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August 25, 2017

Mike Monasmith, Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Mission Rock Energy Center (15-AFC-02)

Dear Mr. Monasmith,

Attached please find Applicant Mission Rock Energy Center, LLC's supplemental response to Commission Staff's Data Request 19. Please direct any questions regarding this matter to Jeffery D. Harris at the phone number below.

Sincerely,

Eric Janssen
Paralegal to Jeffery D. Harris

Attachment

Responses to California Energy Commission Staff

Data Request 19- Supplemental Response

In support of the

Application for Certification

For the

Mission Rock Energy Center

15-AFC-02

Prepared for

Calpine Corporation

August 2017

Contents

Section Page

Introduction **1**

5.1 Air Quality (19) **2**

Mitigation Approach 2

Introduction

Attached are Mission Rock Energy Center, LLC's (Applicant's) supplemental responses to California Energy Commission (CEC) Staff Data Request Set 1, Data Request Number 19 for the Mission Rock Energy Center (MREC) (15-AFC-2).

5.1 Air Quality (19)

Mitigation Approach

19. Please provide a detailed description of the proposed approach to mitigate all nonattainment and nonattainment precursor emissions as required by CEQA.

Response: In Data Request 19, the Applicant stated that further reductions of non-attainment pollutants (VOC, PM, and SO2) from the MREC, beyond those required by the Ventura County Air Pollution Control District (VCAPCD) Rules and Regulations, would be achieved through participation in funding in either the Carl Moyer Memorial Air Quality Standards Attainment Program (CMP) or the Clean Air Fund (CAF), as described below. VCAPCD would direct the funding to the various approaches described below based on the VCAPCD's priorities for achieving maximum, cost effective results from administration of the CMP and the CAF.

Carl Moyer Program: The CMP is an incentive program offered jointly by the California Air Resources Board and California's local air districts. The program provides grants for cleaner-than-required engines and equipment to help improve air quality in California. The grants are administered by the local air districts. The VCAPCD is a regular participant in the CMP.

The CMP provides grant funding for cleaner-than-required engines and equipment. The CMP achieves reductions in emissions of key pollutants (NO_x, PM10/2.5, VOCs, CO, and SO_x) which are necessary for California to meet its clean air commitments under regulatory requirements. Typical projects include the repower of agricultural irrigation and water well pumps with electric motors or Tier 4 diesel engines; repower of marine vessels, locomotives, agricultural equipment, and lawn mowers with new lower emission engines; and replacement of farm tractors and construction equipment with new lower emission engines. The main focus of the program is reductions of PM10/2.5 and NO_x, but typically, reductions in criteria and other pollutants (sometimes referred to as "co-benefits") will be achieved concurrently with NO_x and PM10/2.5 reductions.

Clean Air Fund: The CAF in Ventura County was created by a donation from the 3M Company. The CAF Advisory Committee reviews all grant proposals and makes recommendations for funding to the VCAPCD. In the past, CAF grants were used for the Electric Vehicle Incentive Program, Electric Lawn Mower Trade-in Program, the Commercial Leaf Blower trade-in program, and Electric Vehicle Charging Station grants.

Proposed Approaches and Associated Anticipated Reductions

Below Applicant sets forth its analysis of the anticipated reductions in non-attainment pollutants (VOC, PM, and SO2) from the MREC that could be achieved through its participation in the CMP and the CAF to achieve the mitigation required by CEQA:

1. Agricultural waste conversion/diversion program.

The purpose of an agricultural (ag) waste conversion/diversion program would be to reduce agricultural burning emissions by (1) conversion of the waste to useful consumer products, (2)

1. <u>Agricultural waste conversion/diversion program</u>.

The purpose of an agricultural (ag) waste conversion/diversion program would be to reduce agricultural burning emissions by (1) conversion of the waste to useful consumer products, (2) chipping of waste for use as fuels for biomass power plants, and (3) diversion of ag wastes to landfills. The Applicant is exploring potential program funding opportunities to be implemented by the VCAPCD for an ag waste conversion/diversion program.

In Ventura County, orchard crops consist primarily of avocados, grapefruit, lemons, mandarins (tangelos), and oranges (all varieties). The 2015 crop report indicates that these orchard crops represent a total acreage of approximately 39,270 acres. Each of these orchard crops generates waste at differing levels. Table 1 shows the orchard crops, 2015 acreages, and waste generation rates by crop type.

Table 1 Crop Data and Waste Generation Rates

Crop	2015 Acreage	Waste Generation Rate, tons/acre[1]	2015 Waste Generated, tons
Avocados	19,459	1.5	29,189
Grapefruit	123	1.0	123
Lemons	14,725	1.0	14,725
Mandarins	2,310	1.0	2,310
Oranges	2,654	1.0	2,654

[1] AP-42, Section 2.5, Table 2.5-5, 1/95.

Table 2 shows the potential emissions generated by open field burning of these amounts of waste. The table is based on burning only a small fraction of the total waste generated (i.e., 10%), which is based on a conservative estimate of participation in the program. The burn fraction can be adjusted to show emissions for other scenarios. The resultant conclusion is that if a significant amount of waste can be diverted from the burn fraction, there are substantial emissions reductions available.

