

BAY AREA AIR QUALITY MANAGEMENT DISTRICT*PERMIT SERVICES DIVISION***Permit Evaluation and Emission Calculations**

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APPLICATION 2625	DATE 04/24/01
PROCESSING ENGINEER DENNIS T. JANG	

**Delta Energy Center; Plant #12095
Arcy Lane, Pittsburg CA 94565**

BACKGROUND

The Delta Energy Center is applying for an Authority to Construct and Permit to Operate for the following equipment:

S-10 Fire Pump Diesel Engine, Detroit Diesel Model 8064-7412; 368 hp, 20 gallons per hour fuel use rate

Although the engine has “passed” a District risk screening and is therefore exempt from permit pursuant to Regulation 2-1-316.1, Calpine has opted to obtain an Authority to Construct and Permit to Operate in anticipation of the loss of exemption expected to take effect in July of 2001. The engine will be used exclusively for the emergency pumping of water for the purpose of fighting fires on site and is required by local fire codes.

CRITERIA-POLLUTANT EMISSION SUMMARY**Annual Average Project Emissions Increase:**

Pollutant	lb/day	ton/yr
POC	0.05	0.009
NO _x	2	0.37
SO ₂	0.04	0.007
CO	0.48	0.088
PM ₁₀	0.03	0.005
NPOC	0	0

Daily Maximum Emissions by Source (lb/day):

Source	POC	NO _x	SO ₂	CO	PM ₁₀	NPOC
S-10 Diesel Engine	0.18	7.41	0.14	1.75	0.1	0

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EMISSION CALCULATIONS

S-10 Fire Pump Diesel Engine

Emission Summary

	NO _x	SO ₂	CO	POC	PM ₁₀
Emission Factors ^a (g/bhp-hr)	9.13	0.168	2.16	0.22	0.12 ^b
Emission Rates					
lb/hr ^c	7.41	0.136	1.75	0.18	0.10
lb/day ^d	7.41	0.136	1.75	0.18	0.10
lb/yr ^e	741	13.6	175	18	10
ton/yr	0.37	0.007	0.088	0.009	0.005

^aper manufacturer's specification sheet

^bbased upon original emission factor of 0.16 g/bhp-hr reduced by 25% since engine will burn exclusively low sulfur fuel (0.05% by weight)

^cbased upon maximum engine output rating of 368 hp

^dbased upon maximum 1 hr operation per day for exercising

^ebased upon maximum 100 hours per year for exercising

FACILITY CUMULATIVE INCREASE

(since April 5, 1991)

	Current		Increase		New Total	
	lb/day	ton/yr	lb/day	ton/yr	lb/day	ton/yr
POC	358.79	65.480	0.05	0.009	358.84	65.489
NO_x	1,122.68	204.890	2	0.370	1,124.68	205.260
SO₂	82.19	15.000	0.04	0.007	82.23	15.007
CO	4,952.33	903.800	0.48	0.088	4,952.81	903.888
NPOC	0	0	0	0	0	0
PM₁₀	697.95	127.375	0.03	0.005	697.98	127.380

TOXIC RISK SCREENING ANALYSIS

Compound	Project Annual Emission Rate (lb/yr)	Risk Screening Trigger Level (lb/yr)
Diesel Exhaust Particulate Matter	10	0.64

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Jane Lundquist of the District Toxics Section has reviewed the health risk assessment submitted by the applicant and determined that the maximum increased cancer risk occurs for the off-site industrial receptor and is 4.8 in one million. The gas turbines, HRSG duct burners, and cooling tower contribute less than 0.2 to the total risk of 4.8.

TBACT ANALYSIS

Pursuant to the District TRMP, the total facility cancer risk is acceptable, provided that all permitted sources satisfy TBACT.

*S-1, S-3, & S-5 Gas Turbines
S-2, S-4, & S-6 HRSGs*

Pursuant to the District BACT/TBACT Workbook, BACT 1 is first considered as TBACT. BACT 1 would be the use of an oxidation catalyst. However, BACT 1 is not cost-effective given the small mass of toxic air contaminant emissions that are produced by the gas turbines and HRSGs. Therefore, BACT 2 is next considered as TBACT. BACT 2 is the exclusive use of natural gas, which inherently burns cleaner and more efficiently than liquid or solid fuels as a function of energy produced.

Because the gas turbines and HRSGs only contribute 0.2 in one million to the total facility risk of 4.8 in one million and cost of installing and maintaining an oxidation catalyst for each gas turbine/HRSG power train would be significant, TBACT is deemed to be BACT 2 as the exclusive use of natural gas.

S-9 Cooling Tower

With a maximum guaranteed drift rate of 0.0005%, the cooling tower satisfies BACT 1 for PM₁₀. This meets or exceeds the drift rate specified for all recent power plant projects in the state. This drift rate is deemed to satisfy TBACT since all of TACs emitted by the cooling tower are emitted as PM₁₀.

