No
	Federal: > 15 $\mu g/m^3$	No	No	No
Nitrogen Dioxide (NO_2)				
Maximum 1 hour concentration (ppm)		0.057	0.043	0.045
Number of days exceeded:	State: > 0.25 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.009	0.009	0.009
Exceeded for the year:	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO_2) (Vallejo-Tuolumne Street closest monitoring station)				
Maximum 1 hour concentration (ppm)		0.016	0.011	0.016
Number of days exceeded:	State: > 0.25 ppm	0	0	0
Maximum 3 hour concentration (ppm)		0.011	0.008	0.012
Number of days exceeded:	Federal: > 0.5 ppm	0	0	0
Maximum 24 hour concentration (ppm)		0.005	0.005	0.004
Number of days exceeded:	State: > 0.04 ppm	0	0	0
	Federal: > 0.14 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.002	0.002	0.001
Exceeded for the year:	Federal: > 0.030 ppm	No	No	No

ppm = parts per million $\mu g/m^3$= micrograms per cubic meter
Source: ARB and EPA 2007.

levels occasionally exceeded State and federal standards during the last three years. The closest PM_{10} and $PM_{2.5}$ monitoring station is located in Woodland; the closest SO_2 monitoring station is located in Vallejo.

3.1.5 Regional Air Quality Management Plan

The 1994 Sacramento Regional Clean Air Plan was developed cooperatively with all the districts in the Sacramento Region (e.g., El Dorado APCD, Feather River AQMD, Placer County APCD, Sacramento Metropolitan AQMD, and Yolo-Solano AQMD). The Clean Air Plan was adopted in 1994 in compliance with the 1990 Amendments to the Federal Clean Air Act.[5] An update to the Clean Air Plan is in progress to address the new 8-hour ozone standard and the associated control strategies that would be required to meet the new standards. The Clean Air Plan is expected to be finalized by the end of 2008.

3.1.6 Attainment Status.

The federal Clean Air Act (CAA) and the California CAA of 1988 require that the State ARB, based on air quality monitoring data, designate portions of the State where the federal or State ambient air quality standards are not met as "nonattainment areas." Because of the differences between the national and State standards, the designation of nonattainment areas is different under the federal and State legislation. Generally, the State standards for these pollutants are more stringent than the federal standards.

The City of Davis is within the jurisdiction of the Yolo-Solano AQMD, which regulates air quality in the Yolo and portions of Solano Counties. Air quality conditions in the Yolo-Solano region have improved over the last 20 years. Ambient concentrations of air pollutants and the number of days during which the region exceeds air quality standards have fallen to an extent. The Attainment Status for the Yolo-Solano AQMD region is shown in Table D.

Table D: Attainment Status for the Yolo-Solano Air Quality Management District

Pollutant	Federal Standards	State Standards
Ozone - 1 hour	No Federal Standard	Nonattainment
Ozone - 8 hour	Nonattainment	Nonattainment
PM_{10}	Unclassified	Nonattainment
$PM_{2.5}$	Unclassified	N/A
CO	Unclassified/Attainment	Attainment
NO_2	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
Lead	Attainment	Attainment
Hydrogen Sulfide	*No Federal Standard	Attainment
Sulfates	*No Federal Standard	Attainment
Visibility Reducing Particles	*No Federal Standard	Attainment

Source: Yolo-Solano Air Quality Management District, April 2007. http://ysaqmd.omsoft.com/state-plans.php

[5] Sacramento Metropolitan AQMD website: www.airqualtiy.org/cleanairplan/cleanairplan94.shtml

3.1.7 Air Quality and Land Use Handbook.

The ARB has also developed an Air Quality and Land Use Handbook[6] which is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. The ARB handbook recommends that planning agencies strongly consider proximity to these sources when finding new locations for "sensitive" land uses such as homes, medical facilities, daycare centers, schools and playgrounds.

Air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners and large gasoline service stations. Key recommendations in the Handbook include taking steps to avoid siting new, sensitive land uses (including residences, day care centers, playgrounds or medical facilities):

- Within 500 feet of a freeway, urban roads with 100,000 vehicles / day or rural roads with 50,000 vehicles / day;
- Within 1,000 feet of a major service and maintenance rail yard;
- Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries;
- Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet); or
- Within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater).

The Handbook specifically states that these recommendations are advisory and acknowledges land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

[6] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A community Health Perspective.* April.

4.0 METHODOLOGY AND THRESHOLDS

4.1 METHODOLOGY

Numerous air quality modeling tools are available to assess air quality impacts of projects; however, certain air districts such as the Yolo-Solano AQMD have created guidelines and requirements to conduct air quality analysis. The AQMD's document, *Handbook for Assessing and Mitigating Air Quality Impacts*[7] was adhered to in the assessment of air quality impacts for the proposed project. The air quality model URBEMIS 2007 was used in this air quality assessment.

Operational Emissions. The air quality assessment includes estimating emissions associated with short-term construction and long-term operation of the proposed project. Criteria pollutants with regional impacts would be emitted by stationary or area (direct) sources and mobile (indirect) sources associated with the proposed project. Long-term stationary or area sources emissions include electricity and natural gas usage. Long-term mobile sources emissions include vehicle trips associated with the proposed project. In addition, localized air quality impacts, i.e., higher carbon monoxide concentrations (CO hot spots) near intersections or roadway segments in the project vicinity would potentially occur due to project generated vehicle trips.

The Urban Emission Model (URBEMIS 2007) computer program, which is the most current air quality model available in California for estimating emissions associated with land use development projects, was used to calculate long-term mobile source emissions associated with the proposed project. Increases in long-term stationary emissions from natural gas and electricity use within the project site were also included in the calculation.

The results from the URBEMIS 2007 model were used to determine the daily emission increase associated with project operational trip generation for reactive organic gases (ROG) and nitrogen oxides (NO_x) (two precursors of ozone) and coarse particle matter (PM_{10}). The pollutant emissions and concentrations determine the significance and impact on regional and local air quality as a result of the proposed project. The results also allow the local government to determine whether the proposed project will deter the region from achieving the goal of reducing pollutants in accordance with the AQAP in order to comply with federal and State ambient air quality standards.

Project Construction Emissions. Construction activities can generate a substantial amount of air pollution. In some cases, the emissions from construction represent the largest air quality impact associated with a project. Construction activities are considered temporary, however, short term impacts can contribute to exceedances of air quality standards. Construction activities include site preparation, earthmoving and general construction. The emissions generated from these common construction activities include fugitive dust from soil disturbance, fuel combustion from mobile

[7] Yolo-Solano Air Quality Management District, 2007. Handbook for Assessing and Mitigating Air Quality Impacts, July.

heavy-duty diesel and gasoline powered equipment, portable auxiliary equipment, and worker commute trips. URBEMIS 2007 was used to quantify PM_{10} emissions and NOx emissions.

Toxic Air Contaminants. The proposed project is located with 500 feet of I-80 and the ARB recommends avoiding siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. Although the ARB makes a distance recommendation, it has not provided specific thresholds of significance for TACs. The AQMD therefore recommends that housing and other facilities accommodating sensitive receptors in new development projects located within the ARB recommended distance from the source categories are considered to be exposed to an elevated risk and further analysis should be conducted to estimate the health risk. To determine the health risk associated with locating sensitive receptors on the project site LSA conducted and analysis using the ARB health risk model, HARP, which includes the EPA dispersion model ISCST3. This model provides a detailed estimate of concentrations considering site and source geometry, source strength, distance to receptor, and site specific meteorological data.

4.2 THRESHOLDS OF SIGNIFICANCE

The project would affect air quality both during construction and operation. Operational impacts would be mainly indirect (related to vehicle trips generated by proposed land uses within the project site). The project would also result in an increase in traffic to the surrounding roadway network, which would affect air quality locally.

This section analyzes the impacts related to air quality that could result from implementation of the project in Davis by the Sacramento Mutual Housing Association (SMHA) in coordination with the Yolo Mutual Housing Association (YMHA). This discussion begins with criteria of significance, which establish the thresholds for determining whether a project impact is significant. The latter part of this section presents the potential air quality impacts associated with the proposed project. Mitigation measures are provided as appropriate.

The Yolo-Solano AQMD and the State CEQA Guidelines state that a project would normally have a significant adverse air quality impact if project-generated pollutant emissions would:

a) Conflict with or obstruct implementation of the applicable air quality plan;
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project is non-attainment under applicable federal or state ambient air quality standards (including releasing emissions which exceed quantitative thresholds for ozone precursors);
d) Expose sensitive receptors to substantial pollutant concentrations; or
e) Create objectionable odors affecting a substantial number of people.

The Yolo-Solano AQMD defines sensitive receptors as facilities where sensitive population groups (children, elderly, acutely and/or chronically ill) are likely to be located. These land uses include residences, schools, playgrounds, child care centers, retirement homes, convalescent homes, hospitals, and medical clinics

Air pollutant emissions associated with the project would occur over the short term from construction, such as fugitive dust from grading, site preparation, and equipment exhaust. Long-term emissions would result from the occupation and use of the proposed land uses. There would be long-term emissions with regional effects associated with project related vehicular trips and long-term emissions with local impacts associated with congested intersections or roadway segments. In addition, long-term stationary source emissions would occur due to energy consumption such as natural gas and electricity usage by the proposed land uses. Feasible mitigation measures are required whenever a significant impact is identified to minimize the amount of pollutants emitted.

Project operational emissions refer to the pollutants generated by the stationary area (direct) sources and mobile (indirect) sources. Stationary sources include electricity and natural gas consumption; mobile sources are the motor vehicles traveling to and from the development. These sources contribute to the deterioration of air quality and potentially prevent the region from achieving compliance of Air Quality Standards. Pollutant thresholds are created to determine the significance of a project's impact on air quality. The thresholds of significance from operational, mobile sources and construction phases as defined by the Yolo-Solano AQMD are as follows: 10 tons per year ROG, 10 tons per year of NOx, and 80 pounds per day of PM_{10}. Projects in the region with related emissions that exceed any of the emission thresholds are considered significant by the Yolo-Solano AQMD.

The significance of localized project impacts depends on whether ambient CO levels in the vicinity of the project are above or below State and federal CO standards. If ambient levels are below the standards, a project is considered to have significant impacts if project emissions result in an exceedance of one or more of these standards. California standards for CO are as follows: 20.0 ppm for 1-hour and 9.0 ppm for 8-hours.

According to the Yolo-Solano AQMD's *Air Quality Handbook*, Development projects are considered cumulatively significant if project emissions (ROG, NOx or PM_{10}) are individually significant. CO impacts are cumulatively significant when modeling shows that the combined emissions from the project and other existing and planned projects (i.e., background concentration) will exceed air quality standards.

Projects meeting the above criteria are considered to have a significant adverse incremental effect on the region's ability to attain air quality standards. Air emission projections, attainment planning and related programs are based on growth levels and distributions reflected in local planning documents. Changes in land use the result in emissions greater than anticipated incrementally add to on overall increase in the pollutant load.[8]

Threshold for Toxic Air Pollutants. Proposed development projects that have the potential to expose the public to TACs from stationary sources in excess of the following thresholds would be considered to have a significant air quality impact. These thresholds are based on the Yolo-Solano AQMD's Risk Management Policy.

- Probability of contracting cancer for the Maximally Exposed Individual (MEI) equals to 10 in one million or more; and

[8] Ibid.

- Ground-level concentrations of non-carcinogenic toxic air contaminants would result in a Hazard Index equal to 1 for the MEI or greater.

While the AQMD's Risk Management Policy provides a basis for a threshold for TACs from stationary sources, this policy does not cover TACs from mobile sources. The District has no permitting or other regulatory authority over mobile sources. There currently is no specific mobile source TAC threshold. [9]

[9] Ibid.

5.0 IMPACTS AND MITIGATION MEASURES

5.1 IMPACTS OF THE PROPOSED PROJECT

5.1.1 Short Term Impacts

Air quality impacts would occur during the construction of the project. Air pollutant emissions associated with the project would occur over the short-term from construction activities, such as fugitive dust from site preparation, grading and emissions from equipment exhaust and architectural coatings.

Construction Emissions. The URBEMIS 2007 model was used to estimate construction emissions for the proposed project. Model assumptions assumed that project construction would start February of 2008 and would have duration of 11 months. Results of the model are shown in Table E. Under this scenario, unmitigated project dust emissions during grading would not exceed the Yolo-Solano AQMD's significance threshold for criteria pollutants. Although the project does not exceed the significance criteria, the AQMD recommends implementation of best management practices to reduce dust emissions and avoid localized health impacts.

Table E: Project Construction Emissions in Tons Per Year

	Reactive Organic Gases	Nitrogen Oxides	PM_{10}
Office Development			
2008 Emissions	0.73	2.01	19.33
Apartment Development			
2008 Emissions	0.87	2.34	25.03
Yolo-Solano AQMD Significance Threshold	**10**	**10**	**80**
Exceed?	No	No	No

Source: LSA Associates, Inc., 2007.

Construction Toxic Risk Impacts. The only toxic air pollution emissions of potentially significant quantity would be those associated with the construction of the proposed project from large, heavy-duty diesel-powered equipment exhaust. The Office of Environmental Health Hazard Assessment (OEHHA) currently describes the health risk from diesel exhaust entirely in terms of the amount of particulate, or PM_{10}, that is emitted. Currently, the health risk associated with diesel exhaust PM_{10} as a carcinogenic and chronic effect. Short term exposure of high concentrations of diesel PM10 can cause temporary eye, nose and throat irritation, headaches. The construction period of the project lasts only a short time, relative to the length of time required for carcinogenic and chronic health impacts. Additionally, sensitive receptors are not located in the immediate vicinity of project construction. Therefore the health risk associated with construction emissions would be less than significant.

5.1.2 Long-Term Impacts

Long-term operational emissions occur consistently over the life of the project. Operational emissions are generated by the project by stationary sources, area sources and mobile sources. The total amount of these sources of emissions make up the operational impact of the proposed project.

Carbon Monoxide Effects of Traffic. Vehicular trips associated with the proposed project would contribute to the congestion at intersections and along roadway segments in the project vicinity.

The primary mobile source pollutant of local concern is CO. Carbon monoxide concentration is a direct function of vehicle idling time and, thus, traffic flow conditions. Carbon monoxide disperses rapidly with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations proximate to a congested roadway or intersection may reach unhealthful levels, affecting local sensitive receptors (residents, school children, elderly, hospital patients, etc.). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient background CO concentration, modeling of CO concentrations is recommended in determining a project's effect on local CO levels.

