

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT**

**Genentech, Inc.**

**Plant Number: A1257**

**Application Number: 24594**

**BACKGROUND**

Genentech, Inc. (Genentech) is subject to the requirements of Title V of the Federal Clean Air Act, Part 70 of Volume 40 of the Code of Federal Regulations (CFR), and BAAQMD Regulation 2, Rule 6, Major Facility Review because it is a major facility as defined by BAAQMD Regulation 2-6-212. Genentech is a major facility because it has the PTE ("potential to emit") more than 100 tons per year of nitrogen oxides (NOx) and 100,000 tons per year of greenhouse gases (GHG). Major facilities that are willing to accept federally enforceable permit conditions that limit emissions to less than Title V thresholds can apply for a Synthetic Minor Operating Permit. Based on 2011 usage data, it is estimated that actual emissions at Genentech are below major facility thresholds. Therefore, Genentech has elected to apply for a Synthetic Minor permit.

This permit will establish federally enforceable permit conditions to limit the facility to a maximum of 90,000 tons/yr of GHG and 95 tons/yr of regulated air pollutants. Synthetic Minor permits must have practically enforceable limits and conditions that ensure that emissions never exceed major facility thresholds. The permit may also contain limits and conditions that have been established pursuant to other BAAQMD rules and regulations but do not contribute to the synthetic minor limits.

**SITE DESCRIPTION**

Genentech is a biotechnology corporation that uses human genetic information to discover, develop, manufacture, and commercialize medicines to treat patients with serious or life-threatening medical conditions. Genentech was founded in 1976 and has become a member of the Roche Group since March 2009. Genentech's South San Francisco campus currently serves as the headquarters for Roche pharmaceutical operations in the United States.

**POTENTIAL TO EMIT**

Genentech has various permitted and exempt sources that can be categorized into the following categories: (1) boilers, (2) diesel generators, (3) laboratories, (4) tanks, (5) wipe cleaning, and (6) sterilizer.

Using EPA and BAAQMD emission factors, permit limits, and facility data, BAAQMD has estimated the PTE of regulated air pollutants for all permitted and exempt sources at the facility. Details of these estimates are presented in Appendix A. These estimates are summarized below in Table 1.

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Table 1. Potential to Emit of Regulated Air Pollutants – Facility Wide

Sources	Criteria Pollutant Potential Emissions					
	NO <sub>x</sub> Emissions	CO Emissions	SO <sub>2</sub> Emissions	POC Emissions	NPOC Emissions	PM <sub>10</sub> Emissions
	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
Boilers <sup>1</sup>	54.4	64.1	0.6	5.7	--	7.8
Diesel Engines	270.6	20.1	46.3	8.5	--	2.0
Laboratories	--	--	--	12.8	1.5	--
Tanks	--	--	--	0.1	0.1	--
Wipe Cleaning	--	--	--	23.9	--	--
Sterilizer	--	--	--	0.0	--	--
<b>Total (tons/year)</b>	<b>325.0</b>	<b>84.3</b>	<b>47.0</b>	<b>51.1</b>	<b>1.6</b>	<b>9.8</b>

**Notes**

1. For purposes of this emissions summary table, the term "boilers" refers to boilers, water heaters, process heaters, and heaters.

Using EPA emission factors or CATEFs, permit limits, and facility data, BAAQMD has estimated the PTE of hazardous air pollutants for all permitted and exempt sources at the facility. Details of these estimates are presented in Appendix B. These estimates are summarized below in Table 2.

Table 2. Potential to Emit of Hazardous Air Pollutants – Facility Wide

Air Toxics	Source			Total Emissions (tons/yr)
	Boilers <sup>1</sup>	Diesel Generators	Exempt Labs	
Acetaldehyde	1.5E-02	1.1E-01	1.5E-04	1.3E-01
Acetonitrile	--	--	1.9E+00	1.9E+00
Acrolein	2.8E-03	1.4E-02	--	1.7E-02
Aniline	--	--	1.4E-04	1.4E-04
Arsenic	2.1E-04	--	--	2.1E-04
Benzene	8.9E-03	1.4E-01	5.0E-04	1.5E-01
Beryllium	1.2E-05	--	--	1.2E-05
Bromine and compounds	--	--	9.6E-04	9.6E-04
Cadmium	1.1E-03	--	--	1.1E-03
Carbon Disulfide	--	--	5.0E-03	5.0E-03
Carbon tetrachloride	--	--	9.2E-04	9.2E-04
Chlorine	--	--	8.6E-04	8.6E-04
Chlorobenzene	--	--	5.2E-05	5.2E-05
Chloroform	--	--	8.1E-03	8.1E-03
Chromium	1.4E-03	--	--	1.4E-03
Cobalt	8.6E-05	--	--	8.6E-05
Cresol	--	--	2.8E-05	2.8E-05
Cyanide	--	--	2.5E-04	2.5E-04
Dichlorobenzene	1.2E-03	--	--	1.2E-03
Dichloroethane, 1,2-	--	--	1.7E-03	1.7E-03
Diethanolamine	--	--	4.7E-05	4.7E-05

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Dimethylformamide, N,N-	--	--	7.5E-02	7.5E-02
Dioxane, 1,4-	--	--	1.6E-02	1.6E-02
Ethyl Benzene	9.8E-03	--	--	9.8E-03
Ethylene glycol	--	--	7.1E-03	7.1E-03
Formaldehyde	6.9E-01	1.2E+00	2.3E-02	1.9E+00
Hexane	1.9E+00	--	4.0E-01	2.2E+00
Hydrazine	--	--	5.6E-07	5.6E-07
Lead	5.1E-04	--	--	5.1E-04
Manganese	3.9E-04	--	--	3.9E-04
Mercury	2.7E-04	--	--	2.7E-04
Methanol	--	--	1.9E+00	1.9E+00
Methyl Isobutyl ketone (Hexone)	--	--	2.0E-03	2.0E-03
Methyl tertiary-butyl ether	--	--	5.6E-03	5.6E-03
Methylene Chloride	--	--	1.5E+00	1.5E+00
Naphthalene	6.3E-04	6.1E-02	--	6.2E-02
Nickel	2.2E-03	--	--	2.2E-03
Nitrosodimethylamine, N-	--	--	1.1E-07	1.1E-07
Phenol	--	--	1.7E-03	1.7E-03
Propylene oxide	--	--	1.1E-03	1.1E-03
Selenium	2.5E-05	--	--	2.5E-05
Toluene	3.8E-02	6.1E-02	2.7E-02	1.3E-01
Triethylamine	--	--	1.5E-03	1.5E-03
Xylenes	2.8E-02	4.3E-02	2.8E-01	3.5E-01
1,3-Butadiene	--	5.8E-03	--	5.8E-03
<b>Total Emissions</b>			<b>10.4</b>	

Notes

1. For purposes of this emissions summary table, the term "boilers" refers to boilers, water heaters, process heaters, and heaters.

Using 40 CFR Part 98 emission factors, permit limits, and facility data, BAAQMD has estimated the PTE of GHG for all permitted and exempt sources at the facility. Details of these estimates are presented in Appendix C. These estimates are summarized below in Table 3.

Table 3. Potential to Emit of GHG – Facility Wide

Sources	CO <sub>2</sub> e Potential Emissions
	(tons/year)
Boilers <sup>1</sup>	122,729
Diesel Engines	24,452
<b>Total</b>	<b>147,182</b>

Notes

1. For purposes of this emissions summary table, the term "boilers" refers to boilers, water heaters, process heaters, and heaters. CO<sub>2</sub>e stands for carbon dioxide equivalent.

As demonstrated above, Genentech's PTE of any of CO, SO<sub>2</sub>, POC, NPOC, PM<sub>10</sub> is below major facility threshold (95 tons/year), Genentech's PTE of any single hazardous air pollutant is below major facility

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threshold (9 tons/year), and Genentech's PTE of any combination of hazardous air pollutants is below major facility threshold (23 tons/year). However, Genentech's PTE of NO<sub>x</sub> exceeds major facility threshold (95 tons/year) and its PTE of GHG, as CO<sub>2</sub> equivalent (CO<sub>2</sub>e), also exceeds major facility threshold (100,000 tons/year). However, the estimated actual emissions of NO<sub>x</sub> and GHG are significantly below both PTEs and the Major Source thresholds. Therefore, Genentech is applying for a Synthetic Minor Operating Permit (SMOP).

Table 4 below summarizes the actual NO<sub>x</sub> and GHG emissions from the facility based on 2011 usage data. Details of these calculations are presented in Appendix D.

Table 4. Actual Emissions of NO<sub>x</sub> and GHG – Facility Wide

Type	Fuel Type (Unit)	CO <sub>2</sub> e (tons/year)	NO <sub>x</sub> (tons/year)
Permitted boilers	Natural gas (MMBtu)	25,689	3.9
Exempt small boilers	Natural gas (MMBtu)	14,412	12.1
Permitted ICE	Diesel oil (gal)	432	4.6
<b>2011 Total</b>		<b>40,534</b>	<b>20.6</b>

#### **SYNTHETIC MINOR OPERATING PERMIT**

In order to be eligible for a Synthetic Minor permit, a site must either have a maximum potential to emit that is less than each Title V emission threshold (less than 95 tons/year of NO<sub>x</sub>, CO, POC, PM<sub>10</sub>, and SO<sub>2</sub>, less than 9 tons/year of any single hazardous air pollutant (HAP), and less than 23 tons/year of all HAPs combined) or must accept conditions limiting the site to less than these emissions thresholds (Regulation 2-6-423). In addition, EPA has recently adopted Title V permitting threshold for GHG emissions that became effective for all sites on July 1, 2011. Any site that has the potential to emit more than 100,000 tons/year of GHG (expressed as CO<sub>2</sub> equivalent) will be deemed a major facility and required to obtain a Title V permit. To be eligible for a Synthetic Minor Operating Permit for GHG emissions, the facility must accept conditions limiting its GHG emissions to 90% of the Title V emission threshold, or 90,000 tons/year on a CO<sub>2</sub> equivalent basis, pursuant to Regulation 2-6-423.2.2.

Genentech has proposed the addition of federally enforceable throughput limitations such that NO<sub>x</sub> emissions will be less than 95 tons/yr and CO<sub>2</sub>e emissions will be less than 90,000 tons/yr. Compliance with these limits will be demonstrated on a rolling monthly basis through the use of an emission calculation procedure that applies a throughput to an established emission factor to each source or source group.

#### **DETERMINATION OF EMISSIONS**

Genentech's emissions of NO<sub>x</sub> and GHG arise from the combustion of fuels (i.e., natural gas and diesel fuel) in stationary sources. Other source groups (i.e., laboratories, tanks, wipe cleaning, and sterilizer) do not contribute to emissions of NO<sub>x</sub> and GHG.

##### Combustion Sources Fired by Natural Gas

Genentech will use its facility-wide gas meter to measure throughput of natural gas used by natural gas fired equipment. Each of the permitted natural gas fired equipment at the facility has a non-resettable totalizing fuel meter to measure the natural gas usage. The natural gas usage in permit-exempt natural

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gas fired equipment is calculated by subtracting the natural gas usage by all the permitted natural gas fired equipment from the facility-wide natural gas usage.

The NO<sub>x</sub> emissions from all permitted natural gas fired equipment are calculated using the NO<sub>x</sub> permit limit for each source. The NO<sub>x</sub> emissions from permit-exempt natural gas fired equipment are calculated using 0.0980 lb/MMBtu as the emission factor (from Table 1.4-2 of Section 1.4 (Natural Gas Combustion) of EPA's AP-42, 5<sup>th</sup> Edition).

The CO<sub>2</sub>e emissions from all natural gas fired equipment are based on the following emission factors and Global Warming Potentials (GWPs) from 40 CFR Part 98 as well as kg-to-lb mass conversion factor:

- a. CO<sub>2</sub> emission factor: 53.02 kg/MMBtu
- b. CH<sub>4</sub> emission factor: 0.001 kg/MMBtu
- c. N<sub>2</sub>O emission factor: 0.0001 kg/MMBtu
- d. CO<sub>2</sub> GWP: 1
- e. CH<sub>4</sub> GWP: 21
- f. N<sub>2</sub>O GWP: 310
- g. 1 kg = 2.2046 lbs

Simplified, the CO<sub>2</sub>e emission factor for all natural gas fired equipment is 117.0 lb/MM BTU, which is derived as follows:

$$((53.02 \text{ kg/MMBtu} * 1) + (0.001 \text{ kg/MMBtu} * 21) + (0.0001 \text{ kg/MMBtu} * 310)) * 2.2046 \text{ lbs/kg} \\ = 117.0 \text{ lb/MMBtu}$$

Combustion Sources Fired by Diesel Fuel

Genentech will use non-resettable hour meters to measure throughput of diesel fuel used by diesel fuel fired equipment. If diesel fuel usage and engine load are not measured but run time is recorded, Genentech shall assume an engine operated at full load and maximum fuel use rate its entire run time.

The NO<sub>x</sub> emissions from all diesel fuel fired equipment that has CARB-certified emission limits are calculated using respective CARB-certified NO<sub>x</sub> emission limits. For the diesel fuel fired equipment that does not have CARB-certified emission limits, emission factors for NO<sub>x</sub> are the emission limits used in respective BAAQMD permit applications. The emission limits for NO<sub>x</sub> for all diesel fuel fired equipment are tabulated in Table D3 of this SMOP Evaluation Report.

Alternatively, the NO<sub>x</sub> emissions from diesel fuel fired equipment may be calculated using the following method as proposed by Genentech: Emission factors for NO<sub>x</sub> are the respective CARB-certified emission limits for NO<sub>x</sub> for all of the sources in this category; or, if applicable, the respective emission limits for NO<sub>x</sub> found in EPA's Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, Final Rule, 2006 (available at [www.epa.gov/ttn/atw/nsps/cinsps/fr11jy06.pdf](http://www.epa.gov/ttn/atw/nsps/cinsps/fr11jy06.pdf)); or 14 g/hp-hr, from EPA's AP-42, 5<sup>th</sup> Edition, Table 3.3-1. This alternative method estimates NO<sub>x</sub> emissions more conservatively than using the NO<sub>x</sub> emission limits tabulated in Table D3 of this SMOP Evaluation Report.