Table 2 Waste Diversion Emission Reductions

	Emissions Reduction, tons/yr				
	PM10	**CO**	**VOC**	**NO_x**	**SO_2**
Avocados	9.395	52.904	8.437	2.372	0.0456
Grapefruit	0.011	0.156	0.013	0.010	0.0002
Lemons	1.357	18.636	1.565	1.196	0.0230
Mandarins	0.213	2.924	0.245	0.188	0.0036
Oranges	0.245	3.359	0.282	0.216	0.0041
Total, tons/yr	**11.2**	**78.0**	**10.5**	**4.0**	**0.1**

2. <u>Replace or repower existing stationary IC engines (CI and/or SI) with newer Tier 4 engines</u>.

The replacement or repowering of old, higher polluting off-road existing in-use engines, with new engines which meet or exceed the EPA/CARB tiered emissions standards is an effective strategy to achieve significant emissions reductions, as well as reducing potential health effects. This approach would be implemented through participation in either the CMP or CAF.

Engine projects under consideration include, but are not limited to, the following general categories: (1) agricultural engines, (2) distributed generation engines, (3) portable/mobile equipment engines, and (4) all other non-farm engine uses. Engines in these categories are typically classified as stationary backup engines, stationary prime use engines, portable (mobile) equipment engines, and agricultural use engines (primarily irrigation pump systems). In a number of stationary engine uses, the reciprocating engine can be replaced by electric motors to achieve an even higher level of emissions reductions.

Table 3 presents the maximum project life for off-road replacements per the CMP. We suggest that these values be used when considering such replacements and computing the number of engines to be replaced over the useful life of the MREC project.

Table 3 Project Life for Engine Repower/Replacement

Type		Project Life
Repower only – no retrofit		7 years
Farm Equipment (all projects)		10 years
Replacement and repower to zero-emission		10 years
Retrofit only		5 years
Replacement	Excavators Skid steer loaders Rough terrain forklifts	3 years
	All other non-farm (existing diesel only)	5 years
	All other non-farm (existing LSI only)	3 years

The illustrative analysis summarized in Table 4 is based on the replacement of ten (10) uncontrolled engines with newer Tier 4 engines.

Table 4 Emission Reductions for Ten Off-Road Stationary and Portable Replacement Engines

	Differential-Uncontrolled to Tier 3			TPY	Differential-Uncontrolled to Tier 4		
Engine Category	NO_x	VOC	PM10		NO_x	VOC	PM10
New	10.797	2.115	0.706		13.518	2.178	0.945
Stationary Backup	2.227	0.436	0.146		2.788	0.449	0.195
Stationary Prime	15.548	3.045	1.017		19.465	3.136	1.361
Portable	2.969	0.581	0.194		3.717	0.599	0.260
Agriculture	5.442	1.066	0.356		6.813	1.097	0.476

Note that these illustrative estimates are based upon replacement of uncontrolled engines with the latest Tier engine available. If engines are identified that are already subject to Tier standards, then the emissions differential would be adjusted accordingly.

3. <u>Replace or repower existing Off-Road and Marine IC engines (CI and/or SI) with newer Tier 4 engines</u>.

The replacement or repowering of older and higher polluting marine engines, such as auxiliary and propulsion engines in tugs, ferries, work boats, crew boats, and tow boats, with new engines which meet or exceed the EPA/CARB tiered emissions standards is an effective strategy to achieve significant emissions reductions, as well as reducing potential health effects. This approach would also be implemented through participation in either the CMP or CAF. Table 5 presents the maximum project life for marine engine replacements per the CMP.

Table 5 Project Life for Marine Engine Repower/Replacement

• Type		• Project Life
• **Marine**	• Engine replace/repower	• 16 years
	• Shore power projects	• 20 years

The illustrative analysis summarized in Table 6 is based on the replacement of ten (10) uncontrolled engines with newer Tier 4 engines.

Table 6 Emission Reductions for Replacement of Marine Auxiliary Engines

Replace Old Auxiliary Engine with New Auxiliary Engine						
					10	# of Replacements Desired
Differential		1 Engine, TPY			TPY	
	NO_x	VOC	PM10	NO_x	VOC	PM10
Tug Boat	0.593	0.011	0.025	5.93	0.11	0.25
Ferry	0.376	0.007	0.016	3.76	0.07	0.16
Work Boat	0.344	0.006	0.014	3.44	0.06	0.14
Crew Boat	0.785	0.015	0.032	7.85	0.15	0.32
Tow Boat	0.632	0.012	0.026	6.32	0.12	0.26

Note that these estimates are based upon replacement of uncontrolled engines with the latest Tier engine available. If engines are identified that are already subject to Tier standards, then the emissions differential would be adjusted accordingly.

4. <u>Lawn and garden equipment exchange programs, primarily targeted at lawn mowers and leaf blowers</u>.

This approach would be implemented through participation in the CAF. Table 7 provides an estimate of the emissions reduction potential for this approach:

Table 7 Lawn Mower and Leaf Blower Emissions Reduction Potential

Pollutant	Mower (gas 2-stroke)	Mower (gas 4-stroke)	Leaf blower (gas 2-stroke)
NO_x, reduction TPY	0.000096	0.000661	0.000427
PM, reduction TPY	0.002544	0.00002	0.003498
SO_x, reduction TPY	0.000039	0.000126	0.000105
VOC, reduction TPY	0.0687	0.0129	0.118571

The emissions reduction potential set forth in Table 7 is based on replacement of 2- and 4-stroke gasoline lawn mower engines with electric mowers, as well as the emissions reduction potential for a typical leaf blower (gas 2-stroke), on a per engine basis.