A traffic impact analysis for the proposed project by KD Anderson & Associates, Inc.[10] The traffic report indicates that all intersections the project vicinity would operate at level of service D or better in the future year plus project conditions. Based on the CO screening procedures outlined in the YSAQMD's handbook, the project would not reduce the level of service to an unacceptable LOS (E or F) and would not worsen an already existing peak-hour LOS F on one or more streets or intersections. Therefore the project would not have the potential to create a violation of the CO standard.

High CO concentrations from traffic along the portion of I-80 adjacent to the project site would only occur under extreme conditions that result in traffic idling on the highway. Quantification of such risks is not possible. Given the low volume of trips that the proposed project is expected to generate and the low background CO concentrations, CO impacts are not anticipated.

Objectionable Odors. Heavy-duty equipment in the project area during construction would emit odors. However, the construction activity would be short-term and would cease to occur after construction is completed. No other sources of objectionable odors have been identified for the proposed project. No mitigation measures are recommended.

Toxic Air Contaminants. The proposed project is not expected to generate any TACs that would result in significant air quality impacts. However, the proposed project would construct residential units adjacent to I-80. The traffic on the freeway, as well as local streets, includes both diesel-powered vehicles which emit diesel particulate and gasoline-powered vehicles which emit a number of TACs collectively contained in the reactive organic gases (ROG) emissions, all of which the California's Office of Environmental Health Hazard Assessment (OEHHA) has determined pose cancer risks and may cause other health problems to future residents of the proposed project.

There are currently no federal project-level requirements for air toxics analysis, and CEQA only requires a consideration of the risks from toxics. The Yolo-Solano AQMD has a toxic air contaminant threshold for development projects that have the potential to expose the public to TACs from stationary sources in excess of the thresholds established in the District's Risk Management Policy. While the District's Risk Management Policy provides a basis for a threshold for TACs from stationary sources, this policy does not cover TACs from mobile sources. Therefore, the project is not subject to a significance threshold for mobile source toxic emissions such as those from vehicle

[10] KD Anderson & Associates, Inc. 2008 Traffic Impact Analysis for New Harmony Communtiy Residential Project. April.

emissions from I-80. The District has no permitting or other regulatory authority over mobile sources, such as vehicle emissions.[11]

The project is located within 500 feet of I-80, therefore the increased risk associated with exposure to freeway emissions was evaluated. LSA Associates, Inc. completed a health risk analysis for the proposed YMHA/SMHA project to assess the potential risk to future residents at the project site from emissions generated by freeway traffic. The analysis considered specific meteorological conditions on the project site and the proximity of the project site to the roadways. The following discussion provides the technical background information used to determine the health risk to future residents of the project site.

General Health Risks of Toxics. Determining how hazardous a substance is depends on many factors, including the amount of the substance in the air, how it enters the body, how long the exposure lasts, and what organs in the body are affected. One major way substances enter the body is through inhalation of either gases or particulates. Diesel engine emissions contain both gases and very small particles that penetrate deeply into the lungs, contributing to a range of health problems. California's OEHHA has determined that long-term exposure to diesel exhaust particulates poses the highest cancer risk of any toxic air contaminant it has evaluated. Exposure to diesel PM can result in an increased risk of cancer and an increase in chronic noncancer health effects including a greater incidence of cough, labored breathing, chest tightness, wheezing and bronchitis.[12]

Fortunately, improvements to diesel fuel and diesel engines have already reduced emissions of some of the contaminants. As noted in the Yolo-Solano AQMD's Handbook, the ARB is currently in the process of implementing the control measure phase of the diesel PM program. During this phase, specific statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles will be evaluated and developed. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions. When federal and State diesel PM regulations and programs are fully implemented, the human health risks related to diesel exhaust emissions are expected to significantly decrease.[13]

Analysis of Site Specific Toxics. According to California Air Resources Board (ARB),[14] when conducting a health risk assessment (HRA), the surrogate for whole diesel exhaust is diesel particulate matter, which is used as the basis for the potential risk calculations. When conducting an HRA, the potential cancer risk from inhalation exposure to diesel PM will outweigh the potential noncancer health impacts. Therefore, inhalation cancer risk is required for every HRA. When comparing whole diesel exhaust to speciated diesel exhaust (e.g., polynuclear aromatic hydrocarbons, metals), potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multipathway cancer risk from the speciated components. For this reason, there will be few situations where an analysis of multipathway risk is necessary.[15]

[11] Yolo-Soloano AQMD, op.cit..

[12] Ibid.

[13] Ibid.

[14] Air Resources Board, 2005. http://www.arb.ca.gov/toxics/harp/docs/userguide/appendixK.pdf

[15] OEHHA. 2003. *Air Toxics Hot Spots Program Risk Assessment Guidelines, Appendix D, Risk Assessment Procedures to Evaluate Particulate Emissions from Diesel-Fueled Vehicles, Section B.* August.

To estimate the potential cancer risk associated with TAC emissions, a dispersion model is used to translate an emission rate from a source location to a concentration at a receptor location of interest. Dispersion modeling varies from the simpler, more conservative screening-level analysis to the more complex and refined detailed analysis. This assessment, which falls into the latter category, was conducted using the ARB health risk model, HARP, which includes the EPA dispersion model ISCST3. This model provides a detailed estimate of concentrations considering site and source geometry, source strength, distance to receptor, and site specific meteorological data.

Emission Estimates. This HRA was conducted as recommended in the OEHHA Guidelines and by the ARB (HARP Model Documentation, Appendix K, Risk Assessment Procedures to Evaluate Particulate Emissions from Diesel-Fueled Engines, ARB, Feb 2005). It consists of several steps including:

1) Determining the PM_{10} emission factor.
2) Determining the PM_{10} emission rate.
3) Determining the PM_{10} concentration at location(s) of interest.
4) Translating the PM_{10} concentration(s) to health risk values.
5) Comparing the health risk values to thresholds and determining significance.

The PM_{10} and ROG emission factors were determined by using the ARB model, EMFAC2007, for the year 2008. Existing year emission factors for use in the HRA were recommended by OEHHA, however, this emission factor does not account for the anticipated technological improvements that would occur over the 70 year period of the analysis.

For purposes of this analysis, all vehicle exhaust was modeled as area sources from sources located along the nearby freeway. These extend approximately 1/4 mile from the edge of the proposed project site in both directions. The PM_{10} and ROG emission rates were determined by using Caltrans traffic data for I-80.[16] Table F shows the derivation of the emission rates. It shows the total average daily traffic (AADT) for the I-80 as well as the average speeds in the first column. The AADT is divided

Table F: Emission Rates

Hwy I-80	AADT by Vehicle Category				Number	Emission Rates per source		
	LDA	**LDT**	**MDT**	**HDT**	**of**	**g/s/m^2**	**lb/hr/m^2**	**lb/yr/m^2**
Total	118,599	3,252	1,255	6,894	**Sources**			
AADT	% of Vehicles That Are Diesel-Powered							
130,000	0%	20.0%	70.0%	87.5%				
	Diesel Exhaust PM_{10} Emissions at 60 mph (g/s)							
	0	5.33E-06	7.19E-06	1.69E-03	16	1.06E-04	8.42E-04	7.38
Average	% of Vehicles That Are Gasoline-Powered							
Speed	100%	80.0%	30.0%	12.5%				
60 mph	**Gasoline Exhaust ROG Emissions at 60 mph (g/s)**							
	8.38E-03	2.45E-04	3.33E-05	3.89E-04	16	5.65E-04	4.49E-03	3.93E+01

Source: LSA Associates, Inc., June 2008.

[16] Caltrans web site: http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/, on 11/27/07

into four vehicle type categories: light duty autos (LDA), light duty trucks (LDT), medium duty trucks (MDT), and heavy duty trucks (HDT) and show the total emissions for that volume of vehicles at the average speed. The right three columns then total the vehicle emissions, divide by the number of modeling sources for the roadway and convert units for input into the model. For the purpose of this assessment, it is assumed that the traffic volumes are constant throughout the year.

To determine the emission rates of the TACs within the ROG emissions, gasoline vehicle exhaust speciation data[17] from the ARB was used. Table G shows the data used.

Table G: Gasoline Exhaust Speciation

CAS Number	Chemical Name	Weight Fraction
106990	1,3-butadiene	0.00775
71432	Benzene	0.04136
100414	ethylbenzene	0.01422
91203	naphthalene	0.00308
115071	propylene	0.04254998
100425	Styrene	0.00308
108883	Toluene	0.07247
95476	m & p-xylene	0.05467999

Source: ARB, November 2007.

Receptors were placed in a general grid extending in all directions to characterize the risk level isopleths and at locations of future residences. Meteorological data from the Sacramento Executive [18] were used to represent the conditions at the project site. The model input and output sheets including the model grid and isopleths results are attached. Portions of the ISCST3 output file showing all model inputs and important outputs is attached. Also attached is the HARP model output listing the modeled health risks for all receptors.

Acute Emission Impacts. Exposure to diesel exhaust can have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. However, according to the rulemaking on *Identifying Particulate Emissions from Diesel-Fueled Engines as a Toxic Air Contaminant* (ARB 1998), the available data from studies of humans exposed to diesel exhaust are not sufficient for deriving an acute noncancer health risk guidance value. While the lung is a major target organ for diesel exhaust, studies of the gross respiratory effects of diesel exhaust in exposed workers have not provided sufficient exposure information to establish a short-term noncancer health risk guidance value for respiratory effects. The maximum acute hazard index is 2.6×10^{-4}.

[17] ARB web site, http://arb.ca.gov/ei/speciate/speciate.htm, on 9/13/07

[18] Downloaded from the ARB web site, http://www.arb.ca.gov/toxics/harp/metfiles.htm, on 11/27/07.

Carcinogenic and Chronic Impacts. The results of the health risk assessment are shown in Table H. Results of the analysis indicate that the maximum exposed individual (MEI) inhalation cancer risk associated with living at the proposed development for 70 years would be exposed to an inhalation cancer risk of 16 in 1 million. The maximum chronic hazard index is 0.010.

Table H: Inhalation Health Risks from Vehicle Sources on I-80.

	Carcinogenic Inhalation Health Risk	Chronic Inhalation Health Index	Acute Inhalation Health Index
MEI onsite	16 in 1 million	0.010	$2.6x10^{-4}$

Source: LSA Associates, Inc., June 2008.

The carcinogenic isopleths contour lines prepared for this analysis indicate that prevailing winds are favorable for the project site with a greater dispersion of vehicle emissions occurring north of the project site. The counter lines are shown in Appendix C.

Health Risk Assessment Conclusions. The exposure risk indicated in Table H only includes exposure to emissions from freeway traffic near the project site. As shown in Table H, a 70-year outdoor exposure of freeway emissions at the proposed residential units on the project site would result in a maximum exposure to future residents at a risk level of 16 in 1 million. The HRA results indicate an exposure risk that would only slightly increase the health risk so it is unlikely that future residents of the project site would be exposed to a health risk which would be substantially greater than the average Californian. (The average cancer risk statewide from exposure to diesel PM is estimated to be over 500 in 1 million.[19])

The OEHHA analysis methodology requires that the modeling assumptions include individual inhalation of 100 percent outdoor air at that location for 70 years while residing outside the residence 350 days of every year for 24-hours each day and does not account for future improvements to vehicle emissions that are planned for over the next 20 years.

This exposure estimate likely overstates the potential increased health risk for residents because typically the average apartment rental duration is 5 to 15 years, not 70 years. Additionally, the model assumes outdoor exposure 24 hours a day, while exposure rates for an indoor/outdoor combination would be much lower. A report to the Air Resources Board in 1998 acknowledges that people spend a majority of time indoors (for example, the report to the ARB estimates the average individual spends 22.5 hours per day indoors.[20]), and that to accurately estimate the population's exposure to toxic air pollutants, risk assessors must consider the amount of time people spend in different environments. The report found that toxic air concentrations were more than one third less in residences and schools, and almost one half less in offices as compared to outdoor areas.[21] Because individuals spend most of their time indoors, the addition of an upgraded HVAC system could significantly improve indoor air quality in the dwelling units on the project site and further reduce the potential for any increased health risk.

[19] California Environmental Protection Agency, CARB, 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October.

[20] Ibid.

[21] Krieger, Robert K., D. Ames, J. Brooks, G. Shiroma, and P. Venturini, 1998. Report to the Air Resources Board on the Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, Part A, Exposure Assessment. April 22.

The proposed project would also install trees and other vegetation along the property line adjacent to the freeway. UC Davis research has found that tall evergreens planted in rows filter toxic auto exhaust and disperse it. The research shows that trees removed 65 percent to 85 percent of particle pollutants according to test results. The addition of this landscaping on the project site would further reduce any increased risk due to freeway exhaust emissions.

Regional Air Quality Impacts. Long-term air emission impacts are those associated with stationary sources and mobile sources involving any change related to the proposed project. Stationary source emissions result from the consumption of natural gas and electricity. Mobile source emissions result from vehicle trips generated by the project and therefore result in air pollutant emissions affecting the entire Sacramento Valley Air Basin. Regional emissions associated with project's mobile sources were calculated using the URBEMIS 2007 model. Two model runs were performed to individually obtain emission estimates for each land use type. Winter emissions of PM_{10} were higher than summer emissions; therefore, winter emissions in lbs/day are shown in Table I. Appendix B contains model worksheets.

The incremental daily emission increase associated with the project is identified in Table I for reactive organic gases (ROG) and nitrogen oxides (NO_x) (two precursors of ozone) and coarse particulate matter (PM_{10}). The Yolo-Solano AQMD has established thresholds of significance for ozone precursors at 10 tons per year and fugitive dust of 80 pounds per day. The emissions associated with the project would be not be considered significant. No mitigation would be required.

Table I: Project Regional Emissions

	Reactive Organic Gases (tons/year)	**Nitrogen Oxides (tons/year)**	**PM_{10} (lbs/day)**
Office Emissions	1.47	2.23	11.45
Apartment Emissions	1.88	1.50	16.62
Yolo-Solano AQMD Significance Threshold	**10.0**	**10.0**	**80.0**
Exceed?	No	No	No

Source: LSA Associates, Inc., 2007.

