AIR QUALITY STUDY

HOSKINGS RANCH

TM 5312, Log No. 03-10-005

Prepared for the County of San Diego

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ENVIRONMENTAL IMPACT REPORT
AIR QUALITY TECHNICAL REPORT
INFORMATION FOR THE READER

This document consists of the Air Quality Technical Report the Hoskings Ranch Project and analyzes air quality associated with construction and operation of the Project. The report provided, "Air Quality Study, Hoskings Ranch TM5312," by Urban Crossroads, Inc., dated October 2011, analyzed a 28-lot project. The Proposed Project now proposes 24 lots, which represents a reduction of 4 lots.

The described changes to the Project would result in an overall reduction in the potential extent of Project-related air quality impacts, since there would be a reduction in area sources (i.e., energy use, landscaping, etc.) and the extent of excavation and construction, as well as a reduction in vehicle trips based on fewer proposed residential units. Reductions associated with the refined Project uses were not incorporated and the report is therefore conservative in nature.

No change to environmental design considerations associated with the refined Project or significance conclusions reached in conformance with the California Environmental Quality Act (CEQA) would occur and no change is required to the attached air quality technical analysis.

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GLOSSARY OF TERMS AND ACRONYMS

APCD	Air Pollution Control District
AQIA	Air Quality Impact Assessment
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
BACM	Best Available Control Measure
BACT	Best Available Control Technology
BMPs	Best Management Practices
CAA	Clean Air Act (Federal)
CAAQS	California Ambient Air Quality Standard
CALINE4	California Line Source Dispersion Model (Version 4)
Caltrans	California Department of Transportation
CCAA	California Clean Air Act
CO	Carbon Monoxide
DPLU	San Diego County Department of Planning and Land Use
HI	Hazard Index
ISCST	Industrial Source Complex Short Term Model
µg/m3	Micrograms per Cubic Meter
NAAQS	National Ambient Air Quality Standard
NOx	Oxides of Nitrogen
NO2	Nitrogen Dioxide
O3	Ozone
PM2.5	Fine Particulate Matter (particulate matter with an aerodynamic diameter of 2.5 microns or less
PM10	Respirable Particulate Matter (particulate matter with an aerodynamic diameter of 10 microns or less
ppm	Parts per million
RAQS	San Diego County Regional Air Quality Strategy
ROCs	Reactive Organic Compounds
ROG	Reactive Organic Gases
SANDAG	San Diego Association of Governments
SCAQMD	South Coast Air Quality Management District
SDAB	San Diego Air Basin
SDAPCD	San Diego County Air Pollution Control District
SIP	State Implementation Plan
SLTs	Screening Level Thresholds
SOx	Oxides of Sulfur
SO2	Sulfur Dioxide
TACs	Toxic Air Contaminants
T-BACT	Toxics Best Available Control Technology
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

HOSKINGS RANCH
TM 5312, LOG NO. 03-10-005
AIR QUALITY STUDY
COUNTY OF SAN DIEGO, CALIFORNIA

1.0 EXECUTIVE SUMMARY

This air quality impact study has been completed to determine the air quality impacts associated with the development of the proposed Hoskings Ranch ("Project"). The project proposes the creation of 28 single-family estate dwelling units and 305.15 acres of agriculture. Residential use of the lots will be incidental to agricultural use, as required in the Hosking Ranch's Land Conservation Contract (Williamson Act Contract). The project proposes preliminary grading for roads, as required by the County of San Diego for a tentative subdivision map submission. Although no pads or residences are proposed, no more than five acres maximum per lot will be graded. As a result, most of the site will remain in its present state. Hoskings Ranch will not be phased; the proponent does not plan to construct homes as part of the project. If homes are built on the site, they will be developed on an individual lot basis. Owners will be responsible for pad grading, home construction, and associated water well and septic system facilities. For purposes of this report, it is conservatively assumed that the site will be constructed with 28 rural estates. The project site is located south of and adjacent to State Route 78 (SR 78) and extends west from Pine Hills Road west of Julian, in northeastern San Diego County. The project site covers an area including Daley Flat Road, Orinoco Drive, Tahoe Lane, Bear Run Lane, Lilac Blossom Lane, and Daley Flat Trail. The project location map is presented on Exhibit 2-A, and the project site plan is presented on Exhibit 2-B. The project alternative site plan is presented on Exhibit 2-C.

During construction of the proposed project, emissions will result from fugitive dust during the grading phase, heavy equipment usage, and construction workers commuting to and from the site. During short-term construction activity, it is anticipated that emissions will not exceed the criteria pollutant thresholds established by the County of San Diego CEQA Guidelines for Determining Significance for Air Quality, and therefore a less than significant impact is expected.

Additionally, emissions will result from the operation of the proposed project. Most of these emissions are the result of project related traffic, but also include emissions resulting from natural gas usage, landscaping equipment, and repainting. Emissions generated during long-term project operational activity are not

expected to exceed significance thresholds for criteria pollutant emissions. It should be noted that results of the analysis indicate that the project will not result in a CO "hotspot," thus the project is not expected to result in adverse impacts for emissions of CO. Based on County of San Diego significance thresholds, since the project does not exceed San Diego County Screening Level Thresholds (SLTs), the project will not result in a significant impact.

A screening-level health risk assessment was conducted to determine the potential for the project to result in a significant impact on nearby sensitive receptors during short-term construction activity. For purposes of this analysis, the primary pollutant of concern is diesel particulate matter (DPM) which is emitted by the operation of heavy diesel equipment during construction activity. The results of the health risk assessment indicate that the proposed project will not result in a significant impact to nearby sensitive receptors during short-term construction activity.

The analysis also concluded that the proposed project will not result in a significant odor impact.

An alternative with no agricultural use and a higher intensity of 35 single-family dwelling units has also been analyzed. Results of the alternative analysis are consistent with the findings for the proposed project, as noted above. The alternative analysis is provided in Section 6.0 of this report.

2.0 INTRODUCTION

2.1 Purpose of Report

The purpose of this report is to evaluate the air quality impacts resulting from the development and operation of the proposed project. This initial section of the air quality impact analysis report describes the project and summarizes the atmospheric setting within the study area. Subsequent sections of the report describe the existing air quality setting for the study area; evaluate the project air quality impacts, and present recommended emissions reduction measures that should be implemented in conjunction with the proposed project.

2.2 Site Location

The project site is located south of and adjacent to State Route 78 (SR 78) and extends west from Pine Hills Road west of Julian, in northeastern San Diego County, as shown in Exhibit 2-A.

2.3 Proposed Project

The project proposes the creation of 28 lots, which will be used for agricultural purposes. Residential use of the lots will be incidental to agricultural use, as required in the Hosking Ranch's Land Conservation Contract (Williamson Act Contract). The project proposes preliminary grading for roads, as required by the County of San Diego for a tentative subdivision map submission. Although no pads or residences are proposed, no more than five acres maximum per lot will be graded. As a result, most of the site will remain in its present state. Hoskings Ranch will not be phased; the proponent does not plan to construct homes as part of the project. If homes are built on the site, they will be developed on an individual lot basis. Owners will be responsible for pad grading, home construction, and associated water well and septic system facilities. For purposes of this report, it is conservatively assumed that the site will be constructed with 28 rural estates. A minimum of two potential agricultural uses have been identified for each lot, although no specific agricultural use is proposed. These consist of grazing, cattle breeding, orchards, vineyards, and greenhouses. The site plan is provided as Exhibit 2-B.

EXHIBIT 2-A

LOCATION MAP

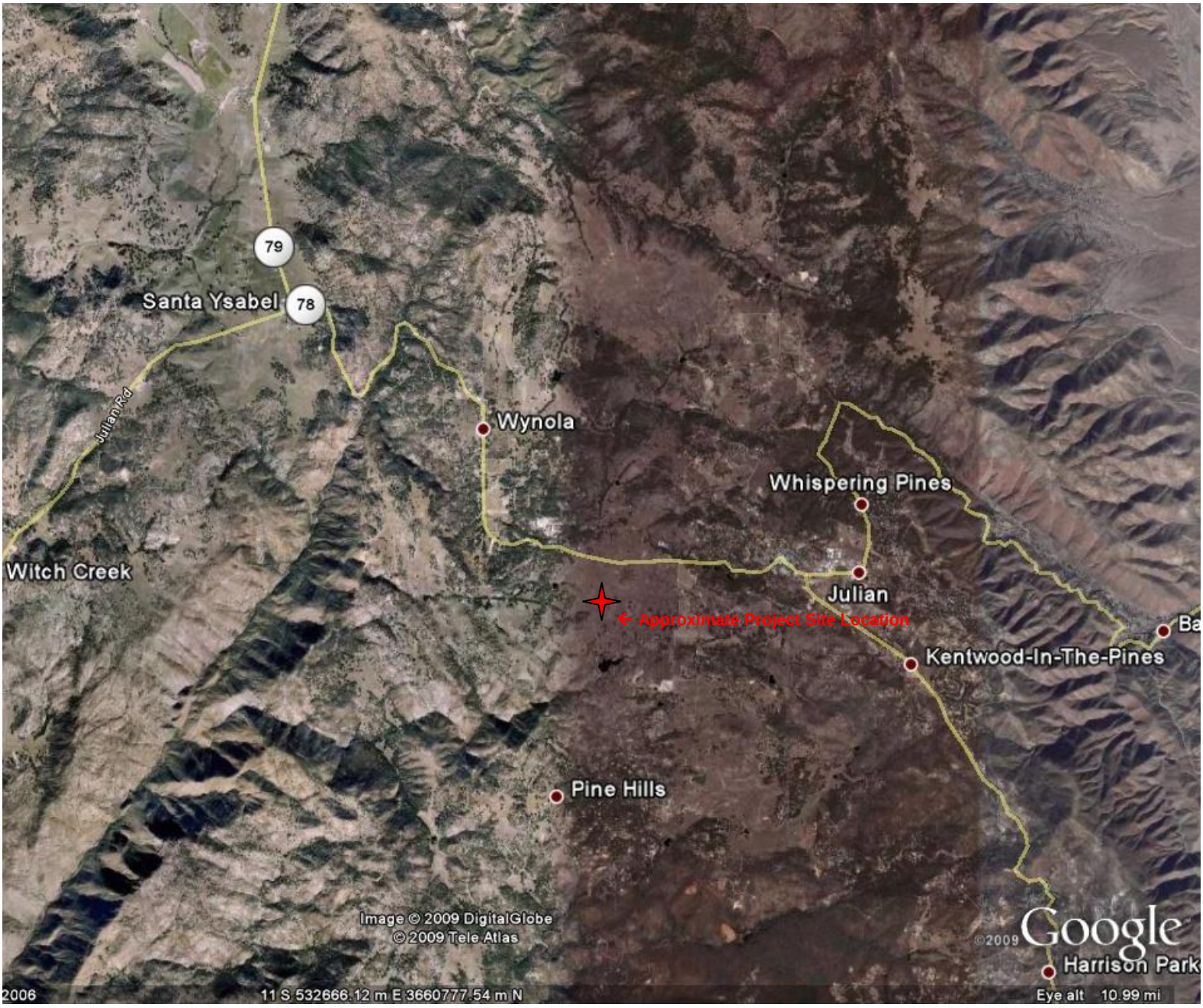


EXHIBIT 2-B

SITE PLAN

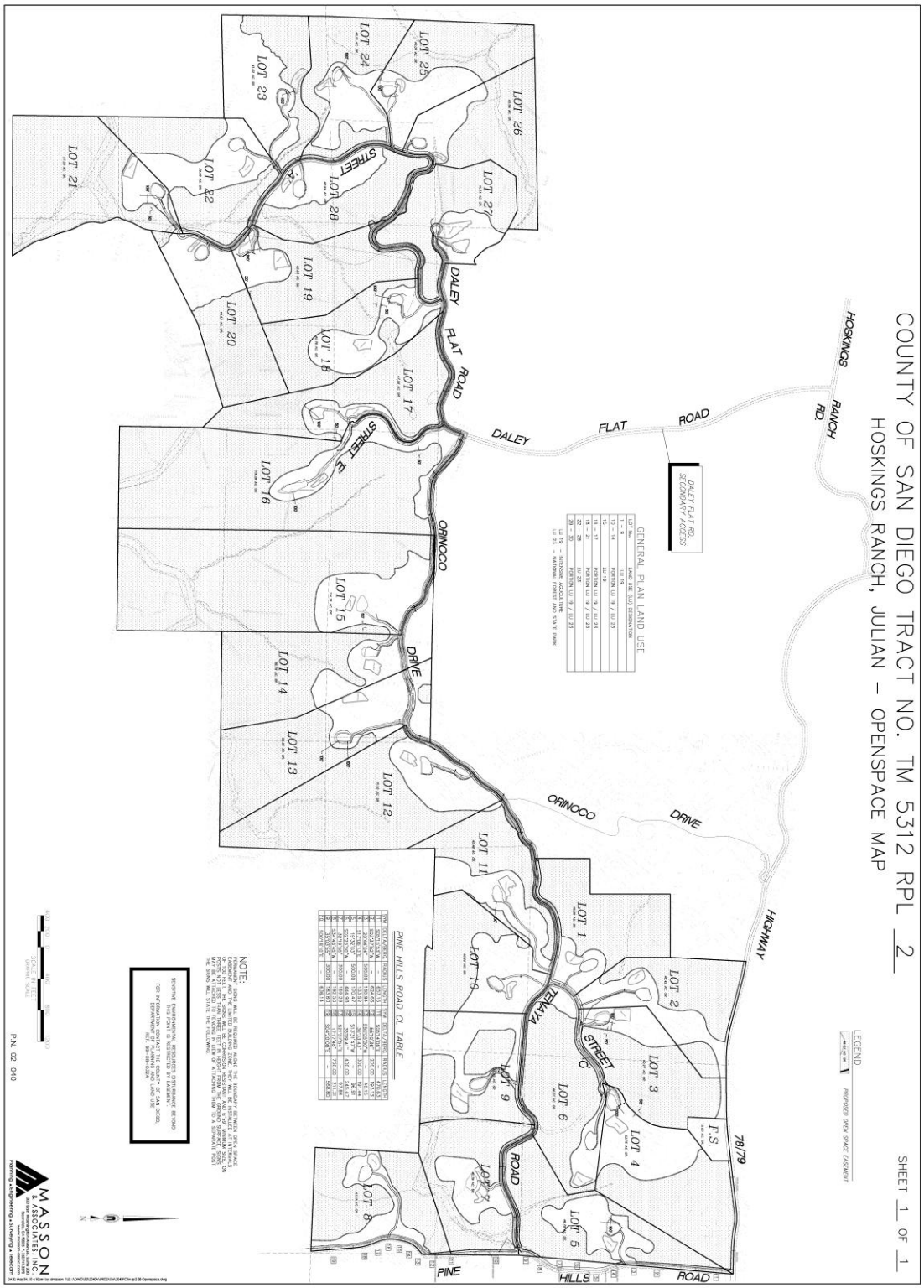
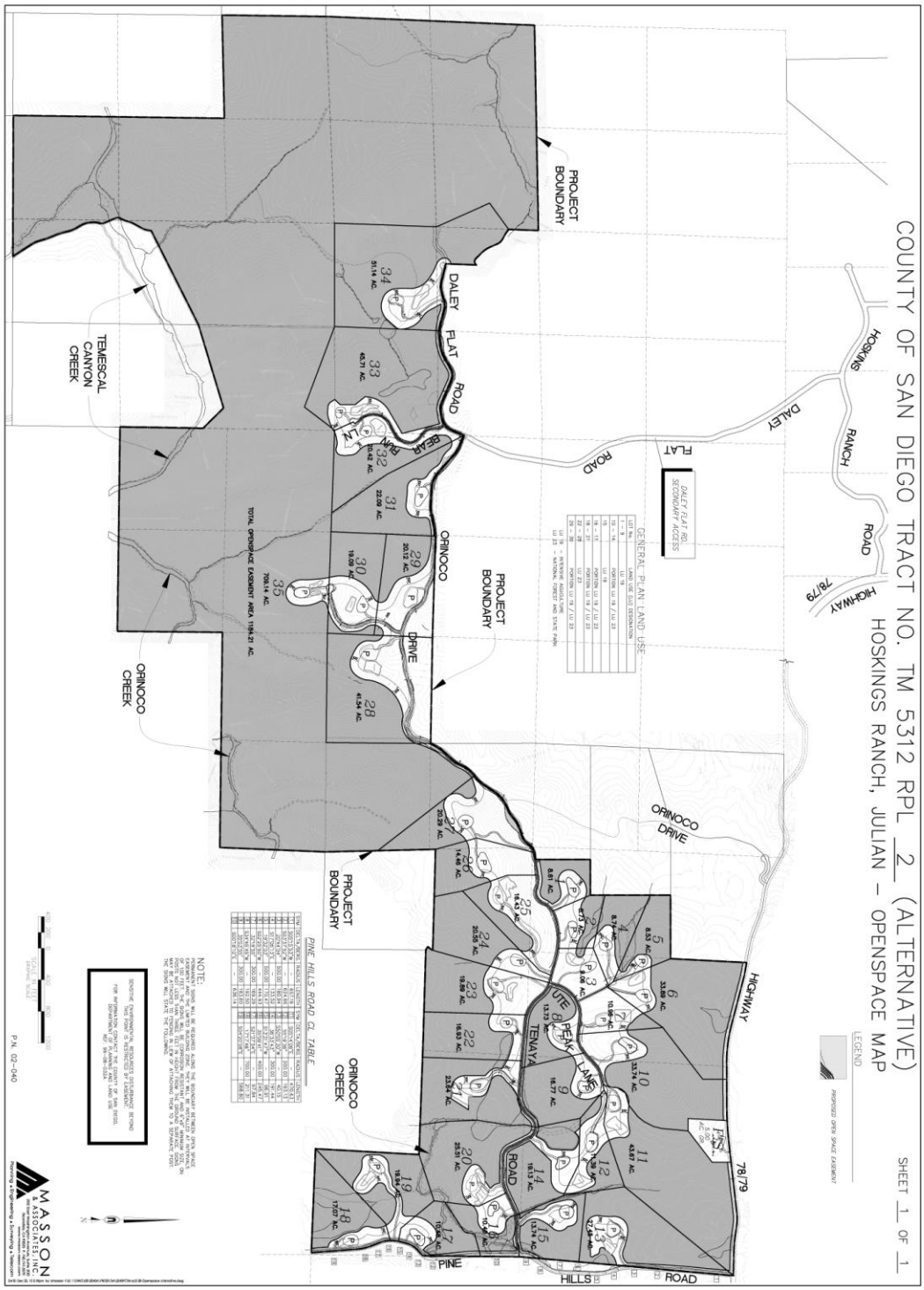


EXHIBIT 2-C

PROJECT ALTERNATIVE SITE PLAN



3.0 EXISTING CONDITIONS

3.1 Existing Setting

The Julian Town Center, which is characterized by a mixture of residential, commercial, and industrial uses is approximately one mile east of the proposed site. It is designated as the Julian Historic District and was established to "preserve what remains of Julian City which was created in 1870 to provide goods, services and housing for a population spawned by a gold rush …" The Historic District of Julian is renowned for retaining the architectural authenticity of early settlement and has based its commerce on tourism.

