AIR QUALITY IMPACT ANALYSIS

FOR THE

SAN JACINTO VALLEY MASTER DRAINAGE PLAN

Prepared For:

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INTRODUCTION

The following air quality assessment was prepared to evaluate whether the expected criteria air pollutant emissions generated as a result of construction and operation of the proposed project would exceed the South Coast Air Quality Management District's (SCAQMD) significance thresholds for air quality in the project area. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000 et seq.). The methodology follows the "CEQA Air Quality Handbook" prepared by the South Coast Air Quality Management District (SCAQMD) for quantification of emissions and evaluation of potential impacts to air quality. As recommended by SCAQMD staff, the URBEMIS 2007 for Windows version 9.2.4 computer program (URBEMIS 2007) was used to quantify project-related emissions.

Project Description

The proposed San Jacinto Valley Master Drainage Plan (project) is located in portions of the Cities of San Jacinto and Hemet and unincorporated Riverside County, California. (**Figure 1, Project Location)** Master Drainage Plans (MDPs) are conceptual planning documents that address the current and future storm water drainage needs of a given community. The boundary of the plan usually follows regional watershed limits.

The proposed San Jacinto Valley MDP will serve as a guide to the long term planning for the future construction and maintenance of the proposed drainage facilities. It will also act as a guide for the location and size of drainage facilities that need to be constructed by the City of San Jacinto and/or others as the area develops, or facilities that need to be constructed to resolve existing flooding problems within developed areas. It is expected that many of the drainage facilities will be constructed in conjunction with other local development projects. All of the proposed MDP facilities would not be constructed at one time. Rather, only segments of open channels, concrete box, and pipeline and/or a basin would be expected to be constructed in series or concurrently, at one time. Following adoption of the proposed San Jacinto Valley MDP, it is expected that proposed facility alignments will be reserved for the future construction of the facilities. The City of San Jacinto will approve the MDP as one step toward establishing a financing mechanism to provide funding for the proposed drainage facilities as the area develops.

The San Jacinto Valley MDP facilities and alignments are represented in **Figure 1.** Proposed drainage facilities consist of reinforced concrete boxes, reinforced concrete pipes, open concrete channels, open earth channels, and earthen basins.

For the purpose of this analysis, four different construction scenarios were identified. These scenarios represent different types of facilities of the MDP that would be constructed at any one given time (**Figure 2, Analyzed Facilities**). These scenarios represent the largest basin and length of facility that would be constructed as one project; therefore, these represent "worst-case" scenarios. The construction of all other facilities is expected to be equal to or smaller (area

and length) than the scenarios; therefore, it would result in construction emissions equal to or less than emissions modeled for the four scenarios.

Casa Loma Basin – 33-acre detention basin
The Casa Loma Basin is approximately 33 acres and is the largest of the proposed detention basins. It is located north of Cottonwood Avenue, east of Warren Road, and west of Cawston Avenue within the city of San Jacinto as shown in **Figure 2**.

Line Y - 12,000 linear feet of concrete box
The portion of Line Y that is expected to be built all at once includes approximately 12,000 linear feet of underground reinforced concrete boxes with dimensions as large as 14 feet wide by 11 feet deep. The analyzed alignment begins at the Line E-Y-Z confluence basin south of Ramona Expressway and continues south until it reaches Line Y-1. From the connection at Line Y-1, the proposed alignment travels southeast until it connects to the Casa Loma Basin (**Figure 2**).

Line E – 14,700 linear feet of open channel
Line E is the largest open channel of the MDP. It is approximately 14,700 linear feet and is trapezoidal in shape with an estimated width of approximately 70 feet. Line E also begins at the Line E-Y-Z confluence basin south of Ramona Expressway and runs east approximately 800 feet past Sanderson Avenue. The channel then heads south until it connects with the existing San Jacinto Reservoir (**Figure 2**).

Line D-4 – 2,200 linear feet of 42-inch diameter pipeline
Line D-4 is the largest underground pipeline alignment that would be constructed at once. It is approximately 2,200 linear feet of 42-inch pipeline that will be constructed within the road right-of-ways of Hewitt Street south of Esplanade Avenue from E. Commonwealth Avenue to the existing Hewitt Street Basin adjacent to Park Street (**Figure 2**).

Recommended Mitigation Measures

In addition to compliance with SCAQMD Rule 403 (see page 11) for project construction, the following mitigation measures shall be implemented:

MM Air 1: During construction**,** ozone precursor emissions from all vehicles and construction equipment shall be controlled by maintaining equipment engines in good condition and in proper tune per manufacturers' specifications to the satisfaction of the City of San Jacinto Public Works Department. Equipment maintenance records and equipment design specification data sheets shall be kept on-site during construction. Compliance with this measure shall be subject to periodic inspections by the City of San Jacinto Public Works Department.

MM Air 2: All vehicles shall be prohibited from idling in excess of five minutes, both on-site and off-site.

MM Air 3: Electricity from power poles shall be used instead of temporary diesel- or gasoline powered generators to reduce the associated emissions.

MM Air 4: To reduce construction vehicle (truck) and equipment idling while waiting to enter/exit the site, the contractor shall submit a traffic control plan that will describe in detail safe detours to prevent traffic congestion to the best of the project's ability, and provide temporary traffic control measures. To reduce traffic congestion, and therefore NO_X, the plan shall include, as necessary, appropriate, and practicable the following: dedicated turn lanes for movement of construction trucks and equipment on- and off-site, scheduling of construction activities that affect traffic flow on the arterial system to off-peak hour, rerouting of construction trucks away from congested streets or sensitive receptors, and/or signal synchronization to improve traffic flow.

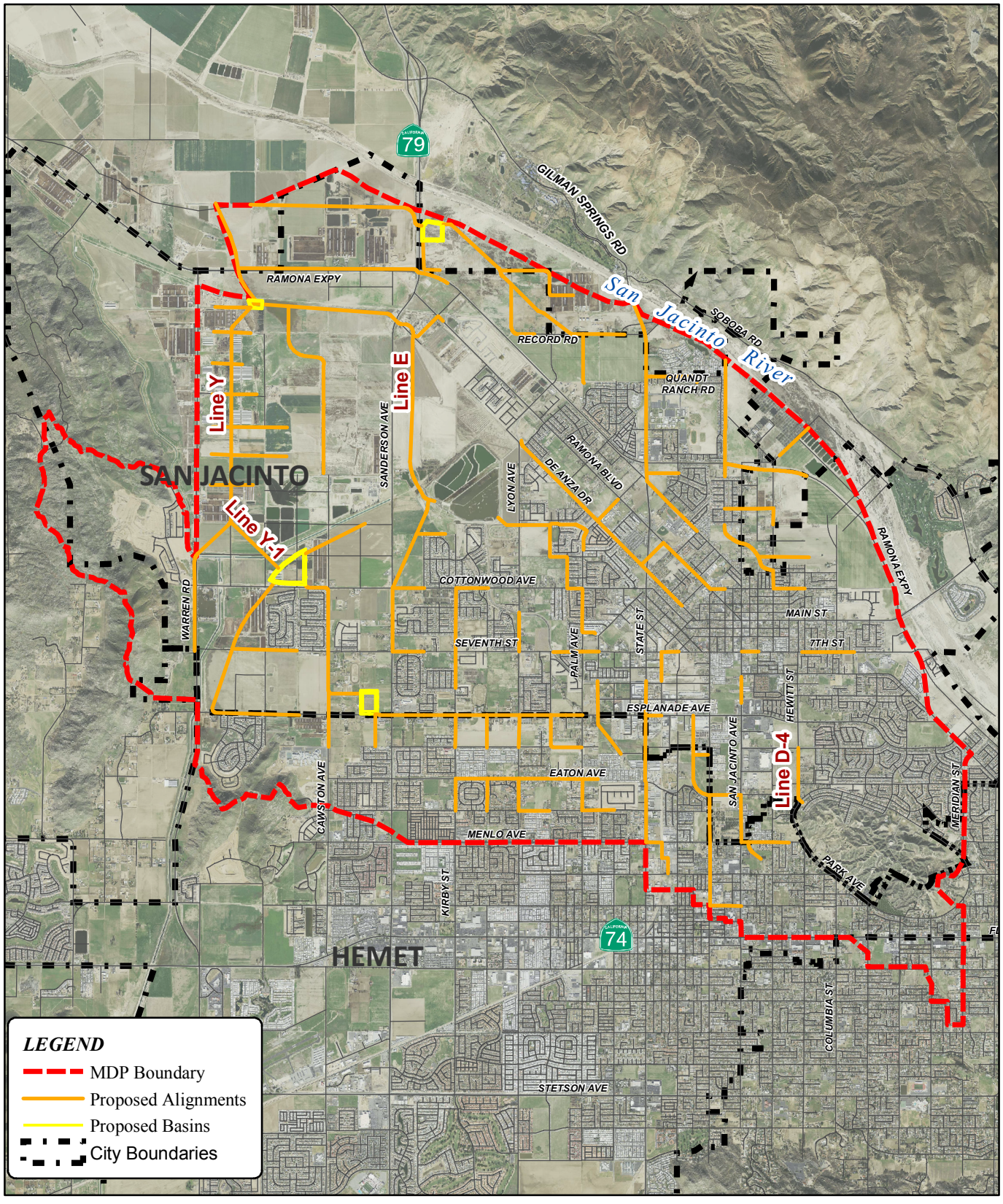
Conclusions

The project-specific evaluation presented in the proceeding analysis demonstrates that, even with the incorporation of mitigation measures, projected short-term emissions from construction of the Casa Loma Basin project will exceed the SCAQMD regional daily thresholds for NO_X throughout construction and construction of Line E will exceed the SCAQMD regional daily thresholds for PM-10, and PM-2.5, but construction of Line Y and D-4 will not exceed any SCAQMD regional daily thresholds during construction. If the Casa Loma Basin and Line Y were under construction concurrently, criteria pollutant emissions from construction of both facilities will exceed the SCAQMD regional daily thresholds for NO_X, PM-10, and PM-2.5. Additionally, short-term emissions from construction of the Casa Loma Basin, Line E, and Line D-4 will exceed SCAQMD's localized significance thresholds for PM-10 and/or PM-2.5 at the respective sensitive receptors in the project vicinity.

No long-term MDP operational emissions were evaluated because the proposed MDP will not result in a change from the operation of the existing MDPs for the project area. Additionally, no long-term localized significance thresholds analysis is needed due to the lack of stationary source emissions**.**

The project's annual CO_2 operational emissions will not exceed the SCAQMD recommended Tier 3 screening level of significance for commercial or industrial projects. The SCAQMD additional requirements for energy and water usage do not apply to this project.

The CARB has not yet developed a quantitative threshold for commercial projects and the currently recommended performance standards for construction and operation of commercial projects also do not apply to this type of project.



Source: Riverside County GIS, 2008

Figure 1

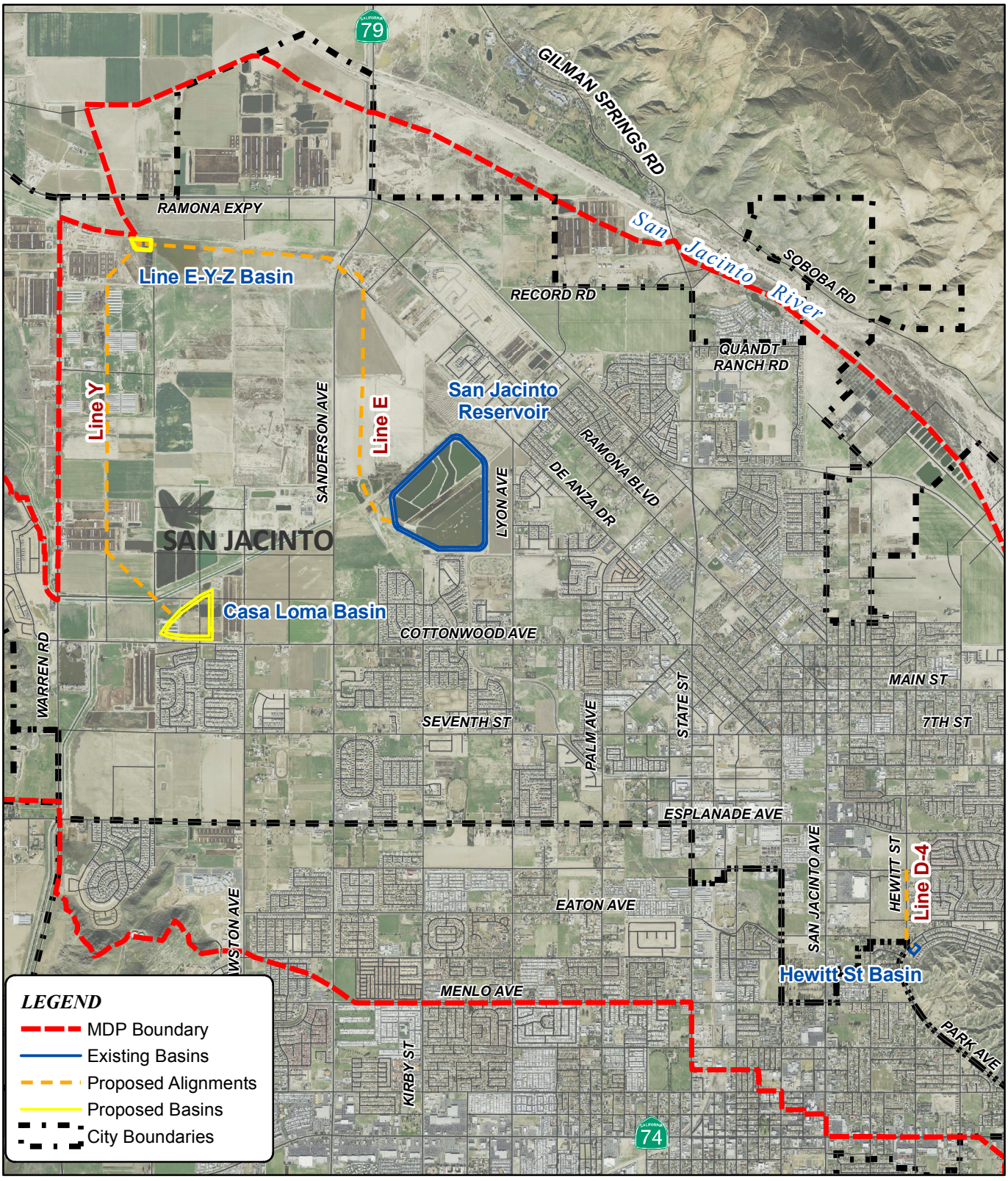
Project Location

N
W E
S

0 3,000 6,000 9,000
Feet

ALBERT A. WEBB ASSOCIATES

G:\\2005\05-0519E\Gis\Project_EL1.mxd



Source: Riverside County GIS, 2008

Figure 2

Analyzed Facilities

N
W E
S

0 3,000 6,000 9,000
Feet

ALBERT A. WEBB ASSOCIATES

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SECTION 2 – EMISSIONS ESTIMATES

BACKGROUND

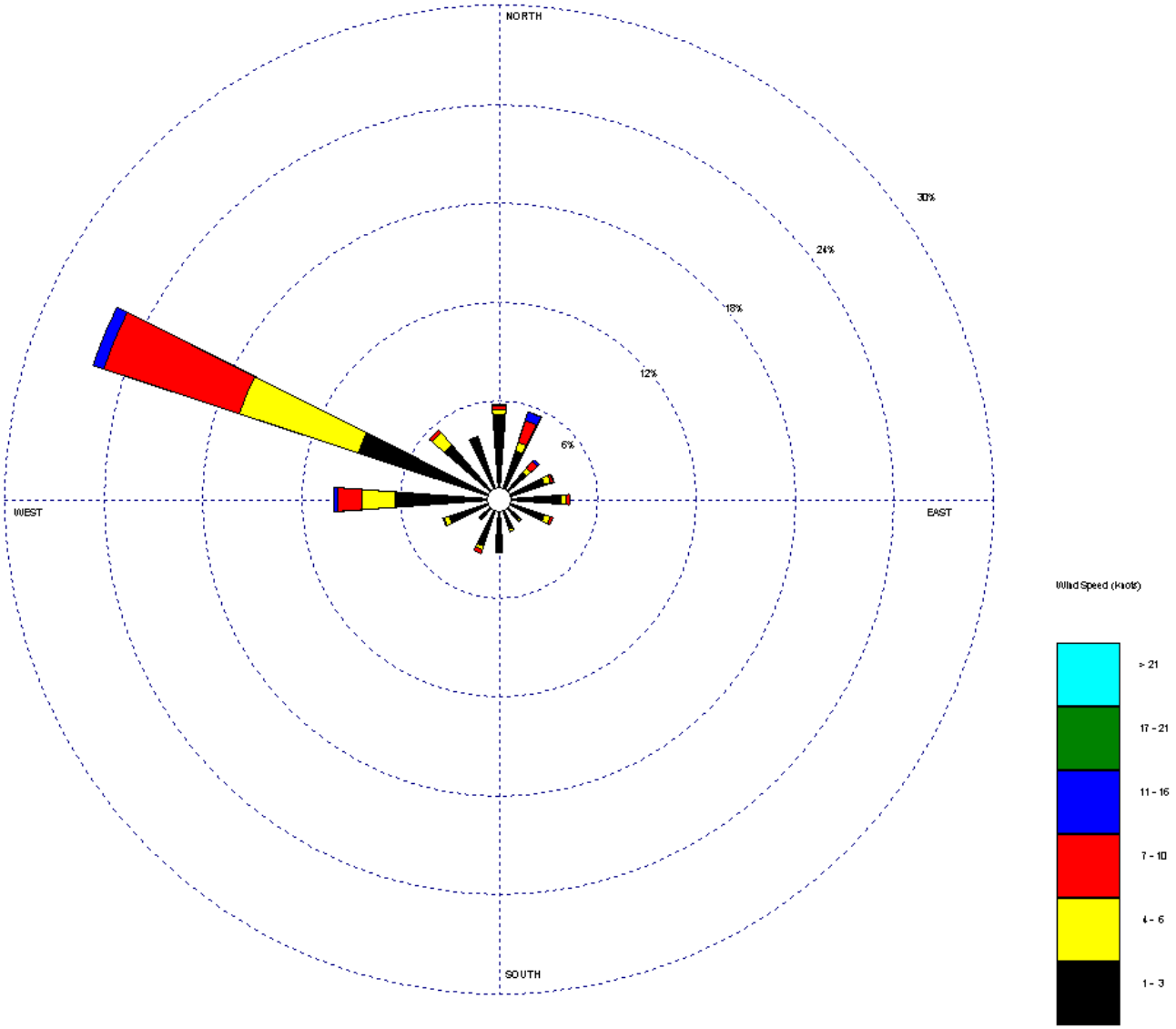
Air quality impacts can be described in a short-term and long-term perspective. Short-term impacts will occur during site grading and project construction. Long-term air quality impacts will occur once the project is in operation.

Many air quality impacts from dispersed mobile sources (cars and trucks), i.e., the dominant pollution generators from the proposed project, often occur hours later and miles away after photochemical processes have converted primary exhaust pollutants into secondary contaminants such as ozone. The incremental regional air quality impact of an individual source is generally immeasurably small. The SCAQMD has therefore developed suggested surrogate significance thresholds based on the volume of pollution emitted rather than on actual ambient air quality because the direct air quality impact of a project is not quantifiable on a regional scale. Air quality impacts can be analyzed on a regional and localized level. Regional air quality thresholds examine the effect of project emissions on the air quality of the Basin, while localized air quality impacts examine the effect of project emissions on the neighborhood around the project site. This report contains analysis of both regional and local air quality impacts from project construction (short-term) and operation (long-term).

The entire project area is located in northwestern Riverside County within the South Coast Air Basin (Basin), under the jurisdiction of the South Coast Air Quality Management District. The Basin consists of Orange County, together with the coastal and mountain portions of Los Angeles, Riverside and San Bernardino counties. Regionally, the interaction of land (offshore) and sea (onshore) breezes control local wind patterns in the area. Daytime winds typically flow from the coast to the inland areas, while this pattern usually reverses in the evenings, flowing from the inland areas to the ocean (SCAQMD 1993). Air stagnation may occur during the early evening and early morning due to periods of transition between day and nighttime flows. The region also experiences periods of hot, dry winds from the desert, known as Santa Ana winds. Locally, the prevailing wind is generally from west to east (**Figure 3, Wind Rose**).

Regional and local air quality within the Basin is affected by topography, atmospheric inversions, and dominant onshore flows. Topographic features such as the San Gabriel and San Bernardino Mountains form natural barriers to the dispersion of air contaminants. The presence of atmospheric inversions limits the vertical dispersion of air pollutants. Due to expansional cooling, the temperature usually decreases with increasing altitude. However, at some elevation, this trend reverses and temperature begins to increase as altitude increases, this transition establishes the effective mixing height of the atmosphere and acts as a barrier to vertical dispersion of pollutants. A dominant onshore flow provides the driving mechanism for both air pollution transport and pollutant dispersion.