Cumulative Air Quality Impacts. A number of individual projects in the City will be under construction simultaneously with the proposed project. Depending on construction schedules and actual implementation of projects in the area, generation of fugitive dust and pollutant emissions during construction may result in substantial short-term increases in air pollutants. Implementation of best management practices would be required to reduce cumulative construction impacts to a less than significant level.

The AQMD considers projects that are considered individually less than significant to be cumulatively less than significant. Therefore, the proposed project would not have a significant cumulative impact on air quality.

Projects, Criteria Pollutants and Public Health. Despite great progress in air quality improvement, approximately 146 million people nationwide lived in counties with pollution levels above the national standards in 2002. Out of the 230 nonattainment areas identified during the 1990 Clean Air Act Amendment designation process, 124 areas remain under nonattainment status or designation today. In these nonattainment areas, however, the severity of air pollution episodes has decreased. Air quality in the Sacramento Valley Air Basin in the past 20 years has improved steadily and dramatically, even with the tremendous increase in population and vehicles and other sources.

As shown in Table A, long-term exposure to elevated levels of criteria pollutants could result in potential health effects. However, as stated in the thresholds of significance, emission thresholds established by the air district are used to manage total regional emissions within an air basin, based on the air basin attainment status for criteria pollutants. These emission thresholds were established for individual projects that would contribute to regional emissions and pollutant concentrations that may affect or delay the projected attainment target year for certain criteria pollutants.

Because of the conservative nature of the thresholds and the basin-wide context of individual project emissions, there is no direct correlation of a single project to localized health effects. One individual project having emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like NOx and ROG.

Based on the above discussion, the potential for an individual project to significantly degrade regional air quality or contribute to significant health risk is small, even if the emission thresholds are exceeded by the project. Because of the overall improvement trend in air quality in the air basin, it is unlikely the regional air quality would worsen or health risk increase from the current condition due to emissions from an individual project.

6.0 CONSTRUCTION BEST MANAGEMENT PRACTICES

To reduce PM_{10} emissions from construction activities, the project should implement the following practices.

- Unpaved areas subject to vehicle traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered.
- The speed of any vehicles and equipment traveling across unpaved areas must be no more than 15 miles per hour.
- Storage piles and disturbed areas not subject to vehicular traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered when material is not being added to or removed from the pile.
- Prior to any ground disturbance, including grading, excavating, and land clearing, sufficient water must be applied to the area to be disturbed to minimize dust emissions.
- Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud and dirt, from being released or tracked off-site.

APPENDIX A – URBEMIS MODEL DATA

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Urbemis 2007 Version 9.2.2

Combined Annual Emissions Reports (Tons/Year)

File Name: X:\Irvine\SAZ0702\apartments.urb9

Project Name: Sacramento Mutual Housing Aparatments

Project Location: Yolo-Solano AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2008 TOTALS (tons/year unmitigated)	0.87	2.38	2.19	0.00	0.23	0.16	0.40	0.05	0.15	0.20	267.86

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.94	0.15	2.54	0.01	0.39	0.37	188.92

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.94	1.35	11.61	0.01	1.31	0.26	727.92

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1.88	1.50	14.15	0.02	1.70	0.63	916.84

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2008	0.87	2.38	2.19	0.00	0.23	0.16	0.40	0.05	0.15	0.20	267.86
Asphalt 02/01/2008-02/15/2008	0.02	0.10	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	8.77
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.02	0.10	0.05	0.00	0.00	0.01	0.01	0.00	0.01	0.01	7.00
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Fine Grading 02/01/2008-02/29/2008	0.04	0.29	0.16	0.00	0.23	0.01	0.25	0.05	0.01	0.06	24.67
Fine Grading Dust	0.00	0.00	0.00	0.00	0.23	0.00	0.23	0.05	0.00	0.05	0.00
Fine Grading Off Road Diesel	0.03	0.29	0.14	0.00	0.00	0.01	0.01	0.00	0.01	0.01	23.60

Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07
Building 03/01/2008-11/30/2008	0.43	1.98	1.95	0.00	0.00	0.14	0.14	0.00	0.13	0.13	233.41
Building Off Road Diesel	0.40	1.78	1.15	0.00	0.00	0.13	0.13	0.00	0.12	0.12	158.07
Building Vendor Trips	0.01	0.17	0.14	0.00	0.00	0.01	0.01	0.00	0.01	0.01	25.10
Building Worker Trips	0.02	0.04	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.24
Coating 11/01/2008-12/31/2008	0.38	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Architectural Coating	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00

Phase Assumptions

Phase: Fine Grading 2/1/2008 - 2/29/2008 - Default Fine Site Grading Description

Total Acres Disturbed: 4.38

Maximum Daily Acreage Disturbed: 1.1

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 2/1/2008 - 2/15/2008 - Default Paving Description

Acres to be Paved: 1.1

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 3/1/2008 - 11/30/2008 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 11/1/2008 - 12/31/2008 - Default Architectural Coating Description

1/17/2008 11:11:42 AM

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 100

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.10	0.04	0.00	0.00	0.00	122.99
Hearth	0.26	0.05	2.36	0.01	0.39	0.37	65.68
Landscape	0.01	0.00	0.14	0.00	0.00	0.00	0.25
Consumer Products	0.62						
Architectural Coatings	0.04						
TOTALS (tons/year, unmitigated)	0.94	0.15	2.54	0.01	0.39	0.37	188.92

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Apartments low rise	0.94	1.35	11.61	0.01	1.31	0.26	727.92
TOTALS (tons/year, unmitigated)	0.94	1.35	11.61	0.01	1.31	0.26	727.92

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Apartments low rise	4.38	6.90	dwelling units	70.00	483.00	4,129.51
					483.00	4,129.51

Vehicle Fleet Mix

1/17/2008 11:11:42 AM

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.0	2.0	97.6	0.4
Light Truck < 3750 lbs	10.9	3.7	90.8	5.5
Light Truck 3751-5750 lbs	21.7	0.9	98.6	0.5
Med Truck 5751-8500 lbs	9.5	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	75.0	25.0
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	77.1	22.9	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	10.0	80.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	10.8	7.3	7.3
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	10.0	10.0
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

1/15/2008 08:46:13 AM

Urbemis 2007 Version 9.2.2

Combined Winter Emissions Reports (Pounds/Day)

File Name: X:\Irvine\SAZ0702\apartments.urb9

Project Name: Sacramento Mutual Housing Aparatments

Project Location: Yolo-Solano AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2008 TOTALS (lbs/day unmitigated)	22.21	47.04	27.41	0.01	22.02	3.01	25.03	4.60	2.76	7.37	3,944.62

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	10.03	1.91	57.95	0.19	9.42	9.07	2,593.17

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	5.43	9.41	67.34	0.04	7.20	1.45	3,631.73

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	15.46	11.32	125.29	0.23	16.62	10.52	6,224.90

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 2/1/2008-2/15/2008 Active Days: 11	6.77	**47.04**	**27.41**	0.00	**22.02**	**3.01**	**25.03**	**4.60**	**2.76**	**7.37**	**3,944.62**
Asphalt 02/01/2008-02/15/2008	3.42	18.97	12.51	0.00	0.01	1.59	1.61	0.00	1.46	1.47	1,595.06
Paving Off-Gas	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.99	17.76	9.40	0.00	0.00	1.54	1.54	0.00	1.41	1.41	1,272.04
Paving On Road Diesel	0.08	1.06	0.44	0.00	0.00	0.05	0.05	0.00	0.04	0.05	118.54
Paving Worker Trips	0.08	0.15	2.67	0.00	0.01	0.01	0.02	0.00	0.01	0.01	204.49
Fine Grading 02/01/2008-02/29/2008	3.36	28.07	14.90	0.00	22.00	1.42	23.42	4.60	1.30	5.90	2,349.56
Fine Grading Dust	0.00	0.00	0.00	0.00	22.00	0.00	22.00	4.59	0.00	4.59	0.00
Fine Grading Off Road Diesel	3.31	28.00	13.56	0.00	0.00	1.41	1.41	0.00	1.30	1.30	2,247.32

1/15/2008 08:46:13 AM

Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.34	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.24
Time Slice 2/18/2008-2/29/2008 Active Days: 10	3.36	28.07	14.90	0.00	22.00	1.42	23.42	4.60	1.30	5.90	2,349.56
Fine Grading 02/01/2008-02/29/2008	3.36	28.07	14.90	0.00	22.00	1.42	23.42	4.60	1.30	5.90	2,349.56
Fine Grading Dust	0.00	0.00	0.00	0.00	22.00	0.00	22.00	4.59	0.00	4.59	0.00
Fine Grading Off Road Diesel	3.31	28.00	13.56	0.00	0.00	1.41	1.41	0.00	1.30	1.30	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.34	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.24
Time Slice 3/3/2008-10/31/2008 Active Days: 175	4.44	20.30	20.02	0.01	0.03	1.43	1.46	0.01	1.31	1.32	2,393.95
Building 03/01/2008-11/30/2008	4.44	20.30	20.02	0.01	0.03	1.43	1.46	0.01	1.31	1.32	2,393.95
Building Off Road Diesel	4.07	18.22	11.80	0.00	0.00	1.33	1.33	0.00	1.22	1.22	1,621.20
Building Vendor Trips	0.15	1.71	1.48	0.00	0.01	0.08	0.09	0.00	0.07	0.08	257.45
Building Worker Trips	0.21	0.37	6.74	0.01	0.03	0.02	0.04	0.01	0.01	0.02	515.30
Time Slice 11/3/2008-11/28/2008 Active Days: 20	**22.21**	20.33	20.63	**0.01**	0.04	1.43	1.47	0.01	1.31	1.32	2,440.61
Building 03/01/2008-11/30/2008	4.44	20.30	20.02	0.01	0.03	1.43	1.46	0.01	1.31	1.32	2,393.95
Building Off Road Diesel	4.07	18.22	11.80	0.00	0.00	1.33	1.33	0.00	1.22	1.22	1,621.20
Building Vendor Trips	0.15	1.71	1.48	0.00	0.01	0.08	0.09	0.00	0.07	0.08	257.45
Building Worker Trips	0.21	0.37	6.74	0.01	0.03	0.02	0.04	0.01	0.01	0.02	515.30
Coating 11/01/2008-12/31/2008	17.78	0.03	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.66
Architectural Coating	17.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.02	0.03	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.66
Time Slice 12/1/2008-12/31/2008 Active Days: 23	17.78	0.03	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.66
Coating 11/01/2008-12/31/2008	17.78	0.03	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.66
Architectural Coating	17.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.02	0.03	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.66

Phase Assumptions

Phase: Fine Grading 2/1/2008 - 2/29/2008 - Default Fine Site Grading Description

Total Acres Disturbed: 4.38

Maximum Daily Acreage Disturbed: 1.1

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1/15/2008 08:46:13 AM

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 2/1/2008 - 2/15/2008 - Default Paving Description
Acres to be Paved: 1.1
Off-Road Equipment:
4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day
1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day
1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day
1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day
1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 3/1/2008 - 11/30/2008 - Default Building Construction Description
Off-Road Equipment:
1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day
2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day
1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day
1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 11/1/2008 - 12/31/2008 - Default Architectural Coating Description
Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 100
Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150
Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150
Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.04	0.53	0.22	0.00	0.00	0.00	673.93
Hearth	6.36	1.38	57.73	0.19	9.42	9.07	1,919.24
Landscaping - No Winter Emissions							
Consumer Products	3.42						
Architectural Coatings	0.21						
TOTALS (lbs/day, unmitigated)	10.03	1.91	57.95	0.19	9.42	9.07	2,593.17

Area Source Changes to Defaults

1/15/2008 08:46:13 AM

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Apartments low rise	5.43	9.41	67.34	0.04	7.20	1.45	3,631.73
TOTALS (lbs/day, unmitigated)	5.43	9.41	67.34	0.04	7.20	1.45	3,631.73

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Apartments low rise	4.38	6.90	dwelling units	70.00	483.00	4,129.51
					483.00	4,129.51

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.0	2.0	97.6	0.4
Light Truck < 3750 lbs	10.9	3.7	90.8	5.5
Light Truck 3751-5750 lbs	21.7	0.9	98.6	0.5
Med Truck 5751-8500 lbs	9.5	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	75.0	25.0
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	77.1	22.9	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	10.0	80.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	10.8	7.3	7.3

1/15/2008 08:46:13 AM

Rural Trip Length (miles)	15.0	10.0	10.0	15.0	10.0	10.0
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

1/17/2008 11:12:17 AM

Urbemis 2007 Version 9.2.2

Combined Annual Emissions Reports (Tons/Year)

File Name: X:\Irvine\SAZ0702\office.urb9

Project Name: Office Development

Project Location: Yolo-Solano AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2008 TOTALS (tons/year unmitigated)	0.73	2.01	1.68	0.00	0.34	0.12	0.46	0.07	0.11	0.19	218.31

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.06	0.09	0.21	0.00	0.00	0.00	102.45

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1.41	2.14	18.02	0.01	2.09	0.42	1,151.62

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1.47	2.23	18.23	0.01	2.09	0.42	1,254.07

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2008	0.73	2.01	1.68	0.00	0.34	0.12	0.46	0.07	0.11	0.19	218.31
Fine Grading 02/01/2008-03/31/2008	0.07	0.59	0.31	0.00	0.34	0.03	0.37	0.07	0.03	0.10	49.34
Fine Grading Dust	0.00	0.00	0.00	0.00	0.34	0.00	0.34	0.07	0.00	0.07	0.00
Fine Grading Off Road Diesel	0.07	0.59	0.28	0.00	0.00	0.03	0.03	0.00	0.03	0.03	47.19
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.15
Asphalt 03/01/2008-04/30/2008	0.05	0.29	0.21	0.00	0.00	0.02	0.03	0.00	0.02	0.02	25.36
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.05	0.29	0.15	0.00	0.00	0.02	0.02	0.00	0.02	0.02	21.05

Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46
Paving Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85
Building 03/01/2008-11/30/2008	0.16	1.12	1.15	0.00	0.00	0.07	0.07	0.00	0.06	0.06	142.71
Building Off Road Diesel	0.14	1.02	0.50	0.00	0.00	0.06	0.06	0.00	0.06	0.06	87.11
Building Vendor Trips	0.01	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.94
Building Worker Trips	0.02	0.03	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.66
Coating 08/08/2008-12/31/2008	0.45	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89
Architectural Coating	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89

