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PETITION TO AMEND

MAGNOLIA POWER PROJECT (MPP) UPGRADE, Part 2, 2021
SOUTHERN CALIFORNIA PUBLIC POWER AUTHORITY
(01-AFC-06C)

Submitted to:

California Energy Commission
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ACRONYMS AND ABBREVIATIONS

AFC	Application for Certification
AFS	Axial Fuel Staging
BACT	Best Available Control Technology
BWP	Burbank Water and Power
CAM	Compliance Assurance Monitoring
CARB	California Air Resources Board
CCGF	Combined Cycle Electrical Power Generation Facility
CEC	California Energy Commission
CEMS	Continuous Emissions Monitoring System
CEQA	California Environmental Quality Act
CFH	cubic feet per hour
CH_4	methane
CAAQS	California Ambient Air Quality Standard
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COB	City of Burbank
COC	Condition of Certification
CTG	combustion turbine generator
DACFM	dry actual cubic feet per minute
DAHS	Data Acquisition & Handling System
DB	Duct Burner
DLN	Dry Low NOx
DSCF	dry standard cubic feet
DSCFM	dry standard cubic feet per minute
EPA	United States Environmental Protection Agency
FSA	Final Staff Assessment
GE	General Electric
GHG	Greenhouse Gases
gpm	gallons per minute
GT	Gas Turbine
GWP	Global Warming Potential
HAP	hazardous air pollutant
HHV	higher heat value
HI	Hazard Index
HRA	Health Risk Assessment
HRSG	Heat Recovery Steam Generator
Hz	Hertz
LAER	Lowest Achievable Emissions Reduction
LHV	lower heating value
LORS	Laws, Ordinances, Regulations, and Standards
MECL	Minimum Emissions Compliance Load
MICR	maximum individual cancer risk

ACRONYMS AND ABBREVIATIONS (CONTINUED)

MPP	Magnolia Power Project
MW	megawatt
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NH_3	ammonia
NHMC	non-methane hydro-carbon
NO_2	nitrogen dioxide
NOx	oxides of nitrogen
N_2O	nitrous oxide
NSPS	New Source Performance Standard
OBB	Overboard Bleed
O_2	oxygen
PFC	perflurocarbons
PM	particulate matter
PM2.5	particulate matter of 2.5 microns or less in diameter
PM10	particulate matter of 10 microns or less in diameter
ppbvd	parts per billion by volume, dry basis
ppmvd	parts per million by volume, dry basis
PSD	prevention of significant deterioration
PTE	Potential-to-Emit
RECLAIM	Regional Clean Air Incentives Market
rpm	revolutions per minute
RTCs	Reclaim Trading Credits
RTU	remote terminal unit
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SCPPA	Southern California Public Power Authority
SCR	selective catalytic reduction
SIP	State Improvement Plan
SO_2	sulfur dioxide
SO_x	oxides of sulfur
STG	steam turbine generator
TAC	toxic air contaminant
tpy	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

SECTION 1
INTRODUCTION

1.1 BACKGROUND

The Magnolia Power Project (MPP) is a 323-megawatt (MW) natural gas fired combined-cycle electrical power generating facility (CCGF) located at the site of an existing City of Burbank (City or COB) Power plant in Burbank, California. The power plant is built on approximately three acres of the existing 23-acre site. MPP is owned by the Southern California Public Power Authority (SCPPA) and operated by the City's Water & Power (BWP) Department. MPP was certified by the California Energy Commission (CEC or Commission) in March 2003 (CEC, 2003, Ref. 9) and went in compliance phase in September 2005.

The MPP electric power generating facility consists of 1-on-1, combined cycle Power Island. The power island includes a natural gas fired, General Electric Model PG7241FA (7FA.03) combustion turbine generator (CTG). The gas turbine (GT) is rated at 1,787 MMBtu/hr (HHV). The GT exhausts into a fired (using a duct burner) heat recovery steam generator (HRSG). Steam from the HRSG is admitted into a steam turbine generator (STG). The duct burner (DB) is rated at 583 MMBtu/hr (HHV). Natural gas is the only fuel utilized by the gas turbine and the duct burner. Total gross power output from the CTG (181.1 MW) and the STG (142.0 MW) is 323.1 MW.

Oxides of nitrogen (NOx) emissions from the GT are controlled by dry low NOx (DLN2.6) combustors and a post-combustion emission control system. The post-combustion control system is a selective catalytic reduction (SCR) system. NOx emissions from the GT and the duct burner are limited to 2 ppmv, 3-hour average, dry basis, at 15% O_2.

Carbon monoxide (CO) and volatile organic compounds (VOC) emissions from the CCGF are controlled by a CO oxidation catalyst. Emissions for both CO and VOC are limited to 2 ppmv, 1-hour average, dry basis, at 15% O_2.

As mentioned above, the DLN installed in the gas turbine was DLN2.6. In 2019, SCPPA proposed to upgrade (modify) the existing MPP combustion system that would allow improved combustor turndown. This upgrade would allow MPP to generate power over a wider operating range of the gas turbine from about 27% GT load to the full GT load. The ability to operate over a broader range will increase the operating flexibility of the MPP to integrate better with intermittent renewable energy resources (e.g. wind and solar). Note that these changes were to be made while continuing to meet the current permit emission limits and also without increasing the following: (1) fuel-input limits and power generating capacity, or (2) the potential to emit of criteria pollutants, greenhouse gases, and air toxics.

On November 5, 2019, BWP filed a post certification petition for a project change for the MPP. CEC issued the Statement of Staff Approval of Proposed Change for the MPP on February 12, 2020 (CEC, 2020, Ref. 10).

The hardware and software modifications to the gas turbine combustor system were completed in February 2020, which included the installation of combustion system with DLN2.6+. However, in March 2020, during the recommissioning phase, General Electric (GE) identified an issue with flexible piping belonging to the Axial Fuel Staging (AFS) installed as part of the hardware and software modifications of the gas turbine. GE personnel determined that the flexible pipes were seeing stresses greater than what was modeled during the design of the MPP gas turbine upgrade. Therefore, GE decided to redesign the affected parts. Until the redesigned parts became available for installation, GE placed MPP into a temporary configuration, which included the disabling of the AFS system. MPP with the temporary configuration as described above became operational in March 2020 and is in compliance with all the SCAQMD modified Title V permit (issued on January 10, 2020; SCAQMD, Ref. 3) and the Condition of Certifications specified in the Statement of Staff Approval of Proposed Change for the MPP [issued on February 12, 2020; (CEC, 2020, Ref. 10). Because the AFS system was disabled, the gas turbine cannot be turned down to Minimum Emissions Compliance Load (MECL) of 27 percent.

The redesigned parts for the AFS system are expected to be ready for installation by the end of January 2021 during the Major Inspection of the MPP. GE is again proposing to perform the gas turbine enhancement work in the following two phases: (1) swapping of one combustion component, combustion casings, and the installation of various sized hard tubing. One piping manifold and extensions will also be removed and replaced with a new manifold and (2) recommissioning of the upgraded gas turbine. Phase 1 of the MPP upgrade is expected to start by the end of January 2021 and will be completed by the middle of March 2021. During this phase, the overall combustion system will include an AFS system with the use of AFS transitional pieces that will be installed. Phase 2 of the MPP upgrade (recommissioning) is expected to start by the middle of March 2021 and will be completed in about 11 days. Additional details of the proposed MPP upgrade are provided below.

1.2 DETAILS OF THE MPP UPGRADE

As mentioned above, the MPP CCGF is now provided with a GE Model 7FA.03 gas turbine with DLN2.6+ combustors. The combustors will be upgraded/modified with an AFS system so that the NOx concentration from the gas turbine will be reduced to 9 ppmv, dry basis (at 15% O_2) at Minimum Emissions Compliance Load (MECL). Note that the existing SCR system is designed to reduce NOx concentration from 9 ppmv to 2 ppmv. Therefore, the MPP will be in compliance with the NOx emission limit of 2 ppmv, 3-hour average, dry basis, at 15% O_2 at MECL. According to the data provided by GE, concentration of NOx as well as CO will be reduced to 9 ppmv at the MECL of 49.3 MW (27% of the maximum GT load at ambient temperature of 22^{o}F).

The upgraded combustion system design combines leading edge GE DLN combustion technology with design enhancements to provide improved combustor turndown. For implementing the AFS, the following systems will be upgraded/installed: (1) DLN2.6+ combustion system hardware, (2) controls modification, (3) upgrade of the gas fuel module, and

(4) packaging and accessory skids upgrades. Additional details of the above systems are provided below.

DLN 2.6+ Major Features

The DLN2.6+ combustion system includes advanced technology to improve stability, reduce emissions and improve turndown. DLN2.6+ adds an advanced fuel nozzle to the DLN2.6+ system architecture called the "swozzle." The swozzle combines the fuel injection ports into the swirler vanes, all within the fuel nozzle body, to provide a better mixed, more stable combustion zone. The asymmetric fuel strategy allows the DLN2.6+ to maintain low emission levels and also allow the Unit to operate at lower loads. The change to the new combustor will require the installation of new fuel gas system piping. For lower NOx emission capability and turndown, it features an integrated premixed pilot.

Fuel Nozzle Features

The new fuel nozzle will have the following key features: (1) quick disconnect flanges for faster outages, (2) integral burner tube for NOx reduction, and (3) premixed pilots to reduce dynamics and improve turndown.

AFS Major Features

The 7F DLN 2.6+ Axial Fuel Staging (AFS) combustor will reduce the emissions compliant minimum load (increasing turndown) to reduce fuel burn at minimum load.

Overboard Bleed System

The Overboard Bleed (OBB) System will allow the combustion turbine to use excess air from the combustion turbine compressor to effectively cool the exhaust air exiting the combustion turbine section. This cool exhaust, while still sufficiently hot to create steam in the HRSG for combined cycle purposes, is cooler than present conditions. This cooler temperature will allow for less flow into the HRSG and prevent overheating of materials which will allow the combustion turbine turn down to lower output levels than are currently possible.

It is important to note that after the upgrade to MPP is completed, MPP will continue to operate within the facility's permitted potential to emit (PTE) and in compliance with the currently permitted NOx emission limits of 2 ppmv, 3-hour average, dry basis, at 15% O_2. In addition, the MPP CCGF will continue to comply with the currently permitted CO and VOC emission limits of 2 ppmv, 1-hour average, dry basis, at 15% O_2. Furthermore, there will be no increase in the fuel-input limits or the MPP's generation capacity.

1.3 SCAQMD AND USEPA PERMITTING REQUIREMENTS FOR THE MPP

The Magnolia Power Project operates under a South Coast Air Quality Management District (SCAQMD) Title V Air Permit. BWP has filed an application with the SCAQMD to modify the existing Title V air permit to allow upgrade to the MPP. BWP is working with the SCAQMD staff to process the permit application.

As mentioned above, MPP will continue to meet all the existing emission limits established in the current facility permit. The facility will also comply with any new emission limits and permit conditions that may be established by the SCAQMD based on the review of the permit application submitted by the BWP for the MPP Upgrade.

BWP will update this Petition to Amend once the modified permit for the MPP Upgrade is received from the SCAQMD.

1.4 DESCRIPTION OF PROPOSED AMENDMENT

The purpose of this filing is to request the CEC's approval to amend the MPP's Condition of Certifications (COCs) listed in Section 3 to conform to the modified Title V permit conditions which are expected to be issued by the SCAQMD in about one month. The amended COCs will be submitted by BWP to the CEC after receiving the modified Title V permit from the SCAQMD.

1.5 NECESSITY OF PROPOSED CHANGES

Sections 1769(a)(1)(A) and (B) of the CEC Siting Regulations require a description of proposed modification, including new language for any conditions of certifications that will be affected, and a discussion of the necessity for the proposed modification.

SCPPA is proposing to upgrade the existing MPP combustion system that will allow improved combustor turndown. This upgrade will allow the MPP to generate power over a wider operating range of the gas turbine from about 27% GT load to the full GT load. The ability to operate over a broader range will increase the operating flexibility of the MPP to integrate better with intermittent renewable energy resources (e.g. wind and solar). Note that the MPP Upgrade will not affect the operation of the selective catalytic reduction system for reducing NOx emissions. The reduction in NOx emissions will be achieved specifically from combustor modification.

The above changes will be made while continuing to meet the current permit emission limits and also without increasing the following: (1) fuel-input limits and power generating capacity, or (2) the potential to emit (PTE) of criteria pollutants, greenhouse gases, and air toxics.

The details of the proposed modifications to the existing conditions of certifications will be provided in Section 3 after receiving the modified Title V permit for the MPP Upgrade from the SCAQMD.

Section 1769(a)(1)(C) Siting Regulation requires a discussion of whether the modification is based on new information or change in circumstances that necessitated the change.

The proposed upgrade is not based upon information that was known during the certification proceedings for the MPP.

Section 1769 (a)(1)(D) of the CEC Siting Regulations requires a discussion of the consistency of each proposed revision with the assumptions, rationale, findings, or other basis of the Final Decision of the project and whether the revisions are based on new information that changes or undermines the basis of the Final Decision of the project. An explanation is also required why the revision(s) should be permitted. The proposed modification (MPP Upgrade) does not undermine the assumptions, rationale, findings, or other basis of the Final Decision for the project. In addition, the proposed project amendments are expected to comply with applicable laws, ordinances, regulations and standards (LORS). Proposed modifications to the existing COCs will be provided in Section 3.

1.6 SUMMARY OF ENVIRONMENTAL IMPACTS

Section 1769 (a)(1)(E) of the CEC Siting Regulations requires that an analysis be conducted that addresses impacts that the proposed revisions may have on the environment and proposed measures to mitigate any significant adverse impacts. In addition, Section 1769(a)(1)(F) of the Siting Regulations requires a discussion of the impacts the proposed revisions may have on the facility's ability to comply with applicable LORS.

Section 2 includes a detailed analysis of the potential environmental impacts of the proposed changes, as well as a discussion of the consistency of the proposed changes with LORS. Section 2 concludes that there will be no significant environmental impacts associated with the Amendment, and that the project as amended will comply with applicable LORS. Proposed modifications to the conditions of certification are provided in Section 3.

1.7 CONSISTENCY OF AMENDMENT WITH LICENSE

Section 1769 (a)(1)(D) of the CEC Siting Regulations requires a discussion of the consistency of each proposed revision with the assumptions, rationale, findings, or other basis of the Final Decision of the project and whether the revisions are based on new information that changes or undermines the basis of the Final Decision of the project. An explanation is also required why the revision(s) should be permitted. The proposed changes do not undermine the assumptions, rationale, findings, or other basis of the Final Decision for the project. In addition, the proposed project amendments are expected to comply with applicable LORS. Proposed modifications to the existing COCs are included in Section 3.

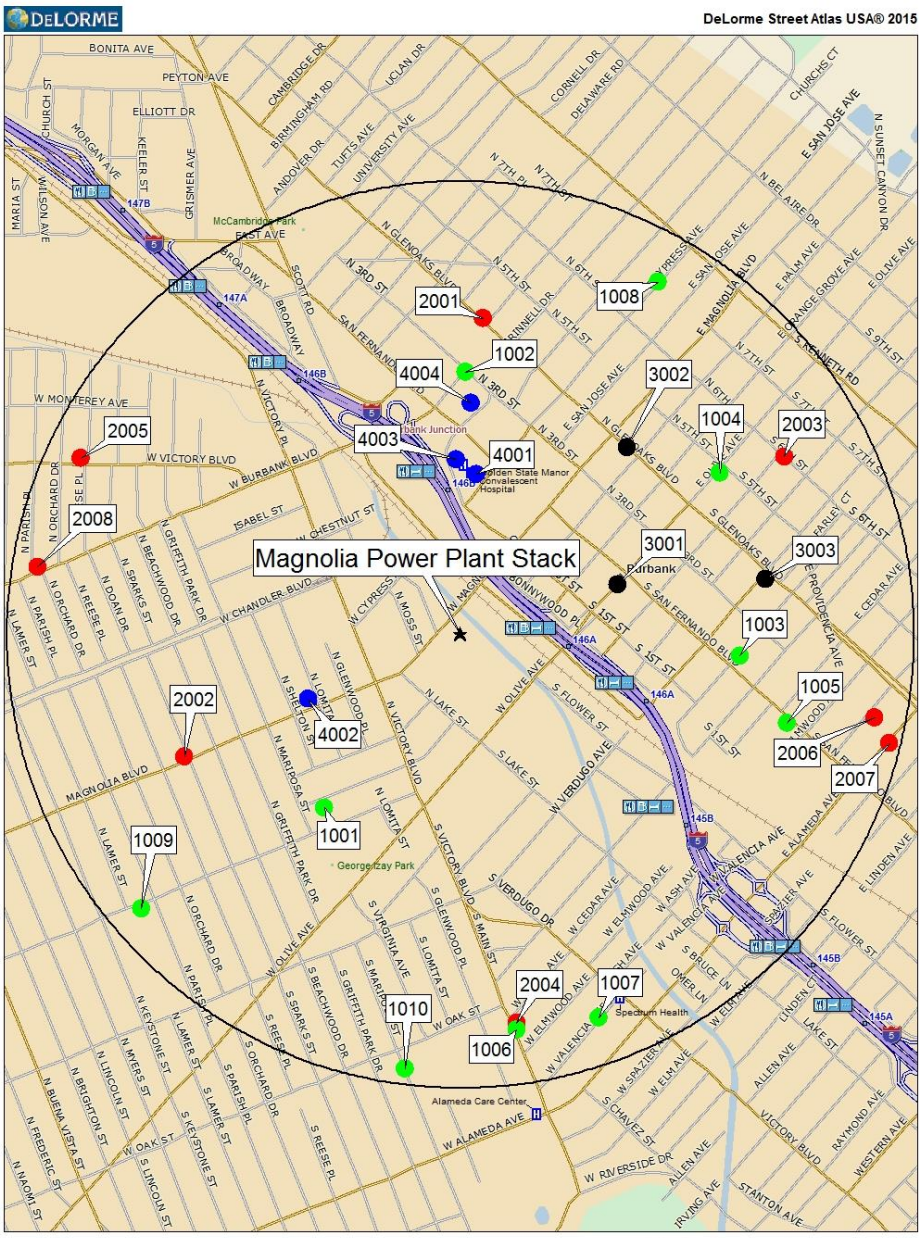
1.8 LOCATION DETAILS OF THE MAGNOLIA POWER PROJECT

MPP is located at 164 West Magnolia Boulevard in the City of Burbank, California, (164 West Magnolia Boulevard, Burbank, CA 91502) within an existing 23-acre power generating facility. The facility is located approximately 2,000 feet southwest of the Burbank City Hall, and it is bordered by Magnolia Blvd., on the north, Lake Street on the west, Flower Street on the east, and Olive Avenue on the south. The facility is bordered by industrial properties on all sides, and the nearest sensitive receptor (school) is located approximately 2,500 feet southwest of the facility. The site location map is shown in Figure 1-1. The MPP site plan is presented in Figure 1-2.

1.9 ADDITIONAL INFORMATION INCLUDED IN THE AMENDMENT APPLICATION

Environmental analysis (including, emission calculations) of the proposed changes are provided in Section 2. The details of the proposed modifications to the conditions of certifications will be provided in Section 3. Potential effects of the proposed changes described in the amendment on the public are provided in Section 4. A list of property owners affected by the proposed changes is provided in Section 5. Potential effects on property owners are described in Section 6.

Appendix A includes the emission details and references. A list of property owners within 1,000 feet of the MPP is provided in Appendix B.



- Pre-Schools and Day-Cares
- Elementary/Intermediate/High Schools
- College or University
- Hospitals

Figure 1-1
Site Location Map
Magnolia Power Project

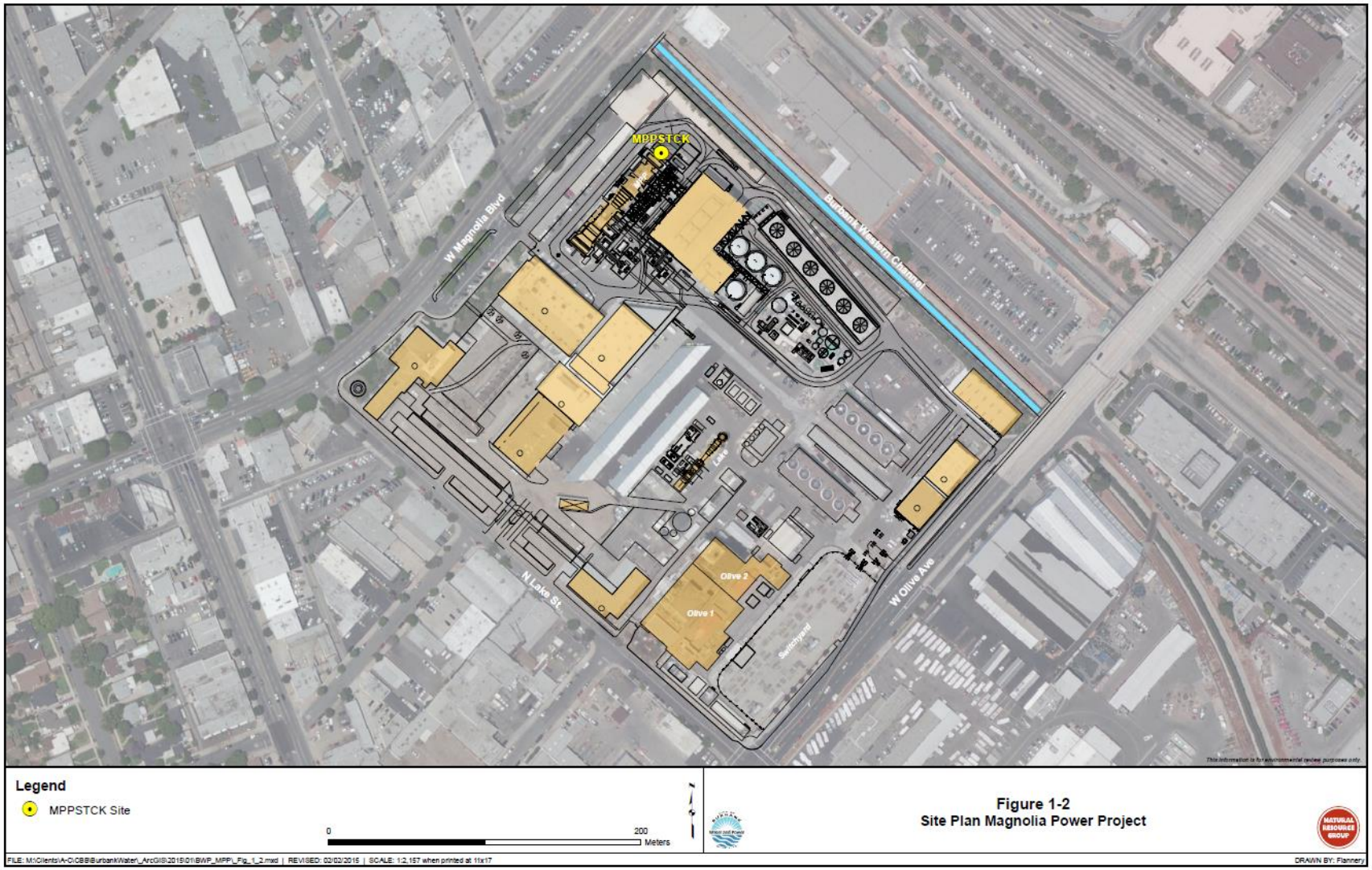


Figure 1-2
Site Plan Magnolia Power Project

SECTION 2
ENVIRONMENTAL ANALYSIS OF THE PROJECT CHANGES

The proposed Amendment was reviewed to determine if the proposed changes will result in any environmental impacts that were not analyzed by the CEC when it approved the project in 2003 (Ref. 9) and also approved the amendments in 2020 (Ref. 10). It may be noted that the proposed changes to MPP will not result in the increase in natural gas or water usage.

The proposed Amendment is only expected to impact air quality resources. No other resource areas are expected to be impacted from the proposed upgrade and are therefore not analyzed. The following section presents the revised pollutant emissions, ambient air quality impact assessment, mitigation measures, cumulative impact assessment, and a discussion of LORS compliance.

2.1 CONSTRUCTION ACTIVITIES RELATING TO THE MPP UPGRADE

As explained below, the construction activity during the MPP upgrade will not result in any changes in the construction phase air emissions.

The MPP Upgrade activities will involve the swapping of one combustion component, combustion casings, and the installation of various sized hard tubing. One piping manifold and extensions will also be removed and replaced with a new manifold. A minimal amount of construction equipment will be needed for the construction related activities and the equipment will be placed on the existing paved site. Therefore, the MPP Upgrade work will not require grading activity that would require ground disturbance. The MPP Upgrade is expected to be completed within the duration of other planned maintenance work. There will not be any additional workers required beyond the crew assigned for other planned maintenance work.

It may be noted that MPP Upgrade activities will be performed during the normal overhaul outage activity at the MPP. The normal overhaul outages typically occur every four years. During a normal overhaul of the MPP, combustion turbine and generator are disassembled, various components are replaced, and then the combustion turbine and generator are re-assembled. The overhaul outage activity normally lasts for about 65 days and involves a peak of about 45 daily workers. The MPP Upgrade is expected to be completed within the duration of the normal overhaul outage activity and no additional workers will be required beyond the crew assigned for normal overhaul outage activity. In addition, no additional heavy equipment will be required for the proposed MPP Upgrade.

2.2 MPP UPGRADE OPERATIONAL ACTIVITIES

The details of MPP Upgrade operational activities are provided below.

2.2.1 Process Description

As described in Section 1, MPP electric power generating facility consists of a combined cycle Power Island. The power island includes a natural gas fired CTG. The gas turbine (GT) exhausts into a fired (using a duct burner) HRSG. Steam from the HRSG is admitted into the STG. Natural gas is the only fuel used by the combustion turbine and the duct burner.

A cooling tower consisting of six cells is also provided at the MPP, which is the source of particulate matter of 10 microns or less in diameter (PM10) emissions.

NOx emissions from the GT are controlled by dry low NOx combustors and a post-combustion emission control system. The post-combustion control system is a SCR system.

CO and VOC emissions from the CCGF are controlled by a CO oxidation catalyst.

The MPP is equipped with a 150-feet tall, 19-feet diameter stack. The base elevation for the stack is 560 feet.

2.2.2 Emission Calculations

The operation of the MPP gas turbine and the duct burner will result in the emissions of criteria air pollutants, air toxics/hazardous air pollutants (HAPs) and greenhouse gases (GHGs). Criteria pollutant emissions from the gas turbine are affected by several factors; most important is the mode of operation. The two basic operational modes for the gas turbine, from an emissions standpoint, are startup/shutdown and normal operation. In addition to the above operating scenarios, the gas turbine will also go through recommissioning (tuning operation) after completion of the upgrade (modification of the existing MPP gas turbine combustor system). During the recommissioning operation, tests will be performed on the modified combustion system to verify its performance and make any needed adjustments. Following recommissioning, the gas turbine will be ready for normal operation. It is important to note that the recommissioning operation is expected to be performed only once after the completion of the upgrade (modification of the existing MPP gas turbine combustor system). In addition, the SCR and the CO catalyst systems will be operational during the recommissioning operation and will reduce the emissions of NOx, CO and VOC. However, the SCR and the CO catalyst systems may not be operating at their full control efficiencies when the gas turbine will be operating at low loads during the recommissioning operation. Additional details of the operation of the upgraded MPP are provided below.

The current permit for the existing MPP is based on the following normal operating schedule: (a) 24 hours/day and 7 days/week; (b) 1,000 hours of duct burner operation in a year; and (c) 95% operation of the gas turbine in a year [i.e. 8,322 hours of operation in a year (8760 x 0.95 = 8,322]. The facility is permitted to have up to 5 startups and 5 shutdowns during a month. In addition, provision for the MPP Upgrade, including recommissioning (Part 1, YR 2020) is also made in the operation of MPP during the first year of operation. The normal operating schedule for the gas turbine and the duct burner for the existing MPP is summarized in Tables 2-1 ad 2-2. The above operating schedule has also been used for preparing this Petition to Amend.

BWP/SCPPA had developed a schedule for the MPP Upgrade Project (YR 2021). This schedule is presented in Table 2-3. According to this schedule, the MPP Upgrade project was to start on January 8, 2021 and end on March 8, 2021. This phase of the upgrade would involve hardware and software modifications to the combustor system. During this phase of the upgrade,

combustor will not be fired; therefore, there will be no emissions from the MPP. The next phase, "recommissioning phase" is planned to start immediately after the completion of hardware and software modifications to the existing MPP and will involve recommissioning of the modified combustor system. The recommissioning phase is expected to be completed in eleven days and the modified MPP facility is expected to be ready for normal operation around March 19, 2021. Note that the modified MPP facility will continue to operate as described in the schedules presented in Tables 2-1 and 2-2 after the YR 2021 upgrades is completed. However, during the first year of operation the MPP gas turbine will be under recommissioning for about 11 days (225.8 hours) during March 2021. The above operating schedule has also been used for preparing this Petition to Amend.

General Electric (GE) has developed a recommissioning schedule for the MPP Upgrade Project (YR 2021). According to this schedule, recommissioning will be completed in about 11 days (see Ref. 1 in Appendix A-8).

It may be noted that the gas turbine will not be continuously "ON" throughout the recommissioning operation of 225.8 hours. The gas turbine will be shutoff for 66.2 hours out of the recommissioning period of 225.8 hours. Therefore, the gas turbine will be "ON" for only 159.6 hours (225.8 – 66.2 = 159.6) during the recommissioning operation. Furthermore, the MPP will operate in non-recommissioning mode for 8,096.2 hours (8,322-225.8 = 8,096.2) during the first year of operation. The upgraded MPP will undergo 56 starts, 57 shutdowns and 1,000 hours of duct burner operation during the first year of operation. The MPP will also be in baseload (normal) operation (without recommissioning, startup, shut down and duct burner operation) for 6,731.7 hours during the first year of operation (8,322-225.8-336-28.5-1,000 = 6,731.7 hrs). A summary of the above operations is provided in Table 2-4. Additional details of the first year operation of the upgraded MPP are provided in Appendix A (A-1).

The above parameters were used for calculating the criteria air pollutants, air toxics/HAPs and GHGs emissions from the existing and modified (upgraded, Part 2, 2021) MPP facility.

2.2.3 Criteria Pollutants Emissions from Gas Turbine and the Duct Burner (Existing MPP Facility)

The details of the criteria pollutant emissions are provided below for various operating scenarios of the existing MPP facility.

Normal Operation

MPP is permitted to operate with and without the duct burner. Tables 2-5 through 2-7 present the hourly emissions of criteria pollutants during the normal operation of the MPP with and without the duct burner. This information was obtained from the South Coast AQMD, Statement of Basis, Proposed Minor Permit Revision for MPP Upgrade Project (Part 1, YR 2020), December 26, 2019 (Ref. 2, see Appendix A-8).

Startup Emissions

Table 2-8 presents the estimated emissions for the MPP during a startup. This information was obtained from the South Coast AQMD, Statement of Basis, Proposed Minor

Permit Revision for MPP Upgrade Project (Part 1, YR 2020), December 26, 2019 (Ref. 2, see Appendix A-8).

Shutdown

Table 2-9 presents the estimated emissions for the MPP during a shutdown operation. Table 2-9 also presents emissions during the hourly (60 minute) operation, which includes 30 minutes of shutdown emissions and 30 minutes of normal operation with duct burner operation emissions. This information was obtained from the South Coast AQMD, Statement of Basis, Proposed Minor Permit Revision for MPP Upgrade Project (Part 1, YR 2020), December 26, 2019 (Ref. 2, see Appendix A-8).

Recommissioning (YR 2020)

Table 2-10 presents the estimated maximum emissions for the MPP during the YR 2020 recommissioning operation. This information was obtained from the South Coast AQMD, Statement of Basis, Proposed Minor Permit Revision for MPP Upgrade Project (Part 1, YR 2020), December 26, 2019 (Ref. 2, see Appendix A-8).

A summary of criteria pollutant emissions from the existing MPP facility is presented in Table 2-11 for the normal operating scenario of the MPP as well as for the startup, shutdown and 2020 recommissioning scenarios.

