



**ENGINEERING DIVISION
PERMIT EVALUATION REPORT**

Applicant: University of California, Berkeley

Application #: 9872

Plant #: A0059

**SYNTHETIC MINOR APPLICATION EVALUATION REPORT
University of California, Berkeley
P/A #9872
P # 59**

I. BACKGROUND:

University of California, Berkeley, (UCB), has chosen to apply for a Synthetic Minor Operating Permit (SMOP) to comply with the Title V provisions of the Federal Clean Air Act permitting requirements. The Title V permitting requirements were implemented as a result of the 1990 revisions to the Federal Clean Air Act.

UCB is a large public university located in Berkeley, California. It has a total campus population of approximately 44,000, including students, faculty, staff, and temporary workers. Major air emissions arise mainly from fuel combustion sources such as boilers, and standby emergency diesel/natural gas engine generators. The plant also operates a facility-wide painting operation, as well as exempt sources such as teaching and research laboratories. It had several printing presses, but they have been relocated to another part of the city.

If all sources were to operate at maximum capacity, all permitted and exempt sources at the facility have the potential to emit greater than 100 tons per year of NOx and of CO. However, since most of these sources are backup emergency generators, they have a permit limit of up to 100 hours per year of non-emergency operation (the newer engines have a limit of 26 hours per year of non-emergency operation for Toxics Risk Screen considerations). The bulk of the CO emissions come from the facility's three space heat boilers. The plant usually depends on an adjacent plant (Site #B1326, P.E. Berkeley) for its space heating steam demands. Its three boilers are only permitted to operate if Site #B1326 is undergoing maintenance, if Site #B1326 cannot provide enough steam to the university, and if the boilers are being tested for emission readings.

PTE calculation assumptions:

The boilers provide back up steam for space heating. In a worst case scenario, if Site #B1326 cannot operate for one year, all three boilers would have to operate. With the temperate climate in the Bay Area, it is assumed that they would not operate during the summers, so the operating hours are 6570 hours/year. Furthermore, since most of the teaching and staff facilities would not be used at night, a 70% firing rate is used for the PTE calculation. Diesel fuel is assumed to be needed for 200 hours per year in case there is a natural gas curtailment.

If there is an emergency, it is assumed the emergency generator would not be run for more than 200 hours per year.

Any HAPS that may be emitted is well under 23 tons per year. UCB has decided to apply for the SMOP to obtain permit conditions limiting their criteria pollutants to less than 95 tons per year and HAP emissions to less than 23 tons per year for any combination of HAPS and less than 9 tons per year for any individual HAP.

Attachment-1 is a list of sources covered by this application.

II. EMISSION LIMITS STRATEGY:

To obtain a synthetic minor permit, a facility must have enforceable limits that keep the potential to emit below 95 tons per year of any regulated criteria pollutant, below 9 tons per year of any single HAP, and below 23 tons per year of any combination of HAPs.

UCB has requested short-term emission limits at the combustion sources that may add up to more than the Title V thresholds. UCB will assure compliance by keeping a monthly log of emissions based on the fuel usage and emission factors for each of its combustion source, and curtailing operations, if necessary.

To make these limits practically enforceable, the facility will be required to have monthly recordkeeping and to calculate the emissions on a rolling 12-month basis. The emissions in each 12-month period are required to be below the Title V thresholds.

Boilers:

UCB has 3 space heat boilers (size range from 135 to 137 million Btu/hr). UCB will keep track of the monthly fuel throughput at these boilers and multiply the throughput by the NOx and CO emission factors to keep track of their NOx and CO emission. The NOx emission factors correspond to the Districts Regulation 9-7 limits of 30 ppmv @ 3% O₂ for natural gas and 40 ppmv @ 4% O₂ for diesel fuel. This corresponds to 0.036 and 0.048 lb/mmbtu, respectively. The AP-42 CO natural gas combustion emission factor of 84 lb/mmscf (0.084 lb/mmbtu or 110 ppmv @ 3% O₂) is used. AP-42 CO emission factor of 5 lb/mgal (0.036 lb/mmbtu) is used for fuel oil combustion. Since these are space heat boilers, it is assumed they will not be used in the summer, so the operating hours used are 6570 hr/yr each, with an additional 200 hr/yr of diesel usage, and running at 70% maximum firing rate.