Phase Assumptions

Phase: Fine Grading 2/1/2008 - 3/31/2008 - Default Fine Site Grading Description

Total Acres Disturbed: 3.21

Maximum Daily Acreage Disturbed: 0.8

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 3/1/2008 - 4/30/2008 - Default Paving Description

Acres to be Paved: 0.8

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 3/1/2008 - 11/30/2008 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 8/8/2008 - 12/31/2008 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 100

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150

1/17/2008 11:12:17 AM

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.09	0.07	0.00	0.00	0.00	102.20
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscape	0.01	0.00	0.14	0.00	0.00	0.00	0.25
Consumer Products	0.00						
Architectural Coatings	0.04						
TOTALS (tons/year, unmitigated)	0.06	0.09	0.21	0.00	0.00	0.00	102.45

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
General office building	1.41	2.14	18.02	0.01	2.09	0.42	1,151.62
TOTALS (tons/year, unmitigated)	1.41	2.14	18.02	0.01	2.09	0.42	1,151.62

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
General office building		11.01	1000 sq ft	70.00	770.70	6,570.22
					770.70	6,570.22

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.0	2.0	97.6	0.4

1/17/2008 11:12:17 AM

Light Truck < 3750 lbs	10.9	3.7	90.8	5.5
Light Truck 3751-5750 lbs	21.7	0.9	98.6	0.5
Med Truck 5751-8500 lbs	9.5	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	75.0	25.0
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	77.1	22.9	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	10.0	80.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	10.8	7.3	7.3
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	10.0	10.0
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
General office building				35.0	17.5	47.5

1/15/2008 08:47:02 AM

Urbemis 2007 Version 9.2.2

Combined Winter Emissions Reports (Pounds/Day)

File Name: X:\Irvine\SAZ0702\office.urb9

Project Name: Office Development

Project Location: Yolo-Solano AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2008 TOTALS (lbs/day unmitigated)	10.30	53.19	36.21	0.01	16.04	3.29	19.33	3.36	3.03	6.38	4,992.92

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.28	0.47	0.39	0.00	0.00	0.00	560.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	8.50	14.91	104.60	0.06	11.45	2.30	5,742.39

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	8.78	15.38	104.99	0.06	11.45	2.30	6,302.39

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 2/1/2008-2/29/2008 Active Days: 21	3.36	28.07	14.90	0.00	16.00	1.42	17.42	3.34	1.30	4.64	2,349.56
Fine Grading 02/01/2008-03/31/2008	3.36	28.07	14.90	0.00	16.00	1.42	17.42	3.34	1.30	4.64	2,349.56
Fine Grading Dust	0.00	0.00	0.00	0.00	16.00	0.00	16.00	3.34	0.00	3.34	0.00
Fine Grading Off Road Diesel	3.31	28.00	13.56	0.00	0.00	1.41	1.41	0.00	1.30	1.30	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.34	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.24
Time Slice 3/3/2008-3/31/2008 Active Days: 21	7.36	**53.19**	**36.21**	**0.01**	**16.04**	**3.29**	**19.33**	**3.36**	**3.03**	**6.38**	**4,992.92**
Asphalt 03/01/2008-04/30/2008	2.36	13.59	9.56	0.00	0.01	1.16	1.17	0.00	1.07	1.07	1,179.70
Paving Off-Gas	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1/15/2008 08:47:02 AM

Paving Off Road Diesel	2.22	13.27	7.15	0.00	0.00	1.15	1.15	0.00	1.06	1.06	979.23
Paving On Road Diesel	0.01	0.19	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	21.55
Paving Worker Trips	0.07	0.13	2.34	0.00	0.01	0.01	0.01	0.00	0.00	0.01	178.93
Building 03/01/2008-11/30/2008	1.64	11.52	11.75	0.01	0.03	0.71	0.74	0.01	0.66	0.66	1,463.65
Building Off Road Diesel	1.39	10.47	5.09	0.00	0.00	0.67	0.67	0.00	0.61	0.61	893.39
Building Vendor Trips	0.07	0.72	0.67	0.00	0.00	0.03	0.04	0.00	0.03	0.03	112.22
Building Worker Trips	0.19	0.33	5.99	0.00	0.02	0.02	0.04	0.01	0.01	0.02	458.05
Fine Grading 02/01/2008-03/31/2008	3.36	28.07	14.90	0.00	16.00	1.42	17.42	3.34	1.30	4.64	2,349.56
Fine Grading Dust	0.00	0.00	0.00	0.00	16.00	0.00	16.00	3.34	0.00	3.34	0.00
Fine Grading Off Road Diesel	3.31	28.00	13.56	0.00	0.00	1.41	1.41	0.00	1.30	1.30	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.34	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.24
Time Slice 4/1/2008-4/30/2008 Active Days: 22	4.00	25.12	21.31	0.01	0.04	1.88	1.91	0.01	1.72	1.74	2,643.36
Asphalt 03/01/2008-04/30/2008	2.36	13.59	9.56	0.00	0.01	1.16	1.17	0.00	1.07	1.07	1,179.70
Paving Off-Gas	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.22	13.27	7.15	0.00	0.00	1.15	1.15	0.00	1.06	1.06	979.23
Paving On Road Diesel	0.01	0.19	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	21.55
Paving Worker Trips	0.07	0.13	2.34	0.00	0.01	0.01	0.01	0.00	0.00	0.01	178.93
Building 03/01/2008-11/30/2008	1.64	11.52	11.75	0.01	0.03	0.71	0.74	0.01	0.66	0.66	1,463.65
Building Off Road Diesel	1.39	10.47	5.09	0.00	0.00	0.67	0.67	0.00	0.61	0.61	893.39
Building Vendor Trips	0.07	0.72	0.67	0.00	0.00	0.03	0.04	0.00	0.03	0.03	112.22
Building Worker Trips	0.19	0.33	5.99	0.00	0.02	0.02	0.04	0.01	0.01	0.02	458.05
Time Slice 5/1/2008-8/7/2008 Active Days: 71	1.64	11.52	11.75	0.01	0.03	0.71	0.74	0.01	0.66	0.66	1,463.65
Building 03/01/2008-11/30/2008	1.64	11.52	11.75	0.01	0.03	0.71	0.74	0.01	0.66	0.66	1,463.65
Building Off Road Diesel	1.39	10.47	5.09	0.00	0.00	0.67	0.67	0.00	0.61	0.61	893.39
Building Vendor Trips	0.07	0.72	0.67	0.00	0.00	0.03	0.04	0.00	0.03	0.03	112.22
Building Worker Trips	0.19	0.33	5.99	0.00	0.02	0.02	0.04	0.01	0.01	0.02	458.05
Time Slice 8/8/2008-11/28/2008 Active Days: 81	**10.30**	11.54	11.97	0.01	0.03	0.72	0.74	0.01	0.66	0.67	1,480.86
Building 03/01/2008-11/30/2008	1.64	11.52	11.75	0.01	0.03	0.71	0.74	0.01	0.66	0.66	1,463.65
Building Off Road Diesel	1.39	10.47	5.09	0.00	0.00	0.67	0.67	0.00	0.61	0.61	893.39
Building Vendor Trips	0.07	0.72	0.67	0.00	0.00	0.03	0.04	0.00	0.03	0.03	112.22
Building Worker Trips	0.19	0.33	5.99	0.00	0.02	0.02	0.04	0.01	0.01	0.02	458.05
Coating 08/08/2008-12/31/2008	8.66	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.20
Architectural Coating	8.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Coating Worker Trips	0.01	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.20
Time Slice 12/1/2008-12/31/2008 Active Days: 23	8.66	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.20
Coating 08/08/2008-12/31/2008	8.66	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.20
Architectural Coating	8.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.20

Phase Assumptions

Phase: Fine Grading 2/1/2008 - 3/31/2008 - Default Fine Site Grading Description

Total Acres Disturbed: 3.21

Maximum Daily Acreage Disturbed: 0.8

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 3/1/2008 - 4/30/2008 - Default Paving Description

Acres to be Paved: 0.8

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 3/1/2008 - 11/30/2008 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 8/8/2008 - 12/31/2008 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 100

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 150

Area Source Unmitigated Detail Report:

1/15/2008 08:47:02 AM

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.03	0.47	0.39	0.00	0.00	0.00	560.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping - No Winter Emissions							
Consumer Products	0.00						
Architectural Coatings	0.25						
TOTALS (lbs/day, unmitigated)	0.28	0.47	0.39	0.00	0.00	0.00	560.00

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
General office building	8.50	14.91	104.60	0.06	11.45	2.30	5,742.39
TOTALS (lbs/day, unmitigated)	8.50	14.91	104.60	0.06	11.45	2.30	5,742.39

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
General office building		11.01	1000 sq ft	70.00	770.70	6,570.22
					770.70	6,570.22

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.0	2.0	97.6	0.4
Light Truck < 3750 lbs	10.9	3.7	90.8	5.5
Light Truck 3751-5750 lbs	21.7	0.9	98.6	0.5
Med Truck 5751-8500 lbs	9.5	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	75.0	25.0

1/15/2008 08:47:02 AM

Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	77.1	22.9	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	10.0	80.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	10.8	7.3	7.3
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	10.0	10.0
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

General office building	35.0	17.5	47.5

APPENDIX B – HEALTH RISK ASSESSMENT

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
1	GRID	0.71	4.33E-04	2.10E-05	610,839	4,268,514	10
2	GRID	0.863	5.27E-04	2.28E-05	610,939	4,268,514	10
3	GRID	1.01	6.18E-04	2.57E-05	611,039	4,268,514	10
4	GRID	1.17	7.13E-04	2.65E-05	611,139	4,268,514	10
5	GRID	1.3	7.96E-04	2.64E-05	611,239	4,268,514	10
6	GRID	1.44	8.80E-04	2.61E-05	611,339	4,268,514	10
7	GRID	1.6	9.77E-04	2.72E-05	611,439	4,268,514	10
8	GRID	1.66	1.01E-03	2.68E-05	611,539	4,268,514	10
9	GRID	1.71	1.05E-03	2.72E-05	611,639	4,268,514	10
10	GRID	1.77	1.08E-03	2.71E-05	611,739	4,268,514	10
11	GRID	1.8	1.10E-03	2.90E-05	611,839	4,268,514	10
12	GRID	1.81	1.10E-03	3.15E-05	611,939	4,268,514	10
13	GRID	1.69	1.03E-03	3.06E-05	612,039	4,268,514	10
14	GRID	1.6	9.75E-04	3.04E-05	612,139	4,268,514	10
15	GRID	1.48	9.04E-04	2.88E-05	612,239	4,268,514	10
16	GRID	1.34	8.15E-04	2.52E-05	612,339	4,268,514	10
17	GRID	1.21	7.41E-04	2.37E-05	612,439	4,268,514	10
18	GRID	1.14	6.99E-04	2.20E-05	612,539	4,268,514	10
19	GRID	1.07	6.56E-04	2.06E-05	612,639	4,268,514	10
20	GRID	0.981	5.99E-04	2.10E-05	612,739	4,268,514	10
21	GRID	0.884	5.40E-04	2.00E-05	612,839	4,268,514	10
22	GRID	0.769	4.69E-04	1.81E-05	612,939	4,268,514	10
23	GRID	0.673	4.11E-04	1.70E-05	613,039	4,268,514	10
24	GRID	0.59	3.60E-04	1.47E-05	613,139	4,268,514	10
25	GRID	0.518	3.16E-04	1.42E-05	613,239	4,268,514	10
26	GRID	0.656	4.01E-04	2.11E-05	610,839	4,268,414	10
27	GRID	0.82	5.01E-04	2.36E-05	610,939	4,268,414	10
28	GRID	1	6.11E-04	2.59E-05	611,039	4,268,414	10
29	GRID	1.18	7.22E-04	2.88E-05	611,139	4,268,414	10
30	GRID	1.38	8.42E-04	3.01E-05	611,239	4,268,414	10
31	GRID	1.54	9.42E-04	2.94E-05	611,339	4,268,414	10
32	GRID	1.74	1.06E-03	3.04E-05	611,439	4,268,414	10
33	GRID	1.91	1.17E-03	3.22E-05	611,539	4,268,414	10
34	GRID	1.99	1.21E-03	3.10E-05	611,639	4,268,414	10
35	GRID	2.06	1.26E-03	3.18E-05	611,739	4,268,414	10
36	GRID	2.11	1.29E-03	3.25E-05	611,839	4,268,414	10
37	GRID	2.12	1.30E-03	3.55E-05	611,939	4,268,414	10
38	GRID	2.01	1.23E-03	3.52E-05	612,039	4,268,414	10
39	GRID	1.9	1.16E-03	3.46E-05	612,139	4,268,414	10
40	GRID	1.74	1.06E-03	3.25E-05	612,239	4,268,414	10
41	GRID	1.57	9.59E-04	2.99E-05	612,339	4,268,414	10
42	GRID	1.42	8.64E-04	2.64E-05	612,439	4,268,414	10
43	GRID	1.33	8.09E-04	2.50E-05	612,539	4,268,414	10
44	GRID	1.21	7.38E-04	2.45E-05	612,639	4,268,414	10
45	GRID	1.09	6.64E-04	2.36E-05	612,739	4,268,414	10
46	GRID	0.945	5.77E-04	2.17E-05	612,839	4,268,414	10
47	GRID	0.814	4.97E-04	2.00E-05	612,939	4,268,414	10
48	GRID	0.702	4.29E-04	1.74E-05	613,039	4,268,414	10
49	GRID	0.603	3.69E-04	1.67E-05	613,139	4,268,414	10
50	GRID	0.512	3.13E-04	1.76E-05	613,239	4,268,414	10
51	GRID	0.643	3.92E-04	2.33E-05	610,839	4,268,314	10
52	GRID	0.761	4.64E-04	2.50E-05	610,939	4,268,314	10
53	GRID	0.962	5.87E-04	2.81E-05	611,039	4,268,314	10
54	GRID	1.18	7.19E-04	3.02E-05	611,139	4,268,314	10
55	GRID	1.41	8.61E-04	3.27E-05	611,239	4,268,314	10
56	GRID	1.65	1.01E-03	3.43E-05	611,339	4,268,314	10
57	GRID	1.88	1.15E-03	3.38E-05	611,439	4,268,314	10
58	GRID	2.14	1.31E-03	3.64E-05	611,539	4,268,314	10
59	GRID	2.34	1.43E-03	3.82E-05	611,639	4,268,314	10