2.2.4 Maximum Daily Criteria Pollutant Emissions from Gas Turbine and Duct Burner (Existing MPP Facility)

Table 2-12 presents the permitted maximum daily criteria pollutant emission limits for the existing MPP facility. Maximum daily CO, NOx, and VOC emissions are based on the following operating scenario: one startup, one shutdown and the remaining hours in normal operation. It was also assumed that the duct burner will operate for 12 hours in a day.

Maximum daily PM10 and SOx emissions are based on the following operating scenario: normal operational mode for all the 24 hours of the day, including duct burner operation for 12 hours in the day.

This information was obtained from the South Coast AQMD, Statement of Basis, Proposed Minor Permit Revision for MPP Upgrade Project (Part 1, YR 2020), December 26, 2019 (Ref. 2, see Appendix A-8).

Additional details of the daily criteria pollutant emissions are provided in Appendix A (A-2).

2.2.5 Maximum Monthly Criteria Pollutant Emissions from the Gas Turbine and the Duct Burner (Existing MPP Facility)

Table 2-12 presents the permitted criteria pollutant monthly emission limits for the existing MPP facility. These emission limits are based on normal operation, startup and shutdown only. This information was obtained from the South Coast AQMD Facility Permit to Operate, January 10, 2020 (Ref. 3, see Appendix A-8).

2.2.6 Annual Criteria Pollutant Emissions from the gas turbine and the duct burner (Existing MPP Facility, including Part 1, YR 2020 Recommissioning Emissions)

Table 2-12 also presents the permitted annual criteria pollutant emissions for the existing MPP facility which includes recommissioning emissions (Part 1, YR 2020). This information was obtained from the SCAQMD Statement of Basis, Proposed Permit Revision for the MPP, December 26, 2019 (Ref. 2, see Appendix A-8).

2.2.7 PM10 Emissions from the Cooling Tower

PM10 emissions from the cooling tower were obtained from the CEC Final Staff Assessment (FSA), Table 12 (CEC October 2002; Ref 11) for the criteria pollutant analysis.

2.2.8 Criteria Pollutants Emissions – Recommissioning (Part 2) Operation (YR 2021 Proposed Operation)

The details of the criteria pollutant emissions during the YR 2021 recommissioning operation are provided below for the MPP facility.

The recommissioning (tuning) operation will involve all of the steps from the first start of the gas turbine after the modification of the gas system through the contractual performance testing. General Electric (GE), the manufacturer of the gas turbine and the designer of the MPP Upgrade has provided a schedule for recommissioning of the upgraded MPP. According to this schedule, recommissioning operation will last for 11 days.

The GE data table includes five basic gas turbine load cases: 10%, 25%, 35%, 50% and 90% GT load cases. The details of the above 5 scenarios are provided in Table 2-13. It may also be noted that the highest fuel flow rate in Table 2-13 at 90% nominal load is 1,733 MMBtu/hr (HHV) that is lower than the permitted fuel input rate to the gas turbine of 1,787 MMBtu/hr (HHV). It should also be noted that MPP facility is provided with a duct burner of 583 MMBtu/hr (HHV) heat input. Therefore, the combined permitted fuel input rate to the gas turbine and the duct burner is 2,370 MMBtu/hr (HHV) that is higher than the maximum fuel flow rate of 1,733 MMBtu/hr during the recommissioning operation. Note that the duct burner will not be operated during the recommissioning of the MPP.

The recommissioning stack exhaust emissions for CO, NOx and VOC (hourly emissions) and the stack temperatures for the basic gas turbine load cases are also provided in Table 2-13. This information was developed by Fossil Energy Research Corporation (FERCo) (see Ref. 4 in Appendix A-8). PM10 and SOx emissions are not included in Table 2-13. There will be no increase in emissions of these two pollutants from the recommissioning operation because PM10 and SOx emissions depend on fuel use. As discussed above, fuel use will be lower during the recommissioning operation in comparison to the normal operation.

For estimating CO, NOx and VOC stack hourly emissions (lb/hr), stack exhaust emissions in parts per million were first estimated by FERCo. This information and the gas turbine exhaust emissions provided by GE in parts per million as well as in lbs/hr were used for estimating the stack exhaust emissions in lbs/hr. Note that the MPP CO CEMS is certified to operate on a dual range, 0-10 ppm and 0-200 ppm. The valid range is 10-95% of full span; therefore, the minimum CO concentration that can be measured at the low range is 1 ppm, and the minimum concentration that can be measured at the high range is 20 ppm. The CO CEMS will switch to the high range when emissions are at 9.5 ppm or higher. These minimum CO concentrations were taken into account for estimating CO emission during the recommissioning operation, i.e. any CO concentrations estimate to be below 1 ppm were adjusted to 1 ppm, and

any CO concentrations estimated to be above 9.5 ppm and below 20 ppm were adjusted to 20 ppm.

Table 2-14 presents the maximum hourly CO, NOx and VOC emissions during the YR 2021 recommissioning (tuning) operation.

Maximum Daily Criteria Pollutant Emissions during YR 2021 Recommissioning Operation

Table 2-15 presents the daily CO, NOx and VOC emissions during the YR 2021 for all the 11 days of recommissioning (tuning) operation.

Table 2-16 presents the maximum daily CO, NOx and VOC emissions during the YR 2021 recommissioning (tuning) operation. The daily CO, NOx and VOC emissions were calculated using the stack exhaust emissions developed by FERCo (Ref. 4, see Appendix A-8).

Additional details of the daily criteria pollutant emissions during recommissioning are provided in Appendix A (A-2).

Monthly Criteria Pollutant Emissions during YR 2021 Recommissioning Month

Table 2-17 presents the monthly CO, NOx and VOC emissions during the month in which recommissioning (tuning) operation will be performed. It should be noted that normal operations are also planned during the month in which recommissioning operation will be performed.

In Table 2-17, PM10 and SOx monthly emissions during the recommissioning month are also provided. Additional details of the recommissioning operation emissions are provided in Appendix A (A-3).

2.2.9 Criteria Pollutants Emissions - Post-Recommissioning (Tuning) Operation

Normal operation (at full load), startup and shutdown emissions from the modified/upgraded MPP facility will be the same as the unmodified MPP facility and are presented in Tables 2-5 through 2-11.

MPP upgrades will allow the MPP facility to generate power over a wider operating range of the gas turbine from the Minimum Emissions Compliance Load (MECL) of about 27% GT load (lowest achievable load for a given ambient temperature) to the full GT load. GE had provided the expected post-upgrade MPP CCGF performance at the gas turbine MECL prior to the start of YR 2020 recommissioning. This information is provided in Ref. 5 (see Appendix A-8).

The stack exhaust emissions for CO, NOx and VOC and stack temperature at the MECL are provided in Table 2-18. This information was developed by FERCo (see Ref. 6 in Appendix A-8). PM10 and SOx emissions are not included in Table 2-18 because there will be no increase in PM10 and SOx emissions from the MPP upgrade.

Note that there will be no changes in the emissions at MECL after the MPP Upgrade Project (Part 2, YR 2021).

The maximum daily and monthly criteria pollutant emissions from the modified/upgraded MPP facility will also be the same as the unmodified MPP facility and are presented in Tables 2-11 and 2-12.

2.2.10 Annual Criteria Pollutant Emissions during the First Year of Operation (YR 2021), Upgraded MPP Facility

Table 2-19 presents the annual criteria pollutant emissions for the first year of operation of the upgraded MPP facility. Annual emissions are based on the schedule of operation provided in Table 2-4.

For estimating annual CO, NOx and VOC emissions, it was assumed that the MPP will undergo 225.8 hrs of recommissioning, 56 startups (336 hrs), 57 shutdowns (28.5 hrs), and 1,000 hrs of GT operation with duct burner and 6,731.7 hrs of GT operation without duct burner.

For estimating annual PM10 and SOx emissions, it was assumed that the MPP will undergo 225.8 hrs of recommissioning, 1,000 hrs of GT operation with duct burner and 7,096.2 hrs of GT operation without duct burner.

Additional details of the annual criteria pollutant emissions are provided in Appendix A (A-6).

2.2.11 Annual Criteria Pollutant Emissions during the Second Year of Operation

Annual criteria pollutant emissions from the modified/upgraded MPP facility during the second year of operation are presented in Table 2-20. Note that during the second year of operation, recommissioning operations will not be performed.

This information was obtained from the SCAQMD Statement of Basis, Proposed Permit Revision for the MPP, December 26, 2019 (Ref. 2, see Appendix A-8).

2.2.12 Maximum Hourly Criteria Pollutant Emissions during the Commissioning of MPP

The maximum hourly criteria pollutant emissions from the commissioning of MPP are provided in Table 2-21. These emissions were considered by the CEC for analyzing the environmental impacts when it approved the project in 2003 (Ref. 9).

2.2.13 Comparison of Criteria Pollutant Emissions

A comparison of the hourly, daily, monthly and annual criteria pollutant emissions for the unmodified MPP with the modified/upgraded (Part 2, 2021) MPP indicated the following:

1. Maximum hourly emissions for all the criteria pollutants for the unmodified MPP and modified/upgraded (Phase 2, 2021) facility during the normal operation will be the same.
2. Startup and shutdown emissions for all the criteria pollutants for the unmodified MPP and modified/upgraded (Phase 2, 2021) facility will be the same.
3. Maximum daily emissions for all the criteria pollutants for the unmodified MPP and modified/upgraded (Phase 2, 2021) facility during the normal operation will be the same.
4. Maximum daily emissions for all the criteria pollutants for the modified/upgraded (Phase 2, 2021) MPP facility will be the same or less than the unmodified MPP facility during the recommissioning scenarios.

5. Maximum monthly emissions for all the criteria pollutants for the modified/upgraded (Phase 2, 2021) MPP facility will be the same or less than the unmodified MPP facility.
6. Annual criteria pollutant emissions during the first year of operation of the modified/upgraded (Phase 2, 2021) MPP facility will be less than the operation of the unmodified MPP facility.
7. Maximum hourly CO and NOx emissions during the recommissioning scenarios for the modified/upgraded (Phase 2, 2021) MPP facility will be less than the commissioning scenario (see Table 2-22).
8. Maximum hourly CO emissions during the recommissioning scenarios for the modified/upgraded (Phase 2, 2021) MPP facility will also be lower than the MPP's startup and shutdown scenarios.

2.3 AIR TOXIS EMISSIONS

The gas turbine and the duct burner at the MPP are the source of air toxics. The details of the air toxics emissions are provided below for the gas turbine and the duct burner.

Annual Air Toxics Emissions from MPP

Table 2-22 presents the maximum annual air toxics emissions for the operation of the MPP facility. This information was obtained from Reference 2 (see Appendix A-8). It should be noted that air toxics emissions during the second year of MPP facility operation (i.e. one year after the upgrade of the MPP facility; Part 2, 2021) will be the same as the existing MPP facility operation without the recommissioning operation.

Air toxics emissions during the year when MPP upgrades, including recommissioning will be made will be less than the emissions presented in Table 2-22 because fuel use will be lower during the upgrade/recommissioning year of operation.

2.4 GREENHOUSE GAS EMISSIONS

The gas turbine and the duct burner are the source of greenhouse gas (GHG) emissions at the MPP.

Total GHG mass emission from the operation of the MPP without the recommissioning operation was estimated at 903,236 tons. In addition total CO_2e emission from the operation of the MPP without the recommissioning operation was estimated at 904,149 tons. The above information was obtained from Ref. 2 (see Appendix A-8).

GHG emissions during the year when MPP upgrades will be made will be less than the emissions during the year when existing MPP facility will be operated without recommissioning operation because fuel use will be lower during the recommissioning year of operation.

2.5 AIR QUALITY IMPACT ANALYSIS

In June 2016, SCPPA submitted a petition requesting modifications to the startup and shutdown operation including an increase in startup duration, number of startups and shutdowns, and duct burner operation (Ref. 12). This petition also included an air quality impact analysis to compare the maximum ground-level impacts resulting from the operational phase of the project

with the state of California and National Ambient Air Quality Standards (CAAQS/NAAQS), as well as with the applicable SCAQMD significance criteria.

Air quality impact analysis was performed for the following normal operating scenarios: (1) startup, (2) normal operation, and (3) shutdown. The results of the dispersion modeling analysis indicated that the maximum estimated CO 1-hr and 8-hr, and NOx 1-hr concentrations would not exceed the CAAQS/NAAQS. Additional details of the above air quality impact analysis are provided in Reference 12.

Because CO and NOx emissions during the normal operation of the unmodified and modified/upgraded MPP facility will be the same as analyzed in the above petition, the maximum estimated CO 1-hr and 8-hr, and NOx 1-hr concentrations from the upgraded MPP facility would also not exceed the CAAQS/NAAQS.

The maximum NOx 1-hr emission of 155.94 lb/hr during the recommissioning scenario will be less than the maximum NOx 1-hr emission of 198.1 lb/hr during the commissioning scenario. Therefore, the impacts of NOx emissions during the recommissioning scenario are not expected to be greater than those analyzed during project licensing.

2.6 MITIGATION MEASURES

The SCPPA provided mitigation in the form of emission reduction credits (ERCs) for the operation of the MPP prior to the issuance of the license in 2003. The quantities of ERCs provided are reflected in COC AQ-11 (Ref. 13), on a monthly basis. Because PM10, SOx and VOC monthly emissions for the operation of the modified/upgraded MPP is estimated to be less than or equal to the monthly emissions from the existing MPP facility, there will be no change in the ERC requirements for the modified/upgraded MPP facility.

2.7 CUMULATIVE IMPACTS

Because no new ambient impacts are anticipated as a result of the proposed changes to the project (MPP Upgrade), no significant changes to the original assessment of the cumulative air quality impacts are expected.

2.8 COMPLIANCE WITH LORS

The proposed project amendments (MPP Upgrade) are expected to comply with all the applicable LORS. Proposed modifications to the existing COCs will be included in Section 3 after the modified Title V permit for the MPP Upgrade will be received from the SCAQMD. Additional details of LORS compliance are provided below.

2.8.1 SCAQMD REGULATIONS

Rule 212 – Standards for Approving Permits

Rule 212(c) requires the issuance of a public notice prior to granting a permit if any of the following apply:

- Any new or modified permit unit, source under Regulation XX, or equipment under Regulation XXX that may emit air contaminants located within 1,000 feet of a school. No notice is required if the modification of an existing facility results in an emission reduction and there is no increase in health risk.

- Any new or modified facility, which has on-site emission increase exceeding 30 lbs/day, of VOC; 40 lbs/day of NOx; 30 lbs/day of PM10; 60 lbs/day of SOx; 220 lbs/day of CO; or 3 lbs/day of lead.
- Any new or modified permit unit, source under Regulation XX, or equipment under Regulation XXX that increases emissions of toxic air contaminants and when the maximum individual cancer risk is equal to or greater than one in one million unless the total facility wide cancer risk is below ten in one million. For a single permitted unit the public notice is required if the maximum individual cancer risk is 10 in one million.

MPP is subject to Regulations XX and XXX. However, there is no school within 1000 feet of the facility and there will be no increase in emissions on a daily basis from the facility modification. Emission changes for CO and VOC from the facility modification are provided in Table 2-23. Furthermore, there will be no increase in toxic air contaminant emissions because there will be no increase in fuel (natural gas) use from the proposed modification to the combustion turbine; therefore, a public notice is not required under Rule 212.

Rule 218 – Continuous Emission Monitoring

A CO CEMS is required to be installed to verify that the emissions of CO do not exceed the emission limits. The CO CEMS has been installed and certified, therefore continued compliance with Rule 218 is expected.

Rule 401 – Visible Emissions

Because the combustion turbine and duct burner fire natural gas, visible emissions are not expected under normal operation. There is no indication of visible emission problems at the MPP. Therefore, continued compliance with Rule 401 is expected.

Rule 402 – Nuisance

Nuisance problems are not expected under normal operating conditions of the MPP. There have been no issues of odor or other nuisance problems at the MPP. Therefore, continued compliance with Rule 402 is expected.

Rule 407 – Liquid and Gaseous Air Contaminants

This rule limits the CO emissions to 2,000 ppm maximum and the SO_2 emissions to 500 ppm for equipment not subject to the emission concentration limits of Rule 431.1. Because the combustion turbine is subject to Rule 431.1, the only limit that applies is the 2,000-ppm CO limit.

Compliance with the CO limit has been demonstrated through stack source testing. The combustion turbine is also subject to a more stringent CO BACT limit of 2 ppm. The initial source test confirmed that MPP can comply with the 2 ppm emission limit. In addition, MPP is required to maintain a CO continuous emission monitoring system. Therefore, continued compliance with Rule 407 is expected.

Rule 409 Combustion Contaminants

The rule limits particulate matter (PM) emissions (from combustion) to 0.1 grains/scf at 12 percent CO_2, averaged over 15 minutes. The recent source test results summarized below show that the actual particulate emissions are below this limit.

The theoretical calculations performed by the SCAQMD also support the conclusion that the MPP is in compliance with Rule 409 [grain loading at maximum load (16.22 lb/hr PM10 emissions) was estimated at 0.0016 gr/scf by the SCAQMD] (see Ref. 2 in Appendix A.9).

	Test Load	Results, gr/scf at 12% CO_2
Initial Testing October 2005	Without Duct Firing	0.001
	With Duct Firing	0.001
Periodic Testing November 2008	Without Duct Firing	0.00079
	With Duct Firing	0.00074
Periodic Testing August 2011	Without Duct Firing	0.00007
	With Duct Firing	0.00078
Periodic Testing September 2014	Without Duct Firing	0.0006
	With Duct Firing	0.0004
Periodic Testing June 2017	Without Duct Firing	0.0004
Periodic Testing September 2017	With Duct Firing	0.0003

Rule 431.1 – Sulfur Content of Natural Gas

The natural gas supplied to the MPP is expected to comply with the 16 ppmv sulfur limit (calculated as H_2S) specified in Rule 431.1(c) (1). Commercial grade natural gas has an average sulfur content of about 4 ppm. MPP will also comply with reporting and record keeping requirements as outlined in subdivision (e) of this rule. Therefore, continued compliance with Rule 431.1 is expected.

Rule 475 – Electric Power Generating Equipment

This rule applies to power generating equipment greater than 10 MW and installed after May 7, 1976 and requires that the equipment meet a limit for combustion contaminants of 11 lb/hr or 0.01 gr/scf. Compliance is achieved if either the mass limit or the concentration limit is met. Mass PM10 emissions from the MPP are estimated at 16.22 lb/hr, and 0.0047 gr/scf during natural gas firing at maximum load (see calculations below). Therefore, compliance is expected and has been verified through the initial and subsequent performance testing.

The following equation is used to determine stack exhaust flow and combustion particulates. The results are presented below.

Stack Exhaust Flow (scf/hr) = F_d x [20.9 / (20.9 - $\%O_2$)] x TFD
where:
F_d: Dry F factor for fuel type, 8710 dscf/MMBtu
O_2: Rule specific dry oxygen content in the effluent stream, 3 percent
TFD: Total fired duty measured at the higher heating value (HHV), 2,370 MMBtu/hr
Combustion Particulates (grain/scf) = (PM10, lb/hr / Stack Exhaust Flow, scf/hr) x 7,000 (gr/lb)

Stack Exhaust Flow = 8710 x (20.9/17.9) x 2370 = 24.10E+06 scf/hr
Combustion Particulate = (16.22/24.10E+06) x 7000 = 0.0047 grain/scf

Regulation IX – Standards of Performance for New Stationary Sources (NSPS)

These requirements are discussed under federal regulations in Section 2.8.2.

Regulation X – National Emission Standards for Hazardous Air Pollutants (NESHAPS)

These requirements are discussed under federal regulations in Section 2.8.2.

Regulation XI – Source Specific Standards - Rule 1135 - Emissions of Oxides of Nitrogen from Electricity Generating Facilities

This rule shall apply to electric generating units at electric generating facilities. The gas turbine at the MPP generates electric power and is subject to this rule.

Notwithstanding the exemptions contained in Rule 2001- Applicability, subdivision (j) - Rule Applicability and its accompanying Table 1: Existing Rules Not Applicable to RECLAIM facilities for Requirements Pertaining to NOx Emissions, on and after January 1, 2024, or when required by a permit to operate issued to effectuate the requirements in this rule, whichever occurs first, the owner or operator of an electric generating facility shall not operate a combined cycle gas turbine and associated duct burner in a manner that exceeds the NOx and ammonia emission limits of 2 ppmv and 5 ppmv, respectively at 15% oxygen (dry).

In addition, the gas turbines installed or for which the owner or operator has applied for permits to construct prior to November 2, 2018 shall average the NOx and ammonia emission limits over a 60 minute rolling average or retain the averaging time requirements specified on the SCAQMD permit as of November 2, 2018. Note that above NOx emission limits shall not apply during start-up, shutdown and tuning (Subparagraph (d)(1)(B)). This subparagraph is applicable to the MPP because the initial application for permit to construct for the gas turbine was submitted in 2001. The MPP is permitted for 2 ppmv NOx emission limit with an averaging period of 3 hours and 5 ppmv ammonia emission limit with an averaging period of 60 minutes. Therefore, the MPP gas turbine is in compliance with Rule 1135 Subparagraph (d)(1)(B).

The owner or operator of each RECLAIM NOx source subject to Rule 1135 is also required to comply with Rule 2012 - Monitoring, Reporting and Recordkeeping for NOx emissions to demonstrate compliance with the NOx emission limits of this Rule. MPP is currently in RECLAIM and is required to comply with Rule 2012.

Regulation XIII – New Source Review

The MPP is subject to best available control technology (BACT), modeling, and offsets requirements of New Source Review. A discussion is presented below on the applicability and compliance with these requirements.

Rule 1303(a) – Best Available Control Technology

MPP's BACT levels for all the criteria pollutants are in compliance with the SCAQMD's BACT requirements.

Rule 1303(b)(1) – Modeling

The proposed modifications will not result in an increase in daily, monthly or annual emissions for any pollutant; therefore New Source Review (NSR) will not be triggered, and an analysis of BACT, offsets, and modeling is not required.

Rule 1303(b)(2) – Emission Offsets

Rule 1303(b)(2) requires that all increases in emissions be offset unless exempt from offset requirements pursuant to Rule 1304. The emission offset ratios for PM10, SO_x, and VOC are 1.2 to 1. Rule 1304 (d)(2) exempts a facility from offsets if the post modification potential to emit (PTE) is less than the following: 4 tons per year of VOC; 4 tons per year of NO_x; 4 tons per year of SO_x; 4 tons per year of PM_{10}, and; 29 tons per year of CO.

BWP/SCPPA has determined that post modification VOC, SO_x, and PM10 PTEs would be greater than 4 tons VOC, 4 tons SO_x, and 4 tons PM10. Therefore, VOC, SO_x, and PM10 emission increases must be offset following the Rule 1306 emission offset calculations. In addition, because the MPP facility is a RECLAIM facility, it is subject to Rule 2005 for NOx Regional Trading Credit (RTC) requirements rather than to Regulation XIII requirements.

The details of the emission reduction credit (ERC) requirements for the MPP facility modifications (Upgrade) are presented below. The following basic modes of operation of the MPP Upgrade consist of recommissioning, startup, normal operation, and shutdown. Therefore, ERC requirements have been analyzed for only four modes of operation.

Table 2-24 presents the monthly emissions of PM10, VOC and SOx for the modified MPP. Table 2-24 also shows the monthly emission limits for these pollutants from the current Title V facility permit issued by the SCAQMD on December 30, 2020 for the MPP. A comparison of the permitted monthly emissions (facility permit issued on December 30, 2020 for the year 2021) with the estimated monthly emissions for the modified MPP indicates that there will be no increase in monthly PM10, SOx or VOC emissions. Therefore, no additional ERCs for PM10, SOx or VOC emissions will be required for the proposed modifications to the MPP facility.

Rule 1303(b)(4) – Facility Compliance

The MPP is currently in compliance with all applicable rules and regulations of the District.

Rule 1303(b)(5) – Major Polluting Facilities

According to the Rule 1303(b)(5), any new major polluting facility or a major modification at an existing major polluting facility shall comply with the following requirements: (1) Alternative Analysis and (2) Statewide Compliance. A major modification means any modification at an existing major polluting facility, located in the South Coast Air Basin (SCAB), [see Rule 1302(r)] that will cause;

1. an increase of one pound per day or more, of the facility's potential to emit (PTE) of oxides of nitrogen (NOx) or volatile organic compounds (VOC), or
2. an increase of 40 tons per year or more, of the facility's potential to emit (oxides of sulfur) SOx, or

3. an increase of 15 tons per year or more, of the facility's potential to emit particulate matter with an aerodynamic diameter of less than or equal to a nominal ten microns (PM10); or,
4. an increase of 50 tons pear or more, of the facility's potential to emit carbon monoxide (CO).

It is estimated that there will be no increase in NOx or VOC emissions (in terms of pound per day of the facility's PTE) from the MPP Upgrade project (see Table 2-23). In addition, the annual increase in SOx, PM10, and CO emissions is estimated to be 1.5 tons/year, 14.1 tons/year, and 39.3 tons/year, respectively (see Table 2-25). The above increase in NOx, VOC, SOx, PM10, and CO emissions is estimated to be less than the emission increase thresholds established in Rule 1302(r). Therefore, the MPP upgrade project is exempt from alternative analysis and statewide compliance demonstration requirements of Rule 1303(b)(5).

Rule 1303(b)(5)(C) – Protection of Visibility

This rule requires that a modeling analysis be conducted to assess the impacts of project emissions on plume visibility in nearby Class I areas if the net emission increase from the new or modified source exceeds 15 tons/year of PM10 or 40 tons/year of NOx and the location of the source, relative to the closest boundary of a specified federal Class I area, is within the distances specified in the rule. The net increase in NOx and PM10 emissions from the MPP are estimated to be less than 40 tons/yr and 15 tons/yr, respectively, which are less than the emission increase thresholds. Therefore, the MPP upgrade project is exempt from plume visibility analysis. The details of NOx and PM10 emission calculations are provided in Table 2-19.

Rule 1325 – Federal PM2.5 New Source Review Program

Rule 1325, adopted June 3, 2011 (amended January 4, 2019) regulates sources under the Federal New Source review Program for $PM_{2.5}$ emissions. This Rule applies to facilities that are a major source of $PM_{2.5}$. As per Rule 1325, the new major polluting facility; or major modification to a major polluting facility; or any modification to an existing facility that would constitute a major polluting facility in and of itself will have to meet the following requirements:

1. Lowest Achievable Emission Rate (LAER) is employed for the new source or for the actual modification to an existing source; and.
2. Emission increases shall be offset at an offset ratio of 1.1:1 for PM2.5 and the ratio required in XIII or Rule 2005 for NOx and SOx as applicable; and
3. Certification is provided by the owner/operator that all major sources, as defined in the jurisdiction where the facilities are located, that are owned or operated by such person in the State of California are subject to emission limitations and are in compliance or on a schedule for compliance with all applicable limitations and standards under the Clean Air Act; and
4. An analysis is conducted of alternative sites, sizes, production processes, and environmental control techniques for such proposed source and demonstration made that the benefits of the proposed project outweigh the environmental and social costs associated with that project.

The threshold for a Major Polluting facility is 100 tons/yr [Rule 1325(b)(5)]. The MPP facility PTE for $PM_{2.5}$ is 50.7 tons/yr, which is less than the 100 tons/yr; therefore, Rule 1325

does not apply to the MPP. Additional details of PM2.5/PM10 emissions are provided in Table 2-19.

Regulation XIV – Toxics

Rule 1401 – New Source Review of Toxic Air Contaminants

Rule 1401, adopted June 1, 1990 (amended September 1, 2017), specifies risk-based limits for new, relocated or modified equipment which emits toxic air contaminants. Rule 1401(d) requires the determination of maximum individual cancer risk (MICR), cancer burden, and non-cancer acute and chronic hazard indices (HIs) associated with new, relocated, and modified permit units, which emit toxic air contaminants. A list of applicable TACs is provided in Table 1 of the Rule. This rule also specifies limits for MICR, cancer burden, and acute and chronic HIs from new, relocated, and modified permit units.

Health risk assessments for the MPP were performed in 2001 and 2006 to demonstrate compliance with the Rule 1401 requirements. There will be no increase in fuel use (natural gas) from the MPP Upgrade project; therefore, additional HRA for the proposed facility modifications was not performed. Continued compliance with Rule 1401 is expected.

Regulation XVII – Prevention of Significant Deterioration (PSD)

Rule 1703 PSD Analysis

The MPP is located in the SCAB, an area geographically under the jurisdiction of the SCAQMD.

Prevention of Significant Deterioration (PSD) analysis applies to new major stationary sources and major modifications to existing major stationary sources. A major source is a listed facility (one of the 28 PSD source categories listed in the federal Clean Air Act) that emits at least 100 tons/year of a listed PSD pollutant, or any other facility that emits at least 250 tons/year of a listed PSD pollutant. The MPP area is currently classified as an attainment area for CO, PM10, NO_2, and SO_2.

For a combined cycle power generating facility, the major source threshold is 100 tons per year based on actual emissions or potential to emit. In case the facility is deemed a major source, Rule 1702 further defines a significant emission increase as 40 tons/year or more of either NOx or SOx, 100 tons/year of CO, or 15 ton/year of PM10 emissions over the emissions before the modifications at the stationary source [Rule 1706(c)(1)(B)(i)]. The actual emissions before modifications are to be determined during the two-year period immediately preceding date of permit application. Future potential annual emissions (first year of operation) of CO, PM10, NOx and SOx from MPP upgrade project are presented in Table 2-19.

The MPP is an existing minor source for CO, NOx, PM10 and SOx (see Table 2-19). Because the permit application was being submitted in July 2019, the two year period immediately preceding the permit submission was from the July 2017 through June 2019. The annual actual CO, PM10, NOx and SOx emissions for the existing MPP for these two years are presented in Table 2-25 along with the emissions change summary. The emissions analysis indicates that there will be a net increase of less than 40 tons for NOx and SOx, less than 100 tons for CO, and also less than 15 tons for PM10. Therefore, the proposed modifications at the

MPP will not be considered a major modification for CO, NOx, PM10 or SOx emissions and provisions of Rule 1703 (PSD analysis) will not apply for modifications to the MPP facility.

Rule 1714 – Prevention of Significant Deterioration for Greenhouse Gases

Rule 1714 adopted November 5, 2010 (amended March 1, 2019) established preconstruction review requirements for greenhouse gases (GHG). The provisions of this rule apply only to GHGs as defined by EPA to mean the air pollutant as an aggregate group of six GHGs: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). The provisions of this rule apply to any source and the owner or operator of any source subject to any GHG requirements under 40 Code of Federal Regulations Part 52.21. It means that SCAQMD Rule 1714 requires GHG BACT analysis for sources that trigger the above mentioned federal requirements.

In the case of Utility Air Regulatory Group (UARG) vs. EPA (No. 12-1146), the U.S. Supreme Court held that emission of GHGs alone cannot trigger PSD applicability, but that once sources trigger PSD review due to their criteria pollutant emissions, such sources must limit emissions of GHG through BACT. As discussed above, the criteria pollutant emissions from the proposed modifications to the operating scenario for MPP do not exceed the significance levels set forth in Rule 1703; therefore GHG BACT analysis is not required under SCAQMD Rule 1714.

Regulation XX – Regional Clean Air Incentives Market (RECLAIM)

Rule 2005 – New Source Review for RECLAIM

Rule 2005 applies to the NOx emissions from the MPP. The rule for NOx emissions requires new sources or modifications to the existing sources to provide RECLAIM Trading Credits (RTCs), perform a modeling analysis, and meet BACT limits. Each of these requirements is discussed in further detail below.

Rule 2005(b)(1)(A) – BACT

MPP's BACT level for NOx emissions are in compliance with the SCAQMD's BACT requirements.

Rule 2005(b)(2)(A) – RECLAIM TRADING CREDITS (RTCs)

Rule 2005(b)(2)(A) requires that a modified facility provide sufficient RTCs to offset emissions prior to the first year of operation on a 1-to-1 basis. Furthermore, paragraph (b)(2)(B) states that the RTCs must comply with the zone requirements of Rule 2005(e). The facility is located in Zone 2 (Inland, Cycle 1); therefore, RTCs may only be obtained from Zone 2.

