DOCKETED	
Docket Number:	03-AFC-02C
Project Title:	Los Esteros Phase II Compliance
TN #:	224569
Document Title:	Petition to Amend (PTA) the Commission Decision
Description:	The Petition to Amend (PTA) requests modification of the conditions of certification for the facility to increase the water circulation rate through the cooling tower and modification of the air quality conditions of certification to conform to the Title V Operating Permit and remove provisions that are longer applicable.
Filer:	Anwar Ali
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	8/22/2018 10:00:35 AM
Docketed Date:	8/22/2018

Los Esteros Critical Energy Facility

800 Thomas Foon Chew Way
San Jose, CA 95134

April 25, 2018

Mr. Anwar Ali
Compliance Project Manager
California Energy Commission
1516 Ninth Street,
Sacramento, CA 95814

RE: **Los Esteros Critical Energy Facility, Phase II**
Docket No. 03-AFC-2C
Amendment No. 6

Dear Mr. Ali:

Pursuant to Section 1769 of the California Energy Commission (CEC) Siting Regulations, Los Esteros Critical Energy Facility, LLC is submitting a Petition for Modification to Docket No. 03-AFC-2C ("Petition" or "Amendment 6") concurrent herewith.

The Petition requests modification of the Conditions of Certification for the facility to increase the water circulation rate through the cooling tower to a level of 90,000 gallons per minute. In addition this Petition seeks to modify the air quality conditions to conform to the Title V Operating Permit and remove provisions that are longer applicable.

If you have any questions or require additional information please contact Rosemary Silva, EHS Specialist III, at 408-361-4954.

Sincerely,

Terry Mahoney
Authorized Signatory and General Manager
Los Esteros Critical Energy Facility, LLC

CC: Katherine Piper, Calpine
Brenda Cabral BAAQMD

Application for Amendment No. 6

(03-AFC-2C)

Los Esteros Critical Energy Facility Phase 2

San Jose, California

Submitted to
California Energy Commission

Submitted by
Los Esteros Critical Energy Facility, LLC

April 2018

Contents

Attachments

Executive Summary

Los Esteros Critical Energy Facility, LLC, as project owner, petitions the California Energy Commission ("CEC" or "Commission") to amend the certification for Phase 2 of the Los Esteros Critical Energy Facility ("LECEF"). This Amendment includes the following components:

- The modification seeks to increase the water circulation rate through the cooling tower to a level of 90,000 gallons per minute (GPM). The currently permitted pump system already has the capacity to supply water circulation at the increased (proposed) rate. As such, there will be no physical modifications at the facility in order to achieve the increase in the circulation rate.
- Conform the air quality conditions to the MEC's Title V Operating Permit issued by the Bay Area Air Quality Management District (BAAQMD);
- Delete provisions associated with initial compliance testing and monitoring for the periods immediately following facility commissioning, where these conditions are no longer applicable.

Section 1.0 provides an overview of the Amendment and a review of the ownership of the project. Section 2.0 provides a complete description of the proposed modifications and the necessity for the proposed changes. Section 3.0 assesses the potential environmental effects of the proposed changes, the project's continued compliance with all laws, ordinances, regulations and standards, and the consistency of the changes with the Commission Decision certifying the facility. This assessment indicates that adoption of the Amendment will not result in any significant, unmitigated adverse environmental impacts. The project will continue to comply with all applicable laws, ordinances, regulations and standards. The findings and conclusions contained in the Commission Decision certifying Phase 2 of LECEF, as amended by the Commission's September 6, 2013 order, are still applicable to the project.

The proposed changes to the relevant Conditions of Certification are included in Section 6.0 of the Amendment.

SECTION 1.0
Introduction

1.1 Overview of Modifications

The Los Esteros Critical Energy Facility ("LECEF") is a natural gas fired power plant located in the City of San Jose. The facility was converted into a 320 MW combined-cycle plant (LECEF Phase 2). Los Esteros Critical Energy Facility, LLC, hereinafter "project owner," is a wholly-owned subsidiary of Calpine Corporation.

On December 30, 2003, the project owner filed an Application for Certification with the Commission to convert the project from a 180 MW simple-cycle plant to a 320 MW combined-cycle plant. (Order No. 06-1011-05, adopting Commission Decision in 03-AFC-2 approving LECEF Phase 2, hereinafter "Decision".) The Decision was subsequently amended, including amendment of Air Quality Conditions of Certification, by the Commission on January 2, 2011. (Order No. 11-0202-6, amending the Energy Commission Decision, Docket No. 03-AFC-2C, hereinafter "Amendment No. 4.") Changes to the Air Quality Conditions of Certification in Amendment No. 4 were made to match the conditions of the LECEF license to changes to Bay Area Air Quality Management District ("BAAQMD") emission standards, and are therefore consistent with the facility's authority to construct ("ATC") air permit. Amendment 5 on October 25, 2012, made non-substantive clarifications and administrative amendments to provisions governing monitoring and source testing to correspond with amendments to the conditions of the BAAQMD Authority to Construct that the project owner had sought.

This amendment petitions the Commission to amend the certification for LECEF Phase 2 as follows:

- Modify the cooling tower throughput rate to a level of 90,000 gpm.
- Conform the air quality conditions to the MEC's Title V Operating Permit issued by the Bay Area Air Quality Management District (BAAQMD);
- Delete provisions associated with initial compliance testing and monitoring for the periods immediately following facility commissioning, where these conditions are no longer applicable.

This Petition for Modification contains all of the information that is required pursuant to the CEC's Siting Regulations (California Code of Regulations [CCR] Title 20, Section 1769, Post Certification Amendments and Changes). The information necessary to fulfill the requirements of Section 1769 is contained in Sections 1.0 through 6.0, as summarized in Table 1.1-1.

TABLE 1.1-1
Informational Requirements for Post-Certification Modifications

Section 1769 Requirement	Section of Petition Fulfilling Requirement
(A) A complete description of the proposed modifications, including new language for any conditions that will be affected	Section 2.0—Proposed modifications Sections 3.1 to 3.15—Proposed changes to Conditions of Certification, if necessary, are located at the end of the technical section
(B) A discussion of the necessity for the proposed modifications	Section 1.3
(C) If the modification is based on information that was known by the petitioner during the certification proceeding, an explanation why the issue was not raised at that time	Section 1.3
(D) If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, an explanation of why the change should be permitted	Sections 1.4, 3.1
(E) An analysis of the impacts the modification may have on the environment and proposed measures to mitigate any significant adverse impacts	Section 3.1
(F) A discussion of the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards;	Section 3.1
(G) A discussion of how the modification affects the public	Section 4.0
(H) A list of property owners potentially affected by the modification	Section 5.0
(I) A discussion of the potential effect on nearby property owners, the public and the parties in the application proceedings.	Section 6.0

1.2 Ownership of the Facility Property

The project owner (Los Esteros Critical Energy Facility, LLC) is an affiliate of Calpine Corporation (Calpine). Calpine is an independent power developer, owner, and operator engaged in the business of owning or leasing, operating, and selling energy and capacity from electric power generation facilities.

1.3 Necessity of Proposed Changes

The Siting Regulations require a discussion of the necessity for the proposed revision to LECEF certification and whether the modification is based on information known by the

petitioner during the certification proceeding (Title 20, CCR, Sections 1769 [a][1][B] and [C]). This amendment requests approval to modify the water throughput rate of the LECEF Phase 2 cooling tower up to 90,000 gallons per minute (gpm). The facility was installed with pumps rated at 90,000 gpm, but is currently operating at the 73,000 gpm circulation rate identified by the Authority to Construct Renewal. The purpose of the modification is to optimize the current cooling tower design and increase the circulation rate to the design capacity. There are no physical modification necessary in order to achieve the increase in the circulation rate.

This Amendment also seeks to conform the air quality conditions to the LECEF's Title V Operating Permit issued by BAAQMD. LECEF proposes to modify Q-19, AQ-19c, AQ-19d, AQ-25b, and AQ-26 in order to align the condition with the existing Title V Operating Permit requirements for the facility. LECEF also proposes to modify certain definitions and additional conditions to conform to the Title V Operating Permit and BAAQMD definitions.

The Amendment proposes to delete provisions associated with initial compliance testing and monitoring for the periods immediately following facility commissioning, where these conditions are no longer applicable. The following air quality staff conditions all contain language associated with initial compliance testing following the post construction commissioning activities, all of which occurred in 2005. Thus, the following permit conditions that require initial plant startup testing are no longer needed and can be marked as "Deleted per Amendment":

- AQ-1
- AQ-2
- AQ-3
- AQ-4
- AQ-5
- AQ-6
- AQ-7
- AQ-8
- AQ-9
- AQ-10
- AQ-11

None of these changes are based on information known by the petitioner during the certification proceeding.

There are no physical modifications necessary nor are there any changes to facility emissions associated with this amendment and these modifications will not affect power plant equipment or the facility design.

Consistency of Changes with Certification

The Siting Regulations also require a discussion of the consistency of the proposed project revision with the applicable laws, ordinances, regulations, and standards (LORS) and whether the modifications are based on new information that changes or undermines the assumptions, rationale, findings, or other basis of the final decision (Title 20, CCR

Section 1769 [a][1][D]). If the project is no longer consistent with the certification, the amendment must provide an explanation why the modification should be permitted.

The proposed project revisions are consistent with all applicable LORS. This amendment is not based on new information that changes or undermines any basis for the Phase 2 Final Decision. The findings and conclusions contained in the Commission Decision for LECEC-Phase 2 (CEC-800-2005-004-CMF) are still applicable to the project, as amended.

1.4 Summary of Environmental Impacts

The CEC Siting Regulations require that an analysis be conducted to address the potential impacts the proposed modifications may have on the environment, and proposed measures to mitigate any potentially significant adverse impacts (Title 20, CCR, Section 1769 [a][1][E]). The regulations also require a discussion of the impact of the modification on the facility's ability to comply with applicable LORS (Section 1769 [1][a][F]). Section 3.0 of this Petition for Amendment includes a discussion of the potential environmental impacts associated with the modifications, as well as a discussion of the consistency of the modification with LORS. Section 3.0 also includes updated environmental baseline information if changes have occurred since the AFC that would have a bearing on the environmental analysis of the Petition for Modification. Section 3.0 concludes that there will be no significant environmental impacts associated with implementing the actions specified in the Petition for Modification and that the project as modified will comply with all applicable LORS.

1.5 Proposed Changes to the Conditions of Certification

The modification of the existing cooling tower identified in this petition would require only one (1) change to the CEC Conditions of Certification, as described in the Commission Decision for the LECEF (October 2012). The only condition that will change will be a modest increase in the water circulation rate through the cooling tower, i.e., from 73,000 gpm to 90,000 gpm. This proposed change is found in the cooling tower description, not in the actual conditions of certification, as presented below. The total dissolved solids in the water will remain unchanged.

AIR QUALITY AND PUBLIC HEALTH CONDITIONS OF CERTIFICATION

S-11 Six-Cell Cooling Tower, 90,000 ~~73,000~~ gallons per minute.

AQ-46 The owner/operator shall properly install and maintain the cooling towers to minimize drift losses. The owner/operator shall equip the cooling towers with high-efficiency mist eliminators with a maximum guaranteed drift rate of 0.0005%. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the wastewater facility shall not be higher than 6,000 ppmw (mg/l). The owner/operator shall sample and test the cooling tower water at least once per day to verify compliance with this TDS limit. (Basis: BACT, cumulative increase.)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-47 The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components which are broken or missing. Prior to the initial operation of the combined-cycle Los Esteros Critical Energy Facility, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in accordance with the manufacturer's design and specifications. Within 60 days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM10 emission rate from the cooling tower to verify compliance with the vendor-guaranteed drift rate specified in **AQ-46**. The CPM may, in years 5 and 15 of cooling tower operation, require the owner/operator to perform source tests to verify continued compliance with the vendor-guaranteed drift rate specified in **AQ-46**. (Basis: BACT, cumulative increase.)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in the fourth quarter report of each year required by Condition of Certification **AQ-34**.

PH-1: The project owner shall develop and implement a Cooling Water Management Plan to ensure that the potential for bacterial growth in cooling water is controlled. The Plan shall be consistent with either Staff's "Cooling Water Management Program Guidelines" or with the Cooling Technology Institute's "Best Practices for Control of Legionella" guidelines.

Verification: At least 30 days prior to the start of commissioning of LECEF Phase 2, the project owner shall provide the Cooling Water Management Plan to the CPM for review and approval.

The full text of the other proposed changes are set forth in Attachment 1 to this Petition.

1.6 References

California Energy Commission (CEC). 2008. Final Commission Decision on Walnut Creek Energy Park. California Energy Commission, Sacramento, California. February.

Walnut Creek Energy, LLC (WCE). 2005. Application for Certification for the Walnut Creek Energy Park. Submitted to the California Energy Commission. Submitted by Walnut Creek Energy, LLC, a wholly owned subsidiary of Edison Mission Energy.

South Coast Air Quality Management District (SCAQMD) "SC*AQMD Modeling Guidance for AERMOD"* October 2009.

SECTION 2.0
Description of Project Modifications

This section includes a description of the proposed project modifications, consistent with CEC Siting Regulations (Title 20, CCR, Section 1769 [a][1][A]).

This Petition has two purposes.

First, this Petition for Modification proposes to modify the water circulation throughput rate of the existing LECEF cooling tower.

The existing Phase 2 cooling tower is a six (6) cell design with a deck height of 45 feet and a cone height of ~49 feet. The overall length is 289 feet with a width of 49 feet, with a fan output of 1,272,185 acfm. The emissions profile for the cooling tower will change slightly, as detailed in Attachment 2.

The proposed change will occur in the equipment description text for device S-11. The proposed change seeks to increase the cooling tower water throughput rate from 73,000 to 90,000 gpm. The pump system already installed at LECEF has the capacity to supply water circulation at the increased (proposed) rate. Based on the increase in circulation rate, there will be a 1.14 tpy increase in emissions of PM10. With adherence to the Conditions of Certification, the LECEF, as modified, will not cause significant adverse impacts to the environment and will not cause environmental impacts substantially different than those addressed in the Phase 2 Final Commission Decision.

This Petition for Modification requests approval to modify the water circulation throughput rate of the existing LECEF cooling tower, as described in the Commission Decision. The purpose of the modification is to optimize cooling tower design as needed to meet the plant performance requirements of the project.

No Conditions of Certification will be changed, only the descriptive information for device S-11 contained in the Conditions of Certification is proposed to be changed. There will be no physical modifications at the facility in order to achieve the increase in the circulation rate.

Additionally, LECEF proposes to conform the conditions of certification to the terms set forth in the Project's BAAQMD issued Title V Operating Permit. Attachment 1 lists all the requested condition changes.

Environmental Analysis of Proposed Project Modifications

The proposed modifications to the LECEF would be limited to the modification of the water circulation rate of the cooling tower and additional compliance changes to air quality conditions. As a result, the environmental analysis for all of the environmental disciplines does not differ significantly from that described in the AFC, and the impacts associated with this Petition for Modification would be less than significant. The environmental analysis for the following environmental disciplines would not differ significantly from the Phase 2 AFC and Final Commission Decision for Phase 2:

- Biological Resources
- Cultural Resources
- Geology and Paleontology
- Hazardous Materials Management
- Land Use
- Noise
- Socioeconomics
- Soil and Water Resources
- Traffic and Transportation
- Visual Resources
- Waste Management
- Worker Safety and Fire Protection

For the environmental disciplines of Air Quality and Public Health, additional evaluation and verification by technical resource experts was undertaken in order to confirm that the proposed cooling tower modification would not change the environmental analysis presented in the AFC. Sections 3.1 and 3.2, below, describe the additional evaluation performed for the aforementioned two resource areas. The cooling tower modification does not require changes to the Conditions of Certification, only to the corresponding equipment description.