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
60	GRID	2.46	1.50E-03	3.74E-05	611,739	4,268,314	10
61	GRID	2.54	1.55E-03	3.75E-05	611,839	4,268,314	10
62	GRID	2.54	1.55E-03	4.16E-05	611,939	4,268,314	10
63	GRID	2.45	1.49E-03	4.03E-05	612,039	4,268,314	10
64	GRID	2.29	1.40E-03	3.93E-05	612,139	4,268,314	10
65	GRID	2.1	1.29E-03	3.75E-05	612,239	4,268,314	10
66	GRID	1.88	1.15E-03	3.41E-05	612,339	4,268,314	10
67	GRID	1.68	1.02E-03	3.08E-05	612,439	4,268,314	10
68	GRID	1.55	9.44E-04	2.97E-05	612,539	4,268,314	10
69	GRID	1.37	8.36E-04	2.82E-05	612,639	4,268,314	10
70	GRID	1.2	7.30E-04	2.60E-05	612,739	4,268,314	10
71	GRID	1.01	6.19E-04	2.34E-05	612,839	4,268,314	10
72	GRID	0.853	5.21E-04	2.11E-05	612,939	4,268,314	10
73	GRID	0.715	4.37E-04	2.01E-05	613,039	4,268,314	10
74	GRID	0.595	3.63E-04	2.05E-05	613,139	4,268,314	10
75	GRID	0.479	2.92E-04	1.91E-05	613,239	4,268,314	10
76	GRID	0.63	3.85E-04	2.32E-05	610,839	4,268,214	10
77	GRID	0.741	4.53E-04	2.55E-05	610,939	4,268,214	10
78	GRID	0.895	5.46E-04	2.86E-05	611,039	4,268,214	10
79	GRID	1.15	7.02E-04	3.32E-05	611,139	4,268,214	10
80	GRID	1.42	8.65E-04	3.56E-05	611,239	4,268,214	10
81	GRID	1.72	1.05E-03	3.73E-05	611,339	4,268,214	10
82	GRID	2.03	1.24E-03	3.92E-05	611,439	4,268,214	10
83	GRID	2.39	1.46E-03	4.14E-05	611,539	4,268,214	10
84	GRID	2.7	1.65E-03	4.33E-05	611,639	4,268,214	10
85	GRID	2.99	1.82E-03	4.62E-05	611,739	4,268,214	10
86	GRID	3.1	1.90E-03	4.53E-05	611,839	4,268,214	10
87	GRID	3.13	1.91E-03	4.68E-05	611,939	4,268,214	10
88	GRID	3.03	1.85E-03	4.88E-05	612,039	4,268,214	10
89	GRID	2.84	1.74E-03	4.68E-05	612,139	4,268,214	10
90	GRID	2.61	1.60E-03	4.39E-05	612,239	4,268,214	10
91	GRID	2.31	1.41E-03	4.13E-05	612,339	4,268,214	10
92	GRID	2.01	1.23E-03	3.61E-05	612,439	4,268,214	10
93	GRID	1.81	1.10E-03	3.37E-05	612,539	4,268,214	10
94	GRID	1.56	9.54E-04	3.20E-05	612,639	4,268,214	10
95	GRID	1.31	8.01E-04	2.83E-05	612,739	4,268,214	10
96	GRID	1.07	6.54E-04	2.61E-05	612,839	4,268,214	10
97	GRID	0.869	5.31E-04	2.46E-05	612,939	4,268,214	10
98	GRID	0.703	4.29E-04	2.40E-05	613,039	4,268,214	10
99	GRID	0.55	3.36E-04	2.15E-05	613,139	4,268,214	10
100	GRID	0.442	2.70E-04	1.76E-05	613,239	4,268,214	10
101	GRID	0.587	3.59E-04	2.20E-05	610,839	4,268,114	10
102	GRID	0.707	4.32E-04	2.62E-05	610,939	4,268,114	10
103	GRID	0.859	5.25E-04	2.90E-05	611,039	4,268,114	10
104	GRID	1.07	6.53E-04	3.21E-05	611,139	4,268,114	10
105	GRID	1.41	8.59E-04	3.87E-05	611,239	4,268,114	10
106	GRID	1.77	1.08E-03	4.27E-05	611,339	4,268,114	10
107	GRID	2.17	1.32E-03	4.41E-05	611,439	4,268,114	10
108	GRID	2.62	1.60E-03	4.79E-05	611,539	4,268,114	10
109	GRID	3.1	1.89E-03	5.22E-05	611,639	4,268,114	10
110	GRID	3.56	2.17E-03	5.20E-05	611,739	4,268,114	10
111	GRID	3.9	2.38E-03	5.72E-05	611,839	4,268,114	10
112	GRID	3.95	2.41E-03	5.81E-05	611,939	4,268,114	10
113	GRID	3.88	2.37E-03	5.59E-05	612,039	4,268,114	10
114	GRID	3.67	2.24E-03	5.80E-05	612,139	4,268,114	10
115	GRID	3.36	2.05E-03	5.43E-05	612,239	4,268,114	10
116	GRID	2.91	1.78E-03	4.88E-05	612,339	4,268,114	10
117	GRID	2.47	1.51E-03	4.39E-05	612,439	4,268,114	10
118	GRID	2.13	1.30E-03	4.03E-05	612,539	4,268,114	10

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
119	GRID	1.78	1.09E-03	3.71E-05	612,639	4,268,114	10
120	GRID	1.4	8.58E-04	3.37E-05	612,739	4,268,114	10
121	GRID	1.09	6.69E-04	3.07E-05	612,839	4,268,114	10
122	GRID	0.851	5.20E-04	2.80E-05	612,939	4,268,114	10
123	GRID	0.642	3.92E-04	2.47E-05	613,039	4,268,114	10
124	GRID	0.501	3.06E-04	1.95E-05	613,139	4,268,114	10
125	GRID	0.398	2.43E-04	1.78E-05	613,239	4,268,114	10
126	GRID	0.557	3.40E-04	2.24E-05	610,839	4,268,014	10
127	GRID	0.655	4.00E-04	2.46E-05	610,939	4,268,014	10
128	GRID	0.795	4.86E-04	2.88E-05	611,039	4,268,014	10
129	GRID	0.999	6.10E-04	3.34E-05	611,139	4,268,014	10
130	GRID	1.3	7.95E-04	3.78E-05	611,239	4,268,014	10
131	GRID	1.78	1.08E-03	4.45E-05	611,339	4,268,014	10
132	GRID	2.29	1.40E-03	5.16E-05	611,439	4,268,014	10
133	GRID	2.86	1.74E-03	5.43E-05	611,539	4,268,014	10
134	GRID	3.53	2.16E-03	5.91E-05	611,639	4,268,014	10
135	GRID	4.24	2.59E-03	6.55E-05	611,739	4,268,014	10
136	GRID	4.89	2.99E-03	6.87E-05	611,839	4,268,014	10
137	GRID	5.2	3.17E-03	7.47E-05	611,939	4,268,014	10
138	GRID	5.17	3.16E-03	6.96E-05	612,039	4,268,014	10
139	GRID	4.94	3.02E-03	7.05E-05	612,139	4,268,014	10
140	GRID	4.48	2.74E-03	6.86E-05	612,239	4,268,014	10
141	GRID	3.77	2.30E-03	6.25E-05	612,339	4,268,014	10
142	GRID	3.12	1.90E-03	5.20E-05	612,439	4,268,014	10
143	GRID	2.56	1.56E-03	4.76E-05	612,539	4,268,014	10
144	GRID	1.96	1.20E-03	4.36E-05	612,639	4,268,014	10
145	GRID	1.45	8.83E-04	3.81E-05	612,739	4,268,014	10
146	GRID	1.06	6.49E-04	3.39E-05	612,839	4,268,014	10
147	GRID	0.765	4.67E-04	2.88E-05	612,939	4,268,014	10
148	GRID	0.574	3.51E-04	2.34E-05	613,039	4,268,014	10
149	GRID	0.443	2.71E-04	2.20E-05	613,139	4,268,014	10
150	GRID	0.356	2.17E-04	1.86E-05	613,239	4,268,014	10
151	GRID	0.489	2.99E-04	1.91E-05	610,839	4,267,914	10
152	GRID	0.604	3.69E-04	2.43E-05	610,939	4,267,914	10
153	GRID	0.738	4.51E-04	2.79E-05	611,039	4,267,914	10
154	GRID	0.915	5.59E-04	3.19E-05	611,139	4,267,914	10
155	GRID	1.19	7.24E-04	3.81E-05	611,239	4,267,914	10
156	GRID	1.62	9.91E-04	4.43E-05	611,339	4,267,914	10
157	GRID	2.32	1.42E-03	5.44E-05	611,439	4,267,914	10
158	GRID	3.12	1.90E-03	6.11E-05	611,539	4,267,914	10
159	GRID	4.06	2.48E-03	7.01E-05	611,639	4,267,914	10
160	GRID	5.07	3.10E-03	7.79E-05	611,739	4,267,914	10
161	GRID	6.14	3.75E-03	8.67E-05	611,839	4,267,914	10
162	GRID	6.89	4.21E-03	9.36E-05	611,939	4,267,914	10
163	GRID	7.25	4.43E-03	9.07E-05	612,039	4,267,914	10
164	GRID	7.02	4.28E-03	9.36E-05	612,139	4,267,914	10
165	GRID	6.29	3.84E-03	8.60E-05	612,239	4,267,914	10
166	GRID	5.14	3.14E-03	8.07E-05	612,339	4,267,914	10
167	GRID	3.99	2.44E-03	6.38E-05	612,439	4,267,914	10
168	GRID	2.99	1.82E-03	5.83E-05	612,539	4,267,914	10
169	GRID	2.05	1.25E-03	4.93E-05	612,639	4,267,914	10
170	GRID	1.39	8.47E-04	4.25E-05	612,739	4,267,914	10
171	GRID	0.933	5.70E-04	3.47E-05	612,839	4,267,914	10
172	GRID	0.666	4.07E-04	3.03E-05	612,939	4,267,914	10
173	GRID	0.503	3.07E-04	2.44E-05	613,039	4,267,914	10
174	GRID	0.407	2.48E-04	1.77E-05	613,139	4,267,914	10
175	GRID	0.351	2.14E-04	1.59E-05	613,239	4,267,914	10
176	GRID	0.391	2.39E-04	1.78E-05	610,839	4,267,814	10
177	GRID	0.492	3.00E-04	2.07E-05	610,939	4,267,814	10

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
178	GRID	0.634	3.87E-04	2.49E-05	611,039	4,267,814	10
179	GRID	0.819	5.00E-04	3.15E-05	611,139	4,267,814	10
180	GRID	1.06	6.47E-04	3.57E-05	611,239	4,267,814	10
181	GRID	1.44	8.81E-04	4.47E-05	611,339	4,267,814	10
182	GRID	2.13	1.30E-03	5.43E-05	611,439	4,267,814	10
183	GRID	3.22	1.97E-03	6.76E-05	611,539	4,267,814	10
184	GRID	4.54	2.77E-03	7.83E-05	611,639	4,267,814	10
185	GRID	6.16	3.76E-03	9.08E-05	611,739	4,267,814	10
186	GRID	7.88	4.81E-03	1.06E-04	611,839	4,267,814	10
187	GRID	9.3	5.68E-03	1.24E-04	611,939	4,267,814	10
188	GRID	10.4	6.38E-03	1.22E-04	612,039	4,267,814	10
189	GRID	10.9	6.63E-03	1.28E-04	612,139	4,267,814	10
190	GRID	9.61	5.87E-03	1.16E-04	612,239	4,267,814	10
191	GRID	7.46	4.56E-03	1.08E-04	612,339	4,267,814	10
192	GRID	5.21	3.18E-03	8.62E-05	612,439	4,267,814	10
193	GRID	3.25	1.99E-03	6.74E-05	612,539	4,267,814	10
194	GRID	1.92	1.17E-03	5.84E-05	612,639	4,267,814	10
195	GRID	1.17	7.16E-04	4.59E-05	612,739	4,267,814	10
196	GRID	0.796	4.86E-04	3.46E-05	612,839	4,267,814	10
197	GRID	0.609	3.72E-04	2.51E-05	612,939	4,267,814	10
198	GRID	0.509	3.11E-04	2.60E-05	613,039	4,267,814	10
199	GRID	0.431	2.63E-04	3.14E-05	613,139	4,267,814	10
200	GRID	0.352	2.15E-04	2.90E-05	613,239	4,267,814	10
201	GRID	0.331	2.02E-04	1.73E-05	610,839	4,267,714	10
202	GRID	0.4	2.45E-04	1.92E-05	610,939	4,267,714	10
203	GRID	0.498	3.04E-04	2.22E-05	611,039	4,267,714	10
204	GRID	0.654	3.99E-04	2.63E-05	611,139	4,267,714	10
205	GRID	0.897	5.48E-04	3.40E-05	611,239	4,267,714	10
206	GRID	1.24	7.58E-04	4.35E-05	611,339	4,267,714	10
207	GRID	1.8	1.10E-03	5.44E-05	611,439	4,267,714	10
208	GRID	2.96	1.81E-03	6.94E-05	611,539	4,267,714	10
209	GRID	4.88	2.98E-03	8.77E-05	611,639	4,267,714	10
210	GRID	7.4	4.52E-03	1.07E-04	611,739	4,267,714	10
211	GRID	10.4	6.37E-03	1.32E-04	611,839	4,267,714	10
212	GRID	13.1	8.01E-03	1.56E-04	611,939	4,267,714	10
213	GRID	15.8	9.66E-03	1.73E-04	612,039	4,267,714	10
214	GRID	17.5	1.07E-02	1.72E-04	612,139	4,267,714	10
215	GRID	17.5	1.07E-02	1.71E-04	612,239	4,267,714	10
216	GRID	12.1	7.39E-03	1.44E-04	612,339	4,267,714	10
217	GRID	6.54	3.99E-03	1.07E-04	612,439	4,267,714	10
218	GRID	2.96	1.81E-03	8.57E-05	612,539	4,267,714	10
219	GRID	1.57	9.56E-04	5.82E-05	612,639	4,267,714	10
220	GRID	1.05	6.44E-04	4.79E-05	612,739	4,267,714	10
221	GRID	0.791	4.83E-04	5.57E-05	612,839	4,267,714	10
222	GRID	0.569	3.48E-04	4.42E-05	612,939	4,267,714	10
223	GRID	0.396	2.42E-04	3.53E-05	613,039	4,267,714	10
224	GRID	0.289	1.77E-04	2.58E-05	613,139	4,267,714	10
225	GRID	0.232	1.41E-04	1.84E-05	613,239	4,267,714	10
226	GRID	0.265	1.62E-04	1.70E-05	610,839	4,267,614	10
227	GRID	0.315	1.92E-04	1.91E-05	610,939	4,267,614	10
228	GRID	0.389	2.37E-04	2.20E-05	611,039	4,267,614	10
229	GRID	0.497	3.04E-04	2.59E-05	611,139	4,267,614	10
230	GRID	0.659	4.02E-04	3.07E-05	611,239	4,267,614	10
231	GRID	0.94	5.74E-04	3.82E-05	611,339	4,267,614	10
232	GRID	1.45	8.83E-04	5.25E-05	611,439	4,267,614	10
233	GRID	2.36	1.44E-03	6.81E-05	611,539	4,267,614	10
234	GRID	4.6	2.81E-03	9.45E-05	611,639	4,267,614	10
235	GRID	8.93	5.46E-03	1.27E-04	611,739	4,267,614	10
236	GRID	14.7	9.00E-03	1.70E-04	611,839	4,267,614	10

