

**ENGINEERING EVALUATION
PETALUMA CREAMERY
PLANT 18712
APPLICATION 29733**

BACKGROUND

Petaluma Creamery is applying for Authorities to Construct for the following equipment.

- S-3 Milk Dryer; Make: Mojonier; Model: Auto Flo Dry Milk System; Maximum Production Capacity: 0.99 ton/hour; equipped with DS-20 Air Heater; Maximum Firing Rate: 5.48 MMBtu/hour; abated by A-1 Primary Cyclone, A-2 Secondary Cyclone, A-3 Venturi Scrubber and A-5 Tertiary Cyclone;**
- S-8 Steam Boiler; Make: Cleaver-Brooks; Model: CBEX 700-700-150ST; Maximum Firing Rate: 28.57 MMBtu/hour;**

and for Permits to Operate for the following equipment:

- S-5 Cooling Tower; Maximum Capacity: 24,000 gallons/hour;**
- S-6 Milk Powder Hopper; Make: Mojonier; Maximum Production Capacity: 0.99 ton/hour; abated by A-4 Dust Collector**
- S-7 Flocculant Storage Tank; Tank Volume: 275 gallons;**

and an Exemption for the following equipment:

- S-4 Dissolve Air Floatation (DAF) Unit for Wastewater Pretreatment Plant; Maximum Capacity: 202,000 gallons/day;**

and add the following equipment under shutdown sources to the District database:

- S-1 Steam Boiler; Make: Cleaver-Brooks; Model: CB200-700-ISO;**
- S-2 Steam Boiler; Make: Cleaver-Brooks; Model: CB200-700-ISO;**

Sources S-1 and S-2 Steam Boilers are existing sources that have been in operation since July, 2007. Source S-3 Milk dryer has been in operation at the site since 1971. The first application (Application No. 16783) for Sources S-1, S-2, and S-3 was submitted to the Air District on October 5, 2007. During the review process of Application No. 16783, the Air District determined that Sources S-1 and S-2 were not in compliance with the NO_x concentration limit set forth in the Regulation 9, Rule 7 (“Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters”). Thus, the facility was required to either retrofit the existing boilers or install new boilers to comply with Regulation 9, Rule 7. However, this application was cancelled due to incompleteness on September 3, 2010.

The application for Sources S-1, S-2, and S-3 (Application No. 27597) was resubmitted on November 15, 2015. However, the application was cancelled once again for incompleteness on March 16, 2017.

The facility submitted a new application (Application No. 29088) on January 22, 2018. During site visit on February 27, 2018, the Air District inspection staff discovered additional equipment including Sources S-4 DAF unit, S-5 Cooling Tower, S-6 Milk Powder Hopper, and S-7 Flocculant Storage Tank that required permitting. However, the application was cancelled for incompleteness on December 28, 2018.

The facility resubmitted a new application (Application No. 29733) on January 29, 2019. On June 10, 2019, the facility has agreed to complete and receive the air permits necessary to operate S-3 Milk Dryer, S-4 DAF Unit, S-5 Cooling Tower, S-6 Milk Powder Hopper, S-7 Flocculant Storage Tank, and S-8 Steam Boiler under the signed executed judgement by no later than December 31, 2020.

Since the existing boilers Sources S-1 and S-2 Steam Boilers could not comply with the NO_x limits set forth in Regulation 9, Rule 7, the facility proposed to install new S-8 Steam Boiler and remove the two existing boilers, Sources S-1 and S-2 Steam Boilers. The facility dismantled and removed Source S-1 Steam Boiler on July, 2018. The facility will dismantle and remove Source S-2 Steam Boiler upon installation of S-8.

S-4 DAF Unit Exemption

Source S-4 DAF Unit is strictly used for wastewater pretreatment purposes to remove dairy solids prior to discharging the wastewater to the City of Petaluma's Wastewater Treatment Plant. The pre-treatment is required in order for the facility to comply with the requirement set forth in Wastewater Discharge Permit issued by City of Petaluma. The source is not an oil-water separator or wastewater system subject to Regulation 8, Rule 8 ("Wastewater Collection and Separation Systems"). Wastewater Pre-treatment system was previously exempted on identical basis in Application No. 28788 for Lehigh Cement Plant.

Because Source S-4 DAF Unit is an equipment that does not fall into any one of the pre-defined exemption categories in Regulation 2, Rule 1, Sections 103 to 127, the exemption basis is Section 128.19, which exempts "Any source or operation deemed by the Air Pollution Control Officer (APCO) to be equivalent to a source or operation which is expressly exempted by Sections 2-1-113 through 128." In this case, the equivalent source or operation is "Liquid Storage and Loading Equipment".

Source S-4 DAF Unit is exempt per Regulation 2, Rule 1, Section 123.2 ("Exemption, Liquid Storage and Loading Equipment"), since the equipment is used for storing aqueous solution less than 1% by weight in organic compounds. Petaluma Creamery's Wastewater Discharge Permit requires that the wastewater discharged from the facility to have less than 1 mg/L of total toxic organics (1 ppmw). In addition, the analysis of Total Organic Carbon (TOC) measured at the influent at Source S-4 DAF Unit indicated that the TOC content of the wastewater was 39 mg/L, which is equivalent to approximately 0.004% by mass.