Surrounding land uses predominantly consist of undeveloped, open tracts of land and forest with scattered residential development and light agriculture. Many of the agricultural operations have adjoining residences, creating a rural mixed use ambience to the surrounding area.

To the north, the uses include large residential lots, a baseball field, and large open tracts with scattered tree cover. Lots are single-family residential, with some agricultural use. Many of these lots are within an agricultural preserve and range in size from 8 to 60 acres. SR 78/79, classified as a second priority scenic highway, provides the northern boundary of the proposed site. It serves as a separation between the project and land uses to the north. Four of the project's proposed 28 lots border the highway.

Pine Hills Road runs parallel to a portion of the eastern boundary of the proposed project. Large residential lots ranging in size from 2 to 50 acres are east of the site. The area directly south of the eastern portion of Hoskings Ranch consists of small-scale agricultural and residential lots ranging in size from four to 120 acres. Pine Hills, a residential development is approximately 7,000 feet south of the project site; lot sizes range from one-half acre to 17 acres in size. The topography becomes very steep further to the east. Orinoco Creek parallels the project boundary along the southern border. The western part of the site descends steeply to Daley Flat, which consists of undulating open terrain.

The Cleveland National Forest is partially within the southwestern corner of the project and extends beyond the site boundaries to the south and west. Privately owned lots are located

within the Cleveland National Forest and west of the project boundary. They range in size from 40 to 120 acres and are primarily in agricultural use.

3.2 Climate and Meteorology

The project site is located in the San Diego Air Basin (SDAB). The climate of the SDAB is dominated by a semi-permanent high pressure cell located over the Pacific Ocean. This cell influences the direction of prevailing winds (westerly to northwesterly) and maintains clear skies for much of the year. The high pressure cell also creates two types of temperature inversions that may act to degrade local air quality.

Subsidence inversions occur during the warmer months as descending air associated with the Pacific high pressure cell comes into contact with cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. The other type of inversion, a radiation inversion, develops on winter nights when air near the ground cools by heat radiation and air aloft remains warm. The shallow inversion layer formed between these two air masses also can trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions occur that produce ozone, commonly known as smog.

The climate of the coastal southern California, including the County of San Diego, is determined largely by high pressure that is almost always present off the west coast of North America. High-pressure systems are characterized by an upper layer of dry air that warms as it descends. This warm, dry air acts as a lid, restricting cool air located near the surface creating an inversion of typical temperature conditions.

During the summer and fall, emissions generated in the region combine with abundant sunshine under the influences of topography and an inversion to create conditions that are conducive to the formation of photochemical pollutants, such as ozone, and secondary particulates, such as sulfates and nitrates. As a result, air quality in the SDAB is often the poorest during the warmer summer and fall months.

Average summer high temperatures in the project vicinity (Julian) are approximately 84 degrees Fahrenheit (˚F). Average winter low temperatures are approximately 37˚F. The average rainfall in the project vicinity is approximately 24.1 inches annually.

Average temperature and rainfall data was obtained from the following website: http://www.wrcc.dri.edu/summary/Climsmsca.html.

The distinctive climate of the project area and the SDAB is determined by its terrain and geographical location. The Basin is located in a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean in the southwest quadrant with high mountains forming the remainder of the perimeter.

Wind patterns across the south coastal region are characterized by westerly and southwesterly on-shore winds during the day and easterly or northeasterly breezes at night. Winds are characteristically light although the speed is somewhat greater during the dry summer months than during the rainy winter season.

The prevailing winds in the project area move predominately from northwest to southeast with an average wind speed of 2.33 meters per second (m/s). A Wind Rose exhibit is available on Exhibit 3-A of this report and shows prevailing wind patterns and average speed in the project area. Meteorological data from the San Diego (Miramar MCAS) air monitoring station was used to be representative of conditions at the project area's inland location. It should be noted that although the Miramar monitoring station is located approximately 31 miles southwest of the project site, its inland location provides the best available data representative of conditions at the project site.

3.3 Regulatory Background

3.3.1 Federal Regulations

The U.S. Environmental Protection Agency (EPA) is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for oxidants (O_3), CO, NO_x, SO_2, PM_{10}, and lead. The U.S. EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

The Federal Clean Air Act (CAA) was first enacted in 1955 and has been amended numerous times in subsequent years (1963, 1965, 1967, 1970, 1977, and 1990). As discussed above, the CAA establishes the federal air quality standards, the NAAQS, and specifies future dates for achieving compliance. The CAA also mandates that States submit and implement State Implementation Plans (SIPs) for local areas not meeting these standards. These Plans must include pollution control measures that demonstrate how the standards will be met.

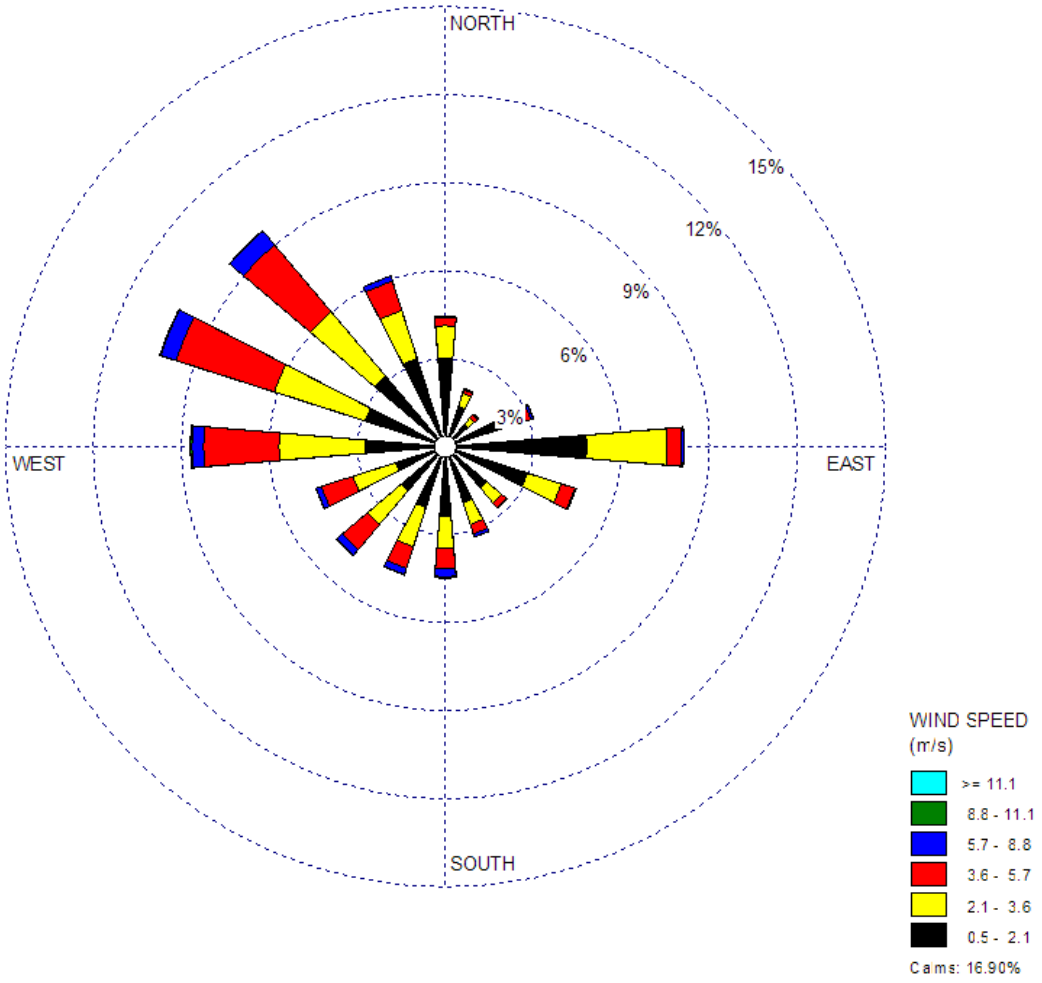
The 1990 amendments to the CAA that identify specific emission reduction goals for areas not meeting the NAAQS require a demonstration of reasonable further progress toward attainment and incorporate additional sanctions for failure to attain or to meet interim milestones. The sections of the CAA most directly applicable to the development of the project site include Title I (Nonattainment Provisions) and Title II (Mobile Source Provisions).

Title I provisions were established with the goal of attaining the NAAQS for the following criteria pollutants O_3, NO_2, SO_2, PM_{10}, CO, $PM_{2.5}$, and lead. The NAAQS were amended in July 1997 to include an additional standard for O_3 and to adopt a NAAQS for $PM_{2.5}$. Table 3-1 (previously presented) provides the NAAQS within the basin.

WIND ROSE EXHIBIT

WIND ROSE PLOT:
San Diego (Miramar) Monitoring Station

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD: 1967-1971 Jan 1 - Dec 31 00:00 - 23:00	COMPANY NAME: Urban Crossroads, Inc.	
		MODELER: M. T.	URBAN CROSSROADS
	CALM WINDS: 16.90%	TOTAL COUNT: 43824 hrs.	
	AVG. WIND SPEED: 2.33 m/s	DATE: 11/20/2007	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Mobile source emissions are regulated in accordance with Title II provisions. These provisions require the use of cleaner burning gasoline and other cleaner burning fuels such as methanol and natural gas. Automobile manufacturers are also required to reduce tailpipe emissions of hydrocarbons and nitrogen oxides (NO_x). NO_x is a collective term that includes all forms of nitrogen oxides (NO, NO_2, NO_3) which are emitted as byproducts of the combustion process.

3.3.2 California Regulations

The CARB, which became part of the California EPA in 1991, is responsible for ensuring implementation of the California Clean Air Act (AB2595), responding to the federal CAA, and for regulating emissions from consumer products and motor vehicles. The California CAA mandates achievement of the maximum degree of emissions reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date. The CARB established the CAAQS for all pollutants for which the federal government has NAAQS and, in addition, establishes standards for sulfates, visibility, hydrogen sulfide, and vinyl chloride. However at this time, hydrogen sulfide and vinyl chloride are not measured at any monitoring stations in the Basin because they are not considered to be a regional air quality problem. It should also be noted that the CAAQS are generally more stringent than the NAAQS.

Local air quality management districts, such as the San Diego Air Pollution Control District (SDAPCD), regulate air emissions. All air pollution control districts have been formally designated as attainment or nonattainment for each CAAQS (as discussed and presented previously in Table 3-2).

Serious non-attainment areas are required to prepare air quality management plans that include specified emission reduction strategies in an effort to meet clean air goals. These plans are required to include:

- Application of Best Available Retrofit Control Technology to existing sources;

- Developing control programs for area sources (e.g., architectural coatings and solvents) and indirect sources (e.g. motor vehicle use generated by residential and commercial development);
- A District permitting systems designed to allow no net increase in emissions from any new or modified permitted sources of emissions;
- Implementing reasonably available transportation control measures and assuring a substantial reduction in growth rate of vehicle trips and miles traveled;
- Significant use of low emissions vehicles by fleet operators;
- Sufficient control strategies to achieve a five percent or more annual reduction in emissions or 15 percent or more in a period of three years for ROCs, NO_x, CO and PM_{10}. However, air basins may use alternative emission reduction strategy which achieves a reduction of less than five percent per year under certain circumstances.

3.3.3 San Diego County

The SDAPCD and the San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis. The RAQS was updated in 1995, 1998, 2001, and most recently in 2004. The RAQS outlines the APCD's plans and control measures designed to attain the state air quality standard for O_3. The SDAPCD has also developed the air basin's input to the SIP, which is required under the Federal Clean Air Act for areas that are out of attainment of air quality standards. The SIP includes the APCD's plans and control measures for attaining the O_3 NAAQS.

The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County in order to project future emissions and then determine from the results strategies that may be necessary for the reduction of emissions through regulatory controls. The ARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the cities and by the County as part of the

development of the County's General Plan. As such, projects that propose development that is consistent with the growth anticipated by the General Plans would be consistent with the RAQS. In the event that a project would propose a development that is less dense than that associated with the General Plan, the project would likewise be consistent with the RAQS. If a project, however, proposes a development that is denser than that assumed in the general plan, and SANDAG's growth projections, the project may be in conflict with the RAQS and SIP, and could therefore result in a significant impact on air quality.

The SIP relies on the same information from SANDAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin. The SIP also includes rules and regulations that have been adopted by the APCD to control emissions from stationary sources. These SIP-approved rules may be used as a guideline to determine whether a project's emissions would have the potential to conflict with the SIP and subsequently hinder attainment of the NAAQS for O_3.

3.4 Background Air Quality

Existing air quality is measured based upon ambient air quality standards. These standards are the levels of air quality that are considered safe, with an adequate margin of safety, to protect the public health and welfare. Those standards currently in effect for both California and federal air quality standards are shown in Table 3-1.

The determination of whether a region's air quality is healthful or unhealthful is determined by comparing contaminant levels in ambient air samples to the state standards and federal standards presented in Table 3-1. The air quality in a region is considered to be in attainment if: the measured ambient air pollutant levels for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, and PM_{10} are not exceeded and all other standards are not equaled or exceeded at any time in any consecutive three-year period; and the federal standards (other than O_3, PM_{10}, and those based on annual averages or arithmetic mean) are not exceeded more than once per year. The O_3 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 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. See Table 3-2 for attainment designations.

TABLE 3-1

Ambient Air Quality Standards						
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	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)	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 (PM2.5)	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	15.0 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/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 (57 µg/m3)	Gas Phase Chemiluminescence	53 ppb (100 µg/m^3) (see footnote 8)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3) (see footnote 8)	None	
Sulfur Dioxide (SO_2)	24 Hour	0.04 ppm (105 µg/m^3)	Ultraviolet Fluorescence	—	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)[9]
	3 Hour	—		—	0.5 ppm (1300 µg/m^3) (see footnote 9)	
	1 Hour	0.25 ppm (655 µg/m^3)		75 ppb (196 µg/m^3) (see footnote 9)	—	
Lead[10]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average[11]	—		0.15 µg/m^3		
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[10]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: California Air Resources Board (09/08/2010)

TABLE 3-2

San Diego County Air Basin Attainment Status by Pollutant[1]

Pollutant	Averaging Time	California Standards	Federal Standards
Ozone (O_3)	1 Hour	Non-attainment	No Federal Standard
	8 Hour		Basic Non-attainment
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	Non-attainment	No Federal Standard
	24 Hour	Non-attainment	Unclassified[1]
	Annual Arithmetic Mean	No State Standard	Unclassified[2]
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No State Standard	Attainment
	Annual Arithmetic Mean	Non-attainment	Attainment
Carbon Monoxide (CO)	8 Hour	Attainment	Maintenance Area[3]
	1 Hour		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	No State Standard	Attainment
	1 Hour	Attainment	No Federal Standard
Lead	30 Day Average	Attainment	No Federal Standard
	Calendar Quarter	No State Standard	Attainment
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	No State Standard	Attainment
	24 Hour	Attainment	Attainment
	1 Hour	Attainment	No Federal Standard
Sulfates	24 Hour	Attainment	No Federal Standard
Hydrogen Sulfide	1 Hour	Unclassified	No Federal Standard
Visibility Reducing Particulates	8 Hour (10 AM to 6 PM, PST)	Unclassified	No Federal Standard

1 Data reflects status as of March 19, 2007.

2 Unclassified; indicates data are not sufficient for determining attainment or nonattainment.

3 Maintenance Area (defined by U.S. Department of Transportation) is any geographic region of the United States previously designated nonattainment pursuant to the CAA Amendments of 1990 and subsequently redesignated to attainment subject to the requirement to develop a maintenance plan under section 175A of the CAA, as amended.

Source: SD County Guidelines for Determining Significance (March 19, 2007)

3.4.1 Regional Air Quality)

The APCD operates a network of ambient air monitoring stations throughout San Diego County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and NAAQS.

Air quality has shown improvement in the SDAB such that there have been no violations of standards for CO, NO_x and $PM_{2.5}$ over the past five years in the project area and very low occurrences of violations for PM_{10}, and O_3.

3.4.2 Local Air Quality

The nearest long-term air quality monitoring station to the project for Ozone (O_3), Nitrogen Dioxide (NO_X), Inhalable Particulates (PM_{10}), and Ultra-Fine Particulates ($PM_{2.5}$) is carried out at the El Cajon monitoring station located approximately 26 miles southwest of the project site. Data for Carbon Monoxide (CO) was obtained from the Chula Vista monitoring station located approximately 39 miles southwest of the project site. Table 3-3 shows the number of days standards were exceeded for the study area.