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
237	GRID	20.3	1.24E-02	2.10E-04	611,939	4,267,614	10
238	GRID	26.3	1.60E-02	2.46E-04	612,039	4,267,614	10
239	GRID	31.8	1.94E-02	2.52E-04	612,139	4,267,614	10
240	GRID	38.5	2.35E-02	2.64E-04	612,239	4,267,614	10
241	GRID	29.2	1.78E-02	2.20E-04	612,339	4,267,614	10
242	GRID	5.96	3.64E-03	1.56E-04	612,439	4,267,614	10
243	GRID	2.39	1.46E-03	1.39E-04	612,539	4,267,614	10
244	GRID	1.24	7.57E-04	8.76E-05	612,639	4,267,614	10
245	GRID	0.782	4.77E-04	5.33E-05	612,739	4,267,614	10
246	GRID	0.601	3.67E-04	4.35E-05	612,839	4,267,614	10
247	GRID	0.504	3.08E-04	4.13E-05	612,939	4,267,614	10
248	GRID	0.438	2.68E-04	4.01E-05	613,039	4,267,614	10
249	GRID	0.387	2.36E-04	3.82E-05	613,139	4,267,614	10
250	GRID	0.345	2.10E-04	3.59E-05	613,239	4,267,614	10
251	GRID	0.19	1.16E-04	1.51E-05	610,839	4,267,514	10
252	GRID	0.228	1.39E-04	1.73E-05	610,939	4,267,514	10
253	GRID	0.278	1.70E-04	1.97E-05	611,039	4,267,514	10
254	GRID	0.347	2.12E-04	2.29E-05	611,139	4,267,514	10
255	GRID	0.447	2.73E-04	2.76E-05	611,239	4,267,514	10
256	GRID	0.607	3.71E-04	3.38E-05	611,339	4,267,514	10
257	GRID	0.895	5.47E-04	4.43E-05	611,439	4,267,514	10
258	GRID	1.52	9.27E-04	5.83E-05	611,539	4,267,514	10
259	GRID	3.1	1.89E-03	8.58E-05	611,639	4,267,514	10
260	GRID	9.17	5.60E-03	1.33E-04	611,739	4,267,514	10
261	GRID	24.5	1.50E-02	2.27E-04	611,839	4,267,514	10
262	GRID	38.6	2.36E-02	2.63E-04	611,939	4,267,514	10
263	GRID	60.1	3.67E-02	3.37E-04	612,039	4,267,514	10
264	GRID	52.2	3.19E-02	3.49E-04	612,139	4,267,514	10
265	GRID	51.1	3.12E-02	5.45E-04	612,239	4,267,514	10
266	GRID	16.9	1.03E-02	2.31E-04	612,339	4,267,514	10
267	GRID	4.89	2.99E-03	1.41E-04	612,439	4,267,514	10
268	GRID	2.16	1.32E-03	1.01E-04	612,539	4,267,514	10
269	GRID	1.36	8.33E-04	7.80E-05	612,639	4,267,514	10
270	GRID	0.964	5.89E-04	6.15E-05	612,739	4,267,514	10
271	GRID	0.725	4.43E-04	4.96E-05	612,839	4,267,514	10
272	GRID	0.568	3.47E-04	4.03E-05	612,939	4,267,514	10
273	GRID	0.459	2.80E-04	3.29E-05	613,039	4,267,514	10
274	GRID	0.38	2.32E-04	2.73E-05	613,139	4,267,514	10
275	GRID	0.321	1.96E-04	2.31E-05	613,239	4,267,514	10
276	GRID	0.152	9.29E-05	1.55E-05	610,839	4,267,414	10
277	GRID	0.179	1.10E-04	1.78E-05	610,939	4,267,414	10
278	GRID	0.216	1.32E-04	2.05E-05	611,039	4,267,414	10
279	GRID	0.265	1.62E-04	2.39E-05	611,139	4,267,414	10
280	GRID	0.335	2.05E-04	2.83E-05	611,239	4,267,414	10
281	GRID	0.44	2.68E-04	3.46E-05	611,339	4,267,414	10
282	GRID	0.605	3.69E-04	4.40E-05	611,439	4,267,414	10
283	GRID	0.894	5.46E-04	5.80E-05	611,539	4,267,414	10
284	GRID	1.52	9.27E-04	8.17E-05	611,639	4,267,414	10
285	GRID	4.13	2.52E-03	1.24E-04	611,739	4,267,414	10
286	GRID	45.9	2.80E-02	2.70E-04	611,839	4,267,414	10
287	GRID	24.1	1.47E-02	3.36E-04	611,939	4,267,414	10
288	GRID	19.4	1.18E-02	2.81E-04	612,039	4,267,414	10
289	GRID	13.6	8.31E-03	2.33E-04	612,139	4,267,414	10
290	GRID	10.4	6.36E-03	1.79E-04	612,239	4,267,414	10
291	GRID	7.7	4.70E-03	1.31E-04	612,339	4,267,414	10
292	GRID	4.46	2.72E-03	9.71E-05	612,439	4,267,414	10
293	GRID	2.31	1.41E-03	7.11E-05	612,539	4,267,414	10
294	GRID	1.34	8.17E-04	5.52E-05	612,639	4,267,414	10
295	GRID	0.892	5.45E-04	3.98E-05	612,739	4,267,414	10

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
296	GRID	0.663	4.05E-04	3.41E-05	612,839	4,267,414	10
297	GRID	0.52	3.18E-04	2.91E-05	612,939	4,267,414	10
298	GRID	0.422	2.58E-04	2.46E-05	613,039	4,267,414	10
299	GRID	0.35	2.14E-04	2.14E-05	613,139	4,267,414	10
300	GRID	0.296	1.81E-04	1.87E-05	613,239	4,267,414	10
301	GRID	0.19	1.16E-04	1.82E-05	610,839	4,267,314	10
302	GRID	0.22	1.34E-04	2.03E-05	610,939	4,267,314	10
303	GRID	0.254	1.55E-04	2.24E-05	611,039	4,267,314	10
304	GRID	0.295	1.80E-04	2.52E-05	611,139	4,267,314	10
305	GRID	0.343	2.09E-04	2.97E-05	611,239	4,267,314	10
306	GRID	0.406	2.48E-04	3.57E-05	611,339	4,267,314	10
307	GRID	0.512	3.13E-04	4.47E-05	611,439	4,267,314	10
308	GRID	0.751	4.58E-04	4.96E-05	611,539	4,267,314	10
309	GRID	1.3	7.97E-04	8.28E-05	611,639	4,267,314	10
310	GRID	2.13	1.30E-03	1.29E-04	611,739	4,267,314	10
311	GRID	5.63	3.44E-03	1.66E-04	611,839	4,267,314	10
312	GRID	7.91	4.83E-03	1.89E-04	611,939	4,267,314	10
313	GRID	7.65	4.67E-03	1.75E-04	612,039	4,267,314	10
314	GRID	6.7	4.09E-03	1.60E-04	612,139	4,267,314	10
315	GRID	5.77	3.52E-03	1.32E-04	612,239	4,267,314	10
316	GRID	4.72	2.88E-03	1.06E-04	612,339	4,267,314	10
317	GRID	3.49	2.13E-03	8.55E-05	612,439	4,267,314	10
318	GRID	2.24	1.37E-03	6.52E-05	612,539	4,267,314	10
319	GRID	1.47	8.97E-04	5.12E-05	612,639	4,267,314	10
320	GRID	0.99	6.05E-04	4.36E-05	612,739	4,267,314	10
321	GRID	0.693	4.23E-04	3.57E-05	612,839	4,267,314	10
322	GRID	0.523	3.19E-04	2.79E-05	612,939	4,267,314	10
323	GRID	0.421	2.57E-04	2.42E-05	613,039	4,267,314	10
324	GRID	0.35	2.13E-04	2.19E-05	613,139	4,267,314	10
325	GRID	0.298	1.82E-04	1.95E-05	613,239	4,267,314	10
326	GRID	0.154	9.43E-05	1.71E-05	610,839	4,267,214	10
327	GRID	0.167	1.02E-04	1.96E-05	610,939	4,267,214	10
328	GRID	0.19	1.16E-04	2.21E-05	611,039	4,267,214	10
329	GRID	0.233	1.42E-04	2.18E-05	611,139	4,267,214	10
330	GRID	0.312	1.90E-04	2.89E-05	611,239	4,267,214	10
331	GRID	0.426	2.60E-04	3.37E-05	611,339	4,267,214	10
332	GRID	0.564	3.44E-04	4.35E-05	611,439	4,267,214	10
333	GRID	0.744	4.54E-04	6.66E-05	611,539	4,267,214	10
334	GRID	0.916	5.60E-04	7.75E-05	611,639	4,267,214	10
335	GRID	1.35	8.22E-04	9.18E-05	611,739	4,267,214	10
336	GRID	2.17	1.33E-03	1.07E-04	611,839	4,267,214	10
337	GRID	3.56	2.17E-03	1.21E-04	611,939	4,267,214	10
338	GRID	4.01	2.45E-03	1.12E-04	612,039	4,267,214	10
339	GRID	4.13	2.52E-03	1.07E-04	612,139	4,267,214	10
340	GRID	3.71	2.27E-03	9.78E-05	612,239	4,267,214	10
341	GRID	3.28	2.00E-03	7.95E-05	612,339	4,267,214	10
342	GRID	2.73	1.67E-03	7.16E-05	612,439	4,267,214	10
343	GRID	2.01	1.23E-03	5.69E-05	612,539	4,267,214	10
344	GRID	1.43	8.72E-04	4.71E-05	612,639	4,267,214	10
345	GRID	1.04	6.36E-04	3.90E-05	612,739	4,267,214	10
346	GRID	0.769	4.70E-04	3.43E-05	612,839	4,267,214	10
347	GRID	0.573	3.50E-04	3.05E-05	612,939	4,267,214	10
348	GRID	0.439	2.68E-04	2.53E-05	613,039	4,267,214	10
349	GRID	0.354	2.16E-04	2.08E-05	613,139	4,267,214	10
350	GRID	0.299	1.82E-04	1.87E-05	613,239	4,267,214	10
351	GRID	0.145	8.88E-05	1.35E-05	610,839	4,267,114	10
352	GRID	0.183	1.12E-04	1.93E-05	610,939	4,267,114	10
353	GRID	0.227	1.38E-04	1.99E-05	611,039	4,267,114	10
354	GRID	0.267	1.63E-04	2.37E-05	611,139	4,267,114	10