All the additional proposed changes herein are administrative in nature, to conform the conditions of certification to the BAAQMD issued Title V Operating Permit or to eliminate conditions that are no longer applicable to the facility. None of the proposed changes will result, directly or indirectly, in any physical changes to the environment. Therefore, none of the proposed changes will have any possible significant effects on the environment.

3.1 Air Quality

The Commission Decision determined that the LECEF would not have significant impacts on Air Quality. Pursuant to this proposed Petition for Modification, the cooling tower modifications or the additional changes are not expected to have a significant impact on Air Quality.

3.1.1 Environmental Baseline Information

This Petition for Modification only requires minor changes to the Environmental Baseline Information as described in the AFC. There have been no significant changes that would alter the analysis or conclusions for Air Quality.

3.1.2 Environmental Consequences

The proposed cooling tower modification or the additional changes are not expected to cause any significant change to air quality, as discussed in the AFC. In preparation of the LECEF AFC, no issues or significant impacts were identified for air quality in relation to the Phase 2 cooling tower.

A revised emissions and air quality impact analysis of the proposed cooling tower modification was conducted in August 2014 by Atmospheric Dynamics, Inc. in support of the BAAQMD Authority to Construct Permit for the proposed modification. This detailed analysis is presented in its entirety in Attachment 2.

Based on detailed analysis presented in Attachment 2, which addresses the existing cooling tower design and proposed increase in water circulation rate, no impacts to air quality are expected to occur. Based on the revised air quality analysis, no significant impacts to Air Quality are anticipated as a result of the proposed cooling tower modification.

3.1.3 Mitigation Measures

The impacts on air quality will be slightly increased for PM10/2.5 and HAPs as a result of the proposed cooling tower modification. These new impacts are less than significant, and will, therefore, not require additional mitigation measures. In addition, the project provided for PM10 mitigation through the surrender of SO_2 offsets at a 3:1 ratio. The PM10 mitigation was for emissions that were greater than the current facility limit (including proposed cooling tower modification) at 53.35 tpy. Thus, no additional mitigation is proposed.

3.1.4 Consistency with LORS

The proposed modifications to the LECEF cooling tower and the additional changes will remain consistent with all applicable LORS related to Air Quality.

3.1.5 Conditions of Certification

The proposed modifications to the LECEF cooling tower will not require changes to the Conditions of Certification for Air Quality. The proposed modifications to the LECEF cooling tower will only require changes to the equipment description for S-11 accompanying the Conditions of Certification.

3.2 Public Health

The Commission Decision determined that the LECEF would not have significant impacts on Public Health. Pursuant to this proposed Petition for Modification, the proposed cooling tower modifications or the additional changes, are not expected to have a significant impact on Public Health.

3.2.1 Environmental Baseline Information

This Petition for Modification does not require changes to the Environmental Baseline Information as described in the AFC. There have been no significant changes in terms of local development that would change the analysis or conclusions for Public Health.

3.2.2 Environmental Consequences

The proposed cooling tower modification is not expected to cause any significant change to Public Health, as discussed in the AFC. In preparation of the LECEF AFC, no issues or significant impacts were identified for Public Health.

In order to confirm that there would be no new issues or potential impacts associated with Public Health as it relates to the proposed cooling tower modification, both 1-hour and annual normalized emissions and impacts were assessed. The HARP2 model (Ver 2.03, ADMRT #15197) was used to assess potential health effects from the modified cooling tower. This analysis indicated the following results for the MIR/MEI receptor; cancer risk of 5.48×10^{-9}, chronic HI of 0.000347, and an acute HI of 0.0000243. The results demonstrate that there will be no significant change in the cooling towers contribution to facility wide health risk significance levels.

Based on these results, no significant impacts to Public Health are anticipated as a result of the proposed cooling tower modification or the additional changes.

3.2.3 Mitigation Measures

The impact on Public Health as a result of the proposed cooling tower modification is less than significant, and will, therefore, not require additional mitigation measures.

3.2.4 Consistency with LORS

The proposed modification to the LECEF cooling tower will remain consistent with all applicable LORS related to Public Health.

3.2.5 Conditions of Certification

The proposed modification to the LECEF cooling tower will not require changes to the Conditions of Certification for Public Health.

3.3 Other Resources

3.3.1 Biological Resources

The proposed changes in this amendment will not cause any adverse impacts to biological resources.

3.3.2 Cultural Resources

The proposed changes in this amendment will not cause any adverse impacts to cultural resources.

3.3.3 Geology and Paleontology

The proposed changes will not have any effect on geological or paleontological resources.

3.3.4 Hazardous Materials Management

The proposed changes will not have any effect or changes to the chemical inventory and/or quantities of chemicals used for the project.

3.3.5 Land Use

The proposed changes will not result in changes to the Commission Decision's condition, finding or conclusions regarding land use.

3.3.6 Noise and Vibration

The proposed changes will not result in changes to the Commission Decision's conditions, finding or conclusions regarding noise and vibration.

3.3.7 Socioeconomics

The proposed changes will have no effect on socioeconomics.

3.3.8 Soil and Water Resources

The proposed changes will not impact soil and water resources.

3.3.9 Traffic and Transportation

The proposed changes will not impact traffic and transportation.

3.3.10 Visual Resources

The proposed changes will not impact visual resources.

3.3.11 Waste Management

The proposed changes will not change or impact waste management practices or the types or quantities of waste generated by the construction or operation of the project

3.3.12 Worker Safety and Fire Protection

The proposed changes will not result in any impacts different than those analyzed by the CEC during certification, and the proposed changes do not affect the Commission Decision's conditions, findings or conclusions regarding worker safety and fire protection.

3.4 LORS

The Commission Decision certifying the LECEF project concluded that the project is in compliance with all applicable LORS. The project, as modified, will continue to comply with all applicable LORS.

SECTION 4.0
Potential Effects on the Public

This section discusses the potential effects on the public that may result from the modification proposed in this Petition for Modification application, pursuant to CEC Siting Regulations (Title 20, CCR, Section 1769[a][1][G]).

No adverse effects on the public will occur because of the changes to the project, as proposed in this Petition for Amendment. The slight increase in PM10 emissions from the cooling tower has been shown to comply with all applicable ambient air quality standards as well as all public health risk based standards. Additionally, the increase in cooling tower emissions has already been sufficiently mitigated, as the CEC previously required surrender of sufficient SO_2 ERCs to mitigate wintertime PM increases associated with an even higher annual PM limit than currently permitted for the entire project[1].

[1] The current annual emissions limit for the project is 44.24 tpy PM2.5/PM10. In comparison, the emissions limit for the proposed Phase 2 project that the CEC previously found to be mitigated through retirement of ERCs was 53.35 tpy PM.

SECTION 5.0
List of Property Owners

This section lists the property owners in accordance with the CEC Siting Regulations (Title 20, CCR, Section 1769[a][1][H]). A list of property owners within 1,000 feet of the proposed facility is included as Attachment 3. The list is provided in a format suitable for copying to mailing labels.

As described in this Amendment, there would be no significant adverse environmental impacts from the proposed changes. Therefore, no significant adverse effects on property owners would result from the adoption of the changes proposed in this Amendment.

SECTION 6.0
Potential Effects on Property Owners

This section addresses potential effects of the project changes proposed in this Petition for Modification on nearby property owners, the public, and parties in the application proceeding, pursuant to CEC Siting Regulations (Title 20, CCR, Section 1769 [a][1][I]).

The project, as modified, will not differ significantly in potential effects on adjacent land owners, compared with the project as previously proposed. The project, therefore, would have no adverse effects on nearby property owners, the public, or other parties in the application proceeding.

ATTACHMENT 1
Proposed Changes to the Air Quality Conditions of Certification

LECEF proposes to conform the conditions of certification to the terms set forth in the Project's BAAQMD issued Title V Operating Permit as follows:

Definitions

Clock Hour:	Any continuous 50-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time.
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf.
Firing Hours:	Period of time, during which fuel is flowing to a unit, measured in fifteen-minute increments.
MMBTU:	million British thermal units.
Gas Turbine Start-up Mode:	The lesser of the first 120 minutes of continuous fuel flow to the gas turbine after fuel flow is initiated or the period of time from gas turbine fuel flow initiation until the gas turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of conditions of Certification AQ-19 subparts and is in compliance with the emission limits contained in subparts (a) and (c').
Gas Turbine Shutdown Mode:	The lesser of the 30 minute period immediately prior to the termination of fuel flow to the gas turbine or the period of time from non- compliance with any requirement listed in Conditions of Certification AQ-19 subparts (a) through – (d) until termination of fuel flow to the gas turbine.
Corrected Concentration:	The concentration of any pollutant (generally NOx, CO or NH_3) corrected to a standard stack gas oxygen concentration. For a gas turbine emission point, the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis.
~~Commissioning Activities (initial startup):~~	~~All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems.~~
~~Commissioning Period (during initial startup):~~	~~The period shall commence when all mechanical, electrical, and control systems are installed and individual system completed, or when a gas turbine is first fired following the installation of the duct burners and associated equipment, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation, and has initiated sales of power to the grid. The commissioning period shall not exceed 180 days under any circumstances.~~
Alternate Calculation:	A District approved calculation used to calculate mass emission data during a period when the CEM or other monitoring system is not capable of calculating mass emissions.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate.

Equipment Description

S-11 Six-Cell Cooling Tower, ~~73,000~~ 90,000 gallons per minute with drift eliminator of 0.005% removal efficiency.

S-13 ~~Fire Pump Engine, 282hp, 2012 or later model year, John Deere Family CJDXL13.5103 or Cummins Family ACEXL0540AAB, which Los Esteros may construct at its option to replace existing S-5, Fire Pump Engine~~ **Clarke JW6H-UF40 fire pump and fire pump engine**

CONDITIONS OF CERTIFICATION

AQ-1 through **AQ-11** were associated with the initial commissioning of the facility and are no longer applicable. Please remove the condition and verification requirements.

~~**AQ-16** Notification of Commencement of Operation: The owner/operator shall notify the District of the date of anticipated commencement of turbine operation not less than 10 days prior to such date. Temporary operations under this permit are granted consistent with the District's rules and regulations. (Basis: BAAQMD 2-1-302.)~~

~~**Verification:** The owner/operators shall notify the District and CPM of the date of anticipated commencement of turbine operation not less than 10 days prior to such date.~~

AQ-23 Sulfuric Acid Mist Limit: The owner/operator shall operate the LECEF so that the sulfuric acid mist emissions (SAM) from S-1, S-2, S-3, S-4, S-7, S-8, S-9, ~~and~~ S-10 **and S-14** combined do not exceed 7 tons totaled over any consecutive four quarters. (Basis: PSD.)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-24 Operational Limits: In order to comply with the mass emission limits of this rule, the project owner shall operate the gas turbines and HRSGs so that they comply with the following operational limits:

a. Heat input limits (Higher Heating Value):

	Each Gas Turbine w/o Duct Burner	Each Gas Turbine w/Duct Burner
Hourly:	500 MM BTU/hr	639 MM BTU/hr
Daily:	12,000 MM BTU/day	15,336 MM BTU/day
Four Turbine/HRSG Power Trains combined:		18,215,000 MM BTU/year

b. Only PUC-Quality natural gas (General Order 58-a) shall be used to fire the gas turbines and HRSGs. The total sulfur content of the natural gas shall not exceed 1.0 gr/100 scf. To

demonstrate compliance with this sulfur content limit, the project owner shall sample and analyze the gas from each supply source at least ~~monthly~~ **quarterly** to determine the sulfur content of the gas, in addition to any monitoring requirements specified in condition AQ-29. ~~The owner/operator may obtain the data from the supplier each source of natural gas monthly. In this case, the data must be real data based on actual sulfur analyses performed by the supplier of natural gas and not assurances that the natural gas meets all specifications.~~ (Basis: BACT for SO2 and PM10.)

c. The project owner of the gas turbines and HRSGs shall demonstrate compliance with the daily and annual NOx and CO emission limits listed in AQ-22 by maintaining running mass emission totals based on CEM data.(Basis: Cumulative increase)

Verification: The project owner shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification AQ-34. ~~If the owner/operator uses data obtained from the source of the natural gas, then the data must demonstrate that the sulfur content is below 1.0 gr/100 scf for each day of the month the facility is in operation.~~

AQ-25 Monitoring Requirements: The owner/operator shall ensure that each gas turbine/HRSG power train complies with the following monitoring requirements:

a. The gas turbine/HRSG exhaust stack shall be equipped with permanent fixtures to enable the collection of stack gas samples consistent with EPA test methods.

b. The ammonia injection system shall be equipped with an operational ammonia flow meter accurate to plus or minus five percent at full scale and shall be calibrated at least once every twelve months and an injection pressure indicator.

c. The gas turbine/HRSG exhaust stacks shall be equipped with continuously recording emissions monitor(s) for NOx, CO and O2. Continuous emissions monitors for CO shall comply with the requirements of 40 CFR Part 60, Appendices B and F. Continuous emissions monitors for NOx and O2 shall comply with the requirements of 40 CFR Part 75. All CO, NOx and O2 monitors shall be capable of monitoring concentrations and mass emissions during normal operating conditions and during gas turbine startups and shutdowns.

d. The fuel heat input rate shall be continuously recorded using District approved fuel flow meters ~~along with quarterly fuel compositional analyses for the fuel's higher heating value (wet basis)~~.

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification AQ-15.

AQ-26 Source Testing/RATA: ~~Within ninety (90) days of the startup of the gas turbines and HRSGs, and at a minimum~~ **On** an annual basis ~~thereafter,~~ the owner/operator shall perform a relative accuracy test audit (RATA) on the CO CEMS in accordance with 40 CFR Part 60

Appendix B Performance Specifications and on the NOx and O2 CEMs in accordance with 40 CFR 75.