Table 2-19 presents a summary of the annual NOx emissions (136,384 lbs) from the modified facility (after implementing the changes in the permit conditions). This includes 4,300 lbs of NOx emissions from the duct burner (4.3 lbs/hr x 1,000 hr/yr of duct burner operation). The amount of first year RTCs required is estimated at 136,391 lbs (NOx emission offset on a 1-to-1 basis). This estimate is based on 8,322 hours of operation for the MPP, including 1,000 hours of duct burner operation. Additional details of NOx annual emission calculations are provided in Appendix A-6.

BWP/SCPPA will use credits from the existing MPP allocation or will either purchase the required NOx RTCs from the open market. Therefore, compliance with Regulation XX, Rule 2005, is expected.

Rule 2005(b)(B) – Modeling

The hourly NOx emission rate during the operation of the modified MPP at Minimum Emissions Compliance Load (MECL) was estimated at 6.4 lb/hr (see Table 2-18). This NOx emission rate is the same as reviewed by the SCAQMD for the development of Statement of Basis, Proposed Minor Permit Revision for the MPP Upgrade Project in December 26, 2019 (Ref. 3). Therefore, no additional NOx modeling analysis for the modified MPP facility operation at MECL has been performed.

Rule 2005(g)(4) – Protection of Visibility

Rule 2005(g)(4) requires that a modeling analysis be conducted to assess the impacts of project emissions on plume visibility in nearby Class I areas if the net emission increase from the new or modified source exceeds 40 tons per year of NOx and the location of the source, relative to the closest boundary of a specified federal Class I area, is within the distances specified in the rule. The net increase in NOx emissions from the MPP is estimated to be less than 40 tons/yr, which is less than the emission increase threshold. Therefore, the MPP modification project is exempt from plume visibility analysis. The details of annual NOx emission increase summary are provided in Table 2-25

Rule 2012 – Monitoring, Reporting, and Recordkeeping for Oxides of Nitrogen Emissions

MPP, is currently in compliance with all monitoring, record-keeping, and reporting requirements of NOx RECLAIM rule. Continued compliance is expected.

Regulation XXX – Title V

MPP is subject to Title V requirements. The facility permit for Compliance Year 2021 (January 1, 2021 - December 31, 2021) was issued on December 30, 2020. The proposed facility modification changes in the permit conditions is considered a minor revision in accordance to Rule 3000 because there is no increase in emissions and no significant changes in permit conditions. As a minor revision, the permit is subject to 45 day EPA review and a 30 day review by the affected states.

2.8.2 Federal Regulations

40 CFR Part 60 Subpart Da – Standards of Performance (NSPS) for Electric Utility Steam Generating Units

This NSPS applies to electric utility steam generating units rated over 250 MMBtu/hr heat input of fossil fuel, which were constructed, modified, or reconstructed after September 18, 1978. This includes fired heat recovery steam generators (HRSG). MPP HRSG is subject to this subpart because its heat input rating (duct burner heat input rating) is 583 MMBtu/hr that is greater than the applicability standard of 250 MMBtu/hr in the rule. The applicable emission standards under this subpart are as follows:

NOx 1.6 lbs/MWh (0.2 lb/MMBtu (construction commenced after July 9, 1997 but

before March 1, 2005) [§60.44Da(d)(1)]
PM 0.03 lb/MMBtu (construction commenced prior to March 1, 2005) [§60.42Da(a)]
SO_2 0.02 lb/MMBtu (construction commenced prior to February 28, 2005) [§60.43Da(b)(2)]

The above standards apply only to the emissions from the duct burner [§60.40Da(e)(2)] and the standards are based on a 30 operating day rolling average.

Note that Units firing natural gas are not subject to the PM standard [§60.42Da(f)] or opacity standard [§60.42Da(b)(2)].

The regulations require the installation of a CEMS to measure NOx and O_2. Also, an initial performance test is required. Note that duct burner generates approximately (142-85 = 57 MW of power when fired at 100% capacity.

The calculated emissions rates from the from the gas turbine and duct burner are as follows:

NOx 0.054 lb/MWh
PM 0.0070 lb/MMBtu
SO_2 0.0007 lb/MMBtu

The calculated emissions and the emissions from the compliance source testing are all lower than subpart Da requirements. The compliance source testing was performed as required. Note that source test is performed for combined emissions from the gas turbine and duct burner. The duct burner is not source tested separately Continued compliance is expected.

40CFR Part 60 Subpart TTTT Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units

The final rule entitled "Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Generating Units (New Source Rule)," 80 FR 64510 (October 23, 2015), was codified as 40 CFR Part 60, Subpart TTTT, and became effective on October 23, 2015. The New Source Rule established national emission standards to limit emissions of carbon dioxide (CO_2) from newly constructed, modified, and reconstructed affected fossil fuel-fired electric utility generating units (EGUs). In order to comply with the Presidential Executive Order on Promoting Energy Independence and Economic Growth, signed by President Trump on 3/28/17, then-EPA Administrator Scott Pruitt issued the following Federal Register notice for the New Source Rule. The Review of the Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Generating Units, 82 FR 16330 (April 4, 2017) announced that the EPA is reviewing *The New Source Rule* and, if appropriate, will as soon as practicable and consistent with law, initiate reconsideration proceedings to suspend, revise or rescind this rule. On December 6, 2018, EPA proposed amendments to Subpart TTTT in Review of Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, 83 FR 65424 (12/20/2018), for which comments were due by February 2019. After further analysis and review, EPA proposed to determine that the best system of emission reduction (BSER) for newly constructed coal-fired units, is the most efficient demonstrated steam cycle in combination with the best operating practices. This proposed BSER would replace the determination from the 2015 rule, which identified the BSER as partial carbon capture and storage. The EPA is not proposing to amend and is not reopening

the standards of performance for newly constructed or reconstructed stationary combustion turbines.

Applicability Requirements to this Subpart - Except as provided for in paragraph (b) of this section, the GHG standards included in this subpart apply to any stationary combustion turbine that commenced construction after January 8, 2014 or commenced reconstruction after June 18, 2014 that meets the relevant applicability conditions in paragraphs (a)(1) and (a)(2) of this section.

(1) Has a base load rating greater than 260 GJ/h (250 MMBtu/h) of fossil fuel (either alone or in combination with any other fuel), and

(2) Serves a generator capable of selling greater than 25 MW of electricity to a utility power distribution system.

§60.5580 defines "base load rating" to mean "the maximum amount of heat input (fuel) that an EGU can combust on a steady state basis, as determined by the physical design and characteristics of the EGU at ISO conditions…." ISO conditions mean 15 deg C (59 °F) ambient temperature, 60% relative humidity, and 14.70 psia. As mentioned in Section 2, the MPP power island includes a natural gas fired, General Electric Model PG7241FA (7FA.03) combustion turbine generator. The gas turbine is rated at 1,787 MMBtu/hr (HHV). The GT exhausts into a fired (using a duct burner) heat recovery steam generator (HRSG). Steam from the HRSG is admitted into a steam turbine generator (STG). The duct burner (DB) is rated at 583 MMBtu/hr (HHV). Note this load rating will not change after the MPP Upgrades, which exceeds the applicability threshold of 250 MMBtu/hr.

In addition, the total gross power output from the CTG (181.1 MW) and the STG (142.0 MW) is 323.1 MW which exceeds the applicability threshold of 25 MW. Therefore, the turbine will be subject to Subpart TTTT if the construction of the turbines commenced after January 8, 2014, or the reconstruction commenced after June 18, 2014.

40 CFR 60 Subpart A—General Provisions provides definitions for "commenced," "construction" and "reconstruction," as shown below.

§60.2 Definitions – "**Commenced"** means, with respect to the definition of new source in section 111(a)(2) of the Act, that an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

Construction means fabrication, erection, or installation of an affected facility.

•§60.15 Reconstruction

(b) "Reconstruction" means the replacement of components of an existing facility to such an extent that:

(1) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and

(2) It is technologically and economically feasible to meet the applicable standards set forth in this part.

(c) "Fixed capital cost" means the capital needed to provide all the depreciable components.

The MPP turbine will not be subject to Subpart TTTT after the turbine upgrade as explained below. The construction of the turbines will not commence after the January 8, 2014 applicability date, as the construction commenced prior to 2005. In addition, the turbine upgrade

project will commence after the January 8, 2014 applicability date, but the project does not meet the definition of "reconstruction." According to the information provided by BWP/GE, the MPP upgrade cost will be about $13.9 million. In addition, the cost for the complete turbine package, including the upgrade will be about $75 million. Because the upgrade cost for the MPP turbine ($13.9 million) does not exceed the 50% of the $75 million for a new gas turbine system, the MPP upgrade is not a "reconstruction." Therefore, the MPP turbine will not be subject to Subpart TTTT.

40CFR Part 63 Subpart YYYY – NESHAPS for Stationary Gas Turbines

EPA has promulgated the National Emission Standards for Hazardous Air Pollutants (NESHAP) applicable to combustion turbines. NESHAPs apply to sources that are classified as major for hazardous air pollutants. A major source is a facility that has emissions of 10 tons per year of any single hazardous air pollutant (HAP) or 25 tons per year of a combination of HAPs. Subpart YYYY establishes national emission limitations and operating limitations for hazardous air pollutants from stationary combustion turbines. Subpart YYYY limits the emissions of formaldehyde to 91 parts per billion by volume and on a dry basis (ppbvd) at 15 percent O_2. If the source owner uses an oxidation catalyst to comply, the 4-hour rolling average of the catalyst inlet temperature must be within the range suggested by the catalyst manufacturer. If the source owner does not use an oxidation catalyst for compliance, the source owner must implement selected operating limitations to insure compliance with the formaldehyde limit. The source owner must develop these operating limitations and petition the agency for approval.

In addition to the above limitations, Subpart YYYY requires performance tests to demonstrate compliance and provide continuous monitoring of certain parameters. For turbines equipped with an oxidation catalyst the inlet temperature to the catalyst system must be monitored. If operating limitations are chosen for compliance, then the operating limitations must be continuously monitored.

Table 3-22 presents the emissions of air toxics/hazardous air pollutants from the MPP facility (gas turbine and the duct burner). The individual HAP of concern with the highest emission rate is formaldehyde. As seen in the table, formaldehyde emissions will be under the 10-ton-per-year major source threshold. The total HAP emissions will also be under the 25-ton-per-year major source threshold. Therefore, the MPP facility is exempt from Subpart YYYY requirements.

40CFR Part 64 – Compliance Assurance Monitoring (CAM)

The CAM regulation applies to emission units at major stationary sources required to obtain a Title V Permit, which use control equipment to achieve a specified emission limit and which have emissions that are at least 100% of the major source thresholds on a pre-control basis (NOx and VOC = 10 tpy; CO =50 tpy, PM10 =70 tpy; SOx = 100 tpy; single HAP = 10 tpy; and Total HAPS = 25 tpy). The rule is intended to provide "reasonable assurance" that the control systems are operating properly to maintain compliance with the emission limits. MPP is a major source of CO, NOx and VOC on a pre-control basis (but not for PM10, or SOx), and the combustion turbine is subject to an emission limit for CO, NOx and VOC.

Combustion turbine is subject to NOx BACT emission limit of 2.0 ppm (3-hour average). Control equipment in the form of an SCR is used to comply with this NO_X limit. As a NOx Major Source under RECLAIM, the combustion turbine is required to have CEMS under Rule 2012, the use of a continuous monitor to show compliance with an emission limit is exempt from

CAM under Rule 64.2(b)(vi).

Combustion turbine is subject to CO BACT emission limit of 2.0 ppm (1-hour average). Control equipment in the form of oxidation catalyst is used to comply with this CO limit. As a CO Major Source, the combustion turbine is required to use a CO CEMS under Rule 1303-BACT. The use of a continuous monitor to show compliance with an emission limit is exempt from CAM under Rule 64.2(b)(vi).

Combustion turbine is subject to VOC BACT emission limit of 2.0 ppm (1-hour average). Control equipment in the form of oxidation catalyst is used to comply with this VOC limit. The oxidation catalyst is effective at operating temperatures above 300^{o}F. The facility is required to maintain a temperature gauge in the exhaust condition D12.2), which will measure the exhaust temperature on a continuous basis and record the temperature on an hourly basis. This will ensure that the oxidation catalyst is operating properly. In addition, compliance with the VOC permit limit will be determined by periodic source testing. Based on the above, compliance with the CAM rule is expected.

40CFR Parts 72, 73, 74 and 75 – Acid Rain Program

MPP facility is subject to the requirements of the federal acid rain program, because the gas turbine is a power generating unit (greater than 25 MW) operated by a utility. The acid rain program is a Cap-and-Trade regulation and the facilities are required to cover SO_2 emissions with "SO_2 Allowances," or purchase of SO_2 on the open market. Facilities that existed in 1993 when the regulation was adopted were given allowances based on past operation. MPP gas turbine does not have an initial allowance allocation because the gas turbine is not an existing unit under the rule; therefore, SO_2 credits to cover the operation of MPP gas turbine must be purchased. The facility is also required to monitor SO_2 emissions through use of fuel gas meters and gas constituent analysis, or if fired with pipeline quality natural gas, as in the case of the MPP, a default emission factor of 0.0006 lb/MMBtu is allowed. SO_2 mass emissions are to be recorded every hour. NOx and O_2 must be monitored with CEMS in accordance with the specifications of Part 75. Under this program, NOx and SOx emission will be reported directly to the USEPA. Based on the above, compliance with acid rain program is expected.

2.9 CONCLUSIONS

With the proposed amendments for the MPP Upgrade project, the CEC Staff's conclusions in the Final Staff Assessment and the Final Decision that air quality impacts from Project are less than significant, will still be applicable.

2.10 PUBLIC HEALTH

The public health impacts assessed during the licensing of the MPP indicated that the acute, chronic, and cancer risk associated with the operation of the MPP were below the CEC's significance impact levels (see MPP Final Staff Assessment, Public Health Table 2, page 4.7-13). The proposed modifications at the MPP are not expected to increase the amount of fuel fired (the basis for calculating the MPP non-criteria pollutant emissions, which drive the health risk assessment). Therefore, no significant public health impacts are expected from the proposed upgrade to the MPP facility.

For the original project, the CEC determined that the MPP would not have a significant direct or cumulative impact on public health (see MPP Final Staff Assessment, Public Health

Section, page 4.7-14). As the proposed changes to the MPP license is not expected to increase public health impact above those analyzed during licensing, no significant cumulative public health impacts are expected.

Table 2-1
Summary of the Operating Scenarios for the MPP Gas Turbine[Ref. 2]

Startups/month	Startups/year	Shutdowns/month	Shutdowns/year	Annual Operation Hours/Year
5	60	5	60	8,322

Table 2-2
Summary of the Operating Scenarios for the MPP Duct Burner [Ref. 2]

Hours/day	Hours/month	Hours/Year
12	240	1,000

Table 2-3
Magnolia Power Project (MPP) Upgrade Schedule

MPP Upgrade Project Activity	Period
Start of the MPP Upgrade Project, Non-Recommissioning Operation	Start of the Project: January 8, 2021
Start of the MPP Upgrade Project, Recommissioning (Tuning Operation)	March 9, 2021
Completion of the MPP Upgrade Project, including Recommissioning (Tuning Operation)	March 19, 2021
Start of the MPP Normal Operation after the Completion of MPP Upgrades	March 19, 2021

Table 2-4
Operating Hours for the Upgraded MPP during the First Year of Operation, 2021

MPP Upgrade Project Activity	Hours of Operation
MPP Current Permitted Hours of Operation	8,322 hrs
Total Number of Hours of Recommissioning in March, 2021	225.8 hrs
Number of Hours when GT will be "OFF" during Recommissioning	66.2 hrs
Number of Hours when GT will be "ON" during Recommissioning	159.6 hrs
MPP Operation during the First Year of Operation without recommissioning	8,096.2 (8,322–225.8 = 8,096.2)
Number of Startups during the First Year of Operation	56
Number of hours in Startups	336 hrs
Number of Shutdowns during the First Year of Operation	57
Number of hours in Shutdowns	28.5 hrs
Hours of Duct Burner Operation during the First Year of Operation	1,000 hrs
Hours of MPP Normal Operation without Startup, Shutdown, Duct Burner and Recommissioning	6,731.7 (8,322–225.8–336.0–28.5– 1,000 = 6,731.7)

Table 2-5
Normal MPP Operation Emissions (100% Load) [Ref. 2]
(Without the Duct Burner)

Pollutant	Hourly Emissions (lb/hr)
NO_x	13.18
CO	8.02
VOC	4.58
PM_{10}	11.79
SO_x	1.28
Ammonia (NH_3)	12.17

Table 2-6
Emissions from the Duct Burner [Ref. 2]

Pollutant	Hourly Emissions (lb/hr)
NO_x	4.30
CO	2.62
VOC	1.50
PM_{10}	4.43
SO_x	0.42
Ammonia (NH_3)	3.97

Table 2-7
Normal MPP Operation Emissions (100% Load) [Ref. 2]
(With the Duct Burner)

Pollutant	Hourly Emissions (lb/hr)
NO_x	17.48
CO	10.64
VOC	6.08
PM_{10}	16.22
SO_x	1.7
Ammonia (NH_3)	16.15

Table 2-8
Emissions during Startup of the MPP [Ref. 2]
(Startup Duration Six Hours)

Pollutant	Startup Emissions (lb)
NO_x	440.00
CO	500.00
VOC	30.00
PM_{10}	70.74
SO_x	7.68

Table 2-9
Emissions during Shutdown of the MPP
[Shutdown Duration 0.5 hour (30 Minutes)]

Pollutant	Shutdown Emissions [Ref. 2] (lb in 30 minutes)	Shutdown Emissions (lb in 60 minutes)[a]
NO_x	25.00	33.74
CO	120.00	125.32
VOC	17.00	20.04
PM_{10}	5.90	14.01
SO_x	0.64	1.49

[a] This includes 30 minutes of shutdown emission and 30 minutes of normal operation with duct burner emission

Table 2-10
Maximum Emissions during Recommissioning
(YR 2020) of the MPP [Ref. 2]

Pollutant	Recommissioning Emissions (lb)
NO_x	155.94
CO	55.64
VOC	43.76

Table 2-11
Summary of Startup, Shutdown, Recommissioning and Normal Operation Criteria Pollutant Emissions (Existing MPP Facility, 2020) [Ref. 2]

Operating Scenario	Length Of Event (minutes)	NO_x (lbs/event)	CO (lbs/event)	VOC (lbs/event)	PM_{10} (lbs/event)	SO_x (lbs/event)
Startup	360	440.00	500.00	30.00	70.74	7.68
Shutdown	30	25.00	120.00	17.00	5.90	0.64
Shutdown + Normal Operation with Duct Burner	60	33.74	125.32	20.04	14.01	1.49
Normal (100% load) without Duct Burner	60	13.18	8.02	4.58	11.79	1.28
Normal (Only Duct Burner)	60	4.30	2.62	1.50	4.43	0.42
Normal (100% load) with Duct Burner	60	17.48	10.64	6.08	16.22	1.70
Recommissioning	60	155.94	55.64	43.76	–	–

Table 2-12
Summary of Daily, Monthly, and Annual Criteria Pollutant Emissions
(Existing MPP Facility, including Recommissioning, Part 1, 2020)

Operating Scenario	Length Of Event (Hours)	NO_x (lbs/event)	CO (lbs/event)	VOC (lbs/event)	PM_{10} (lbs/event)	SO_x (lbs/event)
Daily [Ref. 2]	24	747.3	815.8	145.2	336.1	35.8
Monthly [Ref. 3]	720	-	9,243	3,744	9,552	1,022
Annual [Ref. 2]	8,322	135,506	99,800	39,437	100,519	10,851

Table 2-13
Fuel Use, Stack Emissions and Stack Temperature for Five Basic Gas Turbine Load Scenarios (Part 2, YR 2021)

Case	Nominal Load, %	Fuel Flow MMBtu/hr (LHV)[Ref. 1]	Fuel Flow MMBtu/hr (HHV)[5]	Stack Emissions[Ref. 4]			Stack Temp [Ref. 4] °F
				CO, lb/hr	NOx, lb/hr	VOC, lb/hr	
1	10	483.45	564.03	35.12	98.71	18.86	191.47
2	25	708.10	826.12	34.69	155.94	15.61	196.40
3	35	850.35	992.08	55.64	11.93	43.76	199.69
4	50	1,032.35	1,204.40	3.35	8.44	0.18	204.62
5	90	1,485.07	1,732.58	2.97	12.56	0.29	217.77

[1] Fuel use in HHV = Fuel use in LHV x 1,050/900. Note: Lower heating value (LHV) for natural gas is 900 Btu/scf (see Ref. 5, Appendix 8). Higher heating value (HHV) for natural gas is 1,050 Btu/scf (see Ref. 2, Appendix A-8).

Table 2-14
2021 Maximum Hourly Recommissioning (Part 2) Stack Emissions

Pollutant	Hourly Emissions (lb/hr)
NO_x	155.94
CO	55.64
VOC	43.76

Table 2-15
Daily Criteria Pollutant Emissions during Recommissioning (YR 2021) Operation
(see Appendix A-2)

Operation Description	NO_x (lbs)	CO (lbs)	VOC (lbs)
Day 1	394.84	140.48	75.44
Day 2	470.85	154.89	61.70
Day 3	508.27	178.49	83.64
Day 4	239.64	76.98	5.31
Day 5	259.42	75.16	5.84
Day 6	467.26	146.08	72.51
Day 7	422.96	210.26	108.31
Day 8	284.96	72.80	6.16
Day 9	92.24	24.52	2.10
Day 10	394.84	140.48	75.44
Day 11	579.59	218.98	126.23

Table 2-16
2021 Maximum Daily Recommissioning Stack Emissions (see Appendix A-2)

Pollutant	Operating Scenario	Daily Emissions (lb/day)
NO_x	Recommissioning Day 11	579.59
CO	Recommissioning Day 11	218.98
VOC	Recommissioning Day 11	126.23

Table 2-17
2021 Criteria Pollutant Emissions during the Recommissioning Month (2021)

Pollutant	Monthly Emissions (lb)
NO_x	12,058
CO	6,715
VOC	3,278
PM10	8,371
SOx	894

Table 2-18
Expected Performance of MPP at MECL after MPP Upgrade (YR 2021)

Operation Description	Fuel Input, MMBtu/hr (LHV) [Ref. 5]	Stack Temperature, °F [Ref. 6]	NOx lb/hr [Ref. 6]	CO lb/hr [Ref. 6]	VOC lb/hr [Ref. 6]
MPP operation at MECL (at 22°F) after MPP Upgrade	800.2	197.0	6.40	0.45	0.30

Table 2-19
Annual Emissions during the First Year of Operation of the Upgraded MPP Facility (YR 2021) – see Appendix A-6

Operation Description	NO_x (lbs)	CO (lbs)	VOC (lbs)	PM10 (lbs)	SOx (lbs)
Annual operation of the upgraded MPP facility.	136,384[a]	100,907[a]	40,183[a]	101,365[b]	10,943[b]

[a] 225.8 of recommissioning, 56 starts (336 hours), 57 shutdowns (28.5 hrs), 1,000 hrs GT operation with duct burner and 6,731.7 hrs of GT operation without duct burner).
[b] 225.8 hrs of recommissioning, 1,000 hrs GT operation with duct burner and 7,096.2 hrs of GT operation without duct burner.

Table 2-20
Annual Emissions during the Second Year of Operation of the Upgraded MPP Facility (YR 2022)

Operation Description	NO_x (lbs)	CO (lbs)	VOC (lbs)	PM10 (lbs)	SOx (lbs)
Annual operation of the upgraded MPP facility (8,322 hours)	136,744	103,435	40,649	102,546	11,072

Table 2-21
Maximum Hourly MPP Recommissioning Emissions [Ref. 9]

Pollutant	Task	Total Hours	Emission (lb/task)	Emission (lb/hr)
NO_x	Full Speed No Load	8	1,585	198.1
CO	Full Speed No Load	8	2,441	305.1
VOC	Low Load	4	143	35.8

Table 2-22
Air Toxics Emissions from the Operation of the Existing MPP Facility[Ref. 2]

Air Toxic	Annual Emission, lbs/yr
1,3 butadiene	6.46
Acetaldehyde	2,649.42
Acrolein	54.31
Benzene	49.01
Ethylbenzene	479.84
Formaldehyde	5,401.87
Naphthalene	19.58
PAH (excluding naphthalene)	13.51
Propylene Oxide	435.68
Toluene	1,957.63
Xylenes	961.15
Total, lbs/yr	12,028
Total, tons/yr	**6.0**

Table 2-23
Daily Emission Change from MPP Facility Modification

Pollutant	Maximum Daily Emissions from the Facility Modification (Recommissioning)[a], lb/day	Maximum Daily Emissions from the Facility Modification (Non-Recommissioning)[b], lb/day	Maximum Daily Emissions from the Existing Facility (Non-Recommissioning)[b], lb/day	Change in Emissions from the Facility Modification, lb/day
CO	218.98	815.8	815.8	0
NOx	579.59	747.3	747.3	0
VOC	126.23	145.2	145.2	0
PM10	-	336.1	336.1	0
SO_2	-	35.8	35.8	0

[a] Data from Table 2-15.
[b] Data from Table 2-12.

Table 2-24
Monthly Emissions from the Existing MPP and MPP Facility Modification

Pollutant	Emissions From the Facility Modification (Recommissioning Month)[a], lb/month	Maximum Emissions From the Facility Modification (Non-Recommissioning Month)[b], lb/month	Emissions from the Existing Facility (Non-Recommissioning Month)[b], lb/month	Change in Emissions from the Facility Modification, lb/month
CO	6,715	9,243	9,243	0
VOC	3,278	3,744	3,744	0
PM10	8,371	9,552	9,552	0
SO_2	894	1,022	1,022	0

[a] Data from Table 2-17.
[b] Data from Table 2-12 and Reference 3 (see Appendix A-8).

Table 2-25
CO, NOx, PM10 and SOx Annual Emissions Summary

Pollutant	Baseline (Actual) Emissions (tons/year)[a]	Future Potential Emissions, Modified MPP Facility, 1st Year Operation[b] (tons/year)	Emissions Increase (tons/year)	Significant Emissions Increase Threshold (tons/year)	Emissions Increase Significance (Yes/No)
CO	11.2	50.5	39.3	50	No
NO_X	30.9	68.2	37.3	40	No
PM10	36.6	50.7	14.1	15	No
SO_X	4.0	5.5	1.5	40	No

[a] Details of calculations are provided in Appendix A.7. Emission data is for the period July 2017 through June 2019.

[b] Details of calculations are provided in Appendix A.6.

SECTION 3
PROPOSED MODIFICATIONS TO THE CONDITIONS OF CERTIFICATION

As required under the CEC Siting Regulations Section 1769(a)(1)(A), this section will provide the details of the proposed modifications to the project's condition of certifications after the modified Title V permit for the MPP Upgrade will be received from the SCAQMD.

SECTION 4
POTENTIAL EFFECTS ON THE PUBLIC

As required under the CEC Siting Regulations Section 1769(a)(1)(G), this section addresses the proposed Amendment's effects on the public.

The proposed amendment is not expected to have impacts that are greater than those analyzed during project licensing. Therefore, impacts to public are expected to be the same as those analyzed during CEC license proceeding for the MPP.

Normal maintenance for the MPP requires periodic overhaul outages. These overhaul outages typically occur every four years on the generating units. Traffic in and out of the MPP facility during these overhaul changes is typically higher than in other times, because of the additional contractor personnel required to support these overhauls.

The combustors installed in the gas turbine in 2005 (when the gas turbine was originally installed at the MPP) had a few specific components rated for only 12K hours. These specific components (combustor hardware) were upgraded in 2008/2009 with hardware rating of 24K hours. The combustor hardware in the gas turbine was further upgraded in 2015 based on fleet performance data and overhaul findings. As a result, the service interval (outage interval) has increased from 24K to 32K hours. The new hardware will also be rated at 32K hours.

During the overhaul of the generating units, contractor personnel access the MPP facility at the Lake Street Entrance. Entrance to MPP is shown in Figure 4-1. The contractor access driving paths will not change during the MPP Upgrade and contractor personnel will continue to access the MPP facility at the Lake Street Entrance.

The MPP Upgrade project is expected to start by the end of January 2021 and end by the middle of March 2021. The upgrade activities will involve the swapping of one combustion component, combustion casings, and the installation of various sized hard tubing. One piping manifold and extensions will also be removed and replaced with a new manifold.

It may be noted that MPP Upgrade activities will be performed during the normal overhaul outage activity at the MPP. The normal overhaul outages typically occur every four years. During a normal overhaul of the MPP, combustion turbine and generator are disassembled, various components are replaced, and then the combustion turbine and generator are re-assembled. The overhaul outage activity normally lasts for about 65 days and involves a peak of about 45 daily workers. The MPP Upgrade is expected to be completed within the duration of the normal overhaul outage activity and no additional workers will be required beyond the crew assigned for normal overhaul outage activity. In addition, no additional heavy equipment will be required for the proposed MPP Upgrade.

The MPP is an important facility for the SCPPA and SCPPA would like to minimize the MPP's outage time. Therefore, it is expected that work activity relating to the upgrades may be

performed around-the-clock. BWP/SCPPA expects that each day's work may involve two 12-hour shifts, each beginning at 7 a.m. and ending at 7 p.m.

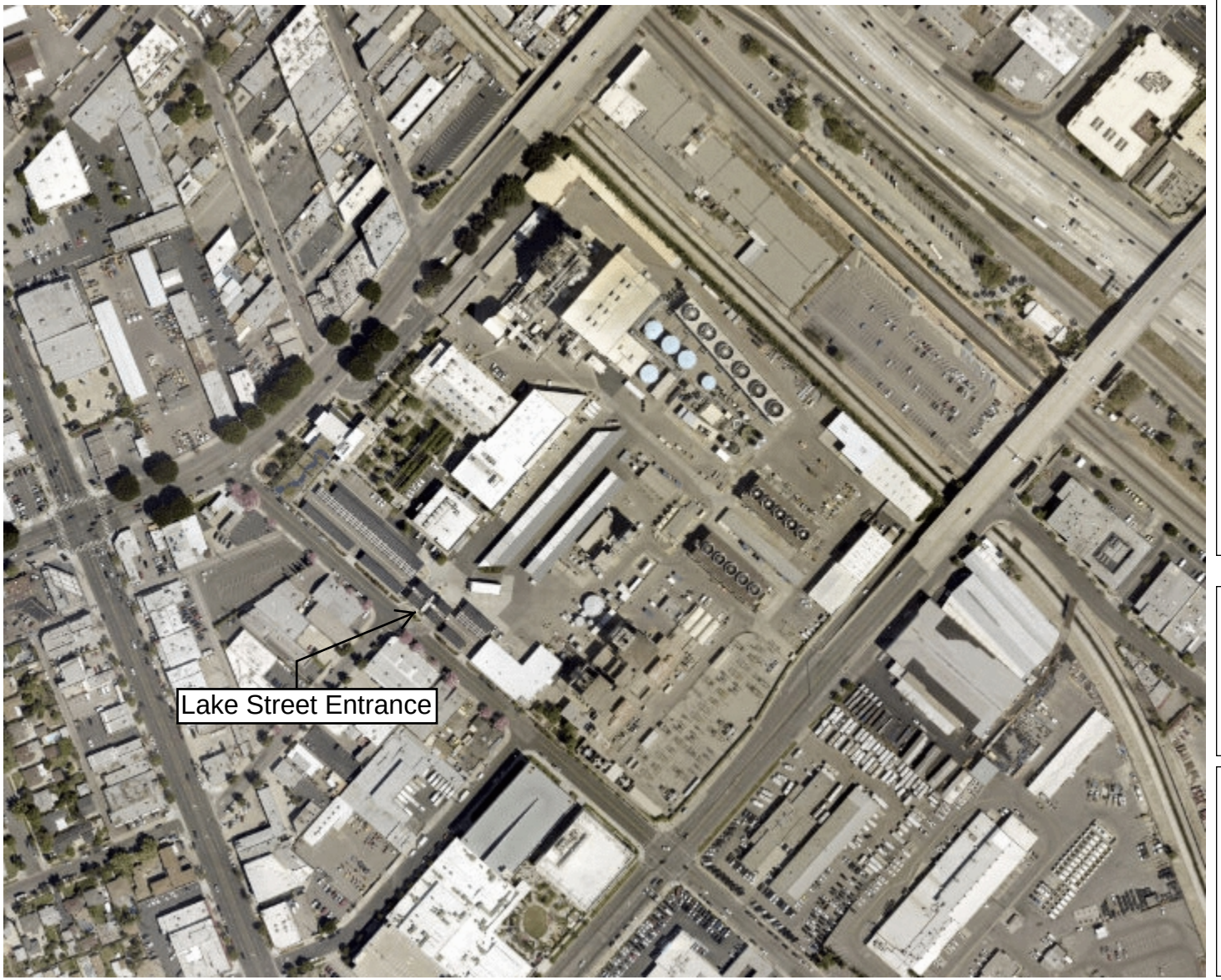
Figure 4-2 shows the parking areas used during the overhaul outages. This parking area will also be used during the MPP Upgrade. The parking area will be able to accommodate the MPP Upgrade workforce, as it has for the overhaul outages employing about 45 workers.