The maximum NOx emission is 35.06 TPY. The potential to emit for carbon monoxide (CO) is 75.91 TPY. Compliance with the proposed limit will be demonstrated by monthly record keeping of the amount of fuel used.

Internal Combustion Engines:

UCB has 36 diesel and 7 natural gas fired emergency backup generators. Their emissions will be calculated according to their permitted emission factors. They are all assumed to run for a maximum of 200 hr/yr.

The SO₂ emission is based on a 0.5% sulfur content in accordance with BAAQMD Regulation 9-1-304. Assuming that a gallon of diesel fuel is equivalent to 140,000 Btu and that the fuel weighs 6.7 lb/gal, the emission factor is 0.48 lb/MMBtu. The AP-42 factor for SO₂ is 0.29 lb/MMBtu. Assuming that the AP-42 lb/hp-hr emission factor is proportional to the AP-42 lb/MMBtu factor, the actual lb/hp-hr emission factor is 0.00339 lb/hp-hr.

The maximum NOx emission is 33.24 TPY. The potential to emit for carbon monoxide (CO) is 6.56 TPY. Compliance with the proposed limit will be demonstrated by monthly record keeping of the amount of fuel used.

Facility Wide Painting Operations

Current BAAQMD permits limit the amount of paint, coating and solvent usage. The estimated VOC emissions were 0.73 TPY. Compliance will be based on daily record keeping of paint, coating, and solvent usage logs.

III. EMISSION SUMMARY

| Source Group | Tons/yr | | | | |
|-----------------------------------|----------------------------------|--------------|----------------------------------|----------------------|----------------------------------|
| | <i>N</i> <i>O</i> <i>x</i> | <i>CO</i> | <i>S</i> <i>O</i> <i>2</i> | <i>P</i> <i>M</i> | <i>P</i> <i>O</i> <i>C</i> |
| Boilers | 35.06 | 75.91 | 1.99 | 7.53 | 5.37 |
| IC Engines | 36.74 | 7.03 | 5.84 | 1.59 | 1.96 |
| Facility Wide Painting Operations | | | | | 0.73 |
| Total: | 71.80 | 82.95 | 7.82 | 9.12 | 8.06 |

The above emissions summary assumes operation assuming 6570 (natural gas) + 200 (diesel) hours per year for the boilers and 200 hr/yr for each backup generator. If they are used for longer periods, the potential to emit for NOx and CO without emission limits is greater than 95 TPY. UCB has requested these individual limits so that they can have the flexibility to have varying usage of each category of combustion equipment in any given year. In order to have this flexibility, UCB has committed to monthly recordkeeping and monthly calculation of the preceding 12-month period to ensure that they do not exceed the limits in any 12-month period.

The potential to emit of POC, PM10 and SO2 is less than the Title V thresholds. Therefore, these pollutants will not be subject to additional recordkeeping and reporting.

IV. EMISSION CALCULATIONS

A. Boilers:

Ap-42 Factors for burning nat'l Gas

Except for NOx, per District Reg 9-7, 0.036 lb/MMBtu (30 ppmv @ 3% O2)

| <u>Pollutant</u> | Emission Factor (lb/MM Btu) | Emission (TPY) |
|------------------|-----------------------------|----------------|
| PM-10 | 0.0076 | 7.11 |
| CO | 0.084 | 74.88 |
| SOx | 0.0006 | 0.56 |
| NOx | 0.036 | 33.69 |
| VOC | 0.0055 | 5.15 |
| Benzene | 0.00045 | 0.0013 |
| Acetaldehyde | 0.0018 | 0.0053 |
| Formaldehyde | 0.015 | 0.0434 |
| Benzaldehyde | 0.0033 | 0.0098 |