Conversion of TOC Concentration to Mass Percentage = $(39 \text{ mg/L})(1 \text{ L of H}_2\text{O} / 1,000,000 \text{ mg}) = 0.0039\%$

EMISSIONS SUMMARY

Maximum Annual and Daily Emissions from S-3 Milk Dryer:

Particulate matter less than 10 micrometer (PM₁₀) and less than 2.5 micrometer in diameter (PM_{2.5}) from Source S-3 Milk Dryer:

Basis:

- Maximum daily production: 33,205 pounds per day (lbs/day), (16.6 tons/day)
- Maximum annual production: 12,000,000 lbs/year (6,000 tons/year)
- Maximum exhaust flowrate for Source S-3 was not provided by the applicant due to age of the equipment and lack of data. Thus, the exhaust flowrate was estimated using maximum firing rate of Source S-3 and F_d-factor of 8,710 dry, standard cubic feet (dscf) per million British thermal units (MMBtu) for natural gas.
- The Air District will limit PM₁₀ and PM_{2.5} emissions for Source S-3 to below 9.0 pounds per day for Best Available Control Technology avoidance purposes. In addition, the facility will be required to perform initial source testing in order to verify that Source S-3 can comply with the emission limits provided below.
- Total suspended particulate (TSP) emissions were assumed to be equivalent for conservative estimate of PM₁₀ and PM_{2.5} emissions for the purpose of this application. PM₁₀ and PM_{2.5} emissions were limited in the permit condition by using TSP emission limit.

S-3 Exhaust Flowrate = $(5.55 \text{ MMBtu/hour})(8,710 \text{ dscf/MMBtu}) = 48,340 \text{ dscf/hour} = 806 \text{ dscf/minute}$

Maximum Daily Hours of Operation for S-3 = (33,205 lbs/day)/(1,980 lbs/hour) = 16.8 hours/day
 TSP Emissions Limit = (9.0 lbs/day)/(16.6 tons/day) = 0.542 lbs/ton
 TSP Grain Loading Limit = (9.0 lbs/day)(7,000 grains/lb)/[(48,340 dscf/hour)(16.8 hours/day)]
 = 0.078 grains/dscf

Daily TSP Emissions = Daily PM₁₀ and PM_{2.5} Emissions = 9.0 lbs/day
 Annual TSP Emissions = Annual PM₁₀ and PM_{2.5} Emissions = (0.542 lbs PM₁₀ or PM_{2.5}/ton) (6,000 tons/year) = 3,253 lbs/year = 1.626 tons/year

Emissions due to Natural Gas Combustion from S-3:

Basis:

- Natural gas higher heating value: 1,020 Btu/scf
- Maximum daily natural gas usage: 90,022 scf/day (91.82 MMBtu/day)
- Maximum annual natural gas usage: 32,533,333 scf/year (33,184 MMBtu/year)

- The emission factors from Table 1.4-1 of Environmental Protection Agency (EPA) document, Compilation of Air Emission Factors (AP-42), Chapter 1.4 - Natural Gas Combustion was used for the NO_x, CO, and POC emissions calculation.

- SO₂ emission factor was derived from based on Pacific Gas & Energy maximum sulfur content specification of 1 grain per 100 standard cubic feet.

- PM emissions due to natural gas combustion was not calculated, since the total PM₁₀ and PM_{2.5} emissions from Source S-3 will be limited to 9 pounds per day.

Table 1 – Emissions due to Natural Gas Emissions from Source S-3 Milk Dryer

| Maximum Firing Rate (scf/hour) | Pollutant | Emission Factor (lbs/MMscf) | Maximum Daily Emission (lbs/day) | Annual Emission (lbs/year) | Annual Emission (tons/year) |
|--------------------------------|-----------------|-----------------------------|----------------------------------|----------------------------|-----------------------------|
| 5,368 | NO _x | 100 | 9.0 | 3,253 | 1.627 |
| | CO | 84 | 7.6 | 2,733 | 1.366 |
| | POC | 5.5 | 0.5 | 179 | 0.089 |
| | SO ₂ | 2.86 | 0.3 | 93 | 0.046 |

Table 2 – Total Criteria Pollutant Emissions from Source S-3 Milk Dryer

| Pollutant | Maximum Daily Emission (lbs/day) | Annual Emission (lbs/year) | Annual Emission (tons/year) |
|-------------------|----------------------------------|----------------------------|-----------------------------|
| NO _x | 9.0 | 3,253 | 1.627 |
| CO | 7.6 | 2,733 | 1.366 |
| POC | 0.5 | 179 | 0.089 |
| PM ₁₀ | 9.0 ¹ | 3,253 | 1.626 |
| PM _{2.5} | 9.0 ¹ | 3,253 | 1.626 |
| SO ₂ | 0.3 | 93 | 0.046 |

¹. As discussed above, S-3 PM₁₀ and PM_{2.5} emissions will be limited to 9.0 pounds per day.