Source Testing: A source test shall be performed ~~on an annual basis~~ **at least once every 8,000 hours of turbine operation or once every three years.** Additional source testing may be required at the discretion of the District to address or ascertain compliance with the requirements of this permit. The written test results of the source tests shall be provided to the District within sixty days after testing. A complete protocol shall be submitted to the District no later than 30 days prior to testing, and notification to the District at least ten days prior to the actual date of testing shall be provided so that a District observer may be present. The source test protocol shall comply with the following measurements of NOx, CO, POC, and stack gas oxygen content shall be conducted in accordance with ARB Test Method 100; measurements of PM10 shall be conducted in accordance with ARB Test Method 5; and measurements of ammonia shall be conducted in accordance with Bay Area Air Quality Management District test method ST-1B. Alternative test methods, and source testing scope, may also be used to address the source testing requirements of the permit if approved in advance by the District. The ~~initial and periodic annual~~ source tests shall be conducted to show compliance with Conditions 19(a), 19(b), a9(c) and 19(d), and shall include those parameters specified in the approved test protocol, and shall at a minimum include the following:

a. NOx – ppmvd at 15% O2, and lb/MMBtu and lb/hr (as NO2)
b. Ammonia – ppmvd at 15% O2 (Exhaust)
c. CO – ppmvd at 15% O2, and lb/MMBtu and lb/hr (Exhaust)
d. POC – ppmvd at 15% O2, and lb/MMBtu and lb/hr (Exhaust)
e. PM10 – lb/hr (Exhaust)
f. SOx– lb/hr (Exhaust Based on sulfur content of fuel as measured by utility)
g. Natural gas consumption, fuel High Heating Value (HHV), and total fuel sulfur content
h. Turbine load in megawatts
i. Stack gas flow rate (DSCFM) calculated according to procedures in U.S. EPA Method 19
j. Exhaust gas temperature (˚F)
k. Ammonia injection rate (lb/hr or moles/hr)
l. Water injection rate for each turbine at S-1, S-2, S-3, & S-4
(Basis: source test requirements & monitoring)

Verification: At least 30 days prior to the date of each source test, the owner/operator shall submit a source test protocol to the District and the CPM for approval. At least 10 days prior to the testing date, the owner/operator shall notify the District and the CPM of the date of the source test. No more than ~~30~~ **60** days after the date of the source test, the owner/operator shall submit the results of the RATA and source test to the District and the CPM for approval.

AQ-27 ~~Within 120 60 days of start-up of the LECEF in combined-cycle configuration and on a semi- annual basis thereafter~~, **The** project owner shall conduct a District approved source test **at least once every 8,000 hours of turbine operation or once every three years** on exhaust points P-1, P-2, P-3, and P-4 while each Gas Turbine/HRSG power train is operating at maximum load to demonstrate compliance with the SAM emission limit specified in AQ-23. ~~The results of the initial source test must be submitted within 165 days of startup.~~ ~~Subsequen~~t **The** source test

results must be submitted within 60 days of the date of the source test. The project owner shall test for (as a minimum) SO2, SO3 evaluated as H2SO4 and sulfuric acid mist (SAM). ~~After acquiring one year of source test data on these units, the project owner may petition the District to switch to annual source testing if test variability is acceptably low as determined by the District.~~ (Basis: Regulation 2-2-306 SAM Periodic Monitoring)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification AQ-34.

AQ-32 Recordkeeping: The owner/operator shall maintain the following records. The format of the records is subject to District review and approval:
a. hourly, daily, quarterly and annual quantity of fuel used and corresponding heat input rates
b. the date and time of each occurrence, duration, and type of any startup, shutdown, or malfunction along with the resulting mass emissions during such time period
c. emission measurements from all source testing, **and** RATAs ~~and fuel analyses~~
d. daily, quarterly and annual hours of operation
e. hourly records of NOx and CO emission concentrations and hourly ammonia injection rates ~~and ammonia/NOx ratio~~
f. for the continuous emissions monitoring system; relative accuracy test audits, evaluations, calibrations, checks, maintenance, adjustments, and any period of non-operation of any continuous emissions
monitor. (Basis: record keeping.)

Verification: The owner/operators shall make access available to the facility and records upon request as set forth in Condition of Certification **AQ-15**.

AQ-34 Reporting: The owner/operator shall submit to the District a written report for each calendar quarter, within 30 days of the end of the quarter, which shall include all of the following items:

a. Daily and quarterly fuel use and corresponding heat input rates
b. Daily and quarterly mass emission rates for all criteria pollutants during normal operations and during other periods (startup/shutdown, breakdowns)
c. Time intervals, date, and magnitude of excess emissions
d. Nature and cause of the excess emission, and corrective actions taken
e. Time and date of each period during which the CEM was inoperative, including zero and span checks, and the nature of system repairs and adjustments
f. A negative declaration when no excess emissions occurred
~~g. Results of quarterly fuel analyses for HHV and total sulfur content.~~

(Basis: recordkeeping & reporting)

Verification: The owner/operator shall submit to the District and the CPM for approval, written reports for each calendar quarter, within thirty (30) days of the end of the quarter. Each quarterly

report will also include, at a minimum, all required compliance documentation for the following conditions: AQ-12, 13, 19, 20, 21, 22, 23, 24, 27, 30, 31, 36, 37, 39, 40, 46, and 47. The report submitted in January of each year shall include an annual summary of the four quarterly reports of the preceding year.

~~**AQ-35 Emissions Offsets**: The owner/operator shall provide 7.5 tons of valid POC emissions reduction credits and 27.945 tons of valid NOx emission reduction credits prior to the issuance of the Authority to Construct. The owner/operator shall deliver the ERC certificates to the District Engineering Division at least ten days prior to the issuance of the Authority to Construct. (Basis: Offsets.)~~

~~**Verification:** At least 10 days prior to the issuance of the ATC, the project owner/operator shall submit all necessary ERC certificates to the District and provide copies of all documentation to the CPM at the same time.~~

AQ-45 ~~Within 120 days of initial start-up of the Los Esteros Critical Energy Facility and on a biennial (once every two years) basis thereafter,~~ **The** project owner shall conduct a District-approved source test **at least once every 8,000 hours of turbine operation or once every three years** at exhaust point P-1, P-2, P-3, or P-4 while the Gas Turbines are at maximum allowable operating rates to demonstrate compliance with AQ-44. ~~The results of the initial source test must be submitted within 165 days of initial startup. Subsequent~~ Source test results must be submitted within 60 days of the date of the source test. If three consecutive ~~biennial~~ source tests demonstrate that the ~~annual~~ emission rates for any of the compounds listed above calculated pursuant to part 435 are less than the BAAQMD Toxic Risk Management Policy trigger levels shown below, then the project owner may discontinue future testing for that pollutant.

~~Formaldehyde < 132 lb/yr~~
~~Acetaldehyde < 288 lb/yr~~
Specified PAHs < 0.18 lb/yr
Acrolein < 15.6 lb/yr
(Basis: BAAQMD 2-1-316, TRMP)

Verification: At least ~~20~~ **30** days prior to the intended source test date, the owner/operator shall submit a source testing methodology to the District and CPM for review and approval. Within ~~30~~ **60** days of the source testing date, all test results shall be submitted to the District and the CEC CPM.

AQ-47 The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components, which are broken or missing. ~~Prior to the initial operation of the combined-cycle Los Esteros Critical Energy Facility, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in accordance with the manufacturer's design and specifications. Within 60 days of~~

~~the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM_{10} emission rate from the cooling tower to verify compliance with the vendor-guaranteed drift rate specified in **AQ-46**.~~ The CPM may, in years 5 and 15 of cooling tower operation, require the owner/operator to perform source tests to verify continued compliance with the vendor-guaranteed drift rate specified in **AQ-46**. **The owner/operator shall ensure that the throughput at S11 does not exceed 90,000 gal/min.** (Basis: BACT, cumulative increase.)

Verification: The project owner/operator shall verify compliance with this Condition of Certification in the fourth quarter report of each year required by Condition of Certification **AQ-34**.

ATTACHMENT 2
Bay Area Air Quality Management District ATC Application

Application for Permit to Construct

BAAQMD Permit Modification

Los Esteros Critical Energy Facility

San Jose, California

Submitted to

Bay Area Air Quality Management District

Submitted by

Los Esteros Critical Energy Facility, LLC

Prepared by

Atmospheric Dynamics, Inc.

August 2014

Project Description

Current Site and Facilities

The Los Esteros Critical Energy Facility (LECEF) is an electric generating facility located on the northern edge of the City of San Jose in Santa Clara County. The facility began selling electricity to the grid as a 190-megawatt (MW) simple-cycle power plant in March of 2003. In January 2012, LECEF ceased operation in simple-cycle mode as part of its conversion to a 320-MW combined-cycle power plant. In a combined-cycle operation, the waste heat in the turbine exhaust is recovered to make steam in order to generate additional electric power, which increases the plant's overall efficiency. The conversion to combined-cycle operation entailed the addition of four (4) heat recovery steam generators (HRSGs) to the existing four (4) natural gas fired LM6000PC turbines, one (1) steam turbine generator and one six-cell cooling tower. The old simple-cycle operation is referred to as "Phase I", and the new combined-cycle operation is referred to as "Phase II". The gas turbines were first fired in combined-cycle configuration in May 2013 and the Phase II project became commercially operational in September 2013.

The LECEF is located within a 34-acre project site that includes the 21-acre fenced area of the power plant. The project address is 800 Thomas Foon Chew Way in San Jose, California. South of the project parcel is State Route (SR) 237. To the east is agricultural land, and further east is Coyote Creek. To the north is agricultural land, San Jose/Santa Clara Water Pollution Control Plant (WPCP) buffer land that is open space, and further north are the WPCP sludge drying yards and ponds. To the west is undeveloped WPCP buffer land. Zanker Road runs north-south about 2,500 feet west of the LECEF. Access to the LECEF, as well as the SVP and PG&E electrical transmission facilities, is via the 2,700 foot-long Thomas Foon Chew Way from Zanker Road, with each facility having controlled access along this route.

In accordance with the Bay Area Air Quality Management District (BAAQMD) Regulation 2, Rule 2, Section 206, the facility currently meets the requirements of Best Available Control Technology (BACT) with the following limits:

- NO_x 2.0 ppm
- CO 2.0 ppm
- POC 1 ppm
- TSP/PM10/PM2.5/SO_2 exclusive use of pipeline quality natural gas
- TSP/PM10/PM2.5 from the cooling tower 0.0005% drift eliminators

Project Equipment Specifications

The Authority to Construct Renewal authorized construction of Source S-11, a six-cell cooling tower, with a permitted circulation rate of 73,000 gallons per minute (GPM). The actual operating capacity of the circulation pumps installed as part of the Phase II construction is 90,000 GPM. The facility is currently operating at the 73,000 GPM circulation rate identified by the Authority to Construct Renewal and is requesting an increase in circulation rate to the design

capacity of 90,000 GPM.[1] There will be no physical modifications at the facility in order to achieve the increase in the circulation rate.

Emissions Evaluation

Facility Emissions

Emissions of particulate matter, i.e., total suspended particulate (TSP), particulate matter less than 10 microns (μm) in diameter (PM10) and particulate matter less than 2.5 μm in diameter (PM2.5) are conservatively estimated by assuming that all total dissolved solids (TDS) contained within the cooling water become particulate matter (PM) upon exiting the top of the cooling tower. Accordingly, the PM emissions from the cooling tower are calculated as a function of the cooling tower's maximum permitted TDS concentration (6,000 parts per million by weight (ppmw)), the permitted maximum water droplet "drift" rate of 0.0005% and the circulation rate (73,000 GPM), as reflected by the source description.[2] Because the requested change would increase the cooling tower circulation rate, it is assumed to result in an increase in PM10/PM2.5, as well as certain listed toxics present within the source of cooling water (ammonia, nickel, and zinc). No changes to any of the existing emission limits on either a short-term or long-term (annual) basis will occur for any permitted equipment at the site as a result of the proposed increase in circulation rate (i.e., the proposed project will not cause an increase in the actual emissions of the natural gas turbines and HRSGs). As such the analysis contained herein only addresses emissions, impacts, and regulatory applicability of PM10, PM2.5 and toxics from the proposed increase in the circulation rate of the cooling tower. Emissions of PM, PM10 and PM2.5 were conservatively assumed to be equal to one another for purposes of this analysis.

The existing permitted emissions for the entire facility are summarized in Table 1.

Table 1 Annual Emissions Limits for LECEF (All Sources)

Pollutant	NO_x	POC	PM10/PM2.5	CO	SO_2
Annual Emission Limit (Tons/Year)	95.21	12.31	44.24	53.44	6.45

The project will not add or delete cells from the cooling tower nor will the project increase or decrease the current fan capacity or air flow rates for any of the cells in the existing tower. The circulation rate will be increasing slightly. The project is not proposing any change in the current 6,000 ppm TDS limit. Table 2 presents a summary of the current emissions from the cooling tower, while Table 3 shows the proposed emissions as well as the emissions increases resulting from the cooling tower increase in circulation rate. The emission calculations in Tables 2 and 3 use the AP-42 emission factor method for the cooling tower, where the calculated PM

[1] Because the Major Facility Review (Title V) Permit, Facility #B3289, identifies the 73,000 GPM capacity at Table II-A, a corresponding amendment to the Title V Permit is being requested, for processing by the BAAQMD along with pending unrelated requests for minor amendment to the Title V Permit.

[2] Source test data for emissions of PM10/PM2.5 obtained from other recently constructed cooling towers within BAAQMD's jurisdiction indicate emissions of PM10/PM2.5 orders of magnitude lower than the potential emissions estimated in this manner.

emissions are based on the total TDS in the water, 73,000 gpm circulation rate, and the maximum guaranteed drift rate of 0.0005%.

Table 2

Current Six Cell Cooling Tower Emissions

Pollutant	Lbs/hr	Lbs/day	TPY
PM10/PM2.5	1.09	26.27	4.79
Ammonia	2.19-05	5.25e-04	9.59e-05
Nickel	3.47e-06	8.33e-5	1.52e-05
Zinc	8.39e-05	2.01e-03	3.675e-04

Basis:
1. 6 cell tower total
2. 6000 ppm TDS limit
3. 73,000 GPM
4. Drift eliminator rating: 0.0005%
5. Drift: 182.4 lbs/hr
6. 8760 hrs/yr

Table 3

Proposed Project Emissions (Cooling Tower Only)

	Post-Circulation rate increase Emissions			Post-Circulation Rate Increase Emissions Increases		
Pollutant	Lbs/hr	Lbs/day	TPY	Lbs/hr	Lbs/day	TPY
TSP/PM10/2.5	1.35	32.39	5.93	0.26	6.24	1.14
Ammonia	2.7e-05	6.48e-04	1.18e-04	5.1e-06	1.22e-04	2.24e-05
Nickel	4.27e-06	1.03e-04	187e-05	8.0e-07	1.92e-05	3.50e-06
Zinc	1.03e-04	2.47e-03	4.51e-04	1.91e-05	4.58e-04	8.37e-05

Basis:
1. 6 cell tower total
2. 6000 ppm TDS limit
3. 90,000 GPM
4. Drift eliminator rating: 0.0005%
5. Drift: 224.9 lbs/hr
6. 8760 hrs/yr

Per Table 4, the project will not result in emissions that will exceed BAAQMD PSD significance thresholds for any criteria pollutant. Emissions of PM10/2.5 from the proposed project will not

exceed the BAAQMD thresholds defining a major source for purposes of New Source Review (NSR) or Prevention of Significant Deterioration (PSD).[3]

Table 4 BAAQMD NSR/PSD Significant Emissions Thresholds		
Pollutant	Cumulative Increase (tons/yr)	Major NSR/PSD Source
PM10/PM2.5	1.14	No

The emissions calculations presented in the application represent the highest potential emissions. As stated previously, the cooling tower will be equipped with high efficiency drift eliminators rated at 0.0005%. The drift eliminators meet all current BAAQMD and EPA BACT requirements.

The projected change in permitted emissions between the existing facility and the proposed modification are summarized in Table 5.