TABLE 3-3

PROJECT AREA AIR QUALITY MONITORING SUMMARY 2006-2008 [a]

POLLUTANT	STANDARD	YEAR		
		2006	2007	2008
Ozone (O_3)				
Maximum 1-Hour Concentration (ppm)		0.106	0.110	0.107
Maximum 8-Hour Concentration (ppm)		0.090	0.082	0.093
Number of Days Exceeding Federal 1-Hour Standard	> 0.12 ppm	0	0	0
Number of Days Exceeding Federal 8-Hour Standard	> 0.08 ppm	4	3	4
Number of Days Exceeding Health Advisory	≥ 0.15 ppm	0	0	0
Carbon Monoxide (CO) [b]				
Maximum 1-Hour Concentration (ppm)		2.7	3.1	2.0
Maximum 8-Hour Concentration (ppm)		2.2	2.7	1.5
Number of Days Exceeding State 1-Hour Standard	> 20 ppm	0	0	0
Number of Days Exceeding Federal / State 8-Hour Standard	> 9.0 ppm	0	0	0
Number of Days Exceeding Federal 1-Hour Standard	> 35 ppm	0	0	0
Nitrogen Dioxide (NO_2)				
Maximum 1-Hour Concentration (ppm)		0.069	0.065	0.054
Annual Arithmetic Mean Concentration (ppm)		0.018	0.015	0.014
Number of Days Exceeding State 1-Hour Standard	> 0.25 ppm	0	0	0
Inhalable Particulates (PM_{10})				
Maximum 24-Hour Concentration (µg/m^3)		47	61	40
Number of Samples		58	58	45
Number of Samples Exceeding Federal Standard	> 150 µg/m^3	0	0	0
Ultra-Fine Particulates ($PM_{2.5}$)				
Maximum 24-Hour Concentration (µg/m^3)		37.6	42.7	30.2
Annual Arithmetic Mean (µg/m^3)		11.60	12.84	13.4
Number of Samples Exceeding Federal 24-Hour Standard	> 65 µg/m^3	0	0	0

[a] El Cajon Monitoring Station used unless otherwise noted

[b] Chula Vista Monitoring Station

Source: U.S. Environmental Protection Agency (http://www.epa.gov/oar/data/geosel.html)

4.0 SIGNIFICANCE CRITERIA AND ANALYSIS METHODOLOGY

The County of San Diego has approved thresholds of significance based on appendix G of the CEQA Guidelines. The County of San Diego published the document *Guidelines for Determining Significance and Report Format and Content Requirements, Air Quality* (March 19, 2007), the document provides guidance on determining project-related air quality impacts. The guidance states that a project would have a significant air quality impact if it would:

1. Conflict with or obstruct implementation of the San Diego Regional Air Quality Strategy (RAQS) or applicable portions of the State Implementation Plan (SIP);

2. Result in emissions that would violate any air quality standard or contribute substantially to an existing or proposed air quality violation;

3. Result in a cumulatively considerable net increase of PM_{10} or exceed quantitative thresholds for O_3 precursors, oxides of nitrogen (NO_x) and/or volatile organic compounds (VOCs);

4. Expose sensitive receptors (i.e., schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations; or

5. Create objectionable odors affecting a substantial number of people.

The AQIA SLTs applicable to this project are shown in Table 4-1 below.

TABLE 4-1 MAXIMUM DAILY EMISSIONS THRESHOLDS
(SAN DIEGO COUNTY GUIDELINES FOR DETERMINING SIGNIFICANCE FOR AIR QUALITY)

Pollutant	Construction	Operational
NO_x	250 lbs/day	250 lbs/day
PM_{10}	100 lbs/day	100 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day
SO_x	250 lbs/day	250 lbs/day
CO	550 lbs/day	550 lbs/day
VOCs*	75 lbs/day	75 lbs/day

* Threshold for VOCs based on threshold of significance for VOCs from the South Coast Air Quality Management District for the Coachella Valley.

In the event that project-related emissions exceed these SLTs, specific modeling will be required for NO_2, SO_2, CO, and lead to demonstrate that the project's ground-level concentrations, including appropriate background levels, do not exceed the NAAQS/CAAQS. For ozone precursors, PM_{10}, and $PM_{2.5}$ exceedences of the SLTs have the potential to result in a significant impact. The primary reason for this is because the SDAB is currently in non-attainment for PM_{10}, $PM_{2.5}$, and ozone. Therefore, unless a project includes design considerations or mitigation measures that would reduce the daily emission to below the applicable screening levels, the impact for these pollutants (ozone precursors, PM_{10}, and $PM_{2.5}$) will be significant.

In addition to impacts from criteria pollutants, project-related impacts may include emissions of pollutants identified by the state and federal government as toxic air contaminants (TACs)/hazardous air pollutants (HAPs). In San Diego County, the Department of Planning and Land Use identifies an excess cancer risk level of 1 in 1 million for projects that do not implement Toxics Best Available Control Technology (T-BACT), and an excess cancer risk of 10 in 1 million or less for projects that do implement T-BACT as the threshold for determining significance. These significance thresholds are consistent with SDAPCD's Rule 1210 requirements for stationary sources. Therefore, if a project has the potential to result in emissions of any TAC or HAP which result in a cancer risk of greater than 1 in 1 million without T-BACT, 10 in 1 million with T-BACT, or a health hazard index greater than or equal to 1, the project would result in a potentially significant impact.

5.0 PROJECT IMPACT ANALYSIS

5.1 Conformance to the Regional Air Quality Strategy

A determination of whether the potential emissions resulting from operations of the proposed project would result in a significant impact is based on an evaluation of the extent to which the proposed project conforms to existing regional or local plans.

The proposed project was assessed to determine consistency with the proposed SANDAG projections for growth within the area; after careful review it has been determined that the project is consistent with the growth projections and therefore does satisfies consistency with the RAQS. This determination is based on a careful review of the SANDAG growth projections and the reasonably foreseeable cumulative projects in the County Community Planning Area (CPA). The Julian CPA, in which the proposed project is located, consists of approximately 1,551 single family residential units (in 2008). SANDAG projections indicate that residential demand will continue to increase in the Julian CPA through the year 2030, when it is estimated that the Julian CPA will consist of approximately 1,980 single family residential units. As a result, it is expected that an additional 429 single family residential dwelling units will be developed between 2008 and 2030. It should be noted that the proposed project along with reasonably foreseeable projects in the local vicinity are not expected to develop more than the required 429 single family residential dwelling units by the year 2030. Since the project along with other cumulative projects do not plan to develop in excess of 429 single family residential dwelling units, it is assumed that the project does not conflict with the RAQS as the growth projections do not exceed those in the RAQS. See Appendix "A" for more details on the Julian CPA.

5.2 Conformance to Federal and State Ambient Air Quality Standards

5.2.1 Construction Impacts

5.2.1.1 Guidelines for the Determination of Significance

Based on San Diego County Guidelines (County of San Diego, 2007), construction impacts are potentially significant if they exceed the quantitative screening-level

thresholds for attainment pollutants (NO_X, SO_X, and CO) and would result in a significant impact if they exceed the screening-level thresholds for non-attainment pollutants (O_3, PM_{10}, and $PM_{2.5}$).

5.2.1.2 Significance of Impacts Prior to Mitigation

Construction activities associated with the proposed project will result in emissions of CO, VOCs, NO_x, SO_x, PM_{10}, and $PM_{2.5}$. For purposes of this analysis, although the majority of the site will remain undisturbed for future agriculture use, a maximum of 5 acres per lot (5 acres x 28 lots = 140 total acres) has the potential to be developed as a residential dwelling unit. For purposes of this analysis it is conservatively assumed that a total of 140 acres will be graded and 28 residential units will be developed. The analysis assumes overlap of grading, underground utility construction, paving, architectural coating (painting), and physical building construction. Construction related emissions are expected from the following construction equipment and construction activities:

- Grading Exhaust Emissions
- Grading Fugitive Dust (PM_{10}) Emissions
- Underground Utility Construction Exhaust Emissions
- Paving Exhaust Emissions
- Off-Site Construction Activity
- Architectural Coatings
- Construction Workers Commuting
- Diesel-fired Particulates and Carcinogenic Impacts

Detailed outputs for each phase of construction and associated duration is presented in Appendix "D."

Grading Exhaust Emissions

Exhaust emissions from grading activity result from both on-road and off-road heavy equipment operating during this activity. For modeling purposes, this activity is expected to last approximately six months. It is important to note that the duration of this activity

does not have an effect on emissions calculations related to individual pad grading since the assumptions include grading of a maximum of 5.0 acres per day. Since detailed construction information was not available at this time, the URBEMIS 2007 model defaults for a project of similar size and scope were utilized and are as follows:

Grading Equipment		
Description	**Qty**	**Hours/day**
Grader	1	6
Dozer	1	6
Tractor/Loader/Backhoe	1	7
Water Truck	1	8

Emissions generated from rough grading exhaust are summarized on Table 5-1 (presented later in this report)

Grading Fugitive Dust (PM_{10}) Emissions

Dust is normally a major concern during rough grading activities. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions". Emissions rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). PM_{10} and $PM_{2.5}$ fugitive dust emissions were calculated by assuming that, approximately 5 acres of the approximate 1,416.5 acre project site would be actively graded at any one time. Grading activity is anticipated to balance on-site, requiring no import or export of material. It is estimated that approximately 234,500 cubic yards of soil will be balanced in cut/fill. However, since the specific duration of soil movement activities is unknown at this time, in order to model and evaluate a conservative scenario, it is estimated that a maximum daily disturbed area of 5 acres will occur. Fugitive dust emission factors from the URBEMIS 2007 model defaults were utilized for purposes of this analysis.

Underground Utility Construction Exhaust Emissions

Exhaust emissions will result from heavy equipment that will be operational during underground utility construction. The types of activities that generally take place may include general trench-work, pipe laying with associated base material and cover, ancillary earthwork, manholes, etc. This activity also may include construction of water wells and septic system construction. This activity is assumed to take place following grading activity and concurrent with off-site construction activity, paving, building construction, and architectural coating for a duration of approximately three months. However, to establish a worst-case scenario for analysis purposes these activities are assumed to overlap with all other construction activities identified in Table 5-1. Since detailed construction information was not available at this time, the URBEMIS 2007 model defaults for a project of similar size and scope were utilized and are as follows:

Underground Utility Equipment		
Description	**Qty**	**Hours/day**
Excavators	2	8
Other General Equipment	1	8
Tractors/Loaders/Backhoes	1	8

Emissions generated from underground utility construction are presented on Table 5-1 (presented later in this report).

Paving Exhaust Emissions

Paving activities include the movement of any remaining material as well as necessary curb and gutter work, road base material placement and blacktop. Paving activity is expected to take place following grading activity and concurrent with underground utility construction, off-site construction, building construction, and architectural coatings over a period of approximately six months. Since detailed construction information was not available at this time, the URBEMIS 2007 model defaults for a project of similar size and scope were utilized and are as follows:

Paving Equipment

Description	Qty	Hours/day
Misc. Paving Equipment	2	8
Rollers	2	6
Pavers	1	8

Emissions generated from paving activity are presented in Table 5-1 (presented later in this report).

Paving activity will also result in a small amount of VOC emissions resulting from off-gassing emissions from the laying of pavement/asphalt. Based on URBEMIS 2007 model defaults, it is estimated that approximately 35 acres of the project site will be paved. Emissions from off-gassing emissions were calculated using the URBEMIS 2007 model.

Off-Site Construction Emissions

Off-Site activities include off-site grading activity and associated roadway and sidewalk paving. Off-site construction is expected to overlap, as a conservative measure with all other construction activities, the duration of off-site construction is expected to last a period of approximately two weeks. Based on discussion with the project team it is estimated that there will be approximately 4.65 acres of off-site construction activity with approximately ½ acre per day that will be disturbed/constructed. Emissions estimates for off-site construction activity were generated from the Road Construction Emissions Model, Version 6.3.2 developed by the Sacramento Metropolitan Air Quality Management District. The following pieces of equipment are expected from off-site construction activity.

Off-Site Equipment		
Description	**Qty**	**Hours/day**
Excavator	1	8
Grader	1	6
Loader	1	8
Scraper	1	8

Signal Board	3	8

Emissions generated from off-site activity are presented in Table 5-1 (presented later in this report). Detailed model outputs have also been included in and are available in Appendix "D"

Building Construction

Since detailed construction information was not available at this time, the URBEMIS 2007 model defaults for a project of similar size and scope were utilized and are as follows:

Building Equipment		
Description	**Qty**	**Hours/day**
Cranes	1	7
Forklifts	3	8
Generator Sets	1	8
Tractors/Loaders/Backhoes	3	7
Welder	1	8

Emissions generated from building construction activity are presented in Table 5-1 (presented later in this report).

Architectural Coatings

Emissions estimates for architectural coatings have been calculated using the URBEMIS 2007 model; worker trips during architectural coatings have also been included in calculations and are available in Appendix "D". VOCs from architectural coatings were estimated assuming that all 28 residential dwelling units were painted over the duration of approximately six months. The URBEMIS 2007 model calculates VOCs from architectural coatings based on the amount of square footage to be painted, in this instance, the model estimates approximately 3,645 square feet of interior painting will occur per unit, and 1,215 square feet of exterior painting will occur. See Table 5-1 for a summary of emissions resulting from architectural coating activity.

Construction Workers Commuting

Emissions for construction worker vehicles traveling to and from the project site were estimated assuming the maximum projected workers at each location traveling to and from the site each weekday. URBEMIS 2007 model defaults were used as a "worst-case" scenario for worker trips based on the number/type of equipment used and amount of area disturbed based on discussion with the project team. The trip length assumed for construction workers commuting is estimated by the URBEMIS 2007 emissions inventory model which estimates a one-way trip length for construction workers commuting of 16.8 miles.

Diesel-fired Particulates and Carcinogenic Impact

In order to assess the impact of particulate emissions throughout the surrounding community, air dispersion modeling using the U.S. EPA-approved SCREEN3 model was conducted. The model is a steady state Gaussian plume model utilized for estimating ground level impacts from point and fugitive sources. For purposes of this analysis, the model was used to calculate the maximum diesel-fired particulate matter concentrations associated with the worst-case phase of construction activity (grading).

To address spatial distributions and accommodate movement of equipment within the project boundary, a worst-case distribution of sensitive receptors was assumed per the model defaults from 20 to 1,000 meters from the source.

To represent the project construction area the area-source algorithm was used, the proposed project encompasses an area of approximately 140 acres to be graded (28 lots x 5 acres lot) or 566,560 square meters. Thus, an area source was programmed into the model to represent the 566,560 square meters (752.7m x 752.7m). Based on the on-site maximum diesel exhaust emissions levels, the emission rate for PM_{10} exhaust was programmed into the model in terms of grams per second per meter squared. To represent a "worst-case" scenario, diesel-fired PM_{10} emissions from rough grading activity (rough grading activity accounts for the highest single phase of diesel-fired PM_{10} levels) were modeled, rough grading activity is expected to result in 6.22 pounds of PM_{10} exhaust emissions per day which yields a 1.72909E-07

grams/second/meters squared value for use as an input into the SCREEN3 model (6.22 pounds/day / 8 hours/day / 3600 seconds/hour / 566,560 square meters x 453.592 grams/pound).

The SCREEN3 model estimates the maximum one-hour concentration downwind due to emissions from the source area for receptor locations of 20 to 1,000 meters. Since risk is derived as a function of annual average concentrations, the U.S. EPA and CARB recommend using a factor to convert the maximum 1-hour average concentration to an annual average. The U.S. EPA and CARB factors range from 0.06-0.1 with a recommended value of 0.08. Thus, for purposes of this analysis, the maximum one-hour predicted concentration from the SCREEN3 model of 1.499 $\mu g/m^3$ was multiplied by 0.08 per CARB recommendations, and the resulting annual average concentration of 0.011992 $\mu g/m^3$ was utilized in the risk calculation. For more information on the U.S. EPA and CARB guidance for converting one-hour concentrations to annual average concentrations please see Appendix "B" or visit the following website:
http://o3.arb.ca.gov/toxics/harp/docs/userguide/appendixH.pdf.

Health risks associated with exposure to carcinogenic compounds are defined in terms of the probability of developing cancer as a result of exposure to a chemical at a given concentration. The cancer risk probability is determined by multiplying the chemical's annual concentration by its unit risk factor (URF). The URF is a measure of carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It represents an upper-bound estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of one microgram per cubic meter ($\mu g/m^3$) over a 70 year lifetime. The URF utilized in this analysis was obtained from the California Environmental Protection Agency, Office of Environmental Health Hazard (OEHHA).

To conservatively represent exposures, an exposure frequency of 365 days and exposure duration of 365days (1 year) was assumed. For carcinogenic exposures associated with the maximum exposed individual (MEI), the risks were predicted to be 5.4E-07 (0.54 in one million) as presented on Table 5-2. Therefore risk estimates do not exceed the County of San Diego threshold of one in one million. See Appendix "C"

for a summary of SCREEN3 outputs for concentrations from construction activity previously discussed. It should be noted that neither CARB, nor the EPA has established guidelines for assessing short-term exposure to diesel-fired toxics; hence the URF that was used in this analysis is not necessarily representative as a URF for short-term exposures (i.e., one year), thus the calculated cancer risk probability is likely a conservative estimate. Table 5-2 summarizes the project-related carcinogenic impacts resulting from short-term construction activity.

An evaluation of the potential noncancer effect of chronic exposures was also conducted. Adverse health effects are evaluated by comparing a compound's annual concentration with its toxicity factor or Reference Exposure Level (REL). The REL for diesel particulates was obtained from OEHHA for this analysis.

To quantify noncarcinogenic impacts, the hazard index approach was used. The hazard index assumes that chronic subthreshold exposures adversely affect a specific organ or organ system. To calculate hazard index, the chemical concentration or dose is divided by its REL. Where the total equals or exceeds one, a health hazard is presumed to exist. For purposes of this analysis the hazard index for the respiratory endpoint totaled less than one and equals 2.5E-02 (0.025) see Noncarcinogenic Hazards Index (column k) on Table 5-2 for more details.

Construction Emission Summary

Assuming a "worst case" scenario where equipment was operated on average for 8 hours per day (unless otherwise noted) and overlap in all construction phases (except demolition and grading), along with other assumptions for construction activity by phase (previously mentioned) the project will not exceed the SLTs for construction activity, as presented in Table 5-1.