Maximum Annual and Daily Emissions from S-5 Cooling Tower:

Basis:

- Operation: 24 hours/day, 253 day/year
- Maximum hourly capacity: 24,000 gallons/hour
- Maximum daily water usage: 570,600 gallons/day
- Maximum annual water usage: 145,454,545 gallons/year

- Drift loss: 0.002% (based on the manufacturer-provided data)
- Total dissolved solid concentration: 1,000 mg/L (equivalent to 1,000 ppmw)
- All PMs emitted were assumed to be PM_{2.5}

$$\text{Maximum Daily PM}_{10} \text{ and PM}_{2.5} \text{ Emissions} = (1,000 \text{ mg/L})(3.79 \text{ L/gal})(1 \text{ lb}/453,592 \text{ mg}) \\ (57,600 \text{ gallons/day})(0.002\%) = 0.1 \text{ lbs/day}$$

$$\text{Maximum Annual PM}_{10} \text{ and PM}_{2.5} \text{ Emissions} = (1,000 \text{ mg/L})(3.79 \text{ L/gal})(1 \text{ lb}/453,592 \text{ mg}) \\ (145,454,545 \text{ gallons/year})(0.002\%) = 24.3 \text{ lbs/year}$$

Maximum Annual and Daily Emissions from S-6 Milk Powder Hopper:

Basis:

- Maximum daily production: 33,205 lbs/day (16.6 tons/day)
- Maximum annual production: 12,000,000 lbs/year (6,000 tons/year)
- The PM emission factor was obtained using equation 1 from EPA AP-42, Chapter 13.2.4 Aggregate Handling and Storage Piles, since no representative emission factor was available for handling of milk powder. All PMs emitted during operation of Source S-6 was assumed to be less than 2.5 micrometer in diameter for the most conservative estimate of PM₁₀ and PM_{2.5} emissions.
- Since Source S-6 will be operated indoor, the wind speed indoor expected to be close to zero or negligible. However, wind speed of 5 miles per hour was assumed for conservative estimate of PM₁₀ and PM_{2.5} emissions.
- Moisture content of 0.25% was assumed for conservative estimate of PM₁₀ and PM_{2.5} emissions, which was lowest moisture allowed by the equation.

$$\text{PM}_{10} \text{ and PM}_{2.5} \text{ Emission Factor [lbs/ton]} = k (0.0032) (U/5)^{1.3} / (M/2)^{1.4} = 0.069 \text{ lbs PM}_{10} \text{ or PM}_{2.5} / \text{ton}$$

k = particle size multiplier = 0.35 for PM₁₀; Identical k multiplier was assumed for PM_{2.5} for conservative estimate of PM_{2.5} emissions.

U = mean wind speed in meters per second [m/s] = 2.23 m/s = 5 miles per hour

M = material moisture content [%] = 0.05%

$$\text{Maximum Daily PM}_{10} \text{ and PM}_{2.5} \text{ Emissions} = (16.6 \text{ tons/day})(0.069 \text{ lbs/ton})(1 \text{ transfer point}) = 0.12 \text{ lb/day} \\ \text{Maximum Annual PM}_{10} \text{ and PM}_{2.5} \text{ Emissions} = (6,000 \text{ ton/year})(0.069 \text{ lb/ton})(1 \text{ transfer point}) \\ = 43.4 \text{ lbs/year}$$

Maximum Annual and Daily Emissions from S-7 Flocculant Storage Tank:

Basis:

- Maximum daily production: 1.32 gallons/day
- Maximum annual production: 482 gallons/year
- The emissions from Source S-7 Flocculant Storage Tank was calculated using EPA Tanks 4.0.9d program.
- The full results from EPA Tanks 4.0.9d program are available in the Appendix Section.
- Maximum daily working loss was calculated assuming that maximum of single tank loading event would occur on any single day (i.e. annual working loss divided by number of tank turnover required per year).
- Maximum daily breathing loss was calculated by dividing the annual breathing loss emissions by 365 days.

Table 3 – Maximum Daily Emission for S-7 Flocculant Storage Tank Maximum

| Emission Type | Daily Emissions (lbs/day) | Annual Emissions (lbs/year) |
|--------------------------|---------------------------|-----------------------------|
| Maximum # of Turnovers | 1 ¹ | 1.8 ¹ |
| Working Loss Emissions | 2.3 | 4.1 |
| Breathing Loss Emissions | 0.4 | 143.7 |
| Total | 2.7 | 147.8 |

¹. The units for maximum # of turnovers for daily and annual emission are in units of # of turnovers per day and per year, respectively.

Maximum Annual and Daily Emissions from S-8 Steam Boiler:

Basis:

- Operation: 24 hours/day, 365 days/year
- Natural gas higher heating value: 1,020 Btu/scf
- Maximum daily natural gas usage: 672,360 scf/day (685 MMBtu/day)
- Maximum annual natural gas usage: 245,411,400 scf/year (250,320 MMBtu/year)
- NO_x concentration: 5 ppmv, dry at 3% oxygen (manufacturer guarantee)
- CO concentration: 15 ppmv, dry at 3% oxygen (manufacturer guarantee)

- The emission factors from Table 1.4-1 of EPA AP-42 Chapter 1.4 - Natural Gas Combustion was used for the POC, and PM emissions calculation.

- SO₂ emission factor was derived from based on Pacific Gas & Energy maximum sulfur content specification of 1 grain per 100 standard cubic feet.

