

**APPENDIX 3**

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**Air Quality Emissions Results**

## 5.1 BAAQMD THRESHOLDS

**Table A-1  
BAAQMD CEQA Thresholds  
Construction-Related Activities**

<b>Pollutant/Parameter</b>	<b>Proposed Threshold of Significance</b>
Reactive Organic Gas (ROG) Emissions	54 lbs/day
Nitrogen Oxide (NO <sub>x</sub> ) Emissions	54 lbs/day
Particulate Matter (10 micron) (PM <sub>10</sub> ) Emissions	82 lbs/day
Particulate Matter (2.5 micron) (PM <sub>2.5</sub> ) Emissions	54 lbs/day
Fugitive Dust	Best Management Practices
Lifetime Excess Cancer Risk	10-in-a-million
Non-Cancer Hazard	1.0
PM <sub>2.5</sub> Annual Average Ambient Concentration	0.3 µg/m <sup>3</sup>

Source: BAAQMD 2009

**Table A-2  
BAAQMD CEQA Thresholds  
Operation-Related Activities**

<b>Pollutant/Parameter</b>	<b>Proposed Threshold of Significance</b>
Reactive Organic Gas (ROG) Emissions	54 lbs/day; 10 tons/yr
Nitrogen Oxide (NO <sub>x</sub> ) Emissions	54 lbs/day; 10 tons/yr
Particulate Matter (10 micron) (PM <sub>10</sub> ) Emissions	82 lbs/day; 15 tons/yr
Particulate Matter (2.5 micron) (PM <sub>2.5</sub> ) Emissions	54 lbs/day; 10 tons/yr
Fugitive Dust	54 lbs/day; 10 tons/yr
Carbon Monoxide (CO) Ambient Concentration	9.0 ppm (8-hr); 20.0 ppm (1-hr)
Lifetime Excess Cancer Risk	10-in-a-million <sup>a</sup>

Pollutant/Parameter	Proposed Threshold of Significance
Non-Cancer Hazard	1.0 <sup>a</sup>
PM <sub>2.5</sub> Annual Average Ambient Concentration	0.3 µg/m <sup>3a</sup>
Odors	Screening Level distance or complaint history

*a Or compliance with a Qualified Community Risk Reduction Plan adopted by the local jurisdiction with enforceable measures to reduce the community risk.*

*Note: Greenhouse gas thresholds are described in Section 5.9, Greenhouse Gas Emissions.*

*Source: BAAQMD 2009*

## 5.2 PROPOSED ACTION

### Methodology

The emissions from mobile sources and area sources were estimated using URBEMIS2007, in accordance with emission factors and parameters recommended by the BAAQMD. A boiler would operate on-site and would have a heat input rating of 0.9 million British thermal units per hour, which is generally considered to be a small industrial boiler. As a conservative measure, it was assumed the boiler would operate every day for 24 hours. Emission factors were obtained from the U.S. Environmental Protection Agency's (US EPA) AP 42 (US EPA 1995). Emissions of NO<sub>x</sub> were assumed to meet 30 parts per million (ppm), in accordance with Best Available Control Technology (BACT).

Criteria pollutant emissions associated with the emergency generators were calculated using emission standards for off-road diesel (compression-ignition) engines established by the California Air Resources Board (CARB) and the US EPA. Because the engines would have an output rating greater than 50 horsepower, these units must comply with CARB's Airborne Toxics Control Measure (ATCM) for stationary compression-ignition engines. The ATCM requires that new emergency standby engines must comply with hydrocarbon, NO<sub>x</sub>, and CO limits that are applicable to an off-road engine of the same model year and horsepower rating. The ATCM further limits the PM emissions from an emergency standby engine to either (1) 0.15 gram per horsepower-hour (g/hp-hr) (with a maximum operating limit of 50 hours per year for testing and maintenance) or 0.01 g/hp-hr (with a maximum operating limit of 100 hours per year for testing and maintenance), or (2) the emission limit for an off-road engine with the same maximum rated power, whichever is more stringent. For the ratings of the proposed engines, assuming a 2010 model year or later, the 0.15 g/hp-hr limit is the applicable PM limit under California and federal standards for off-road engines; however, UC LBNL has proposed to use engines that meet more stringent emission standards. UC LBNL has also proposed to restrict the operating hours to 50 hours per year for testing and maintenance. Since June 2006, the sulfur content of available CARB diesel fuel has been 15

ppm (0.0015 percent) by weight, and this concentration was used to estimate the sulfur oxide (SO<sub>x</sub>) emissions from the proposed engines.