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
355	GRID	0.33	2.01E-04	2.76E-05	611,239	4,267,114	10
356	GRID	0.42	2.56E-04	4.30E-05	611,339	4,267,114	10
357	GRID	0.447	2.73E-04	4.69E-05	611,439	4,267,114	10
358	GRID	0.525	3.21E-04	5.00E-05	611,539	4,267,114	10
359	GRID	0.631	3.86E-04	5.50E-05	611,639	4,267,114	10
360	GRID	0.991	6.05E-04	6.91E-05	611,739	4,267,114	10
361	GRID	1.33	8.12E-04	8.58E-05	611,839	4,267,114	10
362	GRID	1.94	1.19E-03	8.48E-05	611,939	4,267,114	10
363	GRID	2.46	1.50E-03	8.78E-05	612,039	4,267,114	10
364	GRID	2.59	1.58E-03	8.33E-05	612,139	4,267,114	10
365	GRID	2.55	1.56E-03	7.05E-05	612,239	4,267,114	10
366	GRID	2.41	1.47E-03	6.30E-05	612,339	4,267,114	10
367	GRID	2.14	1.31E-03	6.08E-05	612,439	4,267,114	10
368	GRID	1.75	1.07E-03	5.41E-05	612,539	4,267,114	10
369	GRID	1.34	8.17E-04	4.35E-05	612,639	4,267,114	10
370	GRID	1.02	6.22E-04	3.67E-05	612,739	4,267,114	10
371	GRID	0.793	4.84E-04	3.05E-05	612,839	4,267,114	10
372	GRID	0.621	3.79E-04	2.68E-05	612,939	4,267,114	10
373	GRID	0.485	2.96E-04	2.46E-05	613,039	4,267,114	10
374	GRID	0.384	2.34E-04	2.29E-05	613,139	4,267,114	10
375	GRID	0.309	1.88E-04	1.95E-05	613,239	4,267,114	10
376	GRID	0.166	1.02E-04	1.63E-05	610,839	4,267,014	10
377	GRID	0.186	1.14E-04	1.62E-05	610,939	4,267,014	10
378	GRID	0.225	1.37E-04	1.99E-05	611,039	4,267,014	10
379	GRID	0.277	1.69E-04	3.02E-05	611,139	4,267,014	10
380	GRID	0.297	1.81E-04	3.45E-05	611,239	4,267,014	10
381	GRID	0.296	1.81E-04	3.22E-05	611,339	4,267,014	10
382	GRID	0.342	2.09E-04	3.34E-05	611,439	4,267,014	10
383	GRID	0.398	2.43E-04	4.00E-05	611,539	4,267,014	10
384	GRID	0.557	3.40E-04	4.68E-05	611,639	4,267,014	10
385	GRID	0.74	4.52E-04	5.63E-05	611,739	4,267,014	10
386	GRID	0.921	5.62E-04	6.24E-05	611,839	4,267,014	10
387	GRID	1.24	7.58E-04	6.12E-05	611,939	4,267,014	10
388	GRID	1.6	9.77E-04	6.36E-05	612,039	4,267,014	10
389	GRID	1.77	1.08E-03	6.10E-05	612,139	4,267,014	10
390	GRID	1.8	1.10E-03	5.79E-05	612,239	4,267,014	10
391	GRID	1.78	1.09E-03	5.20E-05	612,339	4,267,014	10
392	GRID	1.68	1.02E-03	4.71E-05	612,439	4,267,014	10
393	GRID	1.48	9.03E-04	4.49E-05	612,539	4,267,014	10
394	GRID	1.21	7.40E-04	3.83E-05	612,639	4,267,014	10
395	GRID	0.972	5.94E-04	3.42E-05	612,739	4,267,014	10
396	GRID	0.779	4.76E-04	3.02E-05	612,839	4,267,014	10
397	GRID	0.636	3.88E-04	2.54E-05	612,939	4,267,014	10
398	GRID	0.52	3.18E-04	2.29E-05	613,039	4,267,014	10
399	GRID	0.422	2.58E-04	2.10E-05	613,139	4,267,014	10
400	GRID	0.344	2.10E-04	1.92E-05	613,239	4,267,014	10
401	GRID	0.167	1.02E-04	1.56E-05	610,839	4,266,914	10
402	GRID	0.201	1.22E-04	2.26E-05	610,939	4,266,914	10
403	GRID	0.22	1.35E-04	2.74E-05	611,039	4,266,914	10
404	GRID	0.208	1.27E-04	2.48E-05	611,139	4,266,914	10
405	GRID	0.209	1.28E-04	2.37E-05	611,239	4,266,914	10
406	GRID	0.247	1.51E-04	2.47E-05	611,339	4,266,914	10
407	GRID	0.288	1.76E-04	3.07E-05	611,439	4,266,914	10
408	GRID	0.357	2.18E-04	3.60E-05	611,539	4,266,914	10
409	GRID	0.481	2.94E-04	4.13E-05	611,639	4,266,914	10
410	GRID	0.579	3.53E-04	4.60E-05	611,739	4,266,914	10
411	GRID	0.7	4.28E-04	4.81E-05	611,839	4,266,914	10
412	GRID	0.894	5.46E-04	4.91E-05	611,939	4,266,914	10
413	GRID	1.1	6.69E-04	4.83E-05	612,039	4,266,914	10

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
414	GRID	1.25	7.62E-04	5.04E-05	612,139	4,266,914	10
415	GRID	1.34	8.18E-04	4.55E-05	612,239	4,266,914	10
416	GRID	1.35	8.27E-04	4.45E-05	612,339	4,266,914	10
417	GRID	1.32	8.04E-04	4.10E-05	612,439	4,266,914	10
418	GRID	1.21	7.40E-04	3.78E-05	612,539	4,266,914	10
419	GRID	1.06	6.47E-04	3.41E-05	612,639	4,266,914	10
420	GRID	0.896	5.47E-04	3.07E-05	612,739	4,266,914	10
421	GRID	0.748	4.57E-04	2.81E-05	612,839	4,266,914	10
422	GRID	0.624	3.81E-04	2.54E-05	612,939	4,266,914	10
423	GRID	0.526	3.21E-04	2.17E-05	613,039	4,266,914	10
424	GRID	0.445	2.72E-04	2.00E-05	613,139	4,266,914	10
425	GRID	0.374	2.28E-04	1.85E-05	613,239	4,266,914	10
426	GRID	0.171	1.04E-04	2.17E-05	610,839	4,266,814	10
427	GRID	0.166	1.01E-04	2.09E-05	610,939	4,266,814	10
428	GRID	0.151	9.23E-05	1.79E-05	611,039	4,266,814	10
429	GRID	0.159	9.71E-05	1.79E-05	611,139	4,266,814	10
430	GRID	0.195	1.19E-04	2.05E-05	611,239	4,266,814	10
431	GRID	0.223	1.36E-04	2.43E-05	611,339	4,266,814	10
432	GRID	0.251	1.53E-04	2.76E-05	611,439	4,266,814	10
433	GRID	0.32	1.96E-04	3.01E-05	611,539	4,266,814	10
434	GRID	0.409	2.50E-04	3.44E-05	611,639	4,266,814	10
435	GRID	0.476	2.91E-04	4.03E-05	611,739	4,266,814	10
436	GRID	0.559	3.41E-04	3.87E-05	611,839	4,266,814	10
437	GRID	0.671	4.10E-04	3.96E-05	611,939	4,266,814	10
438	GRID	0.789	4.82E-04	3.78E-05	612,039	4,266,814	10
439	GRID	0.913	5.58E-04	3.98E-05	612,139	4,266,814	10
440	GRID	1.02	6.21E-04	3.85E-05	612,239	4,266,814	10
441	GRID	1.06	6.48E-04	3.56E-05	612,339	4,266,814	10
442	GRID	1.06	6.45E-04	3.47E-05	612,439	4,266,814	10
443	GRID	0.997	6.09E-04	3.43E-05	612,539	4,266,814	10
444	GRID	0.915	5.59E-04	3.21E-05	612,639	4,266,814	10
445	GRID	0.794	4.85E-04	2.68E-05	612,739	4,266,814	10
446	GRID	0.69	4.22E-04	2.47E-05	612,839	4,266,814	10
447	GRID	0.595	3.63E-04	2.26E-05	612,939	4,266,814	10
448	GRID	0.517	3.15E-04	2.14E-05	613,039	4,266,814	10
449	GRID	0.447	2.73E-04	1.86E-05	613,139	4,266,814	10
450	GRID	0.386	2.36E-04	1.73E-05	613,239	4,266,814	10
451	GRID	0.123	7.53E-05	1.53E-05	610,839	4,266,714	10
452	GRID	0.115	7.04E-05	1.36E-05	610,939	4,266,714	10
453	GRID	0.13	7.94E-05	1.47E-05	611,039	4,266,714	10
454	GRID	0.161	9.83E-05	1.78E-05	611,139	4,266,714	10
455	GRID	0.18	1.10E-04	1.99E-05	611,239	4,266,714	10
456	GRID	0.196	1.20E-04	2.27E-05	611,339	4,266,714	10
457	GRID	0.228	1.39E-04	2.44E-05	611,439	4,266,714	10
458	GRID	0.285	1.74E-04	2.64E-05	611,539	4,266,714	10
459	GRID	0.356	2.17E-04	3.02E-05	611,639	4,266,714	10
460	GRID	0.401	2.45E-04	3.14E-05	611,739	4,266,714	10
461	GRID	0.461	2.81E-04	3.40E-05	611,839	4,266,714	10
462	GRID	0.517	3.16E-04	3.21E-05	611,939	4,266,714	10
463	GRID	0.595	3.63E-04	3.21E-05	612,039	4,266,714	10
464	GRID	0.694	4.24E-04	3.24E-05	612,139	4,266,714	10
465	GRID	0.788	4.81E-04	2.96E-05	612,239	4,266,714	10
466	GRID	0.847	5.17E-04	3.07E-05	612,339	4,266,714	10
467	GRID	0.865	5.28E-04	2.96E-05	612,439	4,266,714	10
468	GRID	0.834	5.09E-04	2.97E-05	612,539	4,266,714	10
469	GRID	0.784	4.79E-04	2.85E-05	612,639	4,266,714	10
470	GRID	0.703	4.30E-04	2.52E-05	612,739	4,266,714	10
471	GRID	0.624	3.81E-04	2.26E-05	612,839	4,266,714	10
472	GRID	0.552	3.37E-04	2.06E-05	612,939	4,266,714	10

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
473	GRID	0.485	2.96E-04	1.86E-05	613,039	4,266,714	10
474	GRID	0.434	2.65E-04	1.79E-05	613,139	4,266,714	10
475	GRID	0.386	2.36E-04	1.63E-05	613,239	4,266,714	10
476	GRID	0.0935	5.71E-05	1.09E-05	610,839	4,266,614	10
477	GRID	0.112	6.82E-05	1.32E-05	610,939	4,266,614	10
478	GRID	0.137	8.37E-05	1.53E-05	611,039	4,266,614	10
479	GRID	0.151	9.21E-05	1.65E-05	611,139	4,266,614	10
480	GRID	0.159	9.72E-05	1.89E-05	611,239	4,266,614	10
481	GRID	0.169	1.03E-04	1.99E-05	611,339	4,266,614	10
482	GRID	0.211	1.29E-04	2.18E-05	611,439	4,266,614	10
483	GRID	0.265	1.62E-04	2.45E-05	611,539	4,266,614	10
484	GRID	0.312	1.91E-04	2.53E-05	611,639	4,266,614	10
485	GRID	0.347	2.12E-04	2.71E-05	611,739	4,266,614	10
486	GRID	0.379	2.31E-04	2.83E-05	611,839	4,266,614	10
487	GRID	0.414	2.53E-04	2.83E-05	611,939	4,266,614	10
488	GRID	0.466	2.85E-04	2.61E-05	612,039	4,266,614	10
489	GRID	0.539	3.29E-04	2.64E-05	612,139	4,266,614	10
490	GRID	0.628	3.83E-04	2.62E-05	612,239	4,266,614	10
491	GRID	0.68	4.15E-04	2.59E-05	612,339	4,266,614	10
492	GRID	0.716	4.37E-04	2.55E-05	612,439	4,266,614	10
493	GRID	0.707	4.32E-04	2.53E-05	612,539	4,266,614	10
494	GRID	0.677	4.14E-04	2.55E-05	612,639	4,266,614	10
495	GRID	0.629	3.84E-04	2.42E-05	612,739	4,266,614	10
496	GRID	0.562	3.43E-04	2.09E-05	612,839	4,266,614	10
497	GRID	0.507	3.10E-04	1.98E-05	612,939	4,266,614	10
498	GRID	0.454	2.77E-04	1.77E-05	613,039	4,266,614	10
499	GRID	0.405	2.47E-04	1.57E-05	613,139	4,266,614	10
500	GRID	0.368	2.25E-04	1.48E-05	613,239	4,266,614	10
501	GRID	0.0986	6.02E-05	1.18E-05	610,839	4,266,514	10
502	GRID	0.119	7.24E-05	1.35E-05	610,939	4,266,514	10
503	GRID	0.129	7.86E-05	1.42E-05	611,039	4,266,514	10
504	GRID	0.133	8.10E-05	1.59E-05	611,139	4,266,514	10
505	GRID	0.135	8.26E-05	1.67E-05	611,239	4,266,514	10
506	GRID	0.159	9.74E-05	1.83E-05	611,339	4,266,514	10
507	GRID	0.198	1.21E-04	1.96E-05	611,439	4,266,514	10
508	GRID	0.248	1.52E-04	2.15E-05	611,539	4,266,514	10
509	GRID	0.276	1.69E-04	2.20E-05	611,639	4,266,514	10
510	GRID	0.301	1.84E-04	2.46E-05	611,739	4,266,514	10
511	GRID	0.316	1.93E-04	2.47E-05	611,839	4,266,514	10
512	GRID	0.34	2.07E-04	2.55E-05	611,939	4,266,514	10
513	GRID	0.377	2.30E-04	2.24E-05	612,039	4,266,514	10
514	GRID	0.431	2.63E-04	2.30E-05	612,139	4,266,514	10
515	GRID	0.507	3.10E-04	2.17E-05	612,239	4,266,514	10
516	GRID	0.557	3.40E-04	2.19E-05	612,339	4,266,514	10
517	GRID	0.596	3.64E-04	2.22E-05	612,439	4,266,514	10
518	GRID	0.608	3.71E-04	2.18E-05	612,539	4,266,514	10
519	GRID	0.59	3.60E-04	2.21E-05	612,639	4,266,514	10
520	GRID	0.563	3.44E-04	2.26E-05	612,739	4,266,514	10
521	GRID	0.512	3.13E-04	1.98E-05	612,839	4,266,514	10
522	GRID	0.463	2.82E-04	1.78E-05	612,939	4,266,514	10
523	GRID	0.422	2.57E-04	1.72E-05	613,039	4,266,514	10
524	GRID	0.38	2.32E-04	1.54E-05	613,139	4,266,514	10
525	GRID	0.344	2.10E-04	1.40E-05	613,239	4,266,514	10
526	GRID	0.104	6.35E-05	1.20E-05	610,839	4,266,414	10
527	GRID	0.112	6.81E-05	1.22E-05	610,939	4,266,414	10
528	GRID	0.113	6.88E-05	1.35E-05	611,039	4,266,414	10
529	GRID	0.113	6.93E-05	1.47E-05	611,139	4,266,414	10
530	GRID	0.124	7.55E-05	1.53E-05	611,239	4,266,414	10
531	GRID	0.156	9.51E-05	1.70E-05	611,339	4,266,414	10