- All particulates emitted were assumed to be less than 2.5 micrometer in diameter for conservative estimate of PM₁₀ and PM_{2.5} emissions

Table 4 – Criteria Pollutant Emissions from S-8 Steam Boiler

| Maximum Firing Rate (scf/hour) | Pollutant | Emission Factor (lbs/MMscf) | Daily Emission (lbs/day) | Annual Emission (lbs/year) | Annual Emission (tons/year) |
|--------------------------------|-------------------|-----------------------------|--------------------------|----------------------------|-----------------------------|
| 28,015 | NO _x | 6.2 | 4.2 | 1,518 | 0.759 |
| | CO | 11.3 | 7.6 | 2,771 | 1.386 |
| | POC | 5.5 | 3.7 | 1,350 | 0.675 |
| | PM ₁₀ | 7.6 | 5.1 | 1,865 | 0.933 |
| | PM _{2.5} | 7.6 | 5.1 | 1,865 | 0.933 |
| | SO ₂ | 2.9 | 1.9 | 701 | 0.351 |

Emissions Summary:

Table 5 – Maximum Daily Emissions Summary for Application No. 29733

| Pollutant | Emissions (lbs/day) | | | | |
|-------------------|---------------------|-----|-----|-----|-----|
| | S-3 | S-5 | S-6 | S-7 | S-8 |
| NO _x | 9.0 | 0.0 | 0.0 | 0.0 | 4.2 |
| CO | 7.6 | 0.0 | 0.0 | 0.0 | 7.6 |
| POC | 0.5 | 0.0 | 0.0 | 2.7 | 3.7 |
| PM ₁₀ | 9.0 | 0.1 | 0.1 | 0.0 | 5.1 |
| PM _{2.5} | 9.0 | 0.1 | 0.1 | 0.0 | 5.1 |
| SO ₂ | 0.3 | 0.0 | 0.0 | 0.0 | 1.9 |

Table 6 – Annual Emissions Summary for Application No. 29733

| Pollutant | Emissions (lbs/year) | | | | | Total | |
|-------------------|----------------------|-----|-----|-----|-------|------------|-------------|
| | S-3 | S-5 | S-6 | S-7 | S-8 | (lbs/year) | (tons/year) |
| NO _x | 3,253 | 0 | 0 | 0 | 1,518 | 4,771 | 2.385 |
| CO | 2,733 | 0 | 0 | 0 | 2,771 | 5,504 | 2.752 |
| POC | 179 | 0 | 0 | 148 | 1,350 | 1,676 | 0.838 |
| PM ₁₀ | 3,253 | 24 | 43 | 0 | 1,865 | 5,185 | 2.593 |
| PM _{2.5} | 3,253 | 24 | 43 | 0 | 1,865 | 5,185 | 2.593 |
| SO ₂ | 93 | 0 | 0 | 0 | 701 | 794 | 0.397 |

PLANT CUMULATIVE INCREASE

The cumulative increase for Petaluma Creamery is presented in Table 7.

Table 7 – Cumulative Increase for Petaluma Creamery (Plant #18712)

| Pollutant | Current (tons/year) | Application Increase (tons/year) | New Total (tons/year) |
|-------------------|---------------------|----------------------------------|-----------------------|
| NO _x | 0.000 | 2.385 | 2.385 |
| CO | 0.000 | 2.752 | 2.752 |
| POC | 0.000 | 0.838 | 0.838 |
| PM ₁₀ | 0.000 | 2.593 | 2.593 |
| PM _{2.5} | 0.000 | 2.593 | 2.593 |
| SO ₂ | 0.000 | 0.397 | 0.397 |

HEALTH RISK ASSESSMENT (HRA)

The calculated emissions increase of formaldehyde associated with this project is in excess of the chronic risk screening trigger as set forth in Regulation 2, Rule 5 (“New Source Review for Toxic Air Contaminants”) as shown below. Source S-3 Milk Dryer and S-8 Steam Boiler emit benzene, formaldehyde, and toluene as combustion byproduct. Tables 8 and 9 contains the toxic emissions calculation for Source S-3 Milk Dryer and S-8 Steam Boiler, respectively. The emission factors for the toxic air contaminants (TACs) used in Table 7 and 8 are from the District Policy – “Emissions Factors for Toxic Air Contaminants from Miscellaneous Natural Gas Combustion” approved on February 28th, 2008. Table 10 contains the total toxic emission increase for the application.

Table 8 – TAC Emissions for Source S-3 Milk Dryer

| Annual Natural Gas Usage (MMscf/year) | Pollutant | Emission Factor (lb/MMscf) | Hourly Emission (lbs/hour) | Annual Emissions (lbs/year) |
|---------------------------------------|--------------|----------------------------|----------------------------|-----------------------------|
| 32.5 | Benzene | 2.10E-03 | 1.13E-05 | 0.07 |
| | Formaldehyde | 7.50E-02 | 4.03E-04 | 2.4 |
| | Toluene | 3.40E-03 | 1.83E-05 | 0.11 |

Table 9 – TAC Emissions for Source S-8 Steam Boiler

| Annual Natural Gas Usage Limit (MMscf/year) | Hourly Fuel Input Rate (MMscf/hour) | Pollutant | Emission Factor (lb/MMscf) | Hourly Emission (lbs/hour) | Annual Emissions (lbs/year) |
|---|-------------------------------------|--------------|----------------------------|----------------------------|-----------------------------|
| 245 | 0.028 | Benzene | 2.10E-03 | 5.88E-05 | 10.2 |
| | | Formaldehyde | 7.50E-02 | 2.10E-03 | 18.4 |
| | | Toluene | 3.40E-03 | 9.53E-05 | 0.8 |

