CHAPTER 3.0 SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSED PROJECT WHICH CAN BE MITIGATED

Pursuant to the County of San Diego *Environmental Impact Report Format and General Content Requirements* (2004), this section evaluates those environmental effects that would be avoided, reduced, or minimized through mitigation measures to below levels of significance. Based on analysis conducted as part of this SEIR, implementation of the proposed Project would result in significant impacts and require mitigation measures to fully mitigate impacts to the issue areas of air quality, biological resources, noise, traffic/transportation, and hydrology/water quality. This conclusion was aided in part through technical analysis conducted by independent consultants and documented in reports in the areas of traffic, air quality, biology, and noise. The technical reports are appended to this SEIR for reference as Appendices B, D, E, F, and G1 and G2, respectively.

3.1 Air Quality

An Air Quality Assessment Report was prepared for the Project by Investigative Science and Engineering (ISE), dated September 27, 2007. A copy of the technical report is included as Appendix D to this SEIR.

3.1.1 Existing Conditions

In the area of the proposed project site, the maximum and minimum average temperatures are 82° F and 46° F, respectively. Precipitation in the area averages 13 inches annually, 90 percent of which falls between November and April. The prevailing wind direction is from the west-northwest, with an annual mean speed of 8 to 10 miles per hour. Sunshine is usually plentiful in the area but night and morning cloudiness is common during the spring and summer. Fog can occur occasionally during the winter.

San Diego County's climate is characterized by warm, dry summers and mild, wet winters and is dominated by a semi-permanent high-pressure cell located over the Pacific Ocean. This high-pressure cell maintains clear skies over the air basin for much of the year. It also drives the dominated onshore circulation and helps to create subsidence inversions during the warmer months and radiation inversions during the winter months, both of which contribute to local air quality degradation.

Air quality is defined by ambient air concentrations of specific pollutants determined by the Environmental Protection Agency (EPA) to be of concern with respect to the health and welfare of the public. The subject pollutants, which are monitored by the EPA, are Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), respirable 10-micron particulate matter (PM_{10}), sulfates, lead, Hydrogen Sulfide (H_2S), Volatile Organic Compounds (e.g., vinyl chloride, etc.), and visibility reducing particles. The EPA (under the Federal Clean Air Act of 1970, and amended in 1977) established ambient air quality standards for these pollutants, called the National Ambient Air Quality Standards (NAAQS). The California Air Resources Board (CARB) subsequently established the more stringent California Ambient Air Quality Standards (CAAQS). Both sets of standards are listed in the Air Quality Assessment Report (page 6) included as Appendix D to this SEIR. Areas in California where ambient air concentrations of pollutants are higher than the state standard are considered to be in "non-attainment" status for that pollutant.

The project site is located in the western central portion of the San Diego Air Basin (SDAB). The Basin is either in attainment or unclassified for federal standards of CO, SO_2, NO_2, PM_{10}, and lead. San Diego County areas are in attainment of state air quality standards for all pollutants with the exception of ozone (O3) and PM_{10}.

The CARB monitors ambient air quality at air-monitoring stations across the state. Ambient air pollutant concentrations in the SDAB are measured at 10 air quality monitoring stations operated by the San Diego Air Pollution Control District (SDAPCD). The nearest air quality monitoring stations with respect to the project site are located within the City of El Cajon (1155 Redwood Av, El Cajon CA 92019 – ARB Station ID 80131) approximately 5.8 miles from the project site, and within the City of Chula Vista (80 E. J St., Chula Vista CA 91910 – ARB station ID 80114) approximately 7.6 miles from the project site. A summary of the highest pollutant levels recorded at the closest identified monitoring stations for the last year available (2005) are listed in the Air Quality Assessment Report (Tables 3a through 3l) contained as Appendix D to this SEIR. Factors affecting ground level pollutant concentrations include the rate at which pollutants are emitted to the atmosphere, the height from which they are released, and topographic and meteorological features. Given these factors, both stations reported exceedances for O3. Additionally, the El Cajon station reported an exceedance in PM_{10}. All other criteria pollutants were within both federal and state standards. Monitoring for lead was discontinued entirely in 1998.

3.1.2 Guidelines for the Determination of Significance

The proposed Project would have a significant adverse effect on air quality if any of the following would occur as a result of a Project-related component. Would the Project:

- Conflict with or obstruct the implementation of the San Diego Regional Air Quality Strategies (RAQS) or applicable portions of the State Implementation Plan (SIP).
- Violate any state or federal air quality standard or contribute substantially to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under applicable federal or state ambient air quality standards (including releasing emissions which exceed qualitative thresholds for ozone precursors).
- Expose sensitive receptors, including, but not limited to, schools, hospitals, residential care facilities, or day care centers, to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

3.1.3 Analysis of Project Effects and Determination as to Significance

- ***Would the Project conflict with or obstruct the implementation of the San Diego Regional Air Quality Strategies (RAQS) or applicable portions of the State Implementation Plan (SIP)?***

San Diego RAQS establishes what could be thought of as an "emissions budget" for the San Diego Air Basin. This budget takes into account existing conditions, planned growth based on General

Plans for cities within the San Diego Association of Governments (SANDAG) region, and air quality control measures implemented by the SDAPCD.