TABLE 5-1

SUMMARY OF CONSTRUCTION EMISSIONS
(POUNDS PER DAY) (WITH PROJECT DESIGN CONSIDERATIONS)

Construction Activities	VOC	NO_x	CO	SO_x	PM_{10*}	$PM_{2.5}$
Grading Activity						
Fugitive Dust	0	0	0	0	42.57	8.89
Off-Road Equipment	3.18	26.46	12.98	0	1.33	1.23
Worker Trips	0.04	0.07	1.18	0	0.01	0
Underground/Infrastructure Activity						
Off-Road Equipment	2.63	21.28	10.51	0	1.20	1.11
Worker Trips	0.04	0.06	1.10	0	0.01	0
Paving Activity						
Off-Gas Emissions	1.76	0	0	0	0	0
Off-Road Equipment	3.20	19.17	10.47	0	1.68	1.55
On-Road Equipment	0.38	5.81	1.96	0.01	0.25	0.21
Worker Trips	0.04	0.08	1.37	0	0.01	0.01
Off-Site Construction Activity						
Off-Site Construction	6.60	45.40	31.80	0	7.40	3.20
Building Construction Activity						
Off-Road Equipment	4.08	23.31	14.31	0	1.67	1.54
Vendor Trips	0.04	0.55	0.43	0	0.03	0.02
Worker Trips	0.14	0.24	4.43	0	0.03	0.02
Architectural Coatings Activity						
Architectural Coating	12.35	0	0	0	0	0
Worker Trips	0.01	0.01	0.16	0	0	0
Peak Day Mass Emissions	**34.49**	**142.44**	**90.70**	**0.01**	**56.19**	**17.78**
SD County Screening Level Thresholds (SLTs)	75	250	550	250	100	55
Significant?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Source: URBEMIS 2007 v 9.2.4 and Road Construction Emissions Model, Version 6.2.2 (See Appendix "D" for more details)

* Includes control efficiency for watering

TABLE 5-2

Quantification of Carcinogenic Risks and Noncarcinogenic Hazards (Short-Term Construction Activity)

Source	Maximum Concentration		Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards		
					URF	CPF	RISK	REL	RfD	Index
(a)	(ug/m3) (b)	(mg/m3) (c)	(d)	(e)	(ug/m3) (f)	(mg/kg/day) (g)	(h)	(ug/m3) (i)	(mg/kg/day) (j)	(k)
Diesel	0.1192	1.4E-04	1.00E+00	Particulates	3.0E-04	1.1E+00	5.4E-07	5.0E+00	1.4E-03	2.5E-02

Note: Exposure factors used to calculate contaminant intake

exposure frequency (days/year)	365
exposure duration (years)[1]	1
inhalation rate (m3/day)*	21.14
average body weight (kg)	70
averaging time$_{(cancer)}$ (days)	25550
averaging time$_{(noncancer)}$ (days)	365

[1]Equals 120 days of activity

*Inhalation Rate of 21.14 m3/day equates to the ARB breathing 302 liters per kilogram-day

5.2.1.3 Design Considerations

The following design considerations are required as part of the project construction activity:

- Adhere to best management practices which include the application of water on disturbed soils three times per day (3.2 hour watering interval), covering haul vehicles, replanting disturbed areas as soon as practical and restricting vehicle speeds on unpaved roads to 15 mph or less, to control fugitive dust.

- During construction activities, construction equipment shall be properly maintained to ensure proper timing and tuning of engines. Equipment maintenance records and equipment design specification data sheets shall be kept on-site during construction activity. It is conservatively estimated that keeping engines timed/tuned and reducing idling time will achieve a 5% reduction for emissions of VOCs, CO, NO_x, SO_x, and PM_{10} exhaust emissions during construction activity.

- During grading activities, chemical soil stabilizers shall be applied to inactive areas to reduce fugitive dust emissions. It is conservatively estimated that implementation of this measure will reduce PM_{10} and $PM_{2.5}$ fugitive dust emissions by approximately 84%.

- During construction activities, contractor shall ensure that all equipment on-site will not idle for more than five (5) minutes.

- Contractor shall ensure use of low-sulfur diesel fuel in construction equipment as required by the California Air Resources Board (CARB).

5.2.1.4 Conclusions

Under the assumed worst-case conditions, the project will not exceed the San Diego County SLTs during short-term construction activity and thus a less than significant impact is expected.

5.2.2 Operational Impacts

5.2.2.1 Guidelines for the Determination of Significance

Based on the County of San Diego Guidelines (County of San Diego, 2007), operational emissions impacts would be potentially significant if they exceed the quantitative screening-level thresholds for attainment pollutants (NO_X, SO_X, and CO), and would result in a significant impact if they exceed the screening-level thresholds for non-attainment pollutants (ozone precursors, PM_{10}, and $PM_{2.5}$).

5.2.2.2 Significance of Impacts Prior to Mitigation

Operational activities associated with the proposed project will result in emissions of VOCs, NO_X, CO, PM_{10}, $PM_{2.5}$ and SO_X. Operational emissions would therefore be expected from the following equipment and activities:

- Vehicle emissions
- Fugitive dust related to vehicular travel
- Combustion emissions associated with natural gas use
- Landscape maintenance equipment emissions
- Architectural Coatings

Vehicle Emissions

Project operational (vehicular) impacts are dependent on both overall daily vehicle trip generation and the effect of the project on peak hour traffic volumes and traffic operations in the vicinity of the project. The project related operational air quality impact centers on a worst-case 946 daily vehicle trips generated by the project with 27 vehicle trips in the AM and 34 vehicle trips in the PM. Trip characteristics were available from the report, Hoskings Ranch Traffic Analysis (KOA Corporation, February, 2011). Overall project daily emissions are evaluated first, followed by analysis of the potential peak hour "micro-scale" air quality impacts of the project (i.e. CO hotspot analysis). The trip length assumed for operational activity is estimated by the URBEMIS 2007 emissions inventory model which estimates a one-way trip length for home-to-work as 16.8 miles, home-to-shop as 7.1 miles, and home-to-other as 7.9 miles.

Fugitive Dust Related to Vehicular Travel

Vehicles traveling on paved roads would be a source of fugitive emissions due to the generation of road dust. The emissions estimate for travel on paved roads during operational activity was calculated using the URBEMIS 2007 model. The estimated PM_{10} and $PM_{2.5}$ emissions from vehicles for fugitive dust are provided in Appendix "E".

Combustion Emissions Associated with Natural Gas Use

Combustion emissions would be generated by the use of natural gas in the development. The emissions associated with natural gas use were calculated using the URBEMIS 2007 model. The estimated combustion emissions are provided in Tables 5-3 (presented later in this report). Detailed emission calculations are provided in Appendix "E".

Landscape Maintenance Emissions

Landscape maintenance equipment would generate emissions from fuel combustion and evaporation of unburned fuel. Equipment in this category would include lawnmowers, trailers, shedders/grinders, blowers, trimmers, chain saws, and hedge trimmers used to maintain the landscaping of the development. The emissions associated with landscape maintenance equipment were calculated based on assumptions provided in the URBEMIS 2007 model. Detailed emissions calculations are provided in Appendix "E".

Architectural Coatings

It is assumed that over a period of time the buildings that are part of this project will be subject to emissions resulting from the evaporation of solvents contained in paints, varnishes, primers, and other surface coatings as part of project maintenance. The emissions associated with architectural coatings were calculated using the URBEMIS 2007 model defaults.

CO Hotspot Analysis

Air pollutant emissions related to project traffic have the potential to create new, or worsen existing localized air quality. According to the County of San Diego Guidelines

for Determining Significance for Air Quality (March 19, 2007), the presence of either of the following conditions requires that a CO hotspot analysis be performed:

- Project will place receptors within 500 feet of a signalized intersection operating at or below level of service (LOS) E with over 3,000 peak-hour approach trips, or

- Project will result in intersections operating at LOS E or worse with intersection peak-hour approach trips exceeding 3,000

The proposed project is expected to generate only 27 trips in the AM peak hour and 34 trips in the PM peak hour. The results of the traffic analysis prepared by KOA Corporation also indicate that no intersections will operate at a LOS E or worse with a peak-hour approach volume exceeding 3,000 vehicles.

Since significant impacts would not occur at intersection with the highest potential for CO hotspot formation, no significant impacts are anticipated to occur at any other locations in the project vicinity as a result of the proposed project. Consequently, sensitive receptors would not be significantly affected by CO emissions generated by Project-related traffic.

Agricultural Use Impacts

A minimum of two potential agricultural uses have been identified for each lot, although no specific agricultural use is proposed. These consist of grazing, cattle breeding, orchards, vineyards, and greenhouses. Without more specific information, quantification of emissions associated with agricultural uses would be speculative at best. It is important to note that all agricultural uses will be subject to applicable APCD permit requirements and rules/regulations governing the storage and use of pesticides, herbicides, fertilizers, and any other materials deemed hazardous. Thus compliance with APCD rules and permit requirements will result in a less than significant impact.

Operational Emission Summary

The project-related operations emissions burdens, along with a comparison of significance thresholds, are shown in Tables 5-3. The estimated operational outputs are provided in Appendix “F”. The project related emissions will not exceed the San Diego County SLTs. Additionally, project related traffic is not expected to result in the creation of a CO hotspot.

TABLE 5-3

SUMMARY OF OPERATIONAL EMISSIONS (SUMMER)
(POUNDS PER DAY)

Operational Activities	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source Emissions [a]	41.05	0.38	2.95	0	0.01	0.01
Operational Emissions [b]	11.02	11.25	101.73	0.08	13.35	2.62
Peak Day Mass Emissions	**52.07**	**11.63**	**104.68**	**0.08**	**13.36**	**2.63**
SD County Screening Level Thresholds (SLTs)	75	250	550	250	100	55
Significant?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

[a] Includes emissions of natural gas, landscape maintenance equipment, and architectural coatings emissions

[b] Includes emissions of vehicle emissions and fugitive dust related to vehicular travel

SUMMARY OF OPERATIONAL EMISSIONS (WINTER)
(POUNDS PER DAY)

Operational Activities	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source Emissions [a]	54.16	0.62	15.04	0.02	2.04	1.97
Operational Emissions [b]	9.51	16.45	112.57	0.07	13.35	2.62
Peak Day Mass Emissions	**63.67**	**17.07**	**127.61**	**0.09**	**15.39**	**4.59**
SD County Screening Level Thresholds (SLTs)	75	250	550	250	100	55
Significant?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

[a] Includes emissions of natural gas, landscape maintenance equipment, and architectural coatings emissions

[b] Includes emissions of vehicle emissions and fugitive dust related to vehicular travel

Source: URBEMIS 2007 v 9.2.4 (See Appendix "E" for more details)

5.2.2.4 Conclusions

The project related emissions will not exceed the San Diego County SLTs during short-term construction or long-term operational activity. No mitigation is required.

5.3 Cumulatively Considerable Net Increase of Criteria Pollutants

5.3.1 Construction Impacts

5.3.1.1 Guidelines for the Determination of Significance

Section 4.3 of the document *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements Air Quality (March 19, 2007)*, indicates that the following guidelines must be used for determining the cumulatively considerable net increases during the construction phase:

- *A project that has a significant direct impact on air quality with regard to emissions of PM_{10}, $PM_{2.5}$, NO_x and/or VOCs, would also have a significant cumulatively considerable net increase.*

- *In the event direct impacts from a proposed project are less than significant, a project may still have a cumulatively considerable impact on air quality if the emissions of concern from the proposed project, in combination with the emissions of concern from other proposed projects or reasonably foreseeable future projects within a proximity relevant to the pollutants of concern, are in excess of the guidelines identified in Section 4.2.*

5.3.1.2 Significance of Impacts Prior to Mitigation

For construction activity, the proposed project complies with the first criterion as the project is not expected to result in emissions that will result in a significant direct impact on air quality with regard to emissions of PM_{10}, $PM_{2.5}$, NO_x and/or VOCs.

For the second criterion, the following evaluation was conducted:

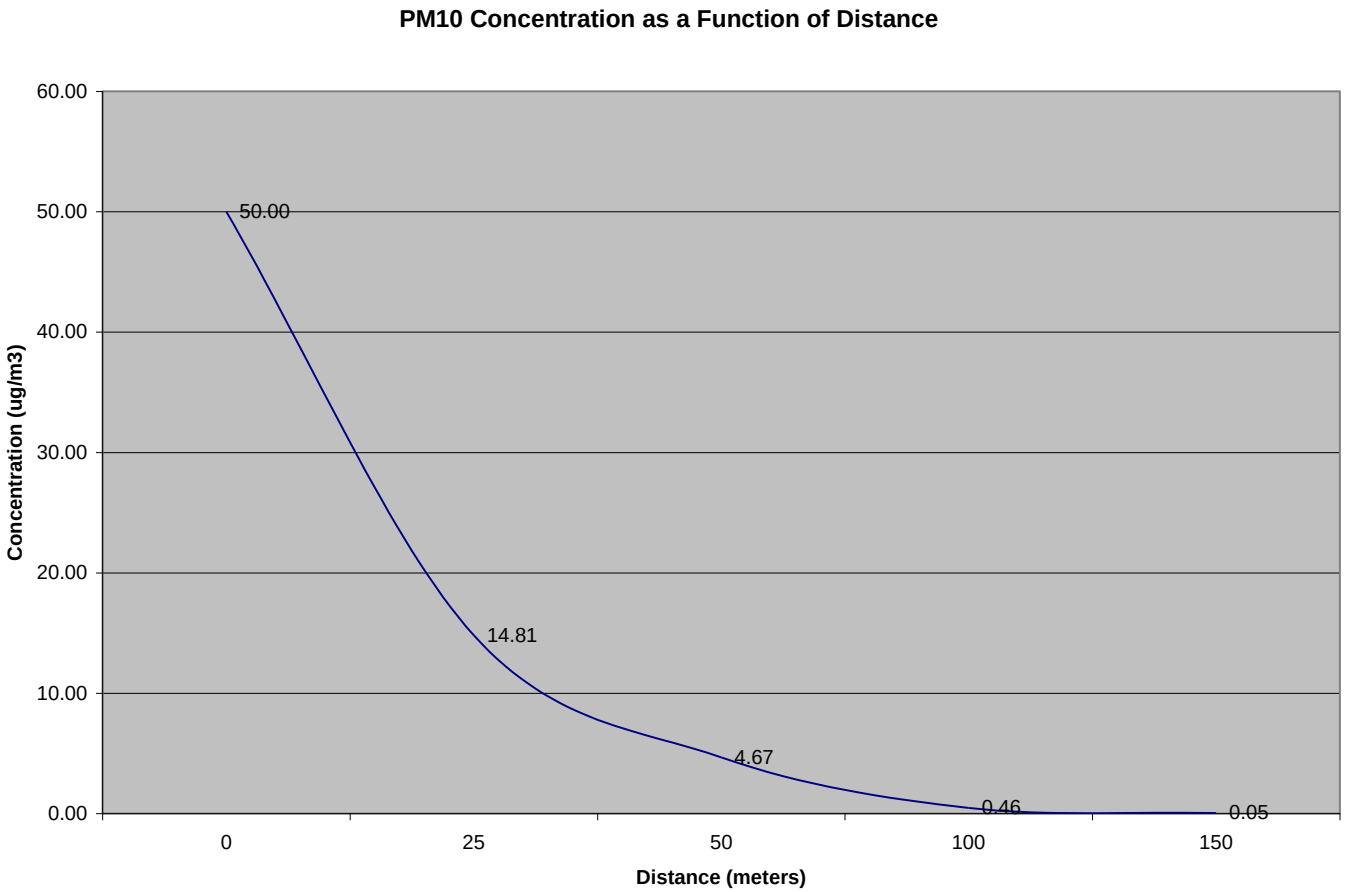
For PM_{10} fugitive dust emissions the following equation (Desert Research Institute, 1996), which is also utilized by the South Coast Air Quality Management District for purposes of determining localized PM_{10} concentrations, was used to describe the change in PM_{10} concentration versus downwind distance:

$$C_x = 0.9403\ C_0\ e^{-0.0462\ X}$$

- C_x is the predicted PM_{10} concentration at X meters from the fence line;
- C_0 is the PM_{10} concentration at the fence line;
- e is the natural logarithm (2.71828);
- X is the distance in meters from the fence line (project boundary).

Since dispersion modeling required to determine C_0 was not conducted since the proposed project does not exceed the SLTs, a comparative analysis to illustrate the change in PM_{10} concentration as a function of distance is utilized for purposes of this analysis. Arbitrarily assuming that C_0 = 50 micrograms per cubic meter ($\mu g/m^3$)

As shown in the graph below, fugitive PM_{10} concentrations decrease by 90% from the project boundary within 50 meters (165 feet) of the source. At 100 meters (330 feet) PM_{10} concentrations decrease by 99%, beyond 100 meters concentrations approach zero. No cumulative contribution of PM_{10} beyond 150 meters would be physically possible.



Furthermore, emissions associated with construction activity are by nature short-term in duration, more specifically, PM_{10} emissions (as previously discussed) tend to settle out in close proximity to the source. For purposes of this analysis the source would be the grading area which the project is expected to disturb on any given day. Thus, in order for even the potential for cumulative PM_{10} impacts to occur, simultaneous construction/grading would need to occur on both a parcel of the proposed project site and on another parcel that is located directly adjacent (within 330 feet) to the project site. There are no proposed projects within 330 feet of the project site that could result in a cumulatively considerable contribution of PM_{10}.

Additionally, project design considerations identified for the proposed project would remain applicable, and other cumulative projects would also need to comply with local ordinances prohibiting nuisances or requiring dust control. These measures will further reduce the cumulative effect of fugitive PM_{10} emissions.

Based on the aforementioned analysis and criterion, the proposed project is not expected to have a cumulatively considerable impact during short-term construction activity.

5.3.1.3 Design Considerations

The following design considerations are required in order to maintain emissions levels within acceptable limits:

- Adhere to best management practices which include the application of water on disturbed soils three times per day (3.2 hour watering interval), covering haul vehicles, replanting disturbed areas as soon as practical and restricting vehicle speeds on unpaved roads to 15 mph or less, to control fugitive dust.

- During construction activities, construction equipment shall be properly maintained to ensure proper timing and tuning of engines. Equipment maintenance records and equipment design specification data sheets shall be kept on-site during construction activity. It is conservatively estimated that keeping engines timed/tuned and reducing idling time will achieve a 5% reduction for emissions of VOCs, CO, NO_x, SO_x, PM_{10}, and $PM_{2.5}$ exhaust emissions during construction activity.