Riverside, California – 1981
January 1-December 31; Midnight-11PM



Note: Data taken from the Rubidoux Monitoring Station in Riverside, California, between January 1 and December 31, 1981.
Calm winds: 18.03%. Direction of the colored bars show the direction the wind is blowing from, colors represent various wind speeds, and percentages marked on rings indicate the percentage that the wind blows from that direction and at that particular wind speed.

Figure 3, Wind Rose

San Jacinto Valley MDP
Riverside County, California

Air pollution generated in coastal areas is transported east to inland receptors by the onshore flow during the daytime until a natural barrier (the mountains) is reached, limiting the horizontal dispersion of pollutants. This results in a gradual degradation of air quality from coastal areas to inland areas, which is most evident with photochemical pollutants like ozone. The greatest ozone levels are registered at the South Coast Air Quality Management District's monitoring stations located at the base of the San Gabriel and San Bernardino mountains, ranging from the city of Santa Clarita, east to the city of San Bernardino.

The project area is located within SCAQMD Source Receptor Area (SRA) 28. However, after 1996, no monitoring was done in SRA 28; therefore, the data for the monitoring station with similar meteorological conditions, in SRA 25 (Lake Elsinore), is shown instead. SRA 25 does not monitor SO_2, PM-10, or PM-2.5. Data for these pollutants was taken from neighboring stations in either SRA 23 (Rubidoux) or SRA 24 (Perris Valley). The most recent published data for SRA 23 is presented in **Table 1**. This data indicates that the baseline air quality conditions in the project area include occasional events of very unhealthful air. However, the frequency of smog alerts has dropped significantly in the last decade. Atmospheric concentrations of ozone and particulate matter are the two most significant air quality concerns in the project area. The yearly monitoring records document that prior to 1998, approximately one-third or more of the days each year experienced a violation of the state hourly ozone standard, with around ten days annually reaching first stage alert levels of 0.20 parts per million (ppm) for one hour. It is encouraging to note that ozone levels have decreased in the last few years with approximately one-fourth or less days each year experiencing a violation of the state hourly ozone standard since 1998. Locally, no second stage alert (0.35 ppm/hour) has been called by SCAQMD in the last twenty years. In fact, the last second stage alert was in 1988 in Upland.

The California Air Resources Board (CARB) established a new 8-hour average California Ozone standard of 0.07 ppm, effective May 17, 2006. The federal 1-hour ozone standard was revoked and replaced by the 8-hour average ozone standard of 0.08 ppm effective in June 2005. The federal 8-hour ozone standard was recently revised from 0.08 ppm to 0.075 ppm and became effective on May 27, 2008.

The California NO_2 standards were amended and approved by CARB on February 23, 2007, which lowered the 1-hour standard from 0.25 ppm to 0.18 ppm and established a new annual standard of 0.030 ppm. However, these standards only become effective once the California Office of Administrative Law (OAL) approves them. The proposed regulation to change the NO_2 standards was sent to the OAL in January 2008 and approved on February 19, 2008. The new standards became effective on March 20, 2008.

Monitoring for PM-2.5 did not begin until 1999. Since then, the annual standard has been consistently exceeded as shown in **Table 1**. The 1997 federal annual average standard for PM-2.5 (15 $\mu g/m^3$) was upheld by the U.S. Supreme Court in February 2001. Effective in December 2006, the federal 24-hour PM-2.5 standard was revised from 65 micrograms per cubic meter ($\mu g/m^3$) to 35 $\mu g/m^3$. The state annual average standard for PM-2.5 (12 $\mu g/m^3$) was finalized in 2003 and became effective on July 5, 2003. Additionally, the federal annual PM-10 standard was revoked in December 2006.

Table 1, SRA 25, Air Quality Monitoring Summary - 1998-2007

	Pollutant/Standard Source: SCAQMD	Monitoring Year									
		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
No. Days Exceeded	**Ozone:**										
	Health Advisory - 0.15 ppm	--	--	--	1	0	2	0	1	0	0
	California Standard:										
	1-Hour - 0.09 ppm	52	51	45	61	52	50	41	37	40	26
	8-Hour - 0.070 ppm [a]	--	--	--	--	--	--	51	46	58	55
	Federal Primary Standards:										
	1-Hour - 0.12 ppm	22	4	1	12	6	7	2	4	3	3
	8-Hour - 0.08 ppm (0.075 ppm)[a]	44	37	31	46	44	35	21	15	24	19(35)
	Max 1-Hour Conc. (ppm)	0.17	0.14	0.13	0.151	0.139	0.154	0.13	0.149	0.14	0.130
	Max 8-Hour Conc. (ppm)	0.14	0.13	0.109	0.120	0.114	0.137	0.12	0.119	0.109	0.108
No. Days Exceeded	**Carbon Monoxide:**										
	California Standard:										
	1-Hour - 20 ppm	--	--	0	0	0	0	0	0	0	0
	8-Hour - 9.0 ppm	--	--	0	0	0	0	0	0	0	0
	Federal Primary Standards:										
	1-Hour - 35 ppm	--	--	0	0	0	0	0	0	0	0
	8-Hour - 9.0 ppm	--	--	0	0	0	0	0	0	0	0
	Max 1-Hour Conc. (ppm)	--	--	4	2	3	4	2	2	1	2
	Max 8-Hour Conc. (ppm)	--	--	2.0	2.0	2.0	1.3	0.9	1.0	1.0	2.3
No. Days Exceeded	**Nitrogen Dioxide:**										
	California Standard:										
	1-Hour - 0.18 ppm	0	0	0	0	0	0	0	0	0	0
	Federal Standard:										
	Annual Arithmetic Mean (ppm) [b]	0.017	0.020	0.018	0.019	0.017	0.018	0.015	0.014	0.015	0.017
	Max. 1-Hour Conc. (ppm)	0.09	0.11	0.08	0.09	0.07	0.08	0.06	0.07	0.07	0.06
No. Days Exceeded	**Sulfur Dioxide [c]:**										
	California Standards:										
	1-Hour – 0.25 ppm	0	0	0	0	0	0	0	0	0	0
	24-Hour – 0.04 ppm	0	0	0	0	0	0	0	0	0	0
	Federal Primary Standards:										
	24-Hour – 0.14 ppm	0	0	0	0	0	0	0	0	0	0
	Annual Standard – 0.03 ppm [d]	No	No	No	No	No	No	No	No	No	No
	Max. 1-Hour Conc. (ppm)	0.03	0.03	0.11	0.02	0.02	0.02	0.02	0.02	0.01	0.02
	Max. 24-Hour Conc. (ppm)	0.010	0.011	0.041	0.011	0.002	0.012	0.015	0.011	0.004	0.002
No. Days Exceeded	**Suspended Particulates (PM10) [e]:**										
	California Standards:										
	24-Hour - 50 $\mu g/m^3$	14	30	13	16	24	19	15	19	19	32
	Federal Primary Standards:										
	24-Hour – 150 $\mu g/m^3$	0	1	0	0	0	2	0	0	0	0
	Annual Arithmetic Mean ($\mu g/m^3$) [f]	36.1	50.0	41.1	40.8	45.2	43.9	41.4	39.2	45.0	54.8
	Max. 24-Hour Conc. ($\mu g/m^3$)	98	112	87	86	100	142	83	80	125	120
No. Days Exceeded	**Suspended Particulates (PM2.5) [c]:**										
	California & Federal Primary Standards:										
	24-Hour – 65 $\mu g/m^3$ ($35\mu g/m^3$) [g]	--	9	11	19	8	8	5	4	1(32)	3(33)
	Annual Arithmetic Mean ($\mu g/m^3$) [h]	--	30.9	28.2	31.1	27.5	24.9	22.1	21.0	19.0	19.1
	Max. 24-Hour Conc. ($\mu g/m^3$)	--	111.2	119.6	98.0	77.6	104.3	91.7	98.7	68.5	75.7

Note: -- No data available.

a. 2004 is first year of SCAQMD records for state 8-hour Ozone standard. Federal 8-hour ozone standard 0.075 ppm effective May 27, 2008.

b. Federal NO_2 standard is AAM > 0.053; State NO_2 standard of AAM > 0.030 effective March 20, 2008.

c. Metro Riverside County 1 air monitoring station (SRA 23) data summaries used.

d. Yes or No indicating whether or not the standard has been exceeded for that year.

e. Perris Valley air monitoring station (SRA 24) data summaries used.

f. Federal PM-10 standard is AAM> $50\mu g/m^3$ was revoked December 17, 2006. State standard is AAM> $20\mu g/m^3$, effective July 5, 2003.

g. 1999 is first year of SCAQMD records for federal 24-hour PM-2.5 standard and data summary. Threshold changed to $35\mu g/m^3$ in 2006.

h. Federal PM-2.5 standard is annual average (AAM) > $15\mu g/m^3$. State standard is annual average (AAM) > $12\mu g/m$

REGULATORY SETTING

The federal and California ambient air quality standards (AAQS) establish the context for the local air quality management plans (AQMP) and for determination of the significance of a project's contribution to local or regional pollutant concentrations. The California and federal AAQS are presented in **Table 1**. The AAQS represent the level of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those people most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other diseases or illness and persons engaged in strenuous work or exercise, all referred to as “sensitive receptors”. SCAQMD defines a "sensitive receptor" as a land use or facility such as residences, schools, child care centers, athletic facilities, playgrounds, retirement homes and convalescent homes.

Both federal and state Clean Air Acts require that each non-attainment area prepare a plan to reduce air pollution to healthful levels. The 1988 California Clean Air Act and the 1990 amendments to the federal Clean Air Act (CAA) established new planning requirements and deadlines for attainment of the air quality standards within specified time frames which are contained in the State Implementation Plan (SIP). Amendments to the SIP have been proposed, revised, and approved over the past decade. The currently adopted clean air plan for the basin is the 1999 SIP Amendment, approved by the U.S. Environmental Protection Agency (EPA) in 2000.

The Air Quality Management Plan (AQMP) for the Basin establishes a program of rules and regulations directed at attainment of the state and national air quality standards. The AQMP control measures and related emission reduction estimates are based upon emissions projections for a future development scenario derived from land use, population, and employment characteristics defined in consultation with local governments. Accordingly, conformance with the AQMP for development projects is determined by demonstrating compliance with local land use plans and/or population projections. The SCAQMD adopted an updated AQMP in June 2007, which outlines the air pollution measures needed to meet federal health-based standards for particulates (PM-2.5) by 2014 and for ozone by 2023 (SCAQMD 2007). The AQMP was forwarded to the California Air Resources Board (CARB) for review and approved on September 27, 2007. It was sent to the EPA for its final approval and to be included as a revision to California’s SIP on November 16, 2007.

The CARB maintains records as to the attainment status of air basins throughout the state, under both state and federal criteria. The portion of the Basin within which the proposed project is located is designated as a non-attainment area for ozone, PM-10, and PM-2.5 under both state and federal standards.

REGIONAL SIGNIFICANCE THRESHOLD ANALYSIS

The thresholds contained in the SCAQMD CEQA Air Quality Handbook are considered regional thresholds and are shown in **Table 2**. These regional thresholds were developed based on the SCAQMD's treatment of a major stationary source.

Table 2, SCAQMD CEQA Regional Significance Thresholds

Emission Threshold	Units	VOC	NO_X	CO	SO_X	PM-10	PM-2.5
Construction	lbs/day	75	100	550	150	150	55
Operations	lbs/day	55	55	550	150	150	55

Short-Term Analysis

Short-term emissions consist of fugitive dust and other particulate matter, as well as exhaust emissions generated by construction-related vehicles. Short-term impacts will also include emissions generated during construction as a result of operation of personal vehicles by construction workers, asphalt degassing and architectural coating (painting) operations.

The project will be required to comply with existing SCAQMD rules for the reduction of fugitive dust emissions. SCAQMD Rule 403 establishes these procedures. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour (mph), sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites. In addition, projects that disturb 50 acres or more of soil or move 5,000 cubic yards of materials per day are required to submit a Fugitive Dust Control Plan or a Large Operation Notification Form to SCAQMD. Depending on the size of individual construction projects, certain MDP facilities may or may not require a Fugitive Dust Control Plan or Large Operation Notification.

Short-term emissions were evaluated using the URBEMIS 2007 for Windows version 9.2.4 computer program. The model evaluated emissions resulting from basin excavation and construction of several types of drainage facilities. Construction timing and phasing of all San Jacinto Valley MDP facilities are unknown; therefore, it was assumed that construction of all four modeled scenarios could start no sooner than August 2010. The default parameters within URBEMIS were used and these default values reflect a worst-case scenario, which means that any other proposed MDP facility project's emissions are expected to be equal to or less than the estimated construction emissions modeled for each of the four modeled scenarios.

Four different "worst-case" scenarios representing each type of individual construction project were analyzed. In addition to the default values used, several assumptions relevant to model inputs for short-term construction emission estimates of each project are presented below.

Casa Loma Basin:

- Construction of this basin is anticipated to require no less than nine months. As stated above, construction timing is unknown and is assumed to occur no sooner than August 2010.
- Approximately 727,000 cubic yards of soil will be exported from the site. While the location of the exported soil is unknown at this time, plenty of sites exist within 10 miles of the project site to deposit fill material. Therefore, for modeling purposes each truck trip (two truck trips per truckload) is set at 10 miles. A maximum disturbance area of 2-acres is assumed to occur per day.
- To evaluate project compliance with SCAQMD Rule 403 for fugitive dust control, the project utilized the mitigation option of watering the project site three times daily which achieves a control efficiency of 61 percent for PM-10 and PM-2.5 emissions.

Line Y:

- Construction of 12,000 linear feet of Line Y in this analysis also includes Line Y-1 and does not include the segment of Line Y that continues south from the connection with Line Y-1 to Warren Road ending at Seventh Street. The maximum dimensions for this underground concrete box alignment are 14-feet wide by 11-feet deep.
- Construction of this project is anticipated to progress at a rate of 100 feet per day. As stated above, construction timing is unknown and is assumed to occur no sooner than August 2010.
- A trench depth of 20 feet is anticipated approximately 1,500 cubic yards of on-site cut/fill will be disturbed daily during the excavation and re-compaction of the project area.
- To evaluate project compliance with SCAQMD Rule 403 for fugitive dust control, the project utilized the mitigation option of watering the project site three times daily which achieves a control efficiency of 61 percent for PM-10 and PM-2.5 emissions.

Line E:

- Construction of the 14,700 linear feet of open channel is anticipated to progress at a rate of 500 feet per day. As stated above, construction timing is unknown and is assumed to occur no sooner than August 2010.
- A trench depth of 7 feet is anticipated and approximately 7,300 cubic yards of on-site cut/fill will be disturbed daily during the excavation and re-compaction of the project area
- To evaluate project compliance with SCAQMD Rule 403 for fugitive dust control, the project utilized the mitigation option of watering the project site three times daily which achieves a control efficiency of 61 percent for PM-10 and PM-2.5 emissions.

Line D-4:

- Construction of the 2,200 linear feet of 42-inch underground pipeline is anticipated to progress at a rate of 100 feet per day. As stated above, construction timing is unknown and is assumed to occur no sooner than August 2010.
- A trench depth of 9 feet is anticipated and approximately 233 cubic yards of on-site cut/fill will be disturbed daily during the excavation and re-compaction of the project area.

- To evaluate project compliance with SCAQMD Rule 403 for fugitive dust control, the project utilized the mitigation option of watering the project site three times daily which achieves a control efficiency of 61 percent for PM-10 and PM-2.5 emissions.
- Approximately 15,400 square feet (0.35 acres) of surface area will be covered in asphalt once the pipeline is in place. To ensure a worst-case scenario, it is assumed that both pipeline installation and asphalt paving could occur concurrently.

The construction equipment estimated to be used for each project is shown in Appendix A. **Table 3** through **Table 6** summarize the estimated construction emissions from each representative construction scenario.

Table 3, Casa Loma Basin - Estimated Daily Construction Emissions

Activity/Year	Peak Daily Emissions (lb/day)					
	VOC	NO_X	CO	SO_2	PM-10	PM-2.5
SCAQMD Daily Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Construction 2010						
Fugitive Dust	0.00	0.00	0.00	0.00	140.51	29.34
Off-Road Diesel	9.51	79.47	41.07	0.00	3.95	3.64
On-Road Diesel	8.01	111.95	39.96	0.15	4.87	4.17
Worker Trips	0.07	0.14	2.35	0.00	0.02	0.01
Maximum	17.59	191.56	83.38	0.15	149.35	37.16
Exceeds Threshold?	**No**	**Yes**	**No**	**No**	**No**	**No**
Construction 2011						
Fugitive Dust	0.00	0.00	0.00	0.00	140.51	29.34
Off-Road Diesel	8.96	74.72	39.27	0.00	3.69	3.39
On-Road Diesel	7.36	100.25	35.96	0.15	4.34	3.68
Worker Trips	0.06	0.12	2.17	0.00	0.02	0.01
Maximum	16.38	175.09	77.40	0.15	148.56	36.42
Exceeds Threshold?	**No**	**Yes**	**No**	**No**	**No**	**No**

Notes: See Appendix A for model output report.

Table 4, Line Y - Estimated Daily Construction Emissions

Activity/Year	Peak Daily Emissions (lb/day)					
	VOC	NO_X	CO	SO_2	PM-10	PM-2.5
SCAQMD Daily Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Construction 2010						
Fugitive Dust	0.00	0.00	0.00	0.00	91.76	19.16
Off-Road Diesel	4.81	38.34	20.73	0.00	2.10	1.94
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01
Maximum	4.86	38.43	22.30	0.00	93.87	21.11
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Construction 2011						
Fugitive Dust	0.00	0.00	0.00	0.00	91.76	19.16
Off-Road Diesel	4.53	35.87	20.03	0.00	1.97	1.82
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.04	0.08	1.45	0.00	0.01	0.01
Maximum	4.57	35.95	21.48	0.00	93.74	20.99
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: See Appendix A for model output report.

Table 5, Line E - Estimated Daily Construction Emissions

Activity/Year	Peak Daily Emissions (lb/day)					
	VOC	NO_X	CO	SO_2	PM-10	PM-2.5
SCAQMD Daily Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Construction 2010						
Fugitive Dust	0.00	0.00	0.00	0.00	452.25	94.45
Off-Road Diesel	8.35	67.59	36.68	0.00	3.56	3.27
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.07	0.14	2.35	0.00	0.02	0.01
Maximum	8.42	67.73	39.03	0.00	455.83	97.73
Exceeds Threshold?	**No**	**No**	**No**	**No**	**Yes**	**Yes**

Notes: See Appendix A for model output report.

Table 6, Line D-4 - Estimated Daily Construction Emissions

Activity/Year	Peak Daily Emissions (lb/day)					
	VOC	NO_X	CO	SO_2	PM-10	PM-2.5
SCAQMD Daily Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Construction 2010						
Trenching						
Fugitive Dust	0.00	0.00	0.00	0.00	15.46	3.23
Off-Road Diesel	3.73	30.98	15.77	0.00	1.55	1.43
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.03	0.06	1.04	0.00	0.01	0.01
Asphalt						
Off-Gas	0.03	0.00	0.00	0.00	0.00	0.00
Off-Road Diesel	1.67	10.14	5.80	0.00	0.86	0.79
On-Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00
Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01
Maximum[1]	5.50	41.29	24.16	0.00	17.88	5.45
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: See Appendix A for model output report.
[1] Maximum emissions are the sum of trenching and asphalt/paving activities since these activities could be occurring concurrently.

Evaluation of the tables above indicates that criteria pollutant emissions from construction of the Casa Loma Basin project will exceed the SCAQMD regional daily thresholds for NO_X throughout construction and construction of Line E will exceed the SCAQMD regional daily thresholds for PM-10, and PM-2.5, but construction of Line Y and D-4 will not exceed any SCAQMD regional daily thresholds during construction. The main source of NO_X emissions are from on-road vehicle exhaust from soil hauling and construction equipment while the main source of PM-10 and PM-2.5 emissions is from fugitive dust during channel excavation activities.

Since this project consists of several distinct project sites, there is the possibility that construction of various projects will overlap. It was determined that construction of the Casa Loma Basin and the analyzed portion of Line Y would be the most likely of all MDP facilities to occur at the same time. The maximum daily emissions from these overlapping construction schedules during 2010 and 2011 are contained in **Table 7**.