Figure 4-3 shows the equipment paved lay down areas used during the overhaul outages. The same equipment paved lay down areas will be used for the MPP Upgrade. It is important to note that the lay down areas are generally adjacent to the equipment to be worked on, and are well within the BWP facility boundaries.

The existing MPP layout and balance of MPP equipment, including the stack, HRSG and associated emission control systems, STG, cooling tower, switchyard and all other MPP equipment will remain unchanged. The existing inlet air filtration, oxidation catalyst, and selective catalytic reduction system will continue to provide emission controls. In addition, the MPP Upgrade will not change the external physical appearance of the affected equipment. Furthermore, the upgrade will be internal to the gas turbine which is self-contained within a sound mitigation enclosure.

The proposed MPP Upgrade is not expected to result in any changes to the noise emissions during operations, as the upgrades are internal to the gas turbine which is self-contained within a sound mitigation enclosure.

Figure 4-1 Contractor Personnel Entrance to MPP during the Overhaul of the Generating Units



Legend

Map Documentation

Date Printed: 16 October 2019

Prepared By: Sean Kigerl

Issued For: California Energy Commission

Project ID: MPP Amendment Application

Notes:

SCALE 1: 4,000

0.1 0 0.1 Miles

Projection: NAD_1983_StatePlane_California_V_FIPS_0405_Feet

BURBANK Water and Power Since 1913

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Figure 4-2 Parking Areas used during the Overhaul Outages

Legend

Parking Areas

Map Documentation

Date Printed:	16 October 2019
Prepared By:	Sean Kigerl
Issued For:	California Energy Commission
Project ID:	MPP Amendment Application

Notes:

SCALE 1: 4,000

0.1 0 0.1 Miles

Projection: NAD_1983_StatePlane_California_V_FIPS_0405_Feet

BURBANK Water and Power Since 1913

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Figure 4-3 Equipment Paved Lay Down Areas used during the Overhaul Outages

Legend

Equipment Laydown

Map Documentation

Date Printed: 16 October 2019

Prepared By: Sean Kigerl

Issued For: California Energy Commission

Project ID: MPP Amendment Application

Notes:

SCALE 1: 4,000

0.1 0 0.1 Miles

Projection: NAD_1983_StatePlane_California_V_FIPS_0405_Feet

BURBANK Water and Power Since 1913

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

SECTION 5
LIST OF PROPERTY OWNERS

As required under the CEC Siting Regulations Section 1769(a)(1)(H), this section lists the property owners affected by the proposed modifications. The list of property owners are presented in Appendix B.

SECTION 6
POTENTIAL EFFECTS ON PROPERTY OWNERS

As required under the CEC Siting Regulations Section 1769(a)(1)(I), this section addresses potential effects of the proposed Amendment on nearby property owners, the public, and parties in the application proceeding.

The proposed project changes are expected to result in comparable impacts as those analyzed during the licensing proceeding. Therefore, impacts to property owners are expected to be the same as those analyzed during the license proceeding for the project.

APPENDIX A
EMISSION CALCULATION SHEETS, DAILY, MONTHLY, AND ANNUAL EMISSION CALCULATIONS, REFERENCES, AND HISTORICAL EMISSIONS

APPENDIX A.1
Calculation of Operating Hours during the First Year of Operation (YR 2021)

Appendix A-1
Calculation of Operating Hours during the First Year of Operation (YR 2021)

Currently Permitted Hours of MPP Operation

1. Total number of hours in a year	8,760	hrs/yr
2. MPP facility is currently permitted for 8760 x 0.95 hours of operation	8,322	hrs/yr
3. Number of starts per month permitted	5	starts/month
4. Number of hours in one start	6	hrs/start
5. Number of hours in start in one year (12 x 5 x 6)	360	hrs/yr
6. Number of shutdowns per month permitted	5	shut/month
7. Number of hours in one shutdown	0.5	hrs/start
8. Number of hours in shutdown in one year (12 x 5 x 0.5)	30	hrs/yr
9. Number of hours of duct burner operation permitted in a day	12	hrs/day
10. Number of hours of duct burner operation permitted in a month	240	hrs/month
11. Number of hours of duct burner operation permitted in a year	1,000	hrs/yr
12. Number of hours of MPP **regular** operation without duct burner	6,932	hrs/yr
= 8322 - 360 - 30 -1000 = 6,932 hrs		

Calculation for the first year of Operation, 2021

13. MPP current permitted hours of operation in a year	8,322	hrs
14. Total number of hours of recommissioning in March 2021	225.8	hrs/yr
15. Number of hours in March when CT will be "OFF" during recommissioning	66.2	hours
16. Number of hours in March when MPP CT will be "ON," during recommissioning	159.6	hours
17. MPP operation excluding recommissioning during the first year (8322-225.8)	8,096.2	hours
18. Number of startups, first year of regular operation after recommissioning, March 2021	1	startup
19. Number of startups during the first year of regular operation (11 months x 5 = 55)	55	startup
20. Total number of startups during the first year of regular operation (1 + 55)	56	startup/yr
21. Number of hours in startup (52 x 6)	336	hrs/yr
22. Number of shutdowns, first year of regular operation after recommissioning, March 2021	2	shutdown
23. Number of shutdowns during the first year of regular operation (11 months x 5 = 55)	55	shutdown
24. Number of shutdowns during the first year of regular operation (2 + 55)	57	shutdown/yr
25. Number of hours in shutdown (57 x 0.5)	28.5	hrs
26. Hours of duct burner operation during the first year of operation	1,000	hours
27. MPP baseload operation withoutout startup, shutdown, DB operation and recommissioning	6,731.7	hrs/yr
= (8322 - 225.8 - 336 - 28.5 - 1000) = 6,731.7 hrs		

APPENDIX A.2
Daily CO, NOx and VOC Emissions, Recommissioning Operation
(YR 2021)

Appendix A-2 Daily CO, NOx and VOC Emissions, Re-Commissioning Operation (YR 2021)

						Average Outlet Emissions (lb/hr)			Event Outlet Emissions (lb)		
Day	Test Point Description	Mode	Time	Start Time	End Time	NOx (lb/hr)	CO (lb/hr)	VOC (lb/hr)	NOx (lb)	CO (lb)	VOC (lb)
1	Cold start, steam temp match, M1P mapping	Tot_M1P	4	20:00	0:00	98.71	35.12	18.86	394.84	140.48	75.44
1 Total									**394.84**	**140.48**	**75.44**
2	Cold start, steam temp match, M1P mapping (continued)	Tot_M1P	2.4	0:00	2:24	98.71	35.12	18.86	236.90	84.29	45.26
2	Mode transfer checkout, TTKX mapping	M3P	0.2	2:24	2:36	155.94	34.69	15.61	31.19	6.94	3.12
2	Mode transfer checkout, TTKX mapping	M62P	0.2	2:36	2:48	11.93	55.64	43.76	2.39	11.13	8.75
2	Mode transfer checkout, TTKX mapping, M5P & M63P mapping	C_P	1	2:48	3:48	8.44	3.35	0.18	8.44	3.35	0.18
2	Mode transfer checkout, TTKX mapping, M63PA mapping	C_PA	1.4	3:48	5:12	12.56	2.97	0.29	17.58	4.16	0.41
2	M63P partload mapping	C_P	2.8	5:12	8:00	8.44	3.35	0.18	23.63	9.38	0.50
2	M63PA partload mapping (hot fuel)	C_PA	12	8:00	20:00	12.56	2.97	0.29	150.72	35.64	3.48
2	Shutdown for fuel strainer removal	SD	4	20:00	0:00	0.00	0.00	0.00	0.00	0.00	0.00
2 Total									**470.85**	**154.89**	**61.70**
3	Shutdown for fuel strainer removal (continued)	SD	8	0:00	8:00	0.00	0.00	0.00	0.00	0.00	0.00
3	Warm start, steam temp match, M1P mapping	Tot_M1P	3	8:00	11:00	98.71	35.12	18.86	296.13	105.36	56.58
3	M3P mapping - checkout	M3P	0.4	11:00	11:24	155.94	34.69	15.61	62.38	13.88	6.24
3	M62P mapping - checkout	M62P	0.4	11:24	11:48	11.93	55.64	43.76	4.77	22.26	17.50
3	M63P partload mapping	C_P	2	11:48	13:48	8.44	3.35	0.18	16.88	6.70	0.36
3	M63PA part/base/peak load mapping & perf testing (hot fuel)	C_PA	10.2	13:48	0:00	12.56	2.97	0.29	128.11	30.29	2.96
3 Total									**508.27**	**178.49**	**83.64**
4	M63PA part/base/peak load mapping & perf testing (hot fuel) (continued)	C_PA	1.8	0:00	1:48	12.56	2.97	0.29	22.61	5.35	0.52
4	M63P & M5P partoad mapping (cold fuel)	C_P	6	1:48	7:48	8.44	3.35	0.18	50.64	20.10	1.08
4	M63PA part/base/peak load mapping (cold fuel)	C_PA	6	7:48	13:48	12.56	2.97	0.29	75.36	17.82	1.74
4	M63P & M5P turndown tuning (hot fuel)	C_P	9	13:48	22:48	8.44	3.35	0.18	75.96	30.15	1.62
4	M63PA turndown tuning, part/base/peak perf testing (hot fuel)	C_PA	1.2	22:48	0:00	12.56	2.97	0.29	15.07	3.56	0.35
4 Total									**239.64**	**76.98**	**5.31**
5	M63PA turndown tuning, part/base/peak perf testing (hot fuel) (continued)	C_PA	1.8	0:00	1:48	12.56	2.97	0.29	22.61	5.35	0.52
5	M63PA autotune validation and AT loop stability testing	C_PA	12	1:48	13:48	12.56	2.97	0.29	150.72	35.64	3.48
5	M63P & M5P autotune validation and AT loop stability testing	C_P	10.2	13:48	0:00	8.44	3.35	0.18	86.09	34.17	1.84
5 Total									**259.42**	**75.16**	**5.84**
6	M63P & M5P autotune validation and AT loop stability testing (continued)	C_P	1.8	0:00	1:48	8.44	3.35	0.18	15.19	6.03	0.32
6	Shutdown for software download w/ new autotune constants	SD	18.2	1:48	20:00	0.00	0.00	0.00	0.00	0.00	0.00
6	Warm start, steam temp match, M1P mapping	Tot_M1P	3	20:00	23:00	98.71	35.12	18.86	296.13	105.36	56.58
6	M3P mapping	M3P	1	23:00	0:00	155.94	34.69	15.61	155.94	34.69	15.61
6 Total									**467.26**	**146.08**	**72.51**

Appendix A-2 Daily CO, NOx and VOC Emissions, Re-Commissioning Operation (YR 2021)

						Average Outlet Emissions (lb/hr)			Event Outlet Emissions (lb)		
Day	Test Point Description	Mode	Time	Start Time	End Time	NOx (lb/hr)	CO (lb/hr)	VOC (lb/hr)	NOx (lb)	CO (lb)	VOC (lb)
7	M3P mapping (continued)	M3P	1	0:00	1:00	155.94	34.69	15.61	155.94	34.69	15.61
7	M62P mapping	M62P	2	1:00	3:00	11.93	55.64	43.76	23.86	111.28	87.52
7	M63P & M5P autotune validation and AT mode transfer checkout	C_P	3	3:00	6:00	8.44	3.35	0.18	25.32	10.05	0.54
7	M63PA autotune validation and AT mode transfer checkout	C_PA	2	6:00	8:00	12.56	2.97	0.29	25.12	5.94	0.58
7	M63P & M5P final autotune validation (cold & hot fuel)	C_P	2	8:00	10:00	8.44	3.35	0.18	16.88	6.70	0.36
7	M63PA final autotune validation (cold & hot fuel)	C_PA	2	10:00	12:00	12.56	2.97	0.29	25.12	5.94	0.58
7	M5P Overnight Run	C_PA	12	12:00	0:00	12.56	2.97	0.26	150.72	35.64	3.12
7 Total									**422.96**	**210.24**	**108.31**
8	M5P Overnight Run (continued)	C_PA	12	0:00	12:00	12.56	2.97	0.26	150.72	35.64	3.12
8	M63PA final autotune validation (cold & hot fuel) - continued	C_PA	8	12:00	20:00	12.56	2.97	0.29	100.48	23.76	2.32
8	Fast Ramp and grid response testing, OBB testing	C_P	4	20:00	0:00	8.44	3.35	0.18	33.76	13.40	0.72
8 Total									**284.96**	**72.80**	**6.16**
9	Fast Ramp and grid response testing, OBB testing	C_P	2	0:00	2:00	8.44	3.35	0.18	16.88	6.70	0.36
9	Fast Ramp and grid response testing, OBB testing	C_PA	6	2:00	8:00	12.56	2.97	0.29	75.36	17.82	1.74
9	Shutdown for final software dowload & water wash	SD	12	8:00	20:00	0.00	0.00	0.00	0.00	0.00	0.00
9	Offline water wash	WW	4	20:00	0:00	0.00	0.00	0.00	0.00	0.00	0.00
9 Total									**92.24**	**24.52**	**2.10**
10	Offline water wash - continued	WW	20	0:00	20:00	0.00	0.00	0.00	0.00	0.00	0.00
10	Cold start, steam temp match, final schedule	Tot_M1P	4	20:00	0:00	98.71	35.12	18.86	394.84	140.48	75.44
10 Total									**394.84**	**140.48**	**75.44**
11	Cold start, steam temp match, final schedule (continued)	Tot_M1P	2.4	0:00	2:24	98.71	35.12	18.86	236.90	84.29	45.26
11	M3P mapping (contingency)	M3P	2	2:24	4:24	155.94	34.69	15.61	311.88	69.38	31.22
11	M62P mapping (contingency	M62P	1	4:24	5:24	11.93	55.64	43.76	11.93	55.64	43.76
11	Load to base	M3P	0.1	5:24	5:30	155.94	34.69	15.61	15.59	3.47	1.56
11	Load to base	M62P	0.1	5:30	5:36	11.93	55.64	43.76	1.19	5.56	4.38
11	Load to base	C_P	0.1	5:36	5:42	8.44	3.35	0.18	0.84	0.34	0.02
11	Load to Base	C_PA_tune	0.1	5:42	5:48	12.56	2.97	0.29	1.26	0.30	0.03
11 Total									**579.59**	**218.98**	**126.23**
Grand Total									**4114.87**	**1439.10**	**622.68**

APPENDIX A.3
Recommissioning Month Emissions (YR 2021)

Appendix A-3
Magnolia Power Project Permit Modification Project 2020
Recommissioing Month Emissions (YR 2021)

Input Data				
		Value	**Units**	**Reference**
a	NOx Emissions from GT, Normal Operation	13.18	lb/hr	Ref. 2
b.	CO Emissions from GT, Normal Operation	8.02	lb/hr	Ref. 2
c.	VOC Emissions from GT, Normal Operation	4.58	lb/hr	Ref. 2
d.	PM10 Emissions from GT, Normal Operation	11.79	lb/hr	Ref. 2
e.	SOx Emissions from GT, Normal Operation	1.28	lb/hr	Ref. 2
f.	NOx Emissions from Gas Turbine and Duct Burner, Peak Operation	17.48	lb/hr	Ref. 2
g.	CO Emissions from Gas Turbine and Duct Burner, Peaking Operation	10.64	lb/hr	Ref. 2
h.	VOC Emissions from Gas Turbine + Duct Burner, Peaking Operation	6.08	lb/hr	Ref. 2
i.	PM10 Emissions from Gas Turbine + Duct Burner, Peaking Operation	16.22	lb/hr	Ref. 2
j.	SOx Emissions from Gas Turbine + Duct Burner, Peaking Operation	1.70	lb/hr	Ref. 2
k.	Startup Duration	6	hours	Ref. 2
l.	NOx Emissions, Startup	440	lb/event	Ref. 2
m.	CO Emissions, Startup	500	lb/event	Ref. 2
n.	VOC Emissions, Startup	30	lb/event	Ref. 2
o.	PM10 Emissions, Startup	70.74	lb/event	Ref. 2
p.	SOx Emissions, Startup	7.68	lb/event	Ref. 2
q.	Shutdown Duration	0.50	hour	Ref. 2
r.	NOx Emissions, Shutdown	25	lb/event	Ref. 2
s.	CO Emissions, Shutdown	120	lb/event	Ref. 2
t.	VOC Emissions, Shutdown	17	lb/event	Ref. 2
u.	PM10 Emissions, Shutdown	5.90	lb/event	Ref. 2
v.	SOx Emissions, Shutdown	0.64	lb/event	Ref. 2
w.	MPP current permitted hours of operation	8,322	hrs/year	Ref. 2
x	Number of Startups per month	5		Ref. 2
y	Number of shutdowns	5		Ref. 2
z	Number of hours in a month	720	hrs	
aa	Total number of hours in recommissioing in March 2021	225.8	hrs	Ref. 1
bb	Number of startups, first year of regular operation after recommissioning, March 2021	1	startup	
cc	Number of hours in startup (1 x 6)	6	hrs	Calculated
dd	Number of shutdowns, first year of regular operation after recommissioning, March 2021	2	shutdown	
ee	Number of hours in shutdown (2 x 0.5)	1	hrs	Calculated
ff	Hours of duct burner operation during the month	240	hours	
gg	Hrs of MPP operation with startup, shutdown, duct burner operation and recommissioning	247.2	hrs	Calculated
	= (720 - 225.8 -6.0 - 1.0 - 240) = 247.2 hrs			
hh	Hrs of MPP normal operation without startup, shutdown, DB operation and recommissioning	254.2	hrs	Calculated
	= (720 - 225.8 - 240) = 254.2 hrs			
kk	NOx Emissions, re-commissioning	4,114.87	lb	Appendix A-2
ll	CO Emissions, re-commissioning	1,439.10	lb	Appendix A-2
mm	VOC Emissions, re-commissioning	622.68	lb	Appendix A-2
nn	PM10 Emissions, re-commissioning	1,480.80	lb	Appendix A-5
oo	SOx Emissions, re-commissioning	160.26	lb	Appendix A-5

Appendix A-3
Magnolia Power Project Permit Modification Project 2020
Recommissioing Month Emissions (YR 2021)

Note: The scenario which results in the highest monthly emissions is assumed for each pollutant. For NOx, CO and VOC				
maximum monthly emissions are calculated assuming 1 startup, 2 shutdown, 240 hours of normal operation with duct				
burner and the remaining time in normal operation without duct burner (247.2 hrs) plus emissions during recommissioning operation.				
PM10 and SOx emissions are based on 240 hrs/month normal operation with the duct burner and the remaining				
operation without the duct burner (254.2 hours) plus emissions during tuning operation.				
Calculation of Recommissioing Month Emissions for NOx, CO and VOC				
NOx	= (440 lb x 1 starts) + (25 lb x 2 shutdowns)+ (240 hrs x 17.48 lb/hr) + (247.2 hrs x 13.18 lb/hr) + 4114.87 lb	12,058	lb	
CO	= (500 lb x 1 starts) + (120 lb x 2 shutdowns)+ (240 hrs x 10.64 lb/hr) + (247.2 hrs x 8.02 lb/hr) + 1439.1 lb	6,715	lb	
VOC	= (30 lb x 1 starts) + (17 lb x 2 shutdowns)+ (240 hrs x 6.08 lb/hr) + (247.2 hrs x 4.58 lb/hr) + 622.68 lb	3,278	lb	
Calculation of Recommissioing Month Emissions for PM10, SOx				
PM10	= (240 hrs x 16.22 lb/hr) + (254.2 hrs x 11.79 lb/hr) + 1480.8 lb	8,371	lb	
SOx	= (240 hrs x 1.7 lb/hr) + (254.2 hrs x 1.28 lb/hr) + 160.26 lb	894	lb	

APPENDIX A.4
Fuel (Natural Gas) Used during Recommissioning Operation
(YR 2021)

Appendix A-4 Fuel (Natural Gas) Used during ReCommissioning Operation (YR 2021)

Day	Test Point Description	Mode	Start Time	End Time	Duration	Nominal Load	Fuel Flow[Ref. 1] (MMBTU/hr), LHV	Fuel Flow per Event (MMBTU), LHV	Fuel Flow per Event (MMBTU), HHV
1	Cold start, steam temp match, M1P mapping	Tot_M1P	20:00	0:00	4	10	483.45	1933.80	2256.10
1 Total							**483.45**	**1933.80**	**2256.10**
2	Cold start, steam temp match, M1P mapping (continued)	Tot_M1P	0:00	2:24	2.4	10	483.45	1160.28	1353.66
	Mode transfer checkout, TTKX mapping	M3P	2:24	2:36	0.2	25	708.10	141.62	165.22
	Mode transfer checkout, TTKX mapping	M62P	2:36	2:48	0.2	35	850.35	170.07	198.42
	Mode transfer checkout, TTKX mapping, M5P & M63P mapping	C_P	2:48	3:48	1	50	1032.35	1032.35	1204.41
	Mode transfer checkout, TTKX mapping, M63PA mapping	C_PA	3:48	5:12	1.4	90	1485.07	2079.10	2425.62
	M63P partload mapping	C_P	5:12	8:00	2.8	50	1032.35	2890.58	3372.34
	M63PA partload mapping (hot fuel)	C_PA	8:00	20:00	12	90	1485.07	17820.84	20790.98
	Shutdown for fuel strainer removal	SD	20:00	0:00	4	0	0.00	0.00	0.00
2 Total							**7076.74**	**25294.84**	**29510.65**
3	Shutdown for fuel strainer removal (continued)	SD	0:00	8:00	8	0	0.00	0.00	0.00
	Warm start, steam temp match, M1P mapping	Tot_M1P	8:00	11:00	3	10	483.45	1450.35	1692.08
	M3P mapping - checkout	M3P	11:00	11:24	0.4	25	708.10	283.24	330.45
	M62P mapping - checkout	M62P	11:24	11:48	0.4	35	850.35	340.14	396.83
	M63P partload mapping	C_P	11:48	13:48	2	50	1032.35	2064.70	2408.82
	M63PA part/base/peak load mapping & perf testing (hot fuel)	C_PA	13:48	0:00	10.2	90	1485.07	15147.71	17672.33
3 Total							**4559.32**	**19286.14**	**22500.51**
4	M63PA part/base/peak load mapping & perf testing (hot fuel) (continued)	C_PA	0:00	1:48	1.8	90	1485.07	2673.13	3118.65
	M63P & M5P partoad mapping (cold fuel)	C_P	1:48	7:48	6	50	1032.35	6194.10	7226.45
	M63PA part/base/peak load mapping (cold fuel)	C_PA	7:48	13:48	6	90	1485.07	8910.42	10395.49
	M63P & M5P turndown tuning (hot fuel)	C_P	13:48	22:48	9	50	1032.35	9291.15	10839.68
	M63PA turndown tuning, part/base/peak perf testing (hot fuel)	C_PA	22:48	0:00	1.2	90	1485.07	1782.08	2079.09
4 Total							**6519.91**	**28850.88**	**33659.36**
5	M63PA turndown tuning, part/base/peak perf testing (hot fuel) (continued)	C_PA	0:00	1:48	1.8	90	1485.07	2673.13	3118.65
	M63PA autotune validation and AT loop stability testing	C_PA	1:48	13:48	12	90	1485.07	17820.84	20790.98
	M63P & M5P autotune validation and AT loop stability testing	C_P	13:48	0:00	10.2	50	1032.35	10529.97	12284.97
5 Total							**4002.49**	**31023.94**	**36194.60**
6	M63P & M5P autotune validation and AT loop stability testing (continued)	C_P	0:00	1:48	1.8	50	1032.35	1858.23	2167.94
	Shutdown for software download w/ new autotune constants	SD	1:48	20:00	18.2	0	0.00	0.00	0.00
	Warm start, steam temp match, M1P mapping	Tot_M1P	20:00	23:00	3	10	483.45	1450.35	1692.08
	M3P mapping	M3P	23:00	0:00	1	25	708.10	708.10	826.12
6 Total							**2223.90**	**4016.68**	**4686.14**
7	M3P mapping (continued)	M3P	0:00	1:00	1	25	708.10	708.10	826.12
	M62P mapping	M62P	1:00	3:00	2	35	850.35	1700.70	1984.15
	M63P & M5P autotune validation and AT mode transfer checkout	C_P	3:00	6:00	3	50	1032.35	3097.05	3613.23
	M63PA autotune validation and AT mode transfer checkout	C_PA	6:00	8:00	2	90	1485.07	2970.14	3465.16
	M63P & M5P final autotune validation (cold & hot fuel)	C_P	8:00	10:00	2	50	1032.35	2064.70	2408.82
	M63PA final autotune validation (cold & hot fuel)	C_PA	10:00	12:00	2	90	1485.07	2970.14	3465.16
	M5P Overnight Run	C_PA	12:00	0:00	12	50	1485.07	17820.84	20790.98
7 Total							**8078.36**	**31331.67**	**36553.62**

Appendix A-4 Fuel (Natural Gas) Used during ReCommissioning Operation (YR 2021)

Day	Test Point Description	Mode	Start Time	End Time	Duration	Nominal Load	Fuel Flow[Ref. 1] (MMBTU/hr), LHV	Fuel Flow per Event (MMBTU), LHV	Fuel Flow per Event (MMBTU), HHV
8	M5P Overnight Run (continued)	C_PA	0:00	12:00	12	50	1485.07	17820.84	20790.98
	M63PA final autotune validation (cold & hot fuel) - continued	C_PA	12:00	20:00	8	90	1485.07	11880.56	13860.65
	Fast Ramp and grid response testing, OBB testing	C_P	20:00	0:00	4	50	1032.35	4129.40	4817.63
8 Total							**4002.49**	**33830.80**	**39469.26**
9	Fast Ramp and grid response testing, OBB testing	C_P	0:00	2:00	2	50	1032.35	2064.70	2408.82
	Fast Ramp and grid response testing, OBB testing	C_PA	2:00	8:00	6	90	1485.07	8910.42	10395.49
	Shutdown for final software dowload & water wash	SD	8:00	20:00	12	0	0.00	0.00	0.00
	Offline water wash	WW	20:00	0:00	4	0	0.00	0.00	0.00
9 Total							**2517.42**	**10975.12**	**12804.31**
10	Offline water wash - continued	WW	0:00	20:00	20	0	0.00	0.00	0.00
	Cold start, steam temp match, final schedule	Tot_M1P	20:00	0:00	4	10	483.45	1933.80	2256.10
10 Total							**483.45**	**1933.80**	**2256.10**
11	Cold start, steam temp match, final schedule (continued)	Tot_M1P	0:00	2:24	2.4	10	483.45	1160.28	1353.66
	M3P mapping (contingency)	M3P	2:24	4:24	2	25	708.10	1416.20	1652.23
	M62P mapping (contingency	M62P	4:24	5:24	1	35	850.35	850.35	992.08
	Load to base	M3P	5:24	5:30	0.1	25	708.10	70.81	82.61
	Load to base	M62P	5:30	5:36	0.1	35	850.35	85.04	99.21
	Load to base	C_P	5:36	5:42	0.1	50	1032.35	103.24	120.45
	Load to Base	C_PA_tune	5:42	5:48	0.1	90	1485.07	148.51	173.26
11 Total							**6117.77**	**3834.43**	**4473.50**
Grand Total							**46065.30**	**192312.10**	**224364.15**

Note: Fuel use in HHV = Fuel use in LHV x 1,050/900

Total Fuel Used during ReCommissioning Operation	**192,312.10**	**224,364.15**

APPENDIX A.5
Recommissioning Emissions (YR 2021)

Appendix A-5
Magnolia Power Project Permit Modification Project 2020
Recommissioning Emissions (YR 2021)

Recommissioning Emissions				
		Value	**Units**	**Reference**
a.	CO Emissions during Recommissioning	1,439.10	lb	Appendix A-2
b.	NOx Emissions during Recommissioning	4,114.87	lb	Appendix A-2
c.	VOC Emissions during Recommissioning	622.68	lb	Appendix A-2
Calculation of PM10 Emissions during Recommissioning				
d.	Total fuel (natural gas) used during the Recommissioning, LHV	192,312.10	MMBtu/hr, LHV	Appendix A-4
e.				
f.	Lower heating value of natural gas	900	Btu/scf	Ref. 5
g.	Lower heating value of natural gas	1,050	Btu/scf	Ref. 2
h.	Total fuel (natural gas) used during the Recommissioning, HHV	224,364.15	MMBtu/hr, HHV	Appendix A-4
i.	Total fuel (natural gas) used during the Recommissioning, mmscf	213.680	mmscf	
j.	Emission factor for calculating PM10 emissions	6.93	lb/mmscf	Ref. 2
k.	PM10 Emissions during Recommissioning	1,480.80	lb	Calculated
Calculation of SOx Emissions during Recommissioning				
l.	Emission factor for calculating SOx emissions	0.75	lb/mmscf	Ref. 2
m.	SOx Emissions during Recommissioning	160.26	lb	Calculated
Calculation of VOC Emission Factor during Recommissioning				
	VOC emission factor during recommissioning = 622.68 lb/213.680 mmscf	2.91	lb/mmscf	Calculated

APPENDIX A.6
First Year Operation Emissions (YR 2021)

Appendix A-6
Magnolia Power Project Permit Modification Project 2020
First Year Operation Emissions (YR 2021)