The proposed project would operate five cooling towers with a maximum circulating water flow rate of 1,465 gallons per minute and a standard flow rate of 735 gallons per minute. The emissions associated with daily operation of the cooling towers were calculated using the maximum flow rate to represent a worst-case day scenario. The emissions associated with cooling towers were calculated using emission factors contained US EPA's AP 42 (US EPA 1995).

## Results

**Table A-3**  
**Estimated Proposed Action Construction Emissions**

Year	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2010	0.18	1.51	0.79	0.00	0.83	0.23
2011	0.19	1.29	1.83	0.00	0.08	0.07
2012	0.18	1.19	1.73	0.00	0.08	0.07
2013	1.51	0.99	1.17	0.00	0.07	0.06
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

**Table A-4**  
**Modeled PM<sub>2.5</sub> Concentrations (Construction)**

Emissions Source	Averaging Period	Maximum Concentration (micrograms per cubic meter)	Chronic Hazard	
			LECR	Index
Grading/Trenching	Annual	0.022	0.9	0.004
Building Construction	Annual	0.018	0.7	0.004
BAAQMD Thresholds	Annual	0.3	10	1.0
Exceeds Threshold?		NO	NO	NO

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

**Table A-5**  
**Estimated Proposed Action Operational Emissions**

Emissions Source	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Stationary Sources						
Boiler	0.02	0.14	0.32	0.00	0.03	0.03
750 kW Generator <sup>1</sup>	0.00	0.29	0.01	0.00	0.00	0.00
750 kW Generator <sup>1</sup>	0.00	0.29	0.01	0.00	0.00	0.00
Cooling Towers	--	--	--	--	0.05	0.05
Operational (Mobile) Sources	0.52	0.49	4.63	0.00	0.84	0.16
Area Sources	0.15	0.15	0.27	0.00	0.00	0.00
<b>Emission Totals</b>	<b>0.69</b>	<b>1.36</b>	<b>5.24</b>	<b>0.00</b>	<b>0.92</b>	<b>0.24</b>
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	-

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

<sup>1</sup> Assumes 50 hours per year for testing and maintenance.

kW = kilowatt

**Table A-6**  
**Modeled PM<sub>2.5</sub> Concentrations (Operational)**

Emissions Source	Averaging Period	Maximum PM <sub>2.5</sub> Concentration (micrograms per cubic meter)
Stationary/Area Sources	Annual	0.016
BAAQMD Thresholds	Annual	0.3
Exceeds Threshold?		NO

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

**Table A-7**  
**Summary of Maximum Modeled Cancer Risks**

Receptor	Cancer Risk
On-Site	
Worker	$0.04 \times 10^{-5}$
Off-Site	
Child/Adult Resident	$0.04 \times 10^{-5}$

*Source: Golder Associates 2007; Impact Sciences 2010*

**Table A-8**  
**Summary of Maximum Modeled Chronic Noncancer Health Impacts**

Receptor	Chronic Hazard Index
On-Site	
Worker	0.004
Off-Site	
Resident	0.0004

*Source: Golder Associates 2007; Impact Sciences 2010*

### 5.3 ALTERNATIVE 1, CAFETERIA PARKING LOT SITE

**Table A-9**  
**Estimated Construction Emissions – Alternative 1**

Year	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2010	0.15	1.30	0.68	0.00	0.20	0.09
2011	0.19	1.29	1.83	0.00	0.08	0.07
2012	0.18	1.19	1.73	0.00	0.08	0.07
2013	1.51	0.99	1.17	0.00	0.07	0.06
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

**Table A-10**  
**Estimated Operational Emissions – Alternative 1**

Emissions Source	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Stationary Sources						
Boiler	0.02	0.14	0.32	0.00	0.03	0.03
750 kW Generator <sup>1</sup>	0.00	0.29	0.01	0.00	0.00	0.00
750 kW Generator <sup>1</sup>	0.00	0.29	0.01	0.00	0.00	0.00
Cooling Towers	--	--	--	--	0.05	0.05
Operational (Mobile) Sources						
Area Sources	0.52	0.49	4.63	0.00	0.84	0.16
<b>Emission Totals</b>	<b>0.69</b>	<b>1.36</b>	<b>5.24</b>	<b>0.00</b>	<b>0.92</b>	<b>0.24</b>
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

<sup>1</sup> Assumes 50 hours per year for testing and maintenance.