Table 7, Estimated Maximum Daily Emissions (2010-2011)

Activity/Year	Peak Daily Emissions (lb/day)					
	VOC	NO_X	CO	SO_2	PM-10	PM-2.5
SCAQMD Daily Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
2010						
Casa Loma Basin	17.59	191.56	83.38	0.15	149.35	37.16
Line Y	4.86	38.43	22.30	0.00	93.87	21.11
Maximum	**22.45**	**229.99**	**105.68**	**0.15**	**243.22**	**58.27**
Exceeds Threshold?	**No**	**Yes**	**No**	**No**	**Yes**	**Yes**
2011						
Casa Loma Basin	16.38	175.09	77.40	0.15	148.56	36.42
Line Y	4.57	35.95	21.48	0.00	93.74	20.99
Maximum	**20.95**	**211.04**	**98.88**	**0.15**	**242.30**	**57.41**
Exceeds Threshold?	**No**	**Yes**	**No**	**No**	**Yes**	**Yes**

The maximum short-term emissions during 2010 and 2011 will be higher than the emissions from the two individual project types alone. As shown in **Table 7**, criteria pollutant emissions from construction in both years will exceed the SCAQMD regional daily thresholds for NO_X, PM-10, and PM-2.5.

Long-Term Analysis

Long-term air quality impacts will occur once the project is in operation. The majority of operational emissions would be from the infrequent visits by vehicles driven by maintenance personnel. This and any other maintenance-related activity will not result in additional sources of emissions when compared to the existing maintenance routine of the current MDPs for the area. Therefore, no long-term impacts related to the San Jacinto Valley MDP facility operation were evaluated.

Conclusion

Based on the regional significance threshold analysis for the proposed project, the short-term construction will exceed the daily regional thresholds set by SCAQMD for NO_X, PM-10, and PM-2.5 during construction of various projects or combinations of projects, but will not exceed any other pollutant thresholds. No long-term MDP operational emissions were evaluated because the proposed MDP will not result in a change from the operation of the existing MDPs for the project area.

LOCALIZED SIGNIFICANCE THRESHOLD ANALYSIS

Background

Recently, as part of the SCAQMD's environmental justice program, attention has been focused on localized effects of air quality. Staff at SCAQMD has developed localized significance threshold (LST) methodology (SCAQMD 2008) that can be used by public agencies to determine whether or not a project may generate significant adverse localized air quality impacts (both short-term and long-term). LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area (SRA). This project is located in SRA 28.

Methodology

The emissions analyzed under the LST methodology are NO_2, CO, PM-10, and PM-2.5. For attainment pollutants, nitrogen dioxide (NO_2) and CO, the LSTs are derived using an air quality dispersion model to back-calculate the emissions per day that would cause or contribute to a violation of any ambient air quality standard for a particular source receptor area. LSTs for NO_2 and CO are derived by adding the incremental emission impacts from the project activity to the peak background NO_2 and CO concentrations and comparing the total concentration to the most stringent ambient air quality standards. The most stringent standard for NO_2 is the 1-hour state standard of 18 parts per hundred million and for CO it is the 1-hour and 8-hour state standards of 9 parts per million (ppm) and 20 ppm respectively. For PM-10 and PM-2.5, which the Basin is non-attainment, the LST's are derived using an air quality dispersion model to back-calculate the emissions necessary to make an existing violation in the specific source receptor area worse, using the allowable change in concentration thresholds approved by the SCAQMD. For PM-10 and PM-2.5, the approved 24-hour concentration thresholds for construction and operation are 10.4 $\mu g/m^3$ and 2.5 $\mu g/m^3$, respectively.

The short-term LST analysis for the each representative project site was performed using lookup tables provided by the SCAQMD. SCAQMD has provided LST lookup tables to allow users to readily determine if the daily emissions for proposed construction or operational activities could result in significant localized air quality impacts for projects five acres or smaller. For each of the project-related activities, it was anticipated that an area no larger than two acres would be disturbed at any one time in a given location during construction. The results are included following the short-term analysis discussion below.

Short-Term Analysis

For short-term construction emissions, it is estimated that the maximum area to be disturbed for each representative project would be less or equal to two acres a day. According to the LST methodology, only on-site emissions need to be analyzed. On-site construction emissions do not include worker trips or on-road diesel truck emissions from soil hauling. SCAQMD has provided LST lookup tables and sample construction scenarios (available at http://www.aqmd.gov/ceqa/handbook/LST/LST.html) to allow users to readily determine if the daily emissions for proposed construction or operational activities could result in significant localized air quality impacts for projects five acres or smaller. Although some of the representative project sites are larger than five acres, it is anticipated that an area no larger than two acres would be disturbed on any of the representative project sites per day during construction. Therefore, the LST lookup tables were used for construction emissions. Project-specific information such as disturbance area, amount of dirt handled, and the equipment type and numbers were input instead of default information when available.

The LST thresholds are estimated using the maximum daily disturbed area (in acres) and the distance of the project to the nearest sensitive receptors (in meters). The LST lookup tables only provide thresholds for distances of 25, 50, 100, 200, and 500 meters away from the project boundary, so the receptor distances used reflect one of these distances. Because the project consists of four separate project sites in different locations that are located different distances from sensitive receptors, each representative project is analyzed separately for its relationship to the nearest sensitive receptors. Existing residences are the nearest sensitive receptors in the project vicinity for each of the representative projects. However, the entire San Jacinto Valley MDP area includes many types of sensitive receptors consisting of schools, child care centers, athletic facilities, playgrounds, retirement homes and convalescent homes adjacent to and in close proximity with the majority of the MDP facilities. The Casa Loma Basin is separated from its nearest sensitive receptors by Cottonwood Avenue at a distance of approximately 100 feet (30 meters). Line Y is separated from the nearest sensitive receptors, residences on agricultural lands, by a minimum of approximately 600 feet (183 meters) so the receptor distance of 200 meters was used. The nearest sensitive receptor to Line E is a residence approximately 170 feet (52 meters) west of the alignment on Sanderson Avenue near the existing San Jacinto Reservoir. LST Methodology states that project's with boundaries located closer than 25 meters to the nearest receptor should use the LST distance of 25 meters for the analysis. A distance of 25 meters was used to estimate the receptor distance for Line D-4 construction that will occur within the road right-of-way adjacent to sensitive receptors on Hewitt Street. **Table 8** summarizes the emissions from each representative project and the corresponding threshold.

Table 8, Localized Short-Term Construction Impacts

Activity	Maximum Daily Disturbed Area (acres)	Peak Daily Emissions (lb/day)			
		NO_X	CO	PM-10	PM-2.5
Casa Loma Basin	2.0	115.2	53.7	9	5.9
25 Meter Threshold	2.0	234	970	7	4
Exceeds Threshold		**No**	**No**	**Yes**	**Yes**
Line Y	0.23	53.5	26.8	3.4	2.8
200 Meter Threshold	1.0	460	4,850	67	20
Exceeds Threshold		**No**	**No**	**No**	**No**
Line E	1.15	102.3	49.7	6.7	5.1
50 Meter Threshold	1.0	203	974	12	4
Exceeds Threshold		**No**	**No**	**No**	**Yes**
D-4	0.23	74.4	38.2	4.8	4.2
25 Meter Threshold	1.0	162	661	4	3
Exceeds Threshold		**No**	**No**	**Yes**	**Yes**

According to **Table 8**, construction of the Casa Loma Basin and Line D-4 will result in localized PM-10 and PM-2.5 impacts to the respective sensitive receptors in the project vicinity and the construction of Line E will result in localized PM-2.5 impacts to its receptors. Localized emissions of NO_X and CO from construction of each representative project will not exceed the applicable LST.

Long-Term Analysis

The proposed drainage facilities consist of the construction of reinforced concrete boxes, reinforced concrete pipes, open concrete channels, open earth channels, and earthen basins. The majority of the operational emissions are in the form of mobile source emissions from infrequent visits by maintenance vehicles, without any stationary sources present. According to the SCAQMD LST methodology, LSTs would apply to the operational phase of a project, if the project includes stationary sources, or attracts mobile sources that may spend long periods queuing and idling at the site; such as warehouse/transfer facilities. The proposed project does not include such uses. Therefore, due the lack of stationary source emissions, no long-term localized significance threshold analysis is needed.

Conclusion

Based on the LST analysis of the proposed project, the short-term construction of the project will result in localized air quality impacts to sensitive receptors in the project vicinity for PM-10 and PM-2.5 during construction of various MDP project types. Short-term construction will not result in an exceedance of the LST thresholds for NO_X and CO. Due to the lack of stationary source emissions; no long-term localized significance threshold analysis is needed.

RECOMMENDED MITIGATION MEASURES

In addition to compliance with SCAQMD Rule 403 (see page 11) for project construction, the following mitigation measures shall be implemented:

MM Air 1: During construction**,** ozone precursor emissions from all vehicles and construction equipment shall be controlled by maintaining equipment engines in good condition and in proper tune per manufacturers' specifications to the satisfaction of the City of San Jacinto Public Works Department. Equipment maintenance records and equipment design specification data sheets shall be kept on-site during construction. Compliance with this measure shall be subject to periodic inspections by the City of San Jacinto Public Works Department.

MM Air 2: All vehicles shall be prohibited from idling in excess of five minutes, both on-site and off-site.

MM Air 3: Electricity from power poles shall be used instead of temporary diesel- or gasoline powered generators to reduce the associated emissions.

MM Air 4: To reduce construction vehicle (truck) and equipment idling while waiting to enter/exit the site, the contractor shall submit a traffic control plan that will describe in detail safe detours to prevent traffic congestion to the best of the project's ability, and provide temporary traffic control measures. To reduce traffic congestion, and therefore NO_X, the plan shall include, as necessary, appropriate, and practicable the following: dedicated turn lanes for movement of construction trucks and equipment on- and off-site, scheduling of construction activities that affect traffic flow on the arterial system to off-peak hour, rerouting of construction trucks away from congested streets or sensitive receptors, and/or signal synchronization to improve traffic flow.

IMPACTS AFTER MITIGATION

In an effort to reduce estimated emissions, the mitigation measures listed above were considered. **MM Air 1** through **4** are associated with reduction in construction-related emissions for NO_X, PM-10 and PM-2.5.

Although implementation of mitigation measures **MM Air 1** through **4** will reduce project-generated emissions, there are no distinct SCAQMD established quantitative reductions associated with them; therefore, to be conservative, it is assumed that there is no change in the estimated emissions of the project from those mitigation measures. The project's short-term construction emissions will still exceed the SCAQMD regional significance thresholds for NO_X, PM-10, and PM-2.5. Short-term construction will also exceed applicable localized significance thresholds (LST) for PM-10 and PM-2.5.

CONCLUSION

The project-specific evaluation presented in the preceding analysis demonstrates that, even with mitigation, projected short-term emissions from construction of the project are above applicable SCAQMD regional thresholds for NO_X, PM-10, and PM-2.5 for various project's or combinations of projects, but will not exceed any other pollutant thresholds. Additionally, short-term emissions from construction of the Casa Loma Basin, Line E, and Line D-4 will exceed SCAQMD's localized significance thresholds (LST) for PM-10 and/or PM-2.5.

No long-term MDP operational emissions were evaluated because the proposed MDP will not result in a change from the operation of the existing MDPs for the project area. Additionally, no long-term localized significance thresholds analysis is needed due to the lack of stationary source emissions**.**

SECTION 3 – GLOBAL CLIMATE CHANGE ANALYSIS

BACKGROUND

Some gases in the atmosphere affect the Earth's heat balance by absorbing infrared radiation. This layer of gases in the atmosphere functions much the same as glass in a greenhouse (i.e., both prevent the escape of heat). This is why global warming is also known as the "greenhouse effect." Increased emissions of these gases due to combustion of fossil fuels and other activities have increased the greenhouse effect, leading to global warming and other climate changes. Gases responsible for global climate change in the South Coast Air Basin and their relative contribution to the overall warming effect are carbon dioxide (55 percent), CFCs (24 percent), methane (15 percent), and nitrous oxide (6 percent) (SCAQMD 2005). It is widely accepted that continued increases in greenhouse gases (GHG) will contribute to global climate change although there is uncertainty concerning the magnitude and timing of future emissions and the resultant warming trend (SCAQMD 2005). Human activities associated with industrial/manufacturing, utilities, transportation, residential, and agricultural sectors contribute to these GHG (CEC 2006a). According to the California Energy Commission (CEC), transportation was responsible for 41 percent of the state's GHG emissions, followed by electricity generation in 2004 (CEC 2006a). More recently, the California Air Resources Board (CARB) reported that transportation was 38 percent of the state's GHG emissions, followed by electricity generation in 2004 (CARB 2007). Emissions of CO_2 and nitrous oxide (N_2O) are byproducts of fossil fuel combustion. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices, landfills, and wastewater treatment.

"Stratospheric ozone depletion" refers to the slow destruction of naturally occurring ozone, which lies in the upper atmosphere (called the stratosphere) and which protects Earth from the damaging effects of solar ultraviolet radiation. Certain compounds, including chlorofluorocarbons (CFCs,) halons, carbon tetrachloride, methyl chloroform, and other halogenated compounds, accumulate in the lower atmosphere and then gradually migrate into the stratosphere. In the stratosphere, these compounds participate in complex chemical reactions to destroy the upper ozone layer. Destruction of the ozone layer increases the penetration of ultraviolet radiation to the Earth's surface, a known risk factor that can increase the incidence of skin cancers and cataracts, contribute to crop and fish damage, and further degrade air quality (SCAQMD 2005).

GHG and ozone-depleting gases include, but are not limited to, the following:

- **Carbon dioxide –** Carbon dioxide results from fossil fuel combustion in stationary and mobile sources. It contributes to the greenhouse effect, but not to stratospheric ozone depletion. In 2004, carbon dioxide accounted for approximately 84 percent of total GHG emissions in the state (CEC 2006a). In the SCAB, approximately 48 percent of carbon dioxide emissions come from transportation, residential and utility sources which contribute approximately 13 percent each, 20 percent come from industry, and the remainder comes from a variety of other sources (SCAQMD 2005).

- **Methane –** Atmospheric methane is emitted from both non-biogenic and biogenic sources. Non-biogenic sources include fossil fuel mining and burning, biomass burning, waste treatment, geologic sources, and leaks in natural gas pipelines. Biogenic sources include wetlands, rice agriculture, livestock, landfills, forest, oceans, and termites. Methane sources can also be divided into anthropogenic and natural. Anthropogenic sources include rice agriculture, livestock, landfills, and waste treatment, some biomass burning, and fossil fuel combustion. Natural sources are wetlands, oceans, forests, fire, termites and geological sources. Anthropogenic sources currently account for more than 60 percent of the total global emissions. (IPCC) It is a greenhouse gas and traps heat 40-70 times more effectively than carbon dioxide. (SCAQMD 2005) In the SCAB, more than 50 percent of human-induced methane emissions come from natural gas pipelines, while landfills contribute 24 percent. Methane emissions from landfills are reduced by SCAQMD Rule 1150.1 - Control of Gaseous Emissions from Active Landfills. Methane emissions from petroleum sources are reduced by a number of rules in SCAQMD Regulation XI that control fugitive emissions from petroleum production, refining, and distribution. (SCAQMD 2005)
- **Other regulated greenhouse gases include Nitrous Oxide, Sulfur Hexafluoride, Hydrofluorocarbons, and Perfluorocarbons -** These gases all possess heat-trapping potentials hundreds to thousands of times more effective than carbon dioxide. Emission sources of nitrous oxide gases include, but are not limited to, waste combustion, waste water treatment, fossil fuel combustion, and fertilizer production. Because the volume of emissions is small, the net effect of nitrous oxide emissions relative to carbon dioxide or methane is relatively small. Sulfur hexafluoride, hydrofluorocarbon, and perfluorocarbon emissions occur at even lower rates.
- **Chlorofluorocarbons** – Chlorofluorocarbons (CFCs) are emitted from blowing agents used in producing foam insulation. They are also used in air conditioners and refrigerators and as solvents to clean electronic microcircuits. CFCs are primary contributors to stratospheric ozone depletion and to global warming. Sixty-three percent of CFC emissions in the SCAB come from the industrial sector. Federal regulations require service practices that maximize recycling of ozone-depleting compounds (both CFCs, hydro-chlorofluorocarbons and their blends) during the servicing and disposal of air-conditioning and refrigeration equipment. SCAQMD Rule 1415 – Reduction of Refrigerant Emissions from Stationary Refrigeration and Air Conditioning Systems requires CFC refrigerants to be reclaimed or recycled from stationary refrigeration and air conditioning systems. SCAQMD Rule 1405 – Control of Ethylene Oxide and Chlorofluorocarbon Emissions From Sterilization or Fumigant Processes requires recovery of reclamation of CFCs at certain commercial facilities and eliminates the use of some CFCs in the sterilization processes. Some CFCs are classified as TACs and regulated by SCAQMD Rule 1401 – New Source Review of Toxic Air Contaminants and SCAQMD Rule 1402 Control of Toxic Air Contaminants from Existing Sources.
- **Halons –** These compounds are used in fire extinguishers and behave as both ozone-depleting and greenhouse gases. Halon production ended in the United States in 1993. SCAQMD Rule 1418 – Halon Emissions From Fire Extinguishing Equipment requires the recovery and recycling of halons used in fire extinguishing systems and prohibits the sale of halon in small fire extinguishers.

- **Hydro-chlorofluorocarbons –** HCFCs are solvents, similar in use and chemical composition to CFCs. The hydrogen component makes HCFCs more chemically reactive than CFCs, allowing them to break down more quickly in the atmosphere. These compounds deplete the stratospheric ozone layer, but to a much lesser extent than CFCs. HCFCs are regulated under the same SCAQMD rules as CFCs.
- **1,1,1,-trichloroethane (TCA**) – TCA (methyl chloroform) is a solvent and cleaning agent commonly used by manufacturers. It is less destructive on the environment than CFCs or HCFCs, but its continued use will contribute to global warming and ozone depletion. 1,1,1-trichloroethane (TCA) is a synthetic chemical that does not occur naturally in the environment. No TCA is supposed to be manufactured for domestic use in the United States after January 1, 2002 because it affects the ozone layer. TCA had many industrial and household uses, including use as a solvent to dissolve other substances, such as glues and paints; to remove oil or grease from manufactured metal parts; and as an ingredient of household products such as spot cleaners, glues, and aerosol sprays. SCAQMD regulates this compound as a toxic air contaminant under Rules 1401 and 1402.

Unlike criteria air pollutants and TACs, which are pollutants of regional and local concern, global warming is a global problem and GHGs are global pollutants. Impacts of GHG emissions are a function of their total atmospheric concentration and most GHGs are globally well mixed atmospheric constituents. This means that the location of a particular GHG emission, in contrast to the situation for criteria pollutants, does not change its environmental impact.

Globally, for the years 2000 through 2005, the annual average emissions of fossil fuel-related carbon dioxide was 26.4 gigatons of CO_2 (one gigaton equals one billion Mt) per year (IPCC). It should also be noted that the annual total U.S. emissions of GHG dropped 1.5 percent in 2006 from 7,181 million Mt to 7,075 million Mt due to warmer weather and decreased energy demand, according to the Energy Information Administration (EIA). During the same timeframe, the U.S. economic output increased 2.9 percent (EIA). This decline results in a GHG intensity reduction of 4.2 percent as a measure of gross domestic product (EIA).

Worldwide, California is the 12th to 16th largest emitter of CO_2, and is responsible for approximately two percent of the world's CO_2 emissions (CEC 2006a). In 2004, the most recent year for which statewide data is available, the CEC reported that California produced 492 million gross metric tonnes (one metric tonne equals 2,205 pounds) of carbon dioxide-equivalent (CEC 2006a).

In January 2007, Assembly Bill 1803 transferred responsibility for developing and maintaining the state's GHG inventory from the California Energy Commission (CEC) to CARB. Using the CEC GHG inventory as a starting point, CARB staff determined the state's 1990 GHG emissions level by conducting a comprehensive review of all GHG emitting sectors. The seven sectors are: Transportation, Electricity Generation, Industrial, Residential, Agriculture, Commercial, and Forestry.

In November 2007, the CARB released its staff report establishing a statewide 1990 GHG emission level and a 2020 emission limit. (CARB 2007) As part of this staff report, CARB staff recommended an amount of 427 million metric tonnes of carbon dioxide equivalent (MMTCO2e) as the total statewide GHG 1990 emissions level and 2020 emissions limit. The

Board approved the 2020 limit on December 6, 2007. This limit is an aggregated statewide limit, rather than sector- or facility-specific. The staff report also included the statewide GHG emissions for 2004, which was 480 $MMTCO_2e$.

While the inventory data numbers from the CEC and CARB are similar for 2004, these estimates have important differences. Emissions from individual sectors differ between CEC and CARB estimates by up to 30 percent due to updated data, methodologies, and differences in included and excluded emissions. Staff at CARB treated carbon stored in landfills differently than CEC by separately tracking stored carbon instead of considering it an emission sink within a landfill. In addition, the CARB estimate only includes intrastate aviation, whereas the CEC estimates include both interstate and intrastate flights. Staff also included emissions from international shipping and related port activities in California waters, whereas the CEC excluded all emissions from international ships.