The CO<sub>2</sub>e emissions from all diesel fuel fired equipment are based on the following emission factors, GWPs, and high heat value from 40 CFR Part 98 as well as kg-to-lb mass conversion factor:

- a. CO<sub>2</sub> emission factor: 73.96 kg/MMBtu
- b. CH<sub>4</sub> emission factor: 0.003 kg/MMBtu
- c. N<sub>2</sub>O emission factor: 0.0006 kg/MMBtu
- d. CO<sub>2</sub> GWP: 1
- e. CH<sub>4</sub> GWP: 21
- f. N<sub>2</sub>O GWP: 310

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g. High heat value of 0.138 MMBtu/gallon

h. 1 kg = 2.2046 lbs

Simplified, the CO<sub>2</sub>e emission factor for all diesel fuel fired equipment is 163.6 lb/MM BTU or 22.58 lb/gallon, which is derived as follows:

$((73.96 \text{ kg/MMBtu} * 1) + (0.003 \text{ kg/MMBtu} * 21) + (0.0006 \text{ kg/MMBtu} * 310)) * 2.2046 \text{ lbs/kg}$

= 163.6 lb/MMBtu

= 163.6 lb/MMBtu \* 0.138 MMBtu/gallon = 22.58 lb/gallon

**SYNTHETIC MINOR OPERATING PERMIT CONDITIONS**

Synthetic Minor Operating Permit Conditions (Condition #25404) will be added as follows in accordance with BAAQMD Regulation 2, Rule 6, Section 423.2, District Procedures for Synthetic Minor Operating Permits: Permit Content to avoid designation as a Title V facility.

SYNTHETIC MINOR OPERATING PERMIT

Genentech, Inc.

South San Francisco, CA 94080

Application #24594

Site #A1257

Genentech, Inc., Site #A1257, has a Synthetic Minor Operating Permit. This operating permit covers all sources at the facility, including exempt sources.

The following conditions establish the federally enforceable permit terms to ensure that this plant is classified as a Synthetic Minor Facility under BAAQMD Regulation 2, Rule 6, Major Facility Review; and ensure that it is not subject to the permitting requirements of Title V of the Federal Clean Air Act as amended in 1990 and 40 CFR Part 70. All applications submitted by the applicant and all modifications to the plant's equipment after issuance of the Synthetic Minor permit must be evaluated to ensure that the facility will not exceed the synthetic minor general limits below and that sufficient monitoring, recordkeeping, and reporting requirements are imposed to ensure enforceability of the limits.

Any revision to a condition establishing this plant's status as a Synthetic Minor Facility or any new permit term that would limit emissions of a new or modified source for the purpose of maintaining the facility as a synthetic minor, must undergo the procedures pursuant to Regulation 2, Rule 6, section 423. The basis for the synthetic minor conditions is an emission limit for regulated air pollutants of 95 tons per year, an emission limit of 90,000 tons per year for greenhouse gases or GHG (on a CO<sub>2</sub> equivalent or CO<sub>2</sub>e basis), an emission limit for a single HAP (hazardous air pollutant) of 9 tons per year, and an emission limit for a combination of HAPs of 23 tons per year.

Synthetic Minor Conditions:

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1. The owner/operator shall in no event emit from this site exceeding any of the emission limits listed below.

NOx	95 tons/year
CO	95 tons/year
POC	95 tons/year
PM10	95 tons/year
SO2	95 tons/year
Any Single HAP	9 tons/year
Combination of HAPs	23 tons/year
CO2e	90,000 tons/year

The facility has successfully demonstrated that the facility wide potential to emit CO, POC, PM10, SO2, and HAPs are below the Title V emissions thresholds. However, the potential to emit NOx and CO2e is above Title V emissions threshold and is subject to additional monitoring under the Synthetic Minor Operating Permit. The owner/operator shall ensure that the total emissions from all emission sources at the facility (including exempt sources and abatement devices) shall not exceed 95 tons of NOx and 90,000 tons of GHG on a CO2e basis, totaled over any consecutive twelve month period. (basis: Regulation 2-6-423.2)

2. The owner/operator shall demonstrate compliance with the emission limits for NOx and CO2e as outlined below:
  - a. Combustion Sources Fired by Natural Gas: the owner/operator shall use either facility-wide utility meter and/or source-specific fuel meters to measure the natural gas usage in each permitted natural gas fired combustion source at the facility and to measure the total natural gas usage in all permit-exempt natural gas fired combustion sources.

Emission factors for NOx shall be the respective NOx permit or regulatory limits for permitted sources. For registered sources, emission factors for NOx shall be the respective NOx regulatory limits or 0.0980 lbs of NOx per MM Btu of natural gas (from Table 1.4-2 of EPA AP-42, 5th Edition). For other permit-exempt sources, emission factor for NOx shall be 0.0980 lbs of NOx per MM Btu of natural gas (from Table 1.4-2 of EPA AP-42, 5th Edition).

Emission factor for CO2e shall be 117.0 lbs of CO2e per MM BTU of natural gas (from 40 CFR Part 98).

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Natural gas consumption applied to the emission factor shall be actual metered throughput. Sources without a dedicated fuel meter shall be grouped together and linked to a main fuel meter in such a way as to determine the entire fuel use for the group.

- b. **Combustion Sources Fired by Diesel Fuel:** the owner/operator shall use hour meters to measure diesel fuel usage in all permitted and exempt-permit diesel fuel fired combustion sources at the facility; if diesel fuel usage and engine load are not measured but run time is recorded, the owner/operator shall assume an engine operated at full load and maximum fuel use rate its entire run time.

Emission factors for NO<sub>x</sub> shall be the respective CARB-certified emission limits for NO<sub>x</sub> for sources in this category; for the diesel fuel fired equipment that does not have CARB-certified emission limits, emission factors for NO<sub>x</sub> shall be the emission limits used in respective BAAQMD permit applications; the emission limits for NO<sub>x</sub> for all diesel fuel fired equipment are tabulated in Table D3 of the SMOP Evaluation Report.

Alternatively, emission factors for NO<sub>x</sub> shall be the respective CARB-certified emission limits for NO<sub>x</sub> for sources in this category; or, if applicable, the respective emission limits for NO<sub>x</sub> found in EPA Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, Final Rule, 2006; or 14 g/hp-hr (from Table 3.3-1 of EPA AP-42, 5th Edition).

Emission factor for CO<sub>2</sub>e shall be 163.6 lb of CO<sub>2</sub>e per MM BTU of diesel fuel or 22.58 lb of CO<sub>2</sub>e per gallon of diesel fuel (from 40 CFR Part 98).

Fuel consumption shall be based on actual usage for each source in this category.

Emissions of NO<sub>x</sub> and CO<sub>2</sub>e from each source or source group shall be calculated and recorded on a monthly basis. Annual emissions shall be summarized on a rolling 12-month basis. All records required by the Synthetic Minor Operating Permit shall be kept on site and be available for inspection by BAAQMD personnel for at least 5 years from the date that a record was made. (basis: Regulation 2-6-423.2)

3. The owner/operator shall develop and maintain monitoring tables to clearly demonstrate compliance with the NO<sub>x</sub> and CO<sub>2</sub>e Synthetic Minor Operating Permit limits on a rolling 12-month basis beginning with the first calendar month after the issuance of the Synthetic Minor Operating Permit. All monitoring tables shall be updated as applicable when equipment is added to or removed from the facility. The facility has the authority under the Synthetic Minor Operating Permit to make additions and deletions to equipment in the approved monitoring tables without prior approval of the BAAQMD provided that approved emissions



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factors and monitoring methodologies are followed. The BAAQMD has the authority at any time to require modifications to the monitoring tables as deemed necessary to improve the accuracy or clarity of monitored data. (basis: Regulation 2-6-423.2)

**RECOMMENDATION**

The BAAQMD is proposing to issue a Synthetic Minor Operating Permit to Plant #1257. In accordance with SIP Regulations 2-6-423.3 and 2-6-423.4, this preliminary decision is subject to a 30-day public comment period and a 30-day EPA review period. At the conclusion of the comment period, the BAAQMD will make a final decision on this matter after considering any comments received.

By: Signed by Kevin Oei  
Kevin Oei  
Air Quality Engineer

Date: December 4, 2012

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**APPENDIX A  
POTENTIAL TO EMIT OF REGULATED AIR POLLUTANTS ESTIMATES**

Table A1. Potential to Emit of Regulated Air Pollutants – Permitted Boilers

Boiler Data <sup>1</sup>			Emission Factors					Potential Emissions				
BAAQMD Source ID	Heat Input Rating	Maximum Throughput	NO <sub>x</sub> Emission Factor <sup>2</sup>	CO Emission Factor <sup>2</sup>	SO <sub>2</sub> Emission Factor <sup>3</sup>	POC Emission Factor <sup>3</sup>	PM <sub>10</sub> Emission Factor <sup>3</sup>	NO <sub>x</sub> Emissions**	CO Emissions**	SO <sub>2</sub> Emissions**	POC Emissions**	PM <sub>10</sub> Emissions**
	(MMBtu/hr)	(MMBtu/yr)	(ppm)	(ppm)	(lb/MMBtu)	(lb/MMBtu)	(lb/MMBtu)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
13	21	132,000	9	50	0.0006	0.0054	0.0075	0.7	2.4	0.0	0.4	0.5
14	21							4.7	15.7	0.2	2.3	3.2
83	97											
84	97											
85	97											
Subtotal							(tons/year)	5.4	18.2	0.3	2.6	3.7

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

- Notes**  
1. Boiler data obtained from BAAQMD's Databank for Plant #1257.  
2. Emission factors for NO<sub>x</sub> and CO obtained from BAAQMD Permit Condition #s 6044 & 23678. (The values were converted from ppmv to lb/MMBtu.)  
3. Emission factors obtained from Table 1.4-2 of Section 1.4 (Natural Gas Combustion) of AP-42. (The values were converted from lb/10<sup>6</sup> scf to lb/MMBtu by dividing them by 1,020.)

Table A2. Potential to Emit of Regulated Air Pollutants – Exempt Boilers

Boiler Data <sup>1</sup>				Emission Factors					Potential Emissions					
Source ID	Building #	Heat Input Rating	Hours of Operation <sup>2</sup>	NO <sub>x</sub> Emission Factor <sup>3,7</sup>	CO Emission Factor <sup>3</sup>	SO <sub>2</sub> Emission Factor <sup>3</sup>	POC Emission Factor <sup>3</sup>	PM <sub>10</sub> Emission Factor <sup>3</sup>	NO <sub>x</sub> Emissions**	CO Emissions**	SO <sub>2</sub> Emissions**	POC Emissions**	PM <sub>10</sub> Emissions**	
		(MMBtu/hr)	(hours/yr)	(ppm)	(lb/MMBtu)	(lb/MMBtu)	(lb/MMBtu)	(lb/MMBtu)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	
B48A	48	9.997	8,760	--	0.098	0.082	0.0006	0.0054	0.0075	4.3E+00	3.6E+00	2.6E-02	2.4E-01	3.3E-01
B48B	48	9.997	8,760	--						4.3E+00	3.6E+00	2.6E-02	2.4E-01	3.3E-01
HWB-51	5	8.369	8,760	--						3.6E+00	3.0E+00	2.2E-02	2.0E-01	2.7E-01
HWB-52	5	8.369	8,760	--						3.6E+00	3.0E+00	2.2E-02	2.0E-01	2.7E-01
SB1	15	8	8,760	--						3.4E+00	2.9E+00	2.1E-02	1.9E-01	2.6E-01
SB2	15	8	8,760	--						3.4E+00	2.9E+00	2.1E-02	1.9E-01	2.6E-01
B48C	48	6	876	--						2.6E-01	2.2E-01	1.6E-03	1.4E-02	2.0E-02
B41	41	5	876	--						2.1E-01	1.8E-01	1.3E-03	1.2E-02	1.6E-02
B42A	42	5	876	--						2.1E-01	1.8E-01	1.3E-03	1.2E-02	1.6E-02
B42B	42	5	876	--						2.1E-01	1.8E-01	1.3E-03	1.2E-02	1.6E-02
B43	43	5	876	--						2.1E-01	1.8E-01	1.3E-03	1.2E-02	1.6E-02
HWB-12 <sup>x</sup>	1	5	8,760	30						8.1E-01	1.8E+00	1.3E-02	1.2E-01	1.6E-01
SB101	10	4	876	--						1.7E-01	1.4E-01	1.1E-03	9.5E-03	1.3E-02
SB102	10	4	876	--						1.7E-01	1.4E-01	1.1E-03	9.5E-03	1.3E-02
148-BR-2203 <sup>x</sup>	48	2.5	8,760	30						4.0E-01	9.0E-01	6.6E-03	5.9E-02	8.2E-02
148-BR-2204 <sup>x</sup>	48	2.5	8,760	30						4.0E-01	9.0E-01	6.6E-03	5.9E-02	8.2E-02
B46A <sup>x</sup>	46	2.4	8,760	30						3.9E-01	8.7E-01	6.3E-03	5.7E-02	7.8E-02
B46B <sup>x</sup>	46	2.4	8,760	30						3.9E-01	8.7E-01	6.3E-03	5.7E-02	7.8E-02
B47A	47	2.4	8,760	--						1.0E+00	8.7E-01	6.3E-03	5.7E-02	7.8E-02
B47B	47	2.4	8,760	--						1.0E+00	8.7E-01	6.3E-03	5.7E-02	7.8E-02
B-3301	33	2.4	8,760	--						1.0E+00	8.7E-01	6.3E-03	5.7E-02	7.8E-02
B20-A <sup>x</sup>	20	2.25	8,760	30						3.6E-01	8.1E-01	5.9E-03	5.3E-02	7.3E-02
B20-B <sup>x</sup>	20	2.25	8,760	30						3.6E-01	8.1E-01	5.9E-03	5.3E-02	7.3E-02
B20-C <sup>x</sup>	20	2.25	8,760	30						3.6E-01	8.1E-01	5.9E-03	5.3E-02	7.3E-02
B-3101	31	1.999	8,760	--						8.6E-01	7.2E-01	5.3E-03	4.7E-02	6.5E-02
B-4401	44	1.999	8,760	--						8.6E-01	7.2E-01	5.3E-03	4.7E-02	6.5E-02
BR 2203	41	1.8	8,760	--						7.7E-01	6.5E-01	4.7E-03	4.3E-02	5.9E-02
BR 2204	41	1.8	8,760	--						7.7E-01	6.5E-01	4.7E-03	4.3E-02	5.9E-02
BR 2203	42	1.8	8,760	--						7.7E-01	6.5E-01	4.7E-03	4.3E-02	5.9E-02
BR 2204	42	1.8	8,760	--						7.7E-01	6.5E-01	4.7E-03	4.3E-02	5.9E-02
BR 2205	42	1.8	8,760	--						7.7E-01	6.5E-01	4.7E-03	4.3E-02	5.9E-02
BR 2203	43	1.8	8,760	--						7.7E-01	6.5E-01	4.7E-03	4.3E-02	5.9E-02
BR 2204	43	1.8	8,760	--						7.7E-01	6.5E-01	4.7E-03	4.3E-02	5.9E-02
BR-2201	45	1	8,760	--						4.3E-01	3.6E-01	2.6E-03	2.4E-02	3.3E-02