Table 10 – TAC Emissions Calculation for the Project

| Pollutant | Total Hourly Emissions (lbs/hour) | Acute Trigger Level (lbs/hour) | Total Annual Emissions (lbs/year) | Chronic Trigger Level (lbs/year) | HRA Required? (Y/N) |
|--------------|-----------------------------------|--------------------------------|-----------------------------------|----------------------------------|---------------------|
| Benzene | 0.00007 | 6.00E-02 | 10.3 | 2.90E+00 | Y |
| Formaldehyde | 0.0025 | 1.20E-01 | 20.8 | 1.40E+01 | Y |
| Toluene | 0.00011 | 8.20E+01 | 0.9 | 1.20E+04 | N |

The project passed the HRA conducted on November 15, 2019, by the District's Toxic Evaluation Section. The increased cancer risk to the maximally exposed resident is 0.41 in a million. The chronic hazard index for the maximally exposed resident is 0.0028. The increased cancer risk to the maximally exposed worker is 0.009 in a million. The chronic hazard index for the maximally exposed worker is 0.0007. The increased cancer risk to the maximally exposed student is 0.009 in a million. The chronic hazard index for the maximally exposed student is 0.00006. In accordance with Regulation 2, Rule 5, the risk level presented above is considered acceptable.

STATEMENT OF COMPLIANCE

Regulation 1 - General Provisions and Definitions

Regulation 1, Section 301, "Public Nuisance", prohibits discharging emissions in quantities that cause injury, detriment, nuisance or annoyance. The facility is expected to comply with this requirement, since the PM emissions Source S-3 Milk Dryer is abated by Abatement Devices A-1 Primary Cyclone, A-2 Secondary Cyclone, A-3 Venturi Scrubber and A-5 Tertiary Cyclone and Source S-6 Milk Powder Hopper is abated by Abatement Device A-4 Dust Collector.

Regulation 2, Rule 1 – General Requirements

This application is considered to be ministerial under the District's California Environmental Quality Act (CEQA) guidelines (Regulation 2, Rule 1, Section 311), since the review of proposed new source was based on the criteria set forth in Regulation 2, Rule 1, Section 428 ("Criteria for Approval of Ministerial Permit Applications") and based on procedures, fixed standards, and objective measurements outlined in District's Permit Handbook and BACT workbook. Thus, this application is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in the Permit Handbook Chapters (Chapter 2.1 Boilers, Steam Generators & Process Heaters, Chapter 4.0 Organic Liquid Storage Tank, Chapter 11.4 Cooling Towers). In addition, the applicant has submitted a completed Environmental Information Form in Appendix H of the State CEQA Guidelines, since this project also satisfies the CEQA exemption per Regulation 2, Rule 1, Section 312.11.4 ("Other Categories of Exempt Projects").

Regulation 2, Rule 1, Section 412 - Public Notice, Schools

The facility is located within 1,000 feet of the outer boundary of the following K-12 schools:

- Petaluma High School located at 201 Fair St., Petaluma, CA 94952.

and is located within ¼ mile of the outer boundary of the following K-12 Schools:

- Carpe Diem High School located at 199 Fair St., Petaluma, CA 94952.
- Valley Vista Elementary School located at 730 North Webster St., Petaluma, CA 94952.

- St. Vincent De Paul Elementary School located at 246 Howard St., Petaluma, CA 94952

Therefore, the public notification requirements of Regulation 2, Rule 1, Section 412 (“Public Notice, Schools”) are triggered.

Regulation 6, Rule 1 - Particulate Matter and Visible Emissions

Sources S-3 Milk Dryer and S-6 Milk Powder Hopper are expected to comply with standards set forth in Section 301 (“Ringelmann No. 1 Limitation”), 305 (“Visible Particles”) and 310 (“Total Suspended Particulate Concentrations Limits”), since Source S-3 Milk Dryer is abated by A-1 Primary Cyclone, A-2 Secondary Cyclone, A-3 Venturi Scrubber and A-5 Tertiary Cyclone and Source S-6 is abated by A-4 Dust Collector. Source S-4 Cooling Tower is expected to comply with Section 301 and 305, since the owner/operator will be required to monitor the total dissolved solid concentration of the water utilized at this source in the permit condition.

Regulation 9, Rule 7 – Nitrogen Oxides and Carbon Monoxide from Industrial Institutional and Commercial Boilers, Steam Generators, and Process Heaters

Source S-8 Steam Boiler is expected to comply with Regulation 9-7, Section 307 (“Final Emission Limits”), Section 403 (“Initial Demonstration of Compliance”), and Section 506 (“Periodic Testing”), since the facility provided NO_x and CO emissions guarantee of 5 and 15 ppmv, dry at 3% oxygen, respectively, from the equipment manufacturer and will be required to perform initial and annual source test to verify that the source can meet the emission limit

Best Available Control Technology (BACT):

In accordance with Regulation 2, Rule 2, Section 301 (Best Available Control Technology Requirement), BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NO_x, CO, SO₂, or PM₁₀. Based on the emission calculations above, Sources S-3 Milk Dryer, S-5 Cooling Tower, S-6 Milk Powder Hopper, S-7 Flocculant Storage Tank, and S-8 Steam Boiler do not require BACT, since the maximum daily emissions for POC, NO_x, CO, SO₂, PM₁₀, or PM_{2.5} do not exceed 10 pounds per highest day.