REGULATORY SETTING

The Montreal Protocol on Substances That Deplete the Ozone Layer is an international agreement which controls the phase-out of ozone-depleting compounds (ODCs). Under this international agreement, several organizations report on the science of ozone depletion, implement projects to help move away from ODCs, and provide a forum for policy discussions. The SCAQMD supports state, federal, and international policies to reduce levels of ozone depleting gases through its Global Warming Policy and rules. Further, SCAQMD has developed ODC Replacement Guidelines to facilitate transition from ODCs to substances that are the most environmentally benign (SCAQMD 2005).

There are currently no federal regulations or policies regarding GHG emissions. However, on July 11, 2008, the U.S. EPA gave *Advance Notice of Proposed Rulemaking: Regulating Greenhouse Gas Emissions under the Clean Air Act* (CAA). It will review various CAA provisions that may be applicable to regulate GHGs and examine the issues that regulating GHGs under those provisions may raise. It will also provide information regarding potential regulatory approaches and technologies for reducing GHG emissions and raise issues relevant to possible legislation and the potential for overlap between legislation and CAA regulation. The Congress instructed the U.S. EPA to publish a proposed mandatory greenhouse gas rule using its authority under the existing CAA in September 2008 and a final rule by June 2009.

California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The latest amendments were made in October 2005 and currently require new homes to use half the energy they used only a decade ago. In September 2008, the new 2008 standards were adopted to update the Building Energy Efficiency Standards contained in the California Code of Regulations (CCR), Title 24, Part 6 (also known as the California Energy Code) and associated administrative regulations in Part 1. The amended 2008 standards will go into effect in July 2009. Energy efficient buildings require less electricity, and electricity production by fossil fuels results in greenhouse gas emissions. Therefore, increased energy efficiency results in decreased greenhouse gas emissions.

In July 2002, Governor Gray Davis signed California Assembly Bill (AB) 1493 (Pavley), which requires CARB to develop and adopt regulations that reduce GHG emitted by passenger vehicles and light duty trucks. Regulations adopted by CARB will apply to 2009 and later model year vehicles. CARB estimates that the regulation, if implemented, will reduce GHG emissions from the light duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030. The US Environmental Protection Agency (EPA) denied the Clean Air Act waiver required to implement AB 1493 on December 19, 2007. However, the US EPA's decision is being challenged in federal court by the State of California. Nevertheless, in the event that the federal waiver be denied or the U.S. EPA's decision is upheld, AB 32 requires CARB to adopt alternative regulations to control mobile sources of greenhouse gas emissions to achieve greater or equivalent reductions (see Health & Safety Code section 38590).

In June 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. This Order calls for the following GHG emission reduction targets to be established: reduce GHG emissions to 2000 levels by 2010; reduce GHG emissions to 1990 levels by 2020; and reduce GHG emissions to 80 percent below 1990 levels by 2050. It also requires biennial reports on potential climate change effects on several areas, including water resources. The Order also requires that the Secretary of the California Environmental Protection Agency coordinate oversight of the efforts made to meet the targets with: the Secretary of the Business, Transportation and Housing Agency, Secretary of the Department of Food and Agriculture, Secretary of the Resources Agency, Chairperson of the Air Resources Board, Chairperson of the Energy Commission, and the President of the Public Utilities Commission.

In September 2006, Governor Arnold Schwarzenegger signed Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 directs the California Air Resources Board (CARB) to implement regulations for a cap on sources or categories of sources of GHG emissions. The bill requires that CARB develop regulations to reduce emissions with an enforcement mechanism to ensure that the reductions are achieved, and to disclose how it arrives at the cap. It also includes conditions to ensure businesses and consumers are not unfairly affected by reductions.

AB 32 requires the CARB to:

- adopt a list of discrete early action measures by July 1, 2007 that can be implemented before January 1, 2010;
- establish a statewide GHG emissions cap for 2020 based on 1990 emissions and adopt mandatory reporting rules for significant sources of GHG by January 1, 2008;
- indicate how emission reductions will be achieved from significant GHG sources via regulations, market mechanisms and other actions by January 1, 2009; and
- Adopt regulations by January 1, 2011 to achieve the maximum technologically feasible and cost-effective reductions in GHG, including provisions for using both market mechanisms and alternative compliance mechanisms.

AB 32 codifies S-3-05's year 2020 goal by requiring that statewide GHG emissions be reduced to 1990 levels by the year 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be implemented no later than January 1, 2012. To effectively implement the cap, AB 32 directs CARB to develop appropriate regulations and establish a mandatory reporting system to track and monitor GHG emissions levels.

Also in September 2006, Governor Arnold Schwarzenegger signed Senate Bill (SB) 1368 which calls for the adoption of a greenhouse gas (GHG) performance standard for in-state and imported electricity generators to mitigate climate change. On January 25, 2007, the California Public Utilities Commission adopted an interim GHG emissions performance standard. This standard is a facility-based emissions standard requiring all new long-term commitments for baseload generation to serve California consumers be with power plants that have emissions no greater than a combined cycle gas turbine plant. The established level is 1,100 pounds of CO_2 per megawatt-hour.

Executive Order S-01-07 was approved by the Governor on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also requires that a Low Carbon Fuel Standard for transportation fuels be established for California.

The Western Regional Climate Action Initiative was signed on February 26, 2007 by five states: Washington, Oregon, Arizona, New Mexico, and California. Utah, as well as Manitoba and British Columbia, Canada joined in April 2007. Montana joined in January, 2008 and Quebec moved from Observer to Partner status in April, 2008. Other United States and Mexican states and Canadian provinces have joined as observers. The Initiative plans on collaborating to identify, evaluate, and implement ways to reduce GHG emissions in the states collectively and to achieve related co-benefits. The Initiative plans to design a regional market-based multi-sector mechanism, such as a load-based cap and trade program by August 2008. In addition, a multi-state registry will track, manage, and credit entities that reduce GHG emissions.

In August 2007, Governor Arnold Schwarzenegger signed Senate Bill (SB) 97, CEQA: greenhouse gas emissions. The bill would require the OPR, by July 1, 2009, to prepare guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption. Also, an exemption exists for certain state bond-funded infrastructure projects. The Resources Agency would be required to certify and adopt those guidelines by January 1, 2010, which will also repeal the exemption for state bond-funded projects. On June 19, 2008, OPR released an interim technical advisory for addressing climate change in CEQA documents (OPR 2008). The recommended approach is to identify and quantify project-related GHG emissions; determine its significance; and if the impact is found to be potentially significant, implement mitigation measures or alternatives that will reduce the impact below significance. Further, the guidance states that the lead agency is not responsible for completely eliminating all project-related GHG emissions.

On January 8, 2009, OPR released preliminary draft CEQA guideline amendments for GHG (OPR 2009). The preliminary draft regulatory language proposed by OPR is intended to clarify

existing state law and is consistent with existing statutes and regulations. OPR has attempted to make the preliminary draft Guideline amendments consistent with the existing CEQA framework for environmental analysis, including but not limited to the determination of baseline conditions, determination of significance, cumulative impacts and evaluation of mitigation measures. For these reasons, OPR did not identify a threshold of significance for greenhouse gas emissions, nor did they prescribe assessment methodologies or specific mitigation measures. The preliminary draft amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but preserve the discretion granted by CEQA to lead agencies in making their own determinations based on substantial evidence. The preliminary draft amendments also encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses.

The approach used in this study is to identify and quantify project-related GHG emissions consistent with the current OPR recommendations, but not determine its significance. Instead project-related emissions are compared to the draft CARB threshold and SCAQMD CEQA GHG screening level.

On September 30, 2008, Governor Arnold Schwarzenegger signed Senate Bill (SB) 375 (Steinberg). SB 375 focuses on housing and transportation planning decisions to reduce fossil fuel consumption and conserve farmlands and habitat. This legislation is important to achieving AB 32 goals because greenhouse gas emissions associated with land use, which includes transportation, are the single largest source of emissions in California. SB 375 provides a path for better planning by providing incentives to locate housing developments closer to where people work and go to school, allowing them to reduce vehicle miles traveled (VMT) every year.

To achieve these goals, SB 375 will:

- require the regional transportation plan for each of the state's major metropolitan areas to adopt a "sustainable community strategy" that will meet the region's target for reducing GHG emissions from cars and light trucks. These strategies would get people out of their cars by promoting smart growth principles such as: development near public transit; projects that include a mix of residential and commercial use; and projects that include affordable housing to help reduce new housing developments in outlying areas with cheaper land and reduce vehicle miles traveled (VMT).
- create incentives for implementing the sustainable community strategies by allocating federal transportation funds only to projects that are consistent with the emissions reductions.
- provide various forms of CEQA relief by allowing projects that are shown to conform to the preferred sustainable community strategy through the local general plans (and therefore contribute to GHG reduction) to have a more streamlined environmental review process. Specifically, if a development is consistent with the sustainable community's strategy and incorporates any mitigation measures required by a prior EIR, then the environmental review does not have to consider: a) growth-inducing impacts, or b) project-specific or cumulative impacts from cars on global climate change or the regional transportation network. In addition, a narrowly-defined group of "transit priority projects" will be exempt from CEQA review.

On October 24, 2008, the CARB released a *Preliminary Draft Staff Proposal* recommending GHG-related significance thresholds which lead agencies can use in the significance determination. On December 9, 2008, CARB held a workshop to discuss potential performance standards and measures for residential and commercial projects. Items discussed at that workshop are included in the appropriate section of Step Three. The final CARB recommendations are expected in early 2009 which will correspond to the OPR timeline for issuing draft guidelines for addressing GHG emissions in CEQA documents. The current recommendations are a sector-specific approach to develop thresholds for projects that result in a substantial portion of the state's GHG emissions. The preliminary interim thresholds are for two sectors: 1) industrial projects, and 2) residential and commercial projects.

Each threshold is summarized below:

Industrial Projects

There are three steps to determine a project's significance regarding climate change. 1) If the project is exempt under existing statutory or categorical exemptions, it is presumed to have less than significant impacts related to climate change. 2) If the project meets performance standards for construction (shown below under residential/commercial projects) and transportation to be specified at a later date AND the project, with mitigation, emits no more than 7,000 $MTCO_2e/yr$ (metric tons of carbon dioxide-equivalent per year) from non-transportation related GHG sources then the project is presumed to have less than significant impacts related to climate change. 3) If the project doesn't meet the requirements of the first two steps, the project will have significant GHG impacts and an EIR must be prepared which will include the implementation of all feasible mitigation measures.

Residential/Commercial Projects

There are four steps to determine a project's significance regarding climate change.

1) If the project is exempt under existing statutory or categorical exemptions, it is presumed to have less than significant impacts related to climate change.

2) If the project complies with a previously approved plan that addresses GHG emissions [satisfies CEQA section 15064(h)(3)], AND has the following attributes, then the project is presumed to have less than significant impacts related to climate change:

- Meets a community level GHG target consistent with the statewide emissions limit in AB 32 and, where the plan will apply beyond 2020, Executive Order S-3-05;
- Is consistent with a transportation related GHG reduction target adopted by CARB pursuant to SB 375;
- Includes a GHG inventory and mechanisms to regularly monitor and evaluate emissions;
- Includes specific, enforceable GHG requirements;
- Incorporates mechanisms that allow the plan to be revised in order to meet targets; and
- Had a certified CEQA document.

3) Step Three includes two requirements which must be met to find the project's GHG impacts to be less than significant; a) and b):

a) The project meets the minimum performance standards below or includes equivalent mitigation measures.

Construction

Meets an interim CARB performance standard for construction related emissions performance standards to be specified at a later date.

Potential standards presented on December 9, 2008 include:

- Providing alternative transportation mode options or incentives for workers to and from work-site on days that construction requires 200 or more workers; AND
- Recycling and/or salvaging at least 75 percent of non-hazardous construction and demolition debris by weight (residential) or by weight and volume (commercial); AND
- Use recycled materials for at least 20 percent of construction materials[1];

Operations

- Meets an energy use performance standard defined as CEC's Tier II Energy Efficiency goal (30 percent beyond the effective Title 24 standards);
- Meets an interim CARB performance standard for water use to be specified at a later date; potential standards presented on December 9, 2008 include reducing indoor potable water use by at least 20 percent and reducing outdoor potable water use by at least 50 percent;
- Meets an interim CARB performance standard for waste to be specified at a later date; potential standards presented on December 9, 2008 relate to jurisdictions where local recycling and/or composting programs exist and include: designing facilities and structures to encourage participating in the program; AND installing adequate, accessible recycling and composting receptacles in common or public areas; AND providing easy access to central recycling and composting receptacles or collections areas;
- Meets an interim CARB performance standard for transportation to be specified at a later date; potential standards presented on December 9, 2008 for residential projects include: demonstrating that average vehicle miles traveled per household per year (VMT/hh-yr) are projected not to exceed 14,000 VMT/hh-yr representing carbon-efficient, compact development with close proximity to transit and a variety of services; potential standards presented on December 9, 2008 for commercial projects include: meets the following proximity and design elements: ½ mile of residential zone or neighborhood with average density of at least 10du/net acre; AND ½ mile of at least 10 neighborhood services; AND pedestrian access between project and services; AND institute comprehensive transportation demand management (TDM) program to reduce employee trips by at least 20 percent;

[1] Percentage of recycled materials: Based on cost for building materials, Based on volume for roadway, parking lot, sidewalk and curb materials, and recycled materials may include: salvaged, reused, and recycled content materials

AND

b) The project with performance standards or equivalent mitigation will emit no more than X $MTCO_2e$/yr (criteria to be developed at a late date).

4) If the project doesn't meet the requirements of the first three steps, the project will have significant GHG impacts and an EIR must be prepared which will include the implementation of all feasible mitigation measures.

The approach used in this analysis is to compare project-related emissions to the CARB recommendations and the below-described proposed SCAQMD recommendations.

In addition to current rules and regulations which also address GHG, SCAQMD plans to provide guidance to local lead agencies on determining significance for GHG in their CEQA documents by convening a *GHG CEQA Significance Threshold Working Group* to work with SCAQMD staff on developing GHG CEQA significance thresholds. The SCAQMD began hosting monthly working group meetings in April 2008. The result of the October 22nd working group meeting was a *Draft AQMD Staff CEQA Greenhouse Gas Significance Threshold* (SCAQMD 2008a) and the *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold* (SCAQMD 2008b). The Draft Threshold is intended to be interim guidance until statewide significance thresholds or guidance is established. The proposed significance threshold is a tiered approach which allows for flexibility by establishing multiple thresholds to cover a broad range of projects.

The draft threshold includes five tiers as summarized below:

- Tier 1: No further action is required if the project qualifies for an exemption under CEQA; if not, continue to the next tier.
- Tier 2: If the project's GHG emissions are within the GHG Budgets in approved regional plans (including local general plans and similar to consistency with existing CEQA Guidelines), then the project is less than significant. If not, continue to the next tier.
- Tier 3: If the project's incremental increase in GHG emissions is below, or mitigated below the currently recommended screening level of 10,000 MT/yr CO_2eq (metric tons of carbon dioxide-equivalent per year) for industrial projects and 3,000 MT/yr CO_2eq for commercial/residential projects (commercial also includes industrial parks and warehouses, etc.) AND increases energy efficiency *x* percent beyond the requirements of Title 24 AND decreases water use by *y* percent, then the project is less than significant. If not, continue to the next tier.
- Tier 4: This tier includes three options for a performance standard. If the project achieves the applicable standard, then it is less than significant. If not, continue to the next tier.

- Option 1: Achieve a uniform percentage reduction target objective (e.g. 30 percent) from the business-as-usual[2] by incorporating project design features and/or implementing emission reduction measures; or
- Option 2: Participate in the early implementation of applicable AB 32 Scoping Plan Measures or substitutes for equivalent reductions; or
- Option 3: Achieve a sector-based standard (e.g. a pound per person or pound per square foot standard, etc.).

- Tier 5: The last tier involves emission offsets. Offsets must be provided for a 30-year project life, unless the project life is limited by permit, lease, or other legally binding conditions. If the project purchases offsets alone or in combination with the specifications of the tiers above to achieve the target screening level, then the project is less than significant. If not, then the project's GHG impacts are significant.

The result of the working group meeting on November 20th and the SCAQMD Board Meeting on December 5, 2008 was the adoption of the staff proposal for an *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans* where the SCAQMD is the lead agency. This interim threshold only applies to industrial (stationary source) projects where the SCAQMD is the lead agency and reflects the description above for the five tiered approach using the screening level of 10,000 MT/yr CO_2eq, except that Tier 4 was not recommended for adoption because there are policy and legal questions that need to be further resolved before adoption. Regarding the residential/commercial sectors GHG significance threshold, SCAQMD staff stated that additional analysis is needed to further define the performance standards and coordinate with the CARB staff's interim GHG proposal before adoption of a threshold. This item was recommended to the Board for discussion and possible action in March 2009 if the CARB board has not taken its final action by February 2009.

The approach used in this analysis is to compare project emissions to the current SCAQMD Tier 3 screening level. The project does not qualify for Tier 1 or Tier 2 since there are no applicable exemptions for this project or regional/local GHG budgets for the Basin or for Riverside County. Tier 4 was not evaluated because it was not currently recommended by the SCAQMD at the November working group meeting.

EMISSIONS ESTIMATES

The following analysis attempts to estimate project-related GHG emissions primarily through the quantification of carbon dioxide emissions. As previously stated, carbon dioxide emissions accounted for approximately 84 percent of the state's total GHG emissions in 2004. Methane and nitrous oxide accounted for 5.7 and 6.8 percent, respectively. Therefore, while not intended to be an all-inclusive inventory of overall GHG emissions from the project; the estimation of CO_2 from the most important construction and operation related sources is illustrative of much of the project's contribution to GHG.

[2] The SCAQMD is recommending that the business-as-usual definition be based on current technologies and regulatory requirements.

It should be noted that the release of GHG in general and CO_2 specifically into the atmosphere is not of itself an adverse environmental affect. It is the affect that increased concentrations of GHG including CO_2 in the atmosphere has upon the Earth's climate (i.e., climate change) and the associated consequences of climate change that results in adverse environmental affects (e.g., sea level rise, loss of snowpack, severe weather events). Although air quality modeling can estimate a project's incremental contribution of CO_2 into the atmosphere, it is not feasible to determine whether or how an individual project's relatively small incremental contribution (on a global scale) might translate into physical effects on the environment. Since the Earth's climate is determined by the complex interaction of different components of the Earth and its atmosphere, it is not possible to discern whether the presence or absence of GHG emitted by the project would result in any measurable impact that would cause climate change.

The following project activities were analyzed below for their contribution to global CO_2 emissions:

Short-Term Analysis

Construction Related Activities

The recently updated URBEMIS model calculates carbon dioxide emissions from fuel usage by construction equipment and construction-related activities, like worker trips, for the project in tons per year (one ton equals 2,000 pounds). The URBEMIS estimate does not analyze emissions from construction related electricity or natural gas. Construction related electricity and natural gas emissions vary based on the amount of electric power used during construction and other unknown factors which make them too speculative to quantify. Life-cycle emissions associated with the manufacture of building materials are also not quantified in this analysis although they undoubtedly exist. Quantification was not attempted because of the large spatio-temporal variation in sources for building products used to construct the project and the consequent large uncertainty associated with the resulting emissions. For this reason, to attempt to quantify life-cycle emissions of materials would be speculative. This conclusion is consistent with recent guidance on quantification of emissions for commercial projects presented by the California Air Pollution Control Officer's Association guidance on CEQA and Climate Change (CAPCOA).

The following table summarizes the output results and presents the emissions estimates in metric tonnes (Mt) of CO_2 (one metric tonne equals approximately 2,205 pounds).

Table 9, Project Construction Equipment Emissions

Project Year	Total tons CO_2	Total $MtCO_2$
2010		
Casa Loma Basin	1,273.70	1,155.48
Line Y	204.66	185.66
Line E	92.19	83.63
Line D-4	42.87	38.89
2011		
Casa Loma Basin	984.22	892.87
Line Y	18.61	16.88
Total		**2,373.42**

Evaluation of the table above indicates that an estimated total of 2,373 $MtCO_2$ emissions from project construction equipment will occur from the four modeled scenarios. The draft SCAQMD GHG threshold guidance document released in October 2008 (SCAQMD 2008b) recommends that construction emissions be amortized for a project lifetime of 30-years to ensure that GHG reduction measures address construction GHG emissions as part of the operational reduction strategies. Therefore, the project's total construction emission were spread evenly over 30 years and included in the analysis of the project's total operational emissions below in **Table 10**.