Input Data				
		Value	**Units**	**Reference**
a	NOx Emissions from GT, Normal Operation	13.18	lb/hr	Ref. 2
b.	CO Emissions from GT, Normal Operation	8.02	lb/hr	Ref. 2
c.	VOC Emissions from GT, Normal Operation	4.58	lb/hr	Ref. 2
d.	PM10 Emissions from GT, Normal Operation	11.79	lb/hr	Ref. 2
e.	SOx Emissions from GT, Normal Operation	1.28	lb/hr	Ref. 2
f.	NOx Emissions from Gas Turbine and Duct Burner, Peak Operation	17.48	lb/hr	Ref. 2
g.	CO Emissions from Gas Turbine and Duct Burner, Peaking Operation	10.64	lb/hr	Ref. 2
h.	VOC Emissions from Gas Turbine + Duct Burner, Peaking Operation	6.08	lb/hr	Ref. 2
i.	PM10 Emissions from Gas Turbine + Duct Burner, Peaking Operation	16.22	lb/hr	Ref. 2
j.	SOx Emissions from Gas Turbine + Duct Burner, Peaking Operation	1.70	lb/hr	Ref. 2
k.	Startup Duration	6	hours	Ref. 2
l.	NOx Emissions, Startup	440	lb/event	Ref. 2
m.	CO Emissions, Startup	500	lb/event	Ref. 2
n.	VOC Emissions, Startup	30	lb/event	Ref. 2
o.	PM10 Emissions, Startup	70.74	lb/event	Ref. 2
p.	SOx Emissions, Startup	7.68	lb/event	Ref. 2
q.	Shutdown Duration	0.50	hour	Ref. 2
r.	NOx Emissions, Shutdown	25	lb/event	Ref. 2
s.	CO Emissions, Shutdown	120	lb/event	Ref. 2
t.	VOC Emissions, Shutdown	17	lb/event	Ref. 2
u.	PM10 Emissions, Shutdown	5.90	lb/event	Ref. 2
v.	SOx Emissions, Shutdown	0.64	lb/event	Ref. 2
w.	MPP current permitted hours of operation	8,322	hrs/year	Ref. 2
x	Number of permitted startups per month	5	per month	Ref. 2
y	Number of permitted shutdowns per month	5	per month	Ref. 2
z	Total permitted hours of operation	8,322	hrs/yr	Ref. 2
aa	Total number of hours in recommissioning in March 2021	225.8	hrs	Ref. 1
bb	Number of hours in March when CT will be "OFF" during recommissioning	66.2	hrs	Ref. 1
cc	Number of hours in March when MPP CT will be "ON," during recommissioning	159.6	hrs	Ref. 1
dd	Number of startups during recommissioning	4	startup	Ref. 1
ee	Number of shutdowns during recommissioning	3	shutdown	Ref. 1
ff	Number of startup, first year of regular operation after recommissioning, March 2021	1	startup	calculated
gg	Number of shutdowns, first year of regular operation after recommissioning, March 2021	2	shutdown	calculated
hh	Number of startups during the first year of regular operation in 11 months = 11 x 5	55	startup	calculated
ii	Total number of startups during the first year of regular operation = 55 + 1	56	startup	calculated
jj	Total duration of startups during regular operation = 56 x 6	336	hrs	calculated
kk	Number of shutdowns during the first year of regular operation in 11 months = 11 x 5	55	shutdown	calculated
ll	Total number of shutdowns during the first year of regular operation = 55 +2	57	shutdown	calculated
mm	Total duration of shutdowns during regular operation = 57 x 0.5	28.5	hrs	calculated
nn	MPP operation excluding recommissioning during the first year = 8322 - 225.8	8,096.2	hrs	calculated
oo	Baseload operation of MPP with Duct Burner	**1,000**	hrs	Ref. 2
pp	Baseload operation of MPP without Duct Burner and recommissioning = 8096.2 - 1000	**7,096.2**	hrs	calculated
qq	MPP baseload operation without startup, shutdown, DB operation and recommissioning	**6,731.7**	hrs	calculated
	= (8322 - 225.8 - 336 - 28.5 - 1000)			
rr	NOx Emissions, re-commissioning	4,114.87	lb	Appendix A-2
ss	CO Emissions, re-commissioning	1,439.10	lb	Appendix A-2
tt	VOC Emissions, re-commissioning	622.68	lb	Appendix A-2
uu	PM10 Emissions, re-commissioning	1,480.80	lb	Appendix A-5
vv	SOx Emissions, re-commissioning	160.26	lb	Appendix A-5

Appendix A-6
Magnolia Power Project Permit Modification Project 2020
First Year Operation Emissions (YR 2021)

Note: The scenario which results in the highest annual emissions is assumed for each pollutant. For NOx, CO and VOC				
maximum annual emissions are calculated assuming 56 startup, 57 shutdown, 1,000 hours of baseload operation with duct				
burner and the remaining time in baseload operation without duct burner (6,731.7 hrs) + emissions during tuning operation.				
PM10 and SOx emissions are based on 1000 hrs/month baseload operation with the duct burner and the remaining				
operation without the duct burner (7096.2 hours) plus emissions during tuning operation.				
Calculation of Annual Emissions for NOx, CO and VOC				
NOx	= (440 lb x 56 starts) + (25 lb x 57 shutdowns)+ (1000 hrs x 17.48 lb/hr) + (6731.7 hrs x 13.18 lb/hr) + 4114.87 lb	136,384	lb/year	
		68.2	ton/year	
CO	= (500 lb x 56 starts)+(120 lb x 57 shutdowns)+ (1000 hrs x 10.64 lb/hr) + (6731.7 hrs x 8.02 lb/hr) + 1439.1 lb	100,907	lb/year	
		50.5	ton/year	
VOC	= (30 lb x 56 starts) + (17 lb x 57 shutdowns)+ (1000 hrs x 6.08 lb/hr) + (6731.7 hrs x 4.58 lb/hr) + 622.68 lb	40,183	lb/year	
		20.1	ton/year	
Calculation of Annual Emissions for PM10, SOx				
PM10	= (1000 hrs x 16.22 lb/hr) + (7096.2 hrs x 11.79 lb/hr) + 1480.8 lb	101,365	lb/year	
		50.7	ton/year	
SOx	= (1000 hrs x 1.7 lb/hr) + (7096.2 hrs x 1.28 lb/hr) + 160.26 lb	10,943	lb/year	
		5.5	ton/year	

APPENDIX A.7
Fuel Use, CO, NOx, PM10, and SOx Emissions during the Last Two Consecutive Years (2017-2019)

Appendix A-7
Fuel Use, NOx, CO, SOx and PM10 Emissions during the Two Consecutive Years

Month	Natural Gas, GT Mscf	Natural Gas, DB Mscf	NOx, lb	CO, lb	SOx, lb	PM10, lb
Jul-17	1004566.398	108.17336	6147.49886	2235.95076	753.51	6962.51
Aug-17	982326.7274	927.29736	5658.30687	2055.05069	737.44	6814.92
Sep-17	919431.4782	3279.74841	5433.50794	1956.12366	692.03	6397.83
Oct-17	1013935.787	244.53471	5661.55985	2036.11989	760.64	7028.53
Nov-17	962773.4805	77.54199	5306.64263	1930.3394	722.14	6672.64
Dec-17	753786.6331	1.92899	5056.35277	1695.83826	565.34	5223.76
Jan-18	978798.9832	0	5464.01852	1998.1273	734.1	6783.08
Feb-18	864823.2124	1.93317	4748.83761	1766.10616	648.62	5993.24
Mar-18	879617.7786	1.97531	5233.1845	1962.84595	659.71	6095.77
Apr-18	916501.3698	3.78742	5083.37534	2162.52752	687.38	6351.38
May-18	948139.6653	1.86598	5363.01456	1910.24129	711.11	6570.62
Jun-18	855244.0165	5.52459	5283.14656	1879.50563	641.44	5926.89
Total 17-18			**64,439.4**	**23,588.8**	**8,313.5**	**76,821.2**
		tons/yr	**32.2**	**11.8**	**4.2**	**38.4**
Jul-18	991149.7925	254.87961	5831.13402	2003.78105	743.55	6870.70
Aug-18	773080.1307	142.18323	4723.809	1813.64256	579.92	5358.58
Sep-18	926235.8552	1.85346	5456.03023	1871.77464	694.68	6418.83
Oct-18	1009538.765	7.5156	5851.6978	2017.11218	757.16	6996.16
Nov-18	867218.5294	0.84262	5246.8347	2010.77601	650.41	6009.83
Dec-18	903700.4786	0	5507.71802	2004.42356	677.78	6262.64
Jan-19	979265.5694	3.83255	5697.2329	1937.84514	734.45	6786.34
Feb-19	691059.5395	6.95465	4254.60973	1556.23969	518.3	4789.10
Mar-19	984817.8227	1.84053	5637.1656	1953.80383	738.61	6824.80
Apr-19	940075.8065	5.99054	5330.63678	1878.18615	705.06	6514.77
May-19	31053.21423	1.7479	177.92015	62.1477	23.29	215.21
Jun-19	946072.4879	3.59479	5414.54758	1892.8758	709.56	6556.31
Total 18-19			**59,129.3**	**21,002.6**	**7,532.8**	**69,603.3**
		tons/yr	**29.6**	**10.5**	**3.8**	**34.8**
Average of 2017-2019		**tons/yr**	**30.9**	**11.2**	**4.0**	**36.6**

Notes:
SOx EF = 0.75 lb/MMscf
PM10 GT EF = 6.93 lb/MMscf
PM10 DB EF = 7.98 lb/MMscf

APPENDIX A.8
References

Reference List
Petition to Amend
Magnolia Power Project (MPP) Upgrade, 2021
Southern California Public Power Authority
(see Appendix A-8 for References)

1. E-mail from Nathan Brown (GE), MPP Recommissioning – GE SCAQMD Data, August 14, 2020.
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3. SCAQMD Facility Permit to Operate, Burbank City, Burbank Water & Power, SCPPA, January 10, 2020.
4. E-mail from Lawrence Muzio (FERCo), Additional Emission Estimates, Phase 2 Magnolia Combustion Tuning, August 15, 2020.
5. E-mail from Frank Messineo (BWP), Expected Post-Uprate Performance at GT MECL Load, May 16, 2019.
6. E-mail from Jessica Muncy (FERCo), MECL22F Estimated Emissions, June 25, 2019.
7. SCAQMD Permit to Operate Evaluation, Magnolia Power Project, Revised Appendix C, April 3, 2002, Application No. 386305, February 1, 2016.
8. F factor for various Fuels, EPA Pt.60, App. A-7.Method 20.
9. California Energy Commission (CEC), "Commission Decision, Magnolia Power Project, Application for Certification (01-AFC-6)." March 2003.
10. CEC, "Statement of Staff Approval of Proposed Change, Magnolia Power Project (01-AFC-06C), February 2020.
11. California Energy Commission (CEC), "Final Staff Assessment, Magnolia Power Project, Application for Certification (01-AFC-6)," October 2002.
12. Southern California Public Power Authority (SCPPA), "Petition to Amend, Change in Startup and Shutdown Operation, Magnolia Power Project (01-AFC-6)," May 2016.
13. California Energy Commission (CEC), "Staff Analysis on Petition to Amend, Magnolia Power Project, Application for Certification (01-AFC-6)," June 2017.
14. SCAQMD Facility Permit to Operate, Burbank City, Burbank Water & Power, SCPPA, December 30, 2020 (January 1, 2021 through December 31, 2021).

Reference 1 1/3

Reply Delete Junk Block ···

RE: MPP Recommissioning - GE SCAQMD data

You replied on Fri 8/14/2020 1:37 PM

BL

Brown, Nathan L (GE Gas Power) <nathan.brown@ge.com>
Fri 8/14/2020 12:49 PM
To: You; Reyes, Claudia; Wicks, Wayne (GE Gas Power)
Cc: Messineo, Frank

TestPlanEmissionsEstimator_r...
65 KB

GE Data - MPP Recommissioning Schedule, March 2021

								Load			Exhaust Temp (GT Exit)			Average Emissionss (ppmvd)			Max Hrly Emissionss (ppmvd)			Average Emissionss (lb/hr)		
Test Point Description	Mode	Time	Cum Time	Cum Time Fired	Day	Start Time	End Time	Nominal	Min	Max	Nominal Texh (GT)	Min Texh (GT)	Max Texh (GT)	NOx (ppmvd @ 15%)	CO (ppmvd raw)	VOC (ppmvd)	NOx (ppmvd @ 15%)	CO (ppmvd raw)	VOC (ppmvd)	NOx (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Cold start, steam temp match, M1P mapping	Tot_M1P	4	4	4	1	20:00	0:00	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
Cold start, steam temp match, M1P mapping (continued)	Tot_M1P	2.4	6.4	6.4	2	0:00	2:24	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
Mode transfer checkout, TTKX mapping	M3P	0.2	6.6	6.6	2	2:24	2:36	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
Mode transfer checkout, TTKX mapping	M62P	0.2	6.8	6.8	2	2:36	2:48	35	15	35	1200	990	1200	40	1200	300	50	1500	400	136.37	2247.53	321.76
Mode transfer checkout, TTKX mapping, M5P & M63P mapping	C_P	1	7.8	7.8	2	2:48	3:48	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
Mode transfer checkout, TTKX mapping, M63PA mapping	C_PA	1.4	9.2	9.2	2	3:48	5:12	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63P partload mapping	C_P	2.8	12	12	2	5:12	8:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA partload mapping (hot fuel)	C_PA	12	24	24	2	8:00	20:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
Shutdown for fuel strainer removal	SD	4	28	24	2	20:00	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Shutdown for fuel strainer removal (continued)	SD	8	36	24	3	0:00	8:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Warm start, steam temp match, M1P mapping	Tot_M1P	3	39	27	3	8:00	11:00	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
M3P mapping - checkout	M3P	0.4	39.4	27.4	3	11:00	11:24	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
M62P mapping - checkout	M62P	0.4	39.8	27.8	3	11:24	11:48	35	15	35	1200	990	1200	40	1200	300	50	1500	400	136.37	2247.53	321.76
M63P partload mapping	C_P	2	41.8	29.8	3	11:48	13:48	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA part/base/peak load mapping & perf testing (hot fuel)	C_PA	10.2	52	40	3	13:48	0:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63PA part/base/peak load mapping & perf testing (hot fuel) (continued)	C_PA	1.8	53.8	41.8	4	0:00	1:48	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63P & M5P partoad mapping (cold fuel)	C_P	6	59.8	47.8	4	1:48	7:48	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA part/base/peak load mapping (cold fuel)	C_PA	6	65.8	53.8	4	7:48	13:48	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63P & M5P turndown tuning (hot fuel)	C_P	9	74.8	62.8	4	13:48	22:48	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA turndown tuning, part/base/peak perf testing (hot fuel)	C_PA	1.2	76	64	4	22:48	0:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63PA turndown tuning, part/base/peak perf testing (hot fuel) (continued)	C_PA	1.8	77.8	65.8	5	0:00	1:48	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63PA autotune validation and AT loop stability testing	C_PA	12	89.8	77.8	5	1:48	13:48	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63P & M5P autotune validation and AT loop stability testing	C_P	10.2	100	88	5	13:48	0:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63P & M5P autotune validation and AT loop stability testing (continued)	C_P	1.8	101.8	89.8	6	0:00	1:48	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
Shutdown for software download w/ new autotune constants	SD	18.2	120	89.8	6	1:48	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Warm start, steam temp match, M1P mapping	Tot_M1P	3	123	92.8	6	20:00	23:00	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
M3P mapping	M3P	1	124	93.8	6	23:00	0:00	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
M3P mapping (continued)	M3P	1	125	94.8	7	0:00	1:00	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
M62P mapping	M62P	2	127	96.8	7	1:00	3:00	35	15	35	1200	990	1200	40	1200	300	50	1500	400	136.37	2247.53	321.76
M63P & M5P autotune validation and AT mode transfer checkout	C_P	3	130	99.8	7	3:00	6:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA autotune validation and AT mode transfer checkout	C_PA	2	132	101.8	7	6:00	8:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63P & M5P final autotune validation (cold & hot fuel)	C_P	2	134	103.8	7	8:00	10:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA final autotune validation (cold & hot fuel)	C_PA	2	136	105.8	7	10:00	12:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M5P Overnight Run	C_PA	12	148	117.8	7	12:00	0:00	50	20	50	1189	1069	1189	12	5	1	15	50	1	75.33	14.84	1.70
M5P Overnight Run (continued)	C_PA	12	160	129.8	8	0:00	12:00	50	20	50	1189	1069	1189	12	5	1	15	50	1	75.33	14.84	1.70
M63PA final autotune validation (cold & hot fuel) - continued	C_PA	8	168	137.8	8	12:00	20:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
Fast Ramp and grid response testing, OBB testing	C_P	4	172	141.8	8	20:00	0:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
Fast Ramp and grid response testing, OBB testing	C_P	2	174	143.8	9	0:00	2:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
Fast Ramp and grid response testing, OBB testing	C_PA	6	180	149.8	9	2:00	8:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
Shutdown for final software dowload & water wash	SD	12	192	149.8	9	8:00	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Offline water wash	WW	4	196	149.8	9	20:00	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Offline water wash - continued	WW	20	216	149.8	10	0:00	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Cold start, steam temp match, final schedule	Tot_M1P	4	220	153.8	10	20:00	0:00	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
Cold start, steam temp match, final schedule (continued)	Tot_M1P	2.4	222.4	156.2	11	0:00	2:24	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
M3P mapping (contingency)	M3P	2	224.4	158.2	11	2:24	4:24	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
M62P mapping (contingency	M62P	1	225.4	159.2	11	4:24	5:24	35	15	35	1200	990	1200	40	1200	300	50	1500	400	136.37	2247.53	321.76
Load to base	M3P	0.1	225.5	159.3	11	5:24	5:30	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
Load to base	M62P	0.1	225.6	159.4	11	5:30	5:36	35	15	35	1200	990	1200	40	1200	300	50	1500	400	136.37	2247.53	321.76
Load to base	C_P	0.1	225.7	159.5	11	5:36	5:42	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
Load to Base	C_PA_tune	0.1	225.8	159.6	11	5:42	5:48	90	30	110	1110	1200	1184	8	2	1	9	6	1	50.22	5.94	1.70

GE Data - MPP Recommissioning Schedule, March 2021

								Fuel Flow		Cumulative Emissionss (lb)				Flow & 02			Emissionss (lb)			
Test Point Description	Mode	Time	Cum Time	Cum Time Fired	Day	Start Time	End Time	Fuel Flow (lbm/hr)	Fuel Flow (MMBTU/hr)	NOx (lb)	CO (lb)	VOC (lb)	Fuel Flow (klbm)	Ex Flow (lb/sec)	Exhaust O2 (%vol)	Exhaust Dry O2 (%vol)	NOx (lb)	CO (lb)	VOC (lb)	Fuel Flow (klbm)
Cold start, steam temp match, M1P mapping	Tot_M1P	4	4	4	1	20:00	0:00	22470.48	483.45	929	3512	563	90	528	16.07	16.96	929	3512	563	90
Cold start, steam temp match, M1P mapping (continued)	Tot_M1P	2.4	6.4	6.4	2	0:00	2:24	22470.48	483.45	1487	5619	901	144	528	16.07	16.96	558	2107	338	54
Mode transfer checkout, TTKX mapping	M3P	0.2	6.6	6.6	2	2:24	2:36	32911.90	708.10	1543	5827	925	150	530	13.96	15.03	56	208	24	6
Mode transfer checkout, TTKX mapping	M62P	0.2	6.8	6.8	2	2:36	2:48	39523.82	850.35	1571	6276	989	158	576	13.24	14.36	28	449	64	8
Mode transfer checkout, TTKX mapping, M5P & M63P mapping	C_P	1	7.8	7.8	2	2:48	3:48	47982.60	1032.35	1621	6384	990	206	664	12.70	13.84	50	108	1	48
Mode transfer checkout, TTKX mapping, M63PA mapping	C_PA	1.4	9.2	9.2	2	3:48	5:12	69025.06	1485.07	1727	6404	993	303	921	12.12	13.29	106	20	3	97
M63P partload mapping	C_P	2.8	12	12	2	5:12	8:00	47982.60	1032.35	1868	6705	996	437	664	12.70	13.84	141	301	3	134
M63PA partload mapping (hot fuel)	C_PA	12	24	24	2	8:00	20:00	69025.06	1485.07	2772	6883	1017	1266	921	12.12	13.29	904	178	21	829
Shutdown for fuel strainer removal	SD	4	28	24	2	20:00	0:00	0.00	0.00	2772	6883	1017	1266	0	0.00	0.00	0	0	0	0
Shutdown for fuel strainer removal (continued)	SD	8	36	24	3	0:00	8:00	0.00	0.00	2772	6883	1017	1266	0	0.00	0.00	0	0	0	0
Warm start, steam temp match, M1P mapping	Tot_M1P	3	39	27	3	8:00	11:00	22470.48	483.45	3469	9517	1439	1333	528	16.07	16.96	697	2634	422	67
M3P mapping - checkout	M3P	0.4	39.4	27.4	3	11:00	11:24	32911.90	708.10	3583	9933	1486	1346	530	13.96	15.03	114	416	47	13
M62P mapping - checkout	M62P	0.4	39.8	27.8	3	11:24	11:48	39523.82	850.35	3637	10832	1615	1362	576	13.24	14.36	54	899	129	16
M63P partload mapping	C_P	2	41.8	29.8	3	11:48	13:48	47982.60	1032.35	3738	11047	1618	1458	664	12.70	13.84	101	215	3	96
M63PA part/base/peak load mapping & perf testing (hot fuel)	C_PA	10.2	52	40	3	13:48	0:00	69025.06	1485.07	4507	11199	1635	2162	921	12.12	13.29	769	152	17	704
M63PA part/base/peak load mapping & perf testing (hot fuel) (continued)	C_PA	1.8	53.8	41.8	4	0:00	1:48	69025.06	1485.07	4642	11225	1638	2286	921	12.12	13.29	135	26	3	124
M63P & M5P partoad mapping (cold fuel)	C_P	6	59.8	47.8	4	1:48	7:48	47982.60	1032.35	4946	11870	1645	2574	664	12.70	13.84	304	645	7	288
M63PA part/base/peak load mapping (cold fuel)	C_PA	6	65.8	53.8	4	7:48	13:48	69025.06	1485.07	5398	11959	1656	2988	921	12.12	13.29	452	89	11	414
M63P & M5P turndown tuning (hot fuel)	C_P	9	74.8	62.8	4	13:48	22:48	47982.60	1032.35	5854	12927	1667	3420	664	12.70	13.84	456	968	11	432
M63PA turndown tuning, part/base/peak perf testing (hot fuel)	C_PA	1.2	76	64	4	22:48	0:00	69025.06	1485.07	5944	12944	1669	3503	921	12.12	13.29	90	17	2	83
M63PA turndown tuning, part/base/peak perf testing (hot fuel) (continued)	C_PA	1.8	77.8	65.8	5	0:00	1:48	69025.06	1485.07	6080	12971	1672	3627	921	12.12	13.29	136	27	3	124
M63PA autotune validation and AT loop stability testing	C_PA	12	89.8	77.8	5	1:48	13:48	69025.06	1485.07	6984	13149	1692	4455	921	12.12	13.29	904	178	20	828
M63P & M5P autotune validation and AT loop stability testing	C_P	10.2	100	88	5	13:48	0:00	47982.60	1032.35	7500	14245	1705	4945	664	12.70	13.84	516	1096	13	490
M63P & M5P autotune validation and AT loop stability testing (continued)	C_P	1.8	101.8	89.8	6	0:00	1:48	47982.60	1032.35	7591	14439	1707	5031	664	12.70	13.84	91	194	2	86
Shutdown for software download w/ new autotune constants	SD	18.2	120	89.8	6	1:48	20:00	0.00	0.00	7591	14439	1707	5031	0	0.00	0.00	0	0	0	0
Warm start, steam temp match, M1P mapping	Tot_M1P	3	123	92.8	6	20:00	23:00	22470.48	483.45	8288	17073	2129	5099	528	16.07	16.96	697	2634	422	68
M3P mapping	M3P	1	124	93.8	6	23:00	0:00	32911.90	708.10	8571	18113	2248	5132	530	13.96	15.03	283	1040	119	33
M3P mapping (continued)	M3P	1	125	94.8	7	0:00	1:00	32911.90	708.10	8855	19154	2368	5165	530	13.96	15.03	284	1041	120	33
M62P mapping	M62P	2	127	96.8	7	1:00	3:00	39523.82	850.35	9128	23649	3011	5244	576	13.24	14.36	273	4495	643	79
M63P & M5P autotune validation and AT mode transfer checkout	C_P	3	130	99.8	7	3:00	6:00	47982.60	1032.35	9280	23971	3015	5388	664	12.70	13.84	152	322	4	144
M63PA autotune validation and AT mode transfer checkout	C_PA	2	132	101.8	7	6:00	8:00	69025.06	1485.07	9430	24001	3018	5526	921	12.12	13.29	150	30	3	138
M63P & M5P final autotune validation (cold & hot fuel)	C_P	2	134	103.8	7	8:00	10:00	47982.60	1032.35	9532	24216	3021	5622	664	12.70	13.84	102	215	3	96
M63PA final autotune validation (cold & hot fuel)	C_PA	2	136	105.8	7	10:00	12:00	69025.06	1485.07	9682	24245	3024	5760	921	12.12	13.29	150	29	3	138
M5P Overnight Run	C_PA	12	148	117.8	7	12:00	0:00	69025.06	1485.07	10586	24424	3045	6588	664	12.70	13.84	904	179	21	828
M5P Overnight Run (continued)	C_PA	12	160	129.8	8	0:00	12:00	69025.06	1485.07	11490	24602	3065	7416	664	12.70	13.84	904	178	20	828
M63PA final autotune validation (cold & hot fuel) - continued	C_PA	8	168	137.8	8	12:00	20:00	69025.06	1485.07	12093	24720	3079	7968	921	12.12	13.29	603	118	14	552
Fast Ramp and grid response testing, OBB testing	C_P	4	172	141.8	8	20:00	0:00	47982.60	1032.35	12295	25150	3083	8160	664	12.70	13.84	202	430	4	192
Fast Ramp and grid response testing, OBB testing	C_P	2	174	143.8	9	0:00	2:00	47982.60	1032.35	12397	25365	3086	8256	664	12.70	13.84	102	215	3	96
Fast Ramp and grid response testing, OBB testing	C_PA	6	180	149.8	9	2:00	8:00	69025.06	1485.07	12848	25454	3096	8670	921	12.12	13.29	451	89	10	414
Shutdown for final software dowload & water wash	SD	12	192	149.8	9	8:00	20:00	0.00	0.00	12848	25454	3096	8670	0	0.00	0.00	0	0	0	0
Offline water wash	WW	4	196	149.8	9	20:00	0:00	0.00	0.00	12848	25454	3096	8670	0	0.00	0.00	0	0	0	0
Offline water wash - continued	WW	20	216	149.8	10	0:00	20:00	0.00	0.00	12848	25454	3096	8670	0	0.00	0.00	0	0	0	0
Cold start, steam temp match, final schedule	Tot_M1P	4	220	153.8	10	20:00	0:00	22470.48	483.45	13778	28966	3659	8760	528	16.07	16.96	930	3512	563	90
Cold start, steam temp match, final schedule (continued)	Tot_M1P	2.4	222.4	156.2	11	0:00	2:24	22470.48	483.45	14335	31073	3997	8814	528	16.07	16.96	557	2107	338	54
M3P mapping (contingency)	M3P	2	224.4	158.2	11	2:24	4:24	32911.90	708.10	14902	33154	4235	8880	530	13.96	15.03	567	2081	238	66
M62P mapping (contingency	M62P	1	225.4	159.2	11	4:24	5:24	39523.82	850.35	15038	35402	4557	8920	576	13.24	14.36	136	2248	322	40
Load to base	M3P	0.1	225.5	159.3	11	5:24	5:30	32911.90	708.10	15067	35506	4569	8923	530	13.96	15.03	29	104	12	3
Load to base	M62P	0.1	225.6	159.4	11	5:30	5:36	39523.82	850.35	15080	35730	4601	8927	576	13.24	14.36	13	224	32	4
Load to base	C_P	0.1	225.7	159.5	11	5:36	5:42	47982.60	1032.35	15086	35741	4601	8932	664	12.70	13.84	6	11	0	5
Load to Base	C_PA_tune	0.1	225.8	159.6	11	5:42	5:48	69025.06	1485.07	15091	35742	4602	8939	921	12.12	13.29	5	1	1	7

Statement of Basis
Proposed Minor Permit Revision

Owner/Operator:	Burbank City, Burbank Water and Power, SCPPA 164 W. Magnolia Blvd Burbank, CA 91502
Facility ID:	128243
SIC Code:	4931
Equipment Location:	164 W. Magnolia Blvd Burbank, CA 91502
Application No.:	614702
Application Submittal Date:	July 18, 2019
Responsible Official:	Jorge Somoano General Manager (818) 238-3550

1.0 INTRODUCTION, SCOPE OF PERMIT, HISTORY AND RECOMMENDATION

Title V is a national operating permit program for air pollution sources established under the Clean Air Act. Facilities subject to Title V must obtain a Title V permit and comply with specific Title V procedures to modify the permit. Title V facilities are required to certify compliance with their permit on an annual basis. The intent of the program is to provide a comprehensive permit document with a clearer determination of applicable requirements, to enhance the enforceability of a source's air quality obligations, as well as to allow greater opportunity for public participation and public access to enforcement actions and facility emissions information.

The Burbank Water and Power (BWP) SCPPA facility is subject to Title V requirements because its potential to emit (PTE) of NOx and VOC emissions are greater than the major source thresholds (see Appendix E). Additionally, the turbine at this facility is defined as an affected unit under the Acid Rain provisions, making this facility an affected source [40CFR Part 72, §72.6(a)(3)]. The facility is not a major source of HAPs (see Appendix D).

The facility has requested to modify their permit by upgrading the combustor in the turbine to allow the turbine to operate at lower loads while still maintaining emission limits.

Reference 2 2/14

The following tables outline the equipment specifications.

Turbine Specs

Specification	
Manufacturer/Model	GE/PG72417FA
Fuel Type	Pipeline natural gas
Maximum Heat Input Rating (CTG only)	1787 mmbtu/hr
Maximum Exhaust Flow (CTG only)[1]	55.14 mmscf/hr
Maximum Fuel Consumption (CTG only)	1.702 mmscf/hr @ 1050 btu/scf
CTG Gross Power Output	181.1 MW
Steam Turbine Gross Power Output	85 MW (no duct firing) 142 MW (with duct firing)
Duct Burner Max Heat Input	583 mmbtu/hr
Duct Burner Max Fuel Consumption	0.555 mmscf/hr @ 1050 btu/scf
Gross Plant Power Output	323.1
Maximum Heat Input Rating (CTG + DB)	2370 mmbtu/hr
Maximum Exhaust Flow (CTG + DB)[1]	73.13 mmscf/hr
Maximum Fuel Consumption (CGT + DB)	2.257 mmscf/hr @ 1050 btu/scf
NOx Combustion Control	DLN 9 ppm
Net Plant Heat Rate HHV	7,335 btu/kWh
Net Plant Efficiency HHV	46.5%

1- calculated using an F-factor of 8710 adjusted to 15% O2

Selective Catalytic Reduction Specs

Specification	
Manufacturer	Cormetech
Catalyst Material	Vanadium/Titanium Oxide
Catalyst Volume	1,100 ft3
Maximum Temperature	850 °F
Minimum Temp for NH3 injection	450 °F
Space Velocity[2]	65,300 hr^{-1}
Ammonia Injection Rate	300 lbs/hr of 19% aqueous NH3
Ammonia Slip	5 ppm @ 15% O2
Outlet NOx	2 ppm @ 15% O2 (1 hour average)
Pressure Drop Across SCR	About 4 inch water

Combustor Upgrade

BWP is proposing to upgrade the existing DLN combustor to a configuration called DLN 2.6+. The DLN 2.6+ combustor will provide for a higher turndown ratio and faster ramp rate so that the turbine can be operated at lower loads on occasions when less power output is needed, as well as respond faster to shifts in grid demand. This will increase the flexibility of the unit and enhance its ability to operate under a wider range of power output scenarios. With the existing combustor, maximum turndown is approximately 50-60%. With the DLN 2.6+ combustor upgrade, maximum turndown is 27%.

Reference 2 3/14

Appendix A

Criteria Pollutant Calculations

Emission Factors

Pollutant	Emission Factor	Source
NOx	2.0 ppmv	Manufacturer guarantee
CO	2.0 ppmv	Manufacturer guarantee
VOC	2.0 ppmv	Manufacturer guarantee
PM10 (GT)	0.0066 lbs/mmbtu	AP-42
PM10 (Duct Burner)	0.0076 lbs/mmbtu	Applicant
SOx	0.75 lbs/mmscf	Applicant
NH3	5.0 ppm	Manufacturer guarantee

Data

GT rated heat input	=	1,787 mmbtu/hr
Duct burner rated heat input	=	583 mmbtu/hr
F Factor	=	8710 scf/mmbtu @ 0% O2
Fuel HHV	=	1050 btu/cf
NO2 MW	=	46 lbs/lb-mole
CO MW	=	28 lbs/lb-mole
VOC MW	=	16 lbs/lb-mole
Specific Molar Volume	=	385 ft3/lb-mole

GT Calculated exhaust rate	=	1787*8710*(20.9/5.9)	=	55.14 mmscf/hr
DB calculated exhaust rate	=	583*8710*(20.9/5.9)	=	17.99 mmscf/hr
Combined exhaust rate			=	73.13 mmscf/hr
GT calculated fuel use	=	1787/1050	=	1.702 mmscf/hr
DB calculated fuel use	=	583/1050	=	0.555 mmscf/hr
Combined fuel use			=	2.257 mmscf/hr

Reference 24/4

Emission Rates, Base Load Operation

Pollutant	GT Emission Rate	DB Emission Rate	Total
	lbs/hr	lbs/hr	lbs/hr
NOx	13.18	4.30	17.48
CO	8.02	2.62	10.64
VOC	4.58	1.50	6.08
PM10	11.79	4.43	16.22
SOx	1.28	0.42	1.7
NH3	12.17	3.97	16.15

Sample Calculations

NOx (GT) = [2.0*8710*1787*(20.9/5.9)*46]/385E6
= 13.18 lbs/hr

PM10 (GT) = 0.0066 *1787
= 11.79 lbs/hr

Note: Shutdown emissions (Ke in 60 minutes) includes 30 minutes of shutdown emissions and 30 minutes of normal operation with duct burner operation.
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8/16/2020

Emission Rates, Start Ups and Shutdowns[1]

Pollutant	Start Up Emission Rate	Total Start Up Emissions (6 hrs/event)	Shutdown Emission Rate	Total Shutdown Emissions (0.5 hrs/event)
	lbs/hr	lbs/event	lbs/hr	lbs/event
NOx	73.33	440	~~50~~ 33.74	25
CO	83.33	500	~~240~~ 125.32	120
VOC	5.00	30	~~34~~ 20.04	17
PM10	11.79	70.74	~~11.79~~ 14.01	5.90
SOx	1.28	7.68	~~1.28~~ 1.49	0.64

1 ~~All start up and shutdown emissions rates provided by the applicant, reference A/N 386305~~

KNland
8/16/2020

Emission Rates, Uncontrolled[1]

Pollutant	Uncontrolled GT Emission Rate	Uncontrolled DB Emission Rate	Total
	lbs/hr	lbs/hr	lbs/hr
NOx	63	61	124
CO	73	31	104
VOC	14.1	3	17.1
PM10	11.79	4.43	16.22
SOx	1.28	0.42	1.7

1 All uncontrolled emissions rates provided by the manufacturer, reference A/N 386305

Emission Rates, Recommissioning[1]

Pollutant	Concentration Ppm @ 15%	Mass Emissions lbs/hr
NOx	55	155.94
CO	27	55.64
VOC	37	43.76

These are the maximum hourly values as provided by the manufacturer. Note that the City of Burbank has asked to allow for a contingency and set the limit for NOx at 198 lbs/hr and CO at 84 lbs/hr during the recommissioning.