Table 5 LECEF Revised Annual Emissions (All Sources)					
Permit Limits in ton/year	NO_x	POC	PM10/PM2.5	CO	SO_2
Existing Facility	95.21	12.31	44.24	53.44	6.45
After the Proposed Modification	95.21	12.31	45.38	53.44	6.45
Difference	0	0	+1.14	0	0

*PM10 emissions are equal to PM2.5 and TSP. The cooling tower emissions will increase from 4.79 tpy to 5.93 tpy.

The applicant has prepared an air quality emissions and impact analysis to comply with the BAAQMD and the California Energy Commission (CEC) regulations. The modeling analysis includes impact evaluations for those pollutants shown in Table 3 as well as the CEC requirements for evaluation of project air quality impacts.

[3] Because the cooling tower constitutes a "new emissions unit" according to 40 C.F.R. § 52.21(b)(7)(ii), baseline actual emissions for purposes of determining applicability of PSD are deemed to equal the cooling tower's potential to emit. *See* 40 C.F.R. § 52.21(b)(48)(iii).

Greenhouse Gas Emissions

The increase in circulation rate at the cooling tower does not affect actual or potential GHG emissions.

NSR Facility Status

BAAQMD regulations 2-2-215, 302 and 303 requires LECEF to provide emission offsets (emissions reduction credits, or ERCs) when emissions exceed specified levels on a pollutant-specific basis. Section 2-2-303 requires emissions offsets for emissions increases at facilities that emit more than 100 tpy of PM10. (Under proposed amendments to Regulation 2-2-303, PM2.5 would need to be offset only if the total emissions from the facility exceed 100 tpy. While the proposed amendments have been adopted by BAAQMD, they will not become effective until approved by the U.S. EPA.) As facility emissions of PM10 and PM2.5 are below 100 tpy, no emissions offsets for either PM10 or PM2.5 are or will be required.

Currently, the BAAQMD air basin is attainment/unclassified for PM10, and is administratively non-attainment for PM2.5. Emissions calculations and support data on the facility are presented in Appendix A. Based upon the annual emissions presented in Table 4, Proposed Cooling Tower Modification, the facility will not trigger the PSD or major source program requirements for any attainment pollutant, including TSP.

Hazardous Air Pollutants

See the Public Health section, for a detailed discussion and quantification of HAP emissions from the Project and the results of the health risk assessment.

Construction

There will be no construction associated with the increase in the circulation rate of the cooling tower.

Best Available Control Technology Evaluation

Current Facility Control Technologies

Table 7, BACT Values for Wet Cooling Towers, summarizes the control technologies currently proposed for use on the cooling tower.

Table 7
BACT Values for Wet Cooling Towers

Pollutant	BACT Emissions Rate	Proposed BACT
TSP, PM10/PM2.5	1.35 lbs/hr	**0.0005% drift rate**

Source: CARB, BAAQMD, SDAPCD, SJVUAPCD, and BAAQMD BACT Guidelines. Calpine, 2013.

Proposed Best Available Control Technology

Table 8 presents the proposed BACT for the Wet Cooling Tower.

Table 8 Proposed BACT for the Modified Cooling Tower			
Pollutant	**Proposed BACT Emissions Level**	**Proposed BACT System(s)**	**Meets Current BACT Requirements**
TSP, PM10/ PM2.5	1.35 lbs/hr	High Efficiency Drift Eliminators, 0.0005%	**Yes**
Source: CARB, BAAQMD, SDAPCD, SJVUAPCD, and BAAQMD BACT Guidelines.			

Cooling Tower BACT

The proposed modification to the six (6) cell cooling tower is subject to BACT for PM10 and PM2.5 since its potential to emit (post-modification) will exceed 10 lbs/day and 5 tons/year for each pollutant. BACT for cooling towers in recent permits have been the use of high efficiency drift eliminators with a maximum draft rate of 0.0005 percent. Recent combined cycle projects in the BAAQMD have also used drift eliminators rated at 0.0005 percent. The existing six (6) cell tower already uses drift eliminators with a maximum guaranteed drift rate of 0.0005 percent. Thus, BACT for the upgraded cooling tower will be the continued use of high efficiency drift eliminators rated at 0.0005 percent. No other emissions of criteria pollutants from the cooling tower would exceed the 10 lbs/day BACT threshold and thus, BACT was only determined for TSP and PM10/PM2.5.

Air Quality Impact Analysis

This section describes the results, in both magnitude and spatial extent, of ground level concentrations resulting from the revised emissions from the cooling tower. The maximum modeled facility concentrations were added to the maximum background concentrations to calculate a total impact when appropriate (e.g., for comparison to ambient air quality standards). In addition, the increase in PM10/PM2.5 emissions from the cooling tower were compared to the applicable Significant Impact Levels (SILs). No modeling of other criteria pollutants (NO_x, CO, and SO_2) was performed as the cooling tower increase in circulation rate will not affect emissions of these pollutants.

Potential air quality impacts were evaluated based on air quality dispersion modeling, using the techniques and methods as summarized in the BAAQMD Modeling Guidelines.

Dispersion Modeling

For modeling the potential impact of the project in terrain that is both below and above stack top (defined as simple terrain when the terrain is below stack top and complex terrain when it is above stack top) the United States Environmental Protection Agency (USEPA) guideline model AERMOD (version 14134) was used as well as the latest versions of the AERMOD preprocessors to determine surface characteristics (AERSURFACE version 13016), to process

meteorological data (AERMET version 13350), and to determine receptor slope factors (AERMAP version 11103). The purpose of the AERMOD modeling analysis was to evaluate compliance with the California and federal air quality standards for PM10 and PM2.5.

AERMOD input data options are listed in the applicable sections below. Use of these options follows the USEPA and BAAQMD modeling guidance procedures. Default model option for temperature gradients, wind profile exponents, and calm processing, which includes final plume rise, stack-tip downwash, and elevated receptor terrain heights option, and all sources were modeled as rural sources.

Meteorological Data Selection

The Bay Area Air Quality Management District (BAAQMD) supplied meteorological data for the Alviso monitoring for calendar years 1999 through 2000. The Alviso data consists of hourly averages of wind speed, wind direction, sigma theta, temperature, and solar insolation. The Alviso meteorological monitoring site location is 592,747 meters east and 4,143,414 meters north in UTM Zone 10, North American Datum 1927 (NAD27) coordinates. The surface data was processed with the United States Environmental Protection Agency (USEPA) AERMOD preprocessor program AERMET based on BAAQMD recommendations. In order to perform deposition calculations, Automated Surface Observing Systems (ASOS) data from the San Jose International Airport (also supplied by BAAQMD) for relative humidity, dew point temperature, and precipitation were added to the final AERMET files. Since San Jose Airport data were missing for the first six hours of each day from 1997 until February 1998, only meteorological data for calendar years 1999 and 2000 were processed. Upper air data were downloaded from the National Oceanic and Atmospheric Administration radiosonde website for Oakland International Airport for the same time period for input to AERMET to determine wind profile characteristics.

AERSURFACE (version 13016) uses U.S. Geological Survey (USGS) National Land Cover Data 1992 archives (NLCD92) to determine the midday albedo, daytime Bowen ratio, and surface roughness length representative. Bowen ratio is based on a simple unweighted geometric mean for the 10x10 km square area centered on the selected location while albedo is based on a simple unweighted arithmetic mean for the 10x10 km square area centered on the selected location (i.e., no direction or distance dependence for either parameter). Surface roughness length is based on an inverse distance-weighted geometric mean for upwind distances up to one (1) km (based on recent USEPA guidance) from the selected location. The circular surface roughness length area (1-km radius) can be divided into any number of sectors as appropriate (USEPA recommends that no sector be less than 30° in width).

The Alviso meteorological monitoring site location was used for the surface characteristics based on USEPA recommendations (i.e., *AERMOD Implementation Guide*, revised January 9, 2008, and the *AERSURFACE User's Guide* [EPA-454/B-08-001]). The Alviso meteorological monitoring site is 2.1 kilometers and 303° (WNW/NW) of the project site and has similar surrounding land use types, as shown later. The moisture conditions were specified by BAAQMD for each month of the years processed using the San Jose NOAA cooperative site and the percentile method specified in the AERSURFACE User's Guide. Months were assigned to each season according to BAAQMD defaults as follows: Spring = February and March; Summer = April through July; Autumn = August through October; and Winter (no snow cover) = November through January. Based on the uniformity of land uses surrounding the

meteorological monitoring and project sites, only one sector (0°-360°) was used to define surface roughness lengths. These AERSURFACE input/output parameters are shown in Table 9.

Table 9 AERSURFACE Inputs/Outputs for Use in AERMET

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Seasonal Assignments and Other Assumptions												
Season	Winter	Spring	Spring	Summer	Summer	Summer	Summer	Autumn	Autumn	Autumn	Winter	Winter
Snow	No	—	—	—	—	—	—	—	—	—	No	No
Arid	No	No	No	No	No	No	No	No	No	No	No	No
Airport	No	No	No	No	No	No	No	No	No	No	No	No
Moisture Conditions for each Month/Year (Used for Bowen Ratio)												
1999	Avg	Avg	Avg	Wet	Avg	Wet	Wet	Dry	Avg	Avg	Dry	Dry
2000	Avg	Wet	Dry	Avg	Avg	Wet	Dry	Wet	Avg	Wet	Dry	Dry
Surface Characteristics: Surface Roughness (SR, in meters), Midday Albedo, and Bowen Ration (BR, depends on moisture conditions)												
SR	0.057	0.081	0.081	0.134	0.134	0.134	0.134	0.133	0.133	0.133	0.057	0.057
Albedo	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16
1999BR	0.51	0.40	0.40	0.34	0.45	0.34	0.34	0.93	0.51	0.51	0.93	0.93
2000BR	0.51	0.31	0.76	0.45	0.45	0.34	0.84	0.36	0.51	0.36	0.93	0.93

The use of the meteorological data collected at the Alviso monitoring location would satisfy the definition of on-site data. USEPA defines the term "on-site data" to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. Specifically, the meteorological data requirement originates from the Clean Air Act in Section 165(e)(1), which requires an analysis "of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under [the Act] which will be emitted from such facility." This requirement and USEPA's guidance on the use of on-site monitoring data are also outlined in the On-Site Meteorological Program Guidance for Regulatory Modeling Applications (USEPA, 1987). The representativeness of meteorological data is dependent upon: (a) the proximity of the meteorological monitoring site to the area under consideration; (b) the complexity of the topography of the area; (c) the exposure of the meteorological sensors; and (d) the period of time during which the data are collected.

First, the meteorological monitoring site and Project location are in close proximity, at approximately the same elevation and with exactly the same topography surrounding each location. Second, the meteorological monitoring site and Project location are located roughly about the same distance and in the same orientation to significant terrain features that might influence wind flow patterns. In addition, there are no nearby (localized) significant terrain features between or surrounding the Project site and/or the meteorological monitoring site that would limit the use of the meteorological data for the proposed Project. Third, the surface characteristics roughness length, Bowen ratio, and albedo are relatively consistent throughout the

Running AERSURFACE at both the Alviso monitoring and project site locations produced similar results for Bowen ratio and albedo, based on the 10-km square area around each location, and surface roughness lengths, based on a 1-km radius. It is our assessment that the meteorological data collected at the Alviso monitoring site are identical to the dispersion conditions at the Project site and to the regional area.

Additional Model Selection

Several other USEPA models and programs were used to quantify pollutant impacts on the surrounding environment based on the emission sources operating parameters and their locations. The models used were Building Profile Input Program for PRIME (BPIP-PRIME, current version 04274), the HARP On-Ramp preprocessor, and the SCREEN3 (version 96043) dispersion model for fumigation impacts. These models, along with options for their use and how they are used, are discussed below.

- Comparison of impacts to significant impact levels.
- Compliance with state and federal ambient air quality standards (AAQS).
- Calculation of health risk impacts through the use of the HARP On-Ramp program.

Good Engineering Practice Stack Height Analysis

Formula Good Engineering Practice (GEP) stack height was calculated at 310 feet based on existing on-site and off-site structure dimensions (i.e., the air-cooled condenser) for all onsite stacks (i.e., turbines, firepump, and wet cells). The design stack heights are less than GEP stack height, thus downwash impacts were included in the modeling analysis.

BPIP-PRIME was used to generate the wind-direction-specific building dimensions for input into AERMOD. All on-site were included for analysis with BPIP-PRIME. The building location plan, located in Appendix A, shows the buildings included in the downwash analysis.

Receptor Grid Selection and Coverage

Receptor and source base elevations were determined from the U.S. Geological Survey (USGS) Digital Elevation Model (DEM) data using 10-meter spacing between grid nodes. All coordinates were referenced to UTM North American Datum 1927 (NAD27), Zone 10. The receptor locations and elevations from the DEM files will be placed exactly on the DEM nodes. Every effort was made to maintain receptor spacing across DEM file boundaries.

Cartesian coordinate receptor grids are used to provide adequate spatial coverage surrounding the Project Area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impacts locations. The receptor grids used in this analysis are listed below.

- 10-meter resolution from the Project fenceline and extending outwards in all directions 500-meters. This is called the downwash grid. In addition, receptors were placed at 10-meter intervals or less along the Project fenceline.
- 50-meter resolution that extends outwards from the edge of the downwash grid to 2 kilometers in all directions. This is referred to as the intermediate grid.
- 200-meter resolution that extends outwards from the edge of the intermediate grid to about 10 kilometers in all directions (and more if necessary to calculate the extent of any significant impact area(s)). This is referred to as the coarse grid.
- 10-meter resolution around any location on the coarse and intermediate grids where a maximum impact is modeled that is above the concentrations on the downwash grid.

- For the HARP On-Ramp program, the minimum receptor spacing was changed to 100 meter resolution due to the limitation of the number of receptors the On-Ramp program can use.

Concentrations within the facility fence-line will not be calculated.

Background Air Quality

In 1970, the United States Congress instructed the USEPA to establish standards for air pollutants, which were of nationwide concern. This directive resulted from the concern of the effects of air pollutants on the health and welfare of the public. The resulting Clean Air Act (CAA) set forth air quality standards to protect the health and welfare of the public. Two levels of standards were promulgated—primary standards and secondary standards. Primary national ambient air quality standards (NAAQS) are "those which, in the judgment of the administrator [of the USEPA], based on air quality criteria and allowing an adequate margin of safety, are requisite to protect the public health (state of general health of community or population)." The secondary NAAQS are "those which in the judgment of the administrator [of the USEPA], based on air quality criteria, are requisite to protect the public welfare and ecosystems associated with the presence of air pollutants in the ambient air." To date, NAAQS have been established for seven criteria pollutants as follows: SO_2, CO, ozone, NO_2, PM_{10}, $PM_{2.5}$, and lead.

The criteria pollutants are those that have been demonstrated historically to be widespread and have a potential to cause adverse health effects. USEPA developed comprehensive documents detailing the basis of, or criteria for, the standards that limit the ambient concentrations of these pollutants. The State of California has also established AAQS that further limit the allowable concentrations of certain criteria pollutants. Review of the established air quality standards is undertaken by both USEPA and the State of California on a periodic basis. As a result of the periodic reviews, the standards have been updated and amended over the years following adoption.

Each federal or state AAQS is comprised of two basic elements: (1) a numerical limit expressed as an allowable concentration, and (2) an averaging time which specifies the period over which the concentration value is to be measured. Table 10, State and Federal Ambient Air Quality Standards, presents the current federal and state AAQS.