Ap-42 Factors for burning Oil

Except for NOx, per District Reg 9-7, 0.048 lb/MMBtu (40 ppmv @ 3% O2)

| <u>Pollutant</u> | Emission Factor (lb/MM Btu) | Emission (TPY) |
|------------------|--------------------------------|-------------------|
| PM-10 | 0.0145 | 0.41 |
| CO | 0.36 | 10.26 |
| SOx | 0.05 | 1.42 |
| NOx | 0.048 | 1.37 |
| VOC | 0.0025 | 0.07 |
| Benzene | 0.00019 | 0.0006 |
| Formaldehyde | 0.004 | 0.0117 |
| Hexane | 9.3e-05 | 0.0003 |
| Toluene | 0.00011 | 0.0003 |
| Xylene | 0.00011 | 0.0003 |

B. Internal Combustion Engines:

| Source # | fuel | hp | NOx | CO | SO2 Lb/hp-hr | PM | ORG | NOx | CO | SO2 tpy | PM | ORG |
|----------|--------|------|--------|--------|-----------------|--------|--------|-------|------|------------|------|------|
| 62 | diesel | 764 | 0.015 | 0.0019 | 0.00339 | 0.0002 | 0.0001 | 1.16 | 0.14 | 0.26 | 0.02 | 0.01 |
| 63 | diesel | 764 | 0.015 | 0.0019 | 0.00339 | 0.0002 | 0.0001 | 1.16 | 0.14 | 0.26 | 0.02 | 0.01 |
| 64 | diesel | 117 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.36 | 0.08 | 0.04 | 0.03 | 0.03 |
| 65 | diesel | 1135 | 0.015 | 0.0019 | 0.00339 | 0.0002 | 0.0001 | 1.73 | 0.21 | 0.38 | 0.03 | 0.02 |
| 105 | diesel | 1200 | 0.024 | 0.0055 | 0.00339 | 0.0007 | 0.0007 | 2.88 | 0.66 | 0.41 | 0.08 | 0.08 |
| 106 | diesel | 1006 | 0.024 | 0.0055 | 0.00339 | 0.0007 | 0.0007 | 2.42 | 0.55 | 0.34 | 0.07 | 0.07 |
| 107 | diesel | 805 | 0.024 | 0.0055 | 0.00339 | 0.0007 | 0.0007 | 1.93 | 0.44 | 0.27 | 0.06 | 0.06 |
| 108 | diesel | 805 | 0.024 | 0.0055 | 0.00339 | 0.0007 | 0.0007 | 1.93 | 0.44 | 0.27 | 0.06 | 0.06 |
| 109 | diesel | 671 | 0.024 | 0.0055 | 0.00339 | 0.0007 | 0.0007 | 1.61 | 0.37 | 0.23 | 0.05 | 0.05 |
| 110 | diesel | 335 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 1.04 | 0.22 | 0.11 | 0.07 | 0.08 |
| 111 | diesel | 385 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 1.20 | 0.26 | 0.13 | 0.08 | 0.10 |
| 112 | diesel | 335 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 1.04 | 0.22 | 0.11 | 0.07 | 0.08 |
| 113 | diesel | 335 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 1.04 | 0.22 | 0.11 | 0.07 | 0.08 |
| 114 | diesel | 335 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 1.04 | 0.22 | 0.11 | 0.07 | 0.08 |
| 115 | diesel | 335 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 1.04 | 0.22 | 0.11 | 0.07 | 0.08 |
| 116 | diesel | 335 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 1.04 | 0.22 | 0.11 | 0.07 | 0.08 |
| 117 | diesel | 335 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 1.04 | 0.22 | 0.11 | 0.07 | 0.08 |
| 118 | diesel | 400 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 1.24 | 0.27 | 0.14 | 0.09 | 0.10 |
| 119 | diesel | 235 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.73 | 0.16 | 0.08 | 0.05 | 0.06 |
| 120 | diesel | 169 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.53 | 0.11 | 0.06 | 0.04 | 0.04 |