- During construction activities, contractor shall ensure that all equipment on-site will not idle for more than five (5) minutes.

- Contractor shall ensure use of low-sulfur diesel fuel in construction equipment as required by the California Air Resources Board (CARB).

5.3.1.4 Conclusions

Based on the aforementioned analysis and criterion, the proposed project is not expected to have a cumulatively considerable impact during short-term construction activity.

5.3.2 Operational Impacts

5.3.2.1 Guidelines for the Determination of Significance

Section 4.3 of the document *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements Air Quality (March 19, 2007)*, indicates that the following guidelines must be used for determining the cumulatively considerable net increases during the operational phase:

- *A project that does not conform to the RAQS and/or has a significant direct impact on air quality with regard to operational emissions of PM_{10}, $PM_{2.5}$, NO_x, and/or VOCs, would also have a significant cumulatively considerable net increase.*

- *Projects that cause road intersections or roadway segments to operate at or below a LOS E and create a CO "hotspot" create a cumulatively considerable net increase of CO.*

County guidelines state further that, it is assumed that a project which conforms to the County of San Diego General Plan, and does not have emissions exceeding the SLTs, will not create a cumulatively considerable net increase in criteria pollutants since emissions were accounted for in the RAQS.

5.3.2.2 Significance of Impacts Prior to Mitigation

For operational activity, the proposed project complies with the first criterion as the project is not expected to result in a significant direct impact on air quality with regard to emissions of VOCs, CO, PM_{10}, and $PM_{2.5}$. The project is also consistent with SANDAG growth projections for the project area and hence is consistent with the RAQS forecast. Based on the operational emissions, this project results in a less than significant cumulatively considerable impact.

It should be noted that the results of the analysis indicate no CO "hotspots" are expected to form as a result of cumulative and project-related traffic.

5.3.2.3 Conclusions

The proposed project is not expected to result in any emissions that exceed the SLTs for operational activity, thus no additional design considerations or mitigation measures are required.

5.4 Impacts to Sensitive Receptors

5.4.1 Guidelines for the Determination of Significance

The potential impact of the project on sensitive receptors has also been considered. Sensitive receptors can include uses such as long term health care facilities, rehabilitation centers, and retirement homes. Residences, schools, playgrounds, child care centers, and athletic facilities are also considered to be sensitive receptors. In evaluating impacts to sensitive receptors, the two primary emissions of concern are CO and diesel particulate matter.

5.4.2 Significance of Impacts Prior to Mitigation

Since the proposed project does not exceed any of the SLTs a less than significant impact to sensitive receptors is expected.

5.4.3 Conclusions

Based on the aforementioned analysis and criterion, the proposed project will not result in a significant impact to sensitive receptors.

5.5 Odor Impacts

5.5.1 Guidelines for the Determination of Significance

The potential impact of the project on sensitive receptors has also been considered. Sensitive receptors can include uses such as long term health care facilities, rehabilitation centers, and retirement homes. Residences, schools, playgrounds, child care centers, and athletic facilities are also considered to be sensitive receptors. In evaluating impacts to sensitive receptors, the two primary emissions of concern are CO and diesel particulate matter.

Section 4.5 of the document *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements Air Quality (March 19, 2007)*, indicates that, in general, a project will not have a significant odor impact if the following are true:

- *The project which is not an agricultural, commercial or an industrial activity subject to SDAPCD standards, as a result of implementation will either generate objectionable odors or place sensitive receptors next to existing objectionable odors, which will affect a considerable number of persons or the public.*

APCD Rule 51 (Public Nuisance) and California Health & Safety Code, Division 26, Part 4, Chapter 3, Section §41700 prohibit the emission of any material which causes nuisance to a considerable number of persons or endangers the comfort, health or safety of the public. Projects required to obtain permits from APCD, typically industrial and some commercial projects, are evaluated by APCD staff for potential odor nuisance and conditions may be applied (or control equipment required) where necessary to prevent occurrence of public nuisance.

As stated in the County's guidance odor issues are very subjective by the nature of odors themselves and their measurements are difficult to quantify. As a result, the guideline is qualitative and each project is reviewed on an individual basis, focusing on the existing and potential surrounding uses and location of sensitive receptors.
For the proposed project, notice is required under the Agricultural Enterprises and Consumer Information Ordinance. The owner shall notify each prospective purchaser about potential agricultural operational issues that may occur on surrounding property and onsite in writing as follows:

Agricultural operations are located throughout the unincorporated area of San Diego County and are often conducted on relatively small parcels. The subject property is also located in the unincorporated area and, as such, is likely to be located near an agricultural enterprise, activity, operation, or facility or appurtenances thereof (collectively, "agricultural use"). Occupants of the property to be purchased may be exposed to inconveniences, irritations or discomforts arising from the agricultural use, including but not limited to noise, odors, fumes, dust, smoke, insects, rodents, the operation of machinery of any kind (including aircraft) during any 24 hour period, the storage and disposal of manure, and the application by spraying or other means of agricultural chemicals, such as pesticides and fertilizers. Purchasers of the property may

be required to accept such inconveniences, irritations and discomforts, unless the agricultural use constitutes a public or private nuisance under the provisions of Section 3482.5 of the Civil Code or Section 63.403 of the San Diego County Code.

5.5.2 Significance of Impacts Prior to Mitigation

On the basis of the preceding discussion, the project is not expected to have a significant odor impact. Any odors associated with the project and adjacent land uses are incidental and expected by future tenants and will be subject to applicable APCD rules and public notification under the Agricultural Enterprises and Consumer Information Ordinance.

5.5.3 Design Considerations

Since the project does not result in any significant impacts without mitigation, mitigation measures are not required.

5.5.4 Conclusions

Based on the aforementioned analysis and criterion, the proposed project is not expected to result in a significant odor impact.

6.0 PROJECT ALTERNATIVE IMPACT ANALYSIS

6.1 Conformance to the Regional Air Quality Strategy

A determination of whether the potential emissions resulting from operations of the proposed project would result in a significant impact is based on an evaluation of the extent to which the proposed project conforms to existing regional or local plans.

The proposed project was assessed to determine consistency with the proposed SANDAG projections for growth within the area; after careful review it has been determined that the project is consistent with the growth projections and therefore does satisfies consistency with the RAQS. This determination is based on a careful review of the SANDAG growth projections and the reasonably foreseeable cumulative projects in the County Community Planning Area (CPA). The Julian CPA, in which the proposed project is located, consists of approximately 1,551 single family residential units (in 2008). SANDAG projections indicate that residential demand will continue to increase in the Julian CPA through the year 2030, when it is estimated that the Julian CPA will consist of approximately 1,980 single family residential units. As a result, it is expected that an additional 429 single family residential dwelling units will be developed between 2008 and 2030. It should be noted that the proposed project along with reasonably foreseeable projects in the local vicinity are not expected to develop more than the required 429 single family residential dwelling units by the year 2030. Since the project along with other cumulative projects do not plan to develop in excess of 429 single family residential dwelling units, it is assumed that the project does not conflict with the RAQS as the growth projections do not exceed those in the RAQS. See Appendix "A" for more details on the Julian CPA.

6.2 Conformance to Federal and State Ambient Air Quality Standards

6.2.1 Construction Impacts

It is assumed that the construction of 35 single-family estate dwelling units will be consistent with the construction analysis provided in Section 5.0 of this report for the proposed project which includes 28 single-family estate dwelling units and 305.15 acres of agricultural use. Although the addition of 7 single-family estate dwelling units may result in additional days of

construction activity, it is assumed that the alternative project scenario would not require additional daily disturabance or construction activity. Therefore the results in Section 5.0 of this report would be consistent with impacts expected from the project alternative.

Therefore, as previously noted, the project alternative would result in a less than significant impact.

6.2.2 Operational Impacts

6.2.2.1 Guidelines for the Determination of Significance

Based on the County of San Diego Guidelines (County of San Diego, 2007), operational emissions impacts would be potentially significant if they exceed the quantitative screening-level thresholds for attainment pollutants (NO_X, SO_X, and CO), and would result in a significant impact if they exceed the screening-level thresholds for non-attainment pollutants (ozone precursors, PM_{10}, and $PM_{2.5}$).

6.2.2.2 Significance of Impacts Prior to Mitigation

Operational activities associated with the proposed project will result in emissions of VOCs, NO_X, CO, PM_{10}, $PM_{2.5}$ and SO_X. Operational emissions would therefore be expected from the following equipment and activities:

- Vehicle emissions
- Fugitive dust related to vehicular travel
- Combustion emissions associated with natural gas use
- Landscape maintenance equipment emissions
- Architectural Coatings

Vehicle Emissions

Project operational (vehicular) impacts are dependent on both overall daily vehicle trip generation and the effect of the project on peak hour traffic volumes and traffic operations in the vicinity of the project. The project related operational air quality impact centers on a worst-case 420 daily vehicle trips generated by the project with 34 vehicle trips in the AM and 42 vehicle trips in the PM. Trip characteristics were available from the report, Hoskings Ranch Traffic Analysis (KOA Corporation, February, 2011). Overall

project daily emissions are evaluated first, followed by analysis of the potential peak hour "micro-scale" air quality impacts of the project (i.e. CO hotspot analysis). The trip length assumed for operational activity is estimated by the URBEMIS 2007 emissions inventory model which estimates a one-way trip length for home-to-work as 16.8 miles, home-to-shop as 7.1 miles, and home-to-other as 7.9 miles.

Fugitive Dust Related to Vehicular Travel

Vehicles traveling on paved roads would be a source of fugitive emissions due to the generation of road dust. The emissions estimate for travel on paved roads during operational activity was calculated using the URBEMIS 2007 model. The estimated PM_{10} and $PM_{2.5}$ emissions from vehicles for fugitive dust are provided in Appendix "E".

Combustion Emissions Associated with Natural Gas Use

Combustion emissions would be generated by the use of natural gas in the development. The emissions associated with natural gas use were calculated using the URBEMIS 2007 model. The estimated combustion emissions are provided in Tables 5-3 (presented later in this report). Detailed emission calculations are provided in Appendix "E".

Landscape Maintenance Emissions

Landscape maintenance equipment would generate emissions from fuel combustion and evaporation of unburned fuel. Equipment in this category would include lawnmowers, trailers, shedders/grinders, blowers, trimmers, chain saws, and hedge trimmers used to maintain the landscaping of the development. The emissions associated with landscape maintenance equipment were calculated based on assumptions provided in the URBEMIS 2007 model. Detailed emissions calculations are provided in Appendix "E".

Architectural Coatings

It is assumed that over a period of time the buildings that are part of this project will be subject to emissions resulting from the evaporation of solvents contained in paints, varnishes, primers, and other surface coatings as part of project maintenance. The

emissions associated with architectural coatings were calculated using the URBEMIS 2007 model defaults.

CO Hotspot Analysis

Air pollutant emissions related to project traffic have the potential to create new, or worsen existing localized air quality. According to the County of San Diego Guidelines for Determining Significance for Air Quality (March 19, 2007), the presence of either of the following conditions requires that a CO hotspot analysis be performed:

- Project will place receptors within 500 feet of a signalized intersection operating at or below level of service (LOS) E with over 3,000 peak-hour approach trips, or
- Project will result in intersections operating at LOS E or worse with intersection peak-hour approach trips exceeding 3,000

The proposed project is expected to generate only 34 trips in the AM peak hour and 42 trips in the PM peak hour. The results of the traffic analysis prepared by KOA Corporation also indicate that no intersections will operate at a LOS E or worse with a peak-hour approach volume exceeding 3,000 vehicles.

Since significant impacts would not occur at intersection with the highest potential for CO hotspot formation, no significant impacts are anticipated to occur at any other locations in the project vicinity as a result of the proposed project. Consequently, sensitive receptors would not be significantly affected by CO emissions generated by Project-related traffic.

Operational Emission Summary

The project-related operations emissions burdens, along with a comparison of significance thresholds, are shown in Tables 6-1. The estimated operational outputs are provided in Appendix “F”. The project related emissions will not exceed the San Diego County SLTs. Additionally, project related traffic is not expected to result in the creation of a CO hotspot.

TABLE 6-1

PROJECT ALTERNATIVE

SUMMARY OF OPERATIONAL EMISSIONS (SUMMER)
(POUNDS PER DAY)

Operational Activities	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source Emissions [a]	2.52	0.46	1.75	0	0	0
Operational Emissions [b]	4.60	6.41	59.18	0.04	7.77	1.52
Peak Day Mass Emissions	**7.12**	**6.87**	**60.93**	**0.04**	**7.77**	**1.52**
SD County Screening Level Thresholds (SLTs)	75	250	550	250	100	55
Significant?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

[a] Includes emissions of natural gas, landscape maintenance equipment, and architectural coatings emissions

[b] Includes emissions of vehicle emissions and fugitive dust related to vehicular travel

SUMMARY OF OPERATIONAL EMISSIONS (WINTER)
(POUNDS PER DAY)

Operational Activities	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source Emissions [a]	19.07	0.78	18.80	0.03	2.55	2.46
Operational Emissions [b]	5.34	9.41	63.68	0.04	7.77	1.52
Peak Day Mass Emissions	**24.41**	**10.19**	**82.48**	**0.07**	**10.32**	**3.98**
SD County Screening Level Thresholds (SLTs)	75	250	550	250	100	55
Significant?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

[a] Includes emissions of natural gas, landscape maintenance equipment, and architectural coatings emissions

[b] Includes emissions of vehicle emissions and fugitive dust related to vehicular travel

Source: URBEMIS 2007 v 9.2.4 (See Appendix "E" for more details)

6.2.2.3 Conclusions

The project related emissions will not exceed the San Diego County SLTs during short-term construction or long-term operational activity. No mitigation is required.

6.3 Cumulatively Considerable Net Increase of Criteria Pollutants

6.3.1 Construction Impacts

6.3.1.1 Guidelines for the Determination of Significance

Section 4.3 of the document *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements Air Quality (March 19, 2007)*, indicates that the following guidelines must be used for determining the cumulatively considerable net increases during the construction phase:

- *A project that has a significant direct impact on air quality with regard to emissions of PM_{10}, $PM_{2.5}$, NO_x and/or VOCs, would also have a significant cumulatively considerable net increase.*

- *In the event direct impacts from a proposed project are less than significant, a project may still have a cumulatively considerable impact on air quality if the emissions of concern from the proposed project, in combination with the emissions of concern from other proposed projects or reasonably foreseeable future projects within a proximity relevant to the pollutants of concern, are in excess of the guidelines identified in Section 4.2.*

6.3.1.2 Significance of Impacts Prior to Mitigation

For construction activity, the proposed project complies with the first criterion as the project is not expected to result in emissions that will result in a significant direct impact on air quality with regard to emissions of PM_{10}, $PM_{2.5}$, NO_x and/or VOCs.

For the second criterion, the following evaluation was conducted:

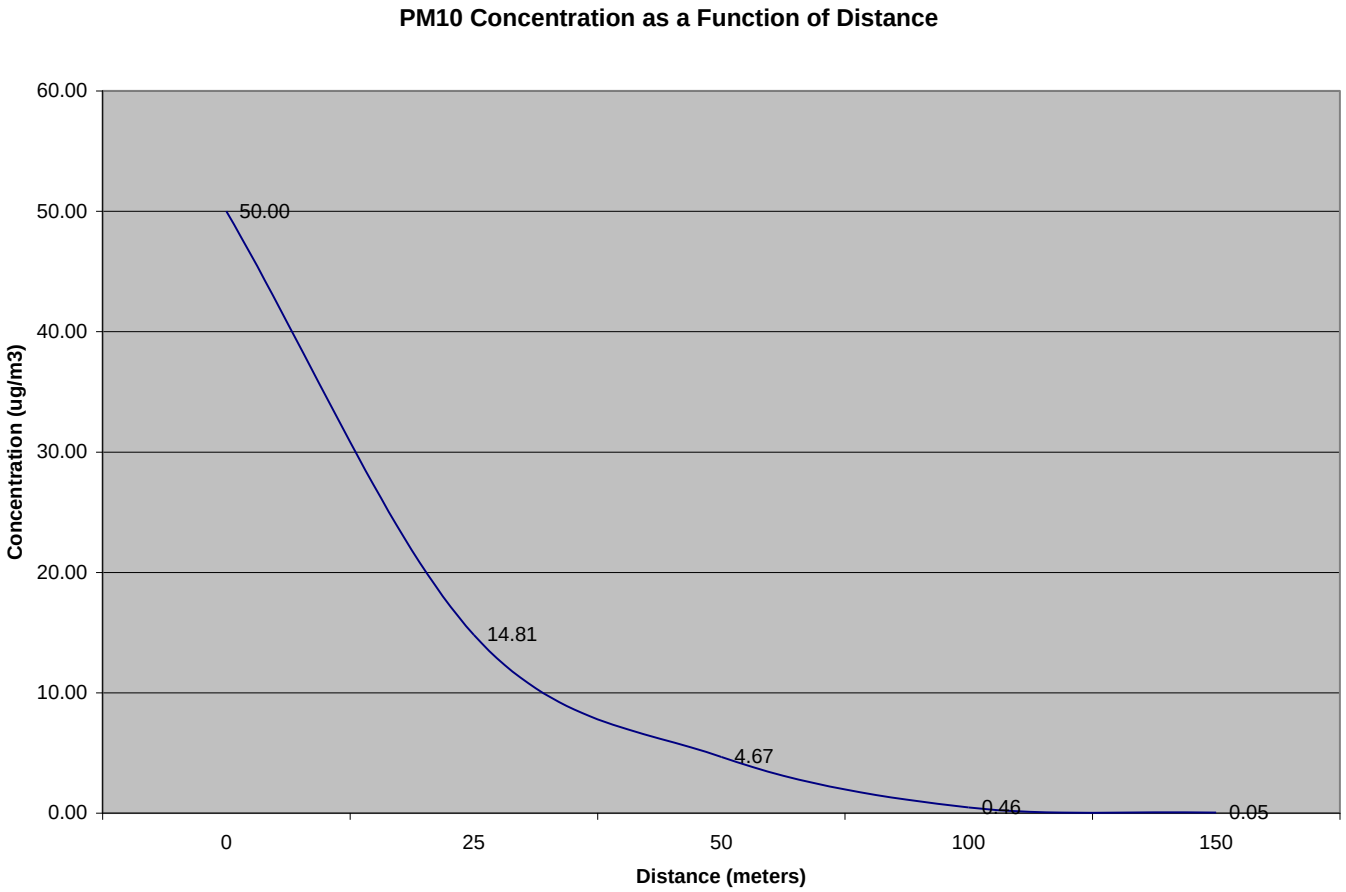
For PM_{10} fugitive dust emissions the following equation (Desert Research Institute, 1996), which is also utilized by the South Coast Air Quality Management District for purposes of determining localized PM_{10} concentrations, was used to describe the change in PM_{10} concentration versus downwind distance:

$$C_x = 0.9403\ C_0\ e^{-0.0462\ X}$$

- C_x is the predicted PM_{10} concentration at X meters from the fence line;
- C_0 is the PM_{10} concentration at the fence line;
- e is the natural logarithm (2.71828);
- X is the distance in meters from the fence line (project boundary).

