Appendix B
El Sobrante Landfill Air Quality Evaluation

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April 22, 2008

Mr. Jeramey Harding
T&B PLANNING
8885 Rio San Diego Drive, Suite 227
San Diego, CA 92108

Subject: El Sobrante Landfill Air Quality Evaluation

Dear Mr. Harding:

SUMMARY OF FINDINGS

The results of the analysis indicate that emissions resulting from the proposed project will not exceed South Coast Air Quality Management District (SCAQMD) regional or localized thresholds therefore additional mitigation beyond what is currently in effect pursuant to the Final Environmental Impact Report, El Sobrante Landfill Expansion State Clearinghouse No. 90020076 (April 1996) and subsequent amendments is not required. The results of the analysis support the following conclusions:

- The project is in compliance with the SCAQMD's 2007 Air Quality Management Plan;
- The project-generated emissions are not expected to violate Federal or State ambient air quality standards;
- The project's contribution to cumulative impacts is not cumulatively considerable;
- The project does not have the potential to expose sensitive receptors to substantial pollutant concentrations;
- Project-generated odors will not affect a substantial number of people; and
- The project is not expected to result in a significant impact to global climate change.

INTRODUCTION

The purpose of this air quality evaluation is to identify any potential air quality impacts as a result of the change in operational characteristics being proposed by the El Sobrante Landfill. The El Sobrante Landfill is generally located easterly of the I-15 Freeway and Temescal Canyon Road in unincorporated Riverside County.

BACKGROUND INFORMATION

The El Sobrante Landfill has been in operation since 1986, and is owned and operated by USA Waste of California, Inc., a subsidiary of Waste Management, Inc. (WMI). In 1998, the County of Riverside entered into the Second El Sobrante Landfill Agreement when the Board of Supervisors approved what is referred to as the "El Sobrante Landfill Expansion Project". The "El Sobrante Landfill Expansion Project", which was fully permitted in 2001, allowed for the following:

- Increase daily disposal tonnage to 10,000 tons per day (tpd)
- Operate 24-hours a day, 7 days a week, 360 days a year
- Waste delivery during 20 hours of the day (between 4:00 AM and 12:00 AM)
- Expand the disposal footprint from 178 acres to 495 acres
- Increase its permitted traffic volume to 1,305

An air quality study was prepared by TRC Environmental Solutions in April 1994 in support of the landfill expansion project, this air study was refined several times in order to represent the project site and any proposed changes, the most recent update occurred in 1998. The South Coast Air Quality Management District (SCAQMD) was involved in an extensive consultation process to determine appropriate modeling methodology and parameters for the El Sobrante Landfill Expansion.

Additionally, as part of the certified Environmental Impact Report (EIR) for its most recent landfill expansion, USA Waste of California, Inc. (USA Waste) is required to implement a California Environmental Quality Act (CEQA) mitigation monitoring and reporting program (MMRP) for the El Sobrante Landfill. Condition AQ-13 of the MMRP requires USA Waste determine the need, if any, for emissions offsets for Nitrogen Oxides (NOx) and Reactive Organic Gases (ROG) from stationary and mobile sources as defined by the EIR. A letter dated September 13, 2007 was prepared by SCS Engineers (SCS) on behalf of USA Waste and constitutes the required Annual MMRP Status Report for 2008. The results indicated that the project resulted in an emissions reduction of 462.0 and 7.6 lbs/day for NOx and ROG, respectively. Therefore, no emission offsets were required for 2008. Excerpts from the Annual MMRP are available for review in Attachment "A." Any future increases in emissions would thus be offset through the Annual MMRP process.

It is also important to note that the County of Riverside Department of Environmental Health Local Enforcement Agency (LEA) issued a revised solid waste facility permit indicating the maximum permitted traffic volume of 1,305 vehicles per day of incoming waste materials.

In 2003, the Second Agreement was amended to allow the landfill to grind green waste for "Alternative Daily Cover" (ADC) in place of soil cover and to convert landfill gas to electricity. In March of 2007, the Board of Supervisors approved the Second Amendment to the Second El Sobrante Landfill Agreement and authorized the Chairman to execute the Amendment on behalf of the Board.

Currently, the landfill operates pursuant to the Second Agreement and amendments thereto (Second Agreement).

Data has been provided by Waste Management, Inc. to be used as the basis of a conservative representation of the facility's current 20-hour operations. The data which shows the current 20-hour operations with the permitted maximum of 1,305 daily incoming trips is shown on Table 1. It should be noted that the volumes shown on Table 1 are inbound trips (i.e. one-way) only. It is important to note that the approved 1,305 daily inbound trips is the theoretical maximum permitted for this facility which may not be observed, even on the most conservative day. The typical day, as analyzed in this traffic assessment, is most-likely the worst-case condition that would be observed on any given day.

PROPOSED PROJECT

WMI is proposing to amend the Solid Waste Facility Permit (SWFP) for the El Sobrante Landfill to allow for the following operational changes as contemplated pursuant to the second amendment to the Second Agreement:

- **Extend the hours at the gate for waste delivery.** As mentioned previously, the facility is currently permitted to accept waste for disposal 20 hours a day (4:00 AM to 12:00 AM-Midnight). The project proposes to increase this by four (4) hours, thus allowing for acceptance of material for a continuous 24-hour period. The permitted days of operations will remain Sunday through Saturday, 7 days a week, 360 days a year.

- **Change the maximum disposal tonnage limits from a daily limit to a weekly limit.** As mentioned previously, the facility is currently permitted to accept 10,000 tons per day of waste 7 days a week. Instead of using daily tonnage limits (10,000 tpd), the project proposes to incorporate a weekly maximum tonnage limit of 70,000 tons per week.

Using the trip data provided in Table 1 as a base, vehicle trips were reallocated throughout a 24-hour period by WMI based on both the expected operational characteristics the El Sobrante site and associated transfer stations the site serves. Table 2 shows the projected volumes, by vehicle type, for the facility with the proposed 24-hour operations. It is important to note that the data reflects that the currently approved and permitted maximum number of incoming vehicles per day (1,305) will not be exceeded as part of the change in operations. Table 3 shows the projected volumes, by vehicle type, for the facility with the proposed 24-hour operations for a typical day (less than 1,305 daily inbound trips). Similar to Table 1, Tables 2 and 3 also present inbound trips only and the passenger vehicles include both the existing and project employee trips. As indicated on Table 2, a reduction during the AM peak hour (8:00-9:00AM) and a nominal change during the PM peak hour (4:00-5:00PM) are anticipated with the proposed 24-hour operations as compared to the current 20-hour operations. Likewise, Table 3 shows an estimated reduction during both the AM and PM peak hours with the proposed 24-hour operations on a typical day.

The project trip generation for the current 20-hour and proposed 24-hour operations are summarized on Table 4.

The on-site vehicle and equipment requirements are summarized on Table 5 for the current 20-hour and proposed 24-hour operations.

Using the equipment data provided in Table 5 as a base, equipment types were reallocated throughout a 24-hour period by WMI based on both the expected operational characteristics the El Sobrante site and associated transfer stations the site serves; this data is presented on Table 6.

EXISTING AIR QUALITY

Existing air quality is measured based upon ambient air quality standards. These standards are the levels of air quality that are considered safe, with an adequate margin of safety, to protect the public health and welfare. Those standards currently in effect for both California and federal air quality standards are shown in Table 7.

The determination of whether a region's air quality is healthful or unhealthful is determined by comparing contaminant levels in ambient air samples to the state standards and federal standards presented in Table 7. The air quality in a region is considered to be in attainment by the state if the measured ambient air pollutant levels for Ozone (O_3), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Inhalable Particulates (PM_{10}), and Ultra-Fine Particulates ($PM_{2.5}$) are not equaled or exceeded at any time in any consecutive three-year period; and the federal standards (other than O_3, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not exceeded more than once per year. The O_3 standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. See Table 8 for attainment designations.

LOCAL AIR QUALITY

The nearest long-term air quality monitoring site in relation to the project for PM_{10} is carried out by the SCAQMD at the Norco/Corona monitoring station located approximately 10.5 miles northwest of the project site. Data for CO and $PM_{2.5}$ was obtained from the Metropolitan Riverside County 2 (monitoring station located approximately 11.4 miles northeast of the project site. Data for O_3 and

NO_2 was obtained from the Lake Elsinore monitoring station located approximately 12.0 miles southeast of the project site. It should be noted that the Metropolitan Riverside County 2 and Lake Elsinore monitoring stations were utilized in lieu of the Norco/Corona monitoring station only where data was not available from the nearest monitoring site.

The 3 years of data in Table 9 shows the number of days standards were exceeded for the study area, which was chosen to be representative of the local air quality at the project site. It should be noted that data for SO_2 has been omitted as attainment is regularly met in the South Coast Air Basin and few monitoring stations measure SO_2 concentrations.

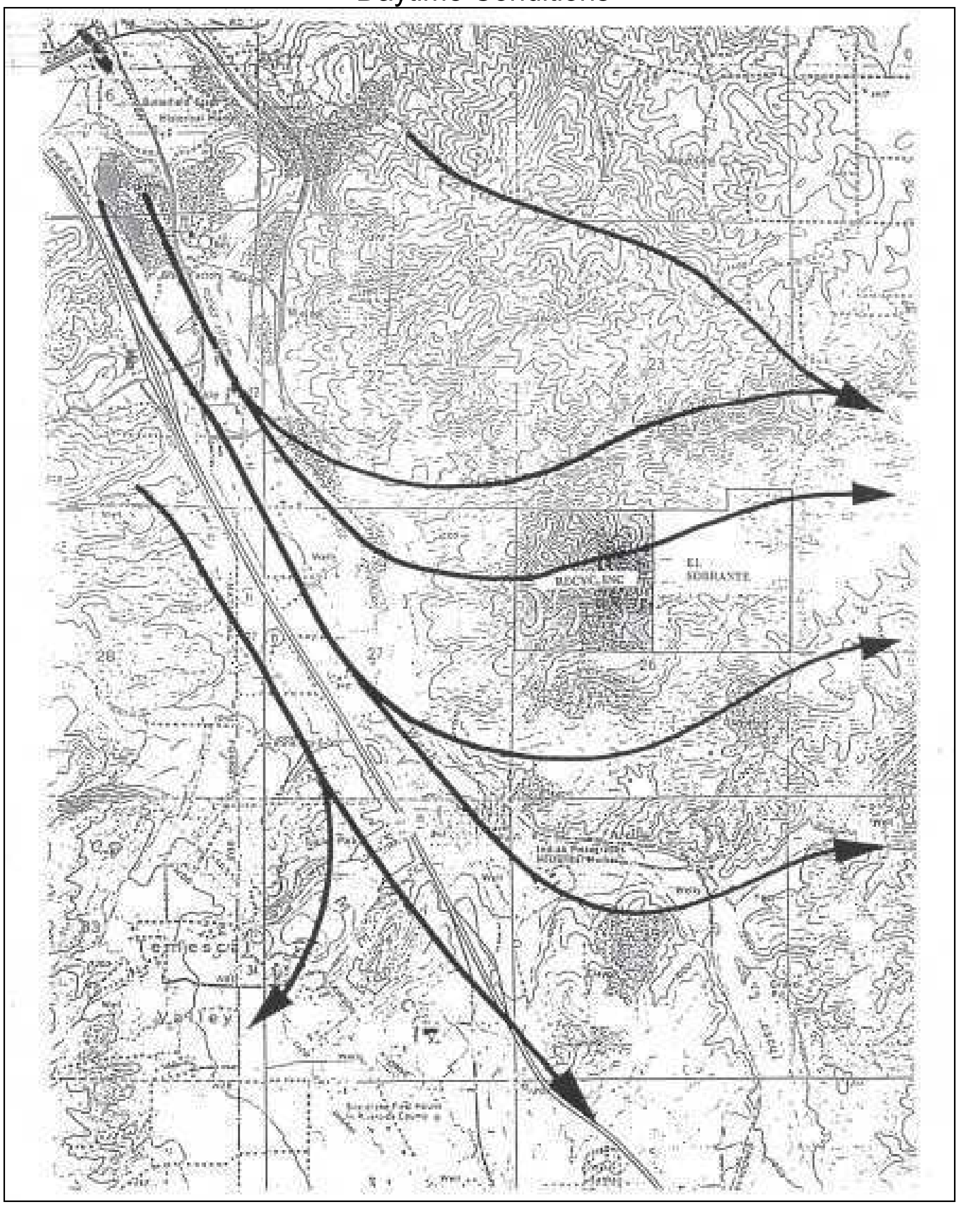
SITE MICROMETEROLOGY

Meteorological conditions in the vicinity of the proposed project are influenced by distinct diurnal fluctuations in the wind field, driven by topographic features of both Temescal Canyon and the lesser canyons and arroyos that feed into it. Winds under the influence of daytime surface heating generally follow Temescal Canyon and present a uniform northwesterly to west-northwesterly pattern.

At night, winds within the project area are light and variable and influenced by cooling in the mountains, resulting in gravitational drainage down the canyons from the north and northwest. Early morning drainage exhibits similar patterns to the observed nighttime flow whereby the air mass dictated by gravitational attraction shifts slowly southward down the canyon towards Lake Elsinore.

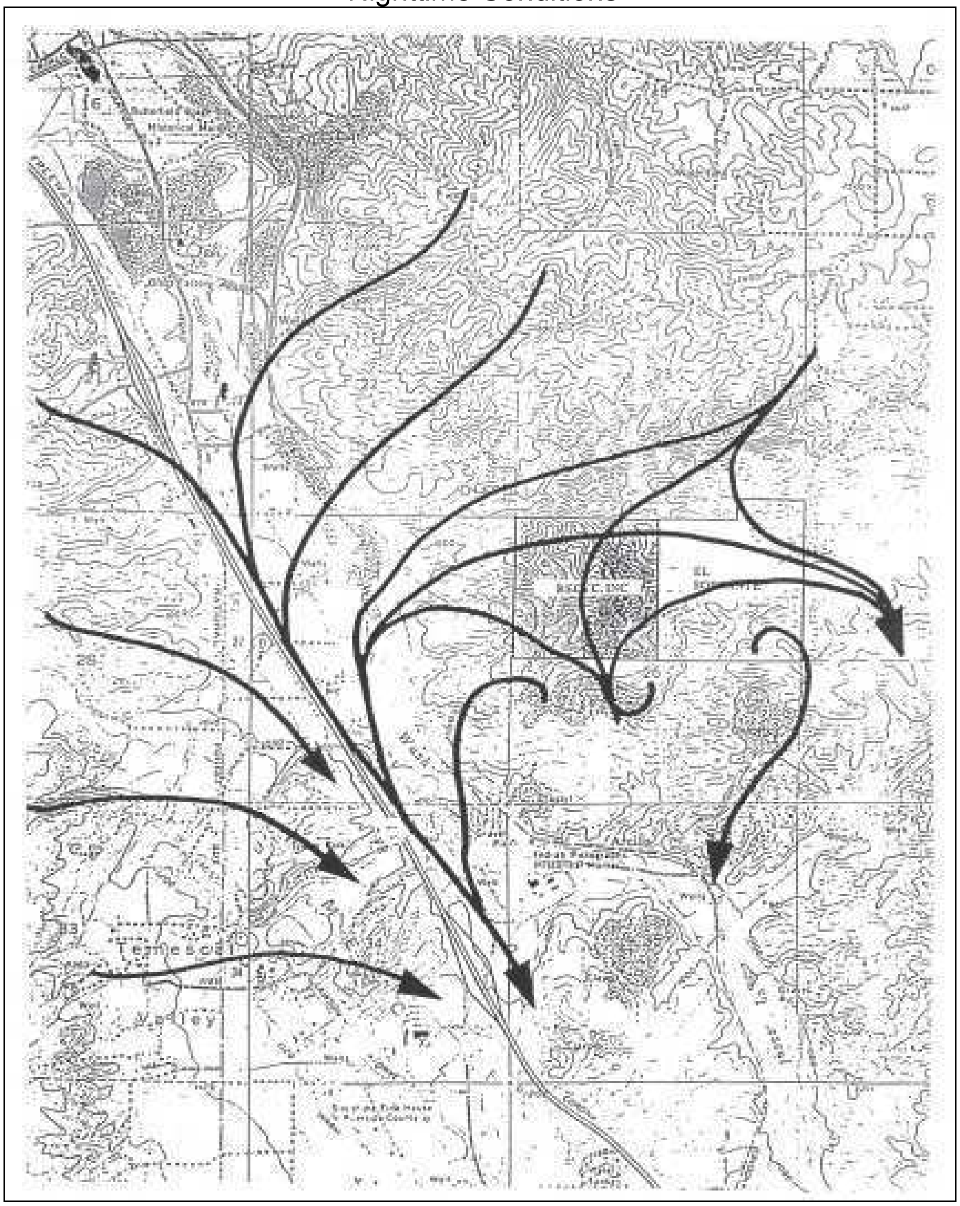
Figures 1 and 2 present a graphical representation of composite wind fields for both daytime and evening conditions.

Figure 1
Daytime Conditions



Source: South Coast Air Quality Management District (1995).

Figure 2
Nighttime Conditions



Source: South Coast Air Quality Management District (1995).

POTENTIAL IMPACTS

The criteria used to determine the significance of potential project-related air quality impacts are taken from the Initial Study checklist form in Appendix G of the State CEQA Guidelines. Based on these thresholds, a project would result in a significant impact related to air quality if it would:

(1) *Conflict with or obstruct implementation of the applicable air quality plan*

(2) *Violate any air quality standard or contribute to an existing or projected air quality violation.*

(3) *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).*

(4) *Expose sensitive receptors to substantial pollutant concentrations.*

(5) *Create objectionable odors affecting a substantial number of people.*

In addition, project impacts would be significant if they exceed the following California standards for localized CO concentrations:

- 1-hour CO standard of 20.0 parts per million (ppm)
- 8-hour CO standard of 9.0 ppm.

The SCAQMD has developed significance thresholds based on the volume of each pollutant emitted. The SCAQMD's CEQA Air Quality Handbook, 1993 states that any projects in the District with daily emissions that exceed any of the following thresholds should be considered as having an individually and cumulatively significant air quality impact. See Table 10 for a summary of daily emissions threshold set forth by the SCAQMD.

Localized Significance thresholds (LSTs) were developed in response to the Governing Board's Environmental Justice Enhancement Initiative I-4. The LST methodology was provisionally adopted by the Governing Board in October 2003 and formally approved by the SCAQMD's Mobile Source Committee in February 2005.

LSTs are only applicable to the following criteria pollutants: NO_2, CO, PM_{10}, and $PM_{2.5}$. LSTs represent the maximum emissions from a project that are not expected to 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 and distance to the nearest sensitive receptor. For PM_{10} and $PM_{2.5}$ LSTs were derived based on requirements in SCAQMD Rule 403 – Fugitive Dust.

The SCAQMD states that the use of LSTs is "voluntary," and ultimately it is the decision of the lead agency pursuant to the CEQA to determine if an LST analysis is required. It should be noted however that the SCAQMD strongly recommends the use of LSTs for any project subject to CEQA. The SCAQMD states that a LST analysis would only apply to projects that are subject to an environmental analysis pursuant to CEQA or the National Environmental Policy Act (NEPA) (Final Localized Significance Threshold Methodology, SCAQMD, 2003). Discussion regarding localized significance addresses Items 2, 3, and 4 respectively for CEQA Appendix G thresholds.

Pollutant emissions are considered to have a significant effect on the environment if they result in concentrations that create either a violation of an ambient air quality standard, contribute to an existing air quality violation or expose sensitive receptors to substantial pollutant concentrations. Should ambient air quality already exceed existing standards, the SCAQMD has established specific significance criteria to account for the continued degradation of local air quality.

For PM_{10} emissions, background concentrations in the project area occasionally exceed the CAAQS for the PM_{10} 24-hour averaging time. As a result, a significant impact is achieved when pollutant concentrations produce a measurable change over existing background concentrations. Background concentrations are based upon the highest observed value for the most recent three year period. For NO_2 and CO, background concentrations are below the current air quality standards. As such, significance is achieved when pollutant concentrations add to existing levels and create an exceedance of the CAAQS. As previously discussed, Table 9 shows the pollutant concentrations collected at the nearest monitoring stations in the project area for CO, NO_2, PM_{10}, and $PM_{2.5}$ where data for the last three years is available.

In order to minimize efforts for detailed dispersion modeling, the SCAQMD has developed screening (lookup) tables to assist lead agencies with a simple tool for evaluating impacts from small projects. The use of LST lookup tables is limited to projects that are five acres or smaller in size.

Although emissions from the proposed project will in all likelihood be spread out over an area greater than 1 acre in size, an LST analysis for operational activity has been performed using the SCAQMD Mass-Rate lookup tables for a 1 acre project, which conservatively represents localized concentrations in the project vicinity. Sensitive receptors were also conservatively assumed to be located at a distance of approximately 50 meters, although it is important to note that the nearest receptors are actually located more than 1,000 meters from the Landfill.

ANALYSIS METHDOLOGY

The Proposed Project would not require additional soil disturbance or additional vehicle trips over and above the project as it was analyzed for the Second Agreement, however the proposed project may require slightly additional equipment and an increase the total operational equipment hours at the site. For purposes of this analysis, “equipment hours” refer to the total amount of hours for any number of equipment pieces that is operational on any given day. Although the hours at the gate for waste delivery will be increased from 20 to 24 hours, and there will be a change from the maximum daily disposal limit to a weekly disposal limit, the following issues that are of concern in the air quality evaluation would not change substantially, and therefore, the change in air quality emissions would not be significant:

- The types and quantities of equipment used for daily operations at the project site would generally be consistent with the types and quantities of equipment that are used for ongoing landfill operations covered under Second Agreement. It should be noted that the proposed project will result in a slight change in the hourly distribution and in the total equipment hours for some equipment and associated operations (as previously discussed). This will result in a negligible increase in associated emissions during daily landfill activities.

- The quantity of soil that would be disturbed on a daily basis during existing activities for the Proposed Project is not anticipated to be greater than the quantity of soil excavated for existing landfill operations covered under the Second Agreement.

- Daily trips would not increase as a result of the Proposed Project. The number of vehicle trips associated with landfill operation activities are not anticipated to be greater than those for the existing landfill operations covered under the Second Agreement. No additional trips are anticipated due to implementation of the proposed project rather only a change in overall hourly distribution of trips is expected. It should be noted that this change in hourly distribution also results in a net benefit (reduction) in idling time at study-area intersections for the AM and PM peak hours.

CURRENT SITE EMISSIONS SOURCES

Air pollutants are emitted in limited amounts from a variety of activities at the project site. Existing sources of air pollutants include:

- Exhaust emissions from loaded packer trucks and public vehicles traveling from the landfill gate to the working face of the landfill and the return trips of empty vehicles back to the site exit. As previously discussed, vehicular activity is not expected to change as a result of the proposed project; therefore no additional emissions are anticipated due to implementation of the proposed project.

- Exhaust emissions from scrapers, dozers, compactors, water trucks, and other operations equipment. The change in equipment type and hourly variability are summarized and presented on Tables 5 and 6 as previously discussed. Emissions estimates for existing and proposed project operations are summarized in Tables 11 and 12.

- Combustion emissions resulting from the combustion landfill gas (LFG) in the energy recovery facility (ERF). The ERF combusts LFG to generate electricity. To further reduce emissions of unburned hydrocarbons, each ERF unit contains an afterburner that destroys 80 percent of the ROGs that are not destroyed in the engine-generator set. These emissions are not expected to change as a result of the proposed project.

- Combustion of LFG in a waste gas flare. The flare system is a back-up system to the ERF, and only used if the ERF is inoperative for maintenance or repair. These emissions are not expected to change as a result of the proposed project.

- Surface emissions of LFG containing ROGs and trace amounts of toxic air contaminants from the fraction of LFG not captured by the control system. These emissions are not expected to change as a result of the proposed project.

- Fugitive dust from vehicle travel on unpaved surfaces from the extraction and transport of cover material, from the placement of daily cover, and from dust in certain types of refuse such as demolition debris or scrap green waste. The amount of dust generated is highly variable and does not lend itself to precise quantification. Because such dust generation is largely determined by the amount of dust control implemented at the landfill site, the focus on fugitive dust analysis is less on emissions estimates and more on the implementation of conscientious and effective housekeeping procedures. These emissions are not expected to change as a result of the proposed project. Standard fugitive dust control measures that the El Sobrante Landfill is required to implement are summarized in Attachment “B.”

CURRENT AND PROPOSED SITE EMISSIONS

For purposes of this analysis, current site emissions for the project result from worker-commute, waste-processing equipment, soil cover equipment, green waste processing equipment, miscellaneous tasks and equipment, and equipment maintenance.

Daily emissions are calculated as follows.

E = H x EF :where:

E = emission in pounds per day

H = total equipment hours per day of equipment operation

EF = the off-road mobile source emission factor by equipment category or horsepower-based equipment category in pounds per hour (see Tables 5 and 6 for additional details).

Worker trips resulting from daily operations are also expected to occur. The number of workers trips has been conservatively estimated to be approximately 63 per day based on the Current 20-Hour site operations; for the Proposed 24-hour site operations the number of daily worker trips is conservatively estimated to be approximately 71 per day. The emissions estimates assume a worker commute fleet mix of 50% light duty auto and 50% light duty trucks. Emissions estimates for current and proposed worker trips are summarized in Tables 11 and 12.