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
Genentech, Inc.**

**Plant Number: A1257**

**Application Number: 24594**

A77238	15	0.93	8,760	--						4.0E-01	3.4E-01	2.4E-03	2.2E-02	3.0E-02
A77237	15	0.93	8,760	--						4.0E-01	3.4E-01	2.4E-03	2.2E-02	3.0E-02
A77232	15	0.93	8,760	--						4.0E-01	3.4E-01	2.4E-03	2.2E-02	3.0E-02
B10-1 <sup>5</sup>	10	0.7	8,760	--						3.0E-01	2.5E-01	1.8E-03	1.7E-02	2.3E-02
B10-2 <sup>5</sup>	10	0.7	8,760	--						3.0E-01	2.5E-01	1.8E-03	1.7E-02	2.3E-02
142-BR-1202	42	0.499	8,760	--						2.1E-01	1.8E-01	1.3E-03	1.2E-02	1.6E-02
142-BR-1201	42	0.499	8,760	--						2.1E-01	1.8E-01	1.3E-03	1.2E-02	1.6E-02
B31-2 <sup>5</sup>	31	0.4	8,760	--						1.7E-01	1.4E-01	1.1E-03	9.5E-03	1.3E-02
B48-1 <sup>5</sup>	48	0.4	8,760	--						1.7E-01	1.4E-01	1.1E-03	9.5E-03	1.3E-02
B48-2 <sup>5</sup>	48	0.4	8,760	--						1.7E-01	1.4E-01	1.1E-03	9.5E-03	1.3E-02
B20-3 <sup>5</sup>	20	0.399	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
B20-4 <sup>5</sup>	20	0.399	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
SB-5	56	0.398	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
SB-4	56	0.398	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
SB-3	56	0.398	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
SB-2 <sup>7</sup>	56	0.398	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
SB-1	56	0.398	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
SB-6	56	0.398	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
SB-7	56	0.398	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
SB-8	56	0.398	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
SB-9	56	0.398	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
B20-1 <sup>5</sup>	20	0.39	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.2E-03	1.3E-02
B20-2 <sup>5</sup>	20	0.39	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.2E-03	1.3E-02
B46-1 <sup>5</sup>	46	0.25	8,760	--						1.1E-01	9.0E-02	6.6E-04	5.9E-03	8.2E-03
B46-2 <sup>5</sup>	46	0.25	8,760	--						1.1E-01	9.0E-02	6.6E-04	5.9E-03	8.2E-03
B47-1 <sup>5</sup>	47	0.25	8,760	--						1.1E-01	9.0E-02	6.6E-04	5.9E-03	8.2E-03
B47-2 <sup>5</sup>	47	0.25	8,760	--						1.1E-01	9.0E-02	6.6E-04	5.9E-03	8.2E-03
B71F-1 <sup>5</sup>	71F	0.1999	8,760	--						8.6E-02	7.2E-02	5.3E-04	4.7E-03	6.5E-03
B71D-1 <sup>5</sup>	71D	0.1999	8,760	--						8.6E-02	7.2E-02	5.3E-04	4.7E-03	6.5E-03
B71C-1 <sup>5</sup>	71C	0.1999	8,760	--						8.6E-02	7.2E-02	5.3E-04	4.7E-03	6.5E-03
B71B-1 <sup>5</sup>	71B	0.1999	8,760	--						8.6E-02	7.2E-02	5.3E-04	4.7E-03	6.5E-03
B71A-1 <sup>5</sup>	71A	0.1999	8,760	--						8.6E-02	7.2E-02	5.3E-04	4.7E-03	6.5E-03
141-BR-1202	41	0.199	8,760	--						8.5E-02	7.2E-02	5.2E-04	4.7E-03	6.5E-03
141-BR-1201	41	0.199	8,760	--						8.5E-02	7.2E-02	5.2E-04	4.7E-03	6.5E-03
143-BR-1201	43	0.199	8,760	--						8.5E-02	7.2E-02	5.2E-04	4.7E-03	6.5E-03
143-BR-1202	43	0.199	8,760	--						8.5E-02	7.2E-02	5.2E-04	4.7E-03	6.5E-03
B71F-2 <sup>5</sup>	71F	0.14	8,760	--						6.0E-02	5.0E-02	3.7E-04	3.3E-03	4.6E-03
B71F-3 <sup>5</sup>	71F	0.14	8,760	--						6.0E-02	5.0E-02	3.7E-04	3.3E-03	4.6E-03
B71D-2 <sup>5</sup>	71D	0.14	8,760	--						6.0E-02	5.0E-02	3.7E-04	3.3E-03	4.6E-03
B71C-2 <sup>5</sup>	71C	0.14	8,760	--						6.0E-02	5.0E-02	3.7E-04	3.3E-03	4.6E-03
B71B-2 <sup>5</sup>	71B	0.14	8,760	--						6.0E-02	5.0E-02	3.7E-04	3.3E-03	4.6E-03
B71A-2 <sup>5</sup>	71A	0.14	8,760	--						6.0E-02	5.0E-02	3.7E-04	3.3E-03	4.6E-03
B71E-1 <sup>5</sup>	71E	0.12	8,760	--						5.2E-02	4.3E-02	3.2E-04	2.8E-03	3.9E-03
B45-1 <sup>5</sup>	45	0.077	8,760	--						3.3E-02	2.8E-02	2.0E-04	1.8E-03	2.5E-03
143-BR-1201	44	0.065	8,760	--						2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
B-1	4	0.715	8,760	--						3.1E-01	2.6E-01	1.9E-03	1.7E-02	2.3E-02
B-2	4	0.4	8,760	--						1.7E-01	1.4E-01	1.1E-03	9.5E-03	1.3E-02
HWB3	4	0.399	8,760	--						1.7E-01	1.4E-01	1.0E-03	9.4E-03	1.3E-02
F-5	9	0.255	8,760	--						1.1E-01	9.2E-02	6.7E-04	6.0E-03	8.3E-03
F-6	9	0.2125	8,760	--						9.1E-02	7.7E-02	5.6E-04	5.0E-03	6.9E-03
WH1	4	0.199	8,760	--						8.5E-02	7.2E-02	5.2E-04	4.7E-03	6.5E-03
WH2	4	0.199	8,760	--						8.5E-02	7.2E-02	5.2E-04	4.7E-03	6.5E-03
DHWH1	6	0.181	8,760	--						7.8E-02	6.5E-02	4.8E-04	4.3E-03	5.9E-03
WH1	56	0.18	8,760	--						7.7E-02	6.5E-02	4.7E-04	4.3E-03	5.9E-03
B9-1 <sup>5</sup>	9	0.18	8,760	--						7.7E-02	6.5E-02	4.7E-04	4.3E-03	5.9E-03
IWH2	56	0.175	8,760	--						7.5E-02	6.3E-02	4.6E-04	4.1E-03	5.7E-03
IWH1	56	0.175	8,760	--						7.5E-02	6.3E-02	4.6E-04	4.1E-03	5.7E-03
ACC19	4	0.15	8,760	--						6.4E-02	5.4E-02	3.9E-04	3.5E-03	4.9E-03
68124 <sup>4</sup>	24	0.15	8,760	--						6.4E-02	5.4E-02	3.9E-04	3.5E-03	4.9E-03

**SYNTHETIC MINOR OPERATING PERMIT  
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Genentech, Inc.**

**Plant Number: A1257**

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68125 <sup>4</sup>	24	0.15	8,760	--	6.4E-02	5.4E-02	3.9E-04	3.5E-03	4.9E-03
70348 <sup>4</sup>	24	0.15	8,760	--	6.4E-02	5.4E-02	3.9E-04	3.5E-03	4.9E-03
67892 <sup>4</sup>	27	0.15	8,760	--	6.4E-02	5.4E-02	3.9E-04	3.5E-03	4.9E-03
72311 <sup>4</sup>	28	0.15	8,760	--	6.4E-02	5.4E-02	3.9E-04	3.5E-03	4.9E-03
72312 <sup>4</sup>	28	0.15	8,760	--	6.4E-02	5.4E-02	3.9E-04	3.5E-03	4.9E-03
72313 <sup>4</sup>	28	0.15	8,760	--	6.4E-02	5.4E-02	3.9E-04	3.5E-03	4.9E-03
72314 <sup>4</sup>	28	0.15	8,760	--	6.4E-02	5.4E-02	3.9E-04	3.5E-03	4.9E-03
72315 <sup>4</sup>	28	0.15	8,760	--	6.4E-02	5.4E-02	3.9E-04	3.5E-03	4.9E-03
RTU-1/ACCU-1/DX-1	29	0.13	8,760	--	5.6E-02	4.7E-02	3.4E-04	3.1E-03	4.2E-03
RTU-2/ACCU-2/DX-2	29	0.13	8,760	--	5.6E-02	4.7E-02	3.4E-04	3.1E-03	4.2E-03
F-4	9	0.1275	8,760	--	5.5E-02	4.6E-02	3.4E-04	3.0E-03	4.2E-03
F-3	9	0.1275	8,760	--	5.5E-02	4.6E-02	3.4E-04	3.0E-03	4.2E-03
F-1	9	0.127	8,760	--	5.5E-02	4.6E-02	3.3E-04	3.0E-03	4.1E-03
F-2	9	0.127	8,760	--	5.5E-02	4.6E-02	3.3E-04	3.0E-03	4.1E-03
AC-9	5	0.125	8,760	--	5.4E-02	4.5E-02	3.3E-04	3.0E-03	4.1E-03
AC-25	5	0.125	8,760	--	5.4E-02	4.5E-02	3.3E-04	3.0E-03	4.1E-03
AC-17	5	0.12	8,760	--	5.2E-02	4.3E-02	3.2E-04	2.8E-03	3.9E-03
72316 <sup>4</sup>	28	0.1	8,760	--	4.3E-02	3.6E-02	2.6E-04	2.4E-03	3.3E-03
AC-5	9	0.09	8,760	--	3.9E-02	3.2E-02	2.4E-04	2.1E-03	2.9E-03
AC-5007	9A	0.08	8,760	--	3.4E-02	2.9E-02	2.1E-04	1.9E-03	2.6E-03
WH01	5	0.076	8,760	--	3.3E-02	2.7E-02	2.0E-04	1.8E-03	2.5E-03
WH02	5	0.076	8,760	--	3.3E-02	2.7E-02	2.0E-04	1.8E-03	2.5E-03
ACHG14	4	0.075	8,760	--	3.2E-02	2.7E-02	2.0E-04	1.8E-03	2.4E-03
ACHG16	4	0.075	8,760	--	3.2E-02	2.7E-02	2.0E-04	1.8E-03	2.4E-03
AC-6	4	0.074	8,760	--	3.2E-02	2.7E-02	1.9E-04	1.8E-03	2.4E-03
AC-5	4	0.074	8,760	--	3.2E-02	2.7E-02	1.9E-04	1.8E-03	2.4E-03
AC-4	4	0.074	8,760	--	3.2E-02	2.7E-02	1.9E-04	1.8E-03	2.4E-03
ACHG17	4	0.074	8,760	--	3.2E-02	2.7E-02	1.9E-04	1.8E-03	2.4E-03
AC-5C	5	0.074	8,760	--	3.2E-02	2.7E-02	1.9E-04	1.8E-03	2.4E-03
AC-8	5	0.074	8,760	--	3.2E-02	2.7E-02	1.9E-04	1.8E-03	2.4E-03
AC-26	5	0.074	8,760	--	3.2E-02	2.7E-02	1.9E-04	1.8E-03	2.4E-03
ACHG15	4	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-1	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-2	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-3	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-7	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-27	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-13	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-28	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-18	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC16	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-31	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-15	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-30	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-21	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-23	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-19	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-6	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-24	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-10	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-22	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-4	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
AC-5	5	0.072	8,760	--	3.1E-02	2.6E-02	1.9E-04	1.7E-03	2.3E-03
WH-1	9	0.065	8,760	--	2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
68132 <sup>4</sup>	24	0.065	8,760	--	2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
68266 <sup>4</sup>	25	0.065	8,760	--	2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
10002364 <sup>4</sup>	27	0.065	8,760	--	2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
72321 <sup>4</sup>	28	0.065	8,760	--	2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
65551	32	0.065	8,760	--	2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
66318 <sup>4</sup>	33	0.065	8,760	--	2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
71994 <sup>4</sup>	36	0.065	8,760	--	2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03

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69254	39	0.065	8,760	--							2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
72299 <sup>4</sup>	54	0.065	8,760	--							2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
72300 <sup>4</sup>	54	0.065	8,760	--							2.8E-02	2.3E-02	1.7E-04	1.5E-03	2.1E-03
ACHG11	4	0.06	8,760	--							2.6E-02	2.2E-02	1.6E-04	1.4E-03	2.0E-03
WH3	4	0.0525	8,760	--							2.3E-02	1.9E-02	1.4E-04	1.2E-03	1.7E-03
67895	27	0.04	8,760	--							1.7E-02	1.4E-02	1.1E-04	9.5E-04	1.3E-03
72298	54	0.04	8,760	--							1.7E-02	1.4E-02	1.1E-04	9.5E-04	1.3E-03
<b>Subtotal</b>										<b>(tons/year)</b>	<b>49.0</b>	<b>46.0</b>	<b>0.3</b>	<b>3.0</b>	<b>4.2</b>

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

**Notes**

- Boiler data obtained from facility.
- To be conservative, these boilers are assumed to operate continuously at full firing rate for 8,760 hours throughout the year, except for units that are restricted to 10% of their maximum annual fuel usage to maintain limited exemption from emission standards under Regulation 9-7-112. For these boilers, for emissions calculation purposes, the hours of operation was restricted to 876 hours (10% \* 8,760 hours) while maintaining the maximum firing rate. This is mathematically equivalent to restricting total fuel use to 10% of total annual heat capacity. This does not indicate that these units will be restricted to 876 hours of operation per year.
- Emission factors obtained from Table 1.4-2 of Section 1.4 (Natural Gas Combustion) of AP-42 except for the boilers whose NO<sub>x</sub> emission factors in ppm are provided (see note 6). (The values were converted from lb/10<sup>3</sup> scf to lb/MMBtu by dividing them by 1,020.)
- Heat input rating based on estimated firing rate.
- Source ID generated by facility for the purposes of this table. The ID consists of the building code followed by the equipment number for that building.
- NO<sub>x</sub> emission limits in ppm are provided for units which have been retrofitted to meet the Regulation 9-7 emission standard. These units are indicated with an "X" next to the Source ID.