Long-Term Analysis

The majority of operational emissions would be from the infrequent visits by vehicles driven by maintenance personnel. This and any other maintenance-related activity will not result in additional sources of emissions when compared to the existing maintenance routine of the current MDPs for the area. Therefore, no long-term impacts related to the San Jacinto Valley MDP facility operation were evaluated.

Total Project CO_2 Emissions

As shown in **Table 10, Annual Project Related CO_2 Emissions**, using the emissions quantified above; the total operational carbon dioxide emissions generated from the project is approximately 79 $MtCO_2$ per year which equals the construction related emissions amortized over a typical project life of 30-years.

Table 10, Annual Project Related CO_2 Emissions

Source	Annual Carbon Dioxide Emissions (Mt)
Construction Emissions[1]	79.11

Note: [1] Construction emission amortized over 30 years. (2,373.42 MT CO_2/30 years = 79.11 MT CO_2 per year)

Although it is uncertain which screening level applies to infrastructure projects, the analyzed project's annual CO_2 do not exceed the SCAQMD recommended screening level of 3,000 $MtCO_2$/year for commercial projects, which is a lower that the level for industrial projects. As previously stated, the CARB has yet to identify a quantitative threshold level for residential or commercial projects and the threshold level for industrial projects is 7,000 $MtCO_2$/year from non-transportation sources.

RECOMMENDED MITIGATION MEASURES

Due to the level of estimated emissions, no mitigation is required to reduce GHG. SCAQMD's recommendation of reducing the project energy use and water use even when the project-related emissions are below the screening level does not apply to this project. The operations of MDP facilities do not require energy usage. In addition, the project transports stormwater and does not include or require water usage..

The CARB has not yet developed a quantitative threshold for commercial projects and the currently recommended performance standards for construction and operation of commercial projects also do not apply to this type of project.

CONCLUSION

The project's annual CO_2 operational emissions will not exceed the SCAQMD recommended Tier 3 screening level of significance for commercial or industrial projects. The SCAQMD additional requirements for energy and water usage do not apply to this project.

The CARB has not yet developed a quantitative threshold for commercial projects and the currently recommended performance standards for construction and operation of commercial projects also do not apply to this type of project.

SECTION 4 – REFERENCES

REFERENCES CITED

The following documents were referred to as general information sources during preparation of this document. They are available for public review at the locations abbreviated after each listing and spelled out at the end of this section. Some of these documents are also available at public libraries and at other public agency offices.

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Location	**Address**
SCAQMD	South Coast Air Quality Management District 21865 East Copley Drive Diamond Bar, CA 91765-4182

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APPENDIX A

URBEMIS 2007 FOR WINDOWS OUTPUT FILES

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Basin.urb924

Project Name: San Jacinto MDP - Casa Loma Basin

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	17.59	191.56	83.38	0.15	460.46	8.31	468.77	96.23	7.64	103.87	23,158.18
2010 TOTALS (lbs/day mitigated)	17.59	191.56	83.38	0.15	141.05	8.31	149.36	29.52	7.64	37.16	23,158.18
2011 TOTALS (lbs/day unmitigated)	16.38	175.09	77.40	0.15	460.46	7.51	467.97	96.23	6.91	103.14	23,158.14
2011 TOTALS (lbs/day mitigated)	16.38	175.09	77.40	0.15	141.05	7.51	148.56	29.52	6.91	36.43	23,158.14

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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	CO2
Time Slice 8/2/2010-12/31/2010 Active Days: 110	**17.59**	**191.56**	**83.38**	**0.15**	**460.46**	**8.31**	**468.77**	**96.23**	**7.64**	**103.87**	**23,158.18**
Mass Grading 08/01/2010-04/30/2011	17.59	191.56	83.38	0.15	460.46	8.31	468.77	96.23	7.64	103.87	23,158.18
Mass Grading Dust	0.00	0.00	0.00	0.00	459.93	0.00	459.93	96.05	0.00	96.05	0.00
Mass Grading Off Road Diesel	9.51	79.47	41.07	0.00	0.00	3.95	3.95	0.00	3.64	3.64	7,157.29
Mass Grading On Road Diesel	8.01	111.95	39.96	0.15	0.52	4.35	4.87	0.17	4.00	4.17	15,721.01
Mass Grading Worker Trips	0.07	0.14	2.35	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.88
Time Slice 1/3/2011-4/29/2011 Active Days: 85	16.38	175.09	77.40	**0.15**	**460.46**	7.51	467.97	**96.23**	6.91	103.14	23,158.14
Mass Grading 08/01/2010-04/30/2011	16.38	175.09	77.40	0.15	460.46	7.51	467.97	96.23	6.91	103.14	23,158.14
Mass Grading Dust	0.00	0.00	0.00	0.00	459.93	0.00	459.93	96.05	0.00	96.05	0.00
Mass Grading Off Road Diesel	8.96	74.72	39.27	0.00	0.00	3.69	3.69	0.00	3.39	3.39	7,157.29
Mass Grading On Road Diesel	7.36	100.25	35.96	0.15	0.52	3.82	4.34	0.17	3.51	3.68	15,721.01
Mass Grading Worker Trips	0.06	0.12	2.17	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.84

Phase Assumptions

Phase: Mass Grading 8/1/2010 - 4/30/2011 - Basin Excavation Description

Total Acres Disturbed: 33

Maximum Daily Acreage Disturbed: 2

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 3728.21 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 3709.18

Off-Road Equipment:

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

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

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

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

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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	CO2
Time Slice 8/2/2010-12/31/2010 Active Days: 110	**17.59**	**191.56**	**83.38**	**0.15**	141.05	**8.31**	149.36	29.52	**7.64**	37.16	**23,158.18**
Mass Grading 08/01/2010-04/30/2011	17.59	191.56	83.38	0.15	141.05	8.31	149.36	29.52	7.64	37.16	23,158.18
Mass Grading Dust	0.00	0.00	0.00	0.00	140.51	0.00	140.51	29.34	0.00	29.34	0.00
Mass Grading Off Road Diesel	9.51	79.47	41.07	0.00	0.00	3.95	3.95	0.00	3.64	3.64	7,157.29
Mass Grading On Road Diesel	8.01	111.95	39.96	0.15	0.52	4.35	4.87	0.17	4.00	4.17	15,721.01
Mass Grading Worker Trips	0.07	0.14	2.35	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.88
Time Slice 1/3/2011-4/29/2011 Active Days: 85	16.38	175.09	77.40	**0.15**	141.05	7.51	148.56	29.52	6.91	36.43	23,158.14
Mass Grading 08/01/2010-04/30/2011	16.38	175.09	77.40	0.15	141.05	7.51	148.56	29.52	6.91	36.43	23,158.14
Mass Grading Dust	0.00	0.00	0.00	0.00	140.51	0.00	140.51	29.34	0.00	29.34	0.00
Mass Grading Off Road Diesel	8.96	74.72	39.27	0.00	0.00	3.69	3.69	0.00	3.39	3.39	7,157.29
Mass Grading On Road Diesel	7.36	100.25	35.96	0.15	0.52	3.82	4.34	0.17	3.51	3.68	15,721.01
Mass Grading Worker Trips	0.06	0.12	2.17	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.84

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2010 - 4/30/2011 - Basin Excavation Description

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

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

1/19/2009 09:06:06 AM

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Basin.urb924

Project Name: San Jacinto MDP - Casa Loma Basin

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	17.59	191.56	83.38	0.15	460.46	8.31	468.77	96.23	7.64	103.87	23,158.18
2010 TOTALS (lbs/day mitigated)	17.59	191.56	83.38	0.15	141.05	8.31	149.36	29.52	7.64	37.16	23,158.18
2011 TOTALS (lbs/day unmitigated)	16.38	175.09	77.40	0.15	460.46	7.51	467.97	96.23	6.91	103.14	23,158.14
2011 TOTALS (lbs/day mitigated)	16.38	175.09	77.40	0.15	141.05	7.51	148.56	29.52	6.91	36.43	23,158.14

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/2/2010-12/31/2010 Active Days: 110	**17.59**	**191.56**	**83.38**	**0.15**	**460.46**	**8.31**	**468.77**	**96.23**	**7.64**	**103.87**	**23,158.18**
Mass Grading 08/01/2010-04/30/2011	17.59	191.56	83.38	0.15	460.46	8.31	468.77	96.23	7.64	103.87	23,158.18
Mass Grading Dust	0.00	0.00	0.00	0.00	459.93	0.00	459.93	96.05	0.00	96.05	0.00
Mass Grading Off Road Diesel	9.51	79.47	41.07	0.00	0.00	3.95	3.95	0.00	3.64	3.64	7,157.29
Mass Grading On Road Diesel	8.01	111.95	39.96	0.15	0.52	4.35	4.87	0.17	4.00	4.17	15,721.01
Mass Grading Worker Trips	0.07	0.14	2.35	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.88
Time Slice 1/3/2011-4/29/2011 Active Days: 85	16.38	175.09	77.40	**0.15**	**460.46**	7.51	467.97	**96.23**	6.91	103.14	23,158.14
Mass Grading 08/01/2010-04/30/2011	16.38	175.09	77.40	0.15	460.46	7.51	467.97	96.23	6.91	103.14	23,158.14
Mass Grading Dust	0.00	0.00	0.00	0.00	459.93	0.00	459.93	96.05	0.00	96.05	0.00
Mass Grading Off Road Diesel	8.96	74.72	39.27	0.00	0.00	3.69	3.69	0.00	3.39	3.39	7,157.29
Mass Grading On Road Diesel	7.36	100.25	35.96	0.15	0.52	3.82	4.34	0.17	3.51	3.68	15,721.01
Mass Grading Worker Trips	0.06	0.12	2.17	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.84

Phase Assumptions

Phase: Mass Grading 8/1/2010 - 4/30/2011 - Basin Excavation Description

Total Acres Disturbed: 33

Maximum Daily Acreage Disturbed: 2

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 3728.21 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 3709.18

Off-Road Equipment:

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

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

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

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

1/19/2009 09:06:06 AM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/2/2010-12/31/2010 Active Days: 110	**17.59**	**191.56**	**83.38**	**0.15**	141.05	**8.31**	149.36	29.52	**7.64**	37.16	**23,158.18**
Mass Grading 08/01/2010-04/30/2011	17.59	191.56	83.38	0.15	141.05	8.31	149.36	29.52	7.64	37.16	23,158.18
Mass Grading Dust	0.00	0.00	0.00	0.00	140.51	0.00	140.51	29.34	0.00	29.34	0.00
Mass Grading Off Road Diesel	9.51	79.47	41.07	0.00	0.00	3.95	3.95	0.00	3.64	3.64	7,157.29
Mass Grading On Road Diesel	8.01	111.95	39.96	0.15	0.52	4.35	4.87	0.17	4.00	4.17	15,721.01
Mass Grading Worker Trips	0.07	0.14	2.35	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.88
Time Slice 1/3/2011-4/29/2011 Active Days: 85	16.38	175.09	77.40	**0.15**	141.05	7.51	148.56	29.52	6.91	36.43	23,158.14
Mass Grading 08/01/2010-04/30/2011	16.38	175.09	77.40	0.15	141.05	7.51	148.56	29.52	6.91	36.43	23,158.14
Mass Grading Dust	0.00	0.00	0.00	0.00	140.51	0.00	140.51	29.34	0.00	29.34	0.00
Mass Grading Off Road Diesel	8.96	74.72	39.27	0.00	0.00	3.69	3.69	0.00	3.39	3.39	7,157.29
Mass Grading On Road Diesel	7.36	100.25	35.96	0.15	0.52	3.82	4.34	0.17	3.51	3.68	15,721.01
Mass Grading Worker Trips	0.06	0.12	2.17	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.84

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2010 - 4/30/2011 - Basin Excavation Description

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

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

1/20/2009 03:10:30 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Line Y.urb924

Project Name: San Jacinto MDP - Line Y

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	4.86	38.44	22.30	0.00	177.12	2.11	179.23	36.99	1.94	38.93	3,721.17
2010 TOTALS (lbs/day mitigated)	4.86	38.44	22.30	0.00	91.77	2.11	93.88	19.17	1.94	21.11	3,721.17
2011 TOTALS (lbs/day unmitigated)	4.57	35.96	21.48	0.00	177.12	1.98	179.10	36.99	1.82	38.81	3,721.14
2011 TOTALS (lbs/day mitigated)	4.57	35.96	21.48	0.00	91.77	1.98	93.75	19.17	1.82	20.99	3,721.14

1/20/2009 03:10:30 PM

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	CO2
Time Slice 8/2/2010-12/31/2010 Active Days: 110	**4.86**	**38.44**	**22.30**	**0.00**	**177.12**	**2.11**	**179.23**	**36.99**	**1.94**	**38.93**	**3,721.17**
Fine Grading 08/01/2010-01/15/2011	4.86	38.44	22.30	0.00	177.12	2.11	179.23	36.99	1.94	38.93	3,721.17
Fine Grading Dust	0.00	0.00	0.00	0.00	177.11	0.00	177.11	36.99	0.00	36.99	0.00
Fine Grading Off Road Diesel	4.81	38.34	20.73	0.00	0.00	2.10	2.10	0.00	1.94	1.94	3,534.58
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.59
Time Slice 1/3/2011-1/14/2011 Active Days: 10	4.57	35.96	21.48	**0.00**	**177.12**	1.98	179.10	**36.99**	1.82	38.81	3,721.14
Fine Grading 08/01/2010-01/15/2011	4.57	35.96	21.48	0.00	177.12	1.98	179.10	36.99	1.82	38.81	3,721.14
Fine Grading Dust	0.00	0.00	0.00	0.00	177.11	0.00	177.11	36.99	0.00	36.99	0.00
Fine Grading Off Road Diesel	4.53	35.87	20.03	0.00	0.00	1.97	1.97	0.00	1.82	1.82	3,534.58
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.08	1.45	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.56

Phase Assumptions

Phase: Fine Grading 8/1/2010 - 1/15/2011 - Line Y Excavation/Construction Description

Total Acres Disturbed: 27.55

Maximum Daily Acreage Disturbed: 0.23

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 1481.48 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

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

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

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

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

1/20/2009 03:10:30 PM

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	CO2
Time Slice 8/2/2010-12/31/2010 Active Days: 110	**4.86**	**38.44**	**22.30**	**0.00**	91.77	**2.11**	93.88	19.17	**1.94**	21.11	**3,721.17**
Fine Grading 08/01/2010-01/15/2011	4.86	38.44	22.30	0.00	91.77	2.11	93.88	19.17	1.94	21.11	3,721.17
Fine Grading Dust	0.00	0.00	0.00	0.00	91.76	0.00	91.76	19.16	0.00	19.16	0.00
Fine Grading Off Road Diesel	4.81	38.34	20.73	0.00	0.00	2.10	2.10	0.00	1.94	1.94	3,534.58
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.59
Time Slice 1/3/2011-1/14/2011 Active Days: 10	4.57	35.96	21.48	**0.00**	91.77	1.98	93.75	19.17	1.82	20.99	3,721.14
Fine Grading 08/01/2010-01/15/2011	4.57	35.96	21.48	0.00	91.77	1.98	93.75	19.17	1.82	20.99	3,721.14
Fine Grading Dust	0.00	0.00	0.00	0.00	91.76	0.00	91.76	19.16	0.00	19.16	0.00
Fine Grading Off Road Diesel	4.53	35.87	20.03	0.00	0.00	1.97	1.97	0.00	1.82	1.82	3,534.58
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.08	1.45	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.56

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 1/15/2011 - Line Y Excavation/Construction Description

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

PM10: 61% PM25: 61%

1/20/2009 03:10:43 PM

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Line Y.urb924

Project Name: San Jacinto MDP - Line Y

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	4.86	38.44	22.30	0.00	177.12	2.11	179.23	36.99	1.94	38.93	3,721.17
2010 TOTALS (lbs/day mitigated)	4.86	38.44	22.30	0.00	91.77	2.11	93.88	19.17	1.94	21.11	3,721.17
2011 TOTALS (lbs/day unmitigated)	4.57	35.96	21.48	0.00	177.12	1.98	179.10	36.99	1.82	38.81	3,721.14
2011 TOTALS (lbs/day mitigated)	4.57	35.96	21.48	0.00	91.77	1.98	93.75	19.17	1.82	20.99	3,721.14

1/20/2009 03:10:43 PM

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/2/2010-12/31/2010 Active Days: 110	**4.86**	**38.44**	**22.30**	**0.00**	**177.12**	**2.11**	**179.23**	**36.99**	**1.94**	**38.93**	**3,721.17**
Fine Grading 08/01/2010-01/15/2011	4.86	38.44	22.30	0.00	177.12	2.11	179.23	36.99	1.94	38.93	3,721.17
Fine Grading Dust	0.00	0.00	0.00	0.00	177.11	0.00	177.11	36.99	0.00	36.99	0.00
Fine Grading Off Road Diesel	4.81	38.34	20.73	0.00	0.00	2.10	2.10	0.00	1.94	1.94	3,534.58
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.59
Time Slice 1/3/2011-1/14/2011 Active Days: 10	4.57	35.96	21.48	**0.00**	**177.12**	1.98	179.10	**36.99**	1.82	38.81	3,721.14
Fine Grading 08/01/2010-01/15/2011	4.57	35.96	21.48	0.00	177.12	1.98	179.10	36.99	1.82	38.81	3,721.14
Fine Grading Dust	0.00	0.00	0.00	0.00	177.11	0.00	177.11	36.99	0.00	36.99	0.00
Fine Grading Off Road Diesel	4.53	35.87	20.03	0.00	0.00	1.97	1.97	0.00	1.82	1.82	3,534.58
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.08	1.45	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.56

Phase Assumptions

Phase: Fine Grading 8/1/2010 - 1/15/2011 - Line Y Excavation/Construction Description

Total Acres Disturbed: 27.55

Maximum Daily Acreage Disturbed: 0.23

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 1481.48 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

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

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

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

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

1/20/2009 03:10:43 PM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/2/2010-12/31/2010 Active Days: 110	**4.86**	**38.44**	**22.30**	**0.00**	91.77	**2.11**	93.88	19.17	**1.94**	21.11	**3,721.17**
Fine Grading 08/01/2010-01/15/2011	4.86	38.44	22.30	0.00	91.77	2.11	93.88	19.17	1.94	21.11	3,721.17
Fine Grading Dust	0.00	0.00	0.00	0.00	91.76	0.00	91.76	19.16	0.00	19.16	0.00
Fine Grading Off Road Diesel	4.81	38.34	20.73	0.00	0.00	2.10	2.10	0.00	1.94	1.94	3,534.58
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.59
Time Slice 1/3/2011-1/14/2011 Active Days: 10	4.57	35.96	21.48	**0.00**	91.77	1.98	93.75	19.17	1.82	20.99	3,721.14
Fine Grading 08/01/2010-01/15/2011	4.57	35.96	21.48	0.00	91.77	1.98	93.75	19.17	1.82	20.99	3,721.14
Fine Grading Dust	0.00	0.00	0.00	0.00	91.76	0.00	91.76	19.16	0.00	19.16	0.00
Fine Grading Off Road Diesel	4.53	35.87	20.03	0.00	0.00	1.97	1.97	0.00	1.82	1.82	3,534.58
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.08	1.45	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.56

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 1/15/2011 - Line Y Excavation/Construction Description

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

PM10: 61% PM25: 61%

1/21/2009 08:11:02 AM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Line E.urb924

Project Name: San Jacinto MDP - Line E

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	8.42	67.73	39.03	0.00	872.91	3.57	876.48	182.30	3.28	185.58	6,357.94
2010 TOTALS (lbs/day mitigated)	8.42	67.73	39.03	0.00	452.26	3.57	455.83	94.45	3.28	97.73	6,357.94

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	CO2
Time Slice 8/2/2010-9/9/2010 Active Days: 29	**8.42**	**67.73**	**39.03**	**0.00**	**872.91**	**3.57**	**876.48**	**182.30**	**3.28**	**185.58**	**6,357.94**
Fine Grading 08/01/2010-09/09/2010	8.42	67.73	39.03	0.00	872.91	3.57	876.48	182.30	3.28	185.58	6,357.94
Fine Grading Dust	0.00	0.00	0.00	0.00	872.90	0.00	872.90	182.30	0.00	182.30	0.00
Fine Grading Off Road Diesel	8.35	67.59	36.68	0.00	0.00	3.56	3.56	0.00	3.27	3.27	6,078.06
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.14	2.35	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.88

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Phase Assumptions

Phase: Fine Grading 8/1/2010 - 9/9/2010 - Line E Excavation Description

Total Acres Disturbed: 34

Maximum Daily Acreage Disturbed: 1.15

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 7300 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