Maximum Daily Emissions

There will be no increase in maximum daily emissions when comparing the estimates for the maximum emissions that will occur on any given day during recommissioning to the current PTE calculations.

A. Current PTE Calculation (Pre Modification Emissions)

The scenario which results in the highest daily emissions is assumed for each pollutant. For NOx CO, and VOC, maximum daily emissions are calculated assuming 1 start up at the beginning of the day, ½ hour shutdown at the end of the day, and full load operation for the remaining hours of the day, with duct firing for a maximum of 12 hours per day as limited by permit condition. For PM10, and SOx, maximum daily emissions are based on 24 hrs/day base load operation.

Pollutant	Uncontrolled Daily Emissions, lbs/day	Controlled Daily Emissions, lbs/day
NOx	2299.5	747.3
CO	2269.5	815.8
VOC	268.7	145.2
PM10	336.1	336.1
SOx	35.8	35.8
NH3	382.3	382.3

Calculations

NOx uncontrolled = 2299.5 lbs: 440 lbs + 124 lbs/hr*12 hrs + 63 lbs/hr*5.5 hrs + 25 lbs =

NOx controlled = 747.3 lbs: 440 lbs + 17.48 lbs/hr*12 hrs + 13.18*5.5 hrs + 25 lbs =

CO uncontrolled = 2269.5 lbs: 500 lbs + 104 lbs/hr*12 hrs + 73 lbs/hr*5.5 hrs + 120 lbs=

CO controlled = 815.8 lbs: 500 lbs + 10.64 lbs/hr*12 hrs + 8.02 lbs/hr*5.5 hrs + 120 lbs =

VOC controlled= 145.2 lbs: 30 lbs + 6.08 lbs/hr*12 hrs + 4.58 lbs/hr*5.5 hrs + 17 lbs =

PM10 controlled = 16.22 lbs/hr*12 hrs + 11.79 lbs/hr*12 hrs = 336.1 lbs

B. Maximum Daily Recommissioning Emissions (Post Modification Emissions)

The applicant provided a breakdown of the daily recommissioning activities and the estimated emissions for NOx, CO, and VOC. For PM10 and SOx, the emissions are based on heat input, therefore the days with the highest heat input were used to estimate PM10 and SOx emissions during recommissioning. Refer to Appendix C. There will be no normal operation on any day when there is recommissioning activities.

Pollutant	Recommissioning Daily Emissions, lbs/day
NOx	552.53 (Day 3)
CO	201.86 (Day 4)
VOC	107.36 (Day 11)
PM10	218.67 (Day 9)
SOx	23.67 (Day 9)

Note that the City of Burbank has asked to allow for a contingency and set the limit for CO at 792 lbs/day during the recommissioning.

Calculations

PM10 = 0.0066 lbs/mmbtu* 33132.17 mmbtu = 218.67 lbs

SOx = 0.75 lbs/mmscf * (33132.17 mmbtu/1050 btu/scf) = 23.67 lbs

Change in Emissions Pre Modification vs Post Modification

Pollutant	Pre Modification Daily PTE Emissions	Post Modification Daily PTE Emissions	Change
NOx	747.3	552.53	-194.77
CO	815.8	201.86	-613.94
VOC	145.2	107.36	-37.84
PM10	336.1	218.67	-117.43
SOx	35.8	23.67	-12.13
NH3	382.3	382.3	0

Note that the City of Burbank has asked to allow for a contingency and set the limit for CO at 792 lbs/day during the recommissioning. Even with this higher limit, the maximum daily emissions during recommissioning are less than the pre modification PTE.

Reference 2 7/14

Monthly Emissions

There will be no increase in maximum monthly emissions when comparing the estimates for the emissions that will occur during the month when recommissioning is performed and normal operation resumes to the current PTE calculations for any pollutant.

A. Current PTE Calculation (Pre Modification Emissions)

The scenario which results in the highest monthly emissions is assumed for each pollutant. For NOx, CO and VOC monthly emissions are based on 5 starts ups per month (and 5 shutdowns), with the remaining hours in base load operation (240 hrs with duct firing, 447.5 hrs without duct firing). For PM10 and SOx, monthly emissions are based on 720 hours in baseload operation (240 hrs with duct firing, 480 hrs without duct firing) and no start ups or shutdowns.

Pollutant	Total Monthly Emissions	30-Day Average Emissions
NOx	12,418	405
CO	9,243	308
VOC	3,744	125
PM10	9,552	318
SOx	1,022	34

Calculations

NOx
440 lbs/start*5 starts + 17.48*240 + 13.18 lbs/hr*447.5 + 25 lbs/shutdown*5 shutdowns
12418 lbs

CO
500 lbs/start*5 starts + 10.64 lbs/hr*240 hrs + 8.02 lbs/hr*447.5 hrs + 120 lbs/shutdown*5 shutdowns
9243 lbs

VOC
30 lbs/start*5 starts + 6.08 lbs/hr*240 hrs + 4.58 lbs/hr*447.5 hrs + 17 lbs/shutdown*5 shutdowns
3744 lbs

SOx
1.7 lbs/hr*240 hrs + 1.28 lbs/hr*480 hrs
1,022 lbs

PM10
16.22*240 hrs + 11.79*480 hrs
9,552 lbs

B. Maximum Monthly Recommissioning Emissions (Post Modification Emissions)

The scenario which results in the highest monthly emissions is assumed for each pollutant. The applicant provided an estimate of 312 hours of turbine operation and 96 hours of non-operation during recommissioning for a total of 408 hours, including at least 4 SU/SDs. In order to estimate maximum monthly emissions of NOx, CO, and VOC, it will be assumed that the turbine will operate the remaining hours in the month at base load with 1 additional SU/SD (limit of 5 per month). Furthermore, it will be assumed that duct firing will occur at the maximum allowed duration of 240 hours, and the remaining base load operation will be without duct firing. For PM10 and SOx, it will be assumed that the remaining hours after recommissioning are all at base load operation - 240 hours with duct firing and the rest without duct firing, and no start ups or shutdowns.

Operation Type	Duration, hours	NOx	CO	VOC
Recommissioning[1]	312	5656.51	1908.74	725.95
Down time during Recommissioning	96	0	0	0
Start Up (6 hours per start)	6	440	500	30
Shut Down (0.5 hours per shutdown)	0.5	25	120	17
Base Load w/o duct firing	89.5	1179.6	717.8	409.9
Base Load with duct firing	240	4195.2	2553.6	1459.2
Total	744	11496.3	5800.14	2642.1
30 Day Average		383	193	88

1 - includes 4 SU/SD

Calculations

NOx
5656.51 + 440 lbs/start*1 start + 17.48*240 + 13.18 lbs/hr*89.5 + 25 lbs/shutdown*1 shutdown
11496.3 lbs

CO
1908.74+ 500 lbs/start*1 start + 10.64 lbs/hr*240 hrs + 8.02 lbs/hr*89.5 hrs + 120 lbs/shutdown*1 shutdown
5008.14 lbs

VOC
725.95+ 30 lbs/start*1 start + 6.08 lbs/hr*240 hrs + 4.58 lbs/hr*89.5 hrs + 17 lbs/shutdown*1 shutdown
2642.1 lbs

Operation Type	Duration, hours	PM10	SOx
Recommissioning	312	2783.4	301.28
Down time during Recommissioning	96	0	0
Base Load w/o duct firing	96	1131.8	122.9
Base Load with duct firing	240	3892.8	408
Total	744	7808	832.2
30 Day Average		260	28

PM10
2783.4 + 16.22 lbs/hr*240 hrs + 11.79 lbs/hr*96 hrs
8703.12 lbs

SOx
301.28 + 1.7 lbs/hr*240 hrs + 1.28 lbs/hr*96 hrs
930.24 lbs

Change in Monthly Emissions Pre-Modification vs. Post-Modification

	Pre Modification		Post Modification		Change	
Pollutant	Monthly Emissions	30-Day Average	Monthly Emissions	30-Day Average	Monthly Emissions	30-Day Average
NOx	12,418	405	11,496	383	-922	-22
CO	9,243	308	5,800	193	-3,443	-115
VOC	3,744	125	2,642	88	-1,102	-37
PM10	9,552	318	7,808	260	-1,744	-58
SOx	1,022	34	832	28	-190	-6

Annual Emissions (PTE)

There will be no increase in maximum annual emissions when comparing the estimates for the emissions that will occur during the 12 months when recommissioning is performed and normal operation resumes to the current PTE calculations for any pollutant.

Under this latest application, Burbank is proposing 408 hours of recommissioning operation (including 96 hours of turbine downtime and 4 SU/SD), 6550 hrs of baseload operation without duct firing, 1,000 of baseload operation with duct firing, along with 56 start ups and shutdowns outside of recommissioning (364 hours), for a total of 8322 hrs/yr.

Reference2 10/14

A. Current PTE Calculation (Pre Modification Emissions)

	# of Events	Hours	NOx, lbs	CO, lbs	VOC, lbs	PM10, lbs	SOx, lbs	NH3, lbs
Start Up	60	360	26400	30000	1800	4244	461	0
Shutdown	60	30	1500	7200	1020	354	38	0
GT Baseload	/////////	6932	91364	55595	31749	81728	8873	84362
GT + DB Baseload	/////////	1000	17480	10640	6080	16220	~~1280~~ **1700**	16150
Totals		8,322	136,744	103,435	40,649	~~102,456~~ **102,546**	10,652 **11,072**	100,512

Note that PM10 and SOx calculations are being corrected from previous application A/N 598845

Calculations

NOx
440 lbs/start*60 starts + 17.48*1000 + 13.18 lbs/hr*6932 + 25 lbs/shutdown*60 shutdowns
136744 lbs

CO
500 lbs/start*60 starts + 10.64 lbs/hr*1000 hrs + 8.02 lbs/hr*6932 hrs + 120 lbs/shutdown*60 shutdowns
103435 lbs

VOC
30 lbs/start*60 starts + 6.08 lbs/hr*1000 hrs + 4.58 lbs/hr*6932 hrs + 17 lbs/shutdown*60 shutdowns
40649 lbs

PM10
70.74 lbs/start*60 starts + 16.22 lbs/hr*1000 hrs + 11.79 lbs/hr*6932 hrs + 5.90 lbs/shutdown*60 shutdowns
102546 lbs

SOx
7.68 lbs/start*60 starts + 1.7 lbs/hr*1000 hrs + 1.28 lbs/hr*6932 hrs + 0.64 lbs/shutdown*60 shutdowns
11072 lbs

B. Maximum Annual Emissions with Recommissioning (Post Modification Emissions)

	# of Events	Hours	NOx, lbs	CO, Lbs	VOC, lbs	PM10, lbs	SOx, lbs	NH3, lbs
Start Up	56	336	24640	28000	1680	3961	430	0
Shutdown	56	28	1400	6720	952	330	36	0
Recommissioning[1]	/////////	408	5656.51	1908.74	725.95	2783.4	301.28	3797
GT Baseload	/////////	6550	86329	52531	29999	77225	8384	79714
GT + DB Baseload	/////////	1000	17480	10640	6080	16220	1700	16150
Totals		8,322	135,506	99,800	39,437	100,519	10,851	99,661

1 - includes 4 SU/SD and 96 hours of turbine downtime

Calculations

NOx
5656.51 + 440 lbs/start*56 starts + 17.48*1000 + 13.18 lbs/hr*6550 + 25 lbs/shutdown*56 shutdowns
135506 lbs

CO
1908.74 + 500 lbs/start*56 starts + 10.64 lbs/hr*1000 hrs + 8.02 lbs/hr*6550 hrs + 120 lbs/shutdown*56 shutdowns
99800 lbs

VOC
725.95 + 30 lbs/start*56 starts + 6.08 lbs/hr*1000 hrs + 4.58 lbs/hr*6550 hrs + 17 lbs/shutdown*56 shutdowns
39437 lbs

PM10
2783.4 + 70.74 lbs/start*56 starts + 16.22 lbs/hr*1000 hrs + 11.79 lbs/hr*6550 hrs + 5.90 lbs/shutdown*56 shutdowns
100519 lbs

SOx
301.28 + 7.68 lbs/start*56 starts + 1.7 lbs/hr*1000 hrs + 1.28 lbs/hr*6550 hrs + 0.64 lbs/shutdown*56 shutdowns
10431 lbs

Change in Annual Emissions Pre-Modification vs. Post-Modification

Pollutant	Pre Modification Annual Emissions	Post Modification Annual Emissions	Change
NOx	136,744	135,506	-1,238
CO	103,435	99,800	-3,635
VOC	40,649	39,437	-1,212
PM10	~~102,456~~ **102,546**	100,519	-2,027
SOx	~~10,652~~ **11,072**	10,851	-221
NH3	100,512	99,661	-851

Note that PM10 and SOx calculations are being corrected from previous application A/N 598845

Reference 2 13/14

Appendix D

Toxic Emissions

Toxic emissions estimates are based on emission factors from USEPA AP-42 Table 3.1-3, except for Acetaldehyde, Formaldehyde, Benzene, and Acrolein emission factors which are from the Background document for AP-42 Section 3.1, Table 3.4-1 for a natural gas turbine with a CO catalyst.

The following data was used:

Fuel HHV	=	1,050 btu/cf		
Gas Turbine Fuel Use	=	1,787 mmbtu/hr/1050 btu/cf	=	1.702 mmscf/hr
Duct Burner Fuel Use	=	583 mmbtu/hr/1050 btu/cf	=	0.555 mmscf/hr
Total Fuel Use	=	2.257 mmscf/hr		
Hrs/yr with Duct Firing	=	1000		
Annual Fuel Use with DF	=	2.257*1000 =	2257 mmscf	
Hrs/yr no Duct Firing	=	7322 (includes start ups and shutdowns)		
Annual Fuel Use No DF	=	1.702*7322 =	12462 mmscf	
Total Annual Fuel Use	=	14,719 mmscf		

Pollutant	Emission Factor	Hourly Emissions	Annual Emissions
	Lbs/mmscf	Lbs/hr	Lbs/yr
1,3 butadiene	4.39E-04	9.91E-04	6.46
acetaldehyde	1.80E-01	4.06E-01	2649.42
acrolein	3.69E-03	8.33E-03	54.31
benzene	3.33E-03	7.52E-03	49.01
ethylbenzene	3.26E-02	7.36E-02	479.84
formaldehyde	3.67E-01	8.28E-01	5401.87
naphthalene	1.33E-03	3.00E-03	19.58
PAH (excluding naphthalene)	9.18E-04	2.07E-03	13.51
propylene oxide	2.96E-02	6.68E-02	435.68
toluene	1.33E-01	3.00E-01	1957.63
xylenes	6.53E-02	1.47E-01	961.15
		Total, lbs/yr	12,028
		Total, tpy	6.0

Post-Modification Turbine Annual Operating Schedule

Event	Duration/yr	Heat Input
Start	360	*(included below)*
Shutdown	30	*(included below)*
100% Load @ w/o DB	6932	1787 (includes start ups/shutdowns)
100% Load with DB	1000	2370
Total	8322	15,454,414

Turbine GHG PTE

GHG	Hourly Tons @ 2370 mmbtu/hr	Annual Tons @ 15,454,414 mmbtu/yr
CO2	138.5	903,217
CH4	2.61E-03	17
N2O	2.61E-04	1.7
Total Mass	138.5	903,236
CO2e	138.6	904,149

Estimated lbs of CO2 per MWH (based on PTE, not actual operating conditions)

Heat Rate no duct firing = (1787E6 btu/hr)/(181,100 + 85,000)kW = 6715.5 btu/kWh
Heat Rate with duct firing (2370E6 btu/hr)/(323,100 kW) = 7335.2 btu/kWh

Overall net heat rate = [(Heat Rate no duct firing * # of Hours no duct firing) + (Heat Rate with duct firing* # of Hours with duct firing)] /Total Annual Hours of Operation

Overall net heat rate = (6715.5 btu/kWh*7322 hrs + 7335.2 btu/Kwh*1000 hrs)/(8322)
= 6790.0 btu/kWh

6,790.0 btu/kWh * 1000 kWh/MWh * 1*10-6 MMBtu/Btu * 53.02 kg CO2/MMBtu-HHV * 2.205 lb/kg = 793.8 lb CO2/MWH

793.8 lb CO2/netMWH @ HHV

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178

Title Page
Facility ID: 128243
Revision #: 25
Date: January 10, 2020

FACILITY PERMIT TO OPERATE

Reference 3 1/2

BURBANK CITY,BURBANK WATER & POWER,SCPPA
164 W MAGNOLIA BLVD
BURBANK, CA 91502

NOTICE

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR A COPY THEREOF MUST BE KEPT AT THE LOCATION FOR WHICH IT IS ISSUED.

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT SHALL NOT BE CONSTRUED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF ANY OTHER FEDERAL, STATE OR LOCAL GOVERNMENTAL AGENCIES.

Wayne Nastri
Executive Officer

By
Amir Dejbakhsh
Deputy Executive Officer
Engineering and Permitting

FACILITY PERMIT TO OPERATE
BURBANK CITY,BURBANK WATER & POWER,SCPPA

Reference 3 2/2

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

The operator shall comply with the terms and conditions set forth below:

A. Emission Limits

A63.1 The operator shall limit emissions from this equipment as follows:

CONTAMINANT	EMISSIONS LIMIT
CO	Less than or equal to 9243 LBS IN ANY ONE MONTH
PM10	Less than or equal to 9552 LBS IN ANY ONE MONTH
VOC	Less than or equal to 3744 LBS IN ANY ONE MONTH
SOX	Less than or equal to 1022 LBS IN ANY ONE MONTH

The operator shall calculate the emission limit(s) by using the monthly fuel use data and the following emissions factors: PM10 with duct firing = 7.98 lb/MMscf, PM10 without duct firing = 6.93 lb/MMscf, VOC with duct ring = 2.69 lb/MMscf, VOC without duct firing = 2.69 lb/MMscf, VOC startups = 30 lb/event, VOC shutdown = 17 lb/event, SOx = 0.75 lb/MMscf.

The operator shall calculate the emission limit(s) for CO, after the CO CEMS certification based upon the readings from the AQMD certified CEMS. In the event the CO CEMS is not operating or the emissions exceed the valid upper range of the analyzer, the emissions shall be calculated in accordance with the approved CEMS plan.

For the purposes of this condition, the limit(s) shall be based on the total combined emissions from equipment D4 (Gas Turbine 1) and D6 (Duct Burner).

[**RULE 1303(b)(2)-Offset, 5-10-1996;** RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D4, D6]

Reply Delete Junk Block ···

RE: Additional Emission Estimates, Phase 2 Magnolia Combustion Tuning

You replied on Sat 8/15/2020 9:59 AM

LM

Lawrence Muzio <lmuzio@ferco.com>
Sat 8/15/2020 7:20 AM
To: You
Cc: Jessica Muncy

GE Data Phase2 TestPlanEmis...
51 KB

Krishna- Try this one

Lawrence J. Muzio Ph D
FERCo
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FERCo Data - MPP Recommissioning Schedule, March 2021

								Load			Exhaust Temp (GT Exit)			Average Emissionss (ppmvd)			Max Hrly Emissionss (ppmvd)			Average Emissionss (lb/hr)		
Test Point Description	Mode	Time	Cum Time	Cum Time Fired	Day	Start Time	End Time	Nominal	Min	Max	Nominal Texh (GT)	Min Texh (GT)	Max Texh (GT)	NOx (ppmvd @ 15%)	CO (ppmvd raw)	VOC (ppmvd)	NOx (ppmvd @ 15%)	CO (ppmvd raw)	VOC (ppmvd)	NOx (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Cold start, steam temp match, M1P mapping	Tot_M1P	4	4	4	1	20:00	0:00	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
Cold start, steam temp match, M1P mapping (continued)	Tot_M1P	2.4	6.4	6.4	2	0:00	2:24	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
Mode transfer checkout, TTKX mapping	M3P	0.2	6.6	6.6	2	2:24	2:36	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
Mode transfer checkout, TTKX mapping	M62P	0.2	6.8	6.8	2	2:36	2:48	35	15	35	1200	990	1200	40	1200	300	50	1500	400	136.37	2247.53	321.76
Mode transfer checkout, TTKX mapping, M5P & M63P mapping	C_P	1	7.8	7.8	2	2:48	3:48	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
Mode transfer checkout, TTKX mapping, M63PA mapping	C_PA	1.4	9.2	9.2	2	3:48	5:12	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63P partload mapping	C_P	2.8	12	12	2	5:12	8:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA partload mapping (hot fuel)	C_PA	12	24	24	2	8:00	20:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
Shutdown for fuel strainer removal	SD	4	28	24	2	20:00	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Shutdown for fuel strainer removal (continued)	SD	8	36	24	3	0:00	8:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Warm start, steam temp match, M1P mapping	Tot_M1P	3	39	27	3	8:00	11:00	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
M3P mapping - checkout	M3P	0.4	39.4	27.4	3	11:00	11:24	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
M62P mapping - checkout	M62P	0.4	39.8	27.8	3	11:24	11:48	35	15	35	1200	990	1200	40	1200	300	50	1500	400	136.37	2247.53	321.76
M63P partload mapping	C_P	2	41.8	29.8	3	11:48	13:48	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA part/base/peak load mapping & perf testing (hot fuel)	C_PA	10.2	52	40	3	13:48	0:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63PA part/base/peak load mapping & perf testing (hot fuel) (continued)	C_PA	1.8	53.8	41.8	4	0:00	1:48	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63P & M5P partoad mapping (cold fuel)	C_P	6	59.8	47.8	4	1:48	7:48	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA part/base/peak load mapping (cold fuel)	C_PA	6	65.8	53.8	4	7:48	13:48	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63P & M5P turndown tuning (hot fuel)	C_P	9	74.8	62.8	4	13:48	22:48	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA turndown tuning, part/base/peak perf testing (hot fuel)	C_PA	1.2	76	64	4	22:48	0:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63PA turndown tuning, part/base/peak perf testing (hot fuel) (continued)	C_PA	1.8	77.8	65.8	5	0:00	1:48	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63PA autotune validation and AT loop stability testing	C_PA	12	89.8	77.8	5	1:48	13:48	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63P & M5P autotune validation and AT loop stability testing	C_P	10.2	100	88	5	13:48	0:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63P & M5P autotune validation and AT loop stability testing (continued)	C_P	1.8	101.8	89.8	6	0:00	1:48	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
Shutdown for software download w/ new autotune constants	SD	18.2	120	89.8	6	1:48	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Warm start, steam temp match, M1P mapping	Tot_M1P	3	123	92.8	6	20:00	23:00	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
M3P mapping	M3P	1	124	93.8	6	23:00	0:00	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
M3P mapping (continued)	M3P	1	125	94.8	7	0:00	1:00	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
M62P mapping	M62P	2	127	96.8	7	1:00	3:00	35	15	35	1200	990	1200	40	1200	300	50	1500	400	136.37	2247.53	321.76
M63P & M5P autotune validation and AT mode transfer checkout	C_P	3	130	99.8	7	3:00	6:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA autotune validation and AT mode transfer checkout	C_PA	2	132	101.8	7	6:00	8:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M63P & M5P final autotune validation (cold & hot fuel)	C_P	2	134	103.8	7	8:00	10:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
M63PA final autotune validation (cold & hot fuel)	C_PA	2	136	105.8	7	10:00	12:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
M5P Overnight Run	C_PA	12	148	117.8	7	12:00	0:00	50	20	50	1189	1069	1189	12	5	1	15	50	1	75.33	14.84	1.70
M5P Overnight Run (continued)	C_PA	12	160	129.8	8	0:00	12:00	50	20	50	1189	1069	1189	12	5	1	15	50	1	75.33	14.84	1.70
M63PA final autotune validation (cold & hot fuel) - continued	C_PA	8	168	137.8	8	12:00	20:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
Fast Ramp and grid response testing, OBB testing	C_P	4	172	141.8	8	20:00	0:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
Fast Ramp and grid response testing, OBB testing	C_P	2	174	143.8	9	0:00	2:00	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
Fast Ramp and grid response testing, OBB testing	C_PA	6	180	149.8	9	2:00	8:00	90	30	110	1110	1200	1184	12	5	1	15	50	1	75.33	14.84	1.70
Shutdown for final software dowload & water wash	SD	12	192	149.8	9	8:00	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Offline water wash	WW	4	196	149.8	9	20:00	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Offline water wash - continued	WW	20	216	149.8	10	0:00	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Cold start, steam temp match, final schedule	Tot_M1P	4	220	153.8	10	20:00	0:00	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
Cold start, steam temp match, final schedule (continued)	Tot_M1P	2.4	222.4	156.2	11	0:00	2:24	10	0	20	907	738	1069	120	500	140	130	700	200	232.27	877.89	140.76
M3P mapping (contingency)	M3P	2	224.4	158.2	11	2:24	4:24	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
M62P mapping (contingency	M62P	1	225.4	159.2	11	4:24	5:24	35	15	35	1200	990	1200	40	1200	300	50	1500	400	136.37	2247.53	321.76
Load to base	M3P	0.1	225.5	159.3	11	5:24	5:30	25	10	25	1146	907	1146	100	600	120	110	1000	200	283.53	1040.55	119.17
Load to base	M62P	0.1	225.6	159.4	11	5:30	5:36	35	15	35	1200	990	1200	40	1200	300	50	1500	400	136.37	2247.53	321.76
Load to base	C_P	0.1	225.7	159.5	11	5:36	5:42	50	20	50	1189	1069	1189	12	50	1	15	100	1	50.63	107.47	1.23
Load to Base	C_PA_tune	0.1	225.8	159.6	11	5:42	5:48	90	30	110	1110	1200	1184	8	2	1	9	6	1	50.22	5.94	1.70