**Table A3. Potential to Emit of Regulated Air Pollutants – Diesel Generators**

Diesel Generator Data <sup>1</sup>						Diesel Particulate Filter	Emission Factors Source	Uncontrolled Emission Factors					Controlled Potential Emissions <sup>3</sup>				
BA AQMD Source ID	EPA Engine Family #	Year	Purchase Year	Engine Rating	Hours of Operation <sup>2</sup>			NO <sub>x</sub> Emission Factor	CO Emission Factor	POC Emission Factor	SO <sub>2</sub> Emission Factor <sup>4</sup>	PM <sub>10</sub> Emission Factor	NO <sub>x</sub> Emissions**	CO Emissions**	POC Emissions**	SO <sub>2</sub> Emissions**	PM <sub>10</sub> Emissions**
				(hp)	(hr/yr)												
23	1CPXL34.5ERK	2001	2001	1,480		1	5.9	0.60	0.30	0.930	0.16	4.83	0.49	0.24	0.76	0.13	
24	1CPXL51.8ERK	2001	2001	2,153		2	1.7	0.46	0.19	0.930	0.02	2.06	0.54	0.22	1.10	0.02	
25	-	-	1983	2,168		2	7.2	0.19	0.10	0.930	0.03	8.57	0.23	0.11	1.11	0.04	
30	-	-	1988	2,168		2	7.2	0.19	0.10	0.930	0.03	8.57	0.23	0.11	1.11	0.04	
32	-	-	2001	1,135		2	1.7	0.46	0.19	0.930	0.02	1.08	0.29	0.12	0.58	0.01	
33	-	-	1988	1,661		2	7.2	0.19	0.10	0.930	0.03	6.57	0.18	0.09	0.85	0.03	
34	-	-	1995	2,168		2	7.2	0.19	0.10	0.930	0.03	8.57	0.23	0.11	1.11	0.04	
35	1CPXL51.8ERK	2001	2000	2,153		2	1.7	0.46	0.19	0.930	0.02	2.06	0.54	0.22	1.10	0.02	
38	-	-	1994	2,168		2	7.2	0.19	0.10	0.930	0.03	8.57	0.23	0.11	1.11	0.04	
39	-	-	1994	2,168		2	7.2	0.19	0.10	0.930	0.03	8.57	0.23	0.11	1.11	0.04	
40	-	-	1996	2,168		2	7.2	0.19	0.10	0.930	0.03	8.57	0.23	0.11	1.11	0.04	
41	1CPXL51.8ERK	2001	2000	2,153		2	1.7	0.46	0.19	0.930	0.02	2.06	0.54	0.22	1.10	0.02	
42	-	-	1991	2,168		2	7.2	0.19	0.10	0.930	0.03	8.57	0.23	0.11	1.11	0.04	
43	-	-	1991	2,168		2	7.2	0.19	0.10	0.930	0.03	8.57	0.23	0.11	1.11	0.04	
46	1CPXL27.0MRH	2001	2002	896		x	1	6.4	1.5	0.15	0.930	0.27	3.16	0.30	0.04	0.46	0.02
47	-	-	1905	521		2	7.2	0.19	0.10	0.930	0.03	2.06	0.06	0.03	0.27	0.01	
48	YCEXL0855AAA	2000	2001	535		1	5.1	0.90	0.15	0.930	0.07	1.50	0.27	0.04	0.27	0.02	
49	YCEXL0855AAA	2000	2001	535	500	1	5.1	0.90	0.15	0.930	0.07	1.50	0.27	0.04	0.27	0.02	
50	-	-	1988	75		2	7.2	0.19	0.10	0.930	0.03	0.30	0.01	0.00	0.04	0.00	
51	-	-	1990	75		2	7.2	0.19	0.10	0.930	0.03	0.30	0.01	0.00	0.04	0.00	
54	-	-	1996	60		2	11	2.2	0.37	0.930	0.30	0.36	0.07	0.01	0.03	0.01	
55	-	-	2000	67		2	11	2.2	0.37	0.930	0.30	0.40	0.08	0.01	0.03	0.01	
56	-	-	2000	91		2	14	0.57	0.41	0.930	0.25	0.70	0.03	0.02	0.05	0.01	
58	-	-	2003	2,848		2	6.2	0.44	0.15	0.930	0.07	9.68	0.69	0.24	1.46	0.11	
59	-	-	2003	2,848		2	6.2	0.44	0.15	0.930	0.07	9.68	0.69	0.24	1.46	0.11	
60	2DDXL65.0XTE	2002	2003	2,670		1	6.3	0.97	0.75	0.930	0.14	9.27	1.43	1.10	1.37	0.21	
61	2DDXL65.0XTE	2002	2003	2,670		1	6.3	0.97	0.75	0.930	0.14	9.27	1.43	1.10	1.37	0.21	
62	-	-	2003	60		2	6.3	0.83	0.15	0.930	0.13	0.21	0.03	0.00	0.03	0.00	
63	1CPXL34.5ERK	2001	2002	1,408		1	5.9	0.60	0.30	0.930	0.16	4.60	0.47	0.23	0.72	0.12	
70	-	-	2003	94		2	6.1	0.2	0.29	0.930	0.04	0.32	0.01	0.02	0.05	0.00	
71	2CPXL15.8ESK	2002	2003	685		1	4.0	0.45	0.21	0.930	0.07	1.51	0.17	0.08	0.35	0.03	
75	-	-	2004	382		2	5.1	0.68	0.25	0.930	0.10	1.08	0.14	0.05	0.20	0.02	
76	3CPXL27.0MRS	2003	2004	1,114		1	5.7	0.97	0.15	0.930	0.14	3.50	0.60	0.09	0.57	0.09	
77	-	-	-	160		2	5.3	0.49	0.21	0.930	0.15	0.47	0.04	0.02	0.08	0.01	
78	3CPXL34.5ERK	2003	2004	1,480		x	1	5.9	0.60	0.30	0.930	0.16	4.83	0.20	0.12	0.76	0.02

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79	-	-	2005	85																		
80	2CPXL58.6ERK	2002	2005	2,155	x	1	6.3	1.3	0.30	0.930	0.12	0.25	0.04	0.01	0.04	0.01	0.04	0.01	0.04	0.01		
81	-	-	2005	59																		
82	5CPXL78.1ERK	2005	-	2,848		2	5.3	1.8	0.43	0.930	0.14	0.17	0.06	0.01	0.03	0.00						
87	5CPXL58.6ERK	2005	2005	1,807	x	1	6.2	0.90	0.30	0.930	0.10	9.77	0.57	0.24	1.46	0.02						
88	5CPXL78.1ERK	2005	2005	2,848	x	1	6.6	1.0	0.30	0.930	0.13	6.57	0.40	0.15	0.93	0.02						
89	5CPXL78.1ERK	2005	2005	2,848	x	1	6.2	0.90	0.30	0.930	0.10	9.77	0.57	0.24	1.46	0.02						
90	5CPXL78.1ERK	2005	2005	2,848	x	1	6.2	0.90	0.30	0.930	0.10	9.77	0.57	0.24	1.46	0.02						
91	5CPXL78.1ERK	2005	2005	2,848	x	1	6.2	0.90	0.30	0.930	0.10	9.77	0.57	0.24	1.46	0.02						
92	5CPXL78.1ERK	2005	2005	2,847	x	1	6.2	0.90	0.30	0.930	0.10	9.77	0.56	0.24	1.46	0.02						
93	-	2005	2005	325																		
94	6CPXL78.1T2E	2006	2006	2,937		2	5.6	0.3	0.07	0.930	0.05	1.00	0.05	0.01	0.17	0.01						
95	6CPXL78.1T2E	2006	-	2,937	x	1	3.8	0.67	0.20	0.930	0.08	6.11	0.43	0.16	1.51	0.02						
96	6CPXL78.1T2E	2006	-	2,937	x	1	3.8	0.67	0.20	0.930	0.08	6.11	0.43	0.16	1.51	0.02						
98	6PKXL04.4RJ1	2006	-	126		1	3.8	0.45	0.20	0.930	0.21	0.27	0.03	0.01	0.06	0.01						
99	6CPXL78.1T2E	2006	-	2,937	x	1	3.8	0.67	0.20	0.930	0.08	6.11	0.43	0.16	1.51	0.02						
102	9CPXL78.1T2E	2009	2009	2,937	x	1	3.8	0.90	0.20	0.930	0.08	6.11	0.58	0.16	1.51	0.02						
103	9CPXL78.1T2E	2009	2009	2,937	x	1	3.8	0.90	0.20	0.930	0.08	6.11	0.58	0.16	1.51	0.02						
105	6CEXL0540AAB	2006	-	364		1	2.8	2.4	0.15	0.930	0.12	0.56	0.48	0.03	0.19	0.02						
106	4CEXL0661AAD	2004	-	470		1	3.8	0.8	0.20	0.930	0.10	0.98	0.19	0.05	0.24	0.03						
107	ACPXL78.1T2E		-	2,937	x	1	3.8	0.90	0.20	0.930	0.09	6.11	0.58	0.16	1.51	0.02						
											<b>Subtotal</b>	<b>(tons/yr)</b>	<b>270.6</b>	<b>20.1</b>	<b>8.5</b>	<b>46.3</b>	<b>2.0</b>					

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

**Notes**

- Emergency generator data obtained from BAAQMD's Databank for Plant #1257.
- 500 hours/yr of diesel use for testing and emergency situations assumed, based on EPA guidance (1995).
- Controlled emissions account for abatement from diesel particulate filters (where applicable) using the abatement removal efficiencies specified below. Abatement removal efficiencies are consistent with those applied in the BAAQMD evaluation reports (Application #s 20591 [for S-46, S-78, S-80, S-82, S-87 through S-92, S-94 through S-96, and S-99] and 20884 [for S-102 and S-103]). The filter at S-107 is assumed to have the same abatement removal efficiencies.
- Emission factor for SO<sub>2</sub> obtained from Table 3.3-1 from the Stationary Internal Combustion Sources Section of AP-42.

**Unit Conversions**

- grams to lbs : divide by 453.6

**Emission Factors Sources**

- ARB Off-Road Certification Database
- BAAQMD permit application for the source.

**Abatement Efficiencies**

PM	85%
CO	60%
POC	50%

**Table A4. Potential to Emit of Regulated Air Pollutants – Exempt Laboratories (FRC II and South Campus)**

Lab Location	Potential Emissions <sup>1</sup>	
	POC Emissions** (tons/year)	NPOC <sup>2</sup> Emissions** (tons/year)
FRC II (Founders Research Center II) <sup>3</sup>	2.1	0.40
South Campus <sup>4</sup>	2.2	0.13
<b>Subtotal</b>	<b>4.3</b>	<b>0.53</b>

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

**Notes**

- Projected annual emissions for the evaluation of HAP emissions from FRCII and South Campus HRSA's prepared by ENVIRON and submitted to BAAQMD in 2007 and 2006, respectively.
- NPOC emissions from FRC II and South Campus are comprised solely of methylene chloride.
- FRCII laboratories include B13, B14, and B15 labs.
- South Campus laboratories include B41, B42, B43, B46, B47, and B48 labs.

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**Table A5. Potential to Emit of Regulated Air Pollutants – Other Exempt Laboratories**

Lab Data		Potential Emissions	
Building #	Hoods	POC Emissions** (tons/year)	NPOC <sup>2</sup> Emissions** (tons/year)
B3	22	2.3E-01	2.1E-03
B4	15	1.6E-01	1.5E-03
B5 <sup>1</sup>	101	1.3E+00	2.3E-02
B6	3	3.2E-02	2.9E-04
B7 <sup>1</sup>	81	1.1E+00	--
B8	7	7.4E-02	6.8E-04
B9	3	3.2E-02	2.9E-04
FRC1-10 <sup>1</sup>	58	2.4E+00	--
FRC1-11	35	1.3E+00	2.2E-01
FRC1-12 <sup>1</sup>	53	1.7E+00	6.9E-01
B20 <sup>1</sup>	59	1.4E-01	--
<b>Subtotal</b>	<b>(tons/year)</b>	<b>8.5</b>	<b>0.9</b>

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

Notes

1. Emissions based on the maximum of purchase data from Genentech in 2007, 2008 and 2009.
2. B3, B4, B6, B8, B9 emissions scaled based on Method 1 below using estimated emissions from B5, B7, and B20.
3. FRC1-11 Emissions scaled based on Method 2 below using estimated emissions from FRC1-10 and FRC1-12.

Emissions Estimation Methodology

1. The average POC emissions per hood for Labs B5, B7, and B20 was used to scale laboratory emissions by the number of hoods. NPOC emissions per hood for Lab B5 was used to scale laboratory emissions by the number of hoods:

0.011      Ton POC/hood-yr  
9.7E-05    Ton NPOC/hood-yr

2. The average emissions per hood for Labs FRC1-10 and FRC1-12 was used to scale laboratory emissions by the number of hoods:

0.037      Ton POC/hood-yr  
6.2E-03    Ton NPOC/hood-yr

**Table A6. Potential to Emit of Regulated Air Pollutants – Tanks**

Tank Data <sup>1</sup>			Potential Emissions <sup>2</sup>		
BAAQMD Source ID	Description	Location	Maximum Throughput (thousand gal/yr)	NPOC Emissions** (tons/year)	POC Emissions** (tons/year)
15	Chemical Waste Storage Tank	3	20	0.04	0.04
16	Chemical Waste Storage Tank	10	6	0.01	0.01
17	Chemical Waste Storage Tank	10	6	0.01	0.01
73	Chemical Waste Storage Tank	15	19	0.04	0.04
100	Chemical Waste Storage Tank	43	11	0.02	0.02
<b>Subtotal</b>			<b>(tons/year)</b>	<b>0.1</b>	<b>0.1</b>

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

Notes

1. Tank data obtained from BAAQMD's Databank for Plant #1257.
2. Storage tank emissions for S-15, S-16, S-17, and S-73 estimated by scaling the emissions limit for S-100 by throughput. The permitted limit for S-100 is 40 pounds per year of POCs and 40 pounds per year of NPOCs, per BAAQMD Permit Condition # 23347.