S-10 Fire Pump Diesel Engine

Because the fire pump diesel engine may be utilized under emergency standby conditions such as fighting a fire resulting from an earthquake when natural gas supply may be interrupted, a gas-fired engine is not practical.

Based upon engine specifications from the manufacturer, the proposed diesel engine can achieve a PM₁₀ emission rate of 0.12 g/bhp-hr (after 25% adjustment for ultra-low sulfur fuel use) which satisfies TBACT.

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BACT ANALYSIS

With highest daily POC, NO_x, CO, SO₂, and PM₁₀ emissions of less than 10 pounds for each pollutant, S-10 does not trigger the BACT requirement of NSR.

OFFSET ANALYSIS

Because the Delta Energy Center previously triggered the offset requirements of NSR for POC, NO_x, and PM₁₀, the POC, NO_x, and PM₁₀ emission increases attributed to S-10 must also be offset. Calpine will provide the necessary offsets from Banking Certificate 728 as shown below.

Emission Offset Summary

	POC	NO _x	PM ₁₀	SO ₂
S-10 Emission Increases (ton/yr)	0.009	0.37	0.005	0.007
Offsets Required	0.010 ^a	0.426 ^a	0.005	0
Offsets Provided	0.010	0.426	0	0.015 ^b
Banking Certificate 728	88.040	57.190	0	1.030
Balance	88.030	56.764	0	1.015

^abased upon offset ratio of 1.15:1.0

^bbased upon interpollutant trading ratio of 3:1 for SO₂ for PM₁₀ established in application 19414

FEE SUMMARY

Source	Fee Schedule	Filing Fee	Initial Fee	Late Fee	Permit to Operate Fee	Source Sub-Total
S-10 Fire Pump Diesel Engine	B	\$228.00	\$320.00	\$0.00	\$0.00	\$548.00
Grand Total						\$548.00
Amount Paid						\$548.00
Log Number						2965

STATEMENT OF COMPLIANCE

S-10 Fire Pump Diesel Engine is expected to comply with Regulation 9, Rule 1, section 301 (Limitations on Ground Level Concentrations) and 304 (Fuel Burning) since it will utilize diesel fuel with a maximum sulfur content of 0.05% by weight. S-10 is expected to comply with Regulation 6, section 301 (Ringelmann No.1 Limitation), 305 (Visible Particles), 310 (Particulate Weight Limitation), and 311 (General Operations).

This project is considered to be **ministerial** under the District's CEQA Regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors as

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outlined in the District Permit Handbook (**chapter 2.3, "Internal Combustion Engines"**) and therefore is not considered discretionary as defined by CEQA.

The Delta Energy Center facility is **not** located within 1000 feet of the outer boundary of the nearest school and is therefore not subject to the public notification requirements of Regulation 2-1-412.

A Toxics Risk Screening Analysis was performed as a result of the estimated diesel exhaust particulate matter emissions from the proposed engine. With the addition of the fire pump diesel engine, the total facility cancer risk for the Delta Energy Center was determined to be 4.8 in one million. Therefore, all permitted sources that emit TACs must meet the requirements of TBACT. As discussed above, the gas turbines, HRSGs, cooling tower, and fire pump diesel engine all satisfy TBACT.

BACT, Offsets, PSD, NSPS, and NESHAPS do not apply to the proposed S-10 Fire Pump Diesel Engine.

PERMIT CONDITIONS

Conditions for S-10

- 1) **S-10 Fire Pump Diesel Engine is subject to the requirements of Regulation 9, Rule 1 ("Sulfur Dioxide"), and the requirements of Regulation 6 ("Particulate and Visible Emissions"). The engine may be subject to other District regulations, including Regulation 9, Rule 8 ("NO_x and CO from Stationary Internal Combustion Engines") in the future. [Regulation 9, Rule 1; Regulation 6]**
- 2) **S-10 shall burn no more than 2,000 gallons of diesel fuel in any consecutive 12 month period for the purpose of reliability testing. [Regulation 2, Rule 1]**
- 3) **S-10 may burn an unlimited amount of diesel fuel for the purpose of providing power for the emergency pumping of water. [Regulation 2, Rule 1]**
- 4) **S-10 shall each be equipped with a non-resettable totalizing counter which records fuel use. [Recordkeeping]**
- 5) **The sulfur content of all diesel fuel combusted at S-10 shall not exceed 0.05% by weight. [TRMP, TBACT]**
- 6) **The following monthly records shall be maintained in a District-approved log for at least 2 years and shall be made available to the District upon request:**
 - a) **total fuel use for S-10 for the purpose of reliability testing**
 - b) **total fuel use for S-10 for the purpose of emergency pumping of water**
 - c) **fuel sulfur content [Recordkeeping]**

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RECOMMENDATION

Issue a **conditional Authority to Construct** for the following source:

S-10 Fire Pump Diesel Engine, Detroit Diesel Model 8064-7412; 368 hp, 20 gallons per hour fuel use rate

EXEMPT SOURCES

None

By: _____

Air Quality Engineer II

Date