As previously discussed, there is a slight increase in the number of pieces of equipment and in the total equipment hours for the proposed project operations as compared to current operations. There is an increase from the current, approximately 415 daily equipment hours to the proposed, approximately 496.5 daily equipment hours. This change in total equipment hours results in a negligible increase in daily emissions as presented in Table 11. Emissions calculations and modeling outputs are provided in Attachment “C.”

CO HOTSPOT ANALYSIS

A CO hotspot is a localized concentration of carbon monoxide that is above State and/or Federal 1-hour or 8-hour ambient air standards that is generally associated with idling or slow moving traffic. The SCAQMD recommends that a CO hotspot analysis be performed if the project meets either of the following two conditions:

- The volume to capacity ratio increases by two percent or more as a result of a proposed project for intersections rated level of service (LOS) D or worse or if the LOS declines from C to D
- The LOS declines from A, B, or C to D, E, or F.

According to data provided in the letter report El Sobrante Landfill Traffic Evaluation (Urban Crossroads, Inc., April 11, 2008), none of the studied intersections will meet these conditions as a result of project generated vehicular traffic. In fact, the Traffic Evaluation notes that there is actually a net benefit (reduction) in average delay for the peak hours with implementation of the proposed project. Thus, because the project does not have the potential to create a CO hotspot and since the delay is actually decreased as a result of the proposed project, a CO hotspot analysis was not performed and impacts are considered less than significant.

GREENHOUSE GAS EMISSIONS

There is now widespread consensus that human-caused GHGs contribute to climate change (also known as global warming), although there is still much uncertainty regarding the magnitude of this global impact. There are also no current CEQA Thresholds of Significance established for GHGs. However, in recognition of this emerging issue, California Assembly Bill 32 (the *California Global Warming Solutions Act*) calls for CARB to adopt regulations requiring the reporting and verification of GHG emissions statewide and that a limit equivalent to 1990 levels be achieved by the year 2020. In anticipation of this advancing initiative, CEQA documents are more commonly including an inventory of GHGs.

In the context of CEQA, GHGs and Global Climate Change associated with the project may be addressed in two ways:

1. *How does the project affect global climate change?* At this time, there is not enough evidence or data available to reasonably conclude the extent to which any single project will affect global climate change. GHG emissions however may be quantified on an individual project basis for both direct and indirect emissions. This quantitative information is useful to consider when identifying the project's contribution to cumulative impacts (global climate change is by nature a cumulative impact that cannot be attributable to any single project).

2. *How does climate change affect the project?* Due to the global nature of climate change, this cannot be forecast in a project-specific manner, but potential effects of global climate change can have adverse impacts such as sea level rise, wildfire

hazard, and water supply reliability, these items should be discussed in the climate change section of the report.

For this assessment, project-related GHGs were estimated consistent with the methodology employed for calculating criteria pollutant emissions. Therefore, the input parameters were similar to those used in support of the *Current and Proposed Site Emissions* as discussed previously. The analysis focuses on the principle GHG of CO_2 but also includes N_2O and CH_4. The results are reported as CO_2-equivalents based on IPCC Global Warming Potential Values (IPCC 2006) and are expressed as total tons of project-related emissions, the results are presented on Table 12 for review.

It is estimated that the project currently generates 0.0128 Teragrams (Tg) of CO_2 Eq. for the previously discussed activities, the proposed project would result in approximately 0.0148 Tg CO_2 Eq. which represents approximately 0.00259% and 0.00300% respectively of California's 2004 total CO_2 emissions. The incremental increase in CO_2 Eq. related to the proposed project is an increase of less than one thousandth of a percent when compared to California's existing CO_2 emissions, thus the proposed project is not expected to contribute substantially to global climate change. Emissions calculations and modeling outputs are provided in Attachment "C."

ODORS

In 1995 the SCAQMD published the results of a monitoring report that was conducted in the neighboring El Sobrante Landfill area; the purpose of the SCAQMD's study was to determine complex wind patterns in the surrounding canyons of the RECYC Composting Facility (Synagro) which neighbors the El Sobrante Landfill, and to collect ambient samples of potentially odorous materials. For the landfill, methane and carbon monoxide are the primary gaseous constituents. These compounds are produced by microorganisms within the landfill under anaerobic conditions. Landfill gases also contain a small amount of non-methane organic compounds (NMOC). The NMOC fraction contains VOC's, greenhouse gases and compounds associated with stratospheric ozone depletion. To control these emissions, the facility utilizes a gas collection system which combusts the collected gas through the use of internal combustion engines, flares and/or turbines.

Notwithstanding the identified controls to limit emissions, the above referenced SCAQMD monitoring report noted that VOC's were collected during the monitoring exercise, however, they were considered endemic to landfill operations and other industrial activities at "concentrations too low to quantify" and "no source-receptor relationship may be inferred." Therefore, based upon the adequacy of the facility's gas collection system and related monitoring results, the landfill is not anticipated to generate gaseous emissions that present a nuisance to the residents in the project vicinity. Additionally, as noted in the 1994 El Sobrante DEIR, County records show that complaints regarding odor were related to the adjacent composting facility and not related to landfill activities.

Based upon a field survey and review of available documentation, the existing Synagro composting facility was identified as the predominant source of malodorous emissions in the vicinity of the proposed project. This condition is due to the exothermic treatment process which releases organic and inorganic gases such as ammonia, volatile organic compounds (VOC's) and amines.

It should be noted however, based on a settlement agreement between Synagro and the County of Riverside it is our understanding that operations at the Synagro facility will cease on or before December 31, 2008 resulting in closure of the Synagro composting facility. The closure of the Synagro facility will likely alleviate the current malodorous emissions that impact any sensitive receptors in the project vicinity. Excerpts from the SCAQMD's study are presented in Attachment "D."

TOXIC AIR CONTAMINANTS

The ERFs operating at the El Sobrante Landfill have the potential to emit toxic air contaminants (TACs). However, SCAQMD's Rule 1401 prohibits the air district from issuing an authority to construct or a permit to operate any facility that would create an unacceptable public health risk from emissions of TACs. Unacceptable individual cancer risk from a permitted source is a one excess cancer in one million people. If Toxics-Best Available Control Technology (T-BACT) is employed, the allowable risk is increased to ten in one million. According to the analysis contained in El Sobrante DEIR, FEIR, and Updated EIR, the ERF at the Landfill and associated heavy-duty diesel vehicle exhaust underwent a Tier 4 (full health risk) Assessment. The calculated risk for the existing ERF/afterburner system was determined to be less than one in one million at full capacity: an acceptable level. The proposed project is not expected to significantly alter the previous findings since no changes to the ERFs are proposed. For the proposed project, the total daily truck trips are also within the currently permitted maximum 1305 truck trips thus health-risks associated with the daily truck trips are not expected to change. Additionally, a small increase in the amount of diesel-fired particulate exhaust will result from on-site equipment activities for the proposed project as compared to current operating conditions, however this increased level in emissions is not anticipated to significantly increase health risks to residents in the project vicinity since the emissions estimates utilized to conduct the previous health risk assessment accounted for the most conservative site conditions. It should be noted that the El Sobrante Landfill is currently in the process of phasing out older (higher emitting) equipment and replacing it with CARB-certified Tier II or better equipment.

Additionally, it is important to note that the emission factor for heavy-duty trucks was previously obtained (for use in the previous health risk assessment) from the EMFAC7F emissions inventory model for year 2001, which is conservative in nature. Based on the EMFAC7F emissions inventory model, heavy-duty trucks would result in exhaust particulates of 1.37 grams per mile; when compared to recently-released SCAQMD data utilizing the latest EMFAC2007 emissions inventory model, the *Highest (Most Conservative) EMFAC2007 (version 2.3) Emission Factors for On-Road Heavy Heavy Duty Diesel Trucks (SCAQMD 03/07)* result in exhaust particulates of only 0.913 grams per mile for the analysis year 2009 (the proposed project's expected opening year), almost a 33.4% reduction in emissions when compared to the 2001 analysis year levels. Thus, the previous air quality calculations are representative of worst-case conditions that the proposed project will not exceed. Excerpts from the previous air study and a summary of the updated EMFAC2007 values are presented in Attachment "E" for review.

CONCLUSIONS

The results of the analysis indicate that emissions resulting from the proposed project will not exceed SCAQMD regional or localized thresholds therefore additional mitigation beyond what is currently in effect pursuant to the Final Environmental Impact Report, El Sobrante Landfill

Expansion State Clearinghouse No. 90020076 (April 1996) and subsequent amendments is not required. The results of the analysis support the following conclusions:

- The project is in compliance with the SCAQMD's 2007 Air Quality Management Plan;
- The project-generated emissions are not expected to violate Federal or State ambient air quality standards;
- The project's contribution to cumulative impacts is not cumulatively considerable;
- The project does not have the potential to expose sensitive receptors to substantial pollutant concentrations;
- Project-generated odors will not affect a substantial number of people; and
- The project is not expected to result in a significant impact to global climate change.

If you have any questions or comments, please contact me directly at (949) 660-1994.

Respectfully submitted,

URBAN CROSSROADS, INC.

Haseeb Qureshi
Senior Air Quality Specialist

AE:HQ:MT
JN: 05212-03 Letter Report
Attachments

TABLE 1

CURRENT 20-HOUR OPERATIONS WITH 1,305 DAILY TRIPS

VEHICLE TYPE	12AM	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	TOTALS
Car or Pick-up Truck (Employees)	0	0	0	0	11	0	0	11	16	1	0	16	0	0	0	0	0	0	0	2	0	0	0	0	**57**
Van/Pickup/2-Wheel Trailer (<3.25 Tons)	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	**6**
Van/Pickup/4-Wheel Trailer (>3.25 Tons)	0	0	0	0	0	0	0	9	9	13	25	20	22	13	23	25	17	8	0	0	0	0	0	0	**184**
Car/Van/Pickup/Truck w/ 2-4 wheel Trailer	0	0	0	0	0	0	0	2	0	2	0	3	0	0	0	2	0	0	0	0	0	0	0	0	**9**
10-16 Wheel Tractor-Trailer	0	0	0	0	0	0	3	3	3	0	3	5	2	2	6	0	2	0	0	0	2	0	0	0	**31**
18-Wheel Tractor-Trailer	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	2	0	0	0	0	0	0	0	**6**
Commercial Waste Hauler (Non-compacted)	0	0	0	0	0	2	3	3	5	3	3	8	10	6	6	2	3	0	0	0	0	0	0	0	**54**
6-Wheel Truck (>2 Tons)	0	0	0	0	2	2	2	2	5	6	9	11	5	3	16	5	6	2	0	0	0	0	0	0	**76**
Commercial Waste Hauler (Front End Load)	0	0	0	0	2	0	2	5	18	14	20	19	14	5	5	16	17	9	0	0	0	0	0	0	**146**
Commercial Waste Hauler (Roll-off)	0	0	0	0	0	0	5	0	3	3	0	3	2	2	2	2	0	0	0	0	0	0	0	0	**22**
Commercial Waste Hauler (Rear-Side Load)	0	0	0	0	0	0	0	2	0	2	3	5	0	0	2	3	5	2	0	0	0	0	0	0	**24**
Transfer Trailer	0	0	0	0	73	36	39	47	55	48	45	56	42	58	53	30	22	14	9	16	8	9	8	19	**687**
Star Transfer Rig	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
SUBTOTAL	**0**	**0**	**0**	**0**	**88**	**40**	**57**	**84**	**114**	**92**	**110**	**148**	**97**	**89**	**115**	**87**	**76**	**35**	**9**	**18**	**10**	**9**	**8**	**19**	**1,305**

TABLE 2

PROPOSED 24-HOUR OPERATIONS WITH 1,305 DAILY TRIPS

VEHICLE TYPE	12AM	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	TOTALS
Car or Pick-up Truck (Employees)	2	0	0	1	0	2	7	3	31	0	0	1	0	8	0	2	0	0	1	0	0	7	0	0	**65**
Van/Pickup/2-Wheel Trailer (<3.25 Tons)	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	**6**
Van/Pickup/4-Wheel Trailer (>3.25 Tons)	0	0	0	0	0	0	0	9	9	13	25	20	22	13	23	25	17	8	0	0	0	0	0	0	**184**
Car/Van/Pickup/Truck w/ 2-4 wheel Trailer	0	0	0	0	0	0	0	2	0	2	0	3	0	0	0	2	0	0	0	0	0	0	0	0	**9**
10-16 Wheel Tractor-Trailer	0	0	0	0	0	0	3	3	3	0	3	5	2	2	6	0	2	0	0	0	2	0	0	0	**31**
18-Wheel Tractor-Trailer	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	2	0	0	0	0	0	0	0	**6**
Commercial Waste Hauler (Non-compacted)	0	0	0	0	0	2	2	3	5	2	2	8	5	6	6	2	3	0	0	0	0	0	0	0	**46**
6-Wheel Truck (>2 Tons)	0	0	0	0	2	2	2	2	5	6	9	11	5	3	16	5	6	2	0	0	0	0	0	0	**76**
Commercial Waste Hauler (Front End Load)	0	0	0	0	2	0	2	5	18	14	20	19	14	5	5	16	17	9	8	0	0	0	0	0	**154**
Commercial Waste Hauler (Roll-off)	0	0	0	0	0	0	5	0	3	3	0	3	2	2	2	2	0	0	0	0	0	0	0	0	**22**
Commercial Waste Hauler (Rear-Side Load)	0	0	0	0	0	0	0	2	0	2	3	5	0	0	2	3	5	2	0	0	0	0	0	0	**24**
Local Route Truck Totals	**2**	**0**	**0**	**1**	**4**	**6**	**21**	**29**	**74**	**42**	**64**	**77**	**50**	**39**	**62**	**59**	**54**	**21**	**9**	**0**	**2**	**7**	**0**	**0**	**623**
Transfer Trailer	33	31	34	32	32	30	16	16	17	24	35	38	39	46	43	36	22	10	8	12	31	31	32	31	**679**
Star Transfer Rig	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
SUBTOTAL	**35**	**31**	**34**	**33**	**36**	**36**	**40**	**45**	**91**	**66**	**99**	**115**	**89**	**85**	**105**	**95**	**76**	**31**	**17**	**12**	**33**	**38**	**32**	**31**	**1,305**

TABLE 3

PROPOSED 24-HOUR OPERATIONS ON A TYPICAL DAY (LESS THAN 1,305 DAILY TRIPS)

VEHICLE TYPE	12AM	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	TOTALS
Car or Pick-up Truck (Employees)	2	0	0	1	0	2	7	3	31	0	0	1	0	8	0	2	0	0	1	0	0	7	0	0	**65**
Van/Pickup/2-Wheel Trailer (<3.25 Tons)	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	**6**
Van/Pickup/4-Wheel Trailer (>3.25 Tons)	0	0	0	0	0	0	0	9	9	13	25	20	22	19	23	25	17	8	0	0	0	0	0	0	**190**
Car/Van/Pickup/Truck w/ 2-4 wheel Trailer	0	0	0	0	0	0	0	2	0	2	0	3	0	0	0	2	0	0	0	0	0	0	0	0	**9**
10-16 Wheel Tractor-Trailer	0	0	0	0	0	0	3	3	3	0	3	5	2	2	6	0	2	0	0	0	2	0	0	0	**31**
18-Wheel Tractor-Trailer	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	2	0	0	0	0	0	0	0	**6**
Commercial Waste Hauler (Non-compacted)	0	0	0	0	0	2	9	11	5	9	9	8	16	11	6	8	3	0	0	0	0	0	0	0	**97**
6-Wheel Truck (>2 Tons)	0	0	0	0	2	2	2	2	5	6	9	11	5	3	16	5	6	2	0	0	0	0	0	0	**76**
Commercial Waste Hauler (Front End Load)	0	0	0	0	2	0	2	5	13	14	20	19	14	5	5	16	17	9	8	0	0	0	0	0	**149**
Commercial Waste Hauler (Roll-off)	0	0	0	0	0	0	5	0	3	3	0	3	2	2	2	2	0	0	0	0	0	0	0	0	**22**
Commercial Waste Hauler (Rear-Side Load)	0	0	0	0	0	0	0	2	0	2	3	5	0	0	2	3	5	2	0	0	0	0	0	0	**24**
Local Route Truck Totals	**2**	**0**	**0**	**1**	**4**	**6**	**28**	**37**	**69**	**49**	**71**	**77**	**61**	**50**	**62**	**65**	**54**	**21**	**9**	**0**	**2**	**7**	**0**	**0**	**675**
Transfer Trailer	25	27	28	30	29	28	12	12	17	21	22	24	20	23	21	21	14	9	8	9	21	26	28	27	**502**
Star Transfer Rig	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
SUBTOTAL	**27**	**27**	**28**	**31**	**33**	**34**	**43**	**49**	**86**	**70**	**93**	**101**	**81**	**73**	**83**	**86**	**68**	**30**	**17**	**9**	**23**	**33**	**28**	**27**	**1,180**

TABLE 4

PROJECT TRIP GENERATION SUMMARY

LAND USE	AM			PM			DAILY
	IN	OUT	TOTAL	IN	OUT	TOTAL	
CURRENT 20-HOUR OPERATIONS							
Passenger Cars	16	11	27	2	3	5	63
Heavy Trucks	98	65	163	74	121	195	1,242
TOTAL	**114**	**76**	**190**	**76**	**124**	**200**	**1,305**
PROPOSED 24-HOUR OPERATIONS							
Passenger Cars	31	21	52	2	3	5	71
Heavy Trucks	60	40	100	74	121	195	1,234
TOTAL	**91**	**61**	**152**	**76**	**124**	**200**	**1,305**
PROPOSED 24-HOUR OPERATIONS ON A TYPICAL DAY							
Passenger Cars	31	21	52	2	3	5	71
Heavy Trucks	55	37	92	66	108	174	1,109
TOTAL	**86**	**57**	**143**	**68**	**111**	**179**	**1,180**

[1] A Passenger Car Equivalent (PCE) factor of 2.2 has been applied to heavy trucks.

TABLE 5

VEHICLE AND EQUIPMENT REQUIREMENTS
EL SOBRANTE LANDFILL

Type of Equipment	Number of Pieces by Process		CARB Tier Rating
	Existing	Proposed	
Waste Processing			
836 Compactor	4	3	Tier 2 and Tier 3
D-9 Tractor	2	1	Tier 2 and Tier 3
D-8 Tractor	3	1	Tier 2
Truck Tippers	3	3	Tier 1 and Tier 2
Water Trucks	1	1	Tier 3
Soil Cover			
365 Excavator	1	1	Tier 2
Volvo A-40 ADT	3	4	Tier 2
D-6 Tractor	1	1	Tier 1
Motor Grader	1	1	Tier 0
Green Waste Processing			
644 Wheel Loader	1	1	Tier 2
Grinder	1	1	Tier 0
Volvo A-40 ADT	1	1	Tier 2
Misc. Tasks and Equipment			
Motor Grader	1	1	Tier 0
Light Plants (small generator)	13	16	Tier 0
Equipment Maintenance			
Mechanics Trucks	3	3	Tier 0
Fuel/Lube Trucks	1	1	Tier 0

Source: WMI, Damon Defrates, February 2008

TABLE 6

CURRENT 20-HOUR OPERATION EQUIPMENT USAGE BY HOUR

Equipment Description	12AM	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Total
Waste Processing																									
836 Compactor	0.5	0	0	0	4	3.5	3	3	4	4	4	4	4	4	4	2.5	2	1	1	1	1	1	1	1	53.5
D-9 Tractor	0	0	0	0	2	2	2	1	2	2	2	2	2	2	2	1	0	0	0	0	0	0	0	0	22
D-8 Tractor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.5	0.5	0.5	0.5	0	0	0.5	4.5
Truck Tippers	0	0	0	0	3	2	3	3	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1	1	43
Water Trucks	0	0	0	0.5	0	0.5	1	0.5	1	1	1	0.5	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0	14.5
Soil Cover																									
365 Excavator	0	0	0	0	0	0	0	0	0	0	0	0.5	1	1	1	0.5	1	1	1	1	0	0	0	0	8
Volvo A-40 ADT	0	0	0	0	0	0	0	0	0	0	0	1.5	3	3	3	1.5	3	3	3	3	0	0	0	0	24
D-6 Tractor	0	0	0	0	0	0	0	0	1	1	1	0.5	1	1	1	1	1	1	1	1	1	0	0	0	12.5
Motor Grader	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	5
Green Waste Processing																									
644 Wheel Loader	0	0.5	0.5	0.5	0	0	0	0.5	1	1	1	0.5	1	1	1	0	0	0	0	0	0.5	0.5	0.5	0	10
Grinder	0	0	0	0	0	0	0	0	0.5	1	1	1	0.5	1	1	1	0	0	0	0	0	0	0	0	7
Volvo A-40 ADT	0	0.5	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	4
Miscellaneous Tasks and Equipment																									
Motor Grader	1	1	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	4.5
Light Plants (small generator)	13	13	13	13	13	13	0	0	0	0	0	0	0	0	0	0	0	0	13	13	13	13	13	13	156
Equipment Maintenance																									
Mechanic Trucks	0	0	0	0	0	0	0	2	2	2	2	2.5	3	3	3	3	3	3	1	1	1	0.5	0	0	32
Fuel / Lube Trucks	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0	0	14.5
																								Total Equipment Hours:	415

PROPOSED 24-HOUR OPERATION EQUIPMENT USAGE BY HOUR

Equipment Description	12AM	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	Total
Waste Processing																									
836 Compactor	3	2.5	3	3	3	2.5	2	2	2.5	3	3	3	3	3	3	3	1	1	1	1	2	2.5	3	3	59
D-9 Tractor	1	1	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	18.5
D-8 Tractor	0	0.5	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	12.5
Truck Tippers	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	3	3	1	1	1	3	3	3	3	63
Water Trucks	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	19
Soil Cover																									
365 Excavator	0	0	0	0	0	0	0.5	1	1	1	0.5	1	1	1	0.5	0	0	0	0	0	0	0	0	0	7.5
Volvo A-40 ADT	0	0	0	0	0	0	0.5	4	4	4	2	4	4	4	2	0	0	0	0	0	0	0	0	0	28.5
D-6 Tractor	0	0	0	0	0	0	0	0	0	0	0.5	1	1	1	0.5	1	1	1	0.5	0	0	0	0	0	7.5
Motor Grader	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
Green Waste Processing																									
644 Wheel Loader	0	0	0	0	0	0	0	0.5	1	1	1	0.5	1	1	1	0.5	0	0	0	0	0.5	0.5	0.5	0	9
Grinder	0	0	0	0	0	0	0	0	0.5	1	1	1	0.5	1	1	1	0.5	0	0	0	0	0	0	0	7.5
Volvo A-40 ADT	0	0	0	0	0	0	0	0.5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3.5
Miscellaneous Tasks and Equipment																									
Motor Grader	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	3
Light Plants (small generator)	16	16	16	16	16	16	0	0	0	0	0	0	0	0	0	0	0	0	16	16	16	16	16	16	192
Equipment Maintenance																									
Mechanic Trucks	1	1	1	1	1	1	1	0.5	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	1.5	47
Fuel / Lube Trucks	1	1	1	1	1	1	1	0.5	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1.5	17
																								Total Equipment Hours:	496.50

Note: Value of 0.5 indicates one piece of equipment active for 30 minutes. Value of 3 or 4 indicates 3 or 4 pieces of equipment active for a given one hour period, etc.

TABLE 7

AMBIENT AIR QUALITY STANDARDS[1*]

Pollutant	Averaging Time	California Standards		Federal Standards			Most Relevant Effects
		Concentration	Method	Primary	Secondary	Method	
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry	(a) Short-term exposures: (I) Pulmonary function decrements and localized lung edema in humans and animals. (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
	8 Hour	0.070 ppm (137 μg/m^3)		0.08 ppm (157 μg/m^3)			
Respirable Particulate Matter (PM_{10})	24 Hour	50 μg/m^3	Gravimetric or Beta Attenuation	150 μg/m^3	Same as Primary Standard	9.0 ppm, 8-hr avg. >	(a) Excess deaths for short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children; (c) Increased risk of premature death from heart or lung diseases in elderly
	Annual Arithmetic Mean	20 μg/m^3		-		35.0 ppm, 1-hr avg. >	
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		35 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis	
	Annual Arithmetic Mean	12 μg/m^3	Gravimetric or Beta Attenuation	15 μg/m^3			
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)			
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		-	-	-	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (56 μg/m^3)	Gas Phase Chemiluminescence	0.053 ppm (100 μg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
	1 Hour	0.18 ppm (338 μg/m^3)		-			
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	-	Ultraviolet Fluorescence	0.030 ppm (70 μg/m^3)	-	Spectrophotometry (Pararosaniline Method)	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
	24 Hour	0.04 ppm (105 μg/m^3)		0.14 ppm (365 μg/m^3)	-		
	3 Hour	-		-	0.5 ppm (1300 μg/m^3)		
	1 Hour	0.25 ppm (655 μg/m^3)		-	-	-	
Lead	30 Day Average	1.5 μg/m^3	Atomic Absorption	-	-	-	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
	Calendar Quarter	-		1.5 μg/m3	Same as Primary Standard	High Volume Sampler and Atomic Absorption	
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer - visbility of ten miles or more (0.07 - 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and transmittance through Filter Tape		No Federal Standards			Visibility impairment on days when relative humidity is less than 70 percent
Sulfates	24 Hour	25 μg/m^3	Ion Chromatography				(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) property damage
Hydrogen Sulfide	1 Hour	0.03 ppm (42 μg/m^3)	Ultraviolet Fluorescence				Most common effect from exposure is irritation of the eyes and mucous membranes
Vinyl Chloride	24 Hour	0.01 ppm (26 μg/m^3)	Gas Chromatography				(a) Irritation of the eyes and mucous membranes; (b) Nausea

[1]Source: California Air Resources Board (2/22/07)
* For reader's convenience in picking out standards quickly, concentration appears first; e.g. "0.12 ppm, 1-hr avg.>" means 1hr-avg. > 0.12ppm.
[**]There is no separate 24-hour PM 2.5 standard in California; however, the U.S. EPA promulgated a 24-hour PM 2.5 ambient air quality standard of 35 μg/m3.