| 121 | diesel | 168 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.52 | 0.11 | 0.06 | 0.04 | 0.04 |
| 122 | diesel | 168 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.52 | 0.11 | 0.06 | 0.04 | 0.04 |
| 123 | diesel | 207 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.64 | 0.14 | 0.07 | 0.05 | 0.05 |
| 124 | diesel | 168 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.52 | 0.11 | 0.06 | 0.04 | 0.04 |
| 125 | diesel | 166 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.52 | 0.11 | 0.06 | 0.04 | 0.04 |
| 126 | diesel | 134 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.42 | 0.09 | 0.05 | 0.03 | 0.03 |
| 128 | diesel | 67 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.21 | 0.04 | 0.02 | 0.01 | 0.02 |
| 129 | diesel | 67 | 0.031 | 0.0067 | 0.00339 | 0.0022 | 0.0025 | 0.21 | 0.04 | 0.02 | 0.01 | 0.02 |
| 130 | diesel | 277 | 0.0152 | 0.0019 | 0.00339 | 0.0002 | 0.0001 | 0.42 | 0.05 | 0.09 | 0.01 | 0.00 |
| 131 | diesel | 117 | 0.0152 | 0.0019 | 0.00339 | 0.0002 | 0.0001 | 0.18 | 0.02 | 0.04 | 0.00 | 0.00 |
| 132 | diesel | 117 | 0.0152 | 0.0019 | 0.00339 | 0.0002 | 0.0001 | 0.18 | 0.02 | 0.04 | 0.00 | 0.00 |
| 133 | diesel | 755 | 0.0152 | 0.0019 | 0.00339 | 0.0002 | 0.0001 | 1.15 | 0.14 | 0.26 | 0.02 | 0.01 |
| 141 | diesel | 300 | 0.0113 | 0.0015 | 0.00339 | 0.0002 | 0.0007 | 0.34 | 0.04 | 0.10 | 0.01 | 0.02 |
| 142 | diesel | 382 | 0.0113 | 0.0015 | 0.00339 | 0.0002 | 0.0007 | 0.43 | 0.06 | 0.13 | 0.01 | 0.03 |
| 143 | diesel | 382 | 0.0113 | 0.0015 | 0.00339 | 0.0002 | 0.0007 | 0.43 | 0.06 | 0.13 | 0.01 | 0.03 |
| 144 | diesel | 2936 | 0.0128 | 0.0013 | 0.00339 | 0.0003 | 0.0011 | 3.75 | 0.39 | 1.00 | 0.10 | 0.32 |
| 134 | n.g. | 110 | 0.002 | 0.0014 | 0.00002 | 0.0003 | 0.0002 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 |
| 135 | n.g. | 85 | 0.002 | 0.0014 | 0.00002 | 0.0003 | 0.0002 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 |
| 136 | n.g. | 110 | 0.002 | 0.0014 | 0.00002 | 0.0003 | 0.0002 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 |
| 137 | n.g. | 110 | 0.002 | 0.0014 | 0.00002 | 0.0003 | 0.0002 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 |
| 138 | n.g. | 60 | 0.002 | 0.0014 | 0.00002 | 0.0003 | 0.0002 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 139 | n.g. | 60 | 0.002 | 0.0014 | 0.00002 | 0.0003 | 0.0002 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 140 | n.g. | 70 | 0.002 | 0.0014 | 0.00002 | 0.0003 | 0.0002 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| Total | | | | | | | | 36.74 | 7.03 | 5.84 | 1.59 | 1.96 |

The HAPS calculated were less than 0.0001 tpy.

C. Surface Coating:

Basis:

Reported maximum non-water based paint per agreed upon permit condition

Assume all VOC part of coating is emitted to atmosphere

Assume all solvent used for cleaning and prepping is emitted as POC.