Offsets:

Offsets must be provided for any new or modified source at a facility that emits more than 10 ton per year of POC or NO_x or emit more than 100 ton per year of PM₁₀. Since the facility’s permitted emissions are less than 10 tons per year of POC or NO_x and less than 100 ton per year of PM₁₀, offset is not required.

State and Federal Rules:

New Source Performance Standards, Prevention of Significant Deterioration, and National Emission Standards for Hazardous Air Pollutants are not triggered.

PERMIT CONDITIONS

PC #27152

S-3 Milk Dryer

1. The owner/operator of S-3 Milk Dryer shall not exceed the following limits in any consecutive 12-month period:

| | |
|------------------------------|--------------------------------|
| Milk Powder Production | 6,000 tons |
| Natural Gas | 32,533,333 standard cubic feet |
| [Basis: Cumulative Increase] | |
2. The owner/operator of S-3 Milk Dryer shall not exceed the following limits in any consecutive 24-hour period:

| | |
|------------------------------|----------------------------|
| Milk Powder Production | 16.6 tons |
| Natural Gas | 90,022 standard cubic feet |
| [Basis: Cumulative Increase] | |

3. The owner/operator of S-3 Milk Dryer shall not emit more than 9.0 pounds of Total Suspended Particulate (TSP) per day. To demonstrate compliance with this limit, the owner/operator of S-3 shall use S-3 production records with Air District-approved source test results converted to an emission rate of pounds TSP per ton of S-3 production. [Basis: BACT avoidance]
4. The owner/operator of S-3 Milk Dryer shall not exceed a TSP emission limit of 0.54 pound per ton of milk powder produced. [Basis: Cumulative Increase, Regulation 6-1-310, BACT avoidance]
5. The owner/operator of S-3 Milk Dryer shall abate the S-3 Milk Dryer with properly maintained and properly operated A-1 Primary Cyclone, A-2 Secondary Cyclone, A-4 Venturi Scrubber, and A-5 Tertiary Cyclone at all periods of operation.
[Basis: Cumulative Increase, Regulation 6-1-310]
6. Within 60 days of startup, the owner/operator of S-3 Milk Dryer shall conduct a District-approved source test on the exhaust of A-3 Venturi Scrubber to determine compliance with the TSP emission limit in Part 3. The source test shall be conducted use EPA Method 5 (or District-approved alternative). The owner/operator of S-3 Milk Dryer shall submit the source test result to the Air District's Source Test Section within 60 days after the test. [Basis: Cumulative Increase]
7. The owner/operator of S-3 Milk Dryer shall obtain approval for all source test procedures from the District's Source Test Section prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements as specified in Volume V of the District's Manual of Procedures. The owner/operator of S-3 shall notify the District's Source Test Section, in writing, of the source test protocols and projected test dates at least 7 days prior to testing. [Basis: Cumulative Increase]
8. To demonstrate compliance, the owner/operator of S-3 Milk Dryer shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including the following information:
 - a. Daily and monthly records of the quantity of milk powder produced at S-3 Milk Dryer.
 - b. Daily and monthly records of natural gas usage.
 - c. Monthly usage records shall be totaled for each consecutive 12-month period.
 - d. Source Test Reports.All records shall be retained onsite for two years from the date of entry, and made available for inspection by District staff upon request. These record-keeping requirements shall not replace the record keeping requirements contained in any applicable District Regulations.
[Basis: Cumulative Increase]

S-5 Cooling Tower

9. The owner/operator of S-5 Cooling Tower shall not exceed total water throughput of 145,454,545 gallons during any consecutive 12-month period. [Basis: Cumulative Increase]
10. The owner/operator of S-5 Cooling Tower shall not exceed total water throughput of 576,000 gallons during any consecutive 24-hour period. [Basis: Cumulative Increase]
11. The owner/operator of S-5 Cooling Tower shall not exceed total dissolved solid contents of water of 1,000 ppm, by weight. [Basis: Cumulative Increase]
12. The owner/operator of S-5 Cooling Tower shall maintain documentation, written, and provided by the vendor/manufacture of the maximum drift rate of 0.002 wt% and the premise, basis, justification for the drift rate. [Basis: Cumulative Increase]
13. The owner/operator of S-5 Cooling Tower shall maintain monthly record of all water usage, monitoring, source test, vendor specifications, and other records as required to demonstrate compliance with the above conditions on site for at least two years from the date of data entry and shall be made available to the District staff for inspection upon request. [Basis: Cumulative Increase]

S-6 Milk Powder Hopper

14. The owner/operator of S-6 Milk Powder Hopper shall not exceed more than 6,000 tons of milk powder in any consecutive 12-month period.
[Basis: Cumulative Increase]
15. The owner/operator of S-6 Milk Powder Hopper shall not produce more than 16.6 tons of milk powder in any consecutive 24-hour period.
[Basis: Cumulative Increase]
16. The owner/operator of S-6 Milk Powder Hopper shall abate S-6 Milk Powder Hopper with properly maintained and properly operated A-5 Dust Collector at all periods of operation.
[Basis: Cumulative Increase, Regulation 6-1-301, Regulation 6-1-310]
17. To demonstrate compliance, the owner/operator of S-6 Milk Powder Hopper shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including the following information:
 - a. Daily and monthly records of the quantity of milk powder loaded from S-6 Milk Powder Hopper.
 - b. Monthly usage records shall be totaled for each consecutive 12-month period.All records shall be retained onsite for two years from the date of entry and made available for inspection by District staff upon request. These record-keeping requirements shall not replace the record keeping requirements contained in any applicable District Regulations.
[Basis: Cumulative Increase]