TABLE 8

ATTAINMENT STATUS

Criteria Pollutant	Federal Designation	State Designation
Ozone - 8 hour standard	Severe- 17 Nonattainment	Not Established
Ozone - 1hour standard	Revoked June 2005	Extreme Nonattainment
Carbon Monoxide	Nonattainment	Attainment
PM10	Serious Nonattainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment

Source: California Air Resources Board, Attainment Designation Fact Sheets, January 2006

TABLE 9

PROJECT AREA AIR QUALITY MONITORING SUMMARY 2004-2006

NORCO/CORONA (SRA 22), METROPOLITAN RIVERSIDE COUNTY 2 (SRA 23), AND LAKE ELSINORE (SRA 25) AIR MONITORING STATION DATA[1]

POLLUTANT	STANDARD	YEAR		
		2004	2005	2006
Ozone (O_3)[3]				
Maximum 1-Hour Concentration (ppm)		0.130	0.149	0.14
Maximum 8-Hour Concentration (ppm)		0.116	0.119	0.109
Number of Days Exceeding State 1-Hour Standard	> 0.09 ppm	41	37	40
Number of Days Exceeding State 8-Hour Standard	> 0.07 ppm	51	46	58
Number of Days Exceeding Federal 1-Hour Standard	> 0.12 ppm	2	4	3
Number of Days Exceeding Federal 8-Hour Standard	> 0.08 ppm	21	15	24
Number of Days Exceeding Health Advisory	≥ 0.15 ppm	0	1	0
Carbon Monoxide (CO)[2]				
Maximum 1-Hour Concentration (ppm)		4	4	4
Maximum 8-Hour Concentration (ppm)		2.1	2.4	2.3
Number of Days Exceeding State 8-Hour Standard	≥ 9.0 ppm	0	0	0
Number of Days Exceeding Federal 8-Hour Standard	≥ 9.5 ppm	0	0	0
Nitrogen Dioxide (NO_2)[3]				
Maximum 1-Hour Concentration (ppm)		0.06	0.07	0.07
Annual Arithmetic Mean Concentration (ppm)		0.0151	0.0142	0.0151
Number of Days Exceeding State 1-Hour Standard	> 0.25 ppm	0	0	0
Inhalable Particulates (PM_{10})				
Maximum 24-Hour Concentration (μg/m^3)		76	79	74
Number of Samples		57	58	57
Number of Samples Exceeding State Standard	> 50 μg/m^3	11	5	10
Number of Samples Exceeding Federal Standard	> 150 μg/m^3	0	0	0
Ultra-Fine Particulates ($PM_{2.5}$)[2]				
Maximum 24-Hour Concentration (μg/m^3)		93.8	95.0	55.3
Annual Arithmetic Mean (μg/m^3)		20.8	18.0	17.0
Number of Samples Exceeding Federal 24-Hour Standard	> 65 μg/m^3	2	1	9

[1] Norco/Corona Montoring Station data used unless otherwise noted.
[2] Metropolitan Riverside County 2 Monitoring Station data
[3] Lake Elsinore Air Monitoring Station data

Source: South Coast AQMD (www.aqmd.gov)

TABLE 10
MAX DAILY THRESHOLDS

Pollutant	Operations
NO_x	55 lbs/day
VOC	55 lbs/day
PM_{10}	150 lbs/day
$PM_{2.5}$	55 lbs/day
SO_x	150 lbs/day
CO	550 lbs/day
AMBIENT AIR QUALITY FOR CRITERIA POLLUTANTS (LSTs)*	
NOx	423 lbs/day
CO	1,664 lbs/day
PM10	8 lbs/day
PM2.5	3 lbs/day

*Note: Source Receptor Area (SRA) 22 Norco/Corona, conservatively assumes emissions are concentrated over 1-acre and the nearest receptor is located at 100 meters from the source.

Source: SCAQMD, 2008

TABLE 11

CURRENT 20-HOUR OPERATION AND PROPOSED 24-HOUR OPERATION VEHICLE AND EQUIPMENT EMISSIONS BY PROCESS (POUNDS PER DAY)

Scenario	Process	VOCs	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Current 20-Hour Operations	Waste Processing	12.49	208.16	177.85	0.37	9.88	9.61
	Soil Cover	6.25	76.20	38.13	0.11	3.22	3.06
	Green Waste Processing	2.12	28.00	12.07	0.04	1.08	1.02
	Misc. Tasks and Equipment	5.77	35.66	19.03	0.04	2.07	1.91
	Equipment Maintenance	6.88	73.56	18.17	0.07	2.54	2.33
	Worker Commute	11.91	73.62	94.02	0.12	2.81	2.35
	Total	**45.41**	**495.19**	**359.27**	**0.75**	**21.60**	**20.28**
Proposed 24-Hour Operations	Waste Processing	13.71	213.71	192.78	0.42	11.31	10.98
	Soil Cover	4.79	68.16	35.56	0.11	2.69	2.58
	Green Waste Processing	2.13	27.15	11.54	0.04	1.06	1.00
	Misc. Tasks and Equiment	6.63	39.06	22.11	0.05	2.37	2.18
	Equipment Maintenance	9.47	101.24	25.01	0.10	3.49	3.21
	Worker Commute	13.42	82.97	105.95	0.13	3.16	2.65
	Total	**50.15**	**532.29**	**392.96**	**0.84**	**24.09**	**22.61**
Net Difference in Emissions		4.73	37.10	33.69	0.09	2.50	2.33
SCAQMD Regional Threshold		55	55	550	150	150	55
SCAQMD Localized Threshold		N/A	423	1,664	N/A	8	3
Significant?		**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Source: Urban Crossroads, Inc. Hand Calcs, 2008 & SCAQMD 2008

N/A: Not Applicable, Localized Thresholds are not applicable for VOCs and SOx per SCAQMD guidance

TABLE 12

CURRENT 20-HOUR OPERATION AND PROPOSED 24-HOUR OPERATION VEHICLE AND EQUIPMENT GREENHOUSE GAS EMISSIONS BY PROCESS (METRIC TONS PER YEAR)

Scenario	Process	CO_2	CH_4		N_2O	
		mtpy	mtpy	mtpy CO_2 EQ	mtpy	mtpy CO_2 EQ
Current 20-Hour Operations	Waste Processing	6,387.75	0.69	213.35	0.17	3.50
	Soil Cover	1,804.06	0.18	54.89	0.05	0.98
	Green Waste Processing	603.43	0.06	18.40	0.02	0.33
	Misc. Tasks and Equipment	583.60	0.09	26.68	0.02	0.32
	Equipment Maintenance	1,043.80	0.10	31.82	0.03	0.57
	Worker Commute	1,992.64	Negligible			
	Total (metric tons per year)	12,415.27	1.11	345.15	0.27	5.70
	Total (Teragrams CO_2 Equivalent)	0.0128				
Proposed 24-Hour Operations	Waste Processing	7,669.78	0.83	258.50	0.20	4.20
	Soil Cover	1,794.16	0.17	51.64	0.05	0.98
	Green Waste Processing	568.83	0.06	17.52	0.01	0.31
	Misc. Tasks and Equipment	645.95	0.10	30.66	0.02	0.35
	Equipment Maintenance	1,436.63	0.14	43.80	0.04	0.78
	Worker Commute	2,245.67	Negligible			
	Total (metric tons per year)	14,361.01	1.30	402.12	0.32	6.63
	Total (Teragrams CO_2 Equivalent)	0.0148				
Net Difference in Emissions (metric tons per year)		1,945.73	0.18	56.97	0.04	0.93

Source: Urban Crossroads, Inc. Hand Calcs, 2008

ATTACHMENT A

EXCERPTS FROM ANNUAL 2008 MITIGATION MONITORING PROGRAM STATUS REPORT, AIR QUALITY MITIGATION MEASURE AQ-13, EL SOBRANTE LANDFILL, CORONA, CALIFORNIA AS PREPARED BY SCS ENGINEERS (SEPTEMBER 2007)

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SCS ENGINEERS

September 13, 2007
File No. 01202020.05, Task 9

Ms. Linda Dejbakhsh
South Coast Air Quality Management District
21865 East Copley Drive
Diamond Bar, California 91765
(909) 396-2614

SUBJECT: ANNUAL 2008 MITIGATION MONITORING PROGRAM STATUS REPORT, AIR QUALITY MITIGATION MEASURE AQ-13, EL SOBRANTE LANDFILL, CORONA, CALFORNIA

Dear Linda Dejbakhsh:

As part of the certified Environmental Impact Report (EIR) for its most recent landfill expansion, USA Waste of California, Inc. (USA Waste) is required to implement a California Environmental Quality Act (CEQA) mitigation monitoring and reporting program (MMRP) for the El Sobrante Landfill in Corona, California. Condition AQ-13 of the MMRP requires that USA Waste determine the need, if any, for emission offsets for Nitrogen Oxides (NOx) and Reactive Organic Gases (ROG) from stationary and mobile sources as defined by the EIR.

This letter was prepared by SCS Engineers (SCS) on behalf of USA Waste and constitutes the required Annual MMRP Status Report (Report) for 2008.

BACKGROUND

Condition AQ-13 of the MMRP requires that USA Waste provides emission reductions of non-attainment pollutants, NOx, ROG and their precursors, sufficient to result in no net increase of project (i.e., non-construction) emissions after correction to baseline emissions, as defined by the CEQA document.

Under Condition AQ-13 of the MMRP, USA Waste is required to determine the amount of annual emission offsets for NOx and ROG, which are needed for the upcoming year. The emission offset calculations are required to include an estimate of the baseline NOx and ROG emissions prior to the landfill expansion and a comparison to the projected 2008 NOx and ROG emissions from both stationary and mobile sources at the site. If emission increases are determined to occur, USA Waste must provide written proof of acquisition of emission reduction credits (ERCs) in sufficient quantity to ensure no net increases in NOx and ROG.

The emission calculations are required to be summarized in this Report and submitted to the South Coast Air Quality Management District (SCAQMD) and Riverside County Waste Management Department (County) 90 days prior to the beginning of the next calendar year or by October 2, 2007.

EMISSION OFFSET CALCULATIONS

Emission offset calculations were based on the difference between the baseline 2001 NOx and ROG emissions prior to the landfill expansion and the projected 2008 NOx and ROG emissions for stationary sources, off-site vehicles, on-site vehicles and equipment.

As allowed by the MMRP, the landfill gas (LFG) flare emissions, LFG IC engines emissions, and surface emissions were removed from the offset calculation since the SCAQMD provides ERCs for these sources from its Priority Reserve account for sources that are exempt from offsets due to their status as essential public services, as define by SCAQMD Rule 1302.

Stationary Source Calculations

Stationary sources from the landfill include NOx and ROG emitted through the combustion of LFG in the on-site flare, IC engines, and surface emissions of ROG from uncollected LFG. Baseline emissions from these sources were estimated by using actual flare flow rate data from 2001 and other available information. Actual source test data from 2001 were used to determine baseline ROG and NOx emissions from 2001. Projected 2008 emissions from the flare and IC engines were estimated in the same manner; however, the 2008 flow rate was projected using an SCS calibrated version of the U.S. Environmental Protection Agency's (EPA's) LFG generation (LANDGEM) model.

The model inputs included refuse data provided by USA Waste as shown in Table 1. The selected "L_O" and "k" values for the El Sobrante site were calibrated based on precipitation data. The L_o (2,925 ft^3/ton) and k (0.027) values were based upon 12.5 inches of annual rainfall.

SCS assumed a collection efficiency for the baseline and 2008 scenarios of 85% per the EPA's *Compilation of Air Pollutant Emission Factors*, Section 2.4 (AP-42) document. As mentioned in the above reference, EPA notes that collection efficiencies for LFG systems can range between 60-85%, with a default of 75%. An 80-85% collection efficiency was assumed in the certified Final Environmental Impact Report (FEIR) El Sobrante Landfill Expansion (State Clearinghouse No. 90020076), dated April 1996.

Although USA Waste is required to complete these emission calculations, stationary source emissions from LFG-derived sources were not included in the offset calculations since the landfill is considered an essential public service as defined by SCAQMD Rule 1302. The LFG control system and uncontrolled surface emissions would be offset by ERCs banked in the Priority Reserve, as required by Rule 1309.

Table 2 (baseline 2001) and 3-A (2008) provide NOx and ROG emission estimates for flare and surface emissions. Baseline flare maximum NOx and ROG emissions are 25.9 lbs/day and 7.9 lbs/day, respectively. Baseline maximum surface emission estimates for ROG is 69.5 lbs/day. The 2008 NOx and ROG emission estimates for the flare is 13.6 and 8.2 lbs/day, respectively. Surface emission estimate for 2008 is 245.0 lbs/day of ROG. Table 3-B (2008) provides NOx and ROG emission estimates for the IC engines. The 2008 NOx and ROG emission estimates for the IC engines are 178.8 and 58.7 lbs/day, respectively.

The total increase from the baseline and 2008 LFG-derived emissions are 166.5 and 234.5 lbs/day of NOx and ROG, respectively. However, please note that the 2008 emissions estimate was calculated based on the projected flow rate generated via LANDGEM model. It is considered an over-estimate. As noted above, these emissions are not required to be offset since they essentially have been through the District account, as noted previously.

Off-Site Waste Haul Vehicle Emission Calculations

Off-site vehicle emission calculations from transfer trucks and packer trucks were also estimated as shown in Table 4. Baseline emission estimates from Updated Table G.1.1 of the *Draft South Coast Air Quality Management District (SCAQMD) –Consultation Work in Progress Air Quality Analysis Refinements El Sobrante Landfill Expansion (*TRC Environmental Solutions, Inc., TRC, February 5, 1997), which was an update to the air quality section of the Final EIR (FEIR), were used in determining the baseline and projected 2008 emissions from the landfill.

The baseline emissions, as defined by the MMRP, are based on a refuse acceptance rate of 4,000 tons per day (tpd). The 2008 emissions were based on an assumption that the landfill would operate at approximately 6,050 tpd in 2008, based on waste storage rates of 8,150 tpd Monday through Friday, 1,500 tons on Saturday, and no waste storage on Sunday. It is anticipated that the waste disposal capacity increase at the El Sobrante site will be diverted from other landfills, primarily located within the South Coast Air Basin (SCAB); therefore, the above-referenced TRC document and FEIR compared refuse vehicle emissions from facilities or areas within the SCAB that would potentially be routed to the El Sobrante Landfill after expansion.

As shown in Table 4, the use of transfer trucks in place of packer trucks would result in a net reduction of approximately 6,271 miles of daily vehicle travel in the SCAB for the scenario where El Sobrante is receiving 6,050 tpd of municipal solid waste (MSW) compared to the 4,000 tpd of waste under the baseline scenario. The net reduction in NOx and ROG is 639.5 and 15.3 lbs/day, respectively, due to change in refuse hauling practice. The reduction occurs since the transfer trucks have a 22-ton capacity, whereas packer trucks have only an 8-ton capacity. Therefore, fewer vehicle miles are required for transfer trucks than packer trucks to haul the same amount of waste.

Since the FEIR compared vehicle emissions from the worst-case 10,000 tpd scenario, rather than a 6,050 tpd scenario, SCS used ratios in developing the 2008 emissions. Baseline emissions were evaluated assuming 6,050 tpd of MSW was transferred throughout the SCAB if the expansion of El Sobrante Landfill did not occur. The El Sobrante Landfill accepted up to 4,000 tpd in 2001; therefore 2,050 tpd of waste was equally allocated among other landfills, which included the Sunshine Canyon Landfill. The number of truck trips per day was also altered from

Updated Table G.1.1 in the TRC study to reflect the 6,050 tpd of MSW being transported. In particular, the number of trips estimated under the 10,000 tpd scenario was multiplied by a ratio of 2001 amount of MSW transferred to the maximum (10,000 tpd) amount of MSW transferred within each area.

Baseline emission factors were updated from the TRC SCAQMD Consultation document, which used the EMFAC7G model for Heavy-Duty Trucks traveling 60 miles per hour (mph) at 75 degrees Fahrenheit (F). For this study, the EMFAC2002 model was used to estimate heavy-duty trucks traveling 60 mph at 75 degrees F and a relative humidity of 60% in 2001. EMFAC2002 was used to maintain consistency with previous reports.

Estimated baseline NOx and ROG emissions are 1,077.7 and 26.6 lbs/day, respectively.

Projected 2008 off-site truck travel emission estimates were determined in a similar manner. The amount of waste being hauled from each facility or area to the El Sobrante Landfill was based on the projected incoming tonnage rate to the El Sobrante site of 6,050 tpd multiplied by a ratio of the amounts of MSW arriving from in- and out-of-county areas under the 10,000 tpd scenario to a value of 10,000 tpd. For example, the amount of 2008 MSW traveling from the Carson Transfer Station to El Sobrante equals 6,050 tpd multiplied by a ratio (4,000 tpd/10,000 tpd), which equals 2,420 tpd. Under the 10,000 tpd scenario, the FEIR projects 4,000 tpd (40% of total waste) of MSW traveling from Carson Transfer Station to the El Sobrante Landfill.

The number of truck trips for both in- and out-of county areas were estimated using the number of trips projected under the 10,000 tpd scenario and multiplying by a ratio of 2008 MSW tpd transferred to the maximum MSW tpd transferred within each area.

Approximately 44 liquefied natural gas (LNG) vehicles per day will be traveling to the El Sobrante Landfill in 2008; therefore, an LNG vehicle emissions estimate was calculated to determine the amount of reduced NOx emissions from the baseline year, which did not include any LNG vehicles. Attachment 2 provides an emission comparison of diesel and LNG engines, which shows a 49% reduction in NOx emissions. ROG emission reductions from vehicle conversions from diesel to LNG were not studied and were, therefore, not calculated in the 2008 scenario. However, USA Waste reserves the right to complete this calculation in the future.

Projected 2008 emission factors were derived from the EMFAC2002 model for heavy-duty trucks traveling 60 mph at 75 degrees F and a relative humidity of 60% in 2008. Using these factors, the NOx and ROG emissions for 2008 are estimated to be 438.2 and 11.3 lbs/day, respectively. This equates to an emission reduction of 639.5 and 15.3 lbs/day of NOx and ROG, respectively, from the off-site refuse hauling vehicles.

On-Site Mobile Equipment- Landfill Operations

On-site mobile equipment emission calculations were also estimated as shown in Table 5. Emissions and load factors from Attachment 6 of the July 22, 1997 memorandum to Robert A. Nelson from Eric Walther and Bob Mason of TRC was used in determining baseline and projected 2008 emissions. The on-site mobile equipment emissions provided in the memorandum was for a 10,000 tpd scenario; therefore, total usage time for 2001 and 2008 scenarios had to be extrapolated. Baseline total usage time for each piece of equipment was estimated using total usage times provided in the TRC memorandum multiplied by a ratio of baseline to expansion hours of operation and support activities. New equipment obtained to accommodate additional waste tonnages in the expansion was provided by USA Waste.

EMFAC2002 modeling was used to determine baseline and 2008 emission factors for heavy-duty trucks at 75 degrees F traveling 25 mph with a relative humidity of 60%. Baseline mobile equipment emissions for NOx and ROG are estimated to be 133.9 and 7.23 lbs/day, respectively. The 2008 mobile equipment emissions for NOx and ROG are estimated to be 312.5 and 14.97 lbs/day, respectively. This equates to an emission increase of 178.6 and 7.74 lbs/day of NOx and ROG, respectively, from the on-site mobile equipment.

On-Site Solid Waste Hauling and Employee Vehicle Emissions

On-site solid waste hauling and employee vehicle emission calculations were also estimated within the landfill as shown in Table 6. Emission information from Attachment 6 of the July 22, 1997 memorandum to Robert A. Nelson of the USA Waste from Eric Walther and Bob Mason of TRC was used in determining baseline and projected emissions from 6,050 tpd of MSW.

The amount of waste being hauled from each facility or area to the El Sobrante Landfill was based on the hauled tonnages from the 10,000 tpd scenario provided in the TRC SCAQMD Consultation document and multiplying by the ratio of 2001 or 2008 daily tonnages (4,000 or 6,050 tpd) to the maximum daily tonnage (10,000 tpd). The numbers of vehicles were estimated from the amount hauled divided by the assumed capacity of each vehicle type. For instance, transfer trucks have a 22-ton MSW capacity, whereas light-duty trucks have an approximately 1-ton MSW capacity.

Emission factors for both 2001 and 2008 estimates were from the EMFAC2002 model for heavy-duty trucks and light weight automobiles and trucks at 75 degrees F traveling 25 mph with a relative humidity of 60%. The results of the modeling are located in Attachment 1.

The number of employee vehicles (45) decreased between baseline and expansion scenarios due to site-specific data and additional employees are not expected to be necessary to handle the additional refuse.

Table 6 indicates a net emission decrease of 1.1 and 0.07 lbs/day of NOx and ROG, respectively.

RESULTS OF EMISSIONS ANALYSIS

Table 7 provides a summary of the project emission inventory, which includes both stationary and mobile sources associated with the El Sobrante Landfill expansion project. Table 8 provides a summary of the emission increases (or reductions) from the various project emission sources from the baseline year of 4,000 tpd to the project 2008 emissions at 6,050 tpd. This calculation includes an adjustment for the amount of ERCs that have/will be provided from the SCAQMD's Priority Reserve account due to the offset exemption for essential public services. The results show project emission reduction of 462.0 and 7.6 lbs/day for NOx and ROG, respectively. Therefore, no emission offsets are required for 2008.

CLOSING

We believe that this Report satisfies USA Waste's requirements under AQ-13 of the MMRP under CEQA and should allow operations to continue as projected at the site. Please let us know if any fees are required under SCAQMD Rule 301 for this submittal, and USA Waste will pay them promptly.

If you have any questions regarding this submittal or desire any additional information, please contact the undersigned.