Table 10
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards Concentration	National Standards Concentration
Ozone	1-hour	0.09 ppm (180 $\mu g/m^3$)	-
	8-hour	0.07 ppm (137 $\mu g/m^3$)	0.075 ppm (147 $\mu g/m^3$) (3-year average of annual 4th-highest daily maximum)
Carbon Monoxide	8-hour	9.0 ppm (10,000 $\mu g/m^3$)	9 ppm (10,000 $\mu g/m^3$)
	1-hour	20 ppm (23,000 $\mu g/m^3$)	35 ppm (40,000 $\mu g/m^3$)
Nitrogen dioxide	Annual Average	0.030 ppm (57 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)
	1-hour	0.18 ppm (339 $\mu g/m^3$)	0.10 ppm (188 $\mu g/m^3$)
Sulfur dioxide	Annual Average	-	-
	24-hour	0.04 ppm (105 $\mu g/m^3$)	-

	3-hour	-	0.5 ppm (1,300 µg/m³)
	1-hour	0.25 ppm (655 µg/m³)	-
Respirable particulate matter (10 micron)	24-hour	50 µg/m³	150 µg/m³
	Annual Arithmetic Mean	20 µg/m³	-
Fine particulate matter (2.5 micron)	Annual Arithmetic Mean	12 µg/m³	12.0 µg/m³ (3-year average)
	24-hour	-	35 µg/m³ (3-year average of 98th percentiles)
Sulfates	24-hour	25 µg/m³	-
Lead	30-day	1.5 µg/m³	-
	3 Month Rolling Average	-	0.15 µg/m³

Source: CARB website, table updated 6/4/13
µg/m³ = micrograms per cubic meter
ppm = parts per million

A brief description of health effects for PM10/2.5 is as follows.

Particulate Matter (PM_{10} and $PM_{2.5}$)—PM_{10} consists of particulate matter that is 10 microns or less in diameter (a micron is 1 millionth of a meter), and fine particulate matter, $PM_{2.5}$, consists of particulate matter 2.5 microns or less in diameter. Both PM_{10} and $PM_{2.5}$ represent fractions of particulate matter, which can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of these operations, such as demolition and construction activities, contribute to increases in local PM_{10} concentrations, while others, such as vehicular traffic, affect regional PM_{10} concentrations.

Several studies that the USEPA relied on for its staff report have shown an association between exposure to particulate matter, both PM_{10} and $PM_{2.5}$, and respiratory ailments or cardiovascular disease. Other studies have related particulate matter to increases in asthma attacks. In general, these studies have shown that short-term and long-term exposure to particulate matter can cause acute and chronic health effects. $PM_{2.5}$, which can penetrate deep into the lungs, causes more serious respiratory ailments.

Table 11, BAAQMD Attainment Status Table, presents the BAAQMD attainment status for PM10/2.5.

The nearest criteria pollutant air quality monitoring sites to the Project Site would be the stations located at San Jose-Jackson, and Cupertino. Ambient monitoring data for these sites for the most recent three-year period is summarized in Table 12, Summary of Air Quality Monitoring Data for the Most Recent 3 Year Period. Data from these sites is estimated to present a reasonable representation of background air quality for the Project Site and the facility's impact area.

Table 11
BAAQMD Attainment Status

Pollutant	Averaging Time	Federal Status	State Status
PM_{10}	All	UNC	NA
$PM_{2.5}$	All	NA	NA

Source: CARB Website, 2013 and 40 CFR 81.305.
Notes: ATT = attainment, NA = non-attainment, UNC = unclassified

Table 12 Background Air Quality Values							
Pollutant	Units	Averaging Time	NAAQS or SAAQS	Station ID	2010	2011	2012
PM10	µg/m³	24 Hour	NAAQS	San Jose-Jackson	44.2	41.3	56.5
			SAAQS		46.8	44.3	59.6
		AAM	SAAQS		18.9	18.6	18.8
		24 Hour	NAAQS	Cupertino	27.9	28.3	39.1
			SAAQS		27.4	28.9	41.5
		AAM	SAAQS		-	14.2	13.5
PM2.5	µg/m³	24 Hour	NAAQS	San Jose-Jackson	-	30.5	24.7
		AAM	NAAQS		-	9.8	9.1
			SAAQS		9.0	9.9	-
		24 Hour	NAAQS	Cupertino	-	-	-
		AAM	NAAQS		-	-	-
			SAAQS		-	-	-

Notes:

1. **NAAQS=national ambient air quality standards, SAAQS=state ambient air quality standards**
2. **Federal NAAQS PM2.5 24 hour values are the 98th percentile values.**
3. **Conversions used: pphm/100 = ppm, ppb/1000 = ppm**

Table 13, Background Air Quality Values, shows the background air quality values (converted to µg/m³ when appropriate) based upon the data presented in Table 12, Summary of Air Quality Monitoring Data for the Most Recent 3 Year Period. The background values represent the highest values reported for any site during any single year of the most recent three-year period.

Table 13 Background Air Quality Values	
Pollutant and Averaging Time	Background Value, µg/m³
PM_{10} – 24-hr	**59.6**
PM_{10} – Annual	**18.9**
$PM_{2.5}$ – 24-hr	**27.6[a]**
$PM_{2.5}$ – Annual	**9.5[b]**

[a]Regulatory-defined background for Project vicinity based on the 2010-2012 98th percentiles.
[b]3 year avg.

Modeled Impacts

Operational characteristics of the combustion turbine, such as emission rate, exit velocity, and exit temperature vary by operating load and ambient temperature and the Project will be operated over a variety of these temperature ranges. Thus, the air quality analysis considered the range of operational characteristics over a variety of ambient temperatures. The cooling tower does not exhibit the same range of operational parameters as does the turbine. Thus, in the assessment of the cooling tower impacts on PM10 and PM2.5, the worst-case turbine stack parameters were used which were based upon the previous assessments. The 59°F condition was assumed to represent annual average conditions.

Facility sources, including the four natural gas turbines, cooling tower comprised of six cells, emergency fire pump, and one chiller were assessed for comparisons with the California Ambient Air Quality Standards (CAAQS)/National Ambient Air Quality Standards (NAAQS), as necessary. Only the increase in emissions from the cooling tower were compared with the Significant Impact Levels (SILs) in order to determine if the project contributed to any violations of the ambient air quality standards.

The worst-case modeling input information for each pollutant and averaging period are shown in Table 14. As discussed above, the combustion turbine stack parameters used in modeling the impacts for each pollutant and averaging period reflected the worst-case operating condition for that pollutant and averaging period identified in the load screening analysis.

Table 14
Stack Parameters and Emission Rates for Each of the Modeled Sources

	Stack Height (m)	Stack Temp. (deg K)	Exit Vel. (m/s)	Stack Diam. (m)	Emission Rates (g/s)			
							PM10/PM2.5	
Averaging Period: 24-hours for Normal Operating Conditions								
Each Turbine/HRSG	27.432	364.67	15.45	3.467			0.378	
Fire Pump	3.048	665.37	53.34	0.1524			1.733E-4	
Cooling Tower (Each Cell)*	17.678	301.46	8.035	9.754				
Chiller	17.069	294.11	6.035	9.754				
Each Turbine/HRSG	27.432	363.67	15.62	3.467			0.378	
Fire Pump	3.048	665.37	53.34	0.1524			5.753E-5	
Cooling Tower (Each Cell)*	17.678	301.46	8.035	9.754				
Chiller	17.069	294.11	6.035	9.754				

* For comparison with the SIL, the emission increase over baseline was used at 0.00546 g/s per cell
Source: Calpine 2013.

In order to determine the magnitude and location of the maximum impacts for each pollutant and averaging period, the AERMOD model was used. Table 15, Air Quality Impact Results for Refined Modeling Analysis of Project, summarizes maximum modeled concentrations for PM10 and PM2.5 for each of the applicable averaging periods. In order to assess the significance of the modeled concentrations, the maximum concentrations were modeled and compared to the Class II PSD and BAAQMD SILs. All modeled facility pollutant concentrations, based on the project increase, are less than the SILs for those pollutants.

Maximum impacts for $PM_{10}/PM_{2.5}$ annual averages and $PM_{10}/PM_{2.5}$ 24-hour averages occurred in the 50-meter spaced intermediate grid. Therefore, additional 10-meter spaced refined receptor grids were modeled for at least these pollutants. The maximum impacts for other pollutants and averaging times NO_2 1-hour averages, CO 1-hour and 8-hour averages, and SO_2 1-hour and 3-hour averages occurred in the immediate vicinity of the facility either on the fenceline or within the downwash grid in the 10-meter-spaced receptor areas. Therefore, no additional 10-meter-spaced receptor grids in the coarse or intermediate receptor grid areas were required for these pollutants/averaging times. Again, it should be noted that the refined modeling analyses were

performed with the CCP meteorological data processed with the Project site surface characteristics based on the results of the turbine screening analyses.

The maximum modeled impacts for all pollutants and averaging times are less than all applicable significance impact levels. Therefore, the Project would not significantly affect the attainment status of any pollutant and facility impacts are considered to not be discernable from or significantly increase existing background pollutant concentrations. Total concentrations (maximum modeled impacts plus maximum background concentrations) only exceed CAAQS/NAAQS for the one pollutant and averaging time where background concentrations already equal or exceed the standards (i.e., the 24-hour PM10 CAAQS).

Table 15
Air Quality Impact Results
for Refined Modeling Analysis of Project

	Maximum Concentration ($\mu g/m^3$)
	7.256
	0.878
	6.416
	0.878

*The project increases were less than the SILs for all averaging periods. However, the total modeled impacts were still presented.
Source: Calpine, 2013.

Impacts on Soils, Vegetation, and Sensitive Species

Impacts on soils, vegetation, and sensitive species were determined to be "insignificant" for the following reasons:

- No soils, vegetation, or sensitive species were identified in the Project Area, which are recognized to have any known sensitivity to the types or amounts of air pollutants expected to be emitted by the facility.
- The facility emissions are expected to be in compliance with all applicable air quality rules and regulations.
- The facility impacts are not predicted to result in violations of existing air quality standards, nor will the emissions cause an exacerbation of an existing violation of any quality standard.

Air Quality Laws, Ordnances, Regulations, and Statutes (LORS)

Table 16, Summary LORS - Air Quality, presents a summary of federal, state, and local air quality LORS deemed applicable to the Project.

TABLE 16

Applicable Federal Laws, Ordinances, Regulations, and Standards for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Strategy
Title 40 CFR Part 50	Establishes AAQS for criteria pollutants.	EPA Region IX	LECEF will conduct a dispersion modeling analysis to determine if the project will exceed the state or federal AAQS.
Title 40 CFR Parts 51, NSR (BAAQMD Reg 2 Rule 2)	Requires pre-construction review and permitting of new or modified stationary sources of air pollution to allow industrial growth without interfering with the attainment and maintenance of ambient air quality standards.	EPA Region IX	Requires NSR facility permitting for construction or modification of specified stationary sources. The NSR requirements are implemented at the local level with EPA oversight (BAAQMD Reg 2 Rule 2).
Title 40 CFR Parts 52, PSD	The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified in areas classified as attainment, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I Areas (e.g., national parks and wilderness areas).	EPA Region IX	The PSD requirements apply on a pollutant-specific basis to any project that is a new major stationary source or a major modification to an existing major stationary source. BAAQMD classifies an unlisted source (which is not in the specified 28 source categories) that emits or has the potential to emit 250 tons per year (tpy) of any pollutant regulated by the Act as a major stationary source. For listed sources, the threshold is 100 tpy. NO_x or SO_x emissions from a modified major source are subject to PSD if the cumulative emission increases for either pollutant exceeds 40 tpy. In addition, a modification at a non-major source is subject to PSD if the modification itself would be considered a major source.

TABLE 16

Applicable Federal Laws, Ordinances, Regulations, and Standards for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Strategy
Title 40 CFR, Part 60	Establishes national standards of performance for new or modified facilities in specific source categories.	BAAQMD with EPA Region IX oversight	**Turbine:** 40 CFR Part 60 Subpart KKKK – NO_x Emission Limits for New Stationary Combustion Turbines applies to all new combustion turbines that commence construction, modification, or reconstruction after February 18, 2005. The rule requires natural-gas-fired turbines greater than or equal to 30 MW to meet a NO_x emission limit of 50 nanograms per Joule (ng/J) (0.39 pounds per megawatt-hour [lb/MW-hr]), and an SO_2 limit of 73 ng/J (0.58 lb/MW-hr). Alternatively, a fuel sulfur limit of 500 parts per million by weight (ppmw) could be met. Stationary combustion turbines regulated under this subpart would be exempt from the requirements of Subpart GG. The provisions of Subpart KKKK do not apply to the cooling tower.
Title 40 CFR, Part 60	Establishes national standards of performance for new or modified facilities in specific source categories.	BAAQMD with EPA Region IX oversight	**Emergency ICE:** 40 CFR Part 60 Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines) would apply to the diesel fire pump. The NMHC+NO_x emission limit for a model year 2009 fire pump between 175 and 300 hp would be 3.0 g/bhp, the CO emission limit would be 2.6 g/bhp, and the PM_{10} emission limit would be 0.15 g/bhp. The provisions of Subpart IIII do not apply to the cooling tower.

TABLE 16

Applicable Federal Laws, Ordinances, Regulations, and Standards for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Strategy
Title 40 CFR, Part 63	Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific categories.	BAAQMD with EPA Region IX oversight	Title 40, Code of Federal Regulations, Part 63—National Emission Standards for Hazardous Air Pollutants for Source Categories, establishes emission standards to limit emissions of hazardous air pollutants from specific source categories for Major HAP sources. Sources subject to Part 63 requirements must either use the maximum achievable control technology (MACT), be exempted under Part 63, or comply with published emission limitations. The potential NESHAPS applicable to the project are Subpart YYYY, which sets a formaldehyde emission limit or an operational limit of 91 parts per billion by volume (ppbv) for the turbines and subpart ZZZZ the NESHAPS for Stationary Reciprocating Internal Combustion Engines (RICE).
Title 40 CFR Part 64 (CAM Rule)	Establishes onsite monitoring requirements for emission control systems.	BAAQMD with EPA Region IX oversight	Title 40, Code of Federal Regulations, Part 64—Compliance Assurance Monitoring (CAM), requires facilities to monitor the operation and maintenance of emissions control systems and report any control system malfunctions to the appropriate regulatory agency. If an emission control system is not working properly, the CAM rule also requires a facility to take action to correct the control system malfunction. The CAM rule applies to emissions units with uncontrolled potential to emit levels greater than applicable major source thresholds. Emission control systems governed by Title V operating permits requiring continuous compliance determination methods are generally exempt from the CAM rule. This provision does not apply to the cooling tower project.

TABLE 16

Applicable Federal Laws, Ordinances, Regulations, and Standards for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Strategy
Title 40 CRF part 70 (BAAQMD Reg 2, Rule 6)	CAA Title V Operating Permit Program	BAAQMD with EPA Region IX oversight	Title 40, Code of Federal Regulations, Part 70—Operating Permits Program, requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. The requirements of 40 CFR, Part 70 apply to facilities that are subject to NSPS requirements and are implemented at the local level through BAAQMD Reg 2, Rule 6. According to Reg 2, Rule 6, a facility would be considered a Major Facility if the facility had a potential to emit greater than 100 tpy on a pollutant specific basis or the HAP PTE is greater or equal to 25 tpy for combined HAPs and 10 tpy for individual HAPs.
Title 40 CFR part 72 (BAAQMD Reg 2, Rule 7)	CAA Acid Rain Program	BAAQMD with EPA Region IX oversight	Title 40, Code of Federal Regulations, Part 72—Acid Rain Program, establishes emission standards for SO_2 and NO_x emissions from electric generating units through the use of market incentives, requires sources to monitor and report acid gas emissions, and requires the acquisition of SO_2 allowances sufficient to offset SO_2 emissions on an annual basis. This program is implemented through BAAQMD's Reg 2, Rule 7. This provision does not apply to the cooling tower project.