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

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

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

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

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	CO2
Time Slice 8/2/2010-9/9/2010 Active Days: 29	**8.42**	**67.73**	**39.03**	**0.00**	452.26	**3.57**	455.83	94.45	**3.28**	97.73	**6,357.94**
Fine Grading 08/01/2010-09/09/2010	8.42	67.73	39.03	0.00	452.26	3.57	455.83	94.45	3.28	97.73	6,357.94
Fine Grading Dust	0.00	0.00	0.00	0.00	452.25	0.00	452.25	94.45	0.00	94.45	0.00
Fine Grading Off Road Diesel	8.35	67.59	36.68	0.00	0.00	3.56	3.56	0.00	3.27	3.27	6,078.06
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.14	2.35	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.88

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 9/9/2010 - Line E Excavation Description

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

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Line E.urb924

Project Name: San Jacinto MDP - Line E

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	8.42	67.73	39.03	0.00	872.91	3.57	876.48	182.30	3.28	185.58	6,357.94
2010 TOTALS (lbs/day mitigated)	8.42	67.73	39.03	0.00	452.26	3.57	455.83	94.45	3.28	97.73	6,357.94

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/2/2010-9/9/2010 Active Days: 29	**8.42**	**67.73**	**39.03**	**0.00**	**872.91**	**3.57**	**876.48**	**182.30**	**3.28**	**185.58**	**6,357.94**
Fine Grading 08/01/2010-09/09/2010	8.42	67.73	39.03	0.00	872.91	3.57	876.48	182.30	3.28	185.58	6,357.94
Fine Grading Dust	0.00	0.00	0.00	0.00	872.90	0.00	872.90	182.30	0.00	182.30	0.00
Fine Grading Off Road Diesel	8.35	67.59	36.68	0.00	0.00	3.56	3.56	0.00	3.27	3.27	6,078.06
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.14	2.35	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.88

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Phase Assumptions

Phase: Fine Grading 8/1/2010 - 9/9/2010 - Line E Excavation Description

Total Acres Disturbed: 34

Maximum Daily Acreage Disturbed: 1.15

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 7300 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

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

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

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

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

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/2/2010-9/9/2010 Active Days: 29	**8.42**	**67.73**	**39.03**	**0.00**	452.26	**3.57**	455.83	94.45	**3.28**	97.73	**6,357.94**
Fine Grading 08/01/2010-09/09/2010	8.42	67.73	39.03	0.00	452.26	3.57	455.83	94.45	3.28	97.73	6,357.94
Fine Grading Dust	0.00	0.00	0.00	0.00	452.25	0.00	452.25	94.45	0.00	94.45	0.00
Fine Grading Off Road Diesel	8.35	67.59	36.68	0.00	0.00	3.56	3.56	0.00	3.27	3.27	6,078.06
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.07	0.14	2.35	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.88

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 9/9/2010 - Line E Excavation Description

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

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Line D-4.urb924

Project Name: San Jacinto MDP - Line D-4

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	5.52	41.38	24.21	0.00	29.85	2.42	32.27	6.24	2.23	8.46	3,897.70
2010 TOTALS (lbs/day mitigated)	5.52	41.38	24.21	0.00	15.47	2.42	17.89	3.23	2.23	5.46	3,897.70

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	CO2
Time Slice 8/2/2010-8/31/2010 Active Days: 22	**5.52**	**41.38**	**24.21**	**0.00**	**29.85**	**2.42**	**32.27**	**6.24**	**2.23**	**8.46**	**3,897.70**
Asphalt 08/01/2010-08/31/2010	1.76	10.34	7.40	0.00	0.01	0.87	0.88	0.00	0.80	0.80	1,011.42
Paving Off-Gas	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.67	10.14	5.80	0.00	0.00	0.86	0.86	0.00	0.79	0.79	809.62
Paving On Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.21
Paving Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.59
Fine Grading 08/01/2010-08/31/2010	3.76	31.04	16.81	0.00	29.84	1.55	31.39	6.23	1.43	7.66	2,886.28
Fine Grading Dust	0.00	0.00	0.00	0.00	29.83	0.00	29.83	6.23	0.00	6.23	0.00
Fine Grading Off Road Diesel	3.73	30.98	15.77	0.00	0.00	1.55	1.55	0.00	1.43	1.43	2,761.88
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.03	0.06	1.04	0.00	0.01	0.00	0.01	0.00	0.00	0.01	124.39

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Phase Assumptions

Phase: Fine Grading 8/1/2010 - 8/31/2010 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 5.05

Maximum Daily Acreage Disturbed: 0.23

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 233.33 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 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

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

Phase: Paving 8/1/2010 - 8/31/2010 - Default Paving Description

Acres to be Paved: 0.23

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

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

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

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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	CO2
Time Slice 8/2/2010-8/31/2010 Active Days: 22	**5.52**	**41.38**	**24.21**	**0.00**	15.47	**2.42**	17.89	3.23	**2.23**	5.46	**3,897.70**
Asphalt 08/01/2010-08/31/2010	1.76	10.34	7.40	0.00	0.01	0.87	0.88	0.00	0.80	0.80	1,011.42
Paving Off-Gas	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.67	10.14	5.80	0.00	0.00	0.86	0.86	0.00	0.79	0.79	809.62
Paving On Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.21
Paving Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.59
Fine Grading 08/01/2010-08/31/2010	3.76	31.04	16.81	0.00	15.46	1.55	17.02	3.23	1.43	4.66	2,886.28
Fine Grading Dust	0.00	0.00	0.00	0.00	15.46	0.00	15.46	3.23	0.00	3.23	0.00
Fine Grading Off Road Diesel	3.73	30.98	15.77	0.00	0.00	1.55	1.55	0.00	1.43	1.43	2,761.88
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.03	0.06	1.04	0.00	0.01	0.00	0.01	0.00	0.00	0.01	124.39

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 8/31/2010 - Default Fine Site Grading/Excavation Description

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

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Line D-4.urb924

Project Name: San Jacinto MDP - Line D-4

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	5.52	41.38	24.21	0.00	29.85	2.42	32.27	6.24	2.23	8.46	3,897.70
2010 TOTALS (lbs/day mitigated)	5.52	41.38	24.21	0.00	15.47	2.42	17.89	3.23	2.23	5.46	3,897.70

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/2/2010-8/31/2010 Active Days: 22	**5.52**	**41.38**	**24.21**	**0.00**	**29.85**	**2.42**	**32.27**	**6.24**	**2.23**	**8.46**	**3,897.70**
Asphalt 08/01/2010-08/31/2010	1.76	10.34	7.40	0.00	0.01	0.87	0.88	0.00	0.80	0.80	1,011.42
Paving Off-Gas	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.67	10.14	5.80	0.00	0.00	0.86	0.86	0.00	0.79	0.79	809.62
Paving On Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.21
Paving Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.59
Fine Grading 08/01/2010-08/31/2010	3.76	31.04	16.81	0.00	29.84	1.55	31.39	6.23	1.43	7.66	2,886.28
Fine Grading Dust	0.00	0.00	0.00	0.00	29.83	0.00	29.83	6.23	0.00	6.23	0.00
Fine Grading Off Road Diesel	3.73	30.98	15.77	0.00	0.00	1.55	1.55	0.00	1.43	1.43	2,761.88
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.03	0.06	1.04	0.00	0.01	0.00	0.01	0.00	0.00	0.01	124.39

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Phase Assumptions

Phase: Fine Grading 8/1/2010 - 8/31/2010 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 5.05

Maximum Daily Acreage Disturbed: 0.23

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 233.33 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 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

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

Phase: Paving 8/1/2010 - 8/31/2010 - Default Paving Description

Acres to be Paved: 0.23

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

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

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 8/2/2010-8/31/2010 Active Days: 22	**5.52**	**41.38**	**24.21**	**0.00**	15.47	**2.42**	17.89	3.23	**2.23**	5.46	**3,897.70**
Asphalt 08/01/2010-08/31/2010	1.76	10.34	7.40	0.00	0.01	0.87	0.88	0.00	0.80	0.80	1,011.42
Paving Off-Gas	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.67	10.14	5.80	0.00	0.00	0.86	0.86	0.00	0.79	0.79	809.62
Paving On Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.21
Paving Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.59
Fine Grading 08/01/2010-08/31/2010	3.76	31.04	16.81	0.00	15.46	1.55	17.02	3.23	1.43	4.66	2,886.28
Fine Grading Dust	0.00	0.00	0.00	0.00	15.46	0.00	15.46	3.23	0.00	3.23	0.00
Fine Grading Off Road Diesel	3.73	30.98	15.77	0.00	0.00	1.55	1.55	0.00	1.43	1.43	2,761.88
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.03	0.06	1.04	0.00	0.01	0.00	0.01	0.00	0.00	0.01	124.39

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 8/31/2010 - Default Fine Site Grading/Excavation Description

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

PM10: 61% PM25: 61%

APPENDIX B

LST ANALYSIS INFORMATION

Casa Loma Basin LST Worksheet

Summary of Two Acre Site Example Results By Phase

Total On-Site

	CO	NOx	PM10	PM2.5
Demolition	0.0	0.0	0.0	0.0
Site Preparation	14.4	32.5	3.4	1.8
Grading	39.3	82.7	5.6	4.1
Building	0.0	0.0	0.0	0.0
Arch Coating and Paving	0.0	0.0	0.0	0.0
Localized Significance Threshold*	226	147	6	4
Exceed Significance?	NO	NO	NO	NO

* For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

Casa Loma Basin LST Worksheet

Summary of Two Acre Site Example Results By Phase and Equipment

Demolition of Existing 87,000 Square Foot Structure

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Concrete/Industrial Saws	0	8.0			0.00	0.00	0.00	0.00
Rubber Tired Dozers	0	8.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Haul Trucks			0	0	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.0**	**0.0**	**0.0**	**0.0**
Localized Significance Threshold*					**226**	**147**	**6**	**4**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

Site Preparation

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Rubber Tired Dozers	1	8.0			4.47	9.20	1.48	0.67
Graders	1	8.0			9.94	23.26	1.97	1.13
Tractors/Loaders/Backhoes	0	0.0			0.00	0.00	0.00	0.00
Haul Trucks			2	0.1	0.01	0.02	0.001	0.001
Water Trucks			0	2.8	0.00	0.00	0.00	0.000
Total Onsite Emissions					**14.4**	**32.5**	**3.4**	**1.8**
Localized Significance Threshold*					**226**	**147**	**6**	**4**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

Grading

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Bulldozer	2	8.0			22.60	47.83	2.13	1.91
Grader	2	8.0			10.10	22.94	1.27	1.12
Tractor/Loader/Backhoe	2	8.0			6.29	10.80	2.19	1.05
Haul Truck			32	0.1	0.09	0.30	0.01	0.0136
Water Truck			3	2.8	0.24	0.79	0.04	0.04
Total Onsite Emissions					**39.3**	**82.7**	**5.6**	**4.1**
Localized Significance Threshold*					**226**	**147**	**6**	**4**
Exceed Significance?					**NO**	**NO**	**NO**	**YES**

Building of 87,000 Square Foot Structure

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Forklifts	0	6.0			0.00	0.00	0.00	0.00
Cranes	0	6.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	6.0			0.00	0.00	0.00	0.00
Generator Sets	0	8.0			0.00	0.00	0.00	0.00
Electric Welders	0	8.0			N/A	N/A	N/A	N/A
Haul Trucks			0	0.1	0.00	0.00	0.00	0.000
Water Trucks			0	3.2	0.00	0.00	0.00	0.00
Total Onsite Emissions					**0.0**	**0.0**	**0.0**	**0.0**
Localized Significance Threshold*					**226**	**147**	**6**	**4**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

* Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

Casa Loma Basin LST Worksheet

Summary of Two Acre Site Example Results By Phase and Equipment

Architectural Coating and Asphalt Paving of Parking Lot

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Pavers	0	6.0			0.00	0.00	0.00	0.00
Paving Equipment	0	8.0			0.00	0.00	0.00	0.00
Rollers	0	7.0			0.00	0.00	0.00	0.00
Cement and Mortar Mixers	0	6.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Haul Trucks			0	0.1	0.00	0.00	0.0000	0.0000
Water Trucks			0	3.2	0.00	0.00	0.00	0.00
Total Onsite Emissions					**0.0**	**0.0**	**0.0**	**0.0**
Localized Significance Threshold*					**226**	**147**	**6**	**4**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

* Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

Casa Loma Basin LST Worksheet

Two Acre Site Example - Site Preparation Phase

Example	**Construction Activity**		
Two Acre Site	Site Preparation	87,000	Square Feet[a]

Site Preparation Schedule - **1** **days**[a]

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Excavators	1	8.0	5
Scrapers	1	8.0	
Tractors/Loaders/Backhoes	0	0.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Excavators	0.558	1.150	0.064
Scrapers	1.242	2.908	0.126
Tractors/Loaders/Backhoes	0.393	0.675	0.052

Fugitive Dust Clearing Parameters

Silt Content[d]	**Moisture Content**[d]
6.9	7.9

Fugitive Dust Stockpiling Parameters

Silt Content[d]	**Precipitation Days**[e]	**Mean Wind Speed Percent**[f]	**TSP Fraction**	**Area (acres)**[g]
6.9	10	100	0.5	0

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[h]	**Mean Wind Speed**[i]	**Moisture Content**[d]	**Dirt Handled**[a]	**Debris Handled**[a]	**Dirt Handled**[j]
	mph		cy	cy	lb/day
0.35	10	7.9	0	48	0

Casa Loma Basin LST Worksheet

Two Acre Site Example - Site Preparation Phase

Construction Vehicle (Mobile Source) Emission Factors

	CO	NOx	PM10
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[l]	0.014462	0.047182	0.002309

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Haul Truck[k]	2	0.1
Water Truck[m]	0	2.8

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Excavators	4.47	9.20	0.51
Scrapers	9.94	23.26	1.00
Tractors/Loaders/Backhoes	0.00	0.00	0.00
Total	**14.4**	**32.5**	**1.5**

Incremental Increase in Fugitive Dust Emissions from Construction Operations

Equations:

Clearing[n]: PM10 Emissions (lb/day) = 0.75 x (silt content$^{1.5}$)/(moisture content$^{1.4}$) x hours operated (hr/day) x (1 - control efficiency)

Storage Piles[o]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[p] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

	Control Efficiency	PM10[q]
Description	%	lb/day
Clearing	68	1.93
Storage Piles	68	0.00
Material Handling	68	0.00
Total		**1.93**

Casa Loma Basin LST Worksheet

Two Acre Site Example - Site Preparation Phase

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.01	0.02	0.00
Water Truck	0	0	0
Total	**0.01**	**0.02**	**0.00**

Total Incremental Localized Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-site Emissions	**14.4**	**32.5**	**3.4**
Significance Threshold[r]	***226***	***147***	***6***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction[s]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.5	1.4
Combustion (Onroad)	0.96	0.00	0.00
Fugitive	0.21	2	0.41
Total		**3.4**	**1.8**
Significance Threshold[r]			**4**
Exceed Significance?			**NO**

Notes:

Project specific data may be entered into shaded cells. Changing the values in the shaded cells will not affect the integrity of the worksheets. Verify that units of values entered match units for cell. Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations

e) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993

f) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.

g) Assumed storage piles are 0.06 acres in size

h) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

i) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

j) Assuming 0 cubic yards of dirt handled [(0 cyd x 2,500 lb/cyd)/1 days = 0,000 lb/day]

k) CARB, EMFAC2007 (version 2.3) Burden Model, Winter 2007, 75 F, 40% RH: EF, lb/yr = (EF, ton/yr x 2,000 lb/ton)/VMT
l) Assumed 30 cubic yd truck capacity for 0 cyd of dirt and 48 cyd of debris [(48 cy x truck/30 cy)/1 days = 2 one-way truck trips/day]
m) Assumed six foot wide water truck traverses over 87,000 square feet of disturbed area
n) USEPA, AP-42, July 1998, Table 11.9-1, Equation for bulldozer, overburden, ≤ 10 µm
o) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12
p) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1
q) Includes watering at least three times a day per Rule 403 (68% control efficiency).
r) Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.
s) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Casa Loma Basin LST Worksheet

Two Acre Site Example - Grading Phase

Example	**Construction Activity**		
Two Acre Site	Grading	87,000	Square Feet[a]

Site Preparation Schedule - **1** **days**[a]

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Rubber Tired Dozers	2	8.0	6
Graders	2	8.0	
Tractors/Loaders/Backhoes	2	8.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Rubber Tired Dozers	1.413	2.989	0.129
Graders	0.631	1.434	0.075
Tractors/Loaders/Backhoes	0.393	0.675	0.052

Fugitive Dust Grading Parameters

Vehicle Speed (mph)[d]	**Vehicle Miles Traveled**[e]
3	1.50

Fugitive Dust Stockpiling Parameters

Silt Content[f]	**Precipitation Days**[g]	**Mean Wind Speed Percent**[h]	**TSP Fraction**	**Area (acres)**[i]
6.9	10	100	0.5	0.06

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	**Mean Wind Speed**[k]	**Moisture Content**[f]	**Dirt Handled**[a]	**Dirt Handled**[l]
	mph		cy	lb/day
0.35	10	7.9	3,728	9,320,525

Casa Loma Basin LST Worksheet

Two Acre Site Example - Grading Phase

Construction Vehicle (Mobile Source) Emission Factors

	CO	NOx	PM10
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[m]	0.014462	0.047182	0.002309

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Haul Truck[n]	32	0.1
Water Truck[o]	3	2.8

Incremental Increase in Onsite Combustion Emissions from Construction Equipmen

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Rubber Tired Dozers	22.60	47.83	2.06
Graders	10.10	22.94	1.21
Tractors/Loaders/Backhoes	6.29	10.80	0.83
Total	**39.0**	**81.6**	**4.10**

Incremental Increase in Fugitive Dust Emissions from Construction Operations

Equations:

Grading[p]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

	Control Efficiency	PM10[s]
Description	%	lb/day
Earthmoving	68	0.13
Storage Piles	68	0.76
Material Handling	68	0.60
Total		**1.49**

Casa Loma Basin LST Worksheet

Two Acre Site Example - Grading Phase

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicle

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.09	0.30	0.01
Water Truck	0.24	0.79	0.039
Total	**0.33**	**1.09**	**0.05**

Total Incremental Localized Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-site Emissions	**39.3**	**82.7**	**5.6**
Significance Threshold[t]	***226***	***147***	***6***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction[u]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	4.1	3.8
Combustion (Onroad)	0.96	0.05	0.05
Fugitive	0.21	1	0
Total		**5.6**	**4.1**
Significance Threshold[t]			**4**
Exceed Significance?			**YES**

Notes:

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a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.

e) Assumed 13 foot wide blade with 2 foot overlap (11 foot wide). Vehicle miles traveled (VMT) = (87,000 sq ft/11 foot x mile/5,280 ft)/1 days = 1.5miles

f) USEPA, AP-42, Jan 1995, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations

g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993

h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph. At least one meteorological site recorded wind speeds greater than 12 mph over a 24-hour period in 1981.

i) Assumed storage piles are 0.06 acres in size

j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

Casa Loma Basin LST Worksheet

Two Acre Site Example - Grading Phase

k) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

l) Assuming 3728.21 cubic yards of dirt handled [(3728.21 cyd x 2,500 lb/cyd)/1 days = 9,320,525 lb/day]

m) CARB, EMFAC2007 (version 2.3) Burden Model, Winter 2007, 75 F, 40% RH: EF, lb/yr = (EF, ton/yr x 2,000 lb/ton)/VMT

n) Assumed 30 cubic yd truck capacity for 3728.21 cyd of dirt [(3728.21 cyd x truck/30 cyd)/1 days = 32 one-way truck trips/day]. Multiple trucks may be used.

o) Assumed six foot wide water truck traverses over 87,000 square feet of disturbed area

p) USEPA, AP-42, Jan 1995, Table 11.9-1, Equation for Site Grading $\leq$ 10 µm

q) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

r) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1

s) Includes watering at least three times a day per Rule 403 (68% control efficiency).

t) Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

u) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Casa Loma Basin LST Worksheet