Sincerely,

John Henkelman
Staff Engineer

Patrick Sullivan, R.E.A, C.P.P
Vice President
SCS ENGINEERS

Attachments

- Table 1. Landfill Gas Generation Projection, El Sobrante Landfill
- Table 2. Actual Emission Source Estimates for Flare (2001), El Sobrante Landfill and Recycling Center, Corona, California
- Table 3a. Projected Emission Source Estimates for Flare (2008), El Sobrante Landfill and Recycling Center, Corona, California
- Table 3b. Projected Emissions Source Estimates for IC Engines (2008, El Sobrante Landfill and Recycling Center, Corona, California
- Table 4. Emissions Comparison Within the South Coast Air Basin
- Table 5. On-site Mobile Equipment Emissions at 4,000 tons per day (2001)
  On-site Mobile Equipment Emissions at 6,050 tons per day (2008)
- Table 6. Solid Waste Haul and Employee Vehicle Emissions at the Landfill with 4,000 tons per day (2001)
  Solid Waste Haul and Employee Vehicle Emissions at the Landfill with 6,050

tons per day (2008)
Table 7. Project Emission Inventory for Baseline and 6,050 tons per day
Table 8. Emission Offsets Required for Future

Attachment 1. EMFAC2002 Model Results
Attachment 2. Liquefied Natural Gas to Diesel Comparison Table

cc: Nicholas Godfrey; USA Waste (w/attachments)
Leslie Likens; Riverside County Waste Management Department (w/attachments)

TABLES

TABLE 1. LFG GENERATION POTENTIAL
EL SOBRANTE LANDFILL - CORONA, CALIFORNIA

Year	Disposal Rate (tons/yr)	Refuse In-Place (tons)	LFG Generation Potential (scfm)	LFG Generation Potential (mmcf/day)	LFG Generation Potential (mmBtu/yr)	LFG System Coverage (%)	LFG Generation from Existing and Planned System (scfm)	LFG Generation from Existing and Planned System (mmcf/day)	LFG Generation from Existing and Planned System (mmBtu/yr)
1986	79,121	79,121	0	0.00	0	100%	0	0.00	0
1987	246,361	325,482	24	0.03	6,324	100%	24	0.03	6,324
1988	274,562	600,044	97	0.14	25,845	100%	97	0.14	25,845
1989	376,768	976,812	177	0.26	47,100	100%	177	0.26	47,100
1990	348,316	1,325,128	286	0.41	75,958	100%	286	0.41	75,958
1991	297,904	1,623,032	383	0.55	101,773	100%	383	0.55	101,773
1992	270,298	1,893,330	462	0.67	122,871	100%	462	0.67	122,871
1993	455,984	2,349,314	531	0.76	141,201	100%	531	0.76	141,201
1994	499,823	2,849,137	654	0.94	173,883	100%	654	0.94	173,883
1995	413,649	3,262,786	787	1.13	209,198	100%	787	1.13	209,198
1996	456,970	3,719,756	890	1.28	236,685	100%	890	1.28	236,685
1997	617,411	4,337,167	1,004	1.45	266,902	100%	1,004	1.45	266,902
1998	520,983	4,858,150	1,162	1.67	309,138	100%	1,162	1.67	309,138
1999	900,610	5,758,760	1,288	1.85	342,541	100%	1,288	1.85	342,541
2000	931,508	6,690,268	1,524	2.20	405,395	100%	1,524	2.20	405,395
2001	1,120,379	7,810,647	1,764	2.54	469,045	100%	1,764	2.54	469,045
2002	1,868,255	9,678,902	2,053	2.96	546,094	100%	2,053	2.96	546,094
2003	2,218,630	11,897,532	2,560	3.69	680,862	100%	2,560	3.69	680,862
2004	2,396,469	14,294,001	3,159	4.55	840,044	100%	3,159	4.55	840,044
2005	2,310,173	16,604,174	3,795	5.46	1,009,199	100%	3,795	5.46	1,009,199
2006	2,170,195	18,774,369	4,388	6.32	1,166,950	100%	4,388	6.32	1,166,950
2007	2,203,140	20,977,509	5,008	7.21	1,331,798	100%	5,008	7.21	1,331,798
2008	2,203,140	23,180,649	**5,737**	8.26	1,525,858	100%	5,737	8.26	1,525,858
2009	2,203,140	25,383,789	6,448	9.28	1,714,749	100%	6,448	9.28	1,714,749
2010	2,203,140	27,586,929	7,139	10.28	1,898,609	100%	7,139	10.28	1,898,609
2011	2,203,140	29,790,069	7,812	11.25	2,077,570	100%	7,812	11.25	2,077,570
2012	2,203,140	31,993,209	8,467	12.19	2,251,764	100%	8,467	12.19	2,251,764
2013	2,203,140	34,196,349	9,104	13.11	2,421,318	100%	9,104	13.11	2,421,318
2014	2,203,140	36,399,489	9,725	14.00	2,586,355	100%	9,725	14.00	2,586,355
2015	2,203,140	38,602,629	10,329	14.87	2,746,996	100%	10,329	14.87	2,746,996
2016	2,203,140	40,805,769	10,917	15.72	2,903,357	100%	10,917	15.72	2,903,357
2017	2,203,140	43,008,909	11,489	16.54	3,055,553	100%	11,489	16.54	3,055,553
2018	2,203,140	45,212,049	12,046	17.35	3,203,695	100%	12,046	17.35	3,203,695
2019	2,203,140	47,415,189	12,588	18.13	3,347,891	100%	12,588	18.13	3,347,891
2020	2,203,140	49,618,329	13,116	18.89	3,488,245	100%	13,116	18.89	3,488,245
2021	2,203,140	51,821,469	13,630	19.63	3,624,861	100%	13,630	19.63	3,624,861
2022	2,203,140	54,024,609	14,130	20.35	3,757,837	100%	14,130	20.35	3,757,837
2023	2,203,140	56,227,749	14,616	21.05	3,887,271	100%	14,616	21.05	3,887,271
2024	2,203,140	58,430,889	15,090	21.73	4,013,257	100%	15,090	21.73	4,013,257
2025	2,203,140	60,634,029	15,551	22.39	4,135,886	100%	15,551	22.39	4,135,886
2026	2,203,140	62,837,169	16,000	23.04	4,255,250	100%	16,000	23.04	4,255,250
2027	2,203,140	65,040,309	16,437	23.67	4,371,433	100%	16,437	23.67	4,371,433
2028	2,203,140	67,243,449	16,862	24.28	4,484,521	100%	16,862	24.28	4,484,521
2029	2,203,140	69,446,589	17,276	24.88	4,594,597	100%	17,276	24.88	4,594,597
2030	2,203,140	71,649,729	17,679	25.46	4,701,741	100%	17,679	25.46	4,701,741
2031	2,203,140	73,852,869	18,071	26.02	4,806,030	100%	18,071	26.02	4,806,030
2032	2,203,140	76,056,009	18,453	26.57	4,907,542	100%	18,453	26.57	4,907,542
2033	2,203,140	78,259,149	18,824	27.11	5,006,349	100%	18,824	27.11	5,006,349
2034	2,203,140	80,462,289	19,186	27.63	5,102,524	100%	19,186	27.63	5,102,524
2035	10,228,282	90,690,571	19,538	28.13	5,196,137	100%	19,538	28.13	5,196,137
2036	0	90,690,571	22,091	31.81	5,875,190	100%	22,091	31.81	5,875,190

Methane Content of LFG Adjusted to: 50%
Selected Decay Rate Constant (k): 0.0270
Selected Ultimate Methane Recovery Rate (Lo): 2,925 cu ft/ton

TABLE 2
ACTUAL EMISSION SOURCE ESTIMATES FOR FLARE (2001)
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

CAS	COMPOUNDS	Molecular Weight	Average Concentration of Compounds Found In LFG[1]	Maximum Concentration of Compounds Found In LFG[2]	Average Uncontrolled LFG Flow Rate-Surface Emissions	Maximum Uncontrolled LFG Flow Rate- Surface Emissions	Average LFG Flow Rate to Flare[3]	Maximum LFG Flow Rate to Flare[3]	Cmp. Spec. Average Flare Destruction Efficiency[4]	Average Emissions from Flare	Maximum Emissions from Flare
		g/mol	ppmv	ppmv	tons/yr	tons/yr	tons/yr	tons/yr	%	tons/yr	tons/yr
	Hazardous Air Pollutants (HAPs)[1]										
71-55-6	1,1,1-Trichloroethane (methyl chloroform)*	133.42	0.310	0.368	1.87E-03	2.22E-03	4.23E-02	5.02E-02	98.0%	8.46E-04	1.00E-03
79-34-5	1,1,2,2-Tetrachloroethane+	167.85	0.070	0.070	5.30E-04	5.30E-04	1.20E-02	1.20E-02	98.0%	2.40E-04	2.40E-04
107-06-2	1,1-Dichloroethane (ethylidene dichloride)*	98.95	5.965	6.910	2.66E-02	3.09E-02	6.04E-01	7.00E-01	98.0%	1.21E-02	1.40E-02
75-35-4	1,1-Dichloroethene (vinylidene chloride)*	96.94	0.212	0.253	9.25E-04	1.11E-03	2.10E-02	2.51E-02	98.0%	4.20E-04	5.02E-04
107-06-2	1,2-Dichloroethane (ethylene dichloride)*	98.96	0.565	1.000	2.52E-03	4.47E-03	5.72E-02	1.01E-01	98.0%	1.14E-03	2.03E-03
78-87-5	1,2-Dichloropropane (propylene dichloride)+	112.99	0.023	0.023	1.17E-04	1.17E-04	2.66E-03	2.66E-03	98.0%	5.32E-05	5.32E-05
67-63-0	2-Propanol (isopropyl alcohol)+	60.11	7.908	7.908	2.15E-02	2.15E-02	4.86E-01	4.86E-01	98.0%	9.73E-03	9.73E-03
107-13-1	Acrylonitrile+	53.06	0.036	0.036	8.62E-05	8.62E-05	1.95E-03	1.95E-03	98.0%	3.91E-05	3.91E-05
71-43-2	Benzene*	78.11	1.788	2.115	6.30E-03	7.46E-03	1.43E-01	1.69E-01	98.0%	2.86E-03	3.38E-03
75-25-2	Bromodichloromethane+	163.83	0.311	0.311	2.30E-03	2.30E-03	5.21E-02	5.21E-02	98.0%	1.04E-03	1.04E-03
75-15-0	Carbon disulfide*	76.13	0.435	0.590	1.49E-03	2.03E-03	3.39E-02	4.60E-02	98.0%	6.78E-04	9.19E-04
56-23-5	Carbon tetrachloride*	153.84	0.017	0.018	1.15E-04	1.25E-04	2.60E-03	2.83E-03	98.0%	5.19E-05	5.67E-05
463-58-1	Carbonyl sulfide*	60.07	0.155	0.170	4.20E-04	4.61E-04	9.53E-03	1.04E-02	98.0%	1.91E-04	2.09E-04
108-90-7	Chlorobenzene*	112.56	0.079	0.128	4.01E-04	6.50E-04	9.10E-03	1.47E-02	98.0%	1.82E-04	2.95E-04
75-00-3	Chloroethane (ethyl chloride)+	64.52	0.239	0.239	6.96E-04	6.96E-04	1.58E-02	1.58E-02	98.0%	3.16E-04	3.16E-04
67-66-3	Chloroform*	119.39	0.012	0.012	6.47E-05	6.47E-05	1.47E-03	1.47E-03	98.0%	2.93E-05	2.93E-05
75-45-6	Chlorodifluoromethane+	86.47	0.355	0.355	1.39E-03	1.39E-03	3.14E-02	3.14E-02	98.0%	6.28E-04	6.28E-04
74-87-3	Chloromethane (methyl chloride)+	50.49	0.249	0.249	5.67E-04	5.67E-04	1.29E-02	1.29E-02	98.0%	2.57E-04	2.57E-04
106-46-7	Dichlorobenzene (1,4-Dichlorobenzene)*	147.00	0.989	1.090	6.56E-03	7.23E-03	1.49E-01	1.64E-01	98.0%	2.97E-03	3.28E-03
75-43-4	Dichlorodifluoromethane+	120.91	3.395	3.395	1.85E-02	1.85E-02	4.20E-01	4.20E-01	98.0%	8.40E-03	8.40E-03
75-71-8	Dichlorofluoromethane+	102.92	0.355	0.355	1.65E-03	1.65E-03	3.74E-02	3.74E-02	98.0%	7.48E-04	7.48E-04
75-09-2	Dichloromethane (Methylene Chloride)*	84.94	34.325	36.050	1.32E-01	1.38E-01	2.98E+00	3.13E+00	98.0%	5.97E-02	6.27E-02
64-17-5	Ethanol++	46.08	27.200	27.200	5.66E-02	5.66E-02	1.28E+00	1.28E+00	98.0%	2.56E-02	2.56E-02
100-41-4	Ethylbenzene+	106.16	6.789	6.789	3.25E-02	3.25E-02	7.37E-01	7.37E-01	98.0%	1.47E-02	1.47E-02
106-93-4	Ethylene dibromide (1,2-Dibromoethane)*	187.88	0.009	0.012	7.63E-05	1.02E-04	1.73E-03	2.31E-03	98.0%	3.46E-05	4.61E-05
75-69-4	Fluorotrichloromethane+	137.40	0.327	0.327	2.03E-03	2.03E-03	4.60E-02	4.60E-02	98.0%	9.19E-04	9.19E-04
110-54-3	Hexane+	86.18	2.324	2.324	9.04E-03	9.04E-03	2.05E-01	2.05E-01	98.0%	4.10E-03	4.10E-03
7647-01-0	Hydrochloric acid[5]	36.50	46.930	46.930	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0%	1.77E+00	1.77E+00
2148-87-8	Hydrogen Sulfide*	34.08	19.950	21.100	3.07E-02	3.25E-02	6.96E-01	7.36E-01	98.0%	1.39E-02	1.47E-02
7439-97-6	Mercury (total)[6]	200.61	0.0003	0.0003	2.64E-06	2.64E-06	5.99E-05	5.99E-05	0.0%	5.99E-05	6.05E-05
78-93-3	Methyl ethyl ketone+	72.11	10.557	10.557	3.44E-02	3.44E-02	7.79E-01	7.79E-01	98.0%	1.56E-02	1.56E-02
108-10-1	Methyl isobutyl ketone+	100.16	0.750	0.750	3.39E-03	3.39E-03	7.69E-02	7.69E-02	98.0%	1.54E-03	1.54E-03
127-18-4	Perchloroethylene (tetrachloroethylene)*	165.83	3.940	4.160	2.95E-02	3.11E-02	6.68E-01	7.06E-01	98.0%	1.34E-02	1.41E-02
108-88-3	Toluene*	92.13	60.625	72.650	2.52E-01	3.02E-01	5.71E+00	6.85E+00	98.0%	1.14E-01	1.37E-01
79-01-6	Trichloroethylene (trichloroethene)*	131.38	1.838	1.975	1.09E-02	1.17E-02	2.47E-01	2.65E-01	98.0%	4.94E-03	5.31E-03
75-01-4	Vinyl chloride*	62.50	0.126	0.156	3.55E-04	4.40E-04	8.06E-03	9.98E-03	98.0%	1.61E-04	2.00E-04
1330-20-7	Xylenes*	106.16	27.535	32.960	1.32E-01	1.58E-01	2.99E+00	3.58E+00	98.0%	5.98E-02	7.16E-02
Total HAPs:					8.20E-01	9.16E-01	1.86E+01	2.08E+01		2.141	2.184
Criteria Air Pollutants											
Total Non-Methane Organics (NMOCs) as Hexane[4]		86.18	1,892	2,090	29.434	32.524	166.795	184.304	98.0%	3.336	3.686

TABLE 2
ACTUAL EMISSION SOURCE ESTIMATES FOR FLARE (2001)
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

	Maximum Particulate Emissions	Permitted Emission Factor	Emission Factor	Average Uncontrolled LFG Flow Rate-Surface Emissions	Maximum Uncontrolled LFG Flow Rate- Surface Emissions	Emissions from Flare		
	g/dscf	lbs/MMBtu	lbs/MMBtu	lbs/day	lbs/day	lbs/hr	lbs/day	tons/yr
Nitrogen Oxides (NOx)[9]	--	0.060	0.024	--	--	1.079	25.9	4.728
Reactive Organic Gases (ROGs)[9]	--	--	--	62.9	69.5	0.328	7.9	1.438

Variables:

MODEL INPUT VARIABLES:	VALUE:		
Methane Concentration	50.0%		
Fuel Value[7]	500	Btu/cf	
Total Landfill Gas Generation Rate	1764	SCFM	
Total Uncontrolled Landfill Gas Collection Rate	265	SCFM	
Total Landfill Gas Collection Rate (to flare)[8]	1,499	SCFM	Assuming an 85% collection efficiency

Notes:

1 List of hazardous air pollutants was from Title III Clean Air Act Amendments, 1990, and include compounds found in landfill gas, as determined from a list in AP-42 Tables 2.4-1 ("Uncontrolled Landfill Gas Concentrations") and 2.4-2.

2 Actual data from the 2001 source test was used and marked by "*" if available. For compounds analyzed for but not detected during the testing, the Method Detection Limits were used. Concentrations of HAPs were also taken from "Waste Industry Air Coalition Comparison of Recent Landfill Gas Analyses with Historic AP-42 Values." (+) if site specific data was unavailable, otherwise AP-42 Tables 2.4-1 and 2.4-2 was used (++).

3 Based on a maximum flow rate into the flare of 2200 scfm at 36.2% methane, which was converted to 50% methane.

4 Values taken from AP-42 Table 2.4-3 ("Control Efficiencies for LFG Consituents")

5 Concentration of HCl is based on AP-42 Section 2.4.4.2. (11/98)

6 Concentration of Mercury based on the EPA AP-42 Section 2.4 Table 2.4-1 (11/98).

7 In accordance with the proposed permit modifications, ROCs are assumed equal to NMOCs minus Exempt Compounds.

8 Existing flares permitted at 1,389 scfm each.

9 Based on 2001 source test

TABLE 3-A
PROJECTED EMISSION SOURCE ESTIMATES FOR FLARES (2008)
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

CAS	COMPOUNDS	Molecular Weight	Max Concentration of Compounds Found In LFG[2]	Total Landfill Gas Generation	Maximum Uncontrolled LFG Flow Rate- Surface Emissions	Maximum LFG Flow Rate to Flare[3]	Flare Destruction Efficiency[4]	Maximum Emissions from Flare
		g/mol	ppmv	tons/yr	tons/yr	tons/yr	%	tons/yr
	Hazardous Air Pollutants (HAPs)[1]							
71-55-6	1,1,1-Trichloroethane (methyl chloroform)*	133.42	0.060	0.031	4.70E-03	1.71E-02	98.0%	3.43E-04
79-34-5	1,1,2,2-Tetrachloroethane+	167.85	0.070	0.046	6.90E-03	2.52E-02	98.0%	5.03E-04
107-06-2	1,1-Dichloroethane (ethylidene dichloride)*	98.95	0.080	0.031	4.65E-03	1.69E-02	98.0%	3.39E-04
75-35-4	1,1-Dichloroethene (vinylidene chloride)*	96.94	0.080	0.030	4.56E-03	1.66E-02	98.0%	3.32E-04
107-06-2	1,2-Dichloroethane (ethylene dichloride)*	98.96	0.221	0.086	1.28E-02	4.68E-02	98.0%	9.36E-04
78-87-5	1,2-Dichloropropane (propylene dichloride)+	112.99	0.023	0.010	1.53E-03	5.56E-03	98.0%	1.11E-04
67-63-0	2-Propanol (isopropyl alcohol)+	60.11	7.908	1.861	2.79E-01	1.02E+00	98.0%	2.04E-02
107-13-1	Acrylonitrile+	53.06	0.036	0.007	1.12E-03	4.09E-03	98.0%	8.18E-05
71-43-2	Benzene*	78.11	2.990	0.915	1.37E-01	5.00E-01	98.0%	1.00E-02
75-25-2	Bromodichloromethane+	163.83	0.311	0.200	2.99E-02	1.09E-01	98.0%	2.18E-03
75-15-0	Carbon disulfide*	76.13	0.200	0.060	8.94E-03	3.26E-02	98.0%	6.52E-04
56-23-5	Carbon tetrachloride*	153.84	0.060	0.036	5.42E-03	1.98E-02	98.0%	3.95E-04
463-58-1	Carbonyl sulfide*	60.07	0.200	0.047	7.06E-03	2.57E-02	98.0%	5.14E-04
108-90-7	Chlorobenzene*	112.56	0.100	0.044	6.61E-03	2.41E-02	98.0%	4.82E-04
75-00-3	Chloroethane (ethyl chloride)+	64.52	0.239	0.060	9.06E-03	3.30E-02	98.0%	6.60E-04
67-66-3	Chloroform*	119.39	0.020	0.009	1.40E-03	5.11E-03	98.0%	1.02E-04
75-45-6	Chlorodifluoromethane+	86.47	0.355	0.120	1.80E-02	6.57E-02	98.0%	1.31E-03
74-87-3	Chloromethane (methyl chloride)+	50.49	0.249	0.049	7.38E-03	2.69E-02	98.0%	5.38E-04
106-46-7	Dichlorobenzene (1,4-Dichlorobenzene)*	147.00	0.383	0.220	3.31E-02	1.21E-01	98.0%	2.41E-03
75-43-4	Dichlorodifluoromethane+	120.91	3.395	1.607	2.41E-01	8.79E-01	98.0%	1.76E-02
75-71-8	Dichlorofluoromethane+	102.92	0.355	0.143	2.15E-02	7.82E-02	98.0%	1.56E-03
75-09-2	Dichloromethane (Methylene Chloride)*	84.94	0.080	0.027	3.99E-03	1.45E-02	98.0%	2.91E-04
64-17-5	Ethanol++	46.08	27.200	4.908	7.36E-01	2.68E+00	98.0%	5.37E-02
100-41-4	Ethylbenzene+	106.16	6.789	2.822	4.23E-01	1.54E+00	98.0%	3.09E-02
106-93-4	Ethylene dibromide (1,2-Dibromoethane)*	187.88	0.030	0.022	3.31E-03	1.21E-02	98.0%	2.41E-04
75-69-4	Fluorotrichloromethane+	137.40	0.327	0.176	2.64E-02	9.62E-02	98.0%	1.92E-03
110-54-3	Hexane+	86.18	2.324	0.784	1.18E-01	4.29E-01	98.0%	8.58E-03
7647-01-0	Hydrochloric acid[5]	36.50	46.930	0.000	0.00E+00	0.00E+00	0.0%	3.70E+00
2148-87-8	Hydrogen Sulfide*	34.08	4.99	0.666	9.99E-02	3.64E-01	98.0%	7.28E-03
7439-97-6	Mercury (total)[6]	200.61	0.0003	0.0002	3.44E-05	1.25E-04	0.0%	1.25E-04
78-93-3	Methyl ethyl ketone+	72.11	10.557	2.981	4.47E-01	1.63E+00	98.0%	3.26E-02
108-10-1	Methyl isobutyl ketone+	100.16	0.750	0.294	4.41E-02	1.61E-01	98.0%	3.22E-03
127-18-4	Perchloroethylene (tetrachloroethylene)*	165.83	1.510	0.981	1.47E-01	5.36E-01	98.0%	1.07E-02
108-88-3	Toluene*	92.13	30.033	10.835	1.63E+00	5.92E+00	98.0%	1.18E-01
79-01-6	Trichloroethylene (trichloroethene)*	131.38	1.730	0.890	1.34E-01	4.87E-01	98.0%	9.73E-03
75-01-4	Vinyl chloride*	62.50	0.334	0.082	1.23E-02	4.47E-02	98.0%	8.95E-04
1330-20-7	Xylenes*	106.16	18.060	7.507	1.13E+00	4.10E+00	98.0%	8.21E-02
Totals: HAPs				3.86E+01	5.79E+00	2.11E+01		4.123
Criteria Air Pollutants								
Total Non-Methane Organics (NMOCs) as Hexane[7]		86.18	2,265	7.64E+02	1.15E+02	417.923	99.1%	3.845

TABLE 3-A
PROJECTED EMISSION SOURCE ESTIMATES FOR FLARES (2008)
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

			Maximum Uncontrolled LFG Flow Rate-Surface Emissions	Emission Factor	Estimated Emissions from Flare		
			lbs/day	lbs/MMBtu	lbs/hr	lbs/day	tons/yr
Nitrogen Oxides (NO_X)[7]			--	0.006	0.565	13.6	2.473
Reactive Organic Gases (ROGs)[8]			245.0		0.342	8.2	1.500

Variables:

MODEL INPUT VARIABLES:	POTENTIAL TO EMIT		
Methane Concentration	50.0%		
Fuel Value	500	Btu/cf (Default Value)	
Total Landfill Gas Generation Rate	5,737	SCFM	
Total Uncontrolled Landfill Gas Collection Rate	861	SCFM	
Total Landfill Gas Collection Rate (to flare)	3,137	SCFM	Assume a collection efficiency of 85%
Total Landfill Gas Collection Rate (to IC engines)	1,740	SCFM	
Total Landfill Gas Collection Rate	4,877	SCFM	

Notes:

[1] List of hazardous air pollutants was from Title III Clean Air Act Amendments, 1990, and include compounds found in landfill gas, as determined from a list in AP-42 Tables 2.4-1 ("Uncontrolled Landfill Gas Concentrations") and 2.4-2.

[2] Actual data from the 2007 source test was used and marked by "*" if available. For compounds analyzed for but not detected during the testing, the Method Detection Limits were used. Concentrations of HAPs were also taken from "Waste Industry Air Coalition Comparison of Recent Landfill Gas Analyses with Historic AP-42 Values." (+) if site specific data was unavailable, otherwise AP-42 Tables 2.4-1 and 2.4-2 was used (++).

[3] Based on a projected maximum flow rate into the flare of 3,137 scfm at 50% methane.

[4] Values taken from AP-42 Table 2.4-3 ("Control Efficiencies for LFG Consituents")

[5] Concentration of HCl is based on AP-42 Section 2.4.4.2. (11/98)

[6] Concentration of Mercury based on the EPA AP-42 Section 2.4 Table 2.4-1 (11/98).

[7] Based on maximum values from most recent source testing results (2007).