The "emissions budget" accounts for current emissions associated with the proposed Project as well as previously approved projects consistent with current General Plan policies. Therefore, to determine whether the proposed Project is consistent with the RAQS requires a comparison of net emissions from the proposed development to the emissions associated with previously approved and accounted for plans (commonly known as the *Consistency Criterion* of the RAQS).

The proposed Highlands Ranch SPA would reduce the number of permitted single-family residential homes on the site from a maximum of 355 (as permitted by the approved Panorama Ridge SPA), to a maximum of 211. This change would reduce the overall plan density from 1.95 dwelling units per acre (du/ac) to 1.20 du/ac. Because the proposed Highlands Ranch Project proposes a lower development intensity than previously approved, and because the Project is consistent with the proposed SANDAG projections for growth within this area, the Project, by default, satisfies the *Consistency Criterion* of the RAQS and would also be consistent with State Implementation Plan (SIP) for the criteria pollutants under examination. No adverse impacts are identified.

- ***Would the Project violate any state or federal air quality standard or contribute substantially to an existing or projected air quality violation?***

Pursuant to California Health & Safety Code, jurisdiction for regulation of air emissions from non-mobile sources within San Diego County has been delegated to the SDAPCD. As part of its air quality permitting process, the APCD has established thresholds for the preparation of Air Quality Impact Assessments (AQIA). For CEQA purposes, screening criteria are used as numeric methods to demonstrate that a project's total emissions (e.g. stationary and fugitive emissions, as well as emissions from mobile sources) would not result in a significant impact to air quality. Because the SDAPCD does not have AQIA thresholds for emissions of volatile organic compounds (VOCs), the use of the screening level for reactive organic compounds (ROC) from the CEQA Air Quality Handbook for the South Coast Air Basin (SCAB), which has stricter standards for emissions of ROCs/VOCs than San Diego's, is appropriate. The applicable standards are shown below in Table 3-1*, Thresholds of Significance for Air Quality Impacts.* In the event that any criteria pollutant exceeds the threshold levels, the proposed action's impact on air quality are considered significant and mitigation measures would be required.

A. Short-Term Construction Impacts

The estimated construction equipment exhaust emissions are provided in Table 3-2*, Predicted Aggregate Construction Equipment Emissions-Rough Grading/Hauling*. These operations would consist of clearing, grubbing, and general pad and road alignment formation and is generally performed in three distinct phases: mobilization, scraper hauls/finishing, and additional site finishing work. The three phases would constitute the worst-case construction phase. Equipment identified below in Table 3-2 (and corresponding load factors) are based on past observed utilization on similar-type projects as well as anticipated construction utilization proposed by the Project engineer (REC Consultants, 2006).

Table 3-1 THRESHOLDS OF SIGNIFICANCE FOR AIR QUALITY IMPACTS

Pollutant	Thresholds of Significance (Pounds per Day)(3)	Clean Air Act *less than significant* Levels (Tons per Year)
Carbon Monoxide (CO)	550	100
Oxides of Sulfur (SO_x)	250	100
Volatile Organic Compounds (VOC's) Reactive Organic Gasses (ROG's)	55(1) / 75(2)	50
Oxides of Nitrogen (NO_x)	250	50
Particulate Matter (PM_{10})	100	100

(1) Threshold for VOCs based on the threshold of significance for reactive organic gases from Chapter 6 of the CEQA Air Quality Handbook of the South Coast Air Quality Management District.
(2) Threshold for VOCs in the eastern portion of the County based on the threshold of significance for reactive organic gases from Chapter 6 of the CEQA Air Quality Handbook of the Southeast Desert Air Basin.
(3) Thresholds are applicable for either construction or operational phases of a project action.

SOURCE: SDAPCD Rule 1501, 20.2(d)(2), 1995; EPA 40CFR93, 1993

Table 3-2 PREDICTED AGGREGATE CONSTRUCTION EQUIPMENT EMISSIONS – ROUGH GRADING / HAULING

					Aggregate Emissions in Pounds / Day				
Equipment Type	Qty. Used	HP	Daily Load Factor (%)	Duty Cycle (Hrs. / day)	CO	NOx	SOx	PM_{10}	ROG
Dozer - D8 Cat	2	400	50	8	48.000	70.400	6.400	3.200	9.600
Loader	2	150	45	8	16.200	23.760	2.160	1.080	3.240
Water Truck	1	200	50	8	4.800	16.800	1.600	1.200	1.600
Haul Truck	4	300	45	8	25.920	90.720	8.640	6.480	8.640
Scraper	2	300	35	8	18.480	31.920	3.360	2.520	1.680
				Total (Σ):	**113.4**	**233.6**	**22.2**	**14.5**	**24.8**
				Significance Threshold (SDAPCD)	**550.00**	**250.00**	**250.00**	**100.00**	**55.00**

SOURCE: Investigative Science and Engineering, September 27, 2007

Based upon the values shown in Table 3-2, less than significant air quality impacts are expected due to equipment emissions associated with rough grading/hauling activities alone, because levels would not exceed the identified CEQA Thresholds of Significance. This condition does not hold for aggregated construction activities as will be shown below when emission levels from construction equipment and rock crushing are added together. No significant VOC emissions are expected.