Assume 1% VOC in latex paint (EPA AP-42 section 5.10)

$$\begin{aligned} (80 \text{ gal/yr}) (4 \text{ lb/gal VOC}) &+ (10 \text{ gal/yr}) (6.6 \text{ lb/gal POC}) + (250 \text{ gal/yr})(0.01)(8 \text{ lb/gal}) \\ &+ (160 \text{ gal/yr}) (6.6 \text{ lb/gal POC}) \\ &= 1462 \text{ lb/yr} \\ &= \mathbf{0.73 \text{ tpy POC}} \end{aligned}$$

V. **STATEMENT OF COMPLIANCE**

This facility is in compliance with all the necessary requirements in Regulation 2, Rule 6 to obtain a synthetic minor permit. UCB has voluntarily accepted practically enforceable permit conditions including emission limits that will keep UCB potential to emit to less than 95 tons per year of any regulated air pollutant, 9 tons of any hazardousval air pollutant, and 23 tons of any combination of hazardous air pollutants.

Eric Chan
Air Quality Engineer

Date

**ENGINEERING DIVISION
PERMIT EVALUATION REPORT**

Applicant: University of California, Berkeley

Application #: 9872

Plant #: A0059

UC Berkeley, Plant #59, has a synthetic minor operating permit. This operating permit covers all sources at the facility.

The following conditions establish the federally enforceable permit terms that ensure this plant is classified as a Synthetic Minor Facility under District Regulation 2, Rule 6, Major Facility Review; and ensure 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 less than 95 tons per year, an emission limit for a single hazardous air pollutant of less than 9 tons per year, and an emission limit for a combination of hazardous air pollutants of less than 23 tons per year.

Synthetic Minor Conditions:

1. The owner/operator of UC Berkeley shall not emit more than 9 tons of any single hazardous air pollutant (HAP) or 23 tons of any combination of HAPs in any consecutive 12-month period.
(basis: Synthetic Minor)
2. The owner/operator shall not emit more than 95 tons of any regulated air pollutant into the atmosphere during any consecutive 12-month period.
(basis: Synthetic Minor)
3. Boilers:
 - a. In addition to the times of operation allowed in Permit Condition 14330, boilers S-2, 3, and 4 may also run for a period of up to four hours prior to expected winter operations for the purpose of ensuring boiler operational reliability and to test for their CO emissions. This will start the 168-hour clock for CO monitoring.
 - b. Within each 168 hours of operation at each boiler, the owner/operator shall monitor the boiler's CO readings. The 168-hour clock will restart at the end of each test.
 - c. The owner/operator shall maintain records of the CO monitoring data.
 - d. All records must be kept on site and made available for District inspection for at least 5 years.
 - e. *The owner/operator shall use each CO reading to ensure that the CO emission factor is 0.084 lb/mmbtu or less if burning natural gas and 0.036 lb/mmbtu or less when burning fuel oil. If the reading exceeds these values then the higher value shall be used in the monthly calculations for the following month or months, until the next 168 hr reading is performed.*
 - f. *If the CO emission exceeds the 400 ppmv (0.29 lb/mmbtu) limit in BAAQMD Regulation 9-7, the exceedance shall be considered a violation and shall be reported to the Director of Enforcement within 10 days of the reading.*

(basis: Synthetic Minor and recordkeeping)
4. Stationary Emergency Diesel Engine Generators:
 - a. The owner/operator shall ensure each stationary emergency diesel engine generator will for no more than their respective permitted hours in maintenance mode.
 - b. The owner/operator shall record and maintain the number of hours of operation and the hp rating for each generator on a monthly basis and whether the engine operation is maintenance or production.