[8] ROGs are assumed equal to NMOCs minus exempt compounds

TABLE 3-B
PROJECTED EMISSION SOURCE ESTIMATES FOR LFG-FIRED IC ENGINES (2008)
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

CAS	COMPOUNDS	Molecular Weight	Maximum Concentration of Compounds Found In LFG[2]	Hourly Uncontrolled LFG Flow Rate to IC Engines[3]	Daily Uncontrolled LFG Flow Rate to IC Engine[3]	IC Engine Destruction Efficiency[4]	Hourly Controlled Emissions	Daily Controlled Emissions	Annual Emissions
		g/mol	ppmv	lbs/hr	lbs/day	%	lbs/hr	lbs/day	lbs/yr
	Toxic Air Contaminants (TACs)[1]								
71-55-6	1,1,1-Trichloroethane (methyl chloroform)*	133.42	0.060	2.17E-03	5.21E-02	98.0%	4.34E-05	1.04E-03	3.80E-01
79-34-5	1,1,2,2-Tetrachloroethane+	167.85	0.070	3.19E-03	7.65E-02	98.0%	6.37E-05	1.53E-03	5.58E-01
107-06-2	1,1-Dichloroethane (ethylidene dichloride)*	98.95	0.080	2.15E-03	5.15E-02	98.0%	4.29E-05	1.03E-03	3.76E-01
75-35-4	1,1-Dichloroethene (vinylidene chloride)*	96.94	0.080	2.10E-03	5.05E-02	98.0%	4.21E-05	1.01E-03	3.68E-01
107-06-2	1,2-Dichloroethane (ethylene dichloride)*	98.96	0.221	5.93E-03	1.42E-01	98.0%	1.19E-04	2.85E-03	1.04E+00
78-87-5	1,2-Dichloropropane (propylene dichloride)+	112.99	0.023	7.05E-04	1.69E-02	98.0%	1.41E-05	3.38E-04	1.23E-01
67-63-0	2-Propanol (isopropyl alcohol)+	60.11	7.908	1.29E-01	3.09E+00	98.0%	2.58E-03	6.19E-02	2.26E+01
107-13-1	Acrylonitrile+	53.06	0.036	5.18E-04	1.24E-02	98.0%	1.04E-05	2.49E-04	9.07E-02
71-43-2	Benzene*	78.11	2.990	6.33E-02	1.52E+00	98.0%	1.27E-03	3.04E-02	1.11E+01
75-25-2	Bromodichloromethane+	163.83	0.311	1.38E-02	3.32E-01	98.0%	2.76E-04	6.63E-03	2.42E+00
75-15-0	Carbon disulfide*	76.13	0.200	4.13E-03	9.91E-02	98.0%	8.26E-05	1.98E-03	7.23E-01
56-23-5	Carbon tetrachloride*	153.84	0.060	2.50E-03	6.01E-02	98.0%	5.01E-05	1.20E-03	4.38E-01
463-58-1	Carbonyl sulfide*	60.07	0.200	3.26E-03	7.82E-02	98.0%	6.51E-05	1.56E-03	5.71E-01
108-90-7	Chlorobenzene*	112.56	0.100	3.05E-03	7.32E-02	98.0%	6.10E-05	1.46E-03	5.35E-01
75-00-3	Chloroethane (ethyl chloride)+	64.52	0.239	4.18E-03	1.00E-01	98.0%	8.36E-05	2.01E-03	7.33E-01
67-66-3	Chloroform*	119.39	0.020	6.47E-04	1.55E-02	98.0%	1.29E-05	3.11E-04	1.13E-01
75-45-6	Chlorodifluoromethane+	86.47	0.355	8.32E-03	2.00E-01	98.0%	1.66E-04	4.00E-03	1.46E+00
74-87-3	Chloromethane (methyl chloride)+	50.49	0.249	3.41E-03	8.18E-02	98.0%	6.82E-05	1.64E-03	5.97E-01
106-46-7	Dichlorobenzene (1,4-Dichlorobenzene)*	147.00	0.383	1.53E-02	3.66E-01	98.0%	3.05E-04	7.33E-03	2.67E+00
75-43-4	Dichlorodifluoromethane+	120.91	3.395	1.11E-01	2.67E+00	98.0%	2.23E-03	5.34E-02	1.95E+01
75-71-8	Dichlorofluoromethane+	102.92	0.355	9.91E-03	2.38E-01	98.0%	1.98E-04	4.76E-03	1.74E+00
75-09-2	Dichloromethane (Methylene Chloride)*	84.94	0.080	1.84E-03	4.42E-02	98.0%	3.68E-05	8.84E-04	3.23E-01
64-17-5	Ethanol++	46.08	27.200	3.40E-01	8.16E+00	98.0%	6.80E-03	1.63E-01	5.95E+01
100-41-4	Ethylbenzene+	106.16	6.789	1.95E-01	4.69E+00	98.0%	3.91E-03	9.38E-02	3.42E+01
106-93-4	Ethylene dibromide (1,2-Dibromoethane)*	187.88	0.030	1.53E-03	3.67E-02	98.0%	3.06E-05	7.34E-04	2.68E-01
75-69-4	Fluorotrichloromethane+	137.40	0.327	1.22E-02	2.92E-01	98.0%	2.44E-04	5.85E-03	2.13E+00
110-54-3	Hexane+	86.18	2.324	5.43E-02	1.30E+00	98.0%	1.09E-03	2.61E-02	9.51E+00
7647-01-0	Hydrochloric acid[5]	36.50	46.930	0.00E+00	0.00E+00	0.0%	4.69E-01	1.12E+01	4.11E+03
2148-87-8	Hydrogen Sulfide*	34.08	4.99	4.61E-02	1.11E+00	98.0%	9.22E-04	2.21E-02	8.08E+00
7439-97-6	Mercury (total)[6]	200.61	0.0003	1.59E-05	3.81E-04	0.0%	1.59E-05	3.81E-04	1.39E-01
78-93-3	Methyl ethyl ketone+	72.11	10.557	2.06E-01	4.95E+00	98.0%	4.13E-03	9.91E-02	3.62E+01
108-10-1	Methyl isobutyl ketone+	100.16	0.750	2.04E-02	4.89E-01	98.0%	4.07E-04	9.78E-03	3.57E+00
127-18-4	Perchloroethylene (tetrachloroethylene)*	165.83	1.510	6.79E-02	1.63E+00	98.0%	1.36E-03	3.26E-02	1.19E+01
108-88-3	Toluene*	92.13	30.033	7.50E-01	1.80E+01	98.0%	1.50E-02	3.60E-01	1.31E+02
79-01-6	Trichloroethylene (trichloroethene)*	131.38	1.730	6.16E-02	1.48E+00	98.0%	1.23E-03	2.96E-02	1.08E+01
75-01-4	Vinyl chloride*	62.50	0.334	5.66E-03	1.36E-01	98.0%	1.13E-04	2.72E-03	9.93E-01
1330-20-7	Xylenes*	106.16	18.060	5.20E-01	1.25E+01	98.0%	1.04E-02	2.50E-01	9.11E+01
Totals: HAPs				2.67E+00	6.41E+01		0.522	12.533	4574.444
Criteria Air Pollutants									
Total Non-Methane Organics (NMOCs) as Hexane[4]		86.18	2,124	49.630	1191.12	98.0%	0.99	23.82	8,695

TABLE 3-B

PROJECTED EMISSION SOURCE ESTIMATES FOR LFG-FIRED IC ENGINES (2008)

EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

			Emission Factor	Emission from Single IC Engine		Emission from All (3) IC Engines		
			gm/bhpr	lbs/hr		lbs/hr	lbs/day	lbs/yr
Nitrogen Oxides (NO_X)[4]			0.60	2.483		7.449	178.8	65,249
Reactive Organic Gases (ROGs)[4]			0.197	0.815		2.446	58.7	21,424

Variables:

MODEL INPUT VARIABLES:	**POTENTIAL TO EMIT**	
Methane Concentration	50.0%	(at 580 scfm per engine)
Genset horsepower	5631	hp (1,877 hp per engine)
Fuel Value	500	Btu/cf
Total Landfill Gas Collection Rate (IC Engine)[3]	1,740	SCFM (580 scfm per engine)

Notes:

[1] List of hazardous air pollutants was from 1150.1 Table 1

[2] Actual data from the 2007 flare source test was used and marked by "*" if available. For compounds analyzed for but not detected during the testing, the Method Detection Limits were used. Concentrations of HAPs were also taken from "Waste Industry Air Coalition Comparison of Recent Landfill Gas Analyses with Historic AP-42 Values." (+) if site specific data was unavailable, otherwise AP-42 Tables 2.4-1 and 2.4-2 was used (++).

[3] Flow rate (at 50% methane) was calculated based on the permitted throughput of 17.4 MMBtu/hr for each engin

[4] Values based on engine source test conducted on 1/22/2007

[5] Concentration of HCl is based on AP-42 Section 2.4.4.2. (11/98

[6] Concentration of Mercury based on the EPA AP-42 Section 2.4 Table 2.4-1 (11/98).

TABLE 4
EMISSIONS COMPARISON WITHIN THE SOUTH COAST AIR BASIN
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

Baseline Off-Site Truck Travel Emissions for El Sobrante Landfill Including Off-Site Truck Travel Emissions from Landfills within the South Coast Air Basin

From	To	Road Miles (1 way)[1]		Waste[2]	Number of Truck Trips Per Day[4]		Total Daily	NOx Emission Factors[3]	ROG Emission Factors[3]	NOx Emissions	ROG Emissions
		Packer	Transfer	(tons/day)	Packer	Transfer	Truck Miles	g/mi		lbs/day	
In-County MSW											
Corona-Norco Area	El Sobrante	13	0	1,250	169.0	0.0	2,197			--	--
Riverside Area	Agua Mansa/El Sobrante	7.7	25.7	1,250	169.0	57.0	2,766	24.089	0.594	--	--
In-County Sub-Total		--	--	2,500	--	--	4,963			**263.6**	**6.5**
Out-of-County MSW											
Carson Transfer Station	El Sobrante	0	55.9	1000	0.0	45.0	2,516			--	--
Pomona-Chino Area	El Sobrante	21.8	0	250	34	0.0	736			--	--
Upland-Ontario Area	El Sobrante	21.8	0	250	34	0.0	736			--	--
Pomona-Chino Area	Milliken	13.5	0	925	125	0.0	1,688	24.089	0.594	--	--
Upland-Ontario Area	Milliken	9.4	0	925	125	0.0	1,175			--	--
Carson-Wilmington Area	BKK	33.9	0	925	125	0.0	4,238			--	--
Carson-Wilmington Area	Sunshine	33.9	0	925	125	0.0	4,238			--	--
Out-of-County Sub-Total		--	--	5,200	--	--	15,326			**814.1**	**20.1**
Totals		--	--	7,700	906	102	20,289			**1077.7**	**26.6**

Notes:

1) Road miles to and from all areas and number of trips for trucks traveling to El Sobrante in 2001 are provided by the *Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion* , TRC Environmental Solutions, Inc., February 5, 1997.

2) 1,220,000 tpy of MSW was received by El Sobrante Landfill in 2001 (4,000 tpd). 6,000 tpd of MSW was transferred to other landfills within the air basin in 2001 prior to expansion, which was divided up among the other landfills within the air basin, similar to the emissions comparison shown in the Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion, TRC Environmental Solutions, Inc., February 5, 1997 .

3) Emissions Factors were updated from the *Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion* , TRC Environmental Solutions, Inc., February 5, 1997, using EMFAC2001 Modeling for Heavy Duty Trucks at 75 degrees F, 60 mph, and 60% relative humidity in 2001.

4) In and out-of-County truck trips for each area were estimated by taking the estimated daily tonnage divided by 7.4 tons for packer trucks or 22 tons for transfer trucks.

PROJECTED OFF-SITE TRUCK TRAVEL EMISSIONS (2008)
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

From	To	Road Miles (1 way)[1]		Waste[2]	Number of Truck Trips Per Day[1,4]		Total Daily	NOx Emission Factors[3]	ROG Emission Factors[3]	NOx Emissions	ROG Emissions
		Packer	Transfer	(tons/day)	Packer	Transfer	Truck Miles	g/mi		lbs/day	
In-County MSW											
Corona-Norco Area	El Sobrante	13	0	1,210	164	0.0	2,126			--	--
Riverside Area	Agua Mansa/El Sobrante	7.7	25.7	1,210	164	55	2,673	14.62	0.37	--	--
In-County Sub-Total				2,420	327	55	4,798			154.7	3.9
Out-of-County MSW											
Carson Transfer Station[4]	El Sobrante	0	55.9	2,420	0	110	6,149			--	--
Pomona-Chino Area[4]	West Valley/El Sobrante	13.5	21.8	605	82	28	1,703	14.62	0.37	--	--
Upland-Ontario Area[4]	West Valley/El Sobrante	9.4	21.8	605	82	28	1,368			--	--
Out-of-County Sub-Total		--	--	3,630	164	165	9,220			297.2	7.5
LNG Vehicle Emissions Reduction[5]	--	--	--	--	44		--	--	--	-13.7	--
Total		--	--	6,050	491	220	**14,018**	--	--	**438.2**	**11.3**

Notes:

1) Road miles are provided by the *Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion* , TRC Environmental Solutions, Inc., February 5, 1997.

2) El Sobrante is projected to receive 6,050 tons per day in 2008 after the completion of expansion. The Draft SCAQMD Consultation document projects 40% of the MSW will be transferred from within the county. Projected out-of-county waste transferred in 2008 is estimated based on incoming tonnage of 6,050 to El Sobrante multiplied by the percentage of MSW estimated to be transferred to EL Sobrante from in and out-of-county areas under the 10,000 tpd scenario as shown in the above Consultation document. Carson transfer station is assumed to transfer a maximum of 4,000 tpd, and Pomona-Chino and Upland-Ontario areas are projected to transfer a maximum of 1,000 tpd each when El Sobrante reaches its peak tpd.

3) Emissions Factors were estimated using the EMFAC2002 Modeling for Heavy Duty Trucks (HHD, DSL) at 75 degrees F, 60 mph, and 60% relative humidity in 2008.

4) In and out-of-County truck trips for each area were estimated by taking the estimated daily tonnage divided by 7.4 tons for packer trucks or 22 tons for transfer trucks.

5) Approximately 16,000 vehicle trips/yr from LNG vehicles are estimated for 2008. An emission comparison of Diesel and LNG engines was performed showing a 49% reduction in NOx emissions. NOx reductions from LNG vehicles are based on 44 vehicle trips per day multiplied by the average lb/day of NOx per vehicle (0.64 lbs/day) multiplied by 49%. ROG reductions data were not available.

TABLE 5
ON-SITE MOBILE EQUIPMENT EMISSIONS AT 4,000 TONS PER DAY (2001)
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

Equipment Type	Available Running Time**	Total Usage Time	Round Trip Distances	Hp	Load Factor	Emissions Factor			Emissions	Emissions Factor	Emissions Factor		Emissions
						NOx				ROGs			
		hours/day	mi			g/hr	g/mi [2]	lb/hp-hr	lbs/day	g/hr	g/mi	lb/hp-hr	lbs/day
Water Wagon (Scraper Mounted) 613C	12	0.36	--	--	0.361	1308	--	--	0.37	40	--	--	0.01
Water Wagon (Scraper Mounted) 613B	12	0.54	--	--	0.361	1308	--	--	0.56	40	--	--	0.02
Compactor (peak use) 836 C [3]	3.6	1.86	--	--	0.413	2661	--	--	4.51	11	--	--	0.02
Compactor (continuous use) 836 C [3]	12	5.76	--	--	0.413	2661	--	--	13.96	11	--	--	0.06
Compactor (continuous use) 836 C [3]	12	5.76	--	--	0.413	2661	--	--	13.96	11	--	--	0.06
Rex Compactor (Surplus)*	12	0.25	--	--	0.413	2661	--	--	0.61	11	--	--	0.00
D8L Dozer (continuous use) [4]	12	6.24	--	--	0.538	2520	--	--	18.65	250	--	--	1.85
D-8N Dozer (peak use) [4]	3.6	6.42	--	--	0.538	2520	--	--	19.19	250	--	--	1.90
D-9R Dozer (non-peak use) [4]	16	2	--	--	0.538	2412	--	--	5.72	250	--	--	0.59
D-6R Dozer (peak use) [4]	3.6	1.8	--	--	0.538	2520	--	--	5.38	250	--	--	0.53
Backhoe 580K [1]	16	4	--	--	0.465	780	--	--	3.20	72	--	--	0.30
Roll Off Trucks (Medium/Heavy Duty Vehicles) (3) [1]	16	0.5	2.1	--	--	--	15.284	--	0.57	--	1.032	--	0.04
Light Truck (gasoline) (10)	16	1.67	2.1	--	--	--	0.905	--	0.11	--	0.295	--	0.04
Excavator 325L	16	2.47	--	--	0.58	6240	--	--	19.68	127	--	--	0.40
Wheel Loader 936	16	4	--	--	0.465	1650	--	--	6.77	105	--	--	0.43
Motor Grader 14G	16	1.67	--	--	0.322	2370	--	--	2.80	180	--	--	0.21
Columbia Tipper	16	0.5	2.1	--	--	--	15.284	--	0.57	--	1.032	--	0.04
Tool Carrier IT28B	16	4	--	--	0.465	590	--	--	2.42	72	--	--	0.30
Light Plant (9)	5.10	21.97	--	5	0.74	--	--	0.018	1.46		--	0.002	0.16
Scraper 627E	16	2.47	--	--	0.396	6240	--	--	13.44	127	--	--	0.27
Total									**133.9**				**7.23**

Notes:

* Surplus equipment assumed to run 0.25 hours per day.

Total usage time estimated by taking the *Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion*, TRC Environmental Solutions, Inc., February 5, 1997 usage times and multiplying by the ratio of 2001 available running time to available running time at 10,000 tpd.

District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion, TRC Environmental Solutions, Inc., February 5, 1997 using EMFAC2002 Modeling for Heavy Duty Trucks at 75 degrees F, 60 mph in 2001 .

[1] trips per hour were used rather than hours per day

[2] EMFAC2002 Modeling for Heavy Duty Trucks at 75 degrees F, 25 mph in 2001 .

[3] A load factor of 0.413 was used for the various compactors; the load factor was provided by Caterpillar for an 836C compactor.

[4] A load factor of 0.538 was used for the various dozers; the load factor was provided by Caterpillar for an D9N dozer.

ON-SITE MOBILE EQUIPMENT EMISSIONS AT 6,050 TONS PER DAY (2008)
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

Equipment Type	Available Running Time**	Total Usage Time	Round Trip Distances	Hp	Load Factor	Emissions Factor			Emissions	Emissions Factor	Emissions Factor		Emissions
						NOx				ROGs			
		hours/day	mi			g/hr	g/mi [2]	lb/hp-hr	lbs/day	g/hr	g/mi	lb/hp-hr	lbs/day
Water Wagon (Scraper Mounted) 613C	20	0.60	--	--	0.361	1308	--	--	0.62	40	--	--	0.02
Water Wagon (Scraper Mounted) 613B	20	0.90	--	--	0.361	1308	--	--	0.94	40	--	--	0.03
Compactor (continuous use) 836 G [3]	20	9.60	--	--	0.413	2661	--	--	23.26	11	--	--	0.10
Compactor (continuous use) 836 G [3]	20	9.60	--	--	0.413	2661	--	--	23.26	11	--	--	0.10
Compactor (continuous use) 836 H [3]	20	9.60	--	--	0.413	2661	--	--	23.26	11	--	--	0.10
Bomag Compactor (continuous use) [3]	20	9.60	--	--	0.413	2661	--	--	23.26	11	--	--	0.10
Bomag Compactor (continuous use) [3]	20	9.60	--	--	0.413	2661			23.26	11			0.10
D-8L Dozer (peak use) [4]	6	3.00	--	--	0.538	2520	--	--	8.97	250	--	--	0.89
D-9R Dozer (non-peak use) [4]	24	10.70	--	--	0.538	2412	--	--	30.62	250	--	--	3.17
D-9R Dozer (non-peak use) [4]	24	10.70	--	--	0.538	2412	--	--	30.62	250	--	--	3.17
D-6R Dozer (peak use) [4]	6	3.00	--	--	0.538	2520	--	--	8.97	250	--	--	0.89
D-9T Dozer (peak use) [4]	24	10.70	--	--	0.538	2412			30.62	250			3.17
Motor Grader 14G	24	2.50	--	--	0.322	2370	--	--	4.21	180	--	--	0.32
John Deere Loader 644H	24	6.00	--	--	0.465	1650	--	--	10.15	105	--	--	0.65
Excavator 325L	24	3.70	--	--	0.580	6240	--	--	29.53	127	--	--	0.60
Excavator 365BL	24	3.70	--	--	0.580	6240	--	--	29.53	127	--	--	0.60
Case 586G Forklift	24	2.50	--	--	0.300	1308	--	--	2.16	40	--	--	0.07
Volvo Articulating Dump Truck (3) [1,2]	24	0.75	2.1	--	--	--	9.491	--	0.53	--	0.68	--	0.04
Columbia Tipper (3) [1,2]	24	2.25	2.1	--	--	--	9.491	--	1.58	--	0.68	--	0.11
Roll Off Trucks (Medium/Heavy Duty Vehicles) (7) [1,2]	24	1.75	2.1	--	--	--	9.491	--	1.23	--	0.68	--	0.09
Light Truck (gasoline) (9) [1,5]	24	2.25	2.1	--	--	--	0.475	--	0.079	--	0.134	--	0.02
Light Plant (14)	13	87.11	--	5	0.74	--	--	0.018	5.80	--	--	0.002	0.64
Total									**312.5**				**14.97**

Notes:

* Surplus equipment assumed to run 0.5 hours per day.

Total usage time estimated by taking the Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion, TRC Environmental Solutions, Inc., February 5, 1997 usage times for 10,000 tpd scenario. The actual total usage times for 2008 should be lower.

** Future Maintenance/support activities are 24 hour/day and waste disposal is 20 hours per day as discussed in the Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion, TRC Environmental Solutions, Inc., February 5, 1997.

[1] Trips per hour were used rather than hours per day.

[2] EMFAC2002 Modeling for Heavy Duty Trucks (HHD, DSL) at 75 degrees F, 25 mph in 2008

[3] A load factor of 0.413 was used for the various compactors; the load factor was provided by Caterpillar for an 836C compactor.

[4] A load factor of 0.538 was used for the various dozers; the load factor was provided by Caterpillar for a D9N dozer.

[5] EMFAC2002 Modeling for Heavy Duty Trucks (LDT2, CAT) at 75 degrees F, 25 mph in 2008.

TABLE 6
SOLID WASTE HAUL AND EMPLOYEE VEHICLE EMISSIONS AT THE LANDFILL WITH 4,000 TONS PER DAY
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

Equipment Type	Available Running Time**	Amount Hauled[1]	Round Trip Distances	Number of Vehicles[2,3]	Emissions Factor[4]	Emissions	Emissions Factor	Emissions
					NOx		ROGs	
		tpd	mi		g/mi [2]	lbs/day	g/mi	lbs/day
Solid Waste Haul (Transfer Truck Engines)	12	3414	2.1	155	15.284	10.98	1.032	0.74
Solid Waste Packer Truck Engines	12	554	2.1	75	15.284	5.29	1.032	0.36
Light Duty Truck Engines	12	12	2.1	12	0.878	0.05	0.366	0.02
Automobile Engines	12	20	2.1	40	0.598	0.11	0.309	0.06
Employee Vehicles	16	--	1.0	57	0.598	0.08	0.309	0.04
Total						**16.5**		**1.22**

Notes:

[1] Amount hauled was estimated by taking the *Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion* , TRC Environmental Solutions, Inc., February 5, 1997 amount hauled values and multiplying by the ratio of 2001 daily tonnage (4,000 tpd) to maximum daily tonnage (10,000 tpd).

[2] Number of vehicles were estimated by using the *Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion* , TRC Environmental Solutions, Inc., February 5, 1997 amount hauled and number of vehicle estimates in Table C to determine the number of vehicles required for the amount hauled in 2001.

[3] Employee vehicles numbers are based on Table C from the SCAQMD consultation document, which is based on a 10,000 tpd scenario. Employee vehicle numbers are assumed to remain the same before and after expansion.

[4] EMFAC2002 modeling for heavy duty trucks and light weight gasoline automobiles and trucks at 75 degrees F, 25 mph in 2001 .

** Waste disposal is 12 hours per day and maintenance/support activities are 16 hours per day as shown in the Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion, TRC Environmental Solutions, Inc., February 5, 1997.

SOLID WASTE HAUL AND EMPLOYEE VEHICLE EMISSIONS AT THE LANDFILL WITH 6,050 TONS PER DAY
EL SOBRANTE LANDFILL AND RECYCLING CENTER, CORONA, CALIFORNIA

Equipment Type	Available Running Time*	Amount Hauled [1]	Round Trip Distances	Number of Vehicles[2,3]	Emissions Factor[4]	Emissions	Emissions Factor	Emissions
					NOx		ROGs	
		tpd	mi		g/mi	lbs/day	g/mi	lbs/day
Solid Waste Haul (Transfer Truck Engines)	20	5164	2.1	235	9.491	10.32	0.68	0.74
Solid Waste Packer Truck Engines	20	837	2.1	113	9.491	4.97	0.68	0.36
Light Duty Truck Engines	20	18	2.1	18	0.414	0.03	0.163	0.01
Automobile Engines	20	30	2.1	61	0.276	0.08	0.115	0.03
Employee Vehicles	24	--	1.0	45	0.276	0.03	0.115	0.011
Total						**15.4**		**1.15**

Notes:

[1] Amount hauled was estimated by taking the *Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion* , TRC Environmental Solutions, Inc., February 5, 1997 amount hauled values and multiplying by the ratio of 2008 daily tonnage (6,050 tpd) to maximum daily tonnage (10,000 tpd).

[2] Number of vehicles were provided by using the *Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion* , TRC Environmental Solutions, Inc., February 5, 1997 amount hauled and number of vehicle estimates in Table C to determine the number of vehicles required for the amount hauled in future.

[3] Employee vehicles numbers are based on site-specific data. The number of employees is less than Table C from the SCAQMD Consultation document.

[4] EMFAC2002 modeling for heavy duty trucks (HHD, DSL) and light weight gasoline automobiles (LDA, CAT) and trucks (LDT1, CAT) at 75 degrees F, 25 mph in 2008.

* Waste disposal is 20 hours per day and maintenance/support activities are 24 hours per day as shown in the Draft South Coast Air Quality Management District Consultation, Work in Progress Air Quality Analysis Refinements, El Sobrante Landfill Expansion, TRC Environmental Solutions, Inc., February 5, 1997.