FERCo Data - MPP Recommissioning Schedule, March 2021

		Fuel Flow		Cumulative Emissionss (lb)				Flow & 02			Emissionss (lb)				Temperature		Average Outlet Emissions (ppmvd)		
Test Point Description	Mode	Fuel Flow (lbm/hr)	Fuel Flow (MMBTU /hr)	NOx (lb)	CO (lb)	VOC (lb)	Fuel Flow (klbm)	Ex Flow (lb/sec)	Exhaust O2 (%vol)	Exhaust Dry O2 (%vol)	NOx (lb)	CO (lb)	VOC (lb)	Fuel Flow (klbm)	SCR/CO (F)	Stack (F)	NOx (ppmvd @ 15%)	CO (ppmvd raw)	VOC (ppmvd)
Cold start, steam temp match, M1P mapping	Tot_M1P	22470.48	483.45	929	3512	563	90	528	16.07	16.96	929	3512	563	90	543	191.47	51.00	20.00	18.76
Cold start, steam temp match, M1P mapping (continued)	Tot_M1P	22470.48	483.45	1487	5619	901	144	528	16.07	16.96	558	2107	338	54	543	191.47	51.00	20.00	18.76
Mode transfer checkout, TTKX mapping	M3P	32911.90	708.10	1543	5827	925	150	530	13.96	15.03	56	208	24	6	558	196.40	55.00	20.00	15.72
Mode transfer checkout, TTKX mapping	M62P	39523.82	850.35	1571	6276	989	158	576	13.24	14.36	28	449	64	8	567	199.69	3.50	29.71	40.80
Mode transfer checkout, TTKX mapping, M5P & M63P mapping	C_P	47982.60	1032.35	1621	6384	990	206	664	12.70	13.84	50	108	1	48	578	204.62	2.00	1.56	0.15
Mode transfer checkout, TTKX mapping, M63PA mapping	C_PA	69025.06	1485.07	1727	6404	993	303	921	12.12	13.29	106	20	3	97	603	217.77	2.00	1.00	0.17
M63P partload mapping	C_P	47982.60	1032.35	1868	6705	996	437	664	12.70	13.84	141	301	3	134	578	204.62	2.00	1.56	0.15
M63PA partload mapping (hot fuel)	C_PA	69025.06	1485.07	2772	6883	1017	1266	921	12.12	13.29	904	178	21	829	603	217.77	2.00	1.00	0.17
Shutdown for fuel strainer removal	SD	0.00	0.00	2772	6883	1017	1266	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0.00	0.00
Shutdown for fuel strainer removal (continued)	SD	0.00	0.00	2772	6883	1017	1266	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0.00	0.00
Warm start, steam temp match, M1P mapping	Tot_M1P	22470.48	483.45	3469	9517	1439	1333	528	16.07	16.96	697	2634	422	67	543	191.47	51.00	20.00	18.76
M3P mapping - checkout	M3P	32911.90	708.10	3583	9933	1486	1346	530	13.96	15.03	114	416	47	13	558	196.40	55.00	20.00	15.72
M62P mapping - checkout	M62P	39523.82	850.35	3637	10832	1615	1362	576	13.24	14.36	54	899	129	16	567	199.69	3.50	29.71	40.80
M63P partload mapping	C_P	47982.60	1032.35	3738	11047	1618	1458	664	12.70	13.84	101	215	3	96	578	204.62	2.00	1.56	0.15
M63PA part/base/peak load mapping & perf testing (hot fuel)	C_PA	69025.06	1485.07	4507	11199	1635	2162	921	12.12	13.29	769	152	17	704	603	217.77	2.00	1.00	0.17
M63PA part/base/peak load mapping & perf testing (hot fuel) (continued)	C_PA	69025.06	1485.07	4642	11225	1638	2286	921	12.12	13.29	135	26	3	124	603	217.77	2.00	1.00	0.17
M63P & M5P partoad mapping (cold fuel)	C_P	47982.60	1032.35	4946	11870	1645	2574	664	12.70	13.84	304	645	7	288	578	204.62	2.00	1.56	0.15
M63PA part/base/peak load mapping (cold fuel)	C_PA	69025.06	1485.07	5398	11959	1656	2988	921	12.12	13.29	452	89	11	414	603	217.77	2.00	1.00	0.17
M63P & M5P turndown tuning (hot fuel)	C_P	47982.60	1032.35	5854	12927	1667	3420	664	12.70	13.84	456	968	11	432	578	204.62	2.00	1.56	0.15
M63PA turndown tuning, part/base/peak perf testing (hot fuel)	C_PA	69025.06	1485.07	5944	12944	1669	3503	921	12.12	13.29	90	17	2	83	603	217.77	2.00	1.00	0.17
M63PA turndown tuning, part/base/peak perf testing (hot fuel) (continued)	C_PA	69025.06	1485.07	6080	12971	1672	3627	921	12.12	13.29	136	27	3	124	603	217.77	2.00	1.00	0.17
M63PA autotune validation and AT loop stability testing	C_PA	69025.06	1485.07	6984	13149	1692	4455	921	12.12	13.29	904	178	20	828	603	217.77	2.00	1.00	0.17
M63P & M5P autotune validation and AT loop stability testing	C_P	47982.60	1032.35	7500	14245	1705	4945	664	12.70	13.84	516	1096	13	490	578	204.62	2.00	1.56	0.15
M63P & M5P autotune validation and AT loop stability testing (continued)	C_P	47982.60	1032.35	7591	14439	1707	5031	664	12.70	13.84	91	194	2	86	578	204.62	2.00	1.56	0.15
Shutdown for software download w/ new autotune constants	SD	0.00	0.00	7591	14439	1707	5031	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0.00	0.00
Warm start, steam temp match, M1P mapping	Tot_M1P	22470.48	483.45	8288	17073	2129	5099	528	16.07	16.96	697	2634	422	68	543	191.47	51.00	20.00	18.76
M3P mapping	M3P	32911.90	708.10	8571	18113	2248	5132	530	13.96	15.03	283	1040	119	33	558	196.40	55.00	20.00	15.72
M3P mapping (continued)	M3P	32911.90	708.10	8855	19154	2368	5165	530	13.96	15.03	284	1041	120	33	558	196.40	55.00	20.00	15.72
M62P mapping	M62P	39523.82	850.35	9128	23649	3011	5244	576	13.24	14.36	273	4495	643	79	567	199.69	3.50	29.71	40.80
M63P & M5P autotune validation and AT mode transfer checkout	C_P	47982.60	1032.35	9280	23971	3015	5388	664	12.70	13.84	152	322	4	144	578	204.62	2.00	1.56	0.15
M63PA autotune validation and AT mode transfer checkout	C_PA	69025.06	1485.07	9430	24001	3018	5526	921	12.12	13.29	150	30	3	138	603	217.77	2.00	1.00	0.17
M63P & M5P final autotune validation (cold & hot fuel)	C_P	47982.60	1032.35	9532	24216	3021	5622	664	12.70	13.84	102	215	3	96	578	204.62	2.00	1.56	0.15
M63PA final autotune validation (cold & hot fuel)	C_PA	69025.06	1485.07	9682	24245	3024	5760	921	12.12	13.29	150	29	3	138	603	217.77	2.00	1.00	0.17
M5P Overnight Run	C_PA	69025.06	1485.07	10586	24424	3045	6588	664	12.70	13.84	904	179	21	828	578	204.62	2.00	1.00	0.15
M5P Overnight Run (continued)	C_PA	69025.06	1485.07	11490	24602	3065	7416	664	12.70	13.84	904	178	20	828	578	204.62	2.00	1.00	0.15
M63PA final autotune validation (cold & hot fuel) - continued	C_PA	69025.06	1485.07	12093	24720	3079	7968	921	12.12	13.29	603	118	14	552	603	217.77	2.00	1.00	0.17
Fast Ramp and grid response testing, OBB testing	C_P	47982.60	1032.35	12295	25150	3083	8160	664	12.70	13.84	202	430	4	192	578	204.62	2.00	1.56	0.15
Fast Ramp and grid response testing, OBB testing	C_P	47982.60	1032.35	12397	25365	3086	8256	664	12.70	13.84	102	215	3	96	578	204.62	2.00	1.56	0.15
Fast Ramp and grid response testing, OBB testing	C_PA	69025.06	1485.07	12848	25454	3096	8670	921	12.12	13.29	451	89	10	414	603	217.77	2.00	1.00	0.17
Shutdown for final software dowload & water wash	SD	0.00	0.00	12848	25454	3096	8670	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0.00	0.00
Offline water wash	WW	0.00	0.00	12848	25454	3096	8670	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0.00	0.00
Offline water wash - continued	WW	0.00	0.00	12848	25454	3096	8670	0	0.00	0.00	0	0	0	0	0	0.00	0.00	0.00	0.00
Cold start, steam temp match, final schedule	Tot_M1P	22470.48	483.45	13778	28966	3659	8760	528	16.07	16.96	930	3512	563	90	543	191.47	51.00	20.00	18.76
Cold start, steam temp match, final schedule (continued)	Tot_M1P	22470.48	483.45	14335	31073	3997	8814	528	16.07	16.96	557	2107	338	54	543	191.47	51.00	20.00	18.76
M3P mapping (contingency)	M3P	32911.90	708.10	14902	33154	4235	8880	530	13.96	15.03	567	2081	238	66	558	196.40	55.00	20.00	15.72
M62P mapping (contingency	M62P	39523.82	850.35	15038	35402	4557	8920	576	13.24	14.36	136	2248	322	40	567	199.69	3.50	29.71	40.80
Load to base	M3P	32911.90	708.10	15067	35506	4569	8923	530	13.96	15.03	29	104	12	3	558	196.40	55.00	20.00	15.72
Load to base	M62P	39523.82	850.35	15080	35730	4601	8927	576	13.24	14.36	13	224	32	4	567	199.69	3.50	29.71	40.80
Load to base	C_P	47982.60	1032.35	15086	35741	4601	8932	664	12.70	13.84	6	11	0	5	578	204.62	2.00	1.56	0.15
Load to Base	C_PA_tune	69025.06	1485.07	15091	35742	4602	8939	921	12.12	13.29	5	1	1	7	603	217.77	2.00	1.00	0.17

FERCo Data - MPP Recommissioning Schedule, March 2021

		Average Outlet Emissions (lb/hr)			Cumulative Outlet Emissions (lb)			Cumulative Outlet Emissions (lb)-Total Time			Cumulative Outlet Emissions (lb)-Daily		
Test Point Description	**Mode**	**NOx (lb/hr)**	**CO (lb/hr)**	**VOC (lb/hr)**	**NOx (lb)**	**CO (lb)**	**VOC (lb)**	**NOx (lb)**	**CO (lb)**	**VOC (lb)**	**NOx (lb)**	**CO (lb)**	**VOC (lb)**
Cold start, steam temp match, M1P mapping	Tot_M1P	98.71	35.12	18.86	394.86	140.46	75.04	394.86	140.46	75.04	394.86	140.46	75.04
Cold start, steam temp match, M1P mapping (continued)	Tot_M1P	98.71	35.12	18.86	236.92	84.28	45.02	631.77	224.74	120.06	236.92	84.28	45.02
Mode transfer checkout, TTKX mapping	M3P	155.94	34.69	15.61	31.19	6.94	3.14	662.96	231.68	123.21	268.10	91.21	48.17
Mode transfer checkout, TTKX mapping	M62P	11.93	55.64	43.76	2.39	11.13	8.16	665.35	242.80	131.37	270.49	102.34	56.33
Mode transfer checkout, TTKX mapping, M5P & M63P mapping	C_P	8.44	3.34	0.18	8.44	3.34	0.15	673.79	246.15	131.51	278.93	105.69	56.47
Mode transfer checkout, TTKX mapping, M63PA mapping	C_PA	12.56	2.97	0.29	17.58	4.16	0.24	691.36	250.30	131.76	296.51	109.84	56.72
M63P partload mapping	C_P	8.44	3.34	0.18	23.63	9.36	0.41	714.99	259.67	132.17	320.13	119.20	57.13
M63PA partload mapping (hot fuel)	C_PA	12.56	2.97	0.29	150.66	35.62	2.08	865.65	295.28	134.24	470.79	154.82	59.20
Shutdown for fuel strainer removal	SD	0.00	0.00	0.00	0.00	0.00	0.00	865.65	295.28	134.24	470.79	154.82	59.20
Shutdown for fuel strainer removal (continued)	SD	0.00	0.00	0.00	0.00	0.00	0.00	865.65	295.28	134.24	0.00	0.00	0.00
Warm start, steam temp match, M1P mapping	Tot_M1P	98.71	35.12	18.86	296.14	105.35	56.28	1161.80	400.63	190.52	296.14	105.35	56.28
M3P mapping - checkout	M3P	155.94	34.69	15.61	62.38	13.87	6.29	1224.17	414.50	196.81	358.52	119.22	62.57
M62P mapping - checkout	M62P	11.93	55.64	43.76	4.77	22.26	16.32	1228.95	436.76	213.13	363.29	141.48	78.89
M63P partload mapping	C_P	8.44	3.34	0.18	16.88	6.69	0.29	1245.82	443.45	213.42	380.17	148.16	79.18
M63PA part/base/peak load mapping & perf testing (hot fuel)	C_PA	12.56	2.97	0.29	128.06	30.27	1.76	1373.88	473.72	215.19	508.23	178.44	80.94
M63PA part/base/peak load mapping & perf testing (hot fuel) (continued)	C_PA	12.56	2.97	0.29	22.60	5.34	0.31	1396.48	479.06	215.50	22.60	5.34	0.31
M63P & M5P partoad mapping (cold fuel)	C_P	8.44	3.34	0.18	50.63	20.06	0.88	1447.11	499.12	216.37	73.23	25.40	1.19
M63PA part/base/peak load mapping (cold fuel)	C_PA	12.56	2.97	0.29	75.33	17.81	1.04	1522.44	516.93	217.41	148.56	43.21	2.23
M63P & M5P turndown tuning (hot fuel)	C_P	8.44	3.34	0.18	75.95	30.09	1.31	1598.39	547.02	218.73	224.50	73.30	3.54
M63PA turndown tuning, part/base/peak perf testing (hot fuel)	C_PA	12.56	2.97	0.29	15.07	3.56	0.21	1613.45	550.58	218.93	239.57	76.87	3.75
M63PA turndown tuning, part/base/peak perf testing (hot fuel) (continued)	C_PA	12.56	2.97	0.29	22.60	5.34	0.31	1636.05	555.93	219.24	22.60	5.34	0.31
M63PA autotune validation and AT loop stability testing	C_PA	12.56	2.97	0.29	150.66	35.62	2.08	1786.71	591.54	221.32	173.26	40.96	2.39
M63P & M5P autotune validation and AT loop stability testing	C_P	8.44	3.34	0.18	86.07	34.10	1.49	1872.78	625.65	222.81	259.33	75.06	3.88
M63P & M5P autotune validation and AT loop stability testing (continued)	C_P	8.44	3.34	0.18	15.19	6.02	0.26	1887.97	631.67	223.07	15.19	6.02	0.26
Shutdown for software download w/ new autotune constants	SD	0.00	0.00	0.00	0.00	0.00	0.00	1887.97	631.67	223.07	15.19	6.02	0.26
Warm start, steam temp match, M1P mapping	Tot_M1P	98.71	35.12	18.86	296.14	105.35	56.28	2184.12	737.01	279.35	311.33	111.37	56.54
M3P mapping	M3P	155.94	34.69	15.61	155.94	34.69	15.72	2340.06	771.70	295.07	467.27	146.05	72.26
M3P mapping (continued)	M3P	155.94	34.69	15.61	155.94	34.69	15.72	2496.00	806.38	310.79	155.94	34.69	15.72
M62P mapping	M62P	11.93	55.64	43.76	23.86	111.28	81.60	2519.86	917.66	392.39	179.81	145.96	97.32
M63P & M5P autotune validation and AT mode transfer checkout	C_P	8.44	3.34	0.18	25.32	10.03	0.44	2545.18	927.69	392.83	205.12	156.00	97.76
M63PA autotune validation and AT mode transfer checkout	C_PA	12.56	2.97	0.29	25.11	5.94	0.35	2570.29	933.63	393.18	230.23	161.93	98.10
M63P & M5P final autotune validation (cold & hot fuel)	C_P	8.44	3.34	0.18	16.88	6.69	0.29	2587.17	940.32	393.47	247.11	168.62	98.40
M63PA final autotune validation (cold & hot fuel)	C_PA	12.56	2.97	0.29	25.11	5.94	0.35	2612.28	946.25	393.81	272.22	174.55	98.74
M5P Overnight Run	C_PA	12.56	2.97	0.25	150.66	35.62	1.75	2762.94	981.87	395.57	422.88	210.17	100.49
M5P Overnight Run (continued)	C_PA	12.56	2.97	0.25	150.66	35.62	1.75	2913.60	1017.48	397.32	150.66	35.62	1.75
M63PA final autotune validation (cold & hot fuel) - continued	C_PA	12.56	2.97	0.29	100.44	23.74	1.38	3014.04	1041.23	398.70	251.10	59.36	3.14
Fast Ramp and grid response testing, OBB testing	C_P	8.44	3.34	0.18	33.75	13.37	0.58	3047.79	1054.60	399.29	284.85	72.73	3.72
Fast Ramp and grid response testing, OBB testing	C_P	8.44	3.34	0.18	16.88	6.69	0.29	3064.67	1061.29	399.58	16.88	6.69	0.29
Fast Ramp and grid response testing, OBB testing	C_PA	12.56	2.97	0.29	75.33	17.81	1.04	3140.00	1079.10	400.62	92.21	24.50	1.33
Shutdown for final software dowload & water wash	SD	0.00	0.00	0.00	0.00	0.00	0.00	3140.00	1079.10	400.62	92.21	24.50	1.33
Offline water wash	WW	0.00	0.00	0.00	0.00	0.00	0.00	3140.00	1079.10	400.62	92.21	24.50	1.33
Offline water wash - continued	WW	0.00	0.00	0.00	0.00	0.00	0.00	3140.00	1079.10	400.62	0.00	0.00	0.00
Cold start, steam temp match, final schedule	Tot_M1P	98.71	35.12	18.86	394.86	140.46	75.04	3534.85	1219.56	475.66	394.86	140.46	75.04
Cold start, steam temp match, final schedule (continued)	Tot_M1P	98.71	35.12	18.86	236.92	84.28	45.02	3771.77	1303.84	520.68	236.92	84.28	45.02
M3P mapping (contingency)	M3P	155.94	34.69	15.61	311.88	69.37	31.44	4083.65	1373.21	552.12	548.80	153.65	76.46
M62P mapping (contingency	M62P	11.93	55.64	43.76	11.93	55.64	40.80	4095.59	1428.85	592.92	560.73	209.29	117.26
Load to base	M3P	155.94	34.69	15.61	15.59	3.47	1.57	4111.18	1432.32	594.49	576.32	212.76	118.84
Load to base	M62P	11.93	55.64	43.76	1.19	5.56	4.08	4112.37	1437.88	598.57	577.52	218.32	122.92
Load to base	C_P	8.44	3.34	0.18	0.84	0.33	0.01	4113.22	1438.21	598.59	578.36	218.65	122.93
Load to Base	C_PA_tune	12.56	2.97	0.29	1.26	0.30	0.02	4114.47	1438.51	598.60	579.62	218.95	122.95

Reference 5 1/2

Reply Delete Junk Block ···

FW: Data requirements for the preparation of air Permit and CEC document - MPP Upgrades

From: Michaud, Troy A (GE Power) [mailto:troy.michaud@ge.com]
Sent: Thursday, May 16, 2019 7:14 AM
To: Messineo, Frank <FMessineo@burbankca.gov>; Willson, Nathan R (GE Power) <nathan.willson@ge.com>; Robson, Mark (GE Power) <mark.robson@ge.com>
Cc: Reyes, Claudia <CSReyes@burbankca.gov>; Kigerl, Sean <SKigerl@burbankca.gov>
Subject: RE: Data requirements for the preparation of air Permit and CEC document - MPP Upgrades

Frank,

Below and attached are the final bits of emissions information requested.

From emission point of view, worst-case scenario will be the operation at 22 deg F (at lower end of the turndown load). We will need the following parameters:
(a) fuel input in MMBtu/hr (LHV) – 800.2
(b) stack exhaust temperature in deg F - 169
(c) CO , NOx and VOC concentrations in ppmvd at 15% oxygen in Stack exhaust, - See attached
(d) GT power output (kW) - 49
(e) ST power output (kW) - 58
(f) heat rate (Btu/kWh) net basis - 7946

oxygen content in stack exhaust – (see attached)

Provide fuel heating value LHV in terms of Btu/scf - ~900 BTU/scf

Please review and let me know if you have any questions or need any additional data.

Thanks.

Troy Michaud
GE Power Services
M +1 706-313-6289

Reply Reply all Forward

Reference 5 2/2

Expected Post-Uprate CC Performance at GT MECL Load

Ambient Temperature	F	**22**
Ambient Pressure	psia	14.41
Ambient Relative Humidity		50%
GT MECL Output	MW	49.3
ST Generator Output	MW	58.4
Fuel Input (LHV)	MMBTU/hr	800.2
CC Net Output	MW	100.7
CC Net Heat Rate	BTU/kW-hr	7946
Stack Temperature	F	169
Fuel LHV	BTU/lb	**20534**
Fule LHV	BTU/scf	**900**

Notes:

1. Asume 7 MW aux. loss (gross to net)

EMISSIONS

Nox corrected to 15% O2	ppmvd	**9.0**
NOx as NO2	lb/hr	**28.8**
CO	ppmvd	**9.0**
CO	lb/hr	**18.0**
VOC	ppmvw	**1.4**
VOC	lb/hr	**1.6**

EXHAUST ANALYSIS	% VOL.
Argon	**0.90**
Nitrogen	**75.35**
Oxygen	**13.58**
Carbon Dioxide	**3.41**
Water	**6.77**
Dry Oxygen	**14.56%**

Reply Delete Junk Block ···

RE: Combustion Tuning Report

JM

Jessica Muncy <jmuncy@ferco.com>
Tue 6/25/2019 5:11 PM
To: You; Lawrence Muzio; Kigerl, Sean

JMM168r1.pdf
644 KB

Sean/Krisha,
Attached is the revised memo that includes the predicted VOC reductions and estimated stack temperature.

Thanks
Jessica

From: Lawrence Muzio
Sent: Tuesday, June 25, 2019 12:07 PM
To: krishna Nand <krishnanand44@msn.com>; Kigerl, Sean <SKigerl@burbankca.gov>
Cc: Jessica Muncy <jmuncy@ferco.com>
Subject: RE: Combustion Tuning Report

OK we will get that done

Larry

Lawrence J. Muzio Ph D
FERCo
23342C South Pointe
Laguna Hills, CA 92653
Tel: 949-859-4466
Cell: 949-677-0107
Fax: 949-859-7916
lmuzio@ferco.com

From: krishna Nand [mailto:krishnanand44@msn.com]
Sent: Tuesday, June 25, 2019 12:07 PM
To: Kigerl, Sean
Cc: Lawrence Muzio; Jessica Muncy; krishna Nand
Subject: Re: Combustion Tuning Report

That is correct Sean.

Thanks,
Krishna

Reference 6 2/6

FERCo
FOSSIL ENERGY RESEARCH CORPORATION

To: Sean Kigerl
Krishna Nand
Burbank Water and Power

Date: May 20, 2019
FERCo-2827-JMM168

From: J. Muncy, L. Muzio, FERCo

Subject: MECL/22F Estimated Emissions

Copies:

Background

Burbank Water and Power (BWP) has commissioned GE to install advanced combustion modifications to the Magnolia combined-cycle gas turbine to extend the operating range. These combustion modifications will affect the stack NOx, CO and VOC emissions. FERCo was contracted to estimate the stack emissions during the expected combustion tuning period, and the results of those estimates can be found in report R2002. FERCo was also asked to analyze a "worst-case" scenario, the Minimum Emissions Compliant Load (MECL) at ambient temperatures of 22°F. The results of this analysis are summarized below.

MECL/22F Analysis

The NOx, CO and VOC expected outlet results are summarized in Table 1, and described in more detail below.

Table 1. Magnolia MECL/22F Outlet Emissions

Load	%	27.8
Flue Gas Flowrate	lb/sec	553
Catalyst Temperature	°F	566
Stack Temperature	°F	197
Outlet NOx	ppmc	2
	lb/hr	6.4
Outlet VOC	ppmc	0.264
	lb/hr	0.3
Outlet CO	ppmc	0.21
	lb/hr	0.45

The expected operating parameters for the MECL/22F case are shown in Table 2. It should be noted that the heat input given was based on the LHV of the fuel.

To perform the NOx analysis, FERCo first had to calculate several necessary inputs required for the SCR process model, such as load, flue gas flow rate and catalyst temperature. These inputs were calculated from the fuel heat input and dry oxygen shown in Table 2, as well as the data provided in Table 3 (Table 2-1, R2002) which summarized current operating performance of the Magnolia combined cycle.

FOSSIL ENERGY RESEARCH CORP. 23342 SOUTH POINTE, UNIT C LAGUNA HILLS, CA 92653
Telephone: (949) 859-4466 Fax: (949) 859-7916

FERCo then used its SCR process model to determine the NOx reduction performance at the MECL/22F load case. With an inlet NOx of 9ppm at 15% O_2, the SCR catalyst is easily able to achieve NOx reductions of 78% for an outlet NOx of 2ppm (15% O_2), or 6.4 lb/hr, with zero ammonia slip.

For the VOC and CO analysis, FERCo used Case 3 of the analysis performed by Miratech, shown in Table 4, to calculate the expected VOC and CO catalyst performance. Case 3 was chosen as its flue gas flowrate of 2,073,600 lb/hr (576 lb/sec) and catalyst temperature of 565 °F closely mirrored the conditions of the MECL/22F case. Case 3 results in a VOC reduction of 81.1% and a CO reduction of 97.5%. Applying this reduction to an inlet VOC of 1.4ppm (dry, corrected to 15% O2) the result is 0.264 ppmd, or 0.30 lb/hr. Applying a 97.5% reduction to an inlet CO of 9ppmvd (at 14.56% O_2) and correcting to 15%, the result is 0.21 ppmd at 15% O_2, or 0.45 lb/hr.

The stack temperature was derived from Figure 1 (Figure A-2, R2002). Based on this analysis, a load of 27.8% corresponds to a stack temperature of 197 °F.

Reference 6 4/6

Table 2. Expected MECL Performance

Expected Post-Uprate CC Performance at GT MECL Load

Ambient Temperature	F	**22**
Ambient Pressure	psia	14.41
Ambient Relative Humidity		50%
GT MECL Output	MW	49.3
ST Generator Output	MW	58.4
Fuel Input (LHV)	MMBTU/hr	800.2
CC Net Output	MW	100.7
CC Net Heat Rate	BTU/kW-hr	7946
Stack Temperature	F	169
Fuel LHV	BTU/lb	**20534**
Fule LHV	BTU/scf	**900**

Notes:

1. Asume 7 MW aux. loss (gross to net)

EMISSIONS

Nox corrected to 15% O2	ppmvd	**9.0**
NOx as NO2	lb/hr	**28.8**
CO	ppmvd	**9.0**
CO	lb/hr	**18.0**
VOC	ppmvw	**1.4**
VOC	lb/hr	**1.6**

EXHAUST ANALYSIS	% VOL.
Argon	**0.90**
Nitrogen	**75.35**
Oxygen	**13.58**
Carbon Dioxide	**3.41**
Water	**6.77**
Dry Oxygen	**14.56%**

Table 3. Magnolia Current Operating Conditions

Date/Time	CT Load	Load	CT Exh	T (co)	T (scr)	T(SCR/CO)	O2	Fuel Flow	
	MW	%	F	F	F	F	%	kCFH	lb/hr
2/22/2019 11:03	18	11	885	552	559	556	16.9	537.0	22,554
2/22/2019 12:31	31	18	1024	559	573	566	15.9	657.0	27,594
4/16/2019 11:18	104.6	54	1135.5	575.1	592	584	14.087	1181.0	49,602
2/22/2019 13:46	106	55	1136	575	591	583	14.1	1185.0	49,770
2/22/2019 18:48	113	58	1139	576	593	585	13.9	1230.0	51,660
4/16/2019 13:29	115.3	60	1137.4	576.7	594	585	13.966	1257.6	52,819
2/22/2019 12:31	133	69	1116	579	595	587		1377.0	57,834
4/16/2019 20:04	138.3	72	1119.8	585.2	604	595	13.856	1410.0	59,220
4/16/2019 19:15	144.3	76	1116.2	583.6	602	593	13.852	1457.6	61,219
4/6/2019 21:01	155	83	1114.9	593.8	613	603	13.881	1543.8	64,840

Table 4. Miratech CO/VOC Analysis Results

	PARAMETER	Units	DESIGN BASIS	1	2	3	4	5
	CASE DESCRIPTION		CASE 12					
	GENERAL INFORMATION							
	GT Load		Base	Base	Base	Base	Base	Base
	GT Fuel Type		NG	NG	NG	NG	NG	NG
	Supplemental Firing		no	no	no	no	no	no
	DB Fuel Type		NG	NG	NG	NG	NG	NG
	Ambient Temp	°F	-	-	-	-	-	-
Turbine Outlet	Temp at Catalyst	°F	625	546	557	565	577	608
Turbine Outlet	EXHAUST CHARACTERISTICS FROM GT							
Turbine Outlet	GT Flow	lb/hr	3,875,862	1,900,800	1,908,000	2,073,600	2,390,400	3,315,600
Turbine Outlet	Gas Composition	% vol						
Turbine Outlet	O_2		10.93	15.91	13.78	13.07	12.52	11.94
Turbine Outlet	H_2O		9.23	6.17	8.30	9.01	9.56	10.14
Turbine Outlet	N_2		74.31	73.63	73.63	73.63	73.63	73.63
Turbine Outlet	CO_2		4.60	3.36	3.36	3.36	3.36	3.36
Turbine Outlet	Ar		0.93	0.93	0.93	0.93	0.93	0.93
Turbine Outlet	Total		100.00	100.00	100.00	100.00	100.00	100.00
Turbine Outlet	MW	lb/lb-mole	28.36	28.67	28.37	28.27	28.19	28.11
Turbine Outlet	Flow Rate (wet)	scfh	51,793,317	25,128,111	25,488,586	27,799,194	32,133,673	44,698,272
Turbine Outlet	Flow Rate (dry)	scfh	47,012,794	23,578,809	23,373,814	25,293,299	29,060,610	40,167,211
Turbine Outlet	O_2 Concentration Dry	%	12.04	16.96	16.03	14.36	13.84	13.29
Predicted CO	CO EMISSIONS AT CATALYST OUTLET - Predicted							
Predicted CO	CO Destruction Predicted		93.4	97.8	97.8	97.5	96.9	94.8
Predicted CO	CO as ppmvd at 15% O_2		0.1	16.7	13.0	26.8	1.3	0.2
Predicted CO	CO Flow	lb/hr	0.80	19.44	22.36	55.45	3.35	0.77
Predicted VOC	VOC EMISSIONS AT CATALYST OUTLET - Predicted							
Predicted VOC	VOC Destruction Predicted		75.1	81.4	81.7	81.1	80.0	76.9
Predicted VOC	VOC as ppmvd at 15% O_2		1.03	38.98	22.06	51.03	0.17	0.18
Predicted VOC	VOC Flow	lb/hr	3.57	25.9	21.7	60.4	0.2	0.4
	ADDITIONAL DATA							
	SO_2 Inlet Concentration	ppm	<0.9	<0.10	<0.11	<0.12	<0.13	<0.14
	SO_2 to SO_3 Conversion Expected	%	8.1	8.7	8.9	8.7	8.4	8.0
	NO to NO_2 Conversion	%	28.6	27.5	28.1	28.2	28.3	27.5
	Required Pressure Drop	"H_2O	3.0	n/a	n/a	n/a	n/a	n/a
	Expected Pressure Drop	"H_2O	2.3	1.0	1.0	1.1	1.3	1.9

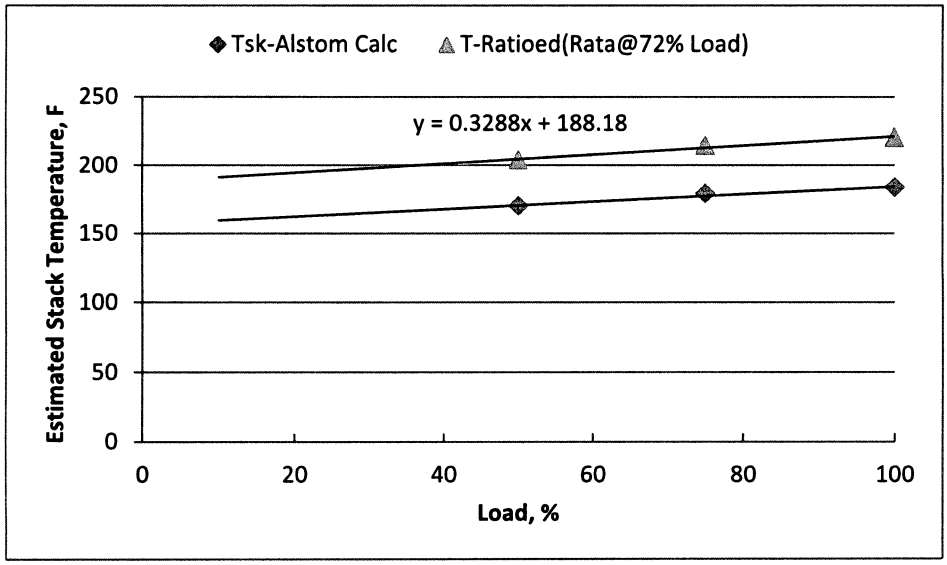


Figure 1. Estimated Stack Temperatures

Reference 7 1/2

Reply Delete Junk Block ···

RE: Maximum Hourly Commissioning Emissions for the MGS facility

CP

Chris Perri <CPerri@aqmd.gov>
Tue 6/4/2019 4:57 PM
To: You
Cc: Reyes, Claudia; Kigerl, Sean

Hi Krishna

I believe the document you have shows the final emissions estimates. To my knowledge, the emissions were not recalculated at a later date.

Chris Perri
Air Quality Engineer
South Coast Air Quality Management District
(909) 396-2696

From: krishna Nand [mailto:krishnanand44@msn.com]
Sent: Tuesday, June 4, 2019 2:33 PM
To: Chris Perri <CPerri@aqmd.gov>
Cc: Reyes, Claudia <CSReyes@burbankca.gov>; Kigerl, Sean <SKigerl@burbankca.gov>; krishna Nand <krishnanand44@msn.com>
Subject: Maximum Hourly Commissioning Emissions for the MGS facility

Hi Chris,

I am trying to obtain the document which provides the final maximum hourly commissioning emissions used for permitting the MPP facility (original permit). The latest document I have is the Attachment C , Engineering Evaluation dated 4/3/2002, Application Number 386305 (master file); copy attached. I am wondering if you have any other document which was prepared after 4/3/2002. I think the FDOC may be the final document. I will appreciate if you could please help us in obtaining the latest document or provide us the maximum hourly CO, NOx, and VOC emissions during the commissioning period.

Thanks for your help.