The anticipated diesel emission rate for the proposed rock crushing plant (which is proposed as an option within the mass grading effort) is shown in Table 3-3, *Predicted Onsite Rock Crusher Emissions*. Values are provided for the following criteria pollutants: carbon monoxide (CO), oxides of nitrogen (NOx), oxides of sulfur (SOx), fine particulate matter (PM_{10}) and reactive organic gasses (ROG). For the purposes of analysis, a worst-case 309 brake-horsepower (BHP) unit was examined which is consistent with the load requirements of a unit capable of the proposed throughput.

Again, as shown in Table 3-3, operation of the rock crushing unit alone does not produce an impact. However, simultaneous operation of the crushing unit and onsite grading operations would produce a cumulative exceedance in oxides of nitrogen (NOx), or a level of 233.6 + 59.3 = 292.9 pounds per day. This level is above the SDAPCD allowable level of 250 pounds per day, and prior to mitigation

a short-term significant impact to air quality would result should the rock crushing plant be required (**Significant Direct and Cumulative Impact 3.1-A**).

Table 3-3 PREDICTED ONSITE ROCK CRUSHER EMISSIONS

	Generation Rates per Pollutant				
Pegson Model 4242 Trackpactor	**CO**	**NOx**	**SOx**	**PM_{10}**	**ROG**
Total for 309 HP unit per hour	6.18	7.41	0.62	0.62	0.93
Total for 309 HP per 8-hour day	49.4	59.3	5.0	5.0	7.4
Significance Threshold (SDAPCD)	**550.00**	**250.00**	**250.00**	**100.00**	**55.00**

Source: U.S. EPA AP-42 "Compilation of Air Pollutant Emission Factors", 9/85. Ratings shown for full (100%) load factor.
Specifications for the unit can be found at http://www.powerscreensales.com/productlines/4242.sr.htm).

Construction activities are also a source of fugitive dust emissions. These emissions are typically associated with land clearing, excavating, and construction. The anticipated excavation quantities (i.e., sand, dirt, and rock) would occur in three distinct mass grading phases, as follows: Phase 1, 532,647 cubic-yards; Phase 2, 220,715 cubic-yards; and Phase 3, 315,327 cubic-yards. Thus, the worst-case earthwork quantity would be 532,647 cubic-yards during the Phase 1 operation. For is the type of earthwork materials present on the project site, the Project would have an approximate worst-case working weight of approximately 692,441 tons. Approximately 30 percent of the working weight would be capable of generating PM_{10} (since most of the project site is composed of rocky granitic material not capable of being reducible to particles small enough to be of concern). This assumption is supported by the Project's geotechnical study (refer to Technical Appendix I), which includes a map and description of the geologic units that occur on-site. According to the Project's geotechnical study, the Project site contains undocumented fill, topsoil, alluvium, and Santiago Peak Volcanics. Of the above-listed geologic soils, undocumented fill, topsoil, and alluvium are capable of producing PM_{10}, while Santiago Peak Volcanics is comprised of very hard metavolcanic rock that would produce very little PM_{10}. Areas proposed for development by the proposed Project are dominated by the Santiago Peak Volcanics formation, with relatively small areas mapped with alluvial materials. Most of the alluvial materials are located on the lower elevations flanks of Dictionary Hill and would be left undisturbed in the Project's open space areas. Thus, for the purposes of analysis, the working weight of earthwork material capable of generating some amount of PM_{10} is reasonably estimated to be 30% of the total working weight, calculated as 0.3 x 692,441 tons or 207,732 tons. Each phase of earthwork operations at the proposed Highlands Ranch site would occur over a total of 120 working days. Thus, the average earthwork movement per day would be 207,732 tons / 120 working days or slightly under 1,731 tons per day.

Following the analysis procedure identified in the *SCAQMD CEQA Handbook* for PM_{10} emissions from fugitive dust with design control measures (e.g., surface wetting) and maximum credible wind speed of 12 mph results in a level of approximately 55.6 pounds of PM_{10} generated per day. Based on an assumption that contractor vehicles moving on unpaved surfaces of the site would traverse a total of 25 vehicle miles per day, total daily PM_{10} emissions (i.e., grading impacts plus impacts due to off-road travel) are estimated at 67.1 pounds per day. The assumption of 25 vehicle miles per day is based on past observed vehicular travel on similar-type projects (REC Consultants, 2006). This level of 67.1 pounds per day is below the 100 pounds per day significance threshold established by SDAPCD. Therefore, less than significant impacts are expected. The above analysis assumes that surface wetting to limit excess dust generation would be incorporated as part of the Project. Without the incorporation of surface wetting measures during grading, a significant short-term impact PM_{10}

emissions impact from fugitive dust would result (**Significant Direct and Cumulative Impact 3.1-B**).