TABLE 7
PROJECT EMISSION INVENTORY FOR BASELINE AND 6,050 TPD
EL SOBRANTE LANDFILL EXPANSION, CORONA, CALIFORNIA

Source	**Maximum Emissions Rate (lbs/day)**	
	NOX	ROG
Stationary (Onsite) at 6,050 tpd - Flare	13.6	8.2
Stationary (Onsite) at 6,050 tpd - IC Engines	178.8	58.7
Surface Emissions (Onsite) at 6,050 tpd	--	245.0
Mobile (Onsite) at 6,050 tpd	312.5	15.0
On-site Solid Waste Hauling and Employee Vehicles at Landfill at 6,050 tpd	15.4	1.2
Waste Transport (Off-site) at 6,050 tpd	438.2	11.3
Total Project at 6,050 tpd	958.4	339.4
Stationary (Onsite) at 4,000 tpd - Flare	25.9	7.9
Surface Emissions (Onsite) at 4,000 tpd	--	69.5
Mobile (Onsite) at 4,000 tpd	133.9	7.2
On-site Solid Waste Hauling and Employee Vehicles at Landfill at 4,000 tpd	16.5	1.2
Waste Transport (Off-site) at 4,000 tpd	1077.7	26.6
Total Project at 4,000 tpd	1254.0	112.4

TABLE 8
EMISSION OFFSETS REQUIRED FOR FUTURE
EL SOBRANTE LANDFILL EXPANSION, CORONA, CALIFORNIA

Source	**Maximum Emissions Rate (lbs/day)**	
	NOx	ROG
Stationary (Onsite) at 6,050 tpd - Flare	--	--
Stationary (Onsite) at 6,050 tpd - IC Engines	--	--
Surface Emissions (Onsite) at 6,050 tpd	--	--
Mobile (Onsite) at 6,050 tpd	312.5	15.0
On-site Solid Waste Hauling and Employee Vehicles at Landfill at 6,050 tpd	15.4	1.2
Waste Transport (Off-site) at 6,050 tpd	438.2	11.3
Total Project at 6,050 tpd	766.1	27.5
Stationary (Onsite) at 4,000 tpd - Flare	--	--
Surface Emissions (Onsite) at 4,000 tpd	--	--
Mobile (Onsite) at 4,000 tpd	133.9	7.2
On-site Solid Waste Hauling and Employee Vehicles at Landfill at 4,000 tpd	16.5	1.2
Waste Transport (Off-site) at 4,000 tpd	1077.7	26.6
Total Project at 4,000 tpd	1228.1	35.0
Expansion (6,050 tpd minus 4,000 tpd)	**-462.0**	**-7.6**
SCAQMD Emission Rate Significance Threshold	**55.0**	**55.0**
Required Emission Reduction	0.0	0.0

ATTACHMENT 1

EMFAC2002 MODEL RESULTS

Title : South Coast Air Basin Avg 2008 Annual El Sobrante
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 09/11/07 09:38:12
Scen Year: 2008 -- Model Years: 1965 to 2008
Season : Annual
Area : South Coast AB
****
Year: 2008 -- Model Years 1965 to 2008 Inclusive -- Annual
Emfac2002 Emission Factors: V2.2 Apr 23 2003

South Coast A Basin Average Basin Average

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 75F Relative Humidity: 60%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL
25	5.7	0.115	0.33	0.152	5.64	0.163	0.173	0.25	5.513	0.134	0.122	0.175
60	4.883	0.069	0.178	0.101	4.832	0.1	0.093	0.175	4.723	0.082	0.066	0.117

Pollutant Name: Oxides of Nitrogen Temperature: 75F Relative Humidity: 60%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL
25	3.297	0.276	1.085	0.298	3.182	0.414	1.033	0.464	3.114	0.475	1.085	0.5
60	4.386	0.262	1.672	0.292	4.232	0.42	1.591	0.493	4.143	0.457	1.672	0.496

MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT
6.365	0.217	0.11	0.271	4.185	0.12	0.315	0.167	4.104	0.208	0.394	0.285	6.286
5.455	0.131	0.059	0.178	1.603	0.045	0.17	0.072	1.571	0.076	0.213	0.133	2.434

MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT
4.413	0.714	1.086	0.758	1.766	0.333	4.065	1.007	1.734	0.625	4.488	2.234	2.633
5.87	0.707	1.673	0.778	2.287	0.432	6.262	1.483	2.246	0.81	6.915	3.353	3.41

MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	LHV NCAT	LHV CAT	LHV DSL	LHV ALL	UBUS NCAT	UBUS CAT
0.656	0.354	0.435	17.109	4.526	0.68	0.856	0	0	0	0	7.472	2.267
0.237	0.191	0.209	6.72	1.742	0.367	0.431	0	0	0	0	2.903	0.88

MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	LHV NCAT	LHV CAT	LHV DSL	LHV ALL	UBUS NCAT	UBUS CAT
2.109	7.448	6.443	15.318	9.895	9.491	9.513	0	0	0	0	3.1	3.283
2.731	11.476	9.828	19.836	12.814	14.623	14.55	0	0	0	0	4.014	4.251

UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL
0.975	1.743	2.613	1.615	0	2.356	6.23	1.54	0.443	0.668	6.211	0.623	0.18
0.573	0.78	4.705	2.718	0	4.193	2.411	0.58	0.239	0.316	2.404	0.231	0.097

UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL
17.375	10.81	0.986	0.914	0	0.967	2.611	2.618	10.232	9.276	2.604	1.395	7.252
30.847	18.46	1.283	1.12	0	1.241	3.381	3.391	15.764	14.21	3.372	1.807	11.173

MH	ALL	ALL	ALL	ALL
ALL	NCAT	CAT	DSL	ALL
0.916	5.066	0.147	0.54	0.221
0.347	4.739	0.087	0.293	0.147

MH	ALL	ALL	ALL	ALL
ALL	NCAT	CAT	DSL	ALL
1.824	2.797	0.391	8.099	0.853
2.471	3.708	0.39	12.627	1.12

ATTACHMENT 2

LIQUIFIED NATURAL GAS TO DIESEL COMPARISON TABLE

Reduced Air Pollution from LNG Refuse Trucks

Emission Comparison – Diesel and LNG Engines

Emissions in Grams Per Brake Horsepower (g/BHP-hr)

Engine Type	Oxides of Nitrogen	Particulate Matter	Carbon Dioxide
Conventional Diesel (1998 Model Year)	3.72	0.157	555.0
New Mack LNG	1.90	0.023	495.8

Annual Emissions Reductions in Pounds

Engine Type	Oxides of Nitrogen	Particulate Matter	Carbon Dioxide
Conventional Diesel (1998 Model Year)	1,261.2	53.2	188,162
New Mack LNG	644.2	8.0	168,091
Percent Reduction	49%	85%	11%

Total Annual Emission Reductions For 120-Truck Project

Oxides of Nitrogen	Particulate Matter	Carbon Dioxide
74,040 lbs (37.02 tons)	5,400 lbs (2.7 tons)	2,408,520 lbs (1,204.6 tons)

The NOx reductions that result from purchasing 120 Mack LNG trucks instead of conventional diesels is equivalent to taking 9,255 new passenger cars off the road.

File name: PressAirEmissionRed.doc

ATTACHMENT B

SUMMARY OF FUGITIVE DUST REQUIREMENTS

Table 1
Fugitive Dust Best Available Control Measure
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Backfilling	01-1 Stabilize backfill material when not actively handling; and 01-2 Stabilize backfill material during handling; and 01-3 Stabilize soil at completion of activity.	• Mix backfill soil with water prior to moving. • Dedicate water truck or high capacity hose to backfilling equipment. • Empty loader bucket slowly so that no dust plumes are generated. • Minimize drop height from loader bucket.
Clearing and grubbing	02-1 Maintain stability of soil through pre-watering of site prior to clearing and grubbing; and 02-2 Stabilize soil during clearing and grubbing activities; and 02-3 Stabilize soil immediately after clearing and grubbing activities.	• Maintain live perennial vegetation where possible. • Apply water in sufficient quantity to prevent generation of dust plumes.
Clearing forms	03-1 Use water spray to clear forms; or 03-2 Use sweeping and water spray to clear forms; or 03-3 Use vacuum system to clear forms.	• Use of high-pressure air to clear forms may cause exceedance of Rule requirements.
Crushing	04-1 Stabilize surface soils prior to operation of support equipment; and 04-2 Stabilize material after crushing.	• Follow permit conditions for crushing equipment. • Prewater material prior to loading into crusher. • Monitor crusher emissions opacity. • Apply water to crushed material to prevent dust plumes
Cut and fill	05-1 Prewater soils prior to cut and fill activities; and 05-2 Stabilize soil during and after cut and fill activities.	• For large site, prewater with sprinklers or water trucks and allow time for penetration. • Use water trucks/pull to water soils to depth of cut prior to subsequent cuts.

Demolition—mechanical/ manual	06-1 Stabilize wind erodible surfaces to reduce dust; and 06-2 Stabilize surface soil where support equipment and vehicles will operate; and 06-3 Stabilize loose soil and demolition debris; and 06-4 Comply with AQMD Rule 1403.	• Apply water in sufficient quantities to prevent the generation of visible dust plumes.
Disturbed soil	07-1 Stabilize disturbed soil throughout the construction site; and 07-2 Stabilize disturbed soil between structures.	• Limit vehicular traffic and disturbances on soils where possible. • If interior block walls are planned, install as early as possible. • Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes.
Earth-moving activities	08-1 Preapply water to depth of proposed cuts; and 08-2 Reapply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and 08-3 Stabilize soils once earth moving activities are complete	• Grade each project phase separately, times to coincide with construction phase. • Upwind fencing can prevent material movement on-site. • Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes.
Importing/ exporting of bulk materials	09-1 Stabilize material while loading to reduce fugitive dust emissions; and 09-2 Maintain at least six inches of freeboard on haul vehicles; and 09-3 Stabilize material while transporting to reduce fugitive dust emissions; and 09-4 Stabilize material while unloading to reduce fugitive dust emissions; and 09-5 Comply with Vehicle Code Section 23114.	• Use tarps or other suitable enclosures on haul trucks. • Check belly-dump truck seals regularly and remove and trapped rocks to prevent spillage. • Comply with track-out prevention/ Mitigation requirements. • Provide water while loading and unloading to reduce visible dust plumes.

Landscaping	10-1 Stabilize soils, materials, slopes.	• Apply water to materials to stabilize. • Maintain materials in a crusted condition. • Maintain effective cover over materials. • Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes. • Hydroseed prior to rain season.
Road shoulder maintenance	11-1 Apply water to unpaved shoulders prior to clearing; and 11-2 Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	• Installation of curbing and/or paving road shoulders can reduce recurring maintenance costs. • Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs.
Screening	12-1 Prewater material prior to screening; and 12-2 Limit fugitive dust emissions to opacity and plum length standards; and 12-3 Stabilize material immediately after screening.	• Dedicate water truck or high capacity hose to screening operation. • Drop material through the screen slowly and minimize drop height. • Install wind barrier with a porosity of no more than 50% upwind of screen to the height of the drop point.
Staging areas	13-1 Stabilize staging areas during use; and 13-2 Stabilize staging area soils at project completion.	• Limit size of staging area. • Limit vehicle speeds of 15 miles per hour • Limit number and size of staging area entrances/exits.
Stockpiles/ Bulk Material Handling	14-1 Stabilize stockpiled materials. 14-2 Stockpiles within 100 yards of off-site occupied buildings must not be greater than eight feet in height; or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage.	• Add or remove material from the downwind portion of the storage pile. • Maintain storage piles to avoid steep sides or faces.

Traffic Areas for Contruction	15-1 Stabilize all off-road traffic and parking areas; and 15-2 Stabilize all haul routes; and 15-3 Direct construction traffic over established haul routes.	• Apply gravel/paving to all haul routes as soon as possible to all future roadway areas. • Barriers can be used to ensure vehicles are only used on established parking areas/haul routes.
Trenching	16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16-2 Stabilize soils at the completion of trenching activities.	• Pre-watering of soils prior to trenching is an effective preventive measure. For deep trenching activities, pre-trench to 18-inches soak soils via the pre-trench and resuming trenching. • Washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment.
Truck loading	17-1 Prewater material prior to loading; and 17-2 Ensure that freeboard exceeds six inches (CVC 23114).	• Empty loader bucket such that no visible dust plumes are created. • Ensure that the loader bucket is closer to the truck to minimize drop height while loading.
Turf Overseeding	18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plum length standards; and 18-2 Cover haul vehicles prior to exiting the site.	• Haul waste material immediately off site.
Unpaved roads/ parking lots	19-1 Stabilize soils to meet the applicable performance standards; and 19-2 Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	• Restricting vehicular access to established unpaved travel path and parking lots can reduce stabilization requirements.
Vacant land	20-1 In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by	

	motor vehicles and/or off-road vehicles, prevent motor vehicles and/or off-road vehicle trespassing, parking and/or access by installing barriers curbs, fences, gates, posts, signs, shrubs, trees, or other effective control measures.	

Table 2
Dust Control Measures for Large Operations

Fugitive Dust Source Category	Control Actions
Earth-moving (except construction cutting and filling area, and mining operations)	1a Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or equivalent method approved by the Executive Officer, CARB, and the USEPA. Two soil moisture evaluations must be conducted during the first three hours or active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; or 1a-1 For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving: Construction fill areas	1b Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and the California Air Resources Board and the U.S. EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four hour period of active operations
Earth-moving: Construction cut areas and mining operations:	1c Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	2a/b Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind-driven fugitive dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed surface areas: Completed grading areas	2c Apply chemical stabilizers within five working days of grading completion; 2d Take actions (3a) or (3c) specified for inactive disturbed surface areas.

Inactive disturbed surface areas	3a Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; or 3b Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; or 3c Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; or 3d Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.
Unpaved Roads	4a Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8 hour work day]; or 4b Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; or 4c Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	5a Apply chemical stabilizers; or 5b Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; or 5c Install temporary coverings; or 5d Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile. This option may only be used at aggregate-related plants or at cement manufacturing facilities.
All Categories	6a Any other control measures approved by the Executive Officer and the USEPA as equivalent to the methods specified in this Table may be used.

Table 3
Contingency Control Measures for Large Operations

Fugitive Dust Source Category	Control Measures
Earth-moving	1A Cease all active operations; or 2A Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	0B On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; or 1B Apply chemical stabilizers prior to wind event; or 2B Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind-driven fugitive dust, watering frequency is increased to a minimum of four times per day; or 3B Take the actions specified in this Table, Item (3c); or 4B Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	1C Apply chemical stabilizers prior to wind event; or 2C Apply water twice per hour during active operation; or 3C Stop all vehicular traffic.
Open storage piles	1D Apply water twice per hour; or 2D Install temporary coverings.
Paved road track-out	1E Cover all haul vehicles; or 2E Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	1F Any other control measures approved by the Executive Officer and the USEPA as equivalent to the methods specified in this Table may be used.

ATTACHMENT C

EMISSIONS CALCULATIONS

WASTE PROCESSING

2009 SCAB Fleet Average Emission Factors For Diesel Engines (Emission Factors in lbs/hr)

Equipment Type	HP	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
		Pounds per hour								
Other Ind. Equipment (Compactors)	500	0.26	0.88	2.75	0.00	0.10	0.09	265.41	0.02	0.01
Off-Hwy Tractors (D-9)	750	0.77	3.80	7.16	0.01	0.30	0.27	568.13	0.07	0.01
Off-Hwy Tractors (D-8)	750	0.20	0.56	1.78	0.00	0.08	0.07	568.13	0.07	0.01
Off-Hwy Trucks (Truck Tippers)	175	0.18	0.76	1.38	0.00	0.08	0.08	125.09	0.02	0.00
Off-Hwy (Water) Trucks	500	0.26	0.81	2.48	0.00	0.09	0.09	272.33	0.02	0.01

Equipment Emissions (lbs/day)

Equipment Type	Equipment Hours by Tier Level				ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
	Tier 0	Tier 1	Tier 2	Tier 3	Pounds per day								
Other Ind. Equipment (Compactors)	0	0	17.8	35.7	3.04	47.04	65.59	0.14	2.88	2.82	14,199.53	1.27	0.37
Off-Hwy Tractors (D-9)	0	0	14.7	7.3	4.29	83.67	82.47	0.13	3.61	3.54	12,498.87	1.53	0.33
Off-Hwy Tractors (D-8)	0	0	4.5	0	0.26	2.52	4.82	0.01	0.19	0.19	2,556.59	0.31	0.07
Off-Hwy Trucks (Truck Tippers)	0	14.3	28.7	0	4.22	32.87	41.97	0.06	2.46	2.34	5,378.77	0.71	0.14
Off-Hwy (Water) Trucks	0	0	0	14.5	0.68	11.75	13.31	0.04	0.74	0.72	3,948.84	0.34	0.10
				Total:	**12.49**	**177.85**	**208.16**	**0.37**	**9.88**	**9.61**	**38,582.60**	**4.16**	**1.01**

Note: CARB Tier Reductions based on SCAQMD guidance

SOIL COVER

2009 SCAB Fleet Average Emission Factors For Diesel Engines (Emission Factors in lbs/hr)

Equipment Type	HP	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
		Pounds per hour								
Excavators	500	0.21	0.66	2.07	0.00	0.08	0.07	233.74	0.02	0.01
Off-Hwy Trucks (Volvo A-40)	500	0.26	0.81	2.48	0.00	0.09	0.09	272.33	0.02	0.01
Off-Hwy Tractors (D-6)	175	0.24	0.86	1.85	0.00	0.11	0.10	130.42	0.02	0.00
Graders	250	0.19	0.52	1.90	0.00	0.07	0.06	172.11	0.02	0.00

Equipment Emissions (lbs/day)

Equipment Type	Equipment Hours by Tier Level				ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
	Tier 0	Tier 1	Tier 2	Tier 3	Pounds per day								
Excavators	0	0	8.0	0	0.48	5.28	9.91	0.02	0.33	0.33	1,869.88	0.15	0.05
Off-Hwy Trucks (Volvo A-40)	0	0	24.0	0	1.81	19.45	35.74	0.06	1.22	1.20	6,536.01	0.56	0.17
Off-Hwy Tractors (D-6)	0	12.5	0	0	3.03	10.81	21.03	0.02	1.32	1.21	1,630.22	0.27	0.04
Graders	5.0	0	0	0	0.93	2.60	9.51	0.01	0.35	0.32	860.57	0.08	0.02
				Total:	**6.25**	**38.13**	**76.20**	**0.11**	**3.22**	**3.06**	**10896.68**	**1.07**	**0.28**

Note: CARB Tier Reductions based on SCAQMD guidance

GREEN WASTE PROCESSING

2009 SCAB Fleet Average Emission Factors For Diesel Engines (Emission Factors in lbs/hr)

Equipment Type	HP	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
		Pounds per hour								
Rubber Tired Loaders	250	0.16	0.44	1.63	0.00	0.06	0.06	148.98	0.01	0.00
Other Ind. Equipment	Comp.	0.19	0.63	1.75	0.00	0.08	0.07	152.24	0.02	0.00
Off-Hwy Trucks (Volvo A-40)	500	0.26	0.81	2.48	0.00	0.09	0.09	272.33	0.02	0.01

Equipment Emissions (lbs/day)

Equipment Type	Equipment Hours by Tier Level				ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
	Tier 0	Tier 1	Tier 2	Tier 3	Pounds per day								
Rubber Tired Loaders	0	0	10.0	0	0.46	4.43	9.80	0.02	0.33	0.32	1489.77	0.14	0.04
Other Ind. Equipment	7.0	0	0	0	1.36	4.40	12.24	0.01	0.55	0.50	1065.68	0.12	0.03
Off-Hwy Trucks (Volvo A-40)	0	0	4.0	0	0.30	3.24	5.96	0.01	0.20	0.20	1089.34	0.09	0.03
				Total:	**2.12**	**12.07**	**28.00**	**0.04**	**1.08**	**1.02**	**3644.78**	**0.36**	**0.09**

Note: CARB Tier Reductions based on SCAQMD guidance

MISCELLANEOUS TASKS AND EQUIPMENT

2009 SCAB Fleet Average Emission Factors For Diesel Engines (Emission Factors in lbs/hr)

Equipment Type	HP	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
		Pounds per hour								
Graders	250	0.19	0.52	1.90	0.00	0.07	0.06	172.11	0.02	0.00
Generator Sets (Light Plants)	25	0.03	0.11	0.17	0.00	0.01	0.01	17.63	0.00	0.00

Equipment Emissions (lbs/day)

Equipment Type	Equipment Hours by Tier Level				ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
	Tier 0	Tier 1	Tier 2	Tier 3	Pounds per day								
Graders	4.5	0	0	0	0.84	2.34	8.56	0.01	0.32	0.29	774.51	0.08	0.02
Generator Sets (Light Plants)	156.0	0	0	0	4.93	16.70	27.10	0.03	1.76	1.62	2,750.50	0.44	0.07
				Total:	**5.77**	**19.03**	**35.66**	**0.04**	**2.07**	**1.91**	**3,525.01**	**0.52**	**0.09**

Note: CARB Tier Reductions based on SCAQMD guidance

EQUIPMENT MAINTENANCE

2009 SCAB Fleet Average Emission Factors For Diesel Engines (Emission Factors in lbs/hr)

Equipment Type	HP	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
		Pounds per hour								
Other Ind. Equipment (Fuel/Lube Truck)	250	0.15	0.39	1.58	0.00	0.05	0.05	135.58	0.01	0.00
Other Ind. Equipment (Mechanic Truck)	250	0.15	0.39	1.58	0.00	0.05	0.05	135.58	0.01	0.00

Equipment Emissions (lbs/day)

Equipment Type	Equipment Hours by Tier Level				ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
	Tier 0	Tier 1	Tier 2	Tier 3	Pounds per day								
Other Ind. Equipment (Fuel/Lube Truck)	32.0	0	0	0	4.73	12.51	50.62	0.05	1.75	1.61	4,338.68	0.43	0.11
Other Ind. Equipment (Mechanic Truck)	14.5	0	0	0	2.14	5.67	22.94	0.02	0.79	0.73	1,965.97	0.19	0.05
				Total:	**6.88**	**18.17**	**73.56**	**0.07**	**2.54**	**2.33**	**6,304.65**	**0.62**	**0.16**

Note: CARB Tier Reductions based on SCAQMD guidance

EMISSIONS FROM WORKER TRIPS (CURRENT)

Construction Worker Trip Emissions	
Number of Workers	63
Average Trip Length One-Way (miles)	50
Average Speed (MPH)	35
Daily VMT LDA & LDT	6300

	LDA (pounds/mile)	LDT (pounds/mile)
CO	0.009685619	0.020160754
NOx	0.001005183	0.022366363
ROG/VOC	0.000992454	0.002788989
SOx	1.06648E-05	2.67923E-05
PM10	8.60062E-05	0.000805497
PM2.5	5.38399E-05	0.000692278
CO2	1.097553983	2.723304957

Emissions From Commuting (assumes 50% LDA and 50% LDT)

	VOC	NOx	CO	SOx	PM10	PM2.5	CO2
Estimated Emissions (lbs/day) from worker trips	**11.91**	**73.62**	**94.02**	**0.12**	**2.81**	**2.35**	**12,035.71**

The emission estimates assume a construction worker commute fleet mix of 50% light duty autos and 50% light duty trucks.