Sum of Ems Factor #/hr		Year / Pollutant				
		2010				
Eq Name	Hp	CO	NOx	PM10	SOx	VOC
Aerial Lifts	Composite	0.209	0.360	0.025	0.000	0.067
Air Compressors	Composite	0.361	0.732	0.053	0.001	0.112
Bore/Drill Rigs	Composite	0.515	1.133	0.050	0.002	0.105
Cement and Mortar Mixers	Composite	0.043	0.060	0.004	0.000	0.010
Concrete/Industrial Saws	Composite	0.427	0.657	0.055	0.001	0.127
Cranes	Composite	0.543	1.451	0.064	0.001	0.159
Crawler Tractors	Composite	0.641	1.385	0.085	0.001	0.186
Crushing/Proc. Equipment	Composite	0.726	1.439	0.094	0.001	0.215
Dumpers/Tenders	Composite	0.034	0.064	0.004	0.000	0.011
Excavators	Composite	0.558	1.150	0.064	0.001	0.148
Forklifts	Composite	0.232	0.516	0.028	0.001	0.069
Generator Sets	Composite	0.329	0.644	0.040	0.001	0.096
Graders	Composite	0.631	1.434	0.075	0.001	0.172
Off-Highway Tractors	Composite	0.839	1.990	0.097	0.002	0.237
Off-Highway Trucks	Composite	0.743	2.388	0.088	0.003	0.248
Other Construction Equipment	Composite	0.411	1.012	0.044	0.001	0.106
Other General Industrial Equipment	Composite	0.595	1.665	0.074	0.002	0.185
Other Material Handling Equipment	Composite	0.556	1.615	0.072	0.002	0.177
Pavers	Composite	0.564	0.987	0.071	0.001	0.177
Paving Equipment	Composite	0.448	0.896	0.063	0.001	0.134
Plate Compactors	Composite	0.026	0.032	0.002	0.000	0.005
Pressure Washers	Composite	0.067	0.099	0.007	0.000	0.020
Pumps	Composite	0.310	0.554	0.039	0.001	0.094
Rollers	Composite	0.421	0.775	0.055	0.001	0.118
Rough Terrain Forklifts	Composite	0.477	0.799	0.068	0.001	0.127
Rubber Tired Dozers	Composite	1.413	2.989	0.129	0.002	0.338
Rubber Tired Loaders	Composite	0.508	1.154	0.065	0.001	0.144
Scrapers	Composite	1.242	2.908	0.126	0.003	0.320
Signal Boards	Composite	0.095	0.161	0.009	0.000	0.022
Skid Steer Loaders	Composite	0.249	0.292	0.025	0.000	0.069
Surfacing Equipment	Composite	0.616	1.568	0.061	0.002	0.155
Sweepers/Scrubbers	Composite	0.538	0.847	0.069	0.001	0.155
Tractors/Loaders/Backhoes	Composite	0.393	0.675	0.052	0.001	0.102
Trenchers	Composite	0.491	0.760	0.064	0.001	0.167
Welders	Composite	0.225	0.292	0.027	0.000	0.081

Line Y LST Worksheet

Summary of One Acre Site Example Results By Phase

Total On-Site

	CO	NOx	PM10	PM2.5
Demolition	0.0	0.0	0.0	0.0
Site Preparation	0.0	0.0	0.0	0.0
Grading	26.8	53.5	3.4	2.8
Building	0.0	0.0	0.0	0.0
Arch Coating and Paving	0.0	0.0	0.0	0.0
Localized Significance Threshold*	151.0	103.0	4.0	3
Exceed Significance?	NO	NO	NO	NO

* For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

Line Y LST Worksheet

Summary of One Acre Site Example Results By Phase and Equipment

Demolition of Existing 41,000 Square Foot Structure

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Concrete/Industrial Saws	0	8.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Rubber Tired Dozers	0	1.0			0.00	0.00	0.00	0.00
Haul Trucks			0	0.1	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.00**	**0.00**	**0.00**	**0.00**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

Site Preparation

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Graders	0	8.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Haul Trucks			0	0.1	0.00	0.00	0.000	0.000
Water Trucks			0	1.3	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.00**	**0.00**	**0.00**	**0.00**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

Grading

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Rubber Tired Dozers	1	8.0			11.30	23.91	1.04	0.95
Graders	2	8.0			8.93	18.40	1.03	0.94
Tractors/Loaders/Backhoes	2	8.0			6.29	10.80	1.32	0.87
Haul Trucks			50	0.1	0.26	0.34	0.0063	0.0058
Water Trucks			3	0.4	0.06	0.08	0.0015	0.001
Total Onsite Emissions					**26.84**	**53.53**	**3.39**	**2.77**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

Building of 41,000 Square Foot Structure

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Cranes	0	4.0			0.00	0.00	0.00	0.00
Forklifts	0	6.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Haul Trucks			0	0.1	0.00	0.00	0.0000	0.0000
Water Trucks			0	1.3	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.00**	**0.00**	**0.00**	**0.00**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

* Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

Line Y LST Worksheet

Summary of One Acre Site Example Results By Phase and Equipment

Architectural Coating and Asphalt Paving of Parking Lot

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Pavers	0	7.0			0.00	0.00	0.00	0.00
Cement and Mortar Mixers	0	6.0			0.00	0.00	0.00	0.00
Rollers	0	7.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	7.0			0.00	0.00	0.00	0.00
Haul Truck			0	0.1	0.00	0.00	0.0000	0.0000
Water Truck			0	1.3	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.00**	**0.00**	**0.00**	**0.00**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

* For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Pape

Line Y LST Worksheet

One Acre Site Example - Grading Phase

Example	**Construction Activity**		
One Acre Site	Grading	10,019	Square Feet[a]
Grading Schedule -	**1**	**days**[a]	

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Rubber Tired Dozers	1	8.0	7
Excavators	2	8.0	
Tractors/Loaders/Backhoes	2	8.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Rubber Tired Dozers	1.413	2.989	0.129
Excavators	0.558	1.150	0.064
Tractors/Loaders/Backhoes	0.393	0.675	0.052

Fugitive Dust Grading Parameters

Vehicle Speed (mph)[d]	**Vehicle Miles Traveled**[e]
3	0.17

Fugitive Dust Stockpiling Parameters

Silt Content[f]	**Precipitation Days**[g]	**Mean Wind Speed Percent**[h]	**TSP Fraction**	**Area**[j] **(acres)**
6.9	10	100	0.5	0.02

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	**Mean Wind Speed**[k]	**Moisture Content**[f]	**Dirt Handled**[a]	**Dirt Handled**[l]
	mph		cy	lb/day
0.35	10	7.9	1481	3,703,700

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[m]	0.026167	0.034155	0.000626

Line Y LST Worksheet

One Acre Site Example - Grading Phase

On-Site Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Haul Truck[n]	50	0.1
Water Truck[o]	3	0.4

Incremental Increase in Onsite Combustion Emissions from Construction Equipmen

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Rubber Tired Dozers	11.30	23.91	1.03
Excavators	8.93	18.40	1.02
Tractors/Loaders/Backhoes	6.29	10.80	0.83
Total	**26.5**	**53.1**	**2.9**

Incremental Increase in Fugitive Dust Emissions from Construction Operation

Equations:

Grading[p]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMTx (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Description	Control Efficiency %	Unmitigated PM10[s] lb/day
Earthmoving	68	0.01
Storage Piles	68	0.25
Material Handling	68	0.24
Total		**0.50**

Line Y LST Worksheet

One Acre Site Example - Grading Phase

Incremental Increase in Onsite Travel Emissions from Onroad Mobile Equipmen

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.2617	0.3416	0.0063
Water Truck	0.0628	0.0820	0.0015
	0.324	**0.424**	**0.008**

Total Incremental Localized Emissions from Construction Activitie

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-site Emissions	**26.8**	**53.5**	**3.4**
Significance Threshold[t]	***151***	***103***	***4***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction[u]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	2.9	2.7
Combustion (Onroad)	0.96	0.008	0.007
Fugitive	0.21	0.50	0.11
Total		**3.4**	**2.8**
Significance Threshold[t]			**3**
Exceed Significance?			**NO**

Notes:

Project specific data may be entered into shaded cells. Changing the values in the shaded cells will not affect the integrity of the worksheets. Verify that units of values entered match units for cell.

Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.

e) Assumed 13 foot wide blade with 2 foot overlap (11 foot wide). Vehicle miles traveled (VMT) = (10,019 sq ft/11 foot x mile/5,280 ft)/1 days = 0.17 mile

f) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations

g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993

h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph. At least one meteorological site recorded wind speeds greater than 12 mph over a 24-hour period in 1981.

i) Assumed storage piles are 0.02 acres in size

j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

k) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

Line Y LST Worksheet

One Acre Site Example - Grading Phase

l) Assuming 1481.48 cubic yards of dirt handled [(1481.48 cyd x 2,500 lb/cyd)/1 days = 3,703,700 lb/day)

m) CARB, EMFAC2007 (version 2.3) Burden Model, Winter 2007, 75 F, 40% RH: EF, lb/yr = (EF, ton/yr x 2,000 lb/ton)/VMT

n) Assumed 30 cubic yd truck capacity for 1481.48 cy of dirt [(1481.48 cy x truck/30 cy)/2 days = 50 one-way truck trips/day]. Assumed haul truck travels 0.1 miles through facility

o) Assumed six foot wide water truck traverses over 10,019 square feet of disturbed area

p) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading $\leq$ 10 µm

q) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1

r) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

s) Includes watering at least three times a day per Rule 403 (68% control efficiency)

t) For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

u) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Line Y LST Worksheet

ARB OffRoad Model Emission Factors

Sum of Ems Factor #/hr		Year	Pollutant			
		2010				
Eq Name	Hp	CO	NOx	PM10	SOx	VOC
Aerial Lifts	Composite	0.209	0.360	0.025	0.000	0.067
Air Compressors	Composite	0.361	0.732	0.053	0.001	0.112
Bore/Drill Rigs	Composite	0.515	1.133	0.050	0.002	0.105
Cement and Mortar Mixers	Composite	0.043	0.060	0.004	0.000	0.010
Concrete/Industrial Saws	Composite	0.427	0.657	0.055	0.001	0.127
Cranes	Composite	0.543	1.451	0.064	0.001	0.159
Crawler Tractors	Composite	0.641	1.385	0.085	0.001	0.186
Crushing/Proc. Equipment	Composite	0.726	1.439	0.094	0.001	0.215
Dumpers/Tenders	Composite	0.034	0.064	0.004	0.000	0.011
Excavators	Composite	0.558	1.150	0.064	0.001	0.148
Forklifts	Composite	0.232	0.516	0.028	0.001	0.069
Generator Sets	Composite	0.329	0.644	0.040	0.001	0.096
Graders	Composite	0.631	1.434	0.075	0.001	0.172
Off-Highway Tractors	Composite	0.839	1.990	0.097	0.002	0.237
Off-Highway Trucks	Composite	0.743	2.388	0.088	0.003	0.248
Other Construction Equipment	Composite	0.411	1.012	0.044	0.001	0.106
Other General Industrial Equipment	Composite	0.595	1.665	0.074	0.002	0.185
Other Material Handling Equipment	Composite	0.556	1.615	0.072	0.002	0.177
Pavers	Composite	0.564	0.987	0.071	0.001	0.177
Paving Equipment	Composite	0.448	0.896	0.063	0.001	0.134
Plate Compactors	Composite	0.026	0.032	0.002	0.000	0.005
Pressure Washers	Composite	0.067	0.099	0.007	0.000	0.020
Pumps	Composite	0.310	0.554	0.039	0.001	0.094
Rollers	Composite	0.421	0.775	0.055	0.001	0.118
Rough Terrain Forklifts	Composite	0.477	0.799	0.068	0.001	0.127
Rubber Tired Dozers	Composite	1.413	2.989	0.129	0.002	0.338
Rubber Tired Loaders	Composite	0.508	1.154	0.065	0.001	0.144
Scrapers	Composite	1.242	2.908	0.126	0.003	0.320
Signal Boards	Composite	0.095	0.161	0.009	0.000	0.022
Skid Steer Loaders	Composite	0.249	0.292	0.025	0.000	0.069
Surfacing Equipment	Composite	0.616	1.568	0.061	0.002	0.155
Sweepers/Scrubbers	Composite	0.538	0.847	0.069	0.001	0.155
Tractors/Loaders/Backhoes	Composite	0.393	0.675	0.052	0.001	0.102
Trenchers	Composite	0.491	0.760	0.064	0.001	0.167
Welders	Composite	0.225	0.292	0.027	0.000	0.081

Line E LST Worksheet

Summary of One Acre Site Example Results By Phase

Total On-Site

	CO	NOx	PM10	PM2.5
Demolition	0.0	0.0	0.0	0.0
Site Preparation	9.2	18.7	1.1	1.0
Grading	40.5	83.6	5.6	4.1
Building	0.0	0.0	0.0	0.0
Arch Coating and Paving	0.0	0.0	0.0	0.0
Localized Significance Threshold*	151.0	103.0	4.0	3
Exceed Significance?	NO	NO	NO	NO

* For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

Line E LST Worksheet

Summary of One Acre Site Example Results By Phase and Equipment

Demolition of Existing 41,000 Square Foot Structure

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Concrete/Industrial Saws	0	8.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Rubber Tired Dozers	0	1.0			0.00	0.00	0.00	0.00
Haul Trucks			0	0.1	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.00**	**0.00**	**0.00**	**0.00**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

Site Preparation

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Graders	2	8.0			8.93	18.40	1.10	0.96
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Haul Trucks			1	0.1	0.01	0.01	0.000	0.000
Water Trucks			3	1.6	0.25	0.33	0.006	0.006
Total Onsite Emissions					**9.19**	**18.73**	**1.11**	**0.96**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

Grading

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Rubber Tired Dozers	2	8.0			22.60	47.83	2.10	1.90
Graders	2	8.0			10.10	22.94	1.25	1.12
Tractors/Loaders/Backhoes	2	8.0			6.29	10.80	2.26	1.07
Haul Trucks			244	0.1	1.28	1.67	0.0305	0.0281
Water Trucks			3	1.6	0.25	0.33	0.0060	0.006
Total Onsite Emissions					**40.52**	**83.56**	**5.65**	**4.12**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**YES**	**YES**

Building of 41,000 Square Foot Structure

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Cranes	0	4.0			0.00	0.00	0.00	0.00
Forklifts	0	6.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Haul Trucks			0	0.1	0.00	0.00	0.0000	0.0000
Water Trucks			0	1.3	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.00**	**0.00**	**0.00**	**0.00**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

* Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

Line E LST Worksheet

Summary of One Acre Site Example Results By Phase and Equipment

Architectural Coating and Asphalt Paving of Parking Lot

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Pavers	0	7.0			0.00	0.00	0.00	0.00
Cement and Mortar Mixers	0	6.0			0.00	0.00	0.00	0.00
Rollers	0	7.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	7.0			0.00	0.00	0.00	0.00
Haul Truck			0	0.1	0.00	0.00	0.0000	0.0000
Water Truck			0	1.3	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.00**	**0.00**	**0.00**	**0.00**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

* For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Pape

Line E LST Worksheet

One Acre Site Example - Site Preparation Phase

Example	**Construction Activity**		
One Acre Site	Site Preparation	50,094	Square Feet[a]
Site Preparation Schedule -	**1**	**day**[a]	

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Excavators	2	8.0	5
Tractors/Loaders/Backhoes	0	8.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Excavators	0.558	1.150	0.064
Tractors/Loaders/Backhoes	0.393	0.675	0.052

Fugitive Dust Clearing Parameters

Vehicle Speed (mph)[d]	**Vehicle Miles Traveled**[e]
3	0.86

Fugitive Dust Stockpiling Parameters

Silt Content[f]	**Precipitation Days**[g]	**Mean Wind Speed Percent**[h]	**TSP Fraction**	**Area (acres)**[i]
6.9	10	100	0.5	0

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	**Mean Wind Speed**[k]	**Moisture Content**[f]	**Dirt Handled**[a]	**Debris Handled**[a]	**Dirt Handled**[l]
	mph		cy	cy	lb/day
0.35	10	7.9	0	20	0

Line E LST Worksheet

One Acre Site Example - Site Preparation Phase

Construction Vehicle (Mobile Source) Emission Factors

	CO	NOx	PM10
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[m]	0.026167	0.034155	0.000626

On-Site Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-WayTrip Length (miles)
Haul Truck[n]	1	0.1
Water Truck[o]	3	1.6

Incremental Increase in Onsite Travel Emissions from Onroad Mobile Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Excavators	8.93	18.40	1.02
Tractors/Loaders/Backhoes	0.00	0.00	0.00
Total	**8.9**	**18.4**	**1.0**

Incremental Increase in Fugitive Dust Emissions from Construction Operations

Equations:

Grading[p]: PM10 Emissions (lb/day) = (0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) x (1 - control efficiency)

	Control Efficiency	PM10[s]
Description	%	lb/day
Clearing	68	0.08
Storage Piles	68	0.00
Material Handling	68	0.00
Total		**0.08**

Line E LST Worksheet

One Acre Site Example - Site Preparation Phase

Incremental Increase in Offsite Combustion Emissions from Construction Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.005	0.007	0.000
Water Truck	0.251	0.328	0.006
Total	**0.256**	**0.335**	**0.006**

Total Incremental Localized Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-site Emissions	**9.2**	**18.7**	**1.1**
Significance Threshold[t]	***151***	***103***	***4***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction[t]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.0	0.9
Combustion (Onroad)	0.96	0.006	0.006
Fugitive	0.21	0.08	0.02
Total		**1.1**	**1.0**
Significance Threshold[t]			**3**
Exceed Significance?			**NO**

Notes:

Project specific data may be entered into shaded cells. Changing the values in the shaded cells will not affect the integrity of the worksheets. Verify that units of values entered match units for cell.

Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.

e) Assumed 13 foot wide blade with 2 foot overlap (11 foot wide). Vehicle miles traveled (VMT) = (50,094 sq ft/11 foot x mile/5,280 ft)/1 day = 0.86 mile

f) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations

g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993

h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph. At least one meteorological site recorded wind speeds greater than 12 mph over a 24-hour period in 1981.

i) Assumed storage piles are 0.02 acres in size

j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 μm

k) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

l) Assuming cubic yards of dirt handled (cyd x 2,500 lb/cyd = 0,000 lb/day)

m) CARB, EMFAC2007 (version 2.3) Burden Model, Winter 2007, 75 F, 40% RH: EF, lb/yr = (EF, ton/yr x 2,000 lb/ton)/VMT

n) Assumed 30 cubic yd truck capacity for 0cy of dirt and 20 cy of debris [(20 cy x truck/30 cy)/1 day = 1 one-way truck trips/day]. Assumed haul truck travels 0.1 miles through facility

o) Assumed six foot wide water truck traverses over 50,094 square feet of disturbed area

p) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

q) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm

r) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1

s) Includes watering at least three times a day per Rule 403 (68% control efficiency)

t) For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

u) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Line E LST Worksheet

One Acre Site Example - Grading Phase

Example	**Construction Activity**		
One Acre Site	Grading	50,094	Square Feet[a]
Grading Schedule -	**1**	**days**[a]	

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Rubber Tired Dozers	2	8.0	6
Graders	2	8.0	
Tractors/Loaders/Backhoes	2	8.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Rubber Tired Dozers	1.413	2.989	0.129
Graders	0.631	1.434	0.075
Tractors/Loaders/Backhoes	0.393	0.675	0.052

Fugitive Dust Grading Parameters

Vehicle Speed (mph)[d]	**Vehicle Miles Traveled**[e]
3	0.86

Fugitive Dust Stockpiling Parameters

Silt Content[f]	**Precipitation Days**[g]	**Mean Wind Speed Percent**[h]	**TSP Fraction**	**Area**[j] **(acres)**
6.9	10	100	0.5	0.02

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	**Mean Wind Speed**[k]	**Moisture Content**[f]	**Dirt Handled**[a]	**Dirt Handled**[l]
	mph		cy	lb/day
0.35	10	7.9	7300	18,250,000

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[m]	0.026167	0.034155	0.000626

Line E LST Worksheet

One Acre Site Example - Grading Phase

On-Site Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Haul Truck[n]	244	0.1
Water Truck[o]	3	1.6

Incremental Increase in Onsite Combustion Emissions from Construction Equipmen

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Rubber Tired Dozers	22.60	47.83	2.06
Graders	10.10	22.94	1.21
Tractors/Loaders/Backhoes	6.29	10.80	0.83
Total	**39.0**	**81.6**	**4.1**

Incremental Increase in Fugitive Dust Emissions from Construction Operation

Equations:

Grading[p]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMTx (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Description	Control Efficiency %	Unmitigated PM10[s] lb/day
Earthmoving	68	0.08
Storage Piles	68	0.25
Material Handling	68	1.18
Total		**1.51**

Line E LST Worksheet

One Acre Site Example - Grading Phase

Incremental Increase in Onsite Travel Emissions from Onroad Mobile Equipmen

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Haul Truck	1.2769	1.6668	0.0305
Water Truck	0.2512	0.3279	0.0060
	1.528	**1.995**	**0.037**

Total Incremental Localized Emissions from Construction Activitie

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-site Emissions	**40.5**	**83.6**	**5.6**
Significance Threshold[t]	***151***	***103***	***4***
Exceed Significance?	**NO**	**NO**	**YES**

Combustion and Fugitive Summary	**PM2.5 Fraction[u]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	4.1	3.8
Combustion (Onroad)	0.96	0.037	0.035
Fugitive	0.21	1.51	0.32
Total		**5.6**	**4.1**
Significance Threshold[t]			**3**
Exceed Significance?			**YES**

Notes:

Project specific data may be entered into shaded cells. Changing the values in the shaded cells will not affect the integrity of the worksheets. Verify that units of values entered match units for cell.

Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.

e) Assumed 13 foot wide blade with 2 foot overlap (11 foot wide). Vehicle miles traveled (VMT) = (50,094 sq ft/11 foot x mile/5,280 ft)/1 days = 0.86 mile

f) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations

g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993

h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph. At least one meteorological site recorded wind speeds greater than 12 mph over a 24-hour period in 1981.

i) Assumed storage piles are 0.02 acres in size

j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

k) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

Line E LST Worksheet

One Acre Site Example - Grading Phase

l) Assuming 7300 cubic yards of dirt handled [(7300 cyd x 2,500 lb/cyd)/1 days = 18,250,000 lb/day)

m) CARB, EMFAC2007 (version 2.3) Burden Model, Winter 2007, 75 F, 40% RH: EF, lb/yr = (EF, ton/yr x 2,000 lb/ton)/VMT

n) Assumed 30 cubic yd truck capacity for 7300 cy of dirt [(7300 cy x truck/30 cy)/2 days = 244 one-way truck trips/day]. Assumed haul truck travels 0.1 miles through facility

o) Assumed six foot wide water truck traverses over 50,094 square feet of disturbed area

p) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading $\leq$ 10 µm

q) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1

r) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

s) Includes watering at least three times a day per Rule 403 (68% control efficiency)

t) For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

u) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Line E LST Worksheet

ARB OffRoad Model Emission Factors

Sum of Ems Factor #/hr		Year	Pollutant			
		2010				
Eq Name	Hp	CO	NOx	PM10	SOx	VOC
Aerial Lifts	Composite	0.209	0.360	0.025	0.000	0.067
Air Compressors	Composite	0.361	0.732	0.053	0.001	0.112
Bore/Drill Rigs	Composite	0.515	1.133	0.050	0.002	0.105
Cement and Mortar Mixers	Composite	0.043	0.060	0.004	0.000	0.010
Concrete/Industrial Saws	Composite	0.427	0.657	0.055	0.001	0.127
Cranes	Composite	0.543	1.451	0.064	0.001	0.159
Crawler Tractors	Composite	0.641	1.385	0.085	0.001	0.186
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Forklifts	Composite	0.232	0.516	0.028	0.001	0.069
Generator Sets	Composite	0.329	0.644	0.040	0.001	0.096
Graders	Composite	0.631	1.434	0.075	0.001	0.172
Off-Highway Tractors	Composite	0.839	1.990	0.097	0.002	0.237
Off-Highway Trucks	Composite	0.743	2.388	0.088	0.003	0.248
Other Construction Equipment	Composite	0.411	1.012	0.044	0.001	0.106
Other General Industrial Equipment	Composite	0.595	1.665	0.074	0.002	0.185
Other Material Handling Equipment	Composite	0.556	1.615	0.072	0.002	0.177
Pavers	Composite	0.564	0.987	0.071	0.001	0.177
Paving Equipment	Composite	0.448	0.896	0.063	0.001	0.134
Plate Compactors	Composite	0.026	0.032	0.002	0.000	0.005
Pressure Washers	Composite	0.067	0.099	0.007	0.000	0.020
Pumps	Composite	0.310	0.554	0.039	0.001	0.094
Rollers	Composite	0.421	0.775	0.055	0.001	0.118
Rough Terrain Forklifts	Composite	0.477	0.799	0.068	0.001	0.127
Rubber Tired Dozers	Composite	1.413	2.989	0.129	0.002	0.338
Rubber Tired Loaders	Composite	0.508	1.154	0.065	0.001	0.144
Scrapers	Composite	1.242	2.908	0.126	0.003	0.320
Signal Boards	Composite	0.095	0.161	0.009	0.000	0.022
Skid Steer Loaders	Composite	0.249	0.292	0.025	0.000	0.069
Surfacing Equipment	Composite	0.616	1.568	0.061	0.002	0.155
Sweepers/Scrubbers	Composite	0.538	0.847	0.069	0.001	0.155
Tractors/Loaders/Backhoes	Composite	0.393	0.675	0.052	0.001	0.102
Trenchers	Composite	0.491	0.760	0.064	0.001	0.167
Welders	Composite	0.225	0.292	0.027	0.000	0.081

Line D-4 LST Worksheet

Summary of One Acre Site Example Results By Phase

Total On-Site

	CO	NOx	PM10	PM2.5
Demolition	0.0	0.0	0.0	0.0
Site Preparation	0.0	0.0	0.0	0.0
Grading	19.6	40.9	2.4	2.0
Building	0.0	0.0	0.0	0.0
Arch Coating and Paving	18.6	33.5	2.4	2.2
Localized Significance Threshold*	151.0	103.0	4.0	3
Exceed Significance?	NO	NO	NO	NO

* For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

Line D-4 LST Worksheet

Summary of One Acre Site Example Results By Phase and Equipment

Demolition of Existing 41,000 Square Foot Structure

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Concrete/Industrial Saws	0	8.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Rubber Tired Dozers	0	1.0			0.00	0.00	0.00	0.00
Haul Trucks			0	0.1	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.00**	**0.00**	**0.00**	**0.00**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

Site Preparation

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Graders	0	8.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Haul Trucks			0	0.1	0.00	0.00	0.000	0.000
Water Trucks			0	1.3	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.00**	**0.00**	**0.00**	**0.00**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

Grading

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Rubber Tired Dozers	1	8.0			11.30	23.91	1.04	0.95
Graders	1	8.0			5.05	11.47	0.61	0.56
Tractors/Loaders/Backhoes	1	8.0			3.14	5.40	0.71	0.44
Haul Trucks			8	0.1	0.04	0.05	0.0010	0.0009
Water Trucks			3	0.4	0.06	0.08	0.0015	0.001
Total Onsite Emissions					**19.60**	**40.92**	**2.35**	**1.95**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

Building of 41,000 Square Foot Structure

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Cranes	0	4.0			0.00	0.00	0.00	0.00
Forklifts	0	6.0			0.00	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0	8.0			0.00	0.00	0.00	0.00
Haul Trucks			0	0.1	0.00	0.00	0.0000	0.0000
Water Trucks			0	1.3	0.00	0.00	0.000	0.000
Total Onsite Emissions					**0.00**	**0.00**	**0.00**	**0.00**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

* Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

Line D-4 LST Worksheet

Summary of One Acre Site Example Results By Phase and Equipment

Architectural Coating and Asphalt Paving of Parking Lot

Vehicle Description	No. of Vehicle	Hours	Trips	Length	CO	NOx	PM10	PM2.5
Pavers	1	8.0			4.52	7.89	0.57	0.52
Cement and Mortar Mixers	4	8.0			13.48	24.80	1.75	1.61
Rollers	1	8.0			0.35	0.48	0.03	0.03
Tractors/Loaders/Backhoes	0	7.0			0.00	0.00	0.00	0.00
Haul Truck			3	0.1	0.02	0.02	0.0004	0.0003
Water Truck			3	1.3	0.20	0.27	0.005	0.004
Total Onsite Emissions					**18.56**	**33.46**	**2.35**	**2.16**
Localized Significance Threshold*					**151**	**103**	**4**	**3**
Exceed Significance?					**NO**	**NO**	**NO**	**NO**

* For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Pape

Line D-4 LST Worksheet

One Acre Site Example - Grading Phase

Example	**Construction Activity**		
One Acre Site	Grading	10,019	Square Feet[a]
Grading Schedule -	**1**	**days**[a]	

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Rubber Tired Dozers	1	8.0	5
Graders	1	8.0	
Tractors/Loaders/Backhoes	1	8.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Rubber Tired Dozers	1.413	2.989	0.129
Graders	0.631	1.434	0.075
Tractors/Loaders/Backhoes	0.393	0.675	0.052

Fugitive Dust Grading Parameters

Vehicle Speed (mph)[d]	**Vehicle Miles Traveled**[e]
3	0.17

Fugitive Dust Stockpiling Parameters

Silt Content[f]	**Precipitation Days**[g]	**Mean Wind Speed Percent**[h]	**TSP Fraction**	**Area**[j] **(acres)**
6.9	10	100	0.5	0.02

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	**Mean Wind Speed**[k]	**Moisture Content**[f]	**Dirt Handled**[a]	**Dirt Handled**[l]
	mph		cy	lb/day
0.35	10	7.9	233	583,325

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[m]	0.026167	0.034155	0.000626

Line D-4 LST Worksheet

One Acre Site Example - Grading Phase

On-Site Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Haul Truck[n]	8	0.1
Water Truck[o]	3	0.4

Incremental Increase in Onsite Combustion Emissions from Construction Equipmen

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Rubber Tired Dozers	11.30	23.91	1.03
Graders	5.05	11.47	0.60
Tractors/Loaders/Backhoes	3.14	5.40	0.42
Total	**19.5**	**40.8**	**2.0**

Incremental Increase in Fugitive Dust Emissions from Construction Operation

Equations:

Grading[p]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMTx (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Description	Control Efficiency %	Unmitigated PM10[s] lb/day
Earthmoving	68	0.01
Storage Piles	68	0.25
Material Handling	68	0.04
Total		**0.30**

Line D-4 LST Worksheet

One Acre Site Example - Grading Phase

Incremental Increase in Onsite Travel Emissions from Onroad Mobile Equipmen

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.0419	0.0546	0.0010
Water Truck	0.0628	0.0820	0.0015
	0.105	**0.137**	**0.003**

Total Incremental Localized Emissions from Construction Activitie

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-site Emissions	**19.6**	**40.9**	**2.4**
Significance Threshold[t]	***151***	***103***	***4***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction**[u]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	2.0	1.9
Combustion (Onroad)	0.96	0.003	0.002
Fugitive	0.21	0.30	0.06
Total		**2.4**	**2.0**
Significance Threshold[t]			**3**
Exceed Significance?			**NO**

Notes:

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a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.

e) Assumed 13 foot wide blade with 2 foot overlap (11 foot wide). Vehicle miles traveled (VMT) = (10,019 sq ft/11 foot x mile/5,280 ft)/1 days = 0.17 mile

f) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Corection Factors Applicable to the Predictive Emission Factor Equations

g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993

h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph. At least one meteorological site recorded wind speeds greater than 12 mph over a 24-hour period in 1981.

i) Assumed storage piles are 0.02 acres in size

j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

k) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

l) Assuming 233.33 cubic yards of dirt handled [(233.33 cyd x 2,500 lb/cyd)/1 days = 583,325 lb/day)

m) CARB, EMFAC2007 (version 2.3) Burden Model, Winter 2007, 75 F, 40% RH: EF, lb/yr = (EF, ton/yr x 2,000 lb/ton)/VMT

n) Assumed 30 cubic yd truck capacity for 233.33 cy of dirt [(233.33 cy x truck/30 cy)/2 days = 8 one-way truck trips/day]. Assumed haul truck travels 0.1 miles through facility

o) Assumed six foot wide water truck traverses over 10,019 square feet of disturbed area

p) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading $\leq$ 10 µm

q) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1

r) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

s) Includes watering at least three times a day per Rule 403 (68% control efficiency)

t) For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

u) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Line D-4 LST Worksheet

One Acre Site Example - Architectural Coating and Asphalt Paving

Example	**Construction Activity**
One Acre Site	Architectural Coating and Asphalt Paving of Parking Lot

Construction Schedule	**1**	**days**[a]

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Pavers	1	8.0	8
Cement and Mortar Mixers	4	8.0	
Rollers	1	8.0	
Tractors/Loaders/Backhoes	0	7.0	

Construction Equipment Combustion Emission Factors

Equipment Type[c]	**CO** lb/hr	**NOx** lb/hr	**PM10** lb/hr
Pavers	0.564	0.987	0.071
Cement and Mortar Mixers	0.043	0.060	0.004
Rollers	0.421	0.775	0.055
Tractors/Loaders/Backhoes	0.393	0.675	0.052

Construction Vehicle (Mobile Source) Emission Factors

	CO lb/mile	**NOx** lb/mile	**PM10** lb/mile
Heavy-Duty Truck[d]	0.026167	0.034155	0.000626

On-Site Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Delivery Truck[e]	3	0.1
Water Truck[f]	3	1.3

Line D-4 LST Worksheet

One Acre Site Example - Architectural Coating and Asphalt Paving

Incremental Increase in Onsite Idling Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Pavers	4.52	7.89	0.57
Cement and Mortar Mixers	13.48	24.80	1.75
Rollers	0.35	0.48	0.03
Tractors/Loaders/Backhoes	0.00	0.00	0.00
Total	**18.34**	**33.17**	**2.35**

Incremental Increase in Offsite Combustion Emissions from Construction Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Flatbed Truck	0.016	0.020	0.0004
Water Truck	0.204	0.266	0.0049
Total	**0.220**	**0.287**	**0.0053**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**18.6**	**33.5**	**2.4**
Significance Threshold[g]	***151***	***103***	***4***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction**[h]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	2.3	2.2
Combustion (Onroad)	0.96	0.005	0.005
Fugitive	0.21	0	0
Total		**2.4**	**2.2**
Significance Threshold[g]			**3**

Exceed Significance?	**NO**

Line D-4 LST Worksheet

One Acre Site Example - Architectural Coating and Asphalt Paving

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Line D-4 LST Worksheet

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Pumps	Composite	0.310	0.554	0.039	0.001	0.094
Rollers	Composite	0.421	0.775	0.055	0.001	0.118
Rough Terrain Forklifts	Composite	0.477	0.799	0.068	0.001	0.127
Rubber Tired Dozers	Composite	1.413	2.989	0.129	0.002	0.338
Rubber Tired Loaders	Composite	0.508	1.154	0.065	0.001	0.144
Scrapers	Composite	1.242	2.908	0.126	0.003	0.320
Signal Boards	Composite	0.095	0.161	0.009	0.000	0.022
Skid Steer Loaders	Composite	0.249	0.292	0.025	0.000	0.069
Surfacing Equipment	Composite	0.616	1.568	0.061	0.002	0.155
Sweepers/Scrubbers	Composite	0.538	0.847	0.069	0.001	0.155
Tractors/Loaders/Backhoes	Composite	0.393	0.675	0.052	0.001	0.102
Trenchers	Composite	0.491	0.760	0.064	0.001	0.167
Welders	Composite	0.225	0.292	0.027	0.000	0.081

APPENDIX C

GHG EMISSIONS ESTIMATES

San Jacinto MDP Construction Emissions Estimates

Construction Emissions

2010

Activity	Annual Tons	Annual MT CO2
Casa Loma Basin	1,273.70	1,155.48
Line Y	204.66	185.66
Line E	92.19	83.63
Line D-4	42.87	38.89
	Total	1,463.67

2011

Activity	Annual Tons	Annual MT CO2
Casa Loma Basin	984.22	892.87
Line Y	18.61	16.88
	Total	909.75

Total by Project Year

Year	Total Tons CO2	Total MT CO2
2010	1,613.42	1,463.67
2011	1,002.83	909.75
	Total	2,373.42

* Annual tons obtained from URBEMIS output.

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Basin.urb924

Project Name: San Jacinto MDP - Casa Loma Basin

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	CO2
2010 TOTALS (tons/year unmitigated)	1,273.70
2010 TOTALS (tons/year mitigated)	1,273.70
Percent Reduction	0.00
2011 TOTALS (tons/year unmitigated)	984.22
2011 TOTALS (tons/year mitigated)	984.22
Percent Reduction	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	CO2
2010	1,273.70
Mass Grading 08/01/2010-04/30/2011	1,273.70
Mass Grading Dust	0.00
Mass Grading Off Road Diesel	393.65
Mass Grading On Road Diesel	864.66
Mass Grading Worker Trips	15.39
2011	984.22
Mass Grading 08/01/2010-04/30/2011	984.22
Mass Grading Dust	0.00
Mass Grading Off Road Diesel	304.18
Mass Grading On Road Diesel	668.14
Mass Grading Worker Trips	11.89

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Phase Assumptions

Phase: Mass Grading 8/1/2010 - 4/30/2011 - Basin Excavation Description

Total Acres Disturbed: 33

Maximum Daily Acreage Disturbed: 2

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 3728.21 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 3709.18

Off-Road Equipment:

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

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

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

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

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	CO2
2010	1,273.70
Mass Grading 08/01/2010-04/30/2011	1,273.70
Mass Grading Dust	0.00
Mass Grading Off Road Diesel	393.65
Mass Grading On Road Diesel	864.66
Mass Grading Worker Trips	15.39
2011	984.22
Mass Grading 08/01/2010-04/30/2011	984.22
Mass Grading Dust	0.00
Mass Grading Off Road Diesel	304.18
Mass Grading On Road Diesel	668.14
Mass Grading Worker Trips	11.89

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2010 - 4/30/2011 - Basin Excavation Description

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

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Line Y.urb924

Project Name: San Jacinto MDP - Line Y

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	CO2
2010 TOTALS (tons/year unmitigated)	204.66
2010 TOTALS (tons/year mitigated)	204.66
Percent Reduction	0.00
2011 TOTALS (tons/year unmitigated)	18.61
2011 TOTALS (tons/year mitigated)	18.61
Percent Reduction	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	CO2
2010	204.66
Fine Grading 08/01/2010-01/15/2011	204.66
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	194.40
Fine Grading On Road Diesel	0.00
Fine Grading Worker Trips	10.26
2011	18.61
Fine Grading 08/01/2010-01/15/2011	18.61
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	17.67
Fine Grading On Road Diesel	0.00
Fine Grading Worker Trips	0.93

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Phase Assumptions

Phase: Fine Grading 8/1/2010 - 1/15/2011 - Line Y Excavation/Construction Description

Total Acres Disturbed: 27.55

Maximum Daily Acreage Disturbed: 0.23

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 1481.48 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

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

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

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

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

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	CO2
2010	204.66
Fine Grading 08/01/2010-01/15/2011	204.66
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	194.40
Fine Grading On Road Diesel	0.00
Fine Grading Worker Trips	10.26
2011	18.61
Fine Grading 08/01/2010-01/15/2011	18.61
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	17.67
Fine Grading On Road Diesel	0.00
Fine Grading Worker Trips	0.93

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 1/15/2011 - Line Y Excavation/Construction Description

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

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Line E.urb924

Project Name: San Jacinto MDP - Line E

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	CO2
2010 TOTALS (tons/year unmitigated)	92.19
2010 TOTALS (tons/year mitigated)	92.19
Percent Reduction	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	CO2
2010	92.19
Fine Grading 08/01/2010-09/09/2010	92.19
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	88.13
Fine Grading On Road Diesel	0.00
Fine Grading Worker Trips	4.06

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Phase Assumptions

Phase: Fine Grading 8/1/2010 - 9/9/2010 - Line E Excavation Description

Total Acres Disturbed: 34

Maximum Daily Acreage Disturbed: 1.15

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 7300 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

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

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

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

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

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	CO2
2010	92.19
Fine Grading 08/01/2010-09/09/2010	92.19
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	88.13
Fine Grading On Road Diesel	0.00
Fine Grading Worker Trips	4.06

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 9/9/2010 - Line E Excavation Description

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

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: G:\2005\05-0519E\Reports\Air\URBEMIS\Line D-4.urb924

Project Name: San Jacinto MDP - Line D-4

Project Location: Riverside County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	CO2
2010 TOTALS (tons/year unmitigated)	42.87
2010 TOTALS (tons/year mitigated)	42.87
Percent Reduction	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	CO2
2010	42.87
Asphalt 08/01/2010-08/31/2010	11.13
Paving Off-Gas	0.00
Paving Off Road Diesel	8.91
Paving On Road Diesel	0.17
Paving Worker Trips	2.05
Fine Grading 08/01/2010-08/31/2010	31.75
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	30.38
Fine Grading On Road Diesel	0.00
Fine Grading Worker Trips	1.37

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Phase Assumptions

Phase: Fine Grading 8/1/2010 - 8/31/2010 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 5.05

Maximum Daily Acreage Disturbed: 0.23

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 233.33 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 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

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

Phase: Paving 8/1/2010 - 8/31/2010 - Default Paving Description

Acres to be Paved: 0.23

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 8 hours per day

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

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	CO2
2010	42.87
Asphalt 08/01/2010-08/31/2010	11.13
Paving Off-Gas	0.00
Paving Off Road Diesel	8.91
Paving On Road Diesel	0.17
Paving Worker Trips	2.05
Fine Grading 08/01/2010-08/31/2010	31.75
Fine Grading Dust	0.00
Fine Grading Off Road Diesel	30.38
Fine Grading On Road Diesel	0.00
Fine Grading Worker Trips	1.37

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 8/31/2010 - Default Fine Site Grading/Excavation Description

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

PM10: 61% PM25: 61%