**ENGINEERING DIVISION
PERMIT EVALUATION REPORT**

Applicant: University of California, Berkeley

Application #: 9872

Plant #: A0059

- c. Fuel oil sulfur content shall not exceed 0.5% by weight.
- d. All records must be kept on site and made available for District inspection for at least 5 years.
(basis: Synthetic Minor)

5. Plant Wide Coating Operations:

a. The total amount of non-water based coating used at Source 100, miscellaneous painting operations, shall not exceed 80 gallons during any consecutive twelve-month period. The total amount of water based coating used at Source 100 shall not exceed 250 gallons during any consecutive twelve-month period. All coating usage must meet the requirements of the Districts Regulation 8 coatings rules.

b. The net amount of cleanup and surface preparation solvent used at Source 100 shall not exceed 10 gallons during any consecutive twelve-month period. The net amount of organic thinner used at Source 100 shall not exceed 10 gallons during any consecutive twelve-month period.

c. The owner/operator shall maintain the following records in a District-approved log:

- i. net clean-up solvent used at Source 100, in gallons/day
- ii. total surface preparation solvent used at Source 100, in gallons/day
- iii. cumulative monthly totals of above daily usage rates, in gallons/month
- iv. all applicable coating and thinner usages as specified in Regulation 8 rules

These records shall be kept on site and made available for District inspection for a period of 5 years from the date on which a record is made.

(basis: cumulative increase and recordkeeping)

6. The owner/operator shall calculate and maintain records on a monthly basis of each regulated air pollutant emitted into the atmosphere for all sources at the facility. Each regulated air pollutant must be totaled on a consecutive twelve-month period to ensure compliance with part #2 of this condition. The following factors shall be used:

a. Boilers

The owner/operator shall use the AP-42 emission factors for the following pollutants, *except for the Regulation 9-7 limit for NOx

AP-42 Factors for burning natural Gas

| Pollutant | Emission Factor (lb/MM Btu) |
|------------------|---|
| CO | <i>Higher of 0.084 or measured value from previous CO reading conducted every 168 hours</i> |
| *NOx | 0.036 |

**ENGINEERING DIVISION
PERMIT EVALUATION REPORT**

Applicant: University of California, Berkeley

Application #: 9872

Plant #: A0059

| | |
|-----|--------|
| POC | 0.0055 |
|-----|--------|

AP-42 Factors for burning fuel oil

| Pollutant | Emission Factor (lb/MM Btu) |
|------------------|--|
| CO | 0.036 |
| *NOx | 0.048 |
| POC | 0.0025 |

b. For Engines S-129,128,126,125,124,123,122,121,120,119,118,117,116,115, 114,113,112,111,110, 64

1. Records of operation for each source shall be totaled monthly to determine emissions of NOx and CO. Records shall be retained on site and made available for inspection by District personnel for a period of 5 years from the date on which a record is made.
2. Monthly NOx and CO emissions shall be calculated using the following emission factors:
NOx- 0.031 lb/hp-hr, CO- 0.0067 lb/hp-hr.

c. For Engines S-109,108, 107, 106, 105

1. Records of operation for each source shall be totaled monthly to determine emissions of NOx and CO. Records shall be retained on site and made available for inspection by District personnel for a period of 5 years from the date on which a record is made.
2. Monthly NOx and CO emissions shall be calculated using the following emission factors:
NOx- 0.024 lb/hp-hr, CO- 0.0055 lb/hp-hr.

d. For Engines S-65, 63, 62, 133, 132, 131, 130

1. Records of operation for each source shall be totaled monthly to determine emissions of NOx and CO. Records shall be retained on site and made available for inspection by District personnel for a period of 5 years from the date on which a record is made.
2. Monthly NOx and CO emissions shall be calculated using the following emission factors:
NOx- 0.015 lb/hp-hr, CO- 0.0019 lb/hp-hr.

e. For Engines S-140, 139, 138, 137,136, 135, 134

1. Records of operation for each source shall be totaled monthly to determine emissions of NOx and CO. Records shall be retained on site and made available for inspection by District personnel for a period of 5 years from the date on which a record is made.
2. Monthly NOx and CO emissions shall be calculated using the following emission factors:
NOx- 0.002 lb/hp-hr, CO- 0.0014 lb/hp-hr.