Emissions Factor Source: Highest (Most Conservative) EMFAC 2007 Emission Factors for On-Road Passanger Vehicles and Delivery Trucks, Analysis Year 2009. (http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html)

WASTE PROCESSING

2009 SCAB Fleet Average Emission Factors For Diesel Engines (Emission Factors in lbs/hr)

Equipment Type	HP	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
		Pounds per hour								
Other Ind. Equipment (Compactors)	500	0.26	0.88	2.75	0.00	0.10	0.09	265.41	0.02	0.01
Off-Hwy Tractors (D-9)	750	0.77	3.80	7.16	0.01	0.30	0.27	568.13	0.07	0.01
Off-Hwy Tractors (D-8)	750	0.20	0.56	1.78	0.00	0.08	0.07	568.13	0.07	0.01
Off-Hwy Trucks (Truck Tippers)	175	0.18	0.76	1.38	0.00	0.08	0.08	125.09	0.02	0.00
Off-Hwy (Water) Trucks	500	0.26	0.81	2.48	0.00	0.09	0.09	272.33	0.02	0.01

Equipment Emissions (lbs/day)

Equipment Type	Equipment Hours by Tier Level				ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
	Tier 0	Tier 1	Tier 2	Tier 3	Pounds per day								
Other Ind. Equipment (Compactors)	0	0	19.7	39.3	3.36	51.87	72.37	0.15	3.17	3.11	15,659.29	1.40	0.41
Off-Hwy Tractors (D-9)	0	0	0	18.5	2.56	70.36	49.00	0.11	3.04	2.98	10,510.41	1.28	0.27
Off-Hwy Tractors (D-8)	0	0	12.5	0	0.71	6.99	13.39	0.02	0.53	0.52	7,101.63	0.87	0.19
Off-Hwy Trucks (Truck Tippers)	0	21.0	42.0	0	6.19	48.17	61.51	0.09	3.60	3.43	7,880.53	1.05	0.21
Off-Hwy (Water) Trucks	0	0	0	19.0	0.89	15.40	17.45	0.05	0.97	0.95	5,174.34	0.45	0.13
				Total:	**13.71**	**192.78**	**213.71**	**0.42**	**11.31**	**10.98**	**46,326.21**	**5.04**	**1.21**

Note: CARB Tier Reductions based on SCAQMD guidance

SOIL COVER

2009 SCAB Fleet Average Emission Factors For Diesel Engines (Emission Factors in lbs/hr)

Equipment Type	HP	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
		Pounds per hour								
Excavators	500	0.21	0.66	2.07	0.00	0.08	0.07	233.74	0.02	0.01
Off-Hwy Trucks (Volvo A-40)	500	0.26	0.81	2.48	0.00	0.09	0.09	272.33	0.02	0.01
Off-Hwy Tractors (D-6)	175	0.24	0.86	1.85	0.00	0.11	0.10	130.42	0.02	0.00
Graders	250	0.19	0.52	1.90	0.00	0.07	0.06	172.11	0.02	0.00

Equipment Emissions (lbs/day)

Equipment Type	Equipment Hours by Tier Level				ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
	Tier 0	Tier 1	Tier 2	Tier 3	Pounds per day								
Excavators	0	0	7.5	0	0.45	4.95	9.30	0.02	0.31	0.30	1,753.02	0.14	0.05
Off-Hwy Trucks (Volvo A-40)	0	0	28.5	0	2.15	23.09	42.44	0.08	1.45	1.42	7,761.51	0.67	0.20
Off-Hwy Tractors (D-6)	0	7.5	0	0	1.82	6.49	12.62	0.01	0.79	0.73	978.13	0.16	0.03
Graders	2.0	0	0	0	0.37	1.04	3.81	0.00	0.14	0.13	344.23	0.03	0.01
				Total:	**4.79**	**35.56**	**68.16**	**0.11**	**2.69**	**2.58**	**10,836.88**	**1.01**	**0.28**

Note: CARB Tier Reductions based on SCAQMD guidance

GREEN WASTE PROCESSING

2009 SCAB Fleet Average Emission Factors For Diesel Engines (Emission Factors in lbs/hr)

Equipment Type	HP	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
		Pounds per hour								
Rubber Tired Loaders	250	0.16	0.44	1.63	0.00	0.06	0.06	148.977	0.01423	0.00387
Other Ind. Equipment	Comp.	0.19	0.63	1.75	0.00	0.08	0.07	152.24	0.0175	0.00396
Off-Hwy Trucks (Volvo A-40)	500	0.26	0.81	2.48	0.00	0.09	0.09	272.334	0.02346	0.00707

Equipment Emissions (lbs/day)

Equipment Type	Equipment Hours by Tier Level				ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
	Tier 0	Tier 1	Tier 2	Tier 3	Pounds per day								
Rubber Tired Loaders	0	0	9.0	0	0.41	3.99	8.82	0.02	0.30	0.29	1340.79	0.13	0.03
Other Ind. Equipment	7.5	0	0	0	1.46	4.71	13.12	0.01	0.58	0.54	1141.80	0.13	0.03
Off-Hwy Trucks (Volvo A-40)	0	0	3.5	0	0.26	2.84	5.21	0.01	0.18	0.17	953.17	0.08	0.02
				Total:	**2.13**	**11.54**	**27.15**	**0.04**	**1.06**	**1.00**	**3435.76**	**0.34**	**0.09**

Note: CARB Tier Reductions based on SCAQMD guidance

MISCELLANEOUS TASKS AND EQUIPMENT

2009 SCAB Fleet Average Emission Factors For Diesel Engines (Emission Factors in lbs/hr)

Equipment Type	HP	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
		Pounds per hour								
Graders	250	0.19	0.52	1.90	0.00	0.07	0.06	172.11	0.02	0.00
Generator Sets (Light Plants)	25	0.03	0.11	0.17	0.00	0.01	0.01	17.63	0.00	0.00

Equipment Emissions (lbs/day)

Equipment Type	Equipment Hours by Tier Level				ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
	Tier 0	Tier 1	Tier 2	Tier 3	Pounds per day								
Graders	3.0	0	0	0	0.56	1.56	5.71	0.01	0.21	0.19	516.34	0.05	0.01
Generator Sets (Light Plants)	192.0	0	0	0	6.07	20.55	33.35	0.04	2.16	1.99	3,385.23	0.55	0.09
				Total:	**6.63**	**22.11**	**39.06**	**0.05**	**2.37**	**2.18**	**3,901.57**	**0.60**	**0.10**

Note: CARB Tier Reductions based on SCAQMD guidance

EQUIPMENT MAINTENANCE

2009 SCAB Fleet Average Emission Factors For Diesel Engines (Emission Factors in lbs/hr)

Equipment Type	HP	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
		Pounds per hour								
Other Ind. Equipment (Fuel/Lube Truck)	250	0.15	0.39	1.58	0.00	0.05	0.05	135.58	0.01	0.00
Other Ind. Equipment (Mechanic Truck)	250	0.15	0.39	1.58	0.00	0.05	0.05	135.58	0.01	0.00

Equipment Emissions (lbs/day)

Equipment Type	Equipment Hours by Tier Level				ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
	Tier 0	Tier 1	Tier 2	Tier 3	Pounds per day								
Other Ind. Equipment (Fuel/Lube Truck)	47.0	0	0	0	6.95	18.37	74.35	0.07	2.56	2.36	6,372.44	0.63	0.17
Other Ind. Equipment (Mechanic Truck)	17.0	0	0	0	2.51	6.64	26.89	0.03	0.93	0.85	2,304.92	0.23	0.06
				Total:	**9.47**	**25.01**	**101.24**	**0.10**	**3.49**	**3.21**	**8,677.36**	**0.85**	**0.23**

Note: CARB Tier Reductions based on SCAQMD guidance

EMISSIONS FROM WORKER TRIPS (PROPOSED)

Construction Worker Trip Emissions	
Number of Workers	71
Average Trip Length One-Way (miles)	50
Average Speed (MPH)	35
Daily VMT LDA & LDT	7100

	LDA (pounds/mile)	LDT (pounds/mile)
CO	0.009685619	0.020160754
NOx	0.001005183	0.022366363
ROG/VOC	0.000992454	0.002788989
SOx	1.06648E-05	2.67923E-05
PM10	8.60062E-05	0.000805497
PM2.5	5.38399E-05	0.000692278
CO2	1.097553983	2.723304957

Emissions From Commuting (assumes 50% LDA and 50% LDT)

	VOC	NOx	CO	SOx	PM10	PM2.5	CO2
Estimated Emissions (lbs/day) from worker trips	**13.42**	**82.97**	**105.95**	**0.13**	**3.16**	**2.65**	**13,564.05**

The emission estimates assume a construction worker commute fleet mix of 50% light duty autos and 50% light duty trucks.

Emissions Factor Source: Highest (Most Conservative) EMFAC 2007 Emission Factors for On-Road Passanger Vehicles and Delivery Trucks, Analysis Year 2009. (http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html)

SCAB Fleet Average Emission Factors (Diesel)

2009

Air Basin	SC

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Equipment	MaxHP	ROG	CO	NOX	SOX	PM	CO2	CH4	N2O
Aerial Lifts	15	0.0108	0.0530	0.0695	0.0001	0.0042	8.7	0.0010	0.0002
	25	0.0229	0.0610	0.1043	0.0001	0.0071	11.0	0.0021	0.0003
	50	0.0798	0.1979	0.2013	0.0003	0.0197	19.6	0.0072	0.0005
	120	0.0743	0.2523	0.4715	0.0004	0.0375	38.1	0.0067	0.0010
	500	0.1617	0.6308	2.0224	0.0021	0.0634	212.9	0.0146	0.0055
	750	0.3008	1.1402	3.7474	0.0039	0.1162	384.8	0.0271	0.0100
Aerial Lifts Composite		0.0710	0.2149	0.3748	0.0004	0.0259	34.7	0.0064	0.0009
Air Compressors	15	0.0151	0.0522	0.0870	0.0001	0.0064	7.2	0.0014	0.0002
	25	0.0343	0.0877	0.1423	0.0002	0.0104	14.4	0.0031	0.0004
	50	0.1220	0.2867	0.2416	0.0003	0.0275	22.3	0.0110	0.0006
	120	0.1066	0.3375	0.6253	0.0006	0.0563	47.0	0.0096	0.0012
	175	0.1331	0.5126	1.0574	0.0010	0.0586	88.5	0.0120	0.0023
	250	0.1305	0.3633	1.4688	0.0015	0.0495	131.2	0.0118	0.0034
	500	0.2061	0.7427	2.3237	0.0023	0.0800	231.7	0.0186	0.0060
	750	0.3242	1.1478	3.6824	0.0036	0.1253	358.1	0.0292	0.0093
	1000	0.5489	2.0084	6.2090	0.0049	0.1891	486.4	0.0495	0.0127
Air Compressors Composite		0.1180	0.3699	0.7664	0.0007	0.0547	63.6	0.0106	0.0017
Bore/Drill Rigs	15	0.0121	0.0632	0.0757	0.0002	0.0038	10.3	0.0011	0.0003
	25	0.0202	0.0664	0.1296	0.0002	0.0072	16.0	0.0018	0.0004
	50	0.0670	0.2612	0.2855	0.0004	0.0222	31.0	0.0060	0.0008
	120	0.0859	0.4868	0.6810	0.0009	0.0522	77.1	0.0077	0.0020
	175	0.1052	0.7542	1.0211	0.0016	0.0528	141.1	0.0095	0.0037
	250	0.0999	0.3479	1.3113	0.0021	0.0395	188.1	0.0090	0.0049
	500	0.1520	0.5595	1.8467	0.0031	0.0625	311.3	0.0137	0.0080
	750	0.3086	1.1055	3.8040	0.0062	0.1260	615.1	0.0278	0.0159
	1000	0.5756	1.7291	8.7661	0.0093	0.2164	928.3	0.0519	0.0240
Bore/Drill Rigs Composite		0.1162	0.5200	1.2287	0.0017	0.0541	164.9	0.0105	0.0043
Cement and Mortar M	15	0.0082	0.0391	0.0532	0.0001	0.0033	6.3	0.0007	0.0002
	25	0.0374	0.0991	0.1678	0.0002	0.0116	17.6	0.0034	0.0005
Cement and Mortar Mixers Compos		0.0107	0.0440	0.0626	0.0001	0.0040	7.2	0.0010	0.0002
Concrete/Industrial S	25	0.0202	0.0678	0.1295	0.0002	0.0071	16.5	0.0018	0.0004
	50	0.1324	0.3310	0.3123	0.0004	0.0318	30.2	0.0119	0.0008
	120	0.1441	0.5029	0.9105	0.0009	0.0755	74.1	0.0130	0.0019
	175	0.2056	0.8827	1.7484	0.0018	0.0903	160.2	0.0185	0.0042
Concrete/Industrial Saws Composit		0.1363	0.4340	0.6906	0.0007	0.0581	58.5	0.0123	0.0015
Cranes	50	0.1375	0.3262	0.2584	0.0003	0.0304	23.2	0.0124	0.0006
	120	0.1187	0.3763	0.6901	0.0006	0.0633	50.1	0.0107	0.0013
	175	0.1276	0.4905	0.9849	0.0009	0.0564	80.3	0.0115	0.0021
	250	0.1314	0.3664	1.3105	0.0013	0.0501	112.2	0.0118	0.0029
	500	0.1913	0.7157	1.8770	0.0018	0.0726	180.1	0.0172	0.0047
	750	0.3237	1.2002	3.2349	0.0030	0.1235	303.0	0.0292	0.0079
	9999	1.1477	4.4498	12.6411	0.0098	0.3962	970.6	0.1035	0.0253
Cranes Composite		0.1683	0.5705	1.5293	0.0014	0.0678	128.7	0.0152	0.0034
Crawler Tractors	50	0.1541	0.3617	0.2817	0.0003	0.0337	24.9	0.0139	0.0007
	120	0.1645	0.5080	0.9519	0.0008	0.0860	65.8	0.0148	0.0017
	175	0.2041	0.7662	1.5613	0.0014	0.0896	121.2	0.0184	0.0032
	250	0.2152	0.6039	2.0519	0.0019	0.0830	166.1	0.0194	0.0043
	500	0.3038	1.2939	2.8737	0.0025	0.1159	259.2	0.0274	0.0068
	750	0.5465	2.3075	5.2572	0.0047	0.2093	464.7	0.0493	0.0121
	1000	0.8377	3.6498	8.9128	0.0066	0.2944	658.1	0.0755	0.0172
Crawler Tractors Composite		0.1961	0.6616	1.4607	0.0013	0.0898	114.0	0.0177	0.0030
Crushing/Proc. Equip	50	0.2406	0.5726	0.4764	0.0006	0.0543	44.0	0.0217	0.0012
	120	0.1861	0.6005	1.0910	0.0010	0.0998	83.1	0.0168	0.0022
	175	0.2486	0.9765	1.9608	0.0019	0.1107	167.3	0.0224	0.0044
	250	0.2387	0.6612	2.6857	0.0028	0.0900	244.5	0.0215	0.0063
	500	0.3267	1.1528	3.6473	0.0037	0.1263	373.6	0.0295	0.0097
	750	0.5231	1.7650	5.9509	0.0059	0.2011	588.8	0.0472	0.0153
	9999	1.4578	5.1762	16.6062	0.0131	0.5019	1,307.8	0.1314	0.0340
Crushing/Proc. Equipment Compos		0.2274	0.7440	1.5130	0.0015	0.0976	132.3	0.0205	0.0035
Dumpers/Tenders	25	0.0114	0.0345	0.0662	0.0001	0.0039	7.6	0.0010	0.0002
Dumpers/Tenders Composite		0.0114	0.0345	0.0662	0.0001	0.0039	7.6	0.0010	0.0002
Excavators	25	0.0200	0.0677	0.1272	0.0002	0.0066	16.4	0.0018	0.0004
	50	0.1254	0.3265	0.2680	0.0003	0.0297	25.0	0.0113	0.0007
	120	0.1519	0.5375	0.8996	0.0009	0.0841	73.6	0.0137	0.0019
	175	0.1564	0.6716	1.1993	0.0013	0.0704	112.2	0.0141	0.0029
	250	0.1529	0.4138	1.6049	0.0018	0.0555	158.7	0.0138	0.0041
	500	0.2072	0.6595	2.0656	0.0023	0.0754	233.7	0.0187	0.0061
	750	0.3462	1.0908	3.5375	0.0039	0.1270	387.4	0.0312	0.0100
Excavators Composite		0.1584	0.5697	1.2340	0.0013	0.0681	119.6	0.0143	0.0031
Forklifts	50	0.0756	0.1921	0.1566	0.0002	0.0178	14.7	0.0068	0.0004
	120	0.0662	0.2272	0.3757	0.0004	0.0373	31.2	0.0060	0.0008

	175	0.0802	0.3314	0.6006	0.0006	0.0364	56.1	0.0072	0.0015
	250	0.0681	0.1759	0.7730	0.0009	0.0240	77.1	0.0061	0.0020
	500	0.0900	0.2438	0.9629	0.0011	0.0323	111.0	0.0081	0.0029
Forklifts Composite		0.0741	0.2366	0.5560	0.0006	0.0302	54.4	0.0067	0.0014
Generator Sets	15	0.0181	0.0738	0.1197	0.0002	0.0073	10.2	0.0016	0.0003
	25	0.0316	0.1070	0.1737	0.0002	0.0113	17.6	0.0028	0.0005
	50	0.1182	0.2970	0.3115	0.0004	0.0296	30.6	0.0107	0.0008
	120	0.1479	0.5099	0.9509	0.0009	0.0742	77.9	0.0133	0.0020
	175	0.1767	0.7500	1.5523	0.0016	0.0747	142.0	0.0159	0.0037
	250	0.1741	0.5333	2.1787	0.0024	0.0658	212.5	0.0157	0.0055
	500	0.2480	0.9606	3.1592	0.0033	0.0974	336.9	0.0224	0.0087
	750	0.4126	1.5508	5.2278	0.0055	0.1593	543.8	0.0372	0.0141
	9999	1.0732	3.8648	12.5361	0.0105	0.3786	1,048.6	0.0967	0.0273
Generator Sets Composite		0.1020	0.3378	0.6718	0.0007	0.0414	61.0	0.0092	0.0016
Graders	50	0.1511	0.3698	0.3004	0.0004	0.0343	27.5	0.0136	0.0007
	120	0.1663	0.5519	0.9819	0.0009	0.0898	75.0	0.0150	0.0020
	175	0.1846	0.7443	1.4391	0.0014	0.0823	123.9	0.0166	0.0032
	250	0.1857	0.5191	1.9027	0.0019	0.0705	172.1	0.0167	0.0045
	500	0.2248	0.8113	2.2502	0.0023	0.0853	229.5	0.0203	0.0060
	750	0.4795	1.7113	4.8918	0.0049	0.1828	485.7	0.0432	0.0126
Graders Composite		0.1825	0.6428	1.5237	0.0015	0.0796	132.7	0.0165	0.0035
Off-Highway Tractors	120	0.2579	0.7530	1.4831	0.0011	0.1306	93.7	0.0232	0.0025
	175	0.2427	0.8648	1.8490	0.0015	0.1054	130.4	0.0219	0.0034
	250	0.1964	0.5593	1.7848	0.0015	0.0773	130.4	0.0177	0.0034
	750	0.7691	3.8033	7.1583	0.0057	0.2985	568.1	0.0693	0.0149
	1000	1.1692	5.9006	11.8314	0.0082	0.4183	814.3	0.1054	0.0213
Off-Highway Tractors Composite		0.2470	0.8664	2.0818	0.0017	0.1017	151.5	0.0223	0.0040
Off-Highway Trucks	175	0.1842	0.7645	1.3750	0.0014	0.0817	125.1	0.0166	0.0033
	250	0.1725	0.4534	1.7336	0.0019	0.0614	166.5	0.0155	0.0043
	500	0.2602	0.8103	2.4818	0.0027	0.0925	272.3	0.0235	0.0071
	750	0.4248	1.3113	4.1542	0.0044	0.1523	441.7	0.0383	0.0115
	1000	0.6754	2.2246	7.6544	0.0063	0.2328	624.7	0.0609	0.0162
Off-Highway Trucks Composite		0.2597	0.7931	2.5505	0.0027	0.0929	260.1	0.0234	0.0068
Other Construction E	15	0.0118	0.0617	0.0739	0.0002	0.0037	10.1	0.0011	0.0003
	25	0.0167	0.0549	0.1072	0.0002	0.0059	13.2	0.0015	0.0003
	50	0.1136	0.3034	0.2833	0.0004	0.0283	28.0	0.0102	0.0007
	120	0.1440	0.5475	0.9243	0.0009	0.0790	80.9	0.0130	0.0021
	175	0.1258	0.5915	1.0659	0.0012	0.0573	106.5	0.0113	0.0028
	500	0.1815	0.6528	2.1224	0.0025	0.0721	254.2	0.0164	0.0066
Other Construction Equipment Com		0.1130	0.4291	1.0812	0.0013	0.0471	122.8	0.0102	0.0032
Other General Indust	15	0.0066	0.0391	0.0466	0.0001	0.0019	6.4	0.0006	0.0002
	25	0.0187	0.0632	0.1189	0.0002	0.0062	15.3	0.0017	0.0004
	50	0.1359	0.3152	0.2446	0.0003	0.0298	21.7	0.0122	0.0006
	120	0.1537	0.4690	0.8620	0.0007	0.0828	62.0	0.0139	0.0016
	175	0.1587	0.5841	1.1959	0.0011	0.0704	95.9	0.0143	0.0025
	250	0.1479	0.3908	1.5819	0.0015	0.0546	135.6	0.0133	0.0035
	500	0.2624	0.8792	2.7454	0.0026	0.0977	265.4	0.0237	0.0069
	750	0.4361	1.4490	4.6469	0.0044	0.1635	437.4	0.0393	0.0114
	1000	0.6693	2.3885	7.3897	0.0056	0.2304	559.6	0.0603	0.0146
Other General Industrial Equipmen		0.1941	0.6281	1.7488	0.0016	0.0779	152.2	0.0175	0.0040
Other Material Handli	50	0.1877	0.4353	0.3400	0.0004	0.0412	30.3	0.0169	0.0008
	120	0.1493	0.4564	0.8402	0.0007	0.0803	60.7	0.0135	0.0016
	175	0.2002	0.7397	1.5174	0.0014	0.0888	122.1	0.0180	0.0032
	250	0.1567	0.4165	1.6870	0.0016	0.0580	145.0	0.0141	0.0038
	500	0.1872	0.6333	1.9782	0.0019	0.0702	191.6	0.0169	0.0050
	9999	0.8816	3.1586	9.7621	0.0073	0.3033	741.3	0.0795	0.0193
Other Material Handling Equipment		0.1867	0.5801	1.6943	0.0015	0.0753	141.2	0.0168	0.0037
Pavers	25	0.0294	0.0870	0.1646	0.0002	0.0100	18.7	0.0026	0.0005
	50	0.1711	0.3951	0.3150	0.0004	0.0371	28.0	0.0154	0.0008
	120	0.1728	0.5287	1.0165	0.0008	0.0889	69.2	0.0156	0.0018
	175	0.2148	0.8036	1.6835	0.0014	0.0940	128.3	0.0194	0.0034
	250	0.2554	0.7375	2.4519	0.0022	0.1008	194.4	0.0230	0.0051
	500	0.2745	1.2660	2.6607	0.0023	0.1077	233.2	0.0247	0.0061
Pavers Composite		0.1867	0.5756	1.0321	0.0009	0.0739	77.9	0.0168	0.0020
Paving Equipment	25	0.0159	0.0525	0.1024	0.0002	0.0057	12.6	0.0014	0.0003
	50	0.1455	0.3352	0.2687	0.0003	0.0316	23.9	0.0131	0.0006
	120	0.1352	0.4135	0.7968	0.0006	0.0695	54.5	0.0122	0.0014
	175	0.1676	0.6268	1.3205	0.0011	0.0732	101.0	0.0151	0.0026
	250	0.1589	0.4598	1.5357	0.0014	0.0627	122.3	0.0143	0.0032
Paving Equipment Composite		0.1405	0.4544	0.9400	0.0008	0.0655	68.9	0.0127	0.0018
Plate Compactors	15	0.0051	0.0263	0.0321	0.0001	0.0018	4.3	0.0005	0.0001
Plate Compactors Composite		0.0051	0.0263	0.0321	0.0001	0.0018	4.3	0.0005	0.0001
Pressure Washers	15	0.0087	0.0354	0.0573	0.0001	0.0035	4.9	0.0008	0.0001
	25	0.0128	0.0434	0.0704	0.0001	0.0046	7.1	0.0012	0.0002
	50	0.0441	0.1172	0.1409	0.0002	0.0120	14.3	0.0040	0.0004
	120	0.0414	0.1501	0.2804	0.0003	0.0201	24.1	0.0037	0.0006
Pressure Washers Composite		0.0212	0.0680	0.1020	0.0001	0.0074	9.4	0.0019	0.0002
Pumps	15	0.0155	0.0537	0.0894	0.0001	0.0066	7.4	0.0014	0.0002
	25	0.0462	0.1183	0.1920	0.0002	0.0140	19.5	0.0042	0.0005