Since dispersion modeling required to determine C_0 was not conducted since the proposed project does not exceed the SLTs, a comparative analysis to illustrate the change in PM_{10} concentration as a function of distance is utilized for purposes of this analysis. Arbitrarily assuming that C_0 = 50 micrograms per cubic meter ($\mu g/m^3$)

As shown in the graph below, fugitive PM_{10} concentrations decrease by 90% from the project boundary within 50 meters (165 feet) of the source. At 100 meters (330 feet) PM_{10} concentrations decrease by 99%, beyond 100 meters concentrations approach zero. No cumulative contribution of PM_{10} beyond 150 meters would be physically possible.



Furthermore, emissions associated with construction activity are by nature short-term in duration, more specifically, PM_{10} emissions (as previously discussed) tend to settle out in close proximity to the source. For purposes of this analysis the source would be the grading area which the project is expected to disturb on any given day. Thus, in order for even the potential for cumulative PM_{10} impacts to occur, simultaneous construction/grading would need to occur on both a parcel of the proposed project site and on another parcel that is located directly adjacent (within 330 feet) to the project site. There are no proposed projects within 330 feet of the project site that could result in a cumulatively considerable contribution of PM_{10}.

Additionally, project design considerations identified for the proposed project would remain applicable, and other cumulative projects would also need to comply with local ordinances prohibiting nuisances or requiring dust control. These measures will further reduce the cumulative effect of fugitive PM_{10} emissions.

Based on the aforementioned analysis and criterion, the proposed project is not expected to have a cumulatively considerable impact during short-term construction activity.

6.3.1.3 Design Considerations

The following design considerations are required in order to maintain emissions levels within acceptable limits:

- Adhere to best management practices which include the application of water on disturbed soils three times per day (3.2 hour watering interval), covering haul vehicles, replanting disturbed areas as soon as practical and restricting vehicle speeds on unpaved roads to 15 mph or less, to control fugitive dust.

- During construction activities, construction equipment shall be properly maintained to ensure proper timing and tuning of engines. Equipment maintenance records and equipment design specification data sheets shall be kept on-site during construction activity. It is conservatively estimated that keeping engines timed/tuned and reducing idling time will achieve a 5% reduction for emissions of VOCs, CO, NO_x, SO_x, PM_{10}, and $PM_{2.5}$ exhaust emissions during construction activity.

- During construction activities, contractor shall ensure that all equipment on-site will not idle for more than five (5) minutes.

- Contractor shall ensure use of low-sulfur diesel fuel in construction equipment as required by the California Air Resources Board (CARB).

6.3.1.4 Conclusions

Based on the aforementioned analysis and criterion, the proposed project is not expected to have a cumulatively considerable impact during short-term construction activity.

6.4.1. Operational Impacts

6.4.1.1 Guidelines for the Determination of Significance

Section 4.3 of the document *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements Air Quality (March 19, 2007)*, indicates that the following guidelines must be used for determining the cumulatively considerable net increases during the operational phase:

- *A project that does not conform to the RAQS and/or has a significant direct impact on air quality with regard to operational emissions of PM_{10}, $PM_{2.5}$, NO_x, and/or VOCs, would also have a significant cumulatively considerable net increase.*

- *Projects that cause road intersections or roadway segments to operate at or below a LOS E and create a CO "hotspot" create a cumulatively considerable net increase of CO.*

County guidelines state further that, it is assumed that a project which conforms to the County of San Diego General Plan, and does not have emissions exceeding the SLTs, will not create a cumulatively considerable net increase in criteria pollutants since emissions were accounted for in the RAQS.

6.4.1.2 Significance of Impacts Prior to Mitigation

For operational activity, the proposed project complies with the first criterion as the project is not expected to result in a significant direct impact on air quality with regard to emissions of VOCs, CO, PM_{10}, and $PM_{2.5}$. The project is also consistent with SANDAG growth projections for the project area and hence is consistent with the RAQS forecast. Based on the operational emissions, this project results in a less than significant cumulatively considerable impact.

It should be noted that the results of the analysis indicate no CO "hotspots" are expected to form as a result of cumulative and project-related traffic.

6.4.1.3 Conclusion

The proposed project is not expected to result in any emissions that exceed the SLTs for operational activity, thus no additional design considerations or mitigation measures are required.

6.5 Impacts to Sensitive Receptors

6.5.1 Guidelines for the Determination of Significance

The potential impact of the project on sensitive receptors has also been considered. Sensitive receptors can include uses such as long term health care facilities, rehabilitation centers, and retirement homes. Residences, schools, playgrounds, child care centers, and athletic facilities are also considered to be sensitive receptors. In evaluating impacts to sensitive receptors, the two primary emissions of concern are CO and diesel particulate matter.

6.5.2 Significance of Impacts Prior to Mitigation

Since the proposed project does not exceed any of the SLTs a less than significant impact to sensitive receptors is expected.

6.5.3 Conclusions

Based on the aforementioned analysis and criterion, the proposed project will not result in a significant impact to sensitive receptors.

6.6 Odor Impacts

6.6.1 Guidelines for the Determination of Significance

The potential impact of the project on sensitive receptors has also been considered. Sensitive receptors can include uses such as long term health care facilities, rehabilitation centers, and retirement homes. Residences, schools, playgrounds, child care centers, and athletic facilities are also considered to be sensitive receptors. In evaluating impacts to sensitive receptors, the two primary emissions of concern are CO and diesel particulate matter.

Section 4.5 of the document *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements Air Quality (March 19, 2007)*, indicates that, in general, a project will not have a significant odor impact if the following are true:

- *The project which is not an agricultural, commercial or an industrial activity subject to SDAPCD standards, as a result of implementation will either generate objectionable odors or place sensitive receptors next to existing objectionable odors, which will affect a considerable number of persons or the public.*

APCD Rule 51 (Public Nuisance) and California Health & Safety Code, Division 26, Part 4, Chapter 3, Section §41700 prohibit the emission of any material which causes nuisance to a considerable number of persons or endangers the comfort, health or safety of the public. Projects required to obtain permits from APCD, typically industrial and some commercial projects, are evaluated by APCD staff for potential odor nuisance and conditions may be applied (or control equipment required) where necessary to prevent occurrence of public nuisance.

As stated in the County's guidance odor issues are very subjective by the nature of odors themselves and their measurements are difficult to quantify. As a result, the guideline is qualitative and each project is reviewed on an individual basis, focusing on the existing and potential surrounding uses and location of sensitive receptors.

For the proposed project, notice is required under the Agricultural Enterprises and Consumer Information Ordinance. The owner shall notify each prospective purchaser about potential agricultural operational issues that may occur on surrounding property and onsite in writing as follows:

Agricultural operations are located throughout the unincorporated area of San Diego County and are often conducted on relatively small parcels. The subject property is also located in the unincorporated area and, as such, is likely to be located near an agricultural enterprise, activity, operation, or facility or appurtenances thereof (collectively, "agricultural use"). Occupants of the property to be purchased may be exposed to inconveniences, irritations or discomforts arising from the agricultural use, including but not limited to noise, odors, fumes, dust, smoke, insects, rodents, the operation of machinery of any kind (including aircraft) during any 24 hour period, the storage and disposal of manure, and the application by spraying or other means of

agricultural chemicals, such as pesticides and fertilizers. Purchasers of the property may be required to accept such inconveniences, irritations and discomforts, unless the agricultural use constitutes a public or private nuisance under the provisions of Section 3482.5 of the Civil Code or Section 63.403 of the San Diego County Code.

6.6.2 Significance of Impacts Prior to Mitigation

On the basis of the preceding discussion, the project is not expected to have a significant odor impact. Any odors associated with the project and adjacent land uses are incidental and expected by future tenants and will be subject to applicable APCD rules and public notification under the Agricultural Enterprises and Consumer Information Ordinance.

6.6.3 Design Considerations

Since the project does not result in any significant impacts without mitigation, mitigation measures are not required.

6.6.4 Conclusions

Based on the aforementioned analysis and criterion, the proposed project is not expected to result in a significant odor impact.

7.0 SUMMARY OF RECOMMENDED PROJECT DESIGN FEATURES, IMPACTS, AND MITIGATION

During construction of the proposed project, emissions will result from fugitive dust during the grading phase, heavy equipment usage, and construction workers commuting to and from the site. During short-term construction activity, it is anticipated that emissions will not exceed the criteria pollutant thresholds established by the County of San Diego CEQA Guidelines for Determining Significance for Air Quality, and therefore a less than significant impact is expected.

Additionally, emissions will result from the operation of the proposed project. Most of these emissions are the result of project related traffic, but also include emissions resulting from natural gas usage, landscaping equipment, and repainting. Emissions generated during long-term project operational activity are not expected to exceed significance thresholds for criteria pollutant emissions. It should be noted that results of the analysis indicate that the project will not result in a CO "hotspot," thus the project is not expected to result in adverse impacts for emissions of CO. Based on County of San Diego significance thresholds, since the project does not exceed San Diego County Screening Level Thresholds (SLTs), the project will not result in a significant impact.

A screening-level health risk assessment was conducted to determine the potential for the project to result in a significant impact on nearby sensitive receptors during short-term construction activity. For purposes of this analysis, the primary pollutant of concern is diesel particulate matter (DPM) which is emitted by the operation of heavy diesel equipment during construction activity. The results of the health risk assessment indicate that the proposed project will not result in a significant impact to nearby sensitive receptors during short-term construction activity.

The analysis also concluded that the proposed project will not result in a significant odor impact.

An alternative with no agricultural use and a higher intensity of 35 single-family dwelling units has also been analyzed. Results of the alternative analysis are consistent with the findings for the proposed project, as noted above. The alternative analysis is provided in Section 6.0 of this report.

APPENDIX A

SANDAG Data Warehouse Information

County CPA	Year	total pop	H total pop	NH total pop	total hh pop	total gq pop	total hh	total hh	total house stock	total house stock	sf	mf	mh & other	sf occ	mf occ	mh & other occ	total vac	total pph	total pph	res dens
Julian	2000	3104	233	2871	3064	40	1265	1265	1822	1822	1638	45	139	1144	33	88	557	2.42	2.42	0.4
Julian	2004	3048	395	2653	3024	24	1240	1240	1772	1772	1553	147	72	1081	117	42	532	2.44	2.44	0.3
Julian	2008	3049	531	2518	3019	30	1168	1168	1686	1686	1551	116	19	1084	73	11	518	2.58	2.58	
Julian	2010	3194	455	2739	3153	41	1292	1292	1803	1803	1583	147	73	1128	121	43	511	2.44	2.44	0.3
Julian	2020	4287	594	3693	4240	47	1697	1697	1853	1853	1625	143	85	1495	128	74	156	2.5	2.5	0.3
Julian	2030	4994	599	4395	4931	63	1872	1872	2210	2210	1980	143	87	1676	122	74	338	2.63	2.63	0.2

Return To Data Warehouse

Table Key

Heading	Definition
total pop	total population
H total pop	Hispanic population
NH total pop	Non-Hispanic population
total hh pop	total household population
total gq pop	group quarters population
total hh	total households (occupied housing units)
total hh	total households (occupied housing units)
total house stock	housing stock / total housing units
total house stock	housing stock / total housing units
sf	housing stock - single family
mf	housing stock - multi family
mh & other	mobile homes & other housing stock
sf occ	occupied single family housing units
mf occ	occupied multi family housing units
mh & other occ	occupied mobile homes & other housing units
total vac	housing stock - vacant
total pph	persons per household - occupied housing units
total pph	persons per household - occupied housing units
res dens	residential density (housing units per residential acre)

APPENDIX B

CARB Recommended Conversion Factors
for One-Hour Average to Annual Average Concentrations

Appendix H

Recommendations for Estimating Concentrations of Longer Averaging Periods from the Maximum One-Hour Concentration for Screening Purposes

A. Introduction

The U.S. Environmental Protection Agency (U.S. EPA) SCREEN3 air dispersion model is frequently used to estimate the maximum one-hour concentration downwind due to emissions from a point source to assess impacts from a source. The SCREEN3 model results (or ISCST3 with screening meteorological data), in conjunction with the U.S. EPA screening factors, are frequently used to estimate concentrations for longer averaging periods, such as the maximum annual average concentration. In addition, it is permissible to use the ISCST3 air dispersion model in a screening mode with identical meteorological conditions as used in the SCREEN3 model to superimpose results from multiple sources.

This method to assess short-term and long-term impacts may be used as a first-level screening indicator to determine if a more refined analysis is necessary. In the event that representative meteorological data are not available, the screening assessment may be the only computer modeling method available to assess source impacts.

In California, this standard procedure will generally bias concentrations towards overprediction in most cases when the source is a continuous release. However, in the case when a source is not continuous, these screening factors may not be biased towards overprediction. In this case, we recommend an alternative procedure for estimating screening value concentrations for longer averaging periods than one-hour for intermittent releases.

B. Current Procedures

The current screening factors used to estimate longer term averages (i.e., 3-hour, 8-hour, 24-hour, 30-day, and annual averages) from maximum one-hour concentrations in California are shown in Table H.1 and Figure H.1. The factors are U.S. EPA recommended values with the exception of the 30-day factor. The 30-day factor is an ARB recommended value (ARB, 1994). The maximum and minimum values are recommended limits to which one may diverge from the general (Rec.) case, (U.S. EPA, 1992). Diverging from the general case should only be done on a case by case basis with prior approval from the reviewing agency.

C. Non-Standard Averaging Periods with a Continuous Release

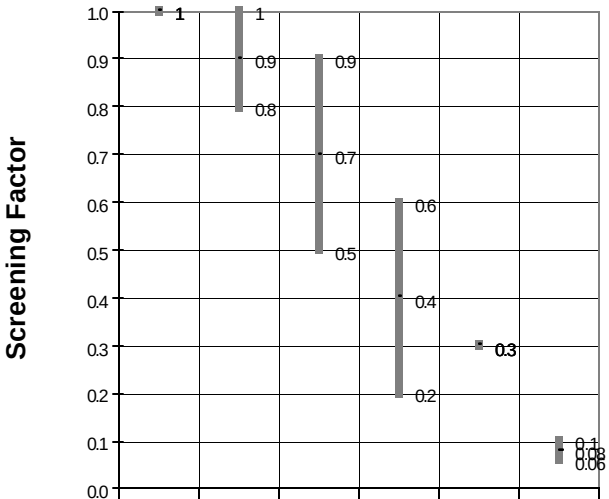
The following is the ARB recommendation for estimating screening concentrations for non-standard averaging periods that are not listed in Table H.1 or Figure H.1. Specifically, the recommendation is for estimating screening concentrations for 4-hour, 6-hour, and 7-hour averaging periods.

The current U.S. EPA screening factors applicable to standard averaging periods should be used for non-standard averaging periods. Specifically for the 4-hour, 6-hour, and 7-hour averaging periods, we recommend that the 3-hour screening factor of (0.9± 0.1) be used. The following illustrates the method to estimate a 6-hour average concentration from a continuous release from a single point source:

1. determine the maximum 1-hour concentration according to standard screening procedures ($C_{max1-hr}$),
2. scale the maximum 1-hour concentration by (0.9±0.1), and
3. the result is the maximum 6-hour concentration ($C_{max6-hr}=C_{max1-hr}$ *(0.9±0.1)).

In the case for the 6-hour and 7-hour average concentration estimates, the user may wish to take the lower bound of (0.9±0.1), or 0.8. For the 4-hour average estimate, we recommend the user to use the 3-hour factor as is, 0.9.

Figure H.1
Screening Factors to Convert
1-hr Max. to Longer Avg. Periods



	1-hr	3-hr	8-hr	24-hr	30-day	Annual
Max	1	1	0.9	0.6	0.3	0.1
Min	1	0.8	0.5	0.2	0.3	0.06
Rec	1	0.9	0.7	0.4	0.3	0.08

Averaging Period

Table H.1 Recommended Factors to Convert Maximum 1-hour Avg. Concentrations to Other Averaging Periods (U.S. EPA, 1992; ARB, 1994).

Averaging Time	Range	Typical Recommended
3 hours	0.8 - 1.0	0.9
8 hours	0.5 - 0.9	0.7
24 hours	0.2 - 0.6	0.4
30 days	0.2 - 0.3	0.3
Annual	0.06 - 0.1	0.08

Table H.2 summarizes these recommendations for the non-standard averaging periods.

Table H.2 Recommended Factors to Convert Maximum 1-hour Avg. Concentrations to Non-Standard Averaging Periods.

Averaging Time	Range	Typical Recommended
4 hours	0.8 - 1.0	0.9
6 hours	0.8 – 1.0	0.8
7 hours	0.8 – 1.0	0.8

D. Definitions

It is convenient to define the following terms relating to sources with respect to the duration of the release.

- Continuous Release – this is a release that is continuous over the duration of a year. An example of this type of release would be fugitive emissions from a 24-hour per day, 7-day per week operation or an operation that is nearly continuous.

- Intermittent Release – many emissions fall under this category. These are emission types that are not continuous over the year. Any operation that has normal business hours (e.g., 8 am to 6 pm) would fall into this category.