B. Long-Term Project Emissions

Motor vehicles would be the primary source of long-term air emissions associated with the proposed Project. The Project is expected to have a total worst-case trip generation level of 2,110 ADT. The calculated operational trip emission levels are shown in *Table 3-4, Predicted Vehicle Trip Emissions*. A median speed of 45 mph was used consistent with average values observed (i.e., combined freeway and surface street traffic activity). Additionally, an average trip distance of 15 miles was assumed. The average trip distance of 15 miles is based on the distance from the site to likely service areas, as summarized in Table 3-5, *Roadway Distance to Service Centers*. Based upon the findings summarized in *Table 3-4,* less than significant air quality impacts are identified due to vehicle emissions.

Table 3-4 PREDICTED VEHICLE TRIP EMISSIONS

		Aggregate Trip Emissions in Pounds / Day				
Development Phase	**ADT**	**CO**	**NO_x**	**SO_x**	**PM_{10}**	**ROG**
EMFAC Year 2004 Emission Rates (in grams/mile @ 45 MPH)						
Light Duty Autos (LDA):		3.031	1.404	0.003	0.009	0.090
Light Duty Trucks (LDT):		3.978	0.625	0.003	0.014	0.113
Medium Duty Trucks (MDT):		3.384	1.086	0.005	0.017	0.124
Heavy Duty Trucks (HDT):		4.784	9.678	0.016	0.161	0.447
Buses (UBUS):		11.315	12.657	0.016	0.111	1.000
Motorcycles (MCY):		38.719	1.646	0.002	0.033	3.097
Proposed Project Action @ 2,110 Net ADT						
Light Duty Autos (LDA):	1456	145.9	19.5	0.1	0.4	4.3
Light Duty Trucks (LDT):	409	53.8	8.5	0.0	0.2	1.5
Medium Duty Trucks (MDT):	135	15.1	4.8	0.0	0.1	0.6
Heavy Duty Trucks (HDT):	99	15.7	31.7	0.1	0.5	1.5
Buses (UBUS):	0	0.0	0.0	0.0	0.0	0.0
Motorcycles (MCY):	11	13.5	0.6	0.0	0.0	1.1
Total (Σ) =	**2110**	**244.1**	**65.1**	**0.3**	**1.2**	**9.0**
Significance Threshold (SDAPCD):		**550.0**	**250.0**	**250.0**	**100.0**	**55.0**

Assumes a 15-mile trip distance per vehicle. SDAPCD air basin. Wintertime conditions (50° F)
SOURCE: Investigative Science and Engineering, September 27, 2007

Even though vehicular emissions would result in less than significant impacts, there could still be an impact from Project implementation if the Project caused or contributed towards a localized concentration of criteria pollutants (CO, NOx or PM_{10}) in excess of CAAQS standards. Table 3-6, *CO Dispersion Results*, lists the roadway segments studied in the traffic impact analysis (see Appendix B of this SEIR) for the ultimate buildout scenario, the predicted peak hour traffic volumes, and the expected CO emissions at 100 feet from the road centerline. Values for one- and 8-hour background levels were taken at 2.0 ppm based upon measured levels. This condition would constitute the worst-case scenario from a CO concentration standpoint. Additionally, *Table 3-7, NO_x Dispersion Results,* and Table 3-8, *PM_{10} Dispersion Results*, identify the respective NO_x and PM_{10} levels due to the same roadway segments. Based upon the dispersion model findings, no localized CO, NO_x or PM_{10} impacts are identified for any roadway segment examined. The roadway segments

examined were found to comply with the CAAQS; therefore, the proposed Project would not result in a cumulatively considerable net increase of any criteria pollutants and no significant cumulative impacts would occur.

Table 3-5 ROADWAY DISTANCE TO SERVICE CENTERS

Service Center	Roadway Distance
Lemon Grove	5.6 miles
La Mesa	7.6 miles
Chula Vista	10.3 miles
National City	10.5 miles
Santee	12.1 miles
Downtown San Diego	12.5 miles
El Cajon	13.8 miles

SOURCE: Google Maps (http://maps.google.com)

Table 3-6 CO DISPERSION RESULTS

Roadway Segment Name		SEG ID	ADT(1)	1-hour CO(2,3)	8-hour CO(2,3,4)	SIG ?
Jamacha Blvd.	Grand Ave. to La Presa St.	J1	31,014	2.4	2.2	**No**
	La Presa St. to Omega St.	J2	29,152	2.4	2.2	**No**
	Omega St. to Jamacha Rd.	J3	27,815	2.4	2.2	**No**
	Jamacha Rd. to Whitestone Rd.	J4	30,164	2.4	2.2	**No**
	Whitestone Rd. to Pointe Pkwy.	J5	37,428	2.5	2.3	**No**
	Pointe Pkwy. To Sweetwater Springs	J6	44,701	2.5	2.3	**No**
	Sweetwater Springs to Calavo Dr.	J7	22,015	2.3	2.2	**No**
	Calavo Dr. to Campo Rd.	J8	43,528	2.5	2.3	**No**
Barcelona Street	North of Austin Dr	B1	3,301	2.1	2.1	**No**
	South of Austin Dr.	B2	1,800	2.0	2.0	**No**
Austin Drive	Barcelona St. to Sweetwater Springs	A1	5,342	2.1	2.1	**No**
Sweetwater Springs	Del Rio to Austin Dr.	S1	38,593	2.5	2.3	**No**
	Austin Dr. to Jamacha Blvd.	S2	28,521	2.4	2.2	**No**