**Table A7. Potential to Emit of Regulated Air Pollutants – Wipe Cleaning and Sterilizer**

BAAQMD Source ID <sup>1</sup>	Equipment Type <sup>1</sup>	Control Efficiency <sup>1</sup>	POC Potential Emissions <sup>1**</sup>	
			(lb/year)	(tons/year)
53	Wipe Cleaning	--	47,880	23.9
72	Ethylene Oxide Sterilizer	99%	1.0	5.0E-04
<b>Subtotal</b>			<b>(tons/year)</b>	<b>23.9</b>

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

Notes

1. Equipment data obtained from 2011 BAAQMD Permit to Operate (Plant #1257). Potential emissions from BAAQMD Permit Condition #s 23460 (for S-53) and 24428 (for S-72).

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**APPENDIX B  
POTENTIAL TO EMIT OF HAZARDOUS AIR POLLUTANTS ESTIMATES**

**Table B1. Potential to Emit of Hazardous Air Pollutants – Permitted Boilers**

BAAQMD Source ID <sup>1</sup>					13	14	83	84	85
Heat Input Rating (MMBTU/hr) <sup>1</sup>					21	21	97	97	97
Maximum Throughput (MMBTU/yr) <sup>1</sup>					132,000		849,720		
Heat Content of Natural Gas (Btu/scf)					1,020				
Pollutant	AP-42	Ventura AB2588	CATEF	Highest Emission Factor <sup>2</sup>	Annual Potential Emissions**				
	(lb/mm scf)	(lb/mm scf)	(lb/mm scf)	(lb/mm scf)	(tons/year)				
Acetaldehyde	--	4.3E-03	1.5E-02	1.5E-02	9.5E-04	6.1E-03			
Acrolein	--	2.7E-03	--	2.7E-03	1.7E-04	1.1E-03			
Arsenic	2.0E-04	--	--	2.0E-04	1.3E-05	8.3E-05			
Benzene	2.1E-03	8.0E-03	8.7E-03	8.7E-03	5.6E-04	3.6E-03			
Beryllium	1.2E-05	--	--	1.2E-05	7.8E-07	5.0E-06			
Cadmium	1.1E-03	--	--	1.1E-03	7.1E-05	4.6E-04			
Chromium	1.4E-03	--	--	1.4E-03	9.1E-05	5.8E-04			
Cobalt	8.4E-05	--	--	8.4E-05	5.4E-06	3.5E-05			
Dichlorobenzene	1.2E-03	--	--	1.2E-03	7.8E-05	5.0E-04			
Ethyl Benzene	--	9.5E-03	--	9.5E-03	6.1E-04	4.0E-03			
Formaldehyde	7.5E-02	1.7E-02	6.7E-01	6.7E-01	4.3E-02	2.8E-01			
Hexane	1.8E+00	6.3E-03	--	1.8E+00	1.2E-01	7.5E-01			
Lead	5.0E-04	--	--	5.0E-04	3.2E-05	2.1E-04			
Manganese	3.8E-04	--	--	3.8E-04	2.5E-05	1.6E-04			
Mercury	2.6E-04	--	--	2.6E-04	1.7E-05	1.1E-04			
Naphthalene	6.1E-04	3.0E-04	--	6.1E-04	3.9E-05	2.5E-04			
Nickel	2.1E-03	--	--	2.1E-03	1.4E-04	8.7E-04			
Selenium	2.4E-05	--	--	2.4E-05	1.6E-06	1.0E-05			
Toluene	3.4E-03	3.7E-02	--	3.7E-02	2.4E-03	1.5E-02			
Xylenes	--	2.7E-02	--	2.7E-02	1.8E-03	1.1E-02			
<b>Subtotal</b>					1.7E-01	1.1E+00			

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

Notes

- Boiler data obtained from BAAQMD's Databank for Plant #1257.
- The largest of the emission factors from US EPA AP-42, Ventura AB2588, and CATEF.

**Table B2. Potential to Emit of Hazardous Air Pollutants – Exempt Boilers**

Source ID <sup>1</sup>	Pollutant	Acet aldehyde	Acrolein	Arsenic	Benzene	Beryllium	Cadmium	Chromium	Cobalt	Dichlorobenzene	Ethyl Benzene	Formaldehyde	Hexane	Lead	Manganese	Mercury	Naphthalene	Nickel	Selenium	Toluene	Xylenes	Sub total	
																							AP-42
		(lb/mm scf)																					
		--	--	2.0E-04	2.1E-03	1.2E-05	1.1E-03	1.4E-03	8.4E-05	1.2E-03	--	7.5E-02	1.8E+00	0.0005	3.8E-04	2.6E-04	6.1E-04	2.1E-03	2.4E-05	3.4E-03	--		
		4.3E-03	2.7E-03	--	8.0E-03	--	--	--	--	--	9.5E-03	1.7E-02	6.3E-03	--	--	--	3.0E-04	--	--	3.7E-02	2.7E-02		
		1.5E-02	--	--	8.7E-03	--	--	--	--	--	--	6.7E-01	--	--	--	--	--	--	--	--	--		
		1.5E-02	2.7E-03	2.0E-04	8.7E-03	1.2E-05	1.1E-03	1.4E-03	8.4E-05	1.2E-03	9.5E-03	6.7E-01	1.8E+00	5.0E-04	3.8E-04	2.6E-04	6.1E-04	2.1E-03	2.4E-05	3.7E-02	2.7E-02		
B48A	Annual Potential Emissions**	6.3E-04	1.2E-04	8.6E-06	3.7E-04	5.2E-07	4.7E-05	6.0E-05	3.6E-06	5.2E-05	4.1E-04	2.9E-02	7.7E-02	2.1E-05	1.6E-05	1.1E-05	2.6E-05	9.0E-05	1.0E-06	1.6E-03	1.2E-03		
B48B		6.3E-04	1.2E-04	8.6E-06	3.7E-04	5.2E-07	4.7E-05	6.0E-05	3.6E-06	5.2E-05	4.1E-04	2.9E-02	7.7E-02	2.1E-05	1.6E-05	1.1E-05	2.6E-05	9.0E-05	1.0E-06	1.6E-03	1.2E-03		
HWB-51		5.3E-04	9.7E-06	7.2E-06	3.1E-04	4.3E-07	4.0E-05	5.0E-05	3.0E-06	4.3E-06	3.4E-04	2.4E-02	6.5E-02	1.8E-05	1.4E-05	9.3E-06	2.2E-05	7.5E-05	8.6E-07	1.3E-03	9.8E-04		
HWB-52		5.3E-04	9.7E-06	7.2E-06	3.1E-04	4.3E-07	4.0E-05	5.0E-05	3.0E-06	4.3E-06	3.4E-04	2.4E-02	6.5E-02	1.8E-05	1.4E-05	9.3E-06	2.2E-05	7.5E-05	8.6E-07	1.3E-03	9.8E-04		
SB1		5.0E-04	9.3E-05	6.9E-06	3.0E-04	4.1E-07	3.8E-05	4.8E-05	2.9E-06	4.1E-06	3.3E-04	2.3E-02	6.2E-02	1.7E-05	1.3E-05	8.9E-06	2.1E-05	7.2E-05	8.2E-07	1.3E-03	9.3E-04		
SB2		5.0E-04	9.3E-05	6.9E-06	3.0E-04	4.1E-07	3.8E-05	4.8E-05	2.9E-06	4.1E-06	3.3E-04	2.3E-02	6.2E-02	1.7E-05	1.3E-05	8.9E-06	2.1E-05	7.2E-05	8.2E-07	1.3E-03	9.3E-04		
B48C		3.8E-04	7.0E-06	5.2E-07	3.1E-08	2.8E-08	3.6E-06	2.2E-06	3.1E-06	2.4E-06	1.7E-04	1.7E-03	4.6E-03	1.3E-06	9.8E-07	6.7E-07	1.6E-06	5.4E-06	6.2E-08	9.4E-05	7.0E-05		
B41		3.2E-05	5.8E-06	4.3E-07	1.9E-08	2.6E-08	2.4E-06	3.0E-06	1.8E-07	2.6E-06	2.0E-03	1.4E-03	3.9E-06	1.1E-06	8.2E-07	5.6E-07	1.3E-06	4.5E-06	5.2E-08	7.9E-05	5.8E-05		
B42A		3.2E-05	5.8E-06	4.3E-07	1.9E-08	2.6E-08	2.4E-06	3.0E-06	1.8E-07	2.6E-06	2.0E-03	1.4E-03	3.9E-06	1.1E-06	8.2E-07	5.6E-07	1.3E-06	4.5E-06	5.2E-08	7.9E-05	5.8E-05		









# SYNTHETIC MINOR OPERATING PERMIT EVALUATION REPORT

## Genentech, Inc.

**Plant Number: A1257                      Application Number: 24594**

66318*			4.1E-06	7.5E-07	5.6E-08	2.4E-06	3.3E-09	3.1E-07	3.9E-07	2.3E-08	3.3E-07	2.7E-06	1.9E-04	5.0E-04	1.4E-07	1.1E-07	7.3E-08	1.7E-07	5.9E-07	6.7E-09	1.0E-05	7.6E-06
71994*			4.1E-06	7.5E-07	5.6E-08	2.4E-06	3.3E-09	3.1E-07	3.9E-07	2.3E-08	3.3E-07	2.7E-06	1.9E-04	5.0E-04	1.4E-07	1.1E-07	7.3E-08	1.7E-07	5.9E-07	6.7E-09	1.0E-05	7.6E-06
69254			4.1E-06	7.5E-07	5.6E-08	2.4E-06	3.3E-09	3.1E-07	3.9E-07	2.3E-08	3.3E-07	2.7E-06	1.9E-04	5.0E-04	1.4E-07	1.1E-07	7.3E-08	1.7E-07	5.9E-07	6.7E-09	1.0E-05	7.6E-06
72299*			4.1E-06	7.5E-07	5.6E-08	2.4E-06	3.3E-09	3.1E-07	3.9E-07	2.3E-08	3.3E-07	2.7E-06	1.9E-04	5.0E-04	1.4E-07	1.1E-07	7.3E-08	1.7E-07	5.9E-07	6.7E-09	1.0E-05	7.6E-06
72300*			4.1E-06	7.5E-07	5.6E-08	2.4E-06	3.3E-09	3.1E-07	3.9E-07	2.3E-08	3.3E-07	2.7E-06	1.9E-04	5.0E-04	1.4E-07	1.1E-07	7.3E-08	1.7E-07	5.9E-07	6.7E-09	1.0E-05	7.6E-06
ACHG11			3.8E-06	7.0E-07	5.2E-08	2.2E-06	3.1E-09	2.8E-07	3.6E-07	2.2E-08	3.1E-07	2.4E-06	1.7E-04	4.6E-04	1.3E-07	9.8E-08	6.7E-08	1.6E-07	5.4E-07	6.2E-09	9.4E-06	7.0E-06
WH3			3.3E-06	6.1E-07	4.5E-08	2.0E-06	2.7E-09	2.5E-07	3.2E-07	1.9E-08	2.7E-07	2.1E-06	1.5E-04	4.1E-04	1.1E-07	8.6E-08	5.9E-08	1.4E-07	4.7E-07	5.4E-09	8.3E-06	6.1E-06
67895			2.5E-06	4.6E-07	3.4E-08	1.5E-06	2.1E-09	1.9E-07	2.4E-07	1.4E-08	2.1E-07	1.6E-06	1.2E-04	3.1E-04	8.6E-08	6.5E-08	4.5E-08	1.0E-07	3.6E-07	4.1E-09	6.3E-06	4.7E-06
72298			2.5E-06	4.6E-07	3.4E-08	1.5E-06	2.1E-09	1.9E-07	2.4E-07	1.4E-08	2.1E-07	1.6E-06	1.2E-04	3.1E-04	8.6E-08	6.5E-08	4.5E-08	1.0E-07	3.6E-07	4.1E-09	6.3E-06	4.7E-06
<b>Subtotal (by Chemical)</b>	<b>(tons/year)</b>		<b>8.0E-03</b>	<b>1.5E-03</b>	<b>1.1E-04</b>	<b>4.8E-03</b>	<b>6.6E-06</b>	<b>6.0E-04</b>	<b>7.7E-04</b>	<b>4.6E-05</b>	<b>6.6E-04</b>	<b>5.2E-03</b>	<b>3.7E-01</b>	<b>9.8E-01</b>	<b>2.7E-04</b>	<b>2.1E-04</b>	<b>1.4E-04</b>	<b>3.3E-04</b>	<b>1.1E-03</b>	<b>1.3E-05</b>	<b>2.0E-02</b>	<b>1.5E-02</b>
																						<b>1.4</b>

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

**Notes**

1. Boiler data obtained from facility. For building #s, heat input ratings, and operation hours, please see Table A2 in Appendix A of this evaluation report.
2. The largest of the emission factors from US EPA AP-42, Ventura AB2588, and CATEF.
3. To be conservative, these boilers are assumed to operate continuously at full firing rate for 8,760 hours throughout the year, except for units that are restricted to 10% of their maximum annual fuel usage to maintain limited exemption from emission standards under Regulation 9-7-112. For these boilers, for emissions calculation purposes, the hours of operation was restricted to 876 hours (10% \* 8,760 hours) while maintaining the maximum firing rate. This is mathematically equivalent to restricting total fuel use to 10% of total annual heat capacity. This does not indicate that these units will be restricted to 876 hours of operation per year.
4. Heat input rating based on estimated firing rate.
5. Source ID generated by facility for purposes of this table. The ID consists of the building code followed by the equipment number for that building.
6. Natural gas heat content is 1,020 Btu/scf.