f. For Engines S-143, 142, 141

1. Records of operation for each source shall be totaled monthly to determine emissions of NOx and CO. Records shall be retained on site and made available for inspection by District personnel for a period of 5 years from the date on which a record is made.
2. Monthly NOx and CO emissions shall be calculated using the following emission factors:
NOx- 0.0113 lb/hp-hr, CO- 0.0015 lb/hp-hr.

g. For Engine S-144

**ENGINEERING DIVISION
PERMIT EVALUATION REPORT**

Applicant: University of California, Berkeley

Application #: 9872

Plant #: A0059

1. Records of operation for each source shall be totaled monthly to determine emissions of NO_x and CO. Records shall be retained on site and made available for inspection by District personnel for a period of 5 years from the date on which a record is made.
2. Monthly NO_x and CO emissions shall be calculated using the following emission factors:
NO_x- 0.0128 lb/hp-hr, CO- 0.0013 lb/hp-hr.

h. Other Internal Combustion Engines

In the absence of actual source test data or District approved emission factors, the owner/operator shall use the AP-42 emission factors for the following pollutants:

| Pollutant | Emission Factor (lb/hp-hr) |
|------------------|---------------------------------------|
| CO | 0.00668 |
| NO _x | 0.031 |
| POC | 0.0027 |

*(Note: This factor is derived from maximum sulfur content of fuel.)

i. Surface Coating and Solvent Cleaning

For surface coatings and cold cleaner solvents, the owner/operator shall use the manufacturers chemical speciation data or the MSDS information to calculate VOC.

(basis: Synthetic Minor and recordkeeping)

7. The owner/operator shall calculate and maintain records on a monthly basis of the quantity of each hazardous air pollutant (HAP) emitted into the atmosphere from all sources at the facility. The HAPs must be totaled on a consecutive twelve-month period to ensure compliance with part #1. In the absence of actual source test data or District approved emissions factors, the owner/operator shall use the California Air Resources Board CATEF database emission factors or AP-42 factors for the following pollutants.

Boilers burning natural Gas (CATEF)

| Pollutant | Emission Factor (lb/MM cf) |
|------------------|---------------------------------------|
| Benzene | 0.00215 |
| Acetaldehyde | 0.00847 |
| Formaldehyde | 0.0696 |
| Benzaldehyde | 0.0157 |

Boilers burning fuel oil (CATEF)

| Pollutant | Emission Factor (lb/1000 gallons) |
|------------------|--|
| Benzene | 0.00262 |
| Formaldehyde | 0.0533 |
| Hexane | 0.00126 |
| Toluene | 0.00143 |
| Xylene | 0.00155 |

Diesel Firing Internal Combustion Engines (AP-42)

**ENGINEERING DIVISION
PERMIT EVALUATION REPORT**

Applicant: University of California, Berkeley

Application #: 9872

Plant #: A0059

| <u>Pollutant</u> | Emission Factor (lb/mmBtu/hr) |
|-------------------------|--|
| Benzene | 0.00000876 |
| Toluene | 0.00000384 |
| Xylene | 0.00000267 |

For surface coatings and cold cleaner solvents, the owner/operator shall use the manufacturers chemical speciation data or the MSDS information to calculate HAPs.
(basis: Synthetic Minor and recordkeeping)

8. The owner/operator shall keep records of other unpermitted, temporary, or portable sources (except emissions from non-road engines as defined by 40 CFR 89) if the total emissions from these sources exceed 2 tons per year of any single regulated air pollutant or 400 pounds per year of a combination of hazardous air pollutants.
(basis: Synthetic Minor and recordkeeping)
9. The Owner/Operator shall prepare an annual emissions report. The report shall contain the following items for the year ending Feb 28:
 - a. Total HAP emissions for the year.
 - b. Emissions of each HAP for the year
 - c. Total NOX, CO, and VOC emissions.
 - d. Usage of fuel oil and natural gas at boilers
 - e. Usage of fuel at engines
 - f. Any regulated air pollutant required by part 7 of this condition

This report shall be submitted to the Director of Compliance and Enforcement by February 28 of each year.