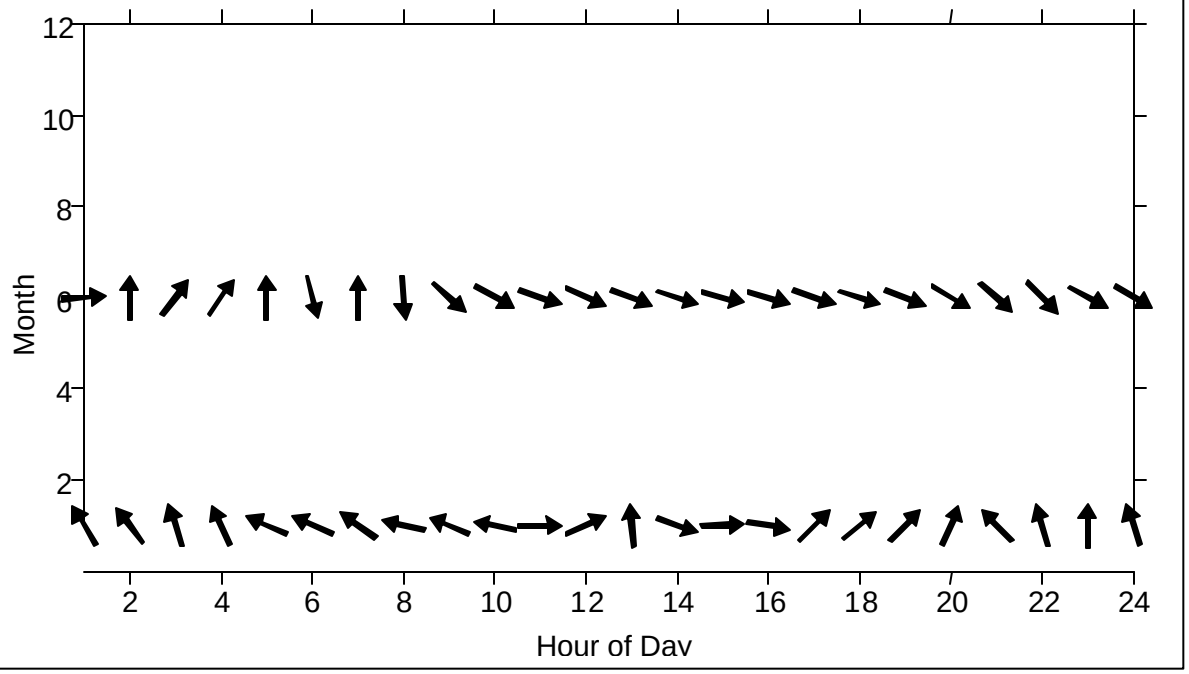
- Systematic Release – these are intermittent releases that occur at a specific time of the day. As an example, these type of releases can occur when a process requires clean out at the end of the work day. Thereby releasing emissions only at the end of the workday systematically. Systematic releases are similar to intermittent releases with a shorter duration during the normal operating schedule.

- Random Release – these are intermittent releases that can occur any time during the operating schedule. An example of this type of release would be of the type that depends on batch processing. For example, a brake shop may emit pollutants only when the brakes are cleaned which happens randomly throughout the normal business hours.

E. Screening Factors

The U.S. EPA screening factors, as shown in Table H.1, compensate for the effects of varying conditions of wind speed, wind direction, ambient temperature, atmospheric stability, and mixing height over longer averaging periods, even though it is not explicitly indicated in the U.S. EPA Guidance (U.S. EPA, 1992). Figure H.2 shows the variability in wind direction over a 24-hour period. The data are averaged for two seven-day periods from data collected at Los Angeles International Airport (LAX). Figure H.2 was compiled for data collected in 1989 for January 1 to January 7 and June1 through June 7, 1989. The ordinate in Figure H.2 shows the months of the year. Only two months are plotted. The abscissa shows the hour of the day.

Figure H.2
Hourly Wind Direction - Los Angeles
January (bottom – 1) and June (top - 6)



As seen in Figure H.2, the wind direction changes throughout all hours of the day. In addition, the wind direction for LAX, in the overnight and early morning hours, can vary from January to June. During the afternoon hours of 1400 – 1600, the wind direction is similar in both months of January and June.

The standard U.S. EPA screening factor to estimate the maximum 24-hour concentration from the maximum 1-hour concentration is 0.4, as seen in Table H.1. Figure H.2 shows that for 15 of 24 hours the wind blows from the west-northwest during June. A 24-hour screening factor could be 0.6 (0.6 ≈ 15hrs/24hrs) based on wind direction alone. This is consistent with the upper bound of the adjustment factors shown in Table H.1. Including the variability for wind speed, ambient temperature, and atmospheric stability could further reduce the estimated scaling factor of 0.6 closer towards the U.S. EPA recommended value of 0.4.

F. Intermittent Release

Support for the U.S. EPA screening factor is demonstrated for a continuous release (i.e., 24 hours per day) in the description above. It is important to be cautious when applying the U.S. EPA screening factors to an intermittent source for the purposes of estimating an annual average concentration (e.g., a business that may only emit during normal operating hours of 8 am to 6 pm).

Intermittent emissions, such as those from burning barrels, testing a standby diesel generator, or any normal business hour operation (e.g., 8am to 6pm Monday through Friday), could have the effect of eliminating some of the annual variability of meteorological conditions. For example, emissions only during the daytime could eliminate the variability of a drainage flow pattern in mountainous terrain. Guidance for estimating long-term averages for a screening approach and intermittent emissions is not available.

For a source located in the LAX meteorological domain, an emission pattern confined to the hours of 1400 to 1600 would eliminate any variability associated with the wind direction. In this case, estimating a 24-hour average with the U.S. EPA scaling factor of 0.4 would be incorrect.

In the event the emissions are intermittent but randomly distributed throughout the day, the scaling factor of 0.4 may be appropriate because the natural diurnal variability of meteorological conditions are concurrent with emissions. An additional pro-rating of the concentration, when estimating a 24-hour concentration, would be required to discount due to the intermittent nature of the emissions.

We recommend the following steps to estimate a screening based estimate of annual average concentrations from intermittent emissions.

1. Estimate the maximum one-hour concentration ($c_{1\text{-hr}}$) based on the SCREEN3 model approach (or similar, e.g., ISCST3 with screening meteorological data) for possible meteorological conditions consistent with the operating conditions and the actual hourly emission rate. It is acceptable to estimate downwind concentrations using all meteorological combinations available to SCREEN3. However, it is possible to be selective for the choices of meteorological conditions and still be conservative. For example, daytime only emissions need not be evaluated for nighttime stable atmospheric conditions (Pasquill-Gifford classes A through D are unstable and neutral atmospheric conditions applicable during the day. Classes D through F are neutral and stable atmospheric conditions applicable during the night.)

2. Estimate the concentration for the longest averaging period applicable based on the length of time of the systematic or randomly distributed emissions and the factors in Table H.1. For example, the longest averaging period concentration that may be estimated with the U.S. EPA scaling factors is an 8-hour concentration ($c_{8\text{-hr}}$) for emissions that are systematically released for 12 hours. Scaling factors between 8-hours and 12-hours are not available. In the case of the 8-hour concentration, the U.S. EPA screening factor of 0.7 ± 0.2 to estimate the maximum 8-hour concentration is appropriate.

   The U.S. EPA Screening Guidance allows for deviation from the suggested conversion factor on a case-by-case basis. We recommend the lower end of the range for the conversion factor (i.e., 0.5 for the 8-hour average) when estimating an annual average concentration. This is because variability associated with seasonal differences in wind speed, wind direction, and atmospheric stability would not be addressed otherwise. As seen in Figure H.2, there are seasonal differences in the wind direction.

For example, if X is the length of time of systematic or randomly distributed emissions, the following scalars can apply.

- $X \leq 2$ hrs; Scalar = 1.0 to estimate a 1-hour average
- 3 hrs $\leq X \leq$ 7 hrs; Scalar = 0.8 to estimate a 3-hour average
- 8 hrs $\leq X \leq$ 20 hrs; Scalar = 0.5 to estimate an 8-hour average (the selection of 20 hours is arbitrary)
- 21 hrs $\leq X \leq$ 24 hrs; this may be a continuous release, use standard screening procedures.

3. Estimate the annual average concentration (c_{annual}) by assuming the longer averaging period estimated above is persistent for the entire year. In the above example the 8-hour concentration is assumed to be persistent for an entire year to estimate an annual average concentration (i.e., the annual average concentration is assumed to be equal to the 8-hour concentration).

   In addition, the annual average concentration should be pro-rated over the final averaging period based on the pro-rated emissions (i.e., the calculation should include the fact that for some hours over the year, the emission rate is zero).

   For example, if Y is the number of operating hours in the year (e.g., Y = X * 365), the following may apply.
   $(c_{annual}) = (c_{1\text{-}hr})$ (Scalar) (Y/8760hrs/yr)

4. The hourly emission rate should be calculated based on the assumed operating schedule in the steps above. An example for a facility operating Y hours per year follows.
   $(q_{hourly}) = (Q_{yearly})/(Y$ hrs/yr)

5. The annual average concentration (or ground level concentration GLC) can be estimated as follows.
   $GLC = (c_{annual})\ (q_{hourly})$
   $= (c_{1\text{-}hr})$(Scalar) (Yhrs/8760hrs) $(Q_{yearly})/(Y$ hrs/yr)
   $= (c_{1\text{-}hr})$(Scalar) $(Q_{yearly})/(8760$ hrs/yr)

Practically speaking, the above five steps condense down to determining three values. The first value is the maximum 1-hour concentration. The second value is the Scalar (either 1.0, 0.8, or 0.5). And the third value is the hourly emission rate estimated by uniformly distributed over the entire year (8760 hours). The operating hours per year drops out of the calculations for an annual average concentration provided the emissions are based on an annual inventory (See step 5).

In the event that the acute averaging period is required and the emissions are based on an annual inventory, then the annual operating hours are required.

Below are four examples using the steps as outlined above. In each case, the annual average concentration is the desired value for use in risk assessment calculations. A fifth example is also

included to demonstrate the need for the operating hours per year for an acute analysis when the inventory is provided on an annual basis.

Example 1 - Fugitive Gasoline Station Emissions

Emissions are **continuous** for 24 hours per day and 365 days per year.

1. Estimate the maximum 1-hour concentration with the Screen3 model (or similar screening modeling approach), $c_{1\text{-hr}}$.

2. Estimate the annual average concentration, $c_{annual,}$ with the U.S. EPA screening factor of 0.08.
   $(c_{annual}) = (c_{1\text{-hr}})(0.08)$

3. The hourly emission rate, q_{hourly}, for the annual average concentration is based on 24 hours per day and 365 days per year (8760 hours per year).
   $(q_{hourly}) = (Q_{yearly})/(8760 \text{ hrs/yr})$

4. The annual average concentration (or ground level concentration GLC) can be estimated as follows.
   $GLC = (c_{annual})\ (q_{hourly})$
   $GLC = (c_{1\text{-hr}})(0.08)\ (Q_{yearly})/(8760 \text{ hrs/yr})$

Example 2 - Dry Cleaner Emissions

Emissions are **intermittent** over the year but **systematic** for 10 hours per day, 5 days per week and 50 weeks per year.

1. Estimate the maximum 1-hour concentration with the Screen3 model (or similar screening modeling approach), $c_{1\text{-hr}}$.

2. Estimate the maximum 8-hour average concentration, $c_{8\text{-hr,}}$ with the U.S. EPA screening factor of 0.7 ± 0.2 as the longest averaging period of continuous release. The averaging period would need to be less than 10 hours. Use the lower range of the screening factor, 0.5, because the annual average is the final product and variability due to seasonal differences are not accounted for otherwise.
   $(c_{8\text{-hr}}) = (c_{1\text{-hr}})(0.5)$

3. Assume the worst-case 8-hour concentration is persistent throughout the year and pro-rate the concentration based on emissions over the year. For this dry cleaner, there are 2500 hours of operating condition emissions. Therefore the annual average is calculated as follows.
   $(c_{annual}) = (c_{8\text{-hr}})\ (2500\text{hrs}/8760\text{hrs})$
   $= (c_{1\text{-hr}})(0.5)\ (2500\text{hrs}/8760\text{hrs})$

4. The hourly emission rate, q_{hourly}, for the annual average concentration is based on 2500 hours per year.
   $(q_{hourly}) = (Q_{yearly})/(2500 \text{ hrs/yr})$

5. The annual average concentration (or ground level concentration GLC) can be estimated as follows.
   $GLC = (c_{annual})(q_{hourly})$
   $= (c_{1\text{-}hr})(0.5)\ (2500hrs/8760hrs)\ (Q_{yearly})/(2500\ hrs/yr)$
   $= (c_{1\text{-}hr})(0.5)\ (Q_{yearly})/(8760\ hrs/yr)$

Example 3 - Burning Barrel Emissions

Emissions are **intermittent** over the year and **random** during daylight hours for two hours per burn, two burns per week, and 52 weeks per year.

1. Estimate the maximum 1-hour concentration with the Screen3 model (or similar screening modeling approach), $c_{1\text{-}hr}$. Meteorological combinations may be restricted to daytime conditions for this screening analysis. Pasquill-Gifford stability classes A, B, C, and D are unstable and neutral conditions for daytime conditions.

2. Estimate the maximum 8-hour average concentration, $c_{8\text{-}hr,}$ with the U.S. EPA screening factor of 0.7 ± 0.2 as the longest averaging period where the emissions have the potential to be randomly distributed. Depending on the day of the year and latitude of the emissions, the daylight hours can vary. For this example, we assume the daylight hours can be as short as 10 hours per day to as long as 14 hours per day. Since the emissions are randomly distributed throughout the daylight hours, the longest averaging period we can scale with U.S. EPA scaling factors is a 10 hour average. In this case, the averaging period becomes the 8-hour average and the scaling factor becomes 0.7 ± 0.2. Again since this is for an annual average, we use the lower end of the range, 0.5.
   $(c_{8\text{-}hr}) = (c_{1\text{-}hr})(0.5)$

3. Assume the worst-case 8-hour concentration is persistent throughout the year and pro-rate the concentration based on the emissions over the year. For the burning barrels there are 208 hours of operating condition emissions (208 hrs = (2hrs/burn)(2burns/wk)(52wk/yr)). Therefore the annual average concentration is calculated as follows.
   $(c_{annual}) = (c_{8\text{-}hr})\ (208hrs/8760hrs)$
   $= (c_{1\text{-}hr})(0.5)\ (208hrs/8760hrs)$

4. The hourly emission rate, q_{hourly}, for the annual average concentration is based on 208 hours per year.
   $(q_{hourly}) = (Q_{yearly})/(208\ hrs/yr)$

5. The annual average concentration (or ground level concentration GLC) can be estimated as follows.
   $GLC = (c_{annual})(q_{hourly})$
   $= (c_{1\text{-}hr})(0.5)\ (208hrs/8760hrs)\ (Q_{yearly})/(208\ hrs/yr)$
   $= (c_{1\text{-}hr})(0.5)\ (Q_{yearly})/(8760\ hrs/yr)$

Example 4 - Standby Diesel Engine Testing

Emissions are **intermittent** over the year and **systematic** for two hours per week and 50 weeks per year. The engine testing is conducted at 2 pm on Fridays.

1. Estimate the maximum 1-hour concentration with the Screen3 model (or similar screening modeling approach), $c_{1\text{-hr}}$. Meteorological combinations may be restricted to daytime conditions in this screening analysis because the engine test is conducted at 2 pm. Pasquill-Gifford stability classes A, B, C, and D are unstable and neutral conditions for daytime conditions.

2. In this case, the emission schedule is systematically fixed over a two hour period. Therefore, the longest averaging period which is applicable for the U.S. EPA screening factors is one-hour because a two-hour conversion factor is not available. Therefore, we assume the maximum 1-hour concentration is persistent for the entire year. We still prorate the concentration based on the emissions. There are 100 hours of engine testing per year. Therefore the annual average concentration becomes.
   $(c_{annual}) = (c_{1\text{-hr}})$ (100hrs/8760hrs)

3. The hourly emission rate, q_{hourly}, for the annual average concentration is based on 100 hours per year.
   $(q_{hourly}) = (Q_{yearly})/(100$ hrs/yr)

4. The annual average concentration (or ground level concentration GLC) can be estimated as follows.
   $GLC = (c_{annual})\ (q_{hourly})$
   $= (c_{1\text{-hr}})$ (100hrs/8760hrs) $(Q_{yearly})/(100$ hrs/yr)
   $= (c_{1\text{-hr}})\ (Q_{yearly})/(8760$ hrs/yr)

Below is an example using the steps above to estimate an acute concentration longer than a 1-hour averaging period. This case is similar to Example 3 above with the exception of the averaging period.

Example 5 - Burning Barrel Emissions – Acute REL

Emissions are **intermittent** over the year and **random** during daylight hours for two **continuous** hours per burn, two burns per week, and 52 weeks per year. The arsenic acute REL is for a 4-hour averaging period. The steps below are used to estimate the acute concentration, 4-hour REL, for arsenic.

1. Estimate the maximum 1-hour concentration with the Screen3 model (or similar screening modeling approach), $c_{1\text{-hr}}$. Meteorological combinations may be restricted to daytime conditions for this screening analysis. Pasquill-Gifford stability classes A, B, C, and D are unstable and neutral conditions for daytime conditions.

2. The maximum 1-hour concentration is used as is without screening adjustment factors listed in Tables H.1 or H.2. The emissions are **continuous** through a 2-hour event within a 4-hour window. The adjustments in Table H.2 would only be used if the

emissions were continuous for a 4-hour event or **randomly** distributed through a 4-hour event.

3. Assume the worst-case 1-hour concentration is persistent for the 4-hour averaging period and pro-rate the concentration based on the emissions over the 4-hour window. For the burning barrels there are 2 hours of operating condition emissions (2hrs/burn). Therefore the 4-hour average concentration is calculated as follows.
   $(c_{4\text{-hr}}) = (c_{1\text{-hr}})$ (2hrs/4hrs)

4. The hourly emission rate, q_{hourly}, for the annual average concentration is based on 208 hours per year (208 hrs = (2hrs/burn)(2burns/wk)(52wk/yr)).
   $(q_{hourly}) = (Q_{yearly})/(208$ hrs/yr)

5. The 4-hr average concentration (or ground level concentration $GLC_{4\text{-hr}}$) can be estimated as follows.
   $GLC_{4\text{-hr}} = (c_{4\text{-hr}})\ (q_{hourly})$
   $= (c_{1\text{-hr}})$ (2hrs/4hrs) $(Q_{yearly})/(208$ hrs/yr)

   This step of Example 5 differs from the previous Examples because the number of operating hours per year does not drop out of the calculation as seen above.