**Table B3. Potential to Emit of Hazardous Air Pollutants – Diesel Generators**

BA AQMD Source ID <sup>1</sup>	Engine Rating <sup>1</sup>	Fuel Consumption <sup>2</sup>	Hours of Operation <sup>3</sup>	Compound	Benzene	Toluene	Xylenes	1,3-Butadiene	Formaldehyde	Acetaldehyde	Acrolein	Naphthalene	Subtotal	
				AP-42 Emission Factor (lb/MMBtu)	9.33E-04	4.09E-04	2.85E-04	3.91E-05	1.18E-03	7.67E-04	9.25E-05	8.48E-05		
				AP-42 Emission Factor (lb/gal)	1.29E-04	5.64E-05	3.93E-05	5.40E-06	1.63E-04	1.06E-04	1.28E-05	1.17E-05		
				CATEF Emission Factor (lb/gal)	3.25E-05	--	--	--	1.11E-03	--	--	5.64E-05		
				Highest Emission Factor <sup>4</sup> (lb/gal)	1.29E-04	5.64E-05	3.93E-05	5.40E-06	1.11E-03	1.06E-04	1.28E-05	5.64E-05		
23	1,480	71	500	Maximum Annual Potential Emission Rate** (tons/year)	2.3E-03	1.0E-03	7.0E-04	9.6E-05	2.0E-02	1.9E-03	2.3E-04	1.0E-03		
24	2,153	104			3.3E-03	1.5E-03	1.0E-03	1.4E-04	2.9E-02	2.8E-03	3.3E-04	1.5E-03		
25	2,168	109			3.5E-03	1.5E-03	1.1E-03	1.5E-04	3.0E-02	2.9E-03	3.5E-04	1.5E-03		
30	2,168	108			3.5E-03	1.5E-03	1.1E-03	1.5E-04	3.0E-02	2.9E-03	3.4E-04	1.5E-03		
32	1,135	55			1.8E-03	7.7E-04	5.4E-04	7.4E-05	1.5E-02	1.4E-03	1.7E-04	7.7E-04		
33	1,661	70			2.3E-03	9.9E-04	6.9E-04	9.5E-05	2.0E-02	1.9E-03	2.2E-04	9.9E-04		
34	2,168	107			3.5E-03	1.5E-03	1.1E-03	1.4E-04	3.0E-02	2.8E-03	3.4E-04	1.5E-03		
35	2,153	104			3.3E-03	1.5E-03	1.0E-03	1.4E-04	2.9E-02	2.8E-03	3.3E-04	1.5E-03		
38	2,168	107			3.5E-03	1.5E-03	1.1E-03	1.4E-04	3.0E-02	2.8E-03	3.4E-04	1.5E-03		
39	2,168	107			3.5E-03	1.5E-03	1.1E-03	1.4E-04	3.0E-02	2.8E-03	3.4E-04	1.5E-03		
40	2,168	107			3.5E-03	1.5E-03	1.1E-03	1.4E-04	3.0E-02	2.8E-03	3.4E-04	1.5E-03		
41	2,153	104			3.3E-03	1.5E-03	1.0E-03	1.4E-04	2.9E-02	2.8E-03	3.3E-04	1.5E-03		
42	2,168	102			3.3E-03	1.4E-03	1.0E-03	1.4E-04	2.8E-02	2.7E-03	3.3E-04	1.4E-03		
43	2,168	69			2.2E-03	9.8E-04	6.8E-04	9.3E-05	1.9E-02	1.8E-03	2.2E-04	9.7E-04		
46	896	46			1.5E-03	6.5E-04	4.6E-04	6.3E-05	1.3E-02	1.2E-03	1.5E-04	6.5E-04		
47	521	42			1.4E-03	5.9E-04	4.1E-04	5.7E-05	1.2E-02	1.1E-03	1.3E-04	5.9E-04		
48	535	25			7.9E-04	3.5E-04	2.4E-04	3.3E-05	6.8E-03	6.5E-04	7.8E-05	3.5E-04		
49	535	25			7.9E-04	3.5E-04	2.4E-04	3.3E-05	6.8E-03	6.5E-04	7.8E-05	3.5E-04		
50	75	15			4.8E-04	2.1E-04	1.5E-04	2.0E-05	4.2E-03	4.0E-04	4.8E-05	2.1E-04		
51	75	15			4.8E-04	2.1E-04	1.5E-04	2.0E-05	4.2E-03	4.0E-04	4.8E-05	2.1E-04		
54	60	3.0			9.6E-05	4.2E-05	2.9E-05	4.0E-06	8.2E-04	7.9E-05	9.5E-06	4.2E-05		
55	67	3.4			1.1E-04	4.9E-05	3.4E-05	4.6E-06	9.5E-04	9.1E-05	1.1E-05	4.9E-05		
56	91	4.1			1.3E-04	5.8E-05	4.0E-05	5.5E-06	1.1E-03	1.1E-04	1.3E-05	5.8E-05		
58	2848	136			4.4E-03	1.9E-03	1.3E-03	1.8E-04	3.8E-02	3.6E-03	4.3E-04	1.9E-03		
59	2848	136			4.4E-03	1.9E-03	1.3E-03	1.8E-04	3.8E-02	3.6E-03	4.3E-04	1.9E-03		
60	2,670	121			3.9E-03	1.7E-03	1.2E-03	1.6E-04	3.4E-02	3.2E-03	3.9E-04	1.7E-03		

**SYNTHETIC MINOR OPERATING PERMIT  
EVALUATION REPORT  
Genentech, Inc.**

**Plant Number: A1257**

**Application Number: 24594**

61	2,670	121		3.9E-03	1.7E-03	1.2E-03	1.6E-04	3.4E-02	3.2E-03	3.9E-04	1.7E-03	
62	60	3.8		1.2E-04	5.4E-05	3.7E-05	5.1E-06	1.1E-03	1.0E-04	1.2E-05	5.4E-05	
63	1,408	71		2.3E-03	1.0E-03	7.0E-04	9.6E-05	2.0E-02	1.9E-03	2.3E-04	1.0E-03	
70	94	3.0		9.7E-05	4.2E-05	2.9E-05	4.0E-06	8.3E-04	7.9E-05	9.6E-06	4.2E-05	
71	685	33		1.0E-03	4.6E-04	3.2E-04	4.4E-05	9.0E-03	8.6E-04	1.0E-04	4.6E-04	
75	382	19.1		6.1E-04	2.7E-04	1.9E-04	2.6E-05	5.3E-03	5.1E-04	6.1E-05	2.7E-04	
76	1,114	55		1.8E-03	7.7E-04	5.4E-04	7.4E-05	1.5E-02	1.5E-03	1.7E-04	7.7E-04	
77	160	11		3.4E-04	1.5E-04	1.1E-04	1.4E-05	3.0E-03	2.8E-04	3.4E-05	1.5E-04	
78	1,480	71		2.3E-03	1.0E-03	7.0E-04	9.6E-05	2.0E-02	1.9E-03	2.3E-04	1.0E-03	
79	85	3.5		1.1E-04	4.9E-05	3.4E-05	4.7E-06	9.7E-04	9.3E-05	1.1E-05	4.9E-05	
80	2,155	104		3.3E-03	1.5E-03	1.0E-03	1.4E-04	2.9E-02	2.8E-03	3.3E-04	1.5E-03	
81	59	3.4		1.1E-04	4.8E-05	3.3E-05	4.6E-06	9.4E-04	9.0E-05	1.1E-05	4.8E-05	
82	2,848	136		4.4E-03	1.9E-03	1.3E-03	1.8E-04	3.8E-02	3.6E-03	4.3E-04	1.9E-03	
87	1,807	89		2.9E-03	1.3E-03	8.8E-04	1.2E-04	2.5E-02	2.4E-03	2.8E-04	1.3E-03	
88	2,848	136		4.4E-03	1.9E-03	1.3E-03	1.8E-04	3.8E-02	3.6E-03	4.3E-04	1.9E-03	
89	2,848	136		4.4E-03	1.9E-03	1.3E-03	1.8E-04	3.8E-02	3.6E-03	4.3E-04	1.9E-03	
90	2,848	136		4.4E-03	1.9E-03	1.3E-03	1.8E-04	3.8E-02	3.6E-03	4.3E-04	1.9E-03	
91	2,848	136		4.4E-03	1.9E-03	1.3E-03	1.8E-04	3.8E-02	3.6E-03	4.3E-04	1.9E-03	
92	2,847	136		4.4E-03	1.9E-03	1.3E-03	1.8E-04	3.8E-02	3.6E-03	4.3E-04	1.9E-03	
93	325	16		5.2E-04	2.3E-04	1.6E-04	2.2E-05	4.5E-03	4.3E-04	5.2E-05	2.3E-04	
94	2,937	138		4.4E-03	1.9E-03	1.4E-03	1.9E-04	3.8E-02	3.7E-03	4.4E-04	1.9E-03	
95	2,937	139		4.5E-03	2.0E-03	1.4E-03	1.9E-04	3.9E-02	3.7E-03	4.4E-04	2.0E-03	
96	2,937	139		4.5E-03	2.0E-03	1.4E-03	1.9E-04	3.9E-02	3.7E-03	4.4E-04	2.0E-03	
98	126	6.3		2.0E-04	8.9E-05	6.2E-05	8.5E-06	1.7E-03	1.7E-04	2.0E-05	8.9E-05	
99	2,937	139		4.5E-03	2.0E-03	1.4E-03	1.9E-04	3.9E-02	3.7E-03	4.4E-04	2.0E-03	
102	2,937	139		4.5E-03	2.0E-03	1.4E-03	1.9E-04	3.9E-02	3.7E-03	4.4E-04	2.0E-03	
103	2,937	139		4.5E-03	2.0E-03	1.4E-03	1.9E-04	3.9E-02	3.7E-03	4.4E-04	2.0E-03	
105	364	23		7.4E-04	3.3E-04	2.3E-04	3.1E-05	6.4E-03	6.1E-04	7.4E-05	3.3E-04	
106	470	17		5.5E-04	2.4E-04	1.7E-04	2.3E-05	4.7E-03	4.5E-04	5.4E-05	2.4E-04	
107	2,937	139		4.5E-03	2.0E-03	1.4E-03	1.9E-04	3.9E-02	3.7E-03	4.4E-04	2.0E-03	
<b>Subtotal (by chemical)</b>			<b>(tons/year)</b>	<b>1.4E-01</b>	<b>6.1E-02</b>	<b>4.3E-02</b>	<b>5.8E-03</b>	<b>1.2E+00</b>	<b>1.1E-01</b>	<b>1.4E-02</b>	<b>6.1E-02</b>	<b>1.6</b>

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

**Notes**

- Emergency generator data obtained from BAAQMD's Databank for Plant #1257.
- Fuel consumption rates based on manufacturer specification sheets.
- 500 hours/yr of diesel use for testing and emergency situations assumed, based on EPA guidance (1995).
- The largest of the emission factors from US EPA AP-42 and CATEF.

**Table B4. Potential to Emit of Hazardous Air Pollutants – Exempt Laboratories (FRC II and South Campus)**

Compound	CAS #	Potential Emissions <sup>1</sup>		Total HAP Potential Emissions** (tons/year)
		FRC II (Founders Research Center II) <sup>2</sup>	South Campus <sup>3</sup>	
		(tons/year)	(tons/year)	
Acetaldehyde	75-07-0	1.5E-04	--	1.5E-04
Acetonitrile	75-05-8	2.5E-01	2.1E-01	4.6E-01
Aniline	62-53-3	1.4E-04	--	1.4E-04
Benzene	71-43-2	3.0E-04	2.0E-04	5.0E-04
Bromine and compounds	7726-95-6	9.6E-04	--	9.6E-04
Carbon tetrachloride	56-23-5	9.2E-04	--	9.2E-04
Chlorine	7782-50-5	8.6E-04	--	8.6E-04
Chlorobenzene	108-90-7	5.2E-05	--	5.2E-05
Chloroform	67-66-3	1.3E-03	1.8E-03	3.1E-03
Cresol	1319-77-3	2.8E-05	--	2.8E-05
Cyanide	57-12-5	2.5E-04	--	2.5E-04
Diethanolamine	111-42-2	4.7E-05	--	4.7E-05
Dimethylformamide, N,N-	68-12-2	2.9E-02	3.5E-02	6.4E-02
Dioxane, 1,4-	123-91-1	3.9E-03	1.1E-02	1.5E-02
Ethylene glycol	107-21-1	1.2E-03	--	1.2E-03
Formaldehyde	50-00-0	3.3E-03	1.0E-02	1.4E-02

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Hexane, N-	110-54-3	1.8E-01	4.4E-02	2.2E-01
Hydrazine	302-01-2	5.6E-07	--	5.6E-07
Methanol	67-56-1	2.2E-01	2.0E-01	4.2E-01
Methyl tertiary-butyl ether	1634-04-4	3.6E-03	--	3.6E-03
Methylene Chloride	75-09-2	4.0E-01	1.3E-01	5.3E-01
Nitrosodimethylamine, N-	62-75-9	1.1E-07	--	1.1E-07
Phenol	108-95-2	1.3E-04	1.2E-04	2.5E-04
Propylene oxide	75-56-9	1.6E-04	9.1E-04	1.1E-03
Toluene	108-88-3	3.1E-03	2.3E-02	2.6E-02
Triethylamine	121-44-8	3.9E-04	--	3.9E-04
Xylene	1330-20-7	6.4E-03	2.2E-01	2.2E-01
<b>Subtotal</b>				<b>2.0</b>

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

**Notes**

1. Projected annual emissions for the evaluation of HAP emissions from FRCII and South Campus HRSA prepared by ENVIRON and submitted to BAAQMD in 2007 and 2006, respectively.
2. FRCII laboratories include B13, B14, and B15 labs.
3. South Campus laboratories include B41, B42, B43, B46, B47, and B48 labs.