TABLE 16
Applicable State Laws, Ordinances, Regulations, and Standards for the Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Strategy
California Code of Regulations, Section 41700	Prohibits emissions in quantities that adversely affect public health, other businesses, or property.	BAAQMD with ARB oversight	The CEC conditions of exemption and the air quality management district (AQMD) ATC processes are developed to ensure no adverse public health affects or public nuisances result from operation of the Project.
California Code of Regulations Sections 93115 (Diesel ATCM)	The purpose of the airborne toxics control measure (ATCM) is to reduce diesel particulate emissions from stationary diesel fired compression engines.	BAAQMD with ARB oversight	This provision does not apply to the cooling tower project.
California Assembly Bill 32 - Global Warming Solutions Act of 2006 (AB32)	The purpose is to reduce carbon emissions within the state by approximately 25% by the year 2020.	ARB with support from BAAQMD and other agencies	This provision does not apply to the cooling tower project.

Table 16

Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Assessment
BAAQMD Reg 1, Section 301 (Public Nuisance)	Prohibits the emissions of air contaminants or other material which create a public nuisance.	BAAQMD	The CEC conditions of exemption and the BAAQMD ATC process is designed to ensure that the operation of the Project will not cause a public nuisance.
BAAQMD Regulation 2, Rule 2 (Permits – NSR)	Purpose of this Rule is to provide for the review of new and modified sources and provide mechanisms, including the use of Best Available Control Technology (BACT), Best Available Control Technology for Toxics (TBACT), and emission offsets, by which authorities to construct such sources may be granted.	BAAQMD	Applicability: As part of the NSR permit approval process, an air quality dispersion analysis must be conducted using a mass emissions-based analysis contained in the rule or an approved dispersion model, to evaluate impacts of increased criteria pollutant emissions from any new or modified facility on ambient air quality. BACT shall be applied to all new and modified sources with a potential to emit 10 pounds or more of any of the following: POC, NPOC, NO_x, SO_2, PM_{10} or CO. (BAAQMD 2-2-301). Compliance: The existing ATC renewal requires use of high efficiency drift eliminators with a maximum guaranteed drift rate of 0.0005%. Use of high efficiency drift eliminator will continue to be required to achieve BACT. No offsets are required, as the facility does not have emissions in excess of 100 tpy.
BAAQMD Regulation 2, Rule 3 (Permits – ATC and Permit to Operate [PTO] for Power Plants)	The purpose of this rule is to outline the special permitting provisions for the construction of power plants within the District.	BAAQMD	In conjunction with the submittal of the AFC to the CEC, LECEF will work with the BAAQMD to provide the information needed for the issuance of a ATC. As stated in this rule, the review will be conducted as outlined in Regulation 2, Rule 2.
BAAQMD Regulation 2, Rule 5 (Permits – Toxics NSR)	The purpose of this rule is to provide for the review of new and modified sources of TAC emissions in order to evaluate potential public exposure and health risk, to mitigate potentially significant health risks resulting from these exposures, and to provide net health risk benefits by improving the level of control when existing sources are modified or replaced.	BAAQMD	TBACT shall be applied to any new or modified source of TACs where the source risk is a cancer risk greater than 1.0 in a million (10^{-6}), and/or a chronic hazard index greater than 0.20. An ATC or PTO will be denied if the facility cancer risk exceeds 10 in a million, or the facility chronic hazard index exceeds 1.0, or the facility acute hazard index exceeds 1.0. The Public Health section presents the results of the facility risk assessment, which shows compliance with all applicable AQMD significance values.

Table 16

Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Assessment
BAAQMD Regulation 2, Rule 6 (Permits – Title V)	The purpose of this rule is to implement the operating permit requirements of Title V of the CAA as amended in 1990.	BAAQMD with EPA Oversight	See Federal, Title 40 CFR, Part 70 to review applicability and the compliance assessment.
BAAQMD Regulation 2, Rule 7 (Permits – Acid Rain)	The purpose of this rule is to incorporate by reference the provisions of 40 CFR Part 72 for purposes of implementing an acid rain program that meets the requirements of Title IV of the CAA.	BAAQMD with EPA Oversight	This provision does not apply to the cooling tower project.
BAAQMD Regulation 6 (Particulate Matter and Visible Emissions)	Purpose of this Regulation is to limit the quantity of particulate matter in the atmosphere through the establishment of limitations on emission rates, concentration, visible emissions, and opacity.	BAAQMD	Exhaust emissions shall not be darker than No. 1 when compared to the Ringleman Chart for any period(s) aggregating 3 minutes in any hour, exceed the opacity standard of not greater than 20 percent for a period or periods aggregating 3 minutes in any hour, or exceed the 0.15 grains per dry standard cubic feet of exhaust gas volume. This provision does not apply to the cooling tower project.
BAAQMD Regulation 7 (Odorous Substances)	The purpose of this regulation is to place general limitations on odorous substances and specific emission limitations on certain odorous compounds.	BAAQMD	Emissions of odorous substances shall not remain odorous after dilution with odor-free air at a rate of 1,000 volumes of odor-free air per volume of source sample. The maximum emissions of ammonia shall not exceed 5,000 ppm. This provision does not apply to the cooling tower project.
BAAQMD Regulation 9, Rule 1	Establishes emission limits for sulfur dioxide from all sources and limits ground-level concentrations of SO_2	BAAQMD	Dispersion modeling will be conducted to determine if off-property SO_2 ground level concentrations are less than 0.5 ppm for 3 consecutive minutes, 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours. Sulfur contents in the fuel will be less than 0.5% and gas stream concentrations will be less than 300 ppm (dry). This provision does not apply to the cooling tower project.

Table 16

Applicable Local Laws, Ordinances, Regulations, Standards, and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Applicability/Compliance Assessment
BAAQMD Regulation 9, Rule 9	Purpose of this rule is to limit emissions of NO_x from stationary gas turbines.	BAAQMD	For turbines with a heat input rating greater than 500 million British thermal units per hour (MMBtu/hr) (40+ MW), NO_x emission levels shall not exceed 0.72 lb/MW-hr or 25 ppmv. This provision does not apply to the cooling tower project.
BAAQMD Regulation 10 (40 CFR Part 60)	Establishes national standards of performance for new or modified facilities in specific source categories.	BAAQMD	See Federal, Title 40 CFR, Part 60 to review applicability and the compliance assessment.

PUBLIC HEALTH

This section presents the methodology and results of a human health risk assessment (HRA) performed to assess potential impacts and public exposure associated with airborne emissions from the routine operation of the upgraded cooling tower.

Air will be the dominant pathway for public exposure to chemical substances released by the Project. Emissions to the air will consist primarily of particulate matter and very small amounts of toxics from the proposed upgraded cooling tower. Potential health risks from project emissions will occur almost entirely by direct inhalation. To be conservative, additional pathways were included in the health risk modeling, *i.e.,* soil ingestion, dermal exposure, mother's milk exposure. However, direct inhalation is considered the most likely exposure pathway. The HRA was conducted in accordance with guidance established by the California Office of Environmental Health Hazard Assessment (OEHHA) and the California Air Resources Board (CARB).

Emissions with established California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS), including particulate matter ($PM_{10}/PM_{2.5}$), are addressed in other sections. However, some discussion of the potential health risks associated with these substances is presented in this section.

Affected Environment

The LECEF is located within a 34-acre project site that includes the 21-acre fenced area of the power plant. The project address is 800 Thomas Foon Chew Way in San Jose, California. South of the project parcel is State Route (SR) 237. To the east is agricultural land, and further east is Coyote Creek. To the north is agricultural land, San Jose/Santa Clara Water Pollution Control Plant (WPCP) buffer land that is open space, and further north are the WPCP sludge drying yards and ponds. To the west is undeveloped WPCP buffer land. Zanker Road runs north-south about 2,500 feet west of the LECEF. Access to the LECEF, as well as the SVP and PG&E electrical transmission facilities, is via the 2,700 foot-long Thomas Foon Chew Way from Zanker Road, with each facility having controlled access along this route.

According to the Auer land use classification scheme, a three-kilometer radius boundary around the site yields a predominantly urban classification. This is consistent with the current land use and zoning designation for the site.

Sensitive receptors are defined as groups of individuals that may be more susceptible to health risks due to chemical exposure. Schools, both public and private, day care facilities, convalescent homes, and hospitals are of particular concern. Cooling tower impacts typically occur very close to the physical tower location. As such, sensitive receptors beyond a distance of one mile from the plant were not considered. Several worker and/or population receptors were identified within the regional area of the Project site and are listed in Table 17.

Table 17. Receptors Within the Regional Area of the Project

Receptor ID	Receptor Type	UTM Coordinates (E/N), m	Direction, Distance (ft)
1	San Jose WWTP	593514, 4142959	NW, 3500
2	Business Park	595038, 4143042	NW, 2380
3	Mall	595286, 4142884	E, 3090
4	Business Park	594926, 4142183	SE, 2300
5	Business Park	594261, 4142048	SSW, 2300
6	Business Park	593668, 4141832	SW, 2300
7	Elem. School	596109, 4143223	ENE, 5700

All coordinates from Google Earth (center location of each receptor location).

Air quality and health risk data presented by CARB in the 2009 Almanac of Emissions and Air Quality for the State shows that over the period from 1990 through 2008, the average concentrations for the top 10 toxic air contaminants (TACs) have been substantially reduced, and the associated health risks for the State are showing a steady downward trend as well. This same trend has, and is expected, to continue in the Bay Area AQMD (BAAQMD). CARB-estimated emissions inventory values for the top 10 TACs for 2008 are presented in Table 18 for the air basin and the State. The Applicant has not identified, nor is the Applicant aware of, any public health studies prepared by the local health department or the air district, related to respiratory illnesses, cancers, or related diseases concerning the local area within a six-mile radius of the proposed Project site.

Table 18. Top Ten Toxic Air Contaminants

TAC	Statewide Year 2008 Emissions (tons/yr)	BAAQMD Year 2008 Emissions (tons/yr)	BAAQMD Predicted Cancer Risk, per 10^6
Acetaldehyde	9103	1350	**3**
Benzene	10794	1634	**25**
1,3 Butadiene	3754	415	**23**
Carbon tetrachloride	4.04	2.13	**ND**
Chromium 6	0.61	0.05	**8**
Para-Dichlorobenzene	1508	284	**ND**
Formaldehyde	20951	3138	**11**
Methylene Chloride	6436	906	**<1**
Perchloroethylene	4982	788	**1**
Diesel Particulate Matter	35884	4151	**ND**

ND = no data

Environmental Consequences

Significance Criteria

Cancer Risk

Cancer risk is the probability or chance of contracting cancer over a human life span (assumed to be 70 years). Carcinogens are not assumed to have a threshold below which there would be no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk (*i.e.*, a linear, no-threshold model). Under various state and local regulations, an incremental cancer risk greater than 10 in a million due to a project is considered to be a significant impact on public health. For example, the 10 in a million risk level is used by the Air Toxics Hot Spots (California Health and Safety Code [CHSC] 44300 et seq.) program and California's Proposition 65 as the public notification level for air toxic emissions from existing sources.

Non-Cancer Risk

Non-cancer health effects can be classified as either chronic or acute. In determining the potential health risks of non-cancerous air toxics, it is assumed there is a dose of the chemical of concern below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level (REL). Non-cancer health risks are measured in terms of a hazard quotient, which is the calculated exposure of each contaminant divided by its REL. Hazard quotients for pollutants affecting the same target organ are typically summed with the resulting totals expressed as hazard indices for each organ system. A hazard index of less than 1.0 is considered to be an insignificant health risk. For this HRA, all hazard quotients were summed regardless of target organ. This method leads to a conservative, upper-bound assessment. RELs used in the hazard index calculations were those published in the CARB/OEHHA listings dated May 2012.

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body, i.e. typically over a lifetime of seventy years. Because chemical accumulation to toxic levels typically occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The lowest no-effect chronic exposure level for a non-carcinogenic air toxic is the chronic REL. Below this threshold, the body is capable of eliminating or detoxifying the chemical rapidly enough to prevent its accumulation. The chronic hazard index was calculated using the hazard quotients calculated with annual concentrations.

Acute toxicity is defined as adverse health effects caused by a brief chemical exposure over periods ranging from 1 to 8 hours. For most chemicals, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the exposure duration is shorter. Because acute toxicity is predominantly manifested in the upper respiratory system at threshold exposures, all hazard quotients are typically summed to calculate the acute hazard index. Average short-term modeled concentrations are divided by acute RELs to obtain a hazard index for health effects caused by relatively high, short-term exposure to air toxics.

Construction Phase Impacts

There is no construction associated with the increase in circulation rate at the cooling tower.

Operational Phase Impacts

Environmental consequences potentially associated with the operation of the Project are potential human exposure to chemical substances emitted to the air. The human health risks potentially associated with these chemical substances were evaluated in a HRA. The chemical substances potentially emitted to the air from the proposed Project cooling tower are listed in Table 19.

Table 19. Chemical Substances Potentially Emitted to the Air From the Project

Criteria Pollutants	Noncriteria Pollutants (Toxic Pollutants)
$PM_{10}/PM_{2.5}$	Ammonia Nickel Zinc

Emissions of criteria pollutants will adhere to NAAQS and CAAQS as discussed in the Air Quality text. The Project will also include emission control technologies necessary to meet the required emission standards specified for criteria pollutants under BAAQMD rules. Offsets will not be required as the current facility is not a major source. Finally, air dispersion modeling results show emissions will not result in concentrations of criteria pollutants in air that exceed ambient air quality standards (either NAAQS or CAAQS). These standards are intended to protect the general public with a wide margin of safety. Therefore, the Project is not anticipated to have a significant impact on public health from emissions of criteria pollutants.

Potential impacts associated with emissions of toxic pollutants to the air from the proposed Project were addressed in a HRA. The HRA was prepared using guidelines developed by OEHHA and CARB, as implemented in the latest version of the Hotspots Analysis and Reporting Program (HARP) model (Version 1.4f).

Public Health Impact Study Methods

Emissions of toxic pollutants potentially associated with the Project were estimated using emission factors approved by CARB and the U.S. Environmental Protection Agency (EPA). Concentrations of these pollutants in air potentially associated with Project emissions were estimated using the HARP dispersion modeling module. Modeling allows the estimation of both short-term and long-term average concentrations in air for use in a HRA, accounting for site-specific terrain and meteorological conditions. Health risks potentially associated with the estimated concentrations of pollutants in air were characterized in terms of excess lifetime cancer risks (for carcinogenic substances), or comparison with reference exposure levels for non-cancer health effects (for non-carcinogenic substances).