The above methods were used in a recent modeling evaluation for emissions from a burning barrel (example 3 above) (ARB, 2002). Table H.3, below, shows results from the modeling evaluation. Shown in Table H.3 are the maximum annual average concentration based on the screening approach outlined above as well as a refined approach with site specific meteorological data from four locations, Alturas, Bishop, San Benito, and Escondido. As seen in Table H.3, the screening evaluation as described in the example overestimates the values calculated based on the refined analysis. This is the desired outcome of a screening approach.

Table H.3
Maximum Annual Average Concentration (c/q)
Above Ambient Conditions - Burning Barrel Emissions

Met. City	Alturas	Bishop	San Benito	Escondido	*SCREENING*
D (m)	(μg/m³)/(g/s)	(μg/m³)/(g/s)	(μg/m³)/(g/s)	(μg/m³)/(g/s)	*(μg/m³)/(g/s)*
20	44.	61.	85.	110.	*590.*
50	12.	16.	22.	30.	*230.*
100	4.	5.	7.	9.	*85.*

Notes: (a) Annual χ/q is based on 208 hours of emissions at 1 g/s.
(b) χ/q is the concentration in μg/m³ based on an hourly emission rate of 1 g/s.

G. Implementation

The approach outlined above has been implemented in the HARP program. Appendix J provides example output files from the Hot Spot Analysis and Reporting Program (HARP). The HARP software has been developed by a contractor through consultation with OEHHA, Air Resources Board (ARB), and District representatives. The HARP software is the recommended model for calculating and presenting HRA results for the Hot Spots Program. Information on obtaining the HARP software can be found on the ARB's web site at www.arb.ca.gov. Note, since the HARP software is a tool that uses the methods specified in this document, the software will be available after these guidelines have undergone public and peer review, been endorsed by the state's Scientific Review Panel (SRP) on Toxic Air Contaminants, and adopted by OEHHA.

References

ARB (1994). ARB memorandum dated 4/11/94 from A. Ranzieri to J. Brooks on the subject, "One-hour to Thirty-day Average Screening Factor."

ARB (2002). Staff Report: Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure to Reduce Emissions of Toxic Air Contaminants from Outdoor Residential Waste Burning, January 2002. California Air Resources Board.

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U.S. EPA (1995). User's Guide for the Industrial Source Complex (ISC3) Dispersion Models, September 1995, EPA-454/B-95-003a. U.S. Environmental Protection Agency, Research Triangle Park, NC.

U.S. EPA (2001). Appendix W to Part 51 - Guideline on Air Quality Models, 2001. U.S. Environmental Protection Agency, Research Triangle Park, NC.

APPENDIX C

Screen3 Diesel-Fired PM10
Analysis Output and Calculations

PM10	
6.22	Pounds per day
0.7775	Pounds per hour
0.000215972	Pounds per second
0.097963352	Grams per second
1.72909E-07	**g/sec/m2**

Area Conversion	
140	Area (acres)
566,559.90	Square Meters
752.701733	Dimensions (m)

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

C:\Documents and Settings\hqureshi\Desktop\06682 Screen3\DPM.scr

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.172909E-06
SOURCE HEIGHT (M) = 5.0000
LENGTH OF LARGER SIDE (M) = 752.7000
LENGTH OF SMALLER SIDE (M) = 752.7000
RECEPTOR HEIGHT (M) = 1.5000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** STABILITY CLASS 4 ONLY ***
*** ANEMOMETER HEIGHT WIND SPEED OF 2.33 M/S ONLY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
20.	1.209	4	2.3	2.3	745.6	5.00	44.
100.	1.279	4	2.3	2.3	745.6	5.00	45.
200.	1.310	4	2.3	2.3	745.6	5.00	45.
300.	1.368	4	2.3	2.3	745.6	5.00	45.
400.	1.444	4	2.3	2.3	745.6	5.00	45.
500.	1.499	4	2.3	2.3	745.6	5.00	44.
600.	1.122	4	2.3	2.3	745.6	5.00	45.
700.	0.7953	4	2.3	2.3	745.6	5.00	45.
800.	0.6334	4	2.3	2.3	745.6	5.00	45.
900.	0.5308	4	2.3	2.3	745.6	5.00	45.
1000.	0.4581	4	2.3	2.3	745.6	5.00	45.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 20. M:

500.	1.499	4	2.3	2.3	745.6	5.00	44.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	1.499	500.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

QUANTIFICATION OF CARCINOGENIC RISKS AND NONCARCINOGENIC HAZARDS
POINT OF MAXIMUM IMPACT (PMI) (CONSTRUCTION ACTIVITY)

Source	Maximum Concentration		Weight Fraction	Contaminant	Carcinogenic Risk			Noncarcinogenic Hazards		
	(ug/m3)	(mg/m3)			URF (ug/m3)	CPF (mg/kg/day)	RISK	REL (ug/m3)	RfD (mg/kg/day)	Index
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
Diesel	0.11992	1.2E-04	1.00E+00	Particulates	3.0E-04	1.1E+00	5.4E-07	5.0E+00	1.4E-03	2.5E-02

Note: Exposure factors used to calculate contaminant intake

Exposure Frequency (days/year)	365
Exposure Duration (years)	1.0
Inhalation Rate (m3/day)*	21.14
Average Body Weight (kg)	70
Averaging Time $_{(cancer)}$ (days)	25550
Averaging Time $_{(non\text{-}cancer)}$ (days)	365

*Inhalation Rate of 21.14 m3/day equates to the ARB breathing 302 liters per kilogram-day

APPENDIX D

URBEMIS 2007 Computer Model Output –
Construction Impact Analysis

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: U:\UcJobs_06600-07000\06600\06682\URBEMIS\Construction.urb924

Project Name: Shadow Run Ranch Construction

Project Location: California State-wide

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
Time Slice 6/2/2009-12/15/2009 Active Days: 141	3.22	26.52	14.16	0.00	**100.00**	1.34	**101.34**	**20.89**	1.23	**22.12**
Mass Grading 06/02/2009-12/15/2009	3.22	26.52	14.16	0.00	100.00	1.34	101.34	20.89	1.23	22.12
Mass Grading Dust	0.00	0.00	0.00	0.00	100.00	0.00	100.00	20.88	0.00	20.88
Mass Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.04	0.07	1.18	0.00	0.00	0.00	0.01	0.00	0.00	0.00

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Time Slice 1/1/2010-3/15/2010 Active Days: 52	**24.68**	**70.50**	**44.74**	**0.01**	0.06	**4.81**	4.87	0.02	**4.42**	4.45
Asphalt 01/01/2010-03/15/2010	5.39	25.05	13.80	0.01	0.03	1.91	1.94	0.01	1.75	1.76
Paving Off-Gas	1.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.20	19.17	10.47	0.00	0.00	1.68	1.68	0.00	1.55	1.55
Paving On Road Diesel	0.38	5.81	1.96	0.01	0.03	0.22	0.25	0.01	0.20	0.21
Paving Worker Trips	0.04	0.08	1.37	0.00	0.01	0.00	0.01	0.00	0.00	0.01
Building 01/01/2010-06/15/2010	4.26	24.10	19.17	0.00	0.02	1.70	1.73	0.01	1.56	1.57
Building Off Road Diesel	4.08	23.31	14.31	0.00	0.00	1.67	1.67	0.00	1.54	1.54
Building Vendor Trips	0.04	0.55	0.43	0.00	0.00	0.02	0.03	0.00	0.02	0.02
Building Worker Trips	0.14	0.24	4.43	0.00	0.02	0.01	0.03	0.01	0.01	0.02
Coating 01/01/2010-06/15/2010	12.36	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	12.35	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	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 01/01/2010-03/15/2010	2.67	21.34	11.61	0.00	0.00	1.20	1.21	0.00	1.11	1.11
Trenching Off Road Diesel	2.63	21.28	10.51	0.00	0.00	1.20	1.20	0.00	1.10	1.10
Trenching Worker Trips	0.04	0.06	1.10	0.00	0.00	0.00	0.01	0.00	0.00	0.00

Time Slice 3/16/2010-6/15/2010 Active Days: 66	16.62	24.11	19.33	0.01	0.02	1.70	1.73	0.01	1.56	1.57
Building 01/01/2010-06/15/2010	4.26	24.10	19.17	0.00	0.02	1.70	1.73	0.01	1.56	1.57
Building Off Road Diesel	4.08	23.31	14.31	0.00	0.00	1.67	1.67	0.00	1.54	1.54
Building Vendor Trips	0.04	0.55	0.43	0.00	0.00	0.02	0.03	0.00	0.02	0.02
Building Worker Trips	0.14	0.24	4.43	0.00	0.02	0.01	0.03	0.01	0.01	0.02
Coating 01/01/2010-06/15/2010	12.36	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	12.35	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	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Mass Grading 6/2/2009 - 12/15/2009 - Default Fine Site Grading Description

Total Acres Disturbed: 140

Maximum Daily Acreage Disturbed: 5

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: Trenching 1/1/2010 - 3/15/2010 - Type Your Description Here

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 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

Phase: Paving 1/1/2010 - 3/15/2010 - Default Paving Description

Acres to be Paved: 35

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

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

2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 1/1/2010 - 6/15/2010 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

3 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

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

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

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

Phase: Architectural Coating 1/1/2010 - 6/15/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5

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Time Slice 6/2/2009-12/15/2009 Active Days: 141	3.22	26.52	14.16	0.00	42.57	1.34	43.91	8.89	1.23	10.12
Mass Grading 06/02/2009-12/15/2009	3.22	26.52	14.16	0.00	42.57	1.34	43.91	8.89	1.23	10.12
Mass Grading Dust	0.00	0.00	0.00	0.00	42.57	0.00	42.57	8.89	0.00	8.89
Mass Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.04	0.07	1.18	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Time Slice 1/1/2010-3/15/2010 Active Days: 52	**24.68**	**70.50**	**44.74**	**0.01**	0.06	**4.81**	4.87	0.02	**4.42**	4.45
Asphalt 01/01/2010-03/15/2010	5.39	25.05	13.80	0.01	0.03	1.91	1.94	0.01	1.75	1.76
Paving Off-Gas	1.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.20	19.17	10.47	0.00	0.00	1.68	1.68	0.00	1.55	1.55
Paving On Road Diesel	0.38	5.81	1.96	0.01	0.03	0.22	0.25	0.01	0.20	0.21
Paving Worker Trips	0.04	0.08	1.37	0.00	0.01	0.00	0.01	0.00	0.00	0.01
Building 01/01/2010-06/15/2010	4.26	24.10	19.17	0.00	0.02	1.70	1.73	0.01	1.56	1.57
Building Off Road Diesel	4.08	23.31	14.31	0.00	0.00	1.67	1.67	0.00	1.54	1.54
Building Vendor Trips	0.04	0.55	0.43	0.00	0.00	0.02	0.03	0.00	0.02	0.02
Building Worker Trips	0.14	0.24	4.43	0.00	0.02	0.01	0.03	0.01	0.01	0.02
Coating 01/01/2010-06/15/2010	12.36	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	12.35	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	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 01/01/2010-03/15/2010	2.67	21.34	11.61	0.00	0.00	1.20	1.21	0.00	1.11	1.11
Trenching Off Road Diesel	2.63	21.28	10.51	0.00	0.00	1.20	1.20	0.00	1.10	1.10
Trenching Worker Trips	0.04	0.06	1.10	0.00	0.00	0.00	0.01	0.00	0.00	0.00

Time Slice 3/16/2010-6/15/2010 Active Days: 66	16.62	24.11	19.33	0.01	0.02	1.70	1.73	0.01	1.56	1.57
Building 01/01/2010-06/15/2010	4.26	24.10	19.17	0.00	0.02	1.70	1.73	0.01	1.56	1.57
Building Off Road Diesel	4.08	23.31	14.31	0.00	0.00	1.67	1.67	0.00	1.54	1.54
Building Vendor Trips	0.04	0.55	0.43	0.00	0.00	0.02	0.03	0.00	0.02	0.02
Building Worker Trips	0.14	0.24	4.43	0.00	0.02	0.01	0.03	0.01	0.01	0.02
Coating 01/01/2010-06/15/2010	12.36	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	12.35	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	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 6/2/2009 - 12/15/2009 - Default Fine Site Grading Description

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

APPENDIX E

URBEMIS 2007 Computer Model Output
- Operational Impact Analysis

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: U:\UcJobs_06600-07000\06600\06682\URBEMIS\Operations.urb924

Project Name: Hoskings Ranch Residential Operations

Project Location: California State-wide

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	41.05	0.38	2.95	0.00	0.01	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	11.02	11.25	101.73	0.08	13.35	2.62

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	52.07	11.63	104.68	0.08	13.36	2.63

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5
Natural Gas	0.03	0.35	0.15	0.00	0.00	0.00
Hearth - No Summer Emissions						
Landscape	0.35	0.03	2.80	0.00	0.01	0.01
Consumer Products	1.37					
Architectural Coatings	39.30					
TOTALS (lbs/day, unmitigated)	41.05	0.38	2.95	0.00	0.01	0.01

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 50%

Percentage of residences with natural gas fireplaces changed from 55% to 50%

Length of summer period for landscape equipment changed from 180 days to 365 days

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25
Single family housing	3.68	5.13	47.34	0.04	6.21	1.22
Agriculture	7.34	6.12	54.39	0.04	7.14	1.40
TOTALS (lbs/day, unmitigated)	11.02	11.25	101.73	0.08	13.35	2.62

Operational Settings:

2/18/2011 10:02:23 AM

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Temperature (F): 85 Season: Summer

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
Single family housing	140.00	12.00	dwelling units	28.00	336.00	3,589.86
Agriculture		2.00	acres	305.15	610.30	4,126.85
					946.30	7,716.71

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.0	1.6	98.0	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	71.4	28.6	0.0
School Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
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	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
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)						
Agriculture				2.0	1.0	97.0

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: U:\UcJobs_06600-07000\06600\06682\URBEMIS\Operations.urb924

Project Name: Hoskings Ranch Residential Operations

Project Location: California State-wide

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	54.16	0.62	15.04	0.02	2.04	1.97

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	9.51	16.45	112.57	0.07	13.35	2.62

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	63.67	17.07	127.61	0.09	15.39	4.59

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5
Natural Gas	0.03	0.35	0.15	0.00	0.00	0.00
Hearth	13.46	0.27	14.89	0.02	2.04	1.97
Landscaping - No Winter Emissions						
Consumer Products	1.37					
Architectural Coatings	39.30					
TOTALS (lbs/day, unmitigated)	54.16	0.62	15.04	0.02	2.04	1.97

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 50%

Percentage of residences with natural gas fireplaces changed from 55% to 50%

Length of summer period for landscape equipment changed from 180 days to 365 days

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25
Single family housing	4.27	7.52	50.94	0.03	6.21	1.22
Agriculture	5.24	8.93	61.63	0.04	7.14	1.40
TOTALS (lbs/day, unmitigated)	9.51	16.45	112.57	0.07	13.35	2.62

Operational Settings:

2/18/2011 10:03:27 AM

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
Single family housing	140.00	12.00	dwelling units	28.00	336.00	3,589.86
Agriculture		2.00	acres	305.15	610.30	4,126.85
					946.30	7,716.71

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.0	1.6	98.0	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	71.4	28.6	0.0
School Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
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	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
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)						
Agriculture				2.0	1.0	97.0

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: U:\UcJobs_06600-07000\06600\06682\URBEMIS\Operations-Alternative.urb924

Project Name: Hoskings Ranch Residential Operations

Project Location: California State-wide

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	2.52	0.46	1.75	0.00	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	4.60	6.41	59.18	0.04	7.77	1.52

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	7.12	6.87	60.93	0.04	7.77	1.52

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5
Natural Gas	0.03	0.44	0.19	0.00	0.00	0.00
Hearth - No Summer Emissions						
Landscape	0.28	0.02	1.56	0.00	0.00	0.00
Consumer Products	1.71					
Architectural Coatings	0.50					
TOTALS (lbs/day, unmitigated)	2.52	0.46	1.75	0.00	0.00	0.00

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 50%

Percentage of residences with natural gas fireplaces changed from 55% to 50%

Length of summer period for landscape equipment changed from 180 days to 365 days

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25
Single family housing	4.60	6.41	59.18	0.04	7.77	1.52
TOTALS (lbs/day, unmitigated)	4.60	6.41	59.18	0.04	7.77	1.52

Operational Settings:

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Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Temperature (F): 85 Season: Summer

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
Single family housing	11.67	12.00	dwelling units	35.00	420.00	4,487.32
					420.00	4,487.32

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.0	1.6	98.0	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	71.4	28.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	10.0	80.0	10.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
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)

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: U:\UcJobs_06600-07000\06600\06682\URBEMIS\Operations-Alternative.urb924

Project Name: Hoskings Ranch Residential Operations

Project Location: California State-wide

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	19.07	0.78	18.80	0.03	2.55	2.46

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	5.34	9.41	63.68	0.04	7.77	1.52

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	24.41	10.19	82.48	0.07	10.32	3.98

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5
Natural Gas	0.03	0.44	0.19	0.00	0.00	0.00
Hearth	16.83	0.34	18.61	0.03	2.55	2.46
Landscaping - No Winter Emissions						
Consumer Products	1.71					
Architectural Coatings	0.50					
TOTALS (lbs/day, unmitigated)	19.07	0.78	18.80	0.03	2.55	2.46

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

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Length of summer period for landscape equipment changed from 180 days to 365 days

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25
Single family housing	5.34	9.41	63.68	0.04	7.77	1.52
TOTALS (lbs/day, unmitigated)	5.34	9.41	63.68	0.04	7.77	1.52

Operational Settings:

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Does not include double counting adjustment for internal trips

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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	71.4	28.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	10.0	80.0	10.0

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Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
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% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)