**Table B5. Potential to Emit of Hazardous Air Pollutants – Other Exempt Laboratories**

Chemical <sup>1</sup>	CAS #	Building Hoods	B3	B4	B5 <sup>2</sup>	B6	B7 <sup>2</sup>	B8	B9	FRC1-10 <sup>2</sup>	FRC1-11	FRC1-12 <sup>2</sup>	B20 <sup>2</sup>	Total HAP Potential Emissions** (tons/year)	
			22	15	101	3	81	7	3	58	35	53	59		
Acetonitrile	75-05-8	Maximum Annual Emissions Rate <sup>2</sup> (tons/year)	9.9E-02	6.8E-02	5.6E-01	1.4E-02	4.7E-01	3.2E-02	1.4E-02	6.9E-03	3.3E-02	9.9E-02	5.5E-02	1.5E+00	
Carbon Disulfide	75-15-0		3.8E-04	2.6E-04	4.2E-03	5.2E-05	--	1.2E-04	5.2E-05	--	--	--	--	--	5.0E-03
Chloroform	67-66-3		3.8E-04	2.6E-04	4.1E-03	5.1E-05	--	1.2E-04	5.1E-05	--	--	--	--	--	5.0E-03
Dimethylformamide, N,N-	68-12-2		4.2E-04	2.9E-04	4.7E-03	5.8E-05	--	1.4E-04	5.8E-05	--	1.3E-03	4.2E-03	--	--	1.1E-02
Dioxane, 1,4-	123-91-1		1.0E-04	7.1E-05	1.1E-03	1.4E-05	--	3.3E-05	1.4E-05	--	--	--	--	--	1.4E-03
Dichloroethane, 1,2-	107-06-2		1.3E-04	8.5E-05	1.4E-03	1.7E-05	--	4.0E-05	1.7E-05	--	--	--	--	--	1.7E-03
Ethylene Glycol	107-21-1		4.5E-04	3.1E-04	--	6.1E-05	4.9E-03	1.4E-04	6.1E-05	--	--	--	--	--	5.9E-03
Formaldehyde	50-00-0		1.3E-04	8.5E-05	1.4E-03	1.7E-05	--	4.0E-05	1.7E-05	1.5E-03	1.8E-03	4.1E-03	--	--	9.0E-03
Hexane, n-	110-54-3		3.0E-03	2.0E-03	3.0E-02	4.1E-04	2.8E-03	9.5E-04	4.1E-04	2.5E-03	3.2E-02	9.8E-02	--	--	1.7E-01
Methanol	67-56-1		3.1E-02	2.1E-02	1.2E-01	4.3E-03	1.9E-01	1.0E-02	4.3E-03	5.4E-01	2.5E-01	2.7E-01	2.8E-02	--	1.5E+00
Methyl Isobutyl ketone (Hexone)	108-10-1		1.5E-04	1.0E-04	1.7E-03	2.1E-05	--	4.8E-05	2.1E-05	--	--	--	--	--	2.0E-03
Methyl tert-Butyl Ether (MTBE)	1634-04-4		1.5E-04	1.0E-04	1.6E-03	2.0E-05	--	4.7E-05	2.0E-05	--	--	--	--	--	2.0E-03
Methylene Chloride	75-09-2		2.1E-03	1.5E-03	2.3E-02	2.9E-04	--	6.8E-04	2.9E-04	--	2.2E-01	6.9E-01	--	--	9.3E-01
Phenol	108-95-2		1.1E-04	7.3E-05	1.2E-03	1.5E-05	--	3.4E-05	1.5E-05	--	--	--	--	--	1.4E-03
Toluene	108-88-3		8.7E-05	5.9E-05	--	1.2E-05	9.5E-04	2.8E-05	1.2E-05	--	--	--	--	--	1.2E-03
Triethylamine	121-44-8		8.7E-05	5.9E-05	4.0E-04	1.2E-05	5.5E-04	2.8E-05	1.2E-05	--	--	--	--	--	1.1E-03
Xylenes	1330-20-7		--	--	--	--	--	--	--	2.3E-02	1.3E-02	2.0E-02	--	--	5.6E-02
<b>Subtotal</b>														<b>4.1</b>	

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

**Notes**

1. Hazardous Air Pollutants (HAPs) identified from original USEPA list. (Available here: [www.epa.gov/ttn/atw/188polls.html](http://www.epa.gov/ttn/atw/188polls.html))
2. Emissions based on the maximum of purchase data from Genentech in 2007, 2008 and 2009.
3. B3, B4, B6, B8, B9 emissions scaled based on Method 1 below using estimated emissions from B5, B7, and B20.
4. FRC1-11 Emissions scaled based on Method 2 below using estimated emissions from FRC1-10 and FRC1-12.

**Emissions Estimation Methodology**

1. The average emissions per lab hood for Labs B5, B7, and B20 were used to scale the Labs by the number of hoods.

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2. The average emissions per lab hood for Labs FRC1-10, FRC1-12 were used to scale the Lab by the number of hoods.

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**APPENDIX C  
POTENTIAL TO EMIT OF GREENHOUSE GASES ESTIMATES**

Table C1. Potential to Emit of Greenhouse Gases – Permitted Boilers

BAAQMD Source ID	Boiler Data <sup>1</sup>			Potential Emissions		
	Heat Input Rating	Maximum Throughput	Hours of Operation	CO <sub>2</sub> e Emission Factor <sup>2</sup>	CO <sub>2</sub> e Emissions**	
	(MMBtu/hour)	(MMBtu/year)	(hours/yr)	(lb/MMBtu)	(tons/year)	
13	21	132,000	3,143	117.0	7,722	
14	21					
83	97					
84	97	849,720	2,920		117.0	49,710
85	97					
<b>Subtotal</b>						<b>57,432</b>

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

Notes

- Boiler data obtained from BAAQMD's Databank for Plant #1257.
- CO<sub>2</sub>e emission factor for natural gas obtained from the sum of products of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions factors and their respective GWPs in 40 CFR Part 98 as follows: (53.02\*1 + 0.001\*21 + 0.0001\*310) lb/MMBtu \* 2.2046 lb/kg = 117.0 lb/MMBtu.

Table C2. Potential to Emit of Greenhouse Gases – Exempt Boilers

Source ID	Building #	Boiler Data <sup>1</sup>		Potential Emissions	
		Heat Input Rating (MMBtu/hour)	Hours of Operation <sup>2</sup> (hours/year)	CO <sub>2</sub> e Emission Factor <sup>3</sup> (lb/MMBtu)	CO <sub>2</sub> e Emissions** (tons/year)
B48A	48	9.997	8,760	117.0	5,123
B48B	48	9.997	8,760		5,123
HWB-51	5	8.369	8,760		4,289
HWB-52	5	8.369	8,760		4,289
SB1	15	8	8,760		4,100
SB2	15	8	8,760		4,100
B48C	48	6	876		307
B41	41	5	876		256
B42A	42	5	876		256
B42B	42	5	876		256
B43	43	5	876		256
HWB-12 <sup>x</sup>	1	5	8,760		2,562
SB101	10	4	876		205
SB102	10	4	876		205
148-BR-2203 <sup>x</sup>	48	2.5	8,760		1,281
148-BR-2204 <sup>x</sup>	48	2.5	8,760		1,281
B46A <sup>x</sup>	46	2.4	8,760		1,230
B46B <sup>x</sup>	46	2.4	8,760		1,230
B47A	47	2.4	8,760		1,230
B47B	47	2.4	8,760		1,230
B-3301	33	2.4	8,760		1,230
B20-A <sup>x</sup>	20	2.25	8,760		1,153
B20-B <sup>x</sup>	20	2.25	8,760		1,153
B20-C <sup>x</sup>	20	2.25	8,760		1,153
B-3101	31	1.999	8,760		1,024
B-4401	44	1.999	8,760		1,024
BR 2203	41	1.8	8,760		922
BR 2204	41	1.8	8,760		922
BR 2203	42	1.8	8,760		922
BR 2204	42	1.8	8,760		922
BR 2205	42	1.8	8,760		922
BR 2203	43	1.8	8,760		922
BR 2204	43	1.8	8,760		922
BR-2201	45	1	8,760		512
A77238	15	0.93	8,760		477



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A77237	15	0.93	8,760	477
A77232	15	0.93	8,760	477
B10-1 <sup>5</sup>	10	0.7	8,760	359
B10-2 <sup>5</sup>	10	0.7	8,760	359
142-BR-1202	42	0.499	8,760	256
142-BR-1201	42	0.499	8,760	256
B31-2 <sup>5</sup>	31	0.4	8,760	205
B48-1 <sup>5</sup>	48	0.4	8,760	205
B48-2 <sup>5</sup>	48	0.4	8,760	205
B20-3 <sup>5</sup>	20	0.399	8,760	204
B20-4 <sup>5</sup>	20	0.399	8,760	204
SB-5	56	0.398	8,760	204
SB-4	56	0.398	8,760	204
SB-3	56	0.398	8,760	204
SB-2	56	0.398	8,760	204
SB-1	56	0.398	8,760	204
SB-6	56	0.398	8,760	204
SB-7	56	0.398	8,760	204
SB-8	56	0.398	8,760	204
SB-9	56	0.398	8,760	204
B20-1 <sup>5</sup>	20	0.39	8,760	200
B20-2 <sup>5</sup>	20	0.39	8,760	200
B46-1 <sup>5</sup>	46	0.25	8,760	128
B46-2 <sup>5</sup>	46	0.25	8,760	128
B47-1 <sup>5</sup>	47	0.25	8,760	128
B47-2 <sup>5</sup>	47	0.25	8,760	128
B71F-1 <sup>5</sup>	71F	0.1999	8,760	102
B71D-1 <sup>5</sup>	71D	0.1999	8,760	102
B71C-1 <sup>5</sup>	71C	0.1999	8,760	102
B71B-1 <sup>5</sup>	71B	0.1999	8,760	102
B71A-1 <sup>5</sup>	71A	0.1999	8,760	102
141-BR-1202	41	0.199	8,760	102
141-BR-1201	41	0.199	8,760	102
143-BR-1201	43	0.199	8,760	102
143-BR-1202	43	0.199	8,760	102
B71F-2 <sup>5</sup>	71F	0.14	8,760	72
B71F-3 <sup>5</sup>	71F	0.14	8,760	72
B71D-2 <sup>5</sup>	71D	0.14	8,760	72
B71C-2 <sup>5</sup>	71C	0.14	8,760	72
B71B-2 <sup>5</sup>	71B	0.14	8,760	72
B71A-2 <sup>5</sup>	71A	0.14	8,760	72
B71E-1 <sup>5</sup>	71E	0.12	8,760	61
B45-1 <sup>5</sup>	45	0.077	8,760	39
143-BR-1201	44	0.065	8,760	33
B-1	4	0.715	8,760	366
B-2	4	0.4	8,760	205
HWB3	4	0.399	8,760	204
F-5	9	0.255	8,760	131
F-6	9	0.2125	8,760	109
WH1	4	0.199	8,760	102
WH2	4	0.199	8,760	102
DHWB1	6	0.181	8,760	93
WH1	56	0.18	8,760	92
B9-1 <sup>5</sup>	9	0.18	8,760	92
IWH2	56	0.175	8,760	90
IWH1	56	0.175	8,760	90
ACC19	4	0.15	8,760	77
68124 <sup>4</sup>	24	0.15	8,760	77
68125 <sup>4</sup>	24	0.15	8,760	77
70348 <sup>4</sup>	24	0.15	8,760	77
67892 <sup>4</sup>	27	0.15	8,760	77
72311 <sup>4</sup>	28	0.15	8,760	77
72312 <sup>4</sup>	28	0.15	8,760	77

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72313 <sup>4</sup>	28	0.15	8,760	77
72314 <sup>4</sup>	28	0.15	8,760	77
72315 <sup>4</sup>	28	0.15	8,760	77
RTU-1/ACCU-1/DX-1	29	0.13	8,760	67
RTU-2/ACCU-2/DX-2	29	0.13	8,760	67
F-4	9	0.1275	8,760	65
F-3	9	0.1275	8,760	65
F-1	9	0.127	8,760	65
F-2	9	0.127	8,760	65
AC-9	5	0.125	8,760	64
AC-25	5	0.125	8,760	64
AC-17	5	0.12	8,760	61
72316 <sup>4</sup>	28	0.1	8,760	51
AC-5	9	0.09	8,760	46
AC-5007	9A	0.08	8,760	41
WH01	5	0.076	8,760	39
WH02	5	0.076	8,760	39
ACHG14	4	0.075	8,760	38
ACHG16	4	0.075	8,760	38
AC-6	4	0.074	8,760	38
AC-5	4	0.074	8,760	38
AC-4	4	0.074	8,760	38
ACHG17	4	0.074	8,760	38
AC-5C	5	0.074	8,760	38
AC-8	5	0.074	8,760	38
AC-26	5	0.074	8,760	38
ACHG15	4	0.072	8,760	37
AC-1	5	0.072	8,760	37
AC-2	5	0.072	8,760	37
AC-3	5	0.072	8,760	37
AC-7	5	0.072	8,760	37
AC-27	5	0.072	8,760	37
AC-13	5	0.072	8,760	37
AC-28	5	0.072	8,760	37
AC-18	5	0.072	8,760	37
AC16	5	0.072	8,760	37
AC-31	5	0.072	8,760	37
AC-15	5	0.072	8,760	37
AC-30	5	0.072	8,760	37
AC-21	5	0.072	8,760	37
AC-23	5	0.072	8,760	37
AC-19	5	0.072	8,760	37
AC-6	5	0.072	8,760	37
AC-24	5	0.072	8,760	37
AC-10	5	0.072	8,760	37
AC-22	5	0.072	8,760	37
AC-4	5	0.072	8,760	37
AC-5	5	0.072	8,760	37
WH-1	9	0.065	8,760	33
68132 <sup>4</sup>	24	0.065	8,760	33
68266 <sup>4</sup>	25	0.065	8,760	33
10002364 <sup>4</sup>	27	0.065	8,760	33
72321 <sup>4</sup>	28	0.065	8,760	33
65551	32	0.065	8,760	33
66318 <sup>4</sup>	33	0.065	8,760	33
71994 <sup>4</sup>	36	0.065	8,760	33
69254	39	0.065	8,760	33
72299 <sup>4</sup>	54	0.065	8,760	33
72300 <sup>4</sup>	54	0.065	8,760	33
ACHG11	4	0.06	8,760	31
WH3	4	0.0525	8,760	27
67895	27	0.04	8,760	20
72298	54	0.04	8,760	20
			<b>Subtotal</b>	<b>65,297</b>

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\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

**Notes**

1. Boiler data obtained from facility.
2. To be conservative, these boilers are assumed to operate continuously at full firing rate for 8,760 hours throughout the year, except for units that are restricted to 10% of their maximum annual fuel usage to maintain limited exemption from emission standards under Regulation 9-7-112. For these boilers, for emissions calculation purposes, the hours of operation was restricted to 876 hours (10% \* 8,760 hours) while maintaining the maximum firing rate. This is mathematically equivalent to restricting total fuel use to 10% of total annual heat capacity. This does not indicate that these units will be restricted to 876 hours of operation per year.
3. CO<sub>2</sub>e emission factor for natural gas obtained from the sum of products of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions factors and their respective GWPs in 40 CFR Part 98 as follows: (53.02\*1 + 0.001\*21 + 0.0001\*310) lb/MMBtu \* 2.2046 lb/kg = 117.0 lb/MMBtu.
4. Heat input rating based on an estimated firing rate.
5. Source ID generated by facility for purposes of this table. The ID consists of the building code followed by the equipment number for that building.