S-7 Flocculant Storage Tank

18. The owner/operator of S-7 Flocculant Storage Tank shall not exceed daily and annual throughput limits of 1.3 gallons per day and 482 gallons per year, respectively [Basis: Cumulative Increase]
19. The owner/operator of S-7 Flocculant Storage Tank shall exclusively use S-7 for storage of wastewater flocculants. [Basis: Cumulative Increase]
20. To demonstrate compliance, the owner/operator of S-7 Flocculant Storage Tank shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including the following information:
 - a. Daily and monthly records of the quantity of flocculant stored at S-7 Flocculant Storage Tank.
 - b. Monthly usage records shall be totaled for each consecutive 12-month period.All records shall be retained onsite for two years from the date of entry, and made available for inspection by District staff upon request. These record-keeping requirements shall not replace the record keeping requirements contained in any applicable District Regulations.
[Basis: Cumulative Increase, Regulation 2-1-403]

S-8 Steam Boiler

21. The owner/operator of S-8 Steam Boiler shall operate this source on natural fuel exclusively.
[Basis: Cumulative Increase]
22. The owner/operator of S-8 Steam Boiler shall not use exceed daily and annual natural gas usages of 672,360 standard cubic feet per day and 245,411,400 standard cubic feet per year.
[Cumulative Increase]

23. The owner/operator of S-8 Steam Boiler shall not exceed the following emissions limits:
 NO_x 5 ppmv, dry, at 3% O₂
 CO 15 ppmv, dry, at 3% O₂
 [Basis: Cumulative Increase, Regulation 9-7-307]
24. Within 60 days of startup of S-8 Steam Boiler, and every year thereafter, the owner/operator of S-8 Steam Boiler shall conduct a District-approved source test to determine compliance with all the emissions limits contained in Part 24. The owner/operator of S-8 Steam Boiler shall submit the source test results to the District Staff within the 60 days after the test. [Basis: Reg 2-1-403]
25. The owner/operator of S-8 Steam Boiler shall obtain approval for all source test procedures from the District's Source Test Section prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements as specified in Volume V of the District's Manual of Procedures. The owner/operator of S-8 Steam Boiler shall notify the District's Source Test Section, in writing, of the source test protocols and projected test dates at least 7 days prior to testing. [Basis: Cumulative Increase, Regulation 2-1-403]
26. To demonstrate compliance, the owner/operator of S-8 Steam Boiler shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions, including the following information:
- Monthly records of the quantity of natural gas used at S-8 Steam Boiler.
 - Monthly usage records shall be totaled for each consecutive 12-month period.
 - Source Test Reports.
- All records shall be retained onsite for two years from the date of entry, and made available for inspection by District staff upon request. These record-keeping requirements shall not replace the record keeping requirements contained in any applicable District Regulations.
 [Basis: Cumulative Increase, Regulation 2-1-403]

RECOMMENDATION

The Air District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue Authorities to Construct, Permits to Operate or Exemption to the equipment listed below. However, the proposed sources will be located within 1,000 feet of a school, which triggers the public notification requirements of District Regulation 2, Rule 1, Section 412. After the comments are received and reviewed, the District will make a final determination on the permit.

Issue Authorities to Construct to following equipment:

- S-3 Milk Dryer; Make: Mojonnier; Model: Auto Flo Dry Milk System; Maximum Production Capacity: 0.99 ton/hour; equipped with DS-20 Air Heater; Maximum Firing Rate: 6.00 MMBtu/hour; abated by A-1 Primary Cyclone, A-2 Secondary Cyclone, A-3 Venturi Scrubber and A-5 Tertiary Cyclone;**
- S-8 Steam Boiler; Make: Cleaver-Brooks; Model: CBEX 700-700-150ST; Maximum Firing Rate: 28.57 MMBtu/hour;**

and Permits to Operate for the following equipment:

- S-5 Cooling Tower; Maximum Capacity: 24,000 gallons/hour;**
- S-6 Milk Powder Hopper; Make: Mojonnier; Maximum Production Capacity: 0.99 ton/hour; abated by A-4 Dust Collector**
- S-7 Flocculant Storage Tank; Tank Volume: 275 gallons;**