Krishna Nand

Reply Reply all Forward

Revised Appendix C - Commissioning Period Emissions

PAGES 57	PAGE 50	A/N 386305
BY KJB	DATE 3/14/02	

Commissioning Period Emission Factors

Task	Total Gas turbine Starts per Task	Total Heat Input (MMbtu)	Total Hours	Avg. Load (%)	CO (lbs/task)	NOx (lbs/task)	VOC (lbs/task)	CO Emission Factor (lbs/MMscf)	NOX Emission Factor (lbs/MMscf)	VOC Emission Factor (lbs/MMscf)
1. First Fire	1 cold start	4,940	3	10	1,210	774	69	250	160	14
2. Install SCR Catalyst	1 warm start	2,187	0	0	505	227	58	236	106	27
3. Full Speed No Load	1 cold start and 1 warm start	8,858	8	10	2,441	1,585	123	281	183	14
4. Emission/Pulsation Tune	1 warm start and 1 hot start	10,745	8	40	2,167	317	166	206	30	16
5. Low Load	1 warm start and 1 hot start	6,072	4	20	1,015	964	143	171	162	24
Low Load Avg. EF								**228**	**120**	**17**
6. Steam Blows	1 cold start and 1 warm start	223,443	110	100	3,492	1,828	1,386	16	8	6
7. Condenser Bypass Test	1 cold start and 1 warm start	22,200	10	100	1,413	764	173	65	35	8
8. STG Commissioning	1 cold, 1 warm, and 1 hot	99,922	72	70	1,965	1,320	303	20	13	3
First Month Emissions					**14,208**	**7,779**	**2,421**			
9. Power Train Optimization	1 warm startup	58,985	40	80	725	600	125	13	10	2
10. Full Load Performance	2 warm starts and 1 hot start	631,124	367	100	4,133	4,401	1,215	7	7	2
11. Full Load Rejection Testing	1 warm start and 1 hot start	15,573	6	100	1,090	369	171	71	24	11
12. Full Load Run Back	1 cold, 1 warm, and 1 hot	22,222	8	100	1,946	821	271	89	38	12
High Load Avg. EF								**14**	**10**	**3**
Totals		1,106,271	636		**22,102**	**13,970**	**4,203**			

Comments

NOx emissions during low load portion assumed to be uncontrolled

NOx emissions during > 40% load portion assumed to be controlled to 2 ppmdv at 15% O2

Maximum NOx (lb/hr) Emission = 1,585/8
= 198.1

VOC (lb/hr) Emission = 143/4
= 35.8

Reference 7 2/2

References

TABLE 19-2—F FACTORS FOR VARIOUS FUELS[1]

Fuel Type	F_d		F_w		F_c	
	dscm/J	dscf/10^6 Btu	wscm/J	wscf/10^6 Btu	scm/J	scf/10^6 Btu
Coal:						
Anthracite[2]	2.71×10^{-7}	10,100	2.83×10^{-7}	10,540	0.530×10^{-7}	1,970
Bituminus[2]	2.63×10^{-7}	9,780	2.86×10^{-7}	10,640	0.484×10^{-7}	1,800
Lignite	2.65×10^{-7}	9,860	3.21×10^{-7}	11,950	0.513×10^{-7}	1,910
Oil[3]	2.47×10^{-7}	9,190	2.77×10^{-7}	10,320	0.383×10^{-7}	1,420
Gas:.						
Natural	2.34×10^{-7}	8,710	2.85×10^{-7}	10,610	0.287×10^{-7}	1,040
Propane	2.34×10^{-7}	8,710	2.74×10^{-7}	10,200	0.321×10^{-7}	1,190
Butane	2.34×10^{-7}	8,710	2.79×10^{-7}	10,390	0.337×10^{-7}	1,250
Wood	2.48×10^{-7}	9,240			0.492×10^{-7}	1,830
Wood Bark	2.58×10^{-7}	9,600			0.516×10^{-7}	1,920
Municipal	2.57×10^{-7}	9,570			0.488×10^{-7}	1,820
Solid Waste						

[1] Determined at standard conditions: 20 °C (68 °F) and 760 mm Hg (29.92 in Hg)
[2] As classified according to ASTM D 388.
[3] Crude, residual, or distillate.

TABLE 19-3—VALUES FOR $T_{0.95}$*

n[1]	$t_{0.95}$	n[1]	$t_{0.95}$	n[1]	$t_{0.95}$
2	6.31	8	1.89	22–26	1.71
3	2.42	9	1.86	27–31	1.70
4	2.35	10	1.83	32–51	1.68
5	2.13	11	1.81	52–91	1.67
6	2.02	12–16	1.77	92–151	1.66
7	1.94	17–21	1.73	152 or more	1.65

[1] The values of this table are corrected for n-1 degrees of freedom. Use n equal to the number (H) of hourly average data points.

METHOD 20—DETERMINATION OF NITROGEN OXIDES, SULFUR DIOXIDE, AND DILUENT EMISSIONS FROM STATIONARY GAS TURBINES

1. *Principle and Applicability*

1.1 Applicability. This method is applicable for the determination of nitrogen oxides (NO_X), sulfur dioxide (SO_2), and a diluent gas, either oxygen (O_2) or carbon dioxide (CO_2), emissions from stationary gas turbines. For the NO_X and diluent concentration determinations, this method includes: (1) Measurement system design criteria; (2) Analyzer performance specifications and performance test procedures; and (3) Procedures for emission testing.

1.2 Principle. A gas sample is continuously extracted from the exhaust stream of a stationary gas turbine; a portion of the sample stream is conveyed to instrumental analyzers for determination of NO_X and diluent content. During each NO_X and diluent determination, a separate measurement of SO_2 emissions is made, using Method 6, or its equivalent. The diluent determination is used to adjust the NO_X and SO_2 concentrations to a reference condition.

2. *Definitions*

2.1 Measurement System. The total equipment required for the determination of a gas concentration or a gas emission rate. The system consists of the following major subsystems:

2.1.1 Sample Interface. That portion of a system that is used for one or more of the following: sample acquisition, sample transportation, sample conditioning, or protection of the analyzers from the effects of the stack effluent.

2.1.2 NO_X Analyzer. That portion of the system that senses NO_X and generates an output proportional to the gas concentration.

2.1.3 O_2 Analyzer. That portion of the system that senses O_2 and generates an output proportional to the gas concentration.

2.1.4 CO_2 Analyzer. That portion of the system that senses CO_2 and generates an output proportional to the gas concentration.

2.1.5 Data Recorder. That portion of the measurement system that provides a permanent record of the analyzer(s) output. The data recorder may include automatic data reduction capabilities.

2.2 Span Value. The upper limit of a gas concentration measurement range that is specified for affected source categories in the applicable part of the regulations.

2.3 Calibration Gas. A known concentration of a gas in an appropriate diluent gas.

2.4 Calibration Error. The difference between the gas concentration indicated by the measurement system and the known concentration of the calibration gas.

Reference 9 1/4

ORDER NO. 02-0305-03

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION
OF THE STATE OF CALIFORNIA

APPLICATION FOR CERTIFICATION OF THE MAGNOLIA POWER PROJECT BY SOUTHERN CALIFORNIA PUBLIC POWER AUTHORITY	**DOCKET NO. 01-AFC-6** APPLICATION ACCEPTED SEPTEMBER 25, 2001

COMMISSION ADOPTION ORDER

This Commission Order adopts the Commission Decision on the Magnolia Power Project. It incorporates the Presiding Member's Proposed Decision (PMPD) in the above-captioned matter and the Committee Errata issued March 4, 2003. The Commission Decision is based upon the evidentiary record of these proceedings (Docket No. 01-AFC-6) and considers the comments received at the March 5, 2003, business meeting. The text of the attached Commission Decision contains a summary of the proceedings, the evidence presented, and the rationale for the findings reached and Conditions imposed.

This ORDER adopts by reference the text, Conditions of Certification, Compliance Verifications, and Appendices contained in the Commission Decision. It also adopts specific requirements contained in the Commission Decision which ensure that the proposed facility will be designed, sited, and operated in a manner to protect environmental quality, to assure public health and safety, and to operate in a safe and reliable manner.

FINDINGS

The Commission hereby adopts the following findings in addition to those contained in the accompanying text:

1. The Magnolia Power Project is sponsored by the Southern California Public Power Authority to meet new demand in the service areas of six participating municipalities (Anaheim, Burbank, Cerritos, Colton, Glendale, and Pasadena).

2. The Conditions of Certification contained in the accompanying text, if implemented by the project owner, ensure that the project will be designed, sited, and operated in conformity with applicable local, regional, state, and federal laws, ordinances, regulations, and standards, including applicable public health and safety standards, and air and water quality standards.

3. Implementation of the Conditions of Certification contained in the accompanying text will ensure protection of environmental quality and assure reasonably safe and reliable operation of the facility. The Conditions of Certification also assure that the project will neither result in, nor contribute substantially to, any significant direct, indirect, or cumulative adverse environmental impacts.

4. Existing governmental land use restrictions are sufficient to adequately control population density in the area surrounding the facility and may be reasonably expected to ensure public health and safety.

5. The evidence of record establishes that no feasible alternatives to the project, as described during these proceedings, exist which would reduce or eliminate any significant environmental impacts of the mitigated project.

6. The evidence of the record does not establish the existence of any environmentally superior alternative site.

7. The Decision contains a discussion of the public benefits of the project as required by Public Resources Code section 25523(h).

8. The Decision contains measures to ensure that the planned, temporary, or unexpected closure of the project will occur in conformance with applicable laws, ordinances, regulations, and standards.

9. The proceedings leading to this Decision have been conducted in conformity with the applicable provisions of Commission regulations governing the consideration of an Application for Certification and thereby meet the requirements of Public Resources Code sections 21000 et seq. and 25500 et seq.

ORDER

Therefore, the Commission ORDERS the following:

1. The Application for Certification of the Magnolia Power Project as described in this Decision, is hereby approved and a certificate to construct and operate the project is hereby granted.

2. The approval of the Application for Certification is subject to the timely performance of the Conditions of Certification and Compliance Verifications enumerated in the accompanying text and Appendices. The Conditions and Compliance Verifications are integrated with this Decision and are not severable therefrom. While the project owner may delegate the performance of a Condition or Verification, the duty to ensure adequate performance of a Condition or Verification may not be delegated.

3. This Decision is final, issued, and effective within the meanings of Public Resources Code sections 25531 and 25901, as well as California Code of Regulations, title 20, section 1720.4, when voted upon by the Commission. Anyone seeking judicial review of the Decision must file a Petition for Review with the California Supreme Court no later than thirty (30) days from March 5, 2003.

4. For purposes of reconsideration pursuant to Public Resources Code section 25530 and California Code of Regulations, title 20, section 1720(a), this Decision is adopted when it is filed with the Commission's Docket Unit. Anyone seeking reconsideration of this Decision must file a petition for reconsideration no later than thirty (30) days from the date the Decision is docketed. The filing of a petition for reconsideration does not extend the 30-day period for seeking judicial review mentioned above, which begins on March 5, 2003.

5. The Commission hereby adopts the Conditions of Certification, Compliance Verifications, and associated dispute resolution procedures as part of this Decision in order to implement the compliance monitoring program required by Public Resources Code section 25532. All conditions in this Decision take effect immediately upon adoption and apply to all construction and site preparation activities including, but not limited to, ground disturbance, site preparation, and permanent structure construction.

6. The Executive Director of the Commission shall transmit a copy of this Decision and appropriate accompanying documents as provided by Public Resources Code section 25537 and California Code of Regulations, title 20, section 1768.

Dated March 5, 2003, at Sacramento, California.

WILLIAM J. KEESE
Chairman

-Absent-
ROBERT PERNELL
Commissioner

ARTHUR H. ROSENFELD, Ph.D.
Commissioner

JAMES B. BOYD
Commissioner

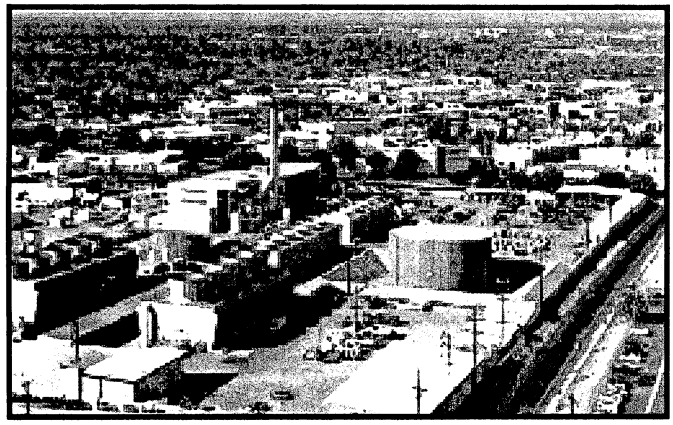
JOHN L. GEESMAN
Commissioner

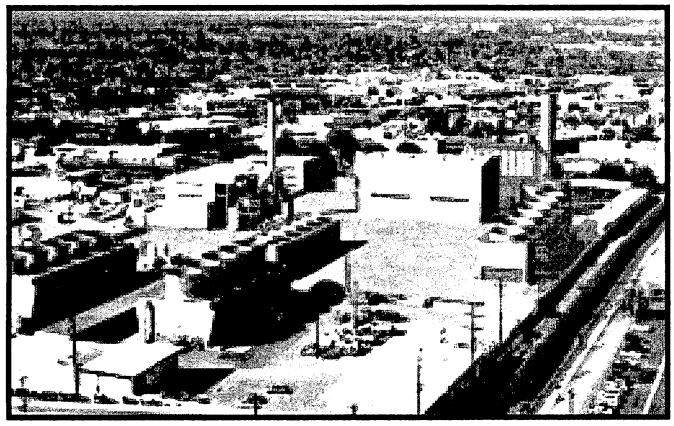
Reference 9 4/4

CALIFORNIA
ENERGY
COMMISSION

MAGNOLIA POWER PROJECT

Application For Certification (01-AFC-6)
Los Angeles County
City of Burbank





COMMISSION DECISION

MARCH 2003
P800-03-003

Gray Davis, Governor

Reference 101/2

Before the Energy Resources Conservation and Development Commission of the State of California
1516 Ninth Street, Sacramento, CA 95814
1-800-822-6228 – www.energy.ca.gov

IN THE MATTER OF:	**Order No. 17-0809-3**
MAGNOLIA POWER PROJECT	**Docket No. 01-AFC-06C**

ORDER APPROVING PETITION TO AMEND – CHANGE IN STARTUP AND SHUTDOWN OPERATION, STAFF ANALYSIS ON PETITION TO AMEND, AND ERRATA

On June 10, 2016, Southern California Public Power Authority (SCPPA), the owner of the Magnolia Power Project (MPP), submitted a petition requesting modifications to the startup and shutdown operation of the MPP including an increase in startup duration, number of startups and shutdowns, and duct burner operation. These changes would conform the Decision to actual project operations and the recently revised permit issued by the South Coast Air Quality Management District.

On June 16, 2017, Energy Commission staff filed in the docket its analysis of the petition and concluded that there would be no additional significant environmental impacts associated with the proposed changes; the facility will remain in compliance with all laws, ordinances, regulations and standards; the changes will be beneficial by enabling the MPP to better integrate with intermittent renewable energy resources and remain in compliance with applicable air quality regulations and permits; and there has been a substantial change in circumstances since the Commission's certification justifying the changes. On July 26, 2017, staff filed Errata to Air Quality Analysis of Startup and Shutdown Operation for the Magnolia Power Project to respond to comments submitted by SCPPA and provide corrections and clarifications as needed.

STAFF RECOMMENDATION

Energy Commission staff reviewed the petition, concludes that it complies with the requirements of Title 20, section 1769 (a) of the California Code of Regulations, and recommends approval of SCPPA's petition to modify the Magnolia Power Project along with changes to the project's conditions of certification as reflected in staff's analysis and errata.

ENERGY COMMISSION FINDINGS

Based on staff's analysis, the Energy Commission concludes that the proposed modifications will not result in any significant impacts to public health and safety, or to the environment. The Energy Commission finds that:

- The petition meets all the filing criteria of Title 20, section 1769 (a), of the California Code of Regulations, concerning post-certification project modifications;
- The MPP will not result in any unmitigated significant environmental impact;

- The project will remain in compliance with all applicable laws, ordinances, regulations, and standards, subject to the provisions of Public Resources Code, section 25525;
- The modifications will be beneficial because the changes will allow the facility to integrate with intermittent renewable energy resources, remain in compliance with applicable air quality regulations and permits, and there would be no significant air quality impacts related to the project and no minority or low-income populations would be significantly or adversely impacted;
- There has been a substantial change in circumstances since the Energy Commission certification justifying the modifications in that the original data used as the basis for project licensing were considered the best at the time and the proposed changes in the increase in monthly startups and shutdowns are necessary to integrate the operation of the MPP with intermittent renewable energy resources and remain in compliance with applicable air quality regulations and permits.

CONCLUSION AND ORDER

The California Energy Commission hereby adopts staff's recommendation and approves the proposed project modifications to the Commission Decision for the Magnolia Power Project, as requested in SCPPA's Petition to Amend – Change in Startup and Shutdown Operation and the changes to the project's conditions of certification as reflected in the Staff Analysis on Petition to Amend and the subsequent Errata.

IT IS SO ORDERED.

CERTIFICATION

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of an Order duly and regularly adopted at a meeting of the California Energy Commission held on August 9, 2017.

AYE: Weisenmiller, Douglas, McAllister, Hochschild, Scott
NAY: None
ABSENT: None
ABSTAIN: None

Original Signed by:

_____

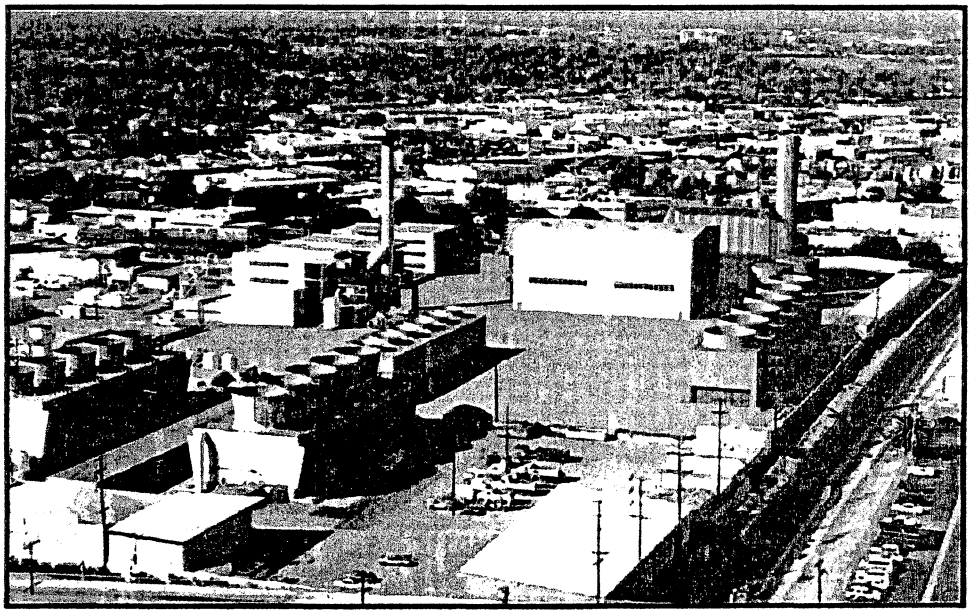
Cody Goldthrite
Secretariat

Reference 11 1/2

Final Staff Assessment

MAGNOLIA POWER PROJECT

Application For Certification (01-AFC-6)
Los Angeles County



CALIFORNIA ENERGY COMMISSION

STAFF REPORT

OCTOBER 2002
(01-AFC-6)

Gray Davis, Governor

Reference 11 2/2

AIR QUALITY Table 12
MPP Maximum Hourly Emissions, lb/hr

Operational Source (Condition)	NO_x	CO	VOC	SO_2	PM_{10}	NH_3
Combustion Turbine (Cold Start, 4.0 hr)[b]	36.25	125.0	10.0	1.31	12.0	4.76
Combustion Turbine (Warm Start, 2.1 hr)[b]	42.86	142.86	9.52	1.31	12.0	9.07
Combustion Turbine (Hot Start, 1.5 hr)[b]	33.33	190.0	13.33	1.31	12.0	7.93
Combustion Turbine (Shutdown, 0.5 hr)[b]	50.0	240.0	34.0	1.31	12.0	5.96
Combustion Turbine w/ Duct Firing (95°F)	17.24	10.49	6.00	1.71	18.0	15.93
Combustion Turbine w/o Duct Firing (41°F)	13.16	8.01	4.58	1.31	12.0	12.16
Cooling Tower[a]	---	---	---	---	1.26[a]	---

Sources: MPP 2002a, Attachment 2, SCAQMD 2002d (offset calculation emissions basis).
Note(s):
a. The Applicant has assumed a total of 0.48 lbs/hr based on Electric Power Research Institute (EPRI) test cell for a 0.0003% drift rate (MPP 2001o, page AQ-4, Table AQ-2) to determine droplet size fraction and deposition. Staff does not agree with the methodology and has revised the emission estimate to disregard the deposition assumption.
b. Maximum hourly emission rates given for starts and shutdowns are averages for the time period of each event, the actual maximum emissions in any 60 minute period may be higher.

The Applicant's cooling tower PM_{10} emission estimate includes the assumption that 38.02% (by weight) of the drift water droplet emissions are in small droplets that are "atmospherically dispersible", while 61.98% of the drift water emissions are composed of large water droplets that are deposited on-site. The maximum potential PM_{10} emissions from the cooling tower assuming that none of the emissions are deposited on-site, or that the deposited emissions are later re-entrained, is 1.26 lbs/hour. Using the Applicant's assumptions would mean that 61.98% of the particulate emissions, or as much as 3.25 tons/year, is deposited on-site. This is an equivalent of 130 50-lb bags of crushed limestone being deposited on the site each and every year. In the approximate thirty-year lifetime of the project, using the Applicants deposition assumption, a total of almost 100 tons of fine particulate (equivalent to 3,900 50-lbs bags of crushed limestone) would deposit on the site. It is the Applicant's contention (MPP 2002l, DR 198) that the regular housekeeping and the site's high walls would limit the re-entrainment of the fine particulate that they assume is deposited on-site.

The Applicant's cooling tower emissions analysis was performed using the assumptions and methodology accepted for the Blythe Energy Project. The Blythe Energy Project is located in the Mojave Desert air basin, which is in attainment for the federal PM_{10} ambient air quality standard. Therefore, the analysis done for the Blythe Energy Project did not required the level of detail that is required for the Magnolia Power Project, which is located in the South Coast air basin and is in non-attainment for both the federal and state PM_{10} ambient air quality standards. The Blythe Energy Project does not set precedence for determining cooling tower PM_{10} emissions. For many recent projects, such as the San Joaquin Valley Energy Center (01-AFC-22) and the Avenal Energy Project (01-AFC-20), cooling towers are permitted by the local agency and PM_{10} emissions and these emissions, without including a deposition fraction assumption, are included in the facility PM_{10} emissions total for offset purposes.

Reference 12

PETITION TO AMEND

CHANGE IN STARTUP AND SHUTDOWN OPERATION
MAGNOLIA POWER PROJECT
SOUTHERN CALIFORNIA PUBLIC POWER AUTHORITY
(01-AFC-6)

Submitted to:

California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Submitted by:

Magnolia Power Project, SCPPA
164 West Magnolia Boulevard
Burbank, CA 91502

May 2016

WITH ASSISTANCE FROM:

ENVIRONMENTAL MANAGEMENT PROFESSIONALS, LLC
22811 MADRONA AVENUE, TORRANCE - CALIFORNIA 90505
Tel/Fax: (310) 539-0606; e-mail: krishnanand44@msn.com

E0203R

Reference 13 1/3

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov

DATE: June 16, 2017

TO: Interested Parties

FROM: Dale Rundquist, Compliance Project Manager

SUBJECT: **Magnolia Power Project (01-AFC-6C)**
Staff Analysis on Petition to Amend

On June 10, 2016, Southern California Public Power Authority (SCPPA) filed a petition with the California Energy Commission (Energy Commission) requesting a modification to the startup and shutdown operation of the Magnolia Power Project (MPP) including an increase in startup duration, number of startups and shutdowns, and duct burner operation. These changes would conform the Decision to actual project operations and the recent revised permit issued by the South Coast Air Quality Management District (SCAQMD). In addition, the increase in monthly startups and shutdowns is necessary to integrate the operation of MPP with intermittent renewable energy resources (e.g. wind and solar). The Staff Analysis of these modifications is attached.

The MPP is a 323-megawatt (MW) natural gas fired combined-cycle electrical power generating facility located at the site of the City of Burbank (COB) power plant in Burbank, California. The power plant is built on approximately three acres of the existing 23-acre site. MPP is owned by SCPPA and operated by the COB's Water & Power (BWP) Department. The MPP was certified by the Energy Commission in March 2003, and began operation in September 2005.

Energy Commission staff (staff) reviewed the petition and assessed the impacts of this proposal on environmental quality and on public health and safety. In the Staff Analysis, staff proposes revising all Air Quality Conditions of Certification except for **AQ-35, AQ-38** and **AQ-39**. **AQ-40** will be a new condition of certification. It is staff's opinion that, with the implementation of these new and revised conditions, the facility would remain in compliance with applicable laws, ordinances, regulations, and standards (LORS), and the proposed changes to conditions of certification would not result in any significant, adverse, direct, indirect, or cumulative impacts to the environment (Title 20 Cal. Code of Regs., § 1769). Energy Commission staff intends to recommend approval of the petition at the August 9, 2017 Energy Commission Business Meeting.

The Energy Commission's webpage for this facility, http://www.energy.ca.gov/sitingcases/magnolia/index.html, has a link to the petition and the Staff Analysis on the right side of the webpage in the box labeled "Compliance Proceeding." Click on the "Documents for this Proceeding (Docket Log)" option. After the Final Decision, the Energy Commission's Order regarding this petition will also be available on the same webpage.

This notice has been mailed to the Energy Commission's list of interested parties and property owners adjacent to the facility site. It has also been e-mailed to the facility listserv. The listserv is an automated Energy Commission e-mail system by which information about this facility is e-mailed to parties who have subscribed. To subscribe, go to the Energy Commission's webpage for this facility, cited above, scroll down the right side of the project webpage to the box labeled "Subscribe," and provide the requested contact information.

Any person may comment on the Staff Analysis. Those who wish to comment on the analysis are asked to submit their comments by 5:00 p.m., July 17, 2017. To use the Energy Commission's electronic commenting feature, go to the Energy Commission's webpage for this facility, cited above, click on the "Submit e-Comment" link, and follow the instructions in the on-line form. Be sure to include the facility name in your comments. Once submitted, the Energy Commission Dockets Unit reviews and approves your comments, and you will receive an e-mail with a link to them.

Written comments may also be mailed or hand-delivered to:

California Energy Commission
Dockets Unit, MS-4
Docket No. 01-AFC-6C
1516 Ninth Street
Sacramento, CA 95814-5512

All comments and materials filed with and approved by the Dockets Unit will be added to the facility Docket Log and become publically accessible on the Energy Commission's webpage for the facility.

If you have questions about this notice, please contact Dale Rundquist, Compliance Project Manager, at (916) 651-2072, or by fax to (916) 654-3882, or via e-mail to dale.rundquist@energy.ca.gov.

For information on participating in the Energy Commission's review of the petition, please call the Public Adviser at (800) 822-6228 (toll-free in California) or send your e-mail to publicadviser@energy.ca.gov. News media inquiries should be directed to the Energy Commission Media Office at (916) 654-4989, or by e-mail to mediaoffice@energy.ca.gov.

Mail List 7070
Magnolia Power Plant List Serve

Reference 13 3/3

[Rule 1303(a)(1)-BACT; Rule 1303(b)(2)-Offset; Rule 2005]
[Devices subject to this condition: D4, D6]

Verification: The project owner shall submit test results to the District and CPM no later than 60 days following the source test date.

AQ-10 The project owner shall vent this equipment to the CO oxidation and SCR control whenever this equipment is in operation. This condition shall not apply during the turbine commissioning period.

[Rule 1303(a)(1)-BACT; Rule 1303(b)(2)-Offset; Rule 2005]
[Devices subject to this condition: D4, D6]

Verification: The project owner shall make the site available for inspection by representatives of the District, ~~CARB~~, **U.S.** EPA and the Commission.

AQ-11 The project owner shall limit emissions from this equipment as follows:

Contaminant	Emissions Limit
CO	~~7,988~~ **9,243** LBS IN ANY 1 MONTH
PM10	~~10,080~~ **9,552** LBS IN ANY 1 MONTH
VOC	~~3,638~~ **3,744** LBS IN ANY 1 MONTH
SOx	~~1,039~~ **1,022** LBS IN ANY 1 MONTH

~~For the purposes of this condition, the limit(s) shall be based on the total combined emissions from the gas turbine and duct burner.~~

The project owner shall calculate the emission limit(s) by using monthly fuel use data and the following emission factors: PM10 with duct firing 7.**98**~~89~~ lbs/MMscf, PM10 without duct firing 6.**93**~~86~~ lbs/MMscf, VOC with duct firing 2.6**9**~~3~~ lbs/MMscf, VOC without duct firing 2.6**9**~~2~~ lbs/MMscf, VOC startups 30 lbs/event, VOC shutdowns 17 lbs/event, SOx 0.75 lbs/mmscf.

~~The project owner shall calculate the emission limit(s) for CO, during the commissioning period, using fuel use data and the following emission factors:~~

~~228 lbs/MMscf during the no load and part load tests when the turbine is operating at or below 60 percent load, and 14 lbs/MMscf during the mid load and full load tests when the turbine is operating at greater than 60 percent load.~~

~~The project owner shall calculate the emission limit(s) for CO, after the commissioning period and prior to the CO CEMS certification, using fuel use data and the following emission factors: 500 lbs/event for cold startups, 300 lbs/event for warm startups, 285 lbs/event for hot startups, 120 lbs/event for shutdowns, and 4.58 lbs/MMscf for all other operations~~.

The project owner shall calculate the emission limit(s) for CO, after the CO CEMS certification, based on readings from the certified CEMS. In the event

Reference 14 1/3

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

December 30, 2020

Claudia Reyes
Sr. Env. Engineer
Burbank City, Burbank Water & Power, SCPPA (ID: 128243)
164 W. Magnolia Blvd
Burbank, CA 91502

Dear Ms. Reyes:

Enclosed is your re-issued Facility Permit for Compliance Year 2021 (January 1, 2021 – December 31, 2021). This reissuance is an Administrative Permit Revision to your RECLAIM/Title V Facility Permit and includes the Title Page, Table of Contents, and Section B (RECLAIM Annual Emission Allocations) in accordance with Rule 2002(b)(4).

Please review the enclosed Section B carefully, as it will be part of your official Facility Permit. The changes are stated below. Please note that the South Coast Air Quality Management District (South Coast AQMD) rules allow you to appeal the terms and conditions of any sections of the enclosed Facility Permit by petitioning the Hearing Board within thirty days of receipt of the permit.

We recently sent you an invoice for the annual operating renewal fee for your facility permit. This must be paid on or before the due date indicated on the invoice or your facility permit will expire due to non-payment of fees.

A. Facility Permit

The enclosed Facility Permit contains changes described as follows:

1. The revision numbers and dates of the Title Page and the Table of Contents have been updated to reflect the reissuance of the relevant permit sections.

2. Section B – RECLAIM Annual Emission Allocation

   Section B has been updated to reflect all approved RECLAIM Trading Credit (RTC) transactions approved as of December 18, 2020. Therefore, if you have submitted any RTC transactions in December, please review your records carefully to ensure that you take into account any RTC transactions that have not been approved as of that date and make necessary changes to your facility's RTC balances when reconciling your facility's emissions.

Reference 14 2/3

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178

Title Page	
Facility ID:	128243
Revision #:	26
Date:	January 01, 2021

FACILITY PERMIT TO OPERATE

BURBANK CITY,BURBANK WATER & POWER,SCPPA
164 W MAGNOLIA BLVD
BURBANK, CA 91502

NOTICE

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR A COPY THEREOF MUST BE KEPT AT THE LOCATION FOR WHICH IT IS ISSUED.

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT SHALL NOT BE CONSTRUED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF ANY OTHER FEDERAL, STATE OR LOCAL GOVERNMENTAL AGENCIES.

Wayne Nastri
Executive Officer

By _____ for
Amir Dejbakhsh
Deputy Executive Officer
Engineering and Permitting

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178

FACILITY PERMIT TO OPERATE
BURBANK CITY,BURBANK WATER & POWER,SCPPA

SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

A63.1 The operator shall limit emissions from this equipment as follows:

CONTAMINANT	EMISSIONS LIMIT
CO	Less than or equal to 9243 LBS IN ANY ONE MONTH
PM10	Less than or equal to 9552 LBS IN ANY ONE MONTH
VOC	Less than or equal to 3744 LBS IN ANY ONE MONTH
SOX	Less than or equal to 1022 LBS IN ANY ONE MONTH

The operator shall calculate the emission limit(s) by using the monthly fuel use data and the following emissions factors: PM10 with duct firing = 7.98 lb/MMscf, PM10 without duct firing = 6.93 lb/MMscf, VOC with duct ring = 2.69 lb/MMscf, VOC without duct firing = 2.69 lb/MMscf, VOC startups = 30 lb/event, VOC shutdown = 17 lb/event, SOx = 0.75 lb/MMscf.

The operator shall calculate the emission limit(s) for CO, after the CO CEMS certification based upon the readings from the AQMD certified CEMS. In the event the CO CEMS is not operating or the emissions exceed the valid upper range of the analyzer, the emissions shall be calculated in accordance with the approved CEMS plan.

For the purposes of this condition, the limit(s) shall be based on the total combined emissions from equipment D4 (Gas Turbine 1) and D6 (Duct Burner).

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D4, D6]

A195.1 The 5 PPMV NH3 emission limit(s) is averaged over 60 minutes at 15 percent oxygen, dry. The operator shall continuously record the NH3 slip concentration using the following:.