HARP Modeling Results

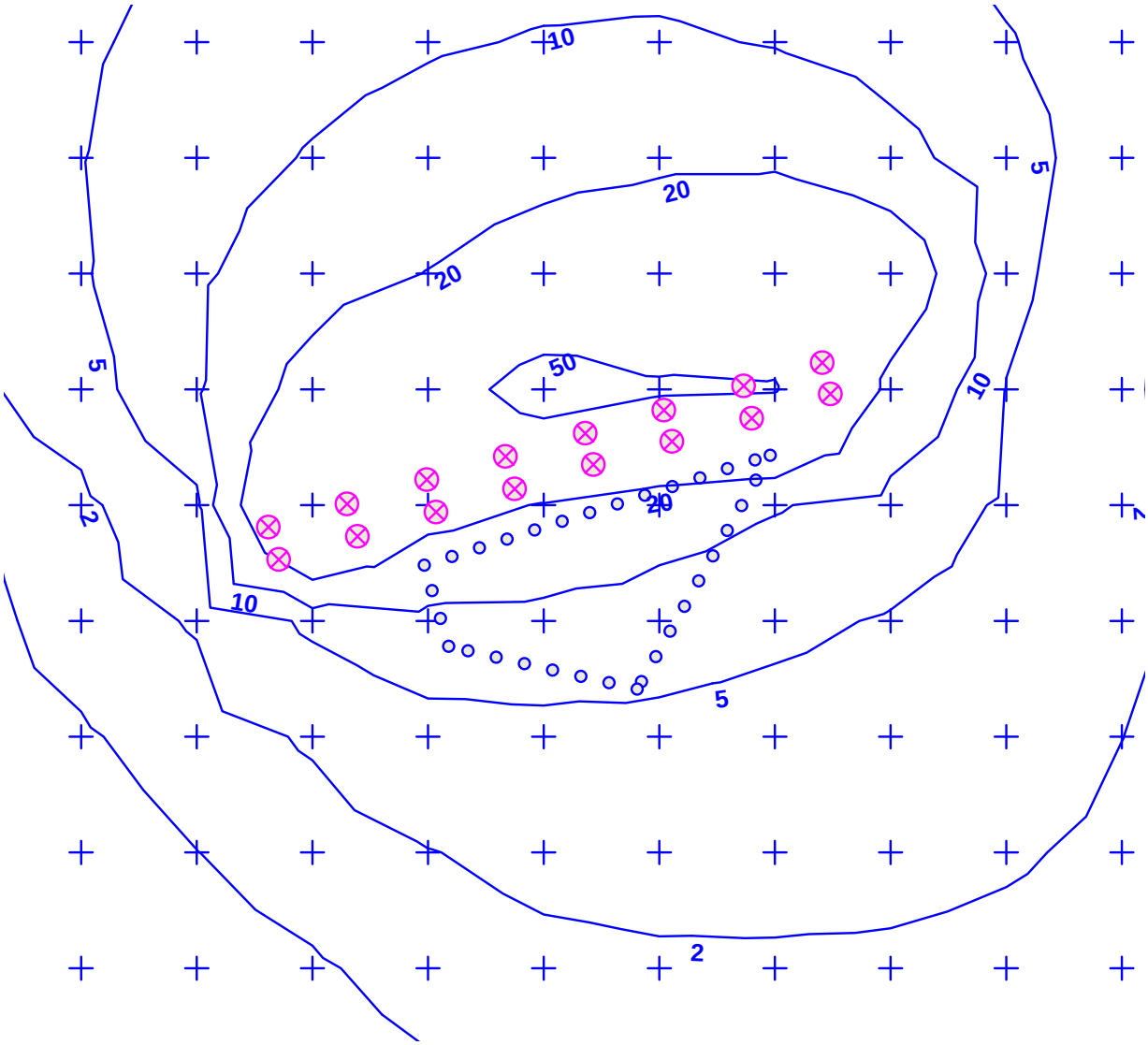
Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
532	GRID	0.191	1.17E-04	1.76E-05	611,439	4,266,414	10
533	GRID	0.229	1.40E-04	1.87E-05	611,539	4,266,414	10
534	GRID	0.248	1.51E-04	2.00E-05	611,639	4,266,414	10
535	GRID	0.258	1.58E-04	2.17E-05	611,739	4,266,414	10
536	GRID	0.268	1.64E-04	2.17E-05	611,839	4,266,414	10
537	GRID	0.283	1.73E-04	2.24E-05	611,939	4,266,414	10
538	GRID	0.313	1.91E-04	1.98E-05	612,039	4,266,414	10
539	GRID	0.357	2.18E-04	1.97E-05	612,139	4,266,414	10
540	GRID	0.416	2.54E-04	1.86E-05	612,239	4,266,414	10
541	GRID	0.467	2.85E-04	1.94E-05	612,339	4,266,414	10
542	GRID	0.502	3.07E-04	1.88E-05	612,439	4,266,414	10
543	GRID	0.522	3.19E-04	1.96E-05	612,539	4,266,414	10
544	GRID	0.518	3.16E-04	1.97E-05	612,639	4,266,414	10
545	GRID	0.503	3.07E-04	1.92E-05	612,739	4,266,414	10
546	GRID	0.469	2.86E-04	1.91E-05	612,839	4,266,414	10
547	GRID	0.426	2.60E-04	1.69E-05	612,939	4,266,414	10
548	GRID	0.389	2.38E-04	1.63E-05	613,039	4,266,414	10
549	GRID	0.356	2.17E-04	1.48E-05	613,139	4,266,414	10
550	GRID	0.323	1.97E-04	1.33E-05	613,239	4,266,414	10
551	GRID	0.0978	5.97E-05	1.08E-05	610,839	4,266,314	10
552	GRID	0.0973	5.94E-05	1.16E-05	610,939	4,266,314	10
553	GRID	0.097	5.92E-05	1.26E-05	611,039	4,266,314	10
554	GRID	0.1	6.11E-05	1.32E-05	611,139	4,266,314	10
555	GRID	0.123	7.50E-05	1.46E-05	611,239	4,266,314	10
556	GRID	0.152	9.28E-05	1.52E-05	611,339	4,266,314	10
557	GRID	0.184	1.12E-04	1.63E-05	611,439	4,266,314	10
558	GRID	0.211	1.29E-04	1.71E-05	611,539	4,266,314	10
559	GRID	0.22	1.34E-04	1.83E-05	611,639	4,266,314	10
560	GRID	0.224	1.37E-04	1.93E-05	611,739	4,266,314	10
561	GRID	0.232	1.42E-04	1.96E-05	611,839	4,266,314	10
562	GRID	0.239	1.46E-04	1.92E-05	611,939	4,266,314	10
563	GRID	0.266	1.62E-04	1.80E-05	612,039	4,266,314	10
564	GRID	0.304	1.86E-04	1.71E-05	612,139	4,266,314	10
565	GRID	0.346	2.11E-04	1.57E-05	612,239	4,266,314	10
566	GRID	0.394	2.41E-04	1.70E-05	612,339	4,266,314	10
567	GRID	0.429	2.62E-04	1.69E-05	612,439	4,266,314	10
568	GRID	0.449	2.74E-04	1.67E-05	612,539	4,266,314	10
569	GRID	0.455	2.78E-04	1.76E-05	612,639	4,266,314	10
570	GRID	0.45	2.75E-04	1.75E-05	612,739	4,266,314	10
571	GRID	0.429	2.62E-04	1.71E-05	612,839	4,266,314	10
572	GRID	0.394	2.40E-04	1.64E-05	612,939	4,266,314	10
573	GRID	0.361	2.21E-04	1.50E-05	613,039	4,266,314	10
574	GRID	0.333	2.03E-04	1.46E-05	613,139	4,266,314	10
575	GRID	0.304	1.86E-04	1.28E-05	613,239	4,266,314	10
576	GRID	0.0853	5.21E-05	1.00E-05	610,839	4,266,214	10
577	GRID	0.0839	5.12E-05	1.10E-05	610,939	4,266,214	10
578	GRID	0.0849	5.18E-05	1.16E-05	611,039	4,266,214	10
579	GRID	0.0977	5.97E-05	1.27E-05	611,139	4,266,214	10
580	GRID	0.123	7.54E-05	1.36E-05	611,239	4,266,214	10
581	GRID	0.147	8.97E-05	1.35E-05	611,339	4,266,214	10
582	GRID	0.176	1.07E-04	1.47E-05	611,439	4,266,214	10
583	GRID	0.193	1.18E-04	1.54E-05	611,539	4,266,214	10
584	GRID	0.193	1.18E-04	1.70E-05	611,639	4,266,214	10
585	GRID	0.196	1.20E-04	1.74E-05	611,739	4,266,214	10
586	GRID	0.203	1.24E-04	1.77E-05	611,839	4,266,214	10
587	GRID	0.205	1.25E-04	1.70E-05	611,939	4,266,214	10
588	GRID	0.229	1.40E-04	1.64E-05	612,039	4,266,214	10
589	GRID	0.263	1.61E-04	1.51E-05	612,139	4,266,214	10
590	GRID	0.293	1.79E-04	1.39E-05	612,239	4,266,214	10

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
591	GRID	0.333	2.04E-04	1.42E-05	612,339	4,266,214	10
592	GRID	0.37	2.26E-04	1.55E-05	612,439	4,266,214	10
593	GRID	0.391	2.39E-04	1.45E-05	612,539	4,266,214	10
594	GRID	0.398	2.43E-04	1.54E-05	612,639	4,266,214	10
595	GRID	0.401	2.45E-04	1.59E-05	612,739	4,266,214	10
596	GRID	0.392	2.40E-04	1.58E-05	612,839	4,266,214	10
597	GRID	0.366	2.23E-04	1.50E-05	612,939	4,266,214	10
598	GRID	0.336	2.05E-04	1.41E-05	613,039	4,266,214	10
599	GRID	0.312	1.90E-04	1.34E-05	613,139	4,266,214	10
600	GRID	0.288	1.76E-04	1.28E-05	613,239	4,266,214	10
601	GRID	0.0734	4.48E-05	9.69E-06	610,839	4,266,114	10
602	GRID	0.074	4.52E-05	1.04E-05	610,939	4,266,114	10
603	GRID	0.0798	4.87E-05	1.10E-05	611,039	4,266,114	10
604	GRID	0.1	6.12E-05	1.20E-05	611,139	4,266,114	10
605	GRID	0.121	7.42E-05	1.19E-05	611,239	4,266,114	10
606	GRID	0.142	8.69E-05	1.25E-05	611,339	4,266,114	10
607	GRID	0.167	1.02E-04	1.35E-05	611,439	4,266,114	10
608	GRID	0.172	1.05E-04	1.39E-05	611,539	4,266,114	10
609	GRID	0.17	1.04E-04	1.54E-05	611,639	4,266,114	10
610	GRID	0.174	1.06E-04	1.59E-05	611,739	4,266,114	10
611	GRID	0.177	1.08E-04	1.56E-05	611,839	4,266,114	10
612	GRID	0.179	1.09E-04	1.54E-05	611,939	4,266,114	10
613	GRID	0.201	1.23E-04	1.49E-05	612,039	4,266,114	10
614	GRID	0.23	1.41E-04	1.33E-05	612,139	4,266,114	10
615	GRID	0.253	1.55E-04	1.28E-05	612,239	4,266,114	10
616	GRID	0.284	1.73E-04	1.21E-05	612,339	4,266,114	10
617	GRID	0.32	1.96E-04	1.34E-05	612,439	4,266,114	10
618	GRID	0.343	2.09E-04	1.38E-05	612,539	4,266,114	10
619	GRID	0.351	2.15E-04	1.34E-05	612,639	4,266,114	10
620	GRID	0.355	2.17E-04	1.42E-05	612,739	4,266,114	10
621	GRID	0.356	2.18E-04	1.46E-05	612,839	4,266,114	10
622	GRID	0.341	2.08E-04	1.43E-05	612,939	4,266,114	10
623	GRID	0.314	1.92E-04	1.27E-05	613,039	4,266,114	10
624	GRID	0.292	1.78E-04	1.24E-05	613,139	4,266,114	10
625	GRID	0.272	1.66E-04	1.23E-05	613,239	4,266,114	10
626	BOUNDARY	15.1	9.22E-03	2.52E-04	612,235	4,267,457	10
627	BOUNDARY	12.6	7.71E-03	2.35E-04	612,223	4,267,435	10
628	BOUNDARY	11.2	6.84E-03	2.01E-04	612,210	4,267,414	10
629	BOUNDARY	9.92	6.06E-03	1.82E-04	612,198	4,267,392	10
630	BOUNDARY	8.72	5.33E-03	1.73E-04	612,186	4,267,370	10
631	BOUNDARY	7.84	4.79E-03	1.68E-04	612,173	4,267,348	10
632	BOUNDARY	7.03	4.29E-03	1.67E-04	612,161	4,267,327	10
633	BOUNDARY	6.35	3.88E-03	1.46E-04	612,148	4,267,305	10
634	BOUNDARY	5.74	3.50E-03	1.49E-04	612,136	4,267,283	10
635	BOUNDARY	5.17	3.16E-03	1.41E-04	612,124	4,267,261	10
636	BOUNDARY	5.01	3.06E-03	1.34E-04	612,120	4,267,255	10
637	BOUNDARY	5.29	3.23E-03	1.27E-04	612,096	4,267,261	10
638	BOUNDARY	5.5	3.36E-03	1.43E-04	612,071	4,267,266	10
639	BOUNDARY	5.72	3.49E-03	1.45E-04	612,047	4,267,272	10
640	BOUNDARY	6.02	3.68E-03	1.59E-04	612,022	4,267,277	10
641	BOUNDARY	6.18	3.77E-03	1.60E-04	611,998	4,267,283	10
642	BOUNDARY	6.48	3.95E-03	1.57E-04	611,974	4,267,288	10
643	BOUNDARY	6.61	4.03E-03	1.61E-04	611,957	4,267,292	10
644	BOUNDARY	8.09	4.94E-03	1.83E-04	611,950	4,267,316	10
645	BOUNDARY	10	6.12E-03	2.13E-04	611,943	4,267,340	10
646	BOUNDARY	13.1	8.00E-03	2.40E-04	611,936	4,267,362	10
647	BOUNDARY	13.2	8.03E-03	2.32E-04	611,960	4,267,370	10
648	BOUNDARY	14.5	8.86E-03	2.33E-04	611,984	4,267,377	10
649	BOUNDARY	14.1	8.59E-03	2.51E-04	612,007	4,267,385	10

HARP Modeling Results

Receptor	Type	Cancer Risk	Hazard Indices		UTM Coordinates		ZONE
		# in a million	Chronic	Acute	Easting	Northing	
650	BOUNDARY	14.4	8.78E-03	2.42E-04	612,031	4,267,392	10
651	BOUNDARY	15.4	9.39E-03	2.42E-04	612,055	4,267,400	10
652	BOUNDARY	14.5	8.88E-03	2.54E-04	612,079	4,267,407	10
653	BOUNDARY	15.1	9.22E-03	2.45E-04	612,103	4,267,415	10
654	BOUNDARY	15.7	9.61E-03	2.51E-04	612,127	4,267,423	10
655	BOUNDARY	14.7	8.96E-03	2.58E-04	612,150	4,267,430	10
656	BOUNDARY	15.6	9.54E-03	2.49E-04	612,174	4,267,438	10
657	BOUNDARY	15.9	9.74E-03	2.56E-04	612,198	4,267,445	10
658	BOUNDARY	14.7	8.96E-03	2.67E-04	612,222	4,267,453	10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