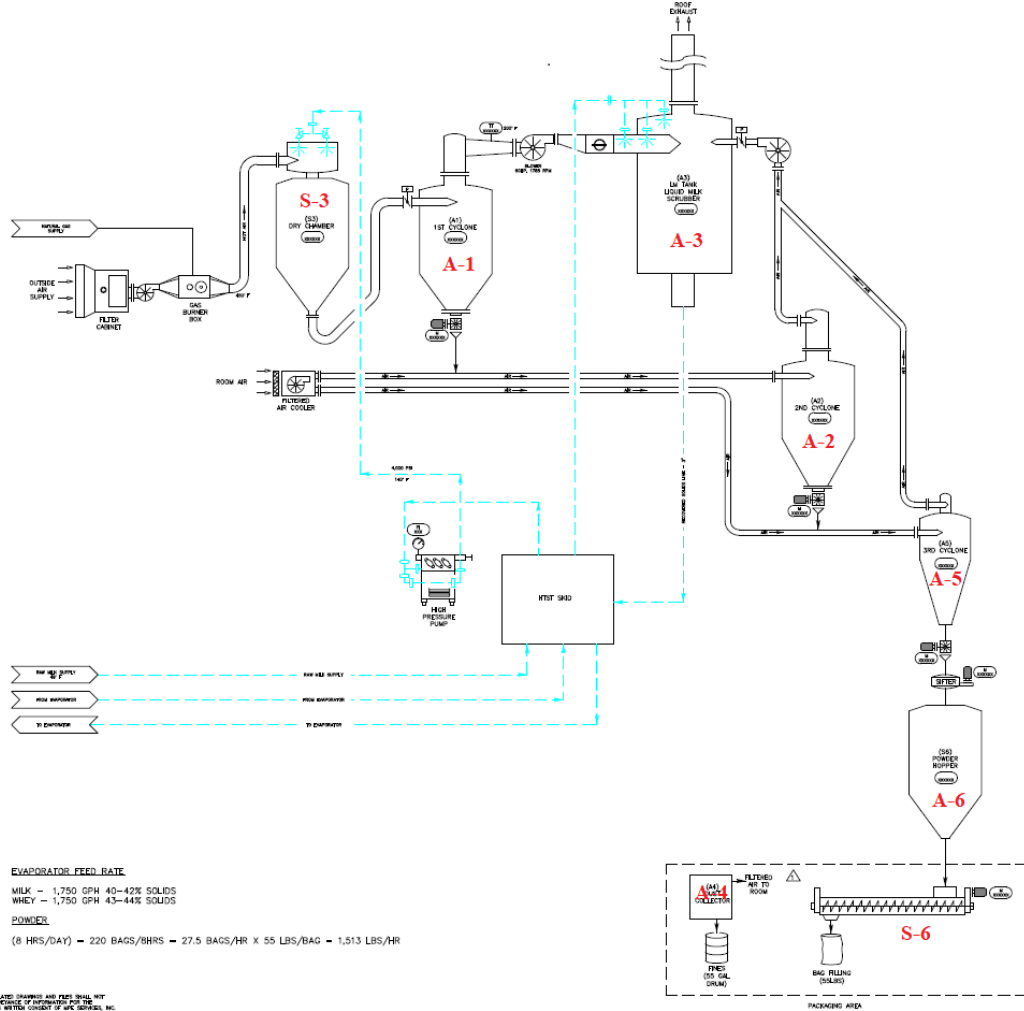
and an Exemption for the following equipment:

S-4 Dissolve Air Flotation (DAF) Unit for Wastewater Pretreatment Plant; Maximum Capacity: 202,000 gallons/day;

By: 
 Alexander Sohn
 Air Quality Engineer

Date: 2/26/2020

Appendix



Tank 4.0.9d Results for S-7 Flocculant Storage Tank
TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification
 User Identification: S-7 Flocculant Storage Tank
 City: San Francisco AP
 State: California
 Company:
 Type of Tank: Vertical Fixed Roof Tank
 Description:

Tank Dimensions
 Shell Height (ft): 5.00
 Diameter (ft): 4.71
 Liquid Height (ft): 2.11
 Avg. Liquid Height (ft): 1.00
 Volume (gallons): 275.00
 Turnovers: 1.75
 Net Throughput(gal/yr): 482.00
 Is Tank Heated (y/n): N

Paint Characteristics
 Shell Color/Shade: White/White
 Shell Condition: Poor
 Roof Color/Shade: White/White
 Roof Condition: Poor

Roof Characteristics
 Type: Cone
 Height (ft): 0.00
 Slope (ft/ft) (Cone Roof): 0.00

Breather Vent Settings
 Vacuum Settings (psig): -0.03
 Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: San Francisco AP, California (Avg Atmospheric Pressure = 14.75 psia)



TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

S-7 Flocculant Storage Tank - Vertical Fixed Roof Tank
 San Francisco AP, California

| Mixture/Component | Month | Daily Liquid Surf. Temperature (deg F) | | | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) | | | Vapor Mol. Weight | Liquid Mass Fract. | Vapor Mass Fract. | Mol. Weight | Basis for Vapor Pressure Calculations |
|-------------------|-------|--|-------|-------|--------------------------|-----------------------|--------|--------|-------------------|--------------------|-------------------|-------------|---------------------------------------|
| | | Avg. | Min. | Max. | | Avg. | Min. | Max. | | | | | |
| Gasoline (RVP 10) | All | 81.85 | 55.24 | 88.47 | 58.14 | 5.3748 | 4.7240 | 6.0956 | 66.0000 | | | 92.00 | Option 4: RVP=10, ASTM Slope=3 |



TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

S-7 Flocculant Storage Tank - Vertical Fixed Roof Tank
 San Francisco AP, California

| Components | Losses(lbs) | | |
|-------------------|--------------|----------------|-----------------|
| | Working Loss | Breathing Loss | Total Emissions |
| Gasoline (RVP 10) | 4.07 | 143.73 | 147.80 |