Health risks were evaluated for a hypothetical maximum exposed individual (MEI) located at the maximum impact receptor (MIR). The hypothetical MEI is an individual assumed to be located

at the MIR location, which is assumed (for purposes of this worst-case analysis) to be a residential receptor where the highest concentrations of air pollutants associated with Project emissions are predicted to occur, based on the air dispersion modeling. Human health risks associated with emissions from the proposed Project are unlikely to be higher at any other location than at the location of the MIR. If there is no significant impact associated with concentrations in air at the MIR location, it is unlikely that there would be significant impacts in any location in the vicinity of the Project. The highest off-site concentration location represents the MIR/MEI.

Health risks potentially associated with concentrations of carcinogenic air pollutants were calculated as estimated excess lifetime cancer risks. The excess lifetime cancer risk for a pollutant is estimated as the product of the concentration in air and a unit risk value. The unit risk value is defined as the estimated probability of a person contracting cancer as a result of constant exposure to an ambient concentration of 1 microgram per cubic meter ($\mu g/m^3$) over a 70-year lifetime. In other words, it represents the increased cancer risk associated with continuous exposure to a concentration in air over a 70-year lifetime. Evaluation of potential non-cancer health effects from exposure to short-term and long-term concentrations in air was performed by comparing modeled concentrations in air with the RELs. A REL is a concentration in air at or below which no adverse health effects are anticipated. RELs are based on the most sensitive adverse effects reported in the medical and toxicological literature. Potential non-cancer effects were evaluated by calculating a ratio of the modeled concentration in air and the REL. This ratio is referred to as a hazard quotient. The unit risk values and RELs used to characterize health risks associated with modeled concentrations in air were obtained from the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* (CARB, 5/2012). Emissions of toxic and/or hazardous pollutants from the cooling tower at the requested circulation rate of 90,000 gallons per minute (GPM) are presented in Table 20. Appendix A contains the support data and emissions calculations for the cooling tower.

Table 20 Cooling Tower Emissions Estimates

Pollutant	Lbs/hr	Lbs/Year
$PM_{10/2.5}$	1.35	11860
Ammonia	0.0000051	0.0447
Nickel	0.0000008	0.007
Zinc	0.0000191	0.1673

Basis:

1. **6 cell tower total**
2. **Drift eliminator control efficiency 0.0005%**
3. **Drift rate: 224.9 lbs/hr**
4. **GPM: 90000**
5. **TDS: <= 6000 ppm**
6. **Emissions increases of PM10/2.5 are estimated to be as follows: 0.26 lbs/hr, 6.12 lbs/day, and 1.139 tpy.**

Characterization of Risks from Toxic Air Pollutants

The excess lifetime cancer risk associated with concentrations in air estimated for the Project MIR location is estimated to be 2.84×10^{-10}. Excess lifetime cancer risks less than 10×10^{-6} (with

T-BACT) are unlikely to represent significant public health impacts that require additional controls of facility emissions. Risks higher than 1 x 10^{-6} may or may not be of concern, depending upon several factors. These include the conservatism of assumptions used in risk estimation, size of the potentially exposed population, and toxicity of the risk-driving chemicals. Health effects risk thresholds are listed in Table 21. Risks associated with pollutants potentially emitted from the Project are presented in Table 22. As described previously, human health risks associated with emissions from the proposed Project are unlikely to be higher at any other location than at the location of the MIR. If there is no significant impact associated with concentrations in air at the MIR location, it is unlikely there would be significant impacts in any other location in the vicinity of the Project.

Table 21. Significant Health Effect Threshold Levels for BAAQMD

Risk Category	Risk Threshold
Cancer Risk	<=1.0 x 10^{-6} without TBACT <=10 x 10^{-6} with TBACT
Chronic Hazard Index	1.0
Acute Hazard Index	1.0

Per Reg 2 Rule 5 BAAQMD

Table 22. Project HRA Summary

	Cooling Tower	
Risk Category	**MIR Project Values**	**Applicable Significance Threshold**
Cancer Risk	2.84 E-10	See Table 5
Chronic Hazard Index	0.000077	
Acute Hazard Index	0.000118	
Cancer Burden	N/A	

MIR Receptor #: 3396 at 594430, 4142110.
MIR location is approximately 255 ft. from the tower center (cell 3).

Cancer risks potentially associated with facility emissions were also assessed in terms of cancer burden. Cancer burden is a hypothetical upper-bound estimate of the additional number of cancer cases that could be associated with emissions from the Project. Cancer burden is calculated as the worst-case product of excess lifetime cancer risk (at the 1 x 10^{-6} cancer risk level and isopleth distance) and the number of individuals at that risk level. The 1 x 10^{-6} isopleth was not reached for the project, *i.e.*, the highest predicted cancer risk was 2.90 x 10^{-10}. The calculated cancer burden for the Project is therefore 0.

As described previously, human health risks associated with emissions from the Project are unlikely to be higher at any other location than at the location of the MIR. Therefore, the risks for all of these individuals would be lower (and in most cases, substantially lower) than 2.84 x 10^{-10}. The estimated cancer burden was 0.0, indicating emissions from the Project would not be associated with any increase in cancer cases in the previously defined population. As stated previously, the methods used in this calculation considerably overstate the potential cancer

burden, further suggesting that Project emissions are unlikely to represent a significant public health impact in terms of cancer risk.

The acute and chronic non-cancer hazard quotients associated with concentrations in air are shown in Table 5. The acute and chronic non-cancer hazard quotients for all target organs fall well below 1.0. As described previously, a hazard quotient less than 1.0 is unlikely to represent significant impact to public health. As described previously, human health risks associated with emissions from the proposed Project are unlikely to be higher at any other location than at the location of the MIR. If there is no significant impact associated with concentrations in air at the MIR location, it is unlikely there would be significant impacts in any other location in the vicinity of the Project.

Detailed risk and hazard values are provided in the HARP output presented in the electronic files on CD. No specific health related studies were identified which pertain to the local Project area for any identified toxic air pollutant or identified specific population.

The estimates of excess lifetime cancer risks and non-cancer risks associated with chronic or acute exposures fall below thresholds used for regulating emissions of toxic pollutants to the air. Historically, exposure to any level of a carcinogen has been considered to have a finite risk of inducing cancer. In other words, there is no threshold for carcinogenicity. Since risks at low levels of exposure cannot be quantified directly by either animal or epidemiological studies, mathematical models have estimated such risks by extrapolation from high to low doses. This modeling procedure is designed to provide a highly conservative estimate of cancer risks based on the most sensitive species of laboratory animal for extrapolation to humans. In other words, the assumption is that humans are as sensitive as the most sensitive animal species. Therefore, the true risk is not likely to be higher than risks estimated using unit risk factors and is most likely lower, and could even be zero.

An excess lifetime cancer risk of 1×10^{-6} is typically used as a screening threshold of significance for potential exposure to carcinogenic substances in air. The excess cancer risk level of 1×10^{-6}, which has historically been judged to be an acceptable risk, originates from efforts by the Food and Drug Administration (FDA) to use quantitative HRA for regulating carcinogens in food additives in light of the zero tolerance provision of the Delany Amendment (Hutt, 1985). The associated dose, known as a "virtually safe dose," has become a standard used by many policy makers and the lay public for evaluating cancer risks. However, a study of regulatory actions pertaining to carcinogens found that an acceptable risk level can often be determined on a case-by-case basis. This analysis of 132 regulatory decisions found that regulatory action was not taken to control estimated risks below 1×10^{-6} (one in a million), which are called de minimis risks. De minimis risks are historically considered risks of no regulatory concern. Chemical exposures with risks above 4×10^{-3} (four in ten thousand), called "de manifestis" risks, were consistently regulated. "De manifestis" risks are typically risks of regulatory concern. The risks falling between these two extremes were regulated in some cases, but not in others (Travis et al, 1987).

The estimated lifetime cancer risks to the maximally exposed individual located at the Project MIR are well below the 10×10^{-6} significance level (with T-BACT). These risk estimates were calculated using assumptions that are highly health conservative. Evaluation of the risks associated with the Project emissions should consider that the conservatism in the assumptions and methods used in risk estimation considerably overstate the risks from Project emissions.

Based on the results of this HRA, there are no significant public health impacts anticipated from emissions of toxic pollutant to the air from the Project.

Hazardous Materials

Hazardous materials are, and will continue to be, used and stored at the Project site. Use of chemicals at the Project will be in accordance with standard practices for storage and management of hazardous materials. Normal use of hazardous materials, therefore, will not pose significant impacts to public health. While mitigation measures will be in place to prevent releases, accidental releases that migrate off-site could result in potential impacts to the public.

The California Accidental Release Program regulations (CalARP) and Code of Federal Regulations (CFR) Title 40 Part 68 under the Clean Air Act (CAA) establish emergency response planning requirements for acutely hazardous materials. These regulations require preparation of a Risk Management Plan (RMP), which is a comprehensive program to identify hazards and predict the areas that may be affected by a release of a program listed hazardous material. An approved RMP is already implemented at the facility.

Operation Odors

The Project is not expected to emit any substances that could cause odors.

Electromagnetic Field Exposure

EMF issues are not applicable to, or affected by, the cooling tower.

Legionella

In addition to being a source of potential toxic air contaminants, the possibility exists for bacterial growth to occur in the cooling towers and similar processes, including Legionella. Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in man-made water systems. It is the principal cause of legionellosis, otherwise known as Legionnaires' disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis.

Legionella can grow symbiotically with other bacteria and can infect protozoan hosts. This provides Legionella with protection from adverse environmental conditions, including making it more resistant to water treatment with chlorine, biocides, and other disinfectants. Thus, if not properly maintained, cooling water systems and their components can amplify and disseminate aerosols containing Legionella.

The State of California regulates recycled water for use in cooling towers in Title 22, Section 60303, California Code of Regulations. This section requires that, in order to protect workers and the public who may come into contact with cooling tower mists, chlorine or another biocide must be used to treat the cooling system water to minimize the growth of Legionella and other micro-organisms.

The EPA published an extensive review of Legionella in a human health criteria document. In 1999, the EPA noted Legionella may propagate in biofilms (collections of microorganisms

surrounded by slime they secrete, attached to either inert or living surfaces) and aerosol-generating systems such as cooling towers can aid in the transmission of Legionella from water to air. The EPA has inadequate quantitative data on the infectivity of Legionella in humans to prepare a dose-response evaluation. Therefore, sufficient information is not available to support a quantitative characterization of the threshold infective dose of Legionella. Thus, the presence of even small numbers of Legionella bacteria presents a risk, however small, of disease in humans.

In 2000, the Cooling Tower Institute (CTI) issued its own report and guidelines for the best practices for control of Legionella. The CTI found that 40 to 60 percent of industrial cooling towers tested were found to contain Legionella. To minimize the risk from Legionella, the CTI noted that consensus recommendations included minimization of water stagnation, minimization of process leads into the cooling system that provide nutrients for bacteria, maintenance of overall system cleanliness, application of scale and corrosion inhibitors as appropriate, use of high-efficiency mist eliminators on cooling towers, and overall general control of microbiological populations. Good preventive maintenance is very important in the efficient operation of cooling towers and other evaporative equipment. Preventive maintenance includes having effective drift eliminators, periodically cleaning the system if appropriate, maintaining mechanical components in working order, and maintaining an effective water treatment program with appropriate biocide concentrations. The efficacy of any biocide in ensuring that bacteria, and in particular Legionella growth, is kept to a minimum is contingent upon a number of factors including, but not limited to, proper dosage amounts, appropriate application procedures, and effective monitoring.

The current legionella treatment program will continue to be implemented for the upgraded cooling tower.

Summary of Impacts

Results from the air toxics HRA based on emissions modeling indicate there will be no significant incremental public health risks from construction or operation of the Project. Results from criteria pollutant modeling for routine operations indicate potential ambient concentrations of $PM_{10/2.5}$ will not significantly impact air quality. Potential concentrations are below the Federal and California standards established to protect public health, including the more sensitive members of the population.

Cumulative Impacts

The HRA for the Project indicates the maximum cancer risk will be approximately 2.84×10^{-10}, versus the BAAQMD significance threshold of 10 in one million (1.0×10^{-5}) at the point of maximum exposure to air toxics from power plant emissions utilizing TBACT. This risk level, which is orders of magnitude below the BAAQMD significance threshold and the 1 in a million (1×10^{-6}) de minimis risk threshold described above, is considered to be insignificant. Non-cancer chronic and acute effects are also less than significant. A cumulative risk impact analysis is not proposed at this time because of the following:

- Low cooling tower operational emissions levels of air toxic substances.
- Insignificant risk resulting from the cooling tower operations.

- Lack of an established background or baseline risk value for the Project impact area. The toxics monitoring data compiled by CARB is designed to provide air quality data in support of general population exposures. The data do not provide information on localized impacts, often referred to as near-source or neighborhood exposures.
- The CARB toxics air contaminant monitoring network does not include any monitoring sites within the cooling tower impact region.
- CEC staff indicates, based on their review of numerous modeling studies, that unless a significantly sized source of HAPs is located within 0.5 miles of the proposed new source, it is highly unlikely that the cumulative emissions of the sources will result in any significant health related impacts. There are no significant sources (existing or proposed) of HAPs within 0.5 miles of the project site, therefore a cumulative analysis of health risk impacts is not warranted at this time.

Mitigation Measures

Criteria Pollutants

Emissions of criteria pollutants will be minimized by applying Best Available Control Technology (BACT) to the Project. BACT for the cooling tower is a continuation of the use of high efficiency drift eliminators rated at 0.0005%.

The proposed Project location is in an area designated by U.S. EPA as nonattainment for the National Ambient Air Quality Standard (NAAQS) for PM2.5, and unclassified for the NAAQS for PM10 (per the CARB attainment status maps/website, respectively dated June 2013 and September 2013). Pursuant to BAAQMD New Source Review (NSR) Rule, offsets are not required for the Project for PM10/PM2.5. Therefore, further mitigation of PM10/2.5 emissions is not required to protect public health.

Toxic Pollutants

Emissions of toxic pollutants to the air will be minimized through the use of T-BACT for the cooling tower. The use of high efficiency drift eliminators is considered T-BACT.

Legionella Mitigation Measure: The proposed Project will continue to implement a wet cooling tower treatment plan to ensure the potential for bacterial growth in cooling water is kept to a minimum. The treatment plan will be consistent with the Cooling Technology Institute's "Best Practices for Control of Legionella" guidelines and will include periodic sampling and testing for the presence of Legionella bacteria in the cooling tower water (RSA, 2008).

Hazardous Materials

No changes to the hazardous materials management program are anticipated as a result of the cooling tow.

Laws, Ordinances, Regulations, and Standards (LORS)

An overview of the regulatory process for public health issues is presented in this section. The relevant LORS that affect public health and are applicable to the Project are identified in Table 23. The conformity of the Project to each of the LORS applicable to public health is also

presented in this table. Table 23 summarizes the primary agencies responsible for public health, as well as the general category of the public health concern regulated by each of these agencies.