**Table C3. Potential to Emit of Greenhouse Gases – Diesel Generators**

BAAQMD Source ID	Location	Generator Data <sup>1</sup>			Potential Emissions	
		Engine Rating	Diesel Fuel Use <sup>2</sup>	Hours of Operation <sup>3</sup>	CO <sub>2</sub> e Emission Factor <sup>4</sup>	CO <sub>2</sub> e Emissions**
		(hp)	(gal/hour)	(hours/year)	(lb/gal)	(tons/year)
23	10C	1,480	71	500	22.58	402
24	6A	2,153	104			587
25	1A	2,168	109			616
30	3C	2,168	108			608
32	4B	1,135	55			309
33	5A	1,661	70			397
34	7A	2,168	107			606
35	7B	2,153	104			587
38	9A	2,168	107			606
39	9B	2,168	107			606
40	9C	2,168	107			606
41	9D	2,153	104			587
42	10A	2,168	102			576
43	10B	2,168	69			390
46	24A	896	46			262
47	25/26	521	42			237
48	25B	535	25			138
49	26B	535	25			138
50	27A	75	15			85
51	54A	75	15			85
54	25 EFP	60	3.0			17
55	26 EFP	67	3.4			19
56	6 EFP	91	4.1			23
58	15A	2848	136			767
59	15B	2848	136			767
60	8C	2,670	121			682
61	8D	2,670	121			682
62	32 EFP	60	3.8			21
63	32	1,408	71			402
70	15 EFP	94	3.0			17
71	36A	685	33			184
75	28	382	19.1			108
76	29A	1,114	55	309		
77	29 EFP	160	11	60		
78	33	1,480	71	402		
79	PS2 EFP	85	3.5	20		
80	20	2,155	104	587		
81	33 EFP	59	3.4	19		
82	9E	2,848	136	766		
87	9F	1,807	89	503		
88	41	2,848	136	766		
89	42	2,848	136	766		
90	43	2,848	136	766		
91	44	2,848	136	766		
92	51	2,847	136	766		
93	39	325	16	91		

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94	45	2,937	138		779
95	46	2,937	139		784
96	47	2,937	139		784
98	71	126	6.3		36
99	48	2,937	139		784
102	27	2,937	139		784
103	56	2,937	139		784
105	PSA	364	23		130
106	PSB	470	17		96
107	3	2,937	139		784
				<b>Subtotal</b>	<b>24,452</b>

\*\* - Indicates that emissions shown here are potential emissions. Potential to emit is conservatively calculated as the aggregate of the maximum potential for each source.

Notes

- Emergency generator data obtained from BAAQMD's Databank for Plant #1257.
- Fuel consumption rates based on manufacturer specification sheets.
- 500 hours/yr of diesel use for testing and emergency situations assumed, based on EPA guidance (1995).
- CO<sub>2</sub>e emission factor for diesel obtained from the sum of products of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions factors and their respective GWPs in 40 CFR Part 98 as follows:  $(73.96 \cdot 1 + 0.003 \cdot 21 + 0.0006 \cdot 310)$  lb/MMBtu \* 2.2046 lb/kg = 163.6 lb/MMBtu. Emission factor in lb/gal obtained from multiplying the value in lb/MMBtu by 0.138 MMBtu/gal (per 40 CFR Part 98), resulting in 22.58 lb/gal.

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**APPENDIX D  
ACTUAL EMISSIONS OF NITROGEN OXIDES AND GREENHOUSE GASES  
CALCULATIONS**

Table D1. Actual Emissions of Nitrogen Oxides and Greenhouse Gases – Permitted Boilers

Source Number	Type	Permitted NOx (ppmv@3% O <sub>2</sub> ) <sup>1</sup>	2011 Natural Gas Consumption (MMBtu/year) <sup>2</sup>	Emissions Factors (lb/MMBtu)		2011 Emissions (ton/year)	
				CO <sub>2</sub> e <sup>3</sup>	NOx <sup>4</sup>	CO <sub>2</sub> e	NOx
13	Natural gas fired boiler	30	68,284	117.0	0.037	3,995	1.3
14	Natural gas fired boiler	30	46,712	117.0	0.037	2,733	0.9
83	Natural gas fired boiler	9	94,020	117.0	0.011	5,500	0.5
84	Natural gas fired boiler	9	113,265	117.0	0.011	6,626	0.6
85	Natural gas fired boiler	9	116,848	117.0	0.011	6,836	0.6
<b>Total</b>			<b>439,129</b>			<b>25,689</b>	<b>3.9</b>

Notes

- NOx permit level was at 30 ppmvd at 3% O<sub>2</sub> for S-13 and S-14 in 2011. In 2012, the two boilers were retrofitted and NOx permit level was lowered to 9 ppmvd.
- Fuel consumption totals were taken from Genentech's 2011 annual information update, dated January 25, 2012
- CO<sub>2</sub>e emission factor for natural gas obtained from the sum of products of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions factors and their respective GWPs in 40 CFR Part 98 as follows: (53.02\*1 + 0.001\*21 + 0.0001\*310) lb/MMBtu \* 2.2046 lb/kg = 117.0 lb/MMBtu.
- Permitted NOx values were converted from ppmv to lb/MMBtu.

Table D2. Actual Emissions of Nitrogen Oxides and Greenhouse Gases – Exempt Boilers

Type	2011 Natural Gas Consumption (MMBtu/year)	Emissions Factors (lb/MMBtu)		2011 Emissions (ton/year)	
		CO <sub>2</sub> e	NOx	CO <sub>2</sub> e	NOx
Non-permitted small boilers	246,363	117.0	0.098	14,412	12.1
<b>Total</b>	<b>246,363</b>			<b>14,412</b>	<b>12.1</b>

Notes

- Fuel consumption in the non-permitted small boilers in 2011 was based on the site's total 2011 natural gas consumption (as provided in Genentech's 2011 California Air Resources Board Greenhouse Gas Summary Report, Facility ARB ID 101451, verified 8/23/2012), minus the 2011 fuel consumption of the five permitted boilers (from Genentech's BAAQMD 2011 annual information update, dated January 25, 2012).
- Although some of the small boilers have been retrofitted to meet the Regulation 9-7 emission standard (at 30 ppmvd at 3% O<sub>2</sub> or 0.037 lb/MMBtu), emission factor for all the small boilers in this table is conservatively assumed 0.098 lb/MMBtu (from Table 1.4-2 of Section 1.4 [Natural Gas Combustion] of AP-42).

Table D3. Actual Emissions of Nitrogen Oxides and Greenhouse Gases – Diesel Generators

Source Number	Type	Power (bhp)	2011 Run-Time (hrs/year)	2011 Diesel Consumption (gal/year) <sup>1</sup>	Emissions Factors			2011 Emissions (ton/year)	
					CO <sub>2</sub> e (lb/gal) <sup>2</sup>	Permitted NOx Limit (g/bhp-hr) <sup>3</sup>	NOx Emission Factors Sources	CO <sub>2</sub> e	NOx
23	Diesel fired ICE	1480	11	704	22.58	5.9	1	7.9	0.1
24	Diesel fired ICE	2153	40	4160	22.58	1.7	2	47.0	0.2
25	Diesel fired ICE	2168	6	609.6	22.58	7.2	2	6.9	0.1
30	Diesel fired ICE	2168	9	914.4	22.58	7.2	2	10.3	0.2
32	Diesel fired ICE	1135	12.7	447.04	22.58	1.7	2	5.0	0.0
33	Diesel fired ICE	1661	7	566.3	22.58	7.2	2	6.4	0.1
34	Diesel fired ICE	2168	9	914.4	22.58	7.2	2	10.3	0.2
35	Diesel fired ICE	2153	9	792	22.58	1.7	2	8.9	0.0
38	Diesel fired ICE	2168	8	812.8	22.58	7.2	2	9.2	0.1
39	Diesel fired ICE	2168	7	711.2	22.58	7.2	2	8.0	0.1
40	Diesel fired ICE	2,168	8	812.8	22.58	7.2	2	9.2	0.1
41	Diesel fired ICE	2153	7	616	22.58	1.7	2	7.0	0.0
42	Diesel fired ICE	2168	9	914.4	22.58	7.2	2	10.3	0.2
43	Diesel fired ICE	2168	10	1016	22.58	7.2	2	11.5	0.2
46	Diesel fired ICE	896	6	156	22.58	6.4	1	1.8	0.0
47	Diesel fired ICE	521	7.2	302.4	22.58	7.2	2	3.4	0.0
48	Diesel fired ICE	535	6.7	164.15	22.58	5.1	1	1.9	0.0
49	Diesel fired ICE	535	7.1	173.95	22.58	5.1	1	2.0	0.0
50	Diesel fired ICE	75	7.1	106.5	22.58	7.2	2	1.2	0.0
51	Diesel fired ICE	75	7.7	115.5	22.58	7.2	2	1.3	0.0

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54	Diesel fired ICE	60	26.4	107.712	22.58	11	2	1.2	0.0
55	Diesel fired ICE	67	31.9	95.7	22.58	11	2	1.1	0.0
56	Diesel fired ICE	91	26.2	107.42	22.58	14	2	1.2	0.0
58	Diesel fired ICE	2847.5	18	2446.2	22.58	6.2	2	27.6	0.3
59	Diesel fired ICE	2847.5	17	2310.3	22.58	6.2	2	26.1	0.3
60	Diesel fired ICE	2670	2.6	237.38	22.58	6.3	1	2.7	0.0
61	Diesel fired ICE	2670	2.2	200.86	22.58	6.3	1	2.3	0.0
62	Diesel fired ICE	60	25.7	97.66	22.58	6.3	2	1.1	0.0
63	Diesel fired ICE	1408	10	712	22.58	5.9	1	8.0	0.1
70	Diesel fired ICE	94	25.3	75.9	22.58	6.1	2	0.9	0.0
71	Diesel fired ICE	685	8	260.8	22.58	4.0	1	2.9	0.0
75	Diesel fired ICE	382	7	133.7	22.58	5.1	2	1.5	0.0
76	Diesel fired ICE	1114	8	438.4	22.58	5.7	1	4.9	0.1
77	Diesel fired ICE	160	26	278.2	22.58	5.3	2	3.1	0.0
78	Diesel fired ICE	1480	8	569.6	22.58	5.9	1	6.4	0.1
79	Diesel fired ICE	85	22.8	68.4	22.58	5.3	2	0.8	0.0
80	Diesel fired ICE	2155	6	624	22.58	6.3	1	7.0	0.1
81	Diesel fired ICE	59	25.7	100.23	22.58	5.3	2	1.1	0.0
82	Diesel fired ICE	2848	7.8	1059.24	22.58	6.2	1	12.0	0.2
87	Diesel fired ICE	1807	12.4	1106.08	22.58	6.6	1	12.5	0.2
88	Diesel fired ICE	2848	6.8	923.44	22.58	6.2	1	10.4	0.1
89	Diesel fired ICE	2848	4.3	583.94	22.58	6.2	1	6.6	0.1
90	Diesel fired ICE	2848	4.3	583.94	22.58	6.2	1	6.6	0.1
91	Diesel fired ICE	2848	6.4	869.12	22.58	6.2	1	9.8	0.1
92	Diesel fired ICE	2,847	11.1	1507.38	22.58	6.2	1	17.0	0.2
93	Diesel fired ICE	325	6.4	103.68	22.58	5.6	2	1.2	0.0
94	Diesel fired ICE	2937	4.9	676.2	22.58	3.8	1	7.6	0.1
95	Diesel fired ICE	2937	4.5	621	22.58	3.8	1	7.0	0.1
96	Diesel fired ICE	2937	4.6	634.8	22.58	3.8	1	7.2	0.1
98	Diesel fired ICE	126	6.6	46.86	22.58	3.8	1	0.5	0.0
99	Diesel fired ICE	2937	5.5	759	22.58	3.8	1	8.6	0.1
102	Diesel fired ICE	2937	4	543.6	22.58	3.8	1	6.1	0.0
103	Diesel fired ICE	2937	8.3	1127.97	22.58	3.8	1	12.7	0.1
105	Diesel fired ICE	364	2.9	49.3	22.58	2.8	1	0.6	0.0
106	Diesel fired ICE	470	3.3	76.23	22.58	3.8	1	0.9	0.0
107	Diesel fired ICE	2937	23.2	3152.88	22.58	3.8	1	35.6	0.3
<b>Total</b>								<b>432</b>	<b>4.6</b>

Notes

- Fuel consumption totals were taken from Genentech's 2011 annual information updated dated January 25, 2012.
- CO<sub>2</sub>e emission factor for diesel obtained from the sum of products of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions factors and their respective GWPs in 40 CFR Part 98 as follows: (73.96\*1 + 0.003\*21 + 0.0006\*310) lb/MMBtu \* 2.2046 lb/kg = 163.6 lb/MMBtu. Emission factor in lb/gal obtained from multiplying the value in lb/MMBtu by 0.138 MMBtu/gal (per 40 CFR Part 98), resulting in 22.58 lb/gal.
- Permitted NOx emission factors were obtained from either ARB Off-Road Certification Database or BAAQMD permit applications for respective sources. See "NOx Emission Factors Sources" column.

Emission Factors Sources

- ARB Off-Road Certification Database
- BAAQMD permit application for the source.

Unit Conversions

- lbs to tons : divide by 2000
- grams to lbs : divide by 453.6