	50	0.1414	0.3503	0.3528	0.0004	0.0347	34.3	0.0127	0.0009
	120	0.1526	0.5180	0.9654	0.0009	0.0773	77.9	0.0138	0.0020
	175	0.1802	0.7518	1.5556	0.0016	0.0768	140.1	0.0162	0.0037
	250	0.1710	0.5151	2.0962	0.0023	0.0649	201.4	0.0154	0.0052
	500	0.2629	1.0240	3.2753	0.0034	0.1033	345.2	0.0237	0.0090
	750	0.4471	1.6929	5.5506	0.0057	0.1730	570.7	0.0403	0.0148
	9999	1.4110	5.1656	16.3756	0.0136	0.4965	1,354.8	0.1272	0.0352
Pumps Composite		0.0991	0.3147	0.5779	0.0006	0.0410	49.6	0.0089	0.0013
Rollers	15	0.0074	0.0386	0.0462	0.0001	0.0023	6.3	0.0007	0.0002
	25	0.0168	0.0554	0.1082	0.0002	0.0060	13.3	0.0015	0.0003
	50	0.1354	0.3258	0.2795	0.0003	0.0307	26.0	0.0122	0.0007
	120	0.1280	0.4221	0.7781	0.0007	0.0672	59.0	0.0115	0.0015
	175	0.1563	0.6303	1.2709	0.0012	0.0687	108.1	0.0141	0.0028
	250	0.1642	0.4800	1.7167	0.0017	0.0642	153.1	0.0148	0.0040
	500	0.2105	0.8408	2.2093	0.0022	0.0830	219.1	0.0190	0.0057
Rollers Composite		0.1250	0.4272	0.8166	0.0008	0.0574	67.1	0.0113	0.0018
Rough Terrain Forklif	50	0.1730	0.4329	0.3615	0.0004	0.0402	33.9	0.0156	0.0009
	120	0.1306	0.4493	0.7797	0.0007	0.0716	62.4	0.0118	0.0016
	175	0.1746	0.7325	1.3765	0.0014	0.0788	124.9	0.0157	0.0033
	250	0.1626	0.4544	1.7779	0.0019	0.0611	170.8	0.0147	0.0044
	500	0.2217	0.7485	2.3512	0.0025	0.0843	256.6	0.0200	0.0067
Rough Terrain Forklifts Composite		0.1368	0.4815	0.8505	0.0008	0.0719	70.3	0.0123	0.0018
Rubber Tired Dozers	175	0.2498	0.8774	1.8708	0.0015	0.1077	129.5	0.0225	0.0034
	250	0.2890	0.8102	2.5615	0.0021	0.1124	183.5	0.0261	0.0048
	500	0.3754	1.8608	3.3530	0.0026	0.1431	264.9	0.0338	0.0070
	750	0.5657	2.7857	5.1236	0.0040	0.2163	398.8	0.0510	0.0105
	1000	0.8798	4.4580	8.7527	0.0060	0.3146	591.9	0.0793	0.0155
Rubber Tired Dozers Composite		0.3508	1.5020	3.1254	0.0025	0.1347	239.1	0.0316	0.0063
Rubber Tired Loader	25	0.0207	0.0697	0.1331	0.0002	0.0073	16.9	0.0019	0.0004
	50	0.1686	0.4135	0.3383	0.0004	0.0384	31.1	0.0152	0.0008
	120	0.1293	0.4314	0.7660	0.0007	0.0699	58.9	0.0117	0.0015
	175	0.1564	0.6351	1.2251	0.0012	0.0698	106.3	0.0141	0.0028
	250	0.1578	0.4432	1.6331	0.0017	0.0600	149.0	0.0142	0.0039
	500	0.2277	0.8216	2.3036	0.0023	0.0867	237.0	0.0205	0.0061
	750	0.4704	1.6776	4.8485	0.0049	0.1798	485.5	0.0424	0.0126
	1000	0.6508	2.4004	7.4214	0.0060	0.2256	593.9	0.0587	0.0154
Rubber Tired Loaders Composite		0.1530	0.5214	1.2255	0.0012	0.0688	108.6	0.0138	0.0028
Scrapers	120	0.2366	0.7257	1.3704	0.0011	0.1233	93.9	0.0213	0.0025
	175	0.2510	0.9371	1.9271	0.0017	0.1101	148.1	0.0226	0.0039
	250	0.2747	0.7749	2.6155	0.0024	0.1065	209.5	0.0248	0.0055
	500	0.3807	1.6480	3.6071	0.0032	0.1459	321.4	0.0343	0.0084
	750	0.6602	2.8336	6.3557	0.0056	0.2539	555.3	0.0595	0.0145
Scrapers Composite		0.3347	1.3278	3.0630	0.0027	0.1321	262.5	0.0302	0.0068
Signal Boards	15	0.0072	0.0377	0.0450	0.0001	0.0018	6.2	0.0006	0.0002
	50	0.1582	0.3915	0.3741	0.0005	0.0381	36.2	0.0143	0.0010
	120	0.1589	0.5428	0.9927	0.0009	0.0824	80.2	0.0143	0.0021
	175	0.2015	0.8467	1.7073	0.0017	0.0878	154.5	0.0182	0.0040
	250	0.2198	0.6518	2.6462	0.0029	0.0843	255.3	0.0198	0.0066
Signal Boards Composite		0.0234	0.0959	0.1678	0.0002	0.0096	16.7	0.0021	0.0004
Skid Steer Loaders	25	0.0270	0.0736	0.1286	0.0002	0.0086	13.8	0.0024	0.0004
	50	0.0893	0.2612	0.2505	0.0003	0.0238	25.5	0.0081	0.0007
	120	0.0678	0.2852	0.4473	0.0005	0.0388	42.8	0.0061	0.0011
Skid Steer Loaders Composite		0.0783	0.2565	0.3057	0.0004	0.0276	30.3	0.0071	0.0008
Surfacing Equipment	50	0.0629	0.1561	0.1472	0.0002	0.0149	14.1	0.0057	0.0004
	120	0.1275	0.4382	0.8099	0.0007	0.0655	63.8	0.0115	0.0017
	175	0.1136	0.4816	0.9690	0.0010	0.0493	85.8	0.0102	0.0022
	250	0.1336	0.4088	1.4565	0.0015	0.0524	134.9	0.0120	0.0035
	500	0.1968	0.8383	2.1681	0.0022	0.0782	221.2	0.0177	0.0058
	750	0.3142	1.3099	3.4781	0.0035	0.1237	347.0	0.0283	0.0090
Surfacing Equipment Composite		0.1647	0.6589	1.6559	0.0017	0.0639	166.0	0.0148	0.0043
Sweepers/Scrubbers	15	0.0124	0.0729	0.0870	0.0002	0.0036	11.9	0.0011	0.0003
	25	0.0240	0.0808	0.1544	0.0002	0.0084	19.6	0.0022	0.0005
	50	0.1672	0.4080	0.3372	0.0004	0.0383	31.6	0.0151	0.0008
	120	0.1624	0.5400	0.9294	0.0009	0.0901	75.0	0.0146	0.0020
	175	0.2004	0.8081	1.5355	0.0016	0.0911	139.0	0.0181	0.0036
	250	0.1417	0.3771	1.6698	0.0018	0.0516	162.0	0.0128	0.0042
Sweepers/Scrubbers Composite		0.1689	0.5475	0.9059	0.0009	0.0733	78.5	0.0152	0.0021
Tractors/Loaders/Bac	25	0.0224	0.0697	0.1355	0.0002	0.0079	15.9	0.0020	0.0004
	50	0.1394	0.3685	0.3165	0.0004	0.0337	30.3	0.0126	0.0008
	120	0.0993	0.3661	0.6071	0.0006	0.0554	51.7	0.0090	0.0014
	175	0.1307	0.5891	1.0398	0.0011	0.0597	101.4	0.0118	0.0026
	250	0.1500	0.4228	1.6664	0.0019	0.0558	171.7	0.0135	0.0045
	500	0.2751	0.9002	2.9210	0.0039	0.1037	344.9	0.0248	0.0089
	750	0.4176	1.3479	4.5341	0.0058	0.1582	517.3	0.0376	0.0134
Tractors/Loaders/Backhoes Compo		0.1109	0.3993	0.7227	0.0008	0.0559	66.8	0.0100	0.0017
Trenchers	15	0.0099	0.0517	0.0617	0.0001	0.0025	8.5	0.0009	0.0002
	25	0.0403	0.1355	0.2587	0.0004	0.0141	32.9	0.0036	0.0009
	50	0.1929	0.4460	0.3666	0.0004	0.0421	32.9	0.0174	0.0009
	120	0.1591	0.4900	0.9512	0.0008	0.0807	64.9	0.0143	0.0017

	175	0.2364	0.8930	1.8852	0.0016	0.1029	143.9	0.0213	0.0038
	250	0.2918	0.8572	2.8121	0.0025	0.1163	222.9	0.0263	0.0058
	500	0.3638	1.7688	3.5695	0.0031	0.1443	311.3	0.0328	0.0081
	750	0.6912	3.3168	6.8402	0.0059	0.2731	586.9	0.0623	0.0153
Trenchers Composite		0.1762	0.4992	0.7910	0.0007	0.0663	58.7	0.0159	0.0016
Welders	15	0.0130	0.0449	0.0747	0.0001	0.0055	6.2	0.0012	0.0002
	25	0.0268	0.0685	0.1112	0.0001	0.0081	11.3	0.0024	0.0003
	50	0.1292	0.3084	0.2760	0.0003	0.0299	26.0	0.0116	0.0007
	120	0.0851	0.2759	0.5126	0.0005	0.0443	39.5	0.0077	0.0010
	175	0.1397	0.5532	1.1430	0.0011	0.0609	98.2	0.0126	0.0026
	250	0.1124	0.3214	1.2992	0.0013	0.0428	119.1	0.0101	0.0031
	500	0.1413	0.5285	1.6482	0.0016	0.0553	167.6	0.0127	0.0043
Welders Composite		0.0847	0.2281	0.3015	0.0003	0.0280	25.6	0.0076	0.0007

Emission factors sent by ARB on December 7, 2006 in grams per hour. EF converted by SCAQMD to pounds per hour.

AQMD

TABLE II - OFF-ROAD ENGINE EMISSION RATES & COMPARISON OF UNCONTROLLED TO TIERED RATES AND TIERED TO TIERED RATES

TABLE II-A
UNCONTROLLED OFF-ROAD ENGINE EMISSION FACTORS

Model Year	Engine Size (hp)	Uncontrolled (g/bhp-hr) NOx	ROG	PM
pre 1988	75 - 99	12.09	1.73	0.605
1988+	75 - 99	8.14	1.19	0.497
pre 1970	100 - 174	13.02	1.59	0.554
1970-71	100 - 174	12.09	1.32	0.475
1972-79	100 - 174	11.16	1.2	0.396
1980-84	100 - 174	10.23	1.13	0.396
1985-87	100 - 174	10.23	1.06	0.396
1987+	100 - 174	7.6	0.82	0.274
pre 1970	175 - 299	13.02	1.52	0.554
1970-71	175 - 299	12.09	1.26	0.475
1972-79	175 - 299	11.16	1.14	0.396
1980-84	175 - 299	10.23	1.08	0.396
1985-87	175 - 299	10.23	1.01	0.396
1987+	175 - 299	7.6	0.82	0.274
pre 1970	300 - 600	13.02	1.52	0.533
1970-71	300 - 600	12.09	1.26	0.454
1972-79	300 - 600	11.16	1.14	0.382
1980-84	300 - 600	10.23	1.08	0.382
1985-87	300 - 600	10.23	1.01	0.382
1987+	300 - 600	7.6	0.82	0.274

TABLE II-B
TIERS 1, 2, 3 & 4 OFF-ROAD ENGINE EMISSION STANDARDS

Engine Size (hp)	Tier 1 (g/bhp-hr) NOx	ROG	PM	Tier 2 (g/bhp-hr) NOx	ROG	PM	Tier 3 (g/bhp-hr) NOx	ROG	PM	Tier 4 (g/bhp-hr) NOx	ROG	PM
75 - 99	6.9	1.19	0.552	5.32	0.28	0.3	3.325	0.175	0.3	2.5	0.14	0.015
100 - 174	6.9	0.82	0.304	4.655	0.245	0.22	2.85	0.15	0.22	2.5	0.14	0.015
175 - 299	6.9	1	0.4	4.655	0.245	0.15	2.85	0.15	0.15	1.5	0.14	0.015
300 - 600	6.9	1	0.4	4.56	0.24	0.15	2.85	0.15	0.15	1.5	0.14	0.015

Source: Carl Moyer Table B-12 > > > http://www.arb.ca.gov/msprog/moyer/guidelines/2005 Carl Moyer Guidelines Part4.pdf

Source: ARB Table 1 > > http://www.arb.ca.gov/msprog/ordiesel/documents/Off-Road_Diesel_Stds.xls

TABLE II-C
PERCENTAGE REDUCTION FROM UNCONTROLLED TO TIERS 1, 2, 3 & 4

Model Year	Engine Size (hp)	Uncontrolled to Tier 1 NOx	ROG	PM	Uncontrolled to Tier 2 NOx	ROG	PM	Uncontrolled to Tier 3 NOx	ROG	PM	Uncontrolled to Tier 4 NOx	ROG	PM
pre 1988	75 - 99	43%	31%	9%	56%	84%	50%	72%	90%	50%	79%	92%	98%
1988+	75 - 99	15%	0%	0%	35%	76%	40%	59%	85%	40%	69%	88%	97%
pre 1970	100 - 174	47%	48%	45%	64%	85%	60%	78%	91%	60%	81%	91%	97%
1970-71	100 - 174	43%	38%	36%	61%	81%	54%	76%	89%	54%	79%	89%	97%
1972-79	100 - 174	38%	32%	23%	58%	80%	44%	74%	88%	44%	78%	88%	96%
1980-84	100 - 174	33%	27%	23%	54%	78%	44%	72%	87%	44%	76%	88%	96%
1985-87	100 - 174	33%	23%	23%	54%	77%	44%	72%	86%	44%	76%	87%	96%
1987+	100 - 174	9%	0%	0%	39%	70%	20%	63%	82%	20%	67%	83%	95%
pre 1970	175 - 299	47%	34%	28%	64%	84%	73%	78%	90%	73%	88%	91%	97%
1970-71	175 - 299	43%	21%	16%	61%	81%	68%	76%	88%	68%	88%	89%	97%
1972-79	175 - 299	38%	12%	0%	58%	79%	62%	74%	87%	62%	87%	88%	96%
1980-84	175 - 299	33%	7%	0%	54%	77%	62%	72%	86%	62%	85%	87%	96%
1985-87	175 - 299	33%	1%	0%	54%	76%	62%	72%	85%	62%	85%	86%	96%
1987+	175 - 299	9%	0%	0%	39%	70%	45%	63%	82%	45%	80%	83%	95%
pre 1970	300 - 600	47%	34%	25%	65%	84%	72%	78%	90%	72%	88%	91%	97%
1970-71	300 - 600	43%	21%	12%	62%	81%	67%	76%	88%	67%	88%	89%	97%
1972-79	300 - 600	38%	12%	0%	59%	79%	61%	74%	87%	61%	87%	88%	96%
1980-84	300 - 600	33%	7%	0%	55%	78%	61%	72%	86%	61%	85%	87%	96%
1985-87	300 - 600	33%	1%	0%	55%	76%	61%	72%	85%	61%	85%	86%	96%
1987+	300 - 600	9%	0%	0%	40%	71%	45%	63%	82%	45%	80%	83%	95%
Avg Red.		33%	18%	12%	54.57%	78.31%	54.82%	71.95%	86.61%	54.82%	81.58%	87.67%	96.29%

TABLE II-D
PERCENTAGE REDUCTION
FROM TIER 1 TO TIERS 2, 3 & 4

Engine	Tier 1 to Tier 2			Tier 1 to Tier 3			Tier 1 to Tier 4		
Size (hp)	NOx	ROG	PM	NOx	ROG	PM	NOx	ROG	PM
75 - 99	23%	76%	46%	52%	85%	46%	64%	88%	97%
100 - 174	33%	70%	28%	59%	82%	28%	64%	83%	95%
175 - 299	33%	76%	63%	59%	85%	63%	78%	86%	96%
300 - 600	34%	76%	63%	59%	85%	63%	78%	86%	96%

TABLE II-E
PERCENTAGE REDUCTION
FROM TIER 2 TO TIERS 3 & 4

Engine	Tier 2 to Tier 3			Tier 2 to Tier 4		
Size (hp)	NOx	ROG	PM	NOx	ROG	PM
75 - 99	38%	38%	0%	53%	50%	95%
100 - 174	39%	39%	0%	46%	43%	93%
175 - 299	39%	39%	0%	68%	43%	90%
300 - 600	38%	38%	0%	67%	42%	90%

TABLE II-F
PERCENTAGE REDUCTION
FROM TIER 3 TO TIER 4

Engine	Tier 3 to Tier 4		
Size (hp)	NOx	ROG	PM
75 - 99	25%	20%	95%
100 - 174	12%	7%	93%
175 - 299	47%	7%	90%
300 - 600	47%	7%	90%

ATTACHMENT D

EXCERPTS FROM SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT REPORT OF MICROMETEROLOGICAL AND AMBIENT AIR QUALITY MONITORING CONDUCTED NEAR THE CITY OF CORONA IN THE VICINITY OF RECYC, INCORPORATED'S COMPOSTING FACILITY AS PREPARED BY SCAQMD (AUGUST 1995)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

REPORT OF MICROMETEOROLOGICAL AND AMBIENT AIR QUALITY MONITORING CONDUCTED NEAR THE CITY OF CORONA IN THE VICINITY OF RECYC, INCORPORATED'S COMPOSTING FACILITY

August, 1995

EXECUTIVE SUMMARY

Micrometeorological and ambient air quality monitoring were conducted in the foothills south of Corona from December 1, 1994 through August 8, 1995. The purpose of the monitoring program was to determine complex wind flow patterns in the canyons surrounding RECYC, Incorporated, a sludge and waste product composting activity, and to collect ambient samples of potentially odorous materials. Data collected from nine monitoring locations included atmospheric measurements, integrated ambient air samples, collected in 10-liter tedlar bags, concentrations of amine compounds, collected in impinger trains, and levels of ammonia gas, measured as the difference between treated and untreated 47mm cassettes. Wind analyses indicate that west-northwesterly winds predominate the entire area during daytime surface heating conditions, while the drainage flow monitored at night tends to conform the the topography. A total of 18 integrated samples were collected, during three sampling episodes conducted on July 19 and August 10, 1995. The results of the sampling indicate a uniform, homogeneous blend of compounds endemic to landfill and other industrial activies is present, at concentrations too low to quantify. No source-receptor relationship is apparent. No sulfur compounds or amines were found above the minimum detection levels of their analysis procedures. Ammonia was discovered in all three samples collected at the perimeters of RECYC and El Sobrante Landfill. The sample upwind of RECYC was very low, 0.98 ug/m^3. Ammonia was identified downwind of El Sobrante Landfill at 2.86 ug/m^3. The concentration of ammonia detected downwind of RECYC was over 200 times the upwind concentration, 219.4 ug/m^3. The data indicate that there are measureable emissions of ammonia released from the composting process. Further, the streamline analysis indicates that the potential for transporting ammonia downstream, towards the nieghborhoods to the south, is high.

6.0 CONCLUSIONS

Sampling conducted in the vicinity of RECYC and El Sobrante Landfill from December 1, 1994 through August 10, 1995 has revealed distinct diurnal fluctuations in the wind field, driven by the radical topographical features of both Tescal Canyon and the lesser canyons and arroyos that feed into it. Winds under the influence of daytime surface heating generally follow Temescal Canyon, and present a uniform northwesterly to west-northwesterly pattern. During this period, the potential for transporting effluent from either RECYC or El Sobrante Landfill to the Dawson Canyon and Spanish Hills residential areas to the southeast appears to be high. However, vertical mixing due to the surface heating often entrains large amounts of relatively clean air into the air mass, significantly diluting effluent concentration.

Nighttime drainage flow follows the terrain, as expected. As the air mass cools in the absense of a heat source, the air mass containing possible odorous or toxic contaminants becomes more stable and heavier, causing anabatic flow or, "drainage" down the canyons from the north to the south-southeast.

Early morning drainage exhibits similar patterns to the nighttime flow. The hours around dawn are normally the coolest, producing the most stable and stratified atmosphere in the surface boundary layer. Winds are generally extremely light or calm, and virtually all air mass movement is dictated by gravitational attraction. In general, the air mass slowly shifts southward, down the canyon towards Lake Elsinore. Analysis of the wind data collected at Site #4 during these hours reveals the presence of thermal forcing. It is apparent that, during this period of greatest cooling, the inherent thermal reactions in the compost windrows exert a local instability which may allow potentially odorous compounds to penetrate the stable, laminar flow directly above RECYC. The stability of this laminar air mass will inhibit dilution of effluent concentration, and may carry concentrations of contaminants well above the odor detection threshold well downstream.

Integrated ambient air sampling was conducted at six locations around RECYC and El Sobrante Landfill during periods of daytime thermal winds and nighttime drainage on July 19 and August 10, 1995. Qualitative GC/MS analysis reveals the presence of chemical compounds endemic to landfill and/or industrial areas. The uniformity of the samples, and the lack of quantifiable concentrations of any effluent indicate that the samples recorded homogeneous background levels of the compounds, and no source-receptor relationship may be inferred.

Source characterization of amines was attempted at the perimeters of RECYC and El Sobrante Landfill on August 10, 1995. No amines were discovered above the minimum detection level of the analysis procedure.

A similar characterization of ammonia gas was undertaken at Sites A, B, and C on August 10, 1995. Under uniformly northwewsterly winds, a background level of 0.98 ug/m^3 was obtained during 5 hours of sampling at Site C, along the western perimeter of RECYC. The sample collected at Site A, due east of the active face of El Sobrante Landfill, was also low, 2.86 ug/m^3. However, Site B, immediately downwind of RECYC, collected 219.4 ug/m^3 of ammonia gas over the same 5 hour sampling interval. It is clear that, even in the face of extreme vertical mixing, significantly high levels of ammonia are being emitted from RECYC, and are being transported downwind, towards Dawson Canyon and Spanish Hills.

ATTACHMENT E

EXCERPTS FROM PREVIOUSLY PREPARED AIR STUDY BY TRC ENVIRONMENTAL, INC. AND UPDATED EMFAC 2007 VALUES

TRC *Environmental Solutions Inc.*

DRAFT
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT-CONSULTATION

WORK IN PROGRESS
AIR QUALITY ANALYSIS REFINEMENTS
EL SOBRANTE LANDFILL EXPANSION

Prepared for

TRC Environmental Solutions, Inc.

On Behalf of:

Riverside County Waste Resources Management District and USA Waste Services

Project No. 91-266
February 5, 1997

35	2.74	0.30	1.30	1.72	0.46	1.20	2.21	0.93	6.40	3.22	10.16	17.48	0.94
40	2.81	0.33	1.33	1.76	0.51	1.24	2.24	1.02	6.65	3.34	10.43	17.95	0.99
45	2.88	0.38	1.41	1.85	0.59	1.32	2.30	1.19	6.90	3.47	11.09	19.09	1.02
50	3.37	0.46	1.56	2.20	0.72	1.45	2.69	1.44	7.15	3.59	12.23	21.04	1.08
55	4.43	0.56	1.78	2.90	0.87	1.66	3.54	1.76	7.40	3.72	13.96	24.03	1.20
60	5.49	0.68	2.11	3.59	1.07	1.96	4.39	2.15	7.65	3.84	16.52	28.43	1.48
65	6.55	0.83	2.58	4.28	1.30	2.40	5.23	2.61	7.90	3.97	20.26	34.86	2.17

TABLE 1(CONTINUED): SUMMERTIME RUNNING I/M EXHAUST EMISSION FACTORS AT 75 DEG F

POLLUTANT NAME: EXHAUST PARTICULATES UNITS: GRAMS PER MILE

SPEED	LIGHT DUTY AUTOS			LIGHT DUTY TRUCKS			MD. DUTY TRUCKS		HEAVY DUTY TRUCKS			URBAN BUS	MCY
MPH	NCAT	CAT	DIESEL	NCAT	CAT	DIESEL	NCAT	CAT	NCAT	CAT	DIESEL	DIESEL	ALL
5	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
10	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
15	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
20	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
25	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
30	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
35	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
40	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
45	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
50	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
55	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
60	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01
65	0.04	0.01	0.48	0.04	0.01	0.44	0.04	0.01	0.08	0.08	1.37	2.83	0.01

POLLUTANT NAME: TIRE WEAR UNITS: GRAMS PER MILE

SPEED	LIGHT DUTY AUTOS			LIGHT DUTY TRUCKS			MD. DUTY TRUCKS		HEAVY DUTY TRUCKS			URBAN BUS	MCY
MPH	NCAT	CAT	DIESEL	NCAT	CAT	DIESEL	NCAT	CAT	NCAT	CAT	DIESEL	DIESEL	ALL
5	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.33	0.33	0.66	0.66	0.10
10	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.33	0.33	0.66	0.66	0.10
15	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.33	0.33	0.66	0.66	0.10
20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.33	0.33	0.66	0.66	0.10
25	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.33	0.33	0.66	0.66	0.10
30	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.33	0.33	0.66	0.66	0.10
35	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.33	0.33	0.66	0.66	0.10
40	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.33	0.33	0.66	0.66	0.10
45	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.33	0.33	0.66	0.66	0.10
50	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.33	0.33	0.66	0.66	0.10

Highest (Most Conservative) EMFAC2007 (version 2.3)
Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks

Projects in the SCAQMD (Scenario Years 2007 - 2026)
Derived from Peak Emissions Inventory (**Winter, Annual, Summer**)

Vehicle Class:
Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and extracting the **Heavy-Heavy-Duty Diesel Truck (HHDT)** Emission Factors.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle/emission categories listed in the tables below, by use of the following equation:

Emissions (pounds per day) = N x TL x EF

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The **HHDT-DSL** vehicle/emission category accounts for all emissions from heavy-heavy-duty diesel trucks, including start, running and idling exhaust. In addition, ROG emission factors account for diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors account for tire and brake wear.

The **HHDT-DSL, Exh** vehicle/emission category includes only the exhaust portion of PM10 & PM2.5 emissions from heavy-heavy-duty diesel trucks.

Scenario Year: **2007**
All model years in the range 1965 to 2007

HHDT-DSL (pounds/mile)	
CO	0.01446237
NOx	0.04718166
ROG	0.00372949
SOx	0.00003962
PM10	0.00230900
PM2.5	0.00204018
CO2	4.22184493

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00216752
PM2.5	0.00199491

Scenario Year: **2008**
All model years in the range 1965 to 2008

HHDT-DSL (pounds/mile)	
CO	0.01361368
NOx	0.04458017
ROG	0.00351579
SOx	0.00004136
PM10	0.00215635
PM2.5	0.00189990
CO2	4.21067145

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00201296
PM2.5	0.00185303

Scenario Year: **2009**
All model years in the range 1965 to 2009

HHDT-DSL (pounds/mile)	
CO	0.01282236
NOx	0.04184591
ROG	0.00329320
SOx	0.00004013
PM10	0.00199572
PM2.5	0.00175227
CO2	4.21080792

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00185393
PM2.5	0.00170680

Scenario Year: **2010**
All model years in the range 1966 to 2010

HHDT-DSL (pounds/mile)	
CO	0.01195456
NOx	0.03822102
ROG	0.00304157
SOx	0.00004131
PM10	0.00183062
PM2.5	0.00160083
CO2	4.21120578

HHDT-DSL, Exh (pounds/mile)	
PM10	0.00168861
PM2.5	0.00155435