Table 23. Laws, Ordinances, Regulations, and Standards for Public Health

LORS	Public Health Concern	Primary Regulatory Agency	Project Conformance
Federal Clean Air Act Title III	Public exposure to air pollutants	USEPA Region 9 CARB BAAQMD	Based on results of HRA as per CARB/OEHHA guidelines, toxic contaminants do not exceed acceptable levels. Emissions of criteria pollutants will be minimized by applying BACT to the Project. Minor increases in emissions of criteria pollutants are not required to be offset.
Health and Safety Code 25249.5 et seq. (Safe Drinking Water and Toxic Enforcement Act of 1986—Proposition 65)	Public exposure to chemicals known to cause cancer or reproductive toxicity	OEHHA	Based on results of HRA as per CARB/OEHHA guidelines, toxic contaminants do not exceed thresholds that require exposure warnings.
40 CFR Part 68 (Risk Management Plan) and CalARP Program Title 19	Public exposure to acutely hazardous materials	USEPA Region 9 Santa Clara County Department of Health Services Santa Clara County Fire Department	An approved RMP is in place and currently meets all state and federal requirements.
Health and Safety Code Sections 25531 to 25541	Public exposure to acutely hazardous materials	Santa Clara County Department of Health Services CARB BAAQMD	An analysis has been performed to assess potential risks from a spill or rupture from any affected storage tank. The project does not affect this past analysis.
CHSC 25500-25542	Hazmat Inventory	State Office of Emergency Services and Santa Clara County Department of Environmental Health	The facility has prepared all required HazMat plans and inventories, distribute to affected agencies.
CHSC 44300 et seq.	Air Toxics Hot Spots Program	BAAQMD	Participate in the inventory and reporting program at the District level.
BAAQMD Reg 2 Rule 5	Toxics NSR	BAAQMD	Application of BACT and T-BACT, preparation of HRA.
CHSC 25249.5	Proposition 65	OEHHA	Comply with all signage and notification requirements.
Health and Safety Code Sections 44360 to 44366 (Air Toxics "Hot Spots" Information and Assessment Act—AB 2588)	Public exposure to toxic air contaminants	CARB BAAQMD	Based on results of HRA as per CARB/OEHHA guidelines, toxic contaminants do not exceed acceptable levels.

Involved Agencies and Agency Contacts

Table 24 provides contact information for agencies involved with Public Health.

Table 24. Summary of Agency Contacts for Public Health

Public Health Concern	Primary Regulatory Agency	Regulatory Contact
Public exposure to hazardous or toxic air pollutants	EPA Region 9	Gerardo Rios Chief, Permits Section EPA-Region 9 75 Hawthorne Street San Francisco, CA 94105 (415) 947-3974
	CARB	Mike Tollstrup 1001 I Street, 19th Floor Sacramento, CA 95814 (916) 322-6026
	BAAQMD	Brian Bateman Engineering Div. 939 Ellis St. San Francisco, CA. 94109 (415) 771-4653
Public exposure to chemicals known to cause cancer or reproductive toxicity	OEHHA	Cynthia Oshita or Susan Long P.O. Box 4010 Sacramento, CA 95812-4010 (916) 445-6900
Public exposure to acutely hazardous materials	EPA Region 9	Gerardo Rios Chief, Permits Section EPA-Region 9 75 Hawthorne Street San Francisco, CA 94105 (415) 947-3974
	Santa Clara County EH Dept. Hazmat Division	HMCD 1555 Berger Dr, Bldg 2, Suite 300 San Jose, CA 95112

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Agency Jurisdiction and Contacts

Table 25, Agencies, Contacts, Jurisdictional Involvement, Required Permits for Air Quality, presents data on the following: (1) air quality agencies that may or will exercise jurisdiction over air quality issues resulting from the proposed increase in circulation rate, (2) the most appropriate agency contact for the Project, (3) contact address and phone information, and (4) the agency involvement in required permits or approvals.

Table 25
Agencies, Contacts, Jurisdictional Involvement, Required Permits For Air Quality

Agency	Contact	Jurisdictional Area	Permit Status
California Energy Commission (CEC)	Assigned Project Manager 1516 Ninth St. Sacramento, CA 95814	Primary reviewing and certification agency.	May require amendment for the increase in circulation rate under the energy siting regulations and CEQA. .
Bay Area AQMD	Brian Bateman Dir. Engineering Div. 939 Ellis St. San Francisco, Ca. 94109 415-771-4653	Prepares Determination of Compliance (DOC) for CEC, Issues BAAQMD Authority to Construct (ATC) and Permit to Operate (PTO), Primary air regulatory and enforcement agency.	The DOC will be prepared subsequent to project application submittal. Modification package in Appendix B comprises the required District application. District forms not included.
California Air Resources Board (CARB)	Mike Tollstrup Chief, Project Assessment Branch 1001 I St., 6th Floor	Oversight of AQMD stationary source permitting and enforcement program	CARB staff will provide comments on applicable project sections affecting air quality and public health. CARB staff will

	Sacramento, CA 95814 (916) 322-6026		also have opportunity to comment on draft ATC.
Environmental Protection Agency, Region IX	Gerardo Rios Chief, Permits Section USEPA Region 9 75 Hawthorne St. San Francisco, CA 94105 (415) 947-3974	Oversight of all AQMD programs, including permitting and enforcement programs	USEPA Region 9 staff will receive a copy of the DOC. USEPA Region 9 staff will have opportunity to comment on draft PTC.

Permit Requirements and Schedules

An ATC application is required in accordance with the BAAQMD rules. Appendix B contains the BAAQMD permitting application forms. These forms in conjunction with the air quality analysis presented herein and the Public Health analysis, constitute the required Authority to Construct application pursuant to the District rules.

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Appendix A

Emissions Calculations and Modeling Support Data

Cooling Towers PM10/PM2.5 Emissions Estimates **Scenario:** Proposed Modification Limit

Cooling Tower Particulate Emissions

# of Identical Towers:	1			**Per Tower**	**Per Cell**	**All Towers**
Operational Schedule:	Hrs/day	Days/Yr	Hrs/Yr			
	24	365	8760			
Pumping rate of recirculation pumps (gal/min)				90000.0		
Flow of cooling water (lbs/hr)				44982000.0		
Avg TDS of circ water (mg/l or ppmw)				6000.0	annual avg value	
Flow of dissolved solids (lbs/hr)				269892.00		
Fraction of flow producing drift*				1.00	1= worst case	
Control efficiency of drift eliminators, %	0.0005			0.000005		
Calculated drift rate (lbs water/hr)				224.9		
PM10 emissions (lbs/hr)				**1.349**	**0.225**	**1.349**
PM10 emissions (lbs/day)				**32.387**	**5.398**	**32.387**
PM10 emissions (tpy)				**5.911**	**0.985**	**5.911**
PM2.5 fraction of PM10				1.000	1= worst case	
PM2.5 emissions (lbs/hr)				**1.349**	**0.225**	**1.349**
PM2.5 emissions (lbs/day)				**32.387**	**5.398**	**32.387**
PM2.5 emissions (tpy)				**5.911**	**0.985**	**5.911**

Notes:
Based on Method AP 42, Section 13.4, Jan 1995
*Technical Report EPA-600-7-79-251a, Page 63
Effects of Pathogenic and Toxic Materials Transported Via Cooling Device Drift - Volume 1.

Cooling Tower Stack Parameters

Base Elevation	-	feet amsl
Number of Cells	6	
Length of Cooling Tower	289.00	feet
Width of Cooling Tower	49.00	feet
Height of Cooling Tower (to fan deck)	45.00	feet agl
Cell Release Height (fan shroud exit)	58.00	feet agl
Flow/Fan Discharge for each Cell	1,272,185	ACFM
Inlet air temperature (ambient):	variable	deg F
Discharge air temperature:	variable	deg F

Calculation of Hazardous and Toxic Pollutant Emissions from Cooling Towers

Scenario: Proposed Modification Limit

Total Cells:	6	Max Drift Rate:	224.9 lbs/hr	Op Hrs/Day:	24
				Op Hrs/Yr:	8760

Constituent	Concentration in Cooling Tower Water		Total All Cells Emissions, lb/hr	Emissions, lb/day	Emissions, ton/yr	Single Cell Emissions, lb/hr	Emissions, lb/day
Ammonia	0.12	ppm	2.70E-05	6.48E-04	1.18E-04	4.50E-06	1.08E-04
Nickel	0.019	ppm	4.27E-06	1.03E-04	1.87E-05	7.12E-07	1.71E-05
Zinc	0.46	ppm	1.03E-04	2.48E-03	4.53E-04	1.72E-05	4.14E-04
*	0	ppm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
*	0	ppm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
*	0	ppm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
*	0	ppm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
*	0	ppm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
*	0	ppm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
*	0	ppm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Notes:
(1) Water analysis data supplied by project applicant.
(2) mg/l = ppm

Figure 1 Receptor Grids used in AERMOD

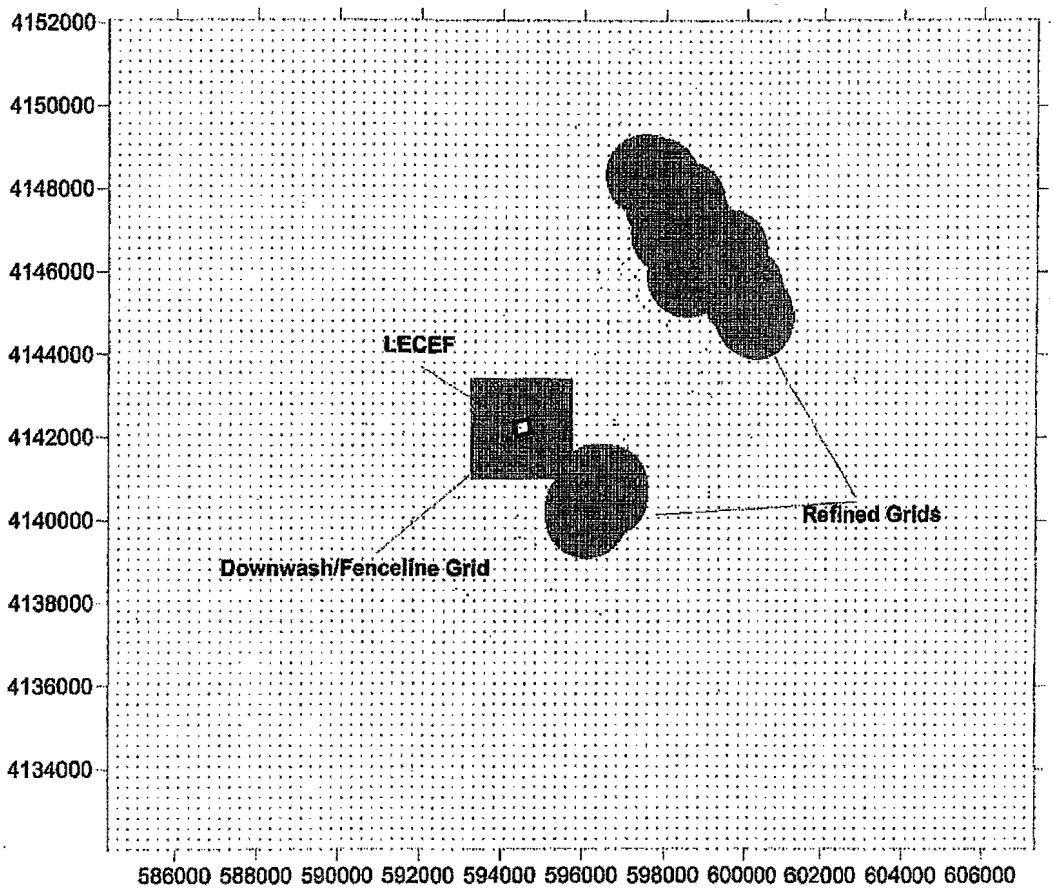
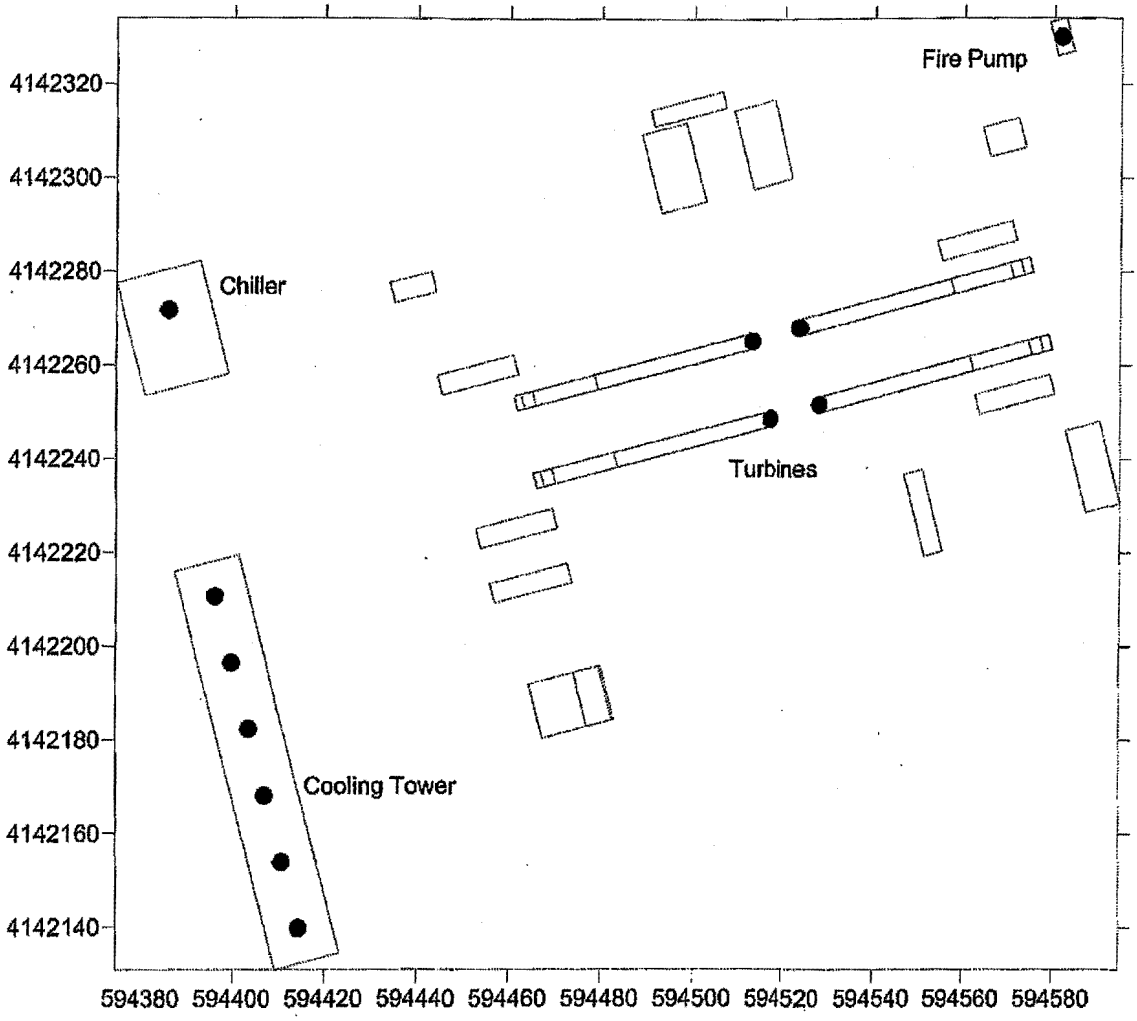


Figure 2 Facility General Arrangement



Appendix B

BAAQMD Permit Application Forms

(not included in CEC submittal)

ATTACHMENT 3
List of Property Owners within 1,000 feet