(1): Average Daily Trips (Near Term Cumulative 2008 Scenario – All Projects), Source Darnell & Assoc., 9/05.
(2): Values given in ppm for 50° F standard day.
(3): Ambient level taken at 2.0 ppm CO. Values below ambient level are taken at ambient level.
(4): 8-hour persistence level taken as 0.6 x 1-hour level based upon past data trends.
De minimis levels based upon 1-hour CO levels of 20 ppm and 8-hour CO levels of 9 ppm.
SOURCE: Investigative Science and Engineering, September 27, 2007

Table 3-7 NOx DISPERSION RESULTS

Roadway Segment Name		SEG ID	ADT(1)	1-hour NOx(2)	SIG ?
Jamacha Blvd.	Grand Ave. to La Presa St.	J1	31,014	14	**No**
	La Presa St. to Omega St.	J2	29,152	14	**No**
	Omega St. to Jamacha Rd.	J3	27,815	14	**No**
	Jamacha Rd. to Whitestone Rd.	J4	30,164	14	**No**
	Whitestone Rd. to Pointe Pkwy.	J5	37,428	14	**No**
	Pointe Pkwy. To Sweetwater Springs	J6	44,701	15	**No**
	Sweetwater Springs to Calavo Dr.	J7	22,015	13	**No**
	Calavo Dr. to Campo Rd.	J8	43,528	15	**No**
Barcelona Street	North of Austin Dr	B1	3,301	9	**No**
	South of Austin Dr.	B2	1,800	9	**No**
Austin Drive	Barcelona St. to Sweetwater Springs	A1	5,342	10	**No**
Sweetwater Springs	Del Rio to Austin Dr.	S1	38,593	15	**No**
	Austin Dr. to Jamacha Blvd.	S2	28,521	14	**No**

(1): Average Daily Trips (Near Term Cumulative 2008 Scenario – All Projects), Source Darnell & Assoc., 9/05.
(2): Values given in pphm for 50° F standard day.
De minimis levels based upon 1-hour NOx levels of 25 pphm
SOURCE: Investigative Science and Engineering, September 27, 2007

Table 3-8 PM_{10} DISPERSION RESULTS

Roadway Segment Name		SEG ID	ADT(1)	PM_{10} Level(2)	Risk Level(3)	SIG ?
Jamacha Blvd.	Grand Ave. to La Presa St.	J1	31,014	5.5	0.0017	**No**
	La Presa St. to Omega St.	J2	29,152	5.4	0.0016	**No**
	Omega St. to Jamacha Rd.	J3	27,815	5.3	0.0016	**No**
	Jamacha Rd. to Whitestone Rd.	J4	30,164	5.5	0.0017	**No**
	Whitestone Rd. to Pointe Pkwy.	J5	37,428	5.9	0.0018	**No**
	Pointe Pkwy. To Sweetwater Springs	J6	44,701	6.4	0.0019	**No**
	Sweetwater Springs to Calavo Dr.	J7	22,015	4.9	0.0015	**No**
	Calavo Dr. to Campo Rd.	J8	43,528	6.3	0.0019	**No**
Barcelona Street	North of Austin Dr	B1	3,301	3.4	0.0010	**No**
	South of Austin Dr.	B2	1,800	3.2	0.0010	**No**
Austin Drive	Barcelona St. to Sweetwater Springs	A1	5,342	3.6	0.0011	**No**
Sweetwater Springs	Del Rio to Austin Dr.	S1	38,593	6.0	0.0018	**No**
	Austin Dr. to Jamacha Blvd.	S2	28,521	5.3	0.0016	**No**

(1): Average Daily Trips (Near Term Cumulative 2008 Scenario – All Projects), Source Darnell & Assoc., 9/05.
(2): PM_{10} levels given in $\mu g/m^3$. Values rounded to three significant decimal places.
(3): Diesel risk calculated using: , based upon ARB 1999 Staff Report from the Scientific Review Panel (SRP) on Diesel Toxics with F(wd)=Dilution=1.0 and URF = 300 x 10^{-6} cancer risk per $\mu g/m^3$ inhaled in a 70-year lifetime.
De minimis levels based upon CAAQS 24-hour standard of 50 $\mu g/m^3$.
Background level taken at 3.0 $\mu g/m^3$ PM_{10}.
SOURCE: Investigative Science and Engineering, September 27, 2007

In addition to vehicle emissions, the potential exists for residential fixed emissions from wood burning fireplaces. Architectural standards proposed by the Project's MUP state that "only gas fireplaces, vented or unvented, will be permitted to be installed in Highlands Ranch." However, there is no way to enforce a restriction on homeowners from installing wood burning fireplaces after sale of a home. The maximum allowable PM_{10} emission levels (based upon SDAPCD Rule 1501, 20.2(d)(2), 1995 and EPA 40CFR93, 1993) for the Highlands Ranch Project due to combined fireplace operation within each of the 211 dwelling units is 100 pounds per day. The average emission level (considered reasonable based upon the variation of wood types, material combustion rates, and end-user heating requirements) was found to be approximately 53 grams of PM_{10} per hour for a normal fireplace utilization rate. If each of the proposed 211 homes had one wood-burning fireplace and roughly 50 percent of all the wood burning fireplaces were running simultaneously (a highly improbable, but reasonable and foreseeable condition under CEQA), the pollution generation rate would be 0.5 x 211 units x 53 grams/hour-home or 5,592 grams (5.6 kilograms) of PM_{10} per hour. This equates to 12.32 pounds per hour and would exceed the allowable threshold in roughly 8.1 hours. Because 8.1 hours is longer than the normal nighttime operation time (which is typically four hours and would produce a total of roughly 49.3 pounds), operational emissions would not be regarded as a significant air quality impact.

- ***Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under applicable federal or state ambient air quality standards (including releasing emissions which exceed qualitative thresholds for ozone precursors)?***

As noted previously, the project site is located in the San Diego Air Basin, which meets state and federal air quality standards for all criteria pollutants except for Ozone (O_3) and Particulate Matter less than 10 microns (PM_{10}). The aggregate construction and operational emission levels produced by the proposed Highlands Ranch Project are shown below in Table 3-9*, Aggregated Construction Emissions*, and Table 3-10, *Aggregated Operational Emissions.* Although emissions of NOx during construction activities would exceed SDAPCD significance thresholds, as identified above, no significant construction-related or Project-related air quality impacts are identified for any of the pollutants for which the region is in non-attainment under applicable federal or state air quality standards. Additionally, as noted above, no localized cumulative concentration exceedances of CAAQS standards were indicated for either construction-related diesel toxics or vehicular emissions. No additional mitigation, other than the aforementioned NOx and PM_{10} mitigation, would be required as part of this Project. No adverse air basin impacts were identified.

- ***Would the Project expose sensitive receptors, including, but not limited to, schools, hospitals, residential care facilities, or day care centers, to substantial pollutant concentrations?***

There are no hospitals, schools, residential care facilities or day care centers adjacent to the project site. An analysis of potential impacts resulting from diesel-fired emissions for construction equipment was conducted to assess potential impacts to adjacent residences in the surrounding community. The proposed onsite construction operations were found to generate worst-case daily pollutant levels of 162.8 pounds of CO, 292.9 pounds of NOx, 27.2 pounds of SOx, and 86.6 pounds of PM_{10}. Onsite rock crushing operations (should they ultimately be required as part of the Project implementation) were found to generate worst-case daily pollutant levels of 49.4 pounds of CO, 59.3 pounds of NOx, 5.0 pounds of SOx, and 5.0 pounds of PM_{10}. These emissions are assumed to occur

over any given 24-hour day (thereby providing an upper bound on expected emission concentrations) and direct comparison with CAAQS standards. As shown in Table 3-9 and Table 3-10, Project emissions would be well below the SDAPCD thresholds for each of these pollutants. Therefore, with possible exception of PM_{10} (which is discussed further below), Project implementation would not expose sensitive receptors to substantial pollutant concentrations.

PM_{10} is a contributing factor to cancer risk. The analysis identified a worst-case PM_{10} level of 5.4 $\mu g/m^3$ occurring at a distance of 876 meters (2,874 feet) from the boundaries of the active construction site. This pollutant concentration is far below the California Ambient Air Quality Standard (CAAQS) of 50 $\mu g/m^3$ established by the State for any given 24-hour exposure period. Additionally, any nearby (standing) receptor would experience levels far less than the identified maximum (concentration values ranging between 0.7 to 3.2 $\mu g/m^3$ were indicated). Based upon model results, all criteria pollutants were found to be below the recommended risk level (both with and without onsite crushing operations), with a PM_{10} risk probability of 0.162% (or 16.2 one-hundredths of one-percent risk per 70-year exposure duration), assuming implementation of the Best Management Practices (BMPs) identified under Mitigation Measure 3.1-B. Because the proposed grading operations would only occur for an estimated duration of 1.5 years, and the calculated risk is based upon a 70-year exposure, no significant carcinogenic impact potential is expected due to proposed grading operations.

Table 3-9 AGGREGATED CONSTRUCTION EMISSIONS

Construction Scenarios	Aggregate Emissions in Pounds / Day				
	CO	NO_x	SO_x	PM_{10}	ROG
Proposed Project Action:					
Construction Vehicle Emissions - Grading / Hauling Operations (Table 3-2):	113.4	233.6	22.2	14.5	24.8
Rock Crushing Operations (Table 3-3):	49.4	59.3	5.0	5.0	7.4
Surface Grading Dust Generation (w/ BMP[1]):	-	-	-	55.6	-
Off Road Powered Haulage:	-	-	-	11.5	-
Proposed Project Action Totals (Σ):	**162.8**	**292.9**	**27.2**	**86.6**	**32.2**
Proposed Action Totals w/ No_x Control Mitigation of 20% (Σ)[2]:	**162.8**	**234.3**	**27.2**	**86.6**	**32.2**
Significance Threshold (SDAPCD):	**550.0**	**250.0**	**250.0**	**100.0**	**55.0**

1. *Assumes that on-site vehicular speeds will be restricted to 25 mph, and that surface watering will occur during grading operations, in accordance with Mitigation Measure 3.1-B.*
2. *Assumes that BMPs will be implemented to reduce NO_x emissions (see Mitigation Measure 3.1-A).*

SOURCE: Investigative Science and Engineering, September 27, 2007

Table 3-10 AGGREGATED OPERATIONAL EMISSIONS

OPERATIONAL SCENARIOS	Aggregate Emissions in Pounds / Day				
	CO	NO_x	SO_x	PM_{10}	ROG
Proposed Project Action:					
Operational Vehicular Traffic Generation (Table 3-4):	244.1	65.1	0.3	1.2	9.0
Fireplace Emissions (4 Hour Burn Time):	-	-	-	49.3	-
Proposed Project Action Totals (Σ):	**244.1**	**65.1**	**0.3**	**50.5**	**9.0**
Significance Threshold (SDAPCD):	**550.0**	**250.0**	**250.0**	**100.0**	**55.0**

SOURCE: Investigative Science and Engineering, September 27, 2007

The Project generated PM_{10} level is expected to approach zero at distances of approximately 5,748 feet (1.08 miles) from the proposed construction area. No cumulative contribution of PM_{10} from construction at the site would be physically possible beyond this point.

- ***Would the Project create objectionable odors affecting a substantial number of people?***

The inhalation of volatile organic compounds (VOCs) causes smell sensations in humans. Odor generation impacts due to construction of the Project (such as diesel emissions due to construction, roofing material application, etc.) would not be significant because the nearest existing sensitive receptor is located over 250 feet away from the Project, and any odor generation would be intermittent and would terminate upon completion of the construction phase of the Project. As a result, no significant air quality impacts are expected due to odors.

3.1.4 Cumulative Impact Analysis

In the short-term, simultaneous operation of the rock crushing unit (if required) and onsite grading operations would produce approximately 292.9 pounds per day of NO_X, which exceeds the SDAPCD allowable level of 250 pounds per day. When considered in conjunction with all cumulative projects examined (see *Table 1-5*), Project implementation has the potential to result in significant air quality impacts. Prior to mitigation, a short-term significant direct and cumulative impact to air quality from NO_X emissions would result should the rock crushing plant be required (**Significant Direct and Cumulative Impact 3.1-A**).

In addition, fugitive dust emissions resulting from construction activities of all cumulative projects examined (see *Table 1-5*), has the potential to result in significant air quality impacts if surface wetting is not applied to each construction site and if on-site vehicular construction vehicle speeds are not restricted. Worst-case aggregate construction-related emissions that would result from implementation of the proposed Project would be slightly less than 87 pounds of PM_{10} per day with the application of design control measures during grading, as required by Mitigation Measure 3.1-B. This level is below the 100 pounds per day threshold established by SDAPCD. Without design control measures to limit excess dust generation during grading of all cumulative projects, a significant short-term impact due to PM_{10} emissions from fugitive dust would result (**Significant Direct and Cumulative Impact 3.1-B**).

As discussed in more detail previously, the proposed Project would not result in any localized cumulative exceedances of CAAQS standards (refer to Table 3-6 through Table 3-8). Dispersion calculations were conducted for CO, NO_x and PM_{10} for buildout conditions along area roadways and no significant impacts were identified for any roadway segment examined.

The Highlands Ranch SPA proposes the development of 211 single-family detached homes, two private parks, supporting roadways and infrastructure surrounded by open space. As identified above, wood burning fireplaces will not be installed in the community. If a homeowner installs a wood burning fireplace after they purchase their home, the small cumulative contribution to emissions of PM_{10} emissions would not be considerable. Over 100 homes would have to simultaneously burn wood in fireplaces for a continuous 8 hours to create an impact, which is highly improbable.

3.1.5 Mitigation Measures

Significant Direct and Cumulative Impact 3.1-A: *Should the rock crushing plant be required during project grading activities, Project implementation would exceed the SDAPCD construction-related air quality standards for oxides of nitrogen (NOx), which would be regarded as a significant direct and cumulative impact.*

3.1-A: During operation of the on-site rock crusher, the following Best Management Practices (BMPs) shall be implemented during construction activities in order to reduce NO_x emissions:

- Use electricity from power poles rather than temporary diesel power generators for all stationary construction equipment (estimated 50% reduction in emissions).
- The construction supervisor shall instruct all diesel-fueled construction vehicle operators to restrict idling times to five minutes and to turn off engines when vehicles are not in use. Idling restrictions shall be noted on all grading plans and construction drawings.
- Construction equipment operating onsite shall be equipped with two to four degree engine timing retard or pre-combustion chamber engines (estimated 20% reduction in emissions).
- Daily NO_x monitoring on the project site shall be performed by an Air Quality engineer approved by the County during operation of the rock crusher. Should NOx levels over the 1-hr CAAQS for NO_2 or 0.25 ppm be identified, use of the rock crusher shall be temporarily suspended until applicable control measures are implemented as required by the Air Quality engineer.

Significant Direct and Cumulative Impact 3.1-B: *Without incorporation of design control measures during grading, a significant short-term impact due to PM_{10} emissions from fugitive dust would result.*

3.1-B: In conformance with Section 87.101 (et seq.) of the County's Grading Ordinance, the following design control measures shall be implemented into the construction plan in order to reduce the potential for dust generation (i.e., PM_{10}) during construction activities:

- In disturbed areas, ground cover shall be replaced as quickly as possible, in conformance with Section 87.417(a) of the County's Grading Ordinance (estimated 10% reduction in PM_{10} emissions);
- Enclose, cover, water twice daily, or apply non-toxic soil binders according to manufacturers' specification to exposed piles (i.e., gravel, sand, and dirt) with 5% silt content, in conformance with Section 87.428 of the County's Grading Ordinance (estimated 30% reduction in PM_{10} emissions);
- In conformance with Section 87.428 of the County's Grading Ordinance, during construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this should include wetting down such areas in the late morning and after work is

completed for the day. Increased watering frequency should be required whenever the wind speed exceeds 15 mph. Reclaimed water should be used whenever possible (estimated 50% reduction in PM_{10} emissions);

- Suspend all excavating and grading operations when wind speeds exceed 25 mph (estimated 30% reduction in PM_{10} emissions);
- All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer) in accordance with the requirements of California Vehicle Code (CVC) Section 23114 (estimated 15% reduction in PM_{10} emissions);
- Restrict onsite vehicle speeds on unpaved surfaces to 15 miles per hour or less, in conformance with Section 87.428 of the County's Grading Ordinance (estimated 30% reduction in PM_{10} emissions). Submit to the Director, Department of Planning and Land Use evidence that temporary 15 MPH signs have been placed along unpaved roads and/or haulways before construction occurs. Evidence shall include photographs of the signs placed on the project site and a stamped, signed statement from a California Registered Engineer, or licensed surveyor that 15 MPH speed signs have been placed along these routes;
- Gravel pads must be installed at all access points to prevent tracking of mud on to public roads, in conformance with Section 87.428 of the County's Grading Ordinance (estimated 5% reduction in PM_{10} emissions);
- In conformance with Section 87.422(a) of the County's Grading Ordinance, the contractor or builder shall designate a person or persons as a "Permit Compliance Engineer" to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holiday and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the Air Pollution Control District prior to land use clearance for map recordation and land use clearance for finish grading for the structure;
- In conformance with Section 87.208(b)(7) of the County's Grading Ordinance, prior to land use clearance, the applicant shall include, as a note on a separate informational sheet, these dust control requirements. All requirements shall be shown on grading and building plans;
- In conformance with Section 87.428 of the County's Grading Ordinance, sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads (recommended water sweepers with reclaimed water; estimated 10% reduction in PM_{10} emissions);
- In conformance with Section 87.428 of the County's Grading Ordinance, apply water three times daily (or as needed) to all unpaved roads and parking or staging areas (estimated 30% reduction in PM_{10} emissions);
- Periodic (once weekly) PM_{10} monitoring shall be performed by a County-approved Air Quality engineer to ensure compliance with the County's Grading Ordinance. Should PM_{10} emissions be found to exceed an ambient air quality concentration

increase of 5 parts per billion, grading activities shall be temporarily reduced until control measures are implemented as required by the Air Quality engineer.

3.1.6 Conclusions

Significant Direct and Cumulative Impact 3.1-A: Mitigation Measure 3.1-A imposes two specific measures that have been identified by the CARB to be effective in reducing NOx emissions. According to the CARB, the use of electricity from power poles in lieu of temporary diesel power generators are estimated to reduce NOx emissions by 50% based on combined conventional and hydroelectric utilization. In addition, the use of construction equipment equipped with two to four degree engine timing retard or pre-combustion chamber engines is estimated to reduce NOx generation by 20%. Implementation of either of these mitigation requirements would reduce NOx generation from 292.9 pounds per day to 146.45 or 234.32 pounds per day, respectively. Therefore, either of these proposed mitigation measures would reduce NOx emissions during construction operations to below the SDAPCD threshold of 250 pounds per day. In addition, air quality monitoring during construction, as is also required by Mitigation Measure 3.1-A, would further ensure that Project construction activities do not exceed the SDACPD thresholds for NOx emissions during construction. Therefore, with implementation of Mitigation Measure 3.1-A, NOx emissions during construction would be reduced to a level below significance.

Significant Direct and Cumulative Impact 3.1-B: Mitigation Measure 3.1-B imposes twelve unique measures that have been identified by the CARB to be effective in reducing PM_{10} emissions. Proper implementation of any of these measures (through BMP) is expected to reduce PM_{10} emissions by 10 to 50 percent. Based on the analysis provided in the Project-specific Air Quality study, a combination of restricting vehicular speeds and surface wetting during grading operations would reduce daily PM_{10} emissions to 67.1 pounds per day. Air quality monitoring during construction, as required by Mitigation Measure 3.1-B, would further ensure that PM_{10} emissions during construction activities are maintained below the SDAPCD thresholds. Therefore, with implementation of Mitigation Measure 3.1-B, PM_{10} emissions during construction would be reduced to a level below significance.