## 5.4 ALTERNATIVE 2, RFS SITE

**Table A-11**  
**Estimated Construction Emissions – Alternative 2**

Year	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2010	0.18	1.51	0.79	0.00	0.29	0.11
2011	0.19	1.29	1.83	0.00	0.08	0.07
2012	0.18	1.19	1.73	0.00	0.08	0.08
2013	1.51	0.99	1.17	0.00	0.07	0.06
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

**Table A-12**  
**Estimated Operational Emissions – Alternative 2**

Emissions Source	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Stationary Sources						
Boiler	0.02	0.14	0.32	0.00	0.03	0.03
750 kW Generator <sup>1</sup>	0.00	0.29	0.01	0.00	0.00	0.00
750 kW Generator <sup>1</sup>	0.00	0.29	0.01	0.00	0.00	0.00
Cooling Towers	—	—	—	—	0.05	0.05
Operational (Mobile) Sources						
Area Sources	1.16	1.09	10.30	0.01	1.87	0.36
<b>Emission Totals</b>	<b>1.33</b>	<b>1.96</b>	<b>10.91</b>	<b>0.01</b>	<b>1.95</b>	<b>0.44</b>
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

<sup>1</sup> Assumes 50 hours per year for testing and maintenance.

## 5.5 ALTERNATIVE 3, FORMER DHS SITE

**Table A-13**  
**Estimated Construction Emissions – Alternative 3**

Year	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2010	0.18	1.51	0.79	0.00	0.16	0.09
2011	0.19	1.29	1.83	0.00	0.08	0.07
2012	0.18	1.19	1.73	0.00	0.08	0.08
2013	1.51	0.99	1.17	0.00	0.07	0.06
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

**Table A-14**  
**Estimated Operational Emissions – Alternative 3**

Emissions Source	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Stationary Sources						
Boiler	0.02	0.14	0.32	0.00	0.03	0.03
750 kW Generator <sup>1</sup>	0.00	0.29	0.01	0.00	0.00	0.00
750 kW Generator <sup>1</sup>	0.00	0.29	0.01	0.00	0.00	0.00
Cooling Towers	–	–	–	–	0.05	0.05
Operational (Mobile) Sources						
Area Sources	0.88	0.83	7.81	0.00	1.42	0.27
<b>Emission Totals</b>	<b>1.05</b>	<b>1.70</b>	<b>8.42</b>	<b>0.00</b>	<b>1.50</b>	<b>0.35</b>
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

<sup>1</sup> Assumes 50 hours per year for testing and maintenance.

## 5.6 ALTERNATIVE 4, LEASED FACILITY ON SAN PABLO AVENUE

**Table A-15**  
**Estimated Construction Emissions – Alternative 4**

Year	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2010	0.05	0.35	0.49	0.00	0.02	0.02
2011	0.19	1.29	1.83	0.00	0.08	0.07
2012	0.18	1.19	1.73	0.00	0.08	0.08
2013	1.43	0.54	0.82	0.00	0.03	0.03
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

<sup>1</sup> Assumes 50 hours per year for testing and maintenance.

**Table A-16**  
**Estimated Operational Emissions – Alternative 4**

Emissions Source	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Stationary Sources						
Boiler	0.02	0.14	0.32	0.00	0.03	0.03
750 kW Generator <sup>1</sup>	0.00	0.29	0.01	0.00	0.00	0.00
750 kW Generator <sup>1</sup>	0.00	0.29	0.01	0.00	0.00	0.00
Cooling Towers	—	—	—	—	0.05	0.05
Operational (Mobile) Sources						
Area Sources	1.02	0.96	9.07	0.01	1.64	0.31
<b>Emission Totals</b>	<b>1.19</b>	<b>1.83</b>	<b>9.68</b>	<b>0.01</b>	<b>1.72</b>	<b>0.39</b>
De minimis levels	100	100	100	100	100	--
Exceeds de minimis level?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.

Totals in table may not appear to add exactly due to rounding in the computer model calculations.

<sup>1</sup> Assumes 50 hours per year for testing and maintenance.

## 5.7 ALTERNATIVE 5, NO ACTION

**Table A-17**  
**Estimated Operational Emissions – Alternative 5**

Emissions Source	Emissions in Tons per Year					
	ROG	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Operational (Mobile) Sources	0.27	0.20	2.14	0.00	0.40	0.07
Area Sources	0.10	0.09	0.33	0.00	0.00	0.00
<b>Emission Totals</b>	<b>0.37</b>	<b>0.29</b>	<b>2.47</b>	<b>0.00</b>	<b>0.40</b>	<b>0.08</b>
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

*Source: Impact Sciences, Inc.*

*Totals in table may not appear to add exactly due to rounding in the computer model calculations.*