(basis: Synthetic Minor and recordkeeping)

The owner/operator shall report non-compliance with any of the above conditions in writing to the Director of Compliance and Enforcement within 10 calendar days of discovery of non-compliance.
Enforcement within 10 calendar days of discovery of non-compliance.

**ENGINEERING DIVISION
PERMIT EVALUATION REPORT**

Applicant: University of California, Berkeley

Application #: 9872

Plant #: A0059

Current Sources

- S2 Boiler No. 2
- S3 Boiler No. 3
- S4 Boiler No. 4
- S62 Diesel Powered Gen.Set,Central Dinning(764 bhp)
- S63 Diesel Powered Generator Set (765 bhp)
- S64 Diesel-fired emergency gen set 117 bhp
- S65 Emergency Genset
- S100 Facility-wide Painting Operations
- S105 Haas Pavillion/Rec. Sprt. CEV Standby Gen-Set 75kw
- S106 Mulford CEV Standby Gen-Set, 75 kw
- S107 Diesel Engine, Cummins model 37116828, emergency standby
- S108 Diesel Engine, Cummins model VTA28G2, emergency standby
- S109 Diesel Engine, Detroit Diesel model 500ROZD71, emergency standby
- S110 Diesel Engine, Volvo model TAD1030GE, emergency standby
- S111 Diesel Engine, Ford model CID 300, emergency standby
- S112 Diesel Engine, Caterpillar model 3208, emergency standby
- S113 Diesel Engine, Caterpillar model 3208, emergency standby
- S114 Diesel Engine, Caterpillar model 3208, emergency standby
- S115 Diesel Engine, Caterpillar model 3208, emergency standby
- S116 Diesel Engine, Detroit Diesel model 80637405, emergency standby
- S117 Diesel Engine, Detroit Diesel model 80637405, emergency standby
- S118 Diesel Engine, Allis Chalmer model 3119-0955, emergency standby
- S119 Diesel Engine, Allis Chalmer model DES 200, emergency standby
- S120 Diesel Engine, John Deere model C5PG 6005-A, emergency standby
- S121 Diesel Engine, Allis Chalmer model 12ST6, emergency standby
- S122 Diesel Engine, John Deere model 6059TF003, emergency standby
- S123 Diesel Engine, Cummins model GCT8.3-G207HP, emergency standby
- S124 Diesel Engine, Cummins model N-55-G, emergency standby
- S125 Diesel Engine, Caterpillar model 27D6, emergency standby
- S126 Diesel Engine, Cummins model 6BT5.9-GC, emergency standby
- S127 Diesel Engine, Allis Chalmer model 11000 MK11, emergency standby
- S128 Diesel Engine, John Deere model 4030TF001, emergency standby
- S129 Diesel Engine, Cummins model KW50, emergency standby
- S130 Diesel-fired emergency gen set;Hildebrand;277 bhp
- S131 CEV Standby Genset, Haas Pavilion
- S132 CEV Standby Gen Set, Mulford
- S133 Generator Set
- S134 Standby Generator - LHS Dock
- S135 Standby Generator - Calvin
- S136 Standby Generator - Etcheverry
- S137 Standby Generator - Silver Space Sciences
- S138 Standby Generator - Art Museum
- S139 Standby Generator - Doe Annex/Moffitt
- S140 Standby Generator - University Hall
- S141 Bowles Hall Stand By Genset, 244 kW
- S142 Stand By Genset 250 kW, Residence Halls
- S143 Standby Genset, 250 kW, Residence Halls
- S144 Emergency Generator 2000 RE0ZDB