

## DOCKETED

<b>Docket Number:</b>	79-AFC-03C
<b>Project Title:</b>	Compliance - Application for Certification of PG&E Geysers Unit 18
<b>TN #:</b>	206732
<b>Document Title:</b>	Geysers Power Socrates (Unit 18) - Cooling Tower Replacement Project Description and Request for Expedited Processing
<b>Description:</b>	N/A
<b>Filer:</b>	Camile Remy -Obad
<b>Organization:</b>	California Energy Commission
<b>Submitter Role:</b>	Commission Staff
<b>Submission Date:</b>	11/23/2015 3:05:00 PM
<b>Docketed Date:</b>	11/23/2015



## GEYSERS POWER COMPANY, LLC

10350 SOCRATES MINE ROAD  
MIDDLETOWN, CA 9546

NYSE:CPN

GWQ-15-166

November 17, 2015

Mr. Robert Oglesby  
Executive Director  
California Energy Commission  
1516 Ninth Street, MS-15  
Sacramento, CA 95814

RE: Geysers Power Company Socrates (Unit 18) Geothermal Project (79-AFC-3C):  
Request for Expedited Processing Pursuant to Executive Order B-36-15

Dear Mr. Oglesby:

Pursuant to Section 5 of Governor Brown's Executive Order B-36-15, issued on November 13, 2015, Geysers Power Company, LLC ("GPC") submits this request for expedited processing and approval by the Executive Director for the Socrates (Unit 18) power plant ("Project"), which was impacted by the Valley Fire. Specifically, the requested authorization will allow the Project to remediate wildfire damage and restore geothermal power plant operation by authorizing emergency construction activities, including replacement, repair and reconstruction necessary for geothermal power plant operation.

First, GPC requests that the Executive Director authorize GPC to immediately begin reconstruction of the cooling tower. GPC has selected a contractor. Sonoma County has agreed to be the Chief Building Official to oversee the construction. GPC is prepared to apply immediately to Sonoma County for a building permit and to begin construction promptly upon issuance of the permit and approval of the Memorandum of Understanding between the County and CEC.

The cooling tower to be constructed consists of replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced. The new structure will differ from the structure replaced only to the extent necessary to conform to current building codes and modern building and engineering practices. Therefore, the replacement of the cooling cover is categorically exempt under the California Environmental Quality Act and is presumed to have no possible significant environmental effects.

Second, GPC requests that the Executive Director approve the addition of an administrative Air Quality Condition of Certification.

GPC has already filed an application for an Authority to Construct with the Northern Sonoma County Air Pollution Control District ("District") to add this condition to the Project's air permit.



Upon approval by the District of this condition, GPC requests that the Executive Director promptly approve the addition of the condition to the CEC license.

The new condition will add additional annual limits to hydrogen sulfide, PM<sub>10</sub> and PM<sub>2.5</sub> emissions in the air permit and CEC license. Annual hydrogen sulfide emissions shall be limited to 24.4 tons per year, annual PM<sub>10</sub> emissions will be limited to 15.9 tons per year and annual PM<sub>2.5</sub> emissions will be limited to 11 tons per year. This new condition will not increase the actual emissions of the facility.

The replacement of the cooling tower will not result in a significant change in the design, operation or performance of the project. The replacement will not require a change in any condition of certification in the license, except for the aforementioned additional Air Quality condition.

- 1. Section 1769 (a)(I)(A) and (B) requires a description of the proposed modifications, including new language for affected conditions and the necessity for the modifications.**

#### **Cooling Tower Replacement**

A brief description of the cooling tower replacement is attached hereto as Attachment A.

No changes in conditions of certification are required.

#### **Air Quality Condition of Certification**

GPC proposes that Condition of Certification AQ-59 be added to read:

*"Annual emissions from the cooling tower shall not exceed, on a calendar year basis, 24.4 tons per year of hydrogen sulfide (H<sub>2</sub>S), 15.9 tons per year particulate matter less than 10 microns in diameter (PM<sub>10</sub>) or 11.0 tons per year particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>)."*

The purpose of this addition is to ensure compliance with NSCAPCD regulations and facilitate immediate replacement of the cooling tower.

The application submitted to the District is attached hereto as Attachment B.

- 2. Section 1769(a)(I)(C) requires a discussion of whether the modification is based on information that was known by the petitioner during the certification proceeding, and an explanation of why the issue was not raised at that time.**

The request for cooling tower replacement and addition of a new Air Quality condition is not based upon information that was known during the certification proceeding for the Project.



Authorization of the request is necessary to facilitate the prompt replacement of the cooling tower that was destroyed by the Valley Fire on September 12, 2015.

3. **Section 1769(a)(1)(D) requires a discussion of whether the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, and explanation of why the change should be permitted.**

The request for cooling tower replacement and addition of a new Air Quality condition does not change or undermine the assumptions, rationale, findings, or other bases of the Commission's decision certifying the Project. The cooling tower replacement will not significantly change the design, operation or performance of the Project. The new condition will not increase the actual emissions of the Project.

The Air Quality condition should be added and GPC should be authorized to immediately proceed to construction of the replacement tower, in order to bring the Project - a valuable renewable energy resource - back into operation as soon as possible. If authorization is granted promptly, GPC hopes to be able to complete construction and bring the project back into operation before the summer of 2016.

4. **Section 1769(a)(1)(E) requires an analysis of the impacts the modifications may have on the environment and proposed measures to mitigate any significant adverse impacts.**

There is no possibility that the cooling tower replacement and addition of a new Air Quality condition will result in any significant adverse environmental impacts; thus, no mitigation measures are required. Neither the additional Air Quality condition nor the replacements will not increase the actual emissions of the Project. The Project will continue to meet all existing emissions limits established in the existing permits. The new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced. Therefore, there will be no material change in the impacts of the Project.

5. **Section 1769(a)(1)(F) requires a discussion of the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards.**

The cooling tower replacement and addition of a new Air Quality condition will not impact the Project's ability to comply with applicable laws, ordinances, regulations, and standards ("LORS").

6. **Section 1769(a)(1)(G) requires a discussion of how the modifications affect the public.**

The cooling tower replacement and addition of a new Air Quality condition will not adversely affect the public. The cooling tower replacement and addition of a new Air



Quality condition will not increase the actual emissions of the Project. Therefore, there are no significant adverse effects on property owners that will result from the cooling tower replacement and addition of a new Air Quality condition.

**7. Section 1769(a)(1)(H) requires a list of property owners potentially affected by the modification is required.**

The cooling tower replacement and addition of a new Air Quality condition will not adversely affect any property owners because the cooling tower replacement and addition of a new Air Quality condition will not increase the actual emissions of the Project or result in adverse environmental effects. Therefore, a list of property owners affected by the cooling tower replacement and addition of a new Air Quality condition is not required.

**8. Section 1769(a)(1)(I) requires a discussion of the potential effect on nearby property owners, the public and the parties in the application proceeding.**

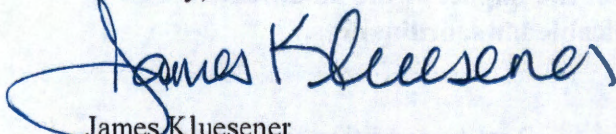
The cooling tower replacement and addition of a new Air Quality condition will not adversely affect any property owners, the public nor any party in the application proceeding. The cooling tower replacement and addition of a new Air Quality condition will not increase the actual emissions of the Project or result in adverse environmental effects. Therefore, a list of property owners affected by the cooling tower replacement and addition of a new Air Quality condition is not required. Therefore, the cooling tower replacement and addition of a new Air Quality condition will have no impact on property owners, the public, or any other parties.

**CONCLUSION**

GPS requests that the Executive Director exercise the authority delegated to him pursuant to Section 5 of Governor Brown's Executive Order B-36-15, issued on November 13, 2105, and approve the requested authorizations for the Project by November 30, 2015.

Please contact Bruce Carlsen at (707) 431-6198 if you have any questions regarding this request.

Sincerely,



James Kluesener  
VP Geothermal Region Operations

Attachments: 2

CC:

Camille Remy-Obad, Compliance Project Manager



**Geysers Power Company Socrates (Unit 18) Geothermal Project (79-AFC-3C)  
Request for Expedited Processing Pursuant to Executive Order B-36-15**

**ATTACHMENT A**

**Cooling Tower Replacement  
Project Description**





## GEYSERS POWER COMPANY, LLC

10350 SOCRATES MINE ROAD  
MIDDLETOWN, CA 95461

NYSE CPN

GWQ-15-166

November 17, 2015

Ms. Camille Remy-Obad  
Compliance Project Manager  
California Energy  
Commission  
1516 Ninth Street, MS-15  
Sacramento, CA 95814

RE: Project Description for Geysers Power Company Socrates (Revision 1)  
(Unit 18) Geothermal Project: 79-AFC-3C  
Replacement in kind of cooling tower damaged in the 2015 Valley fire.

At your request, we are providing a Project Description for replacement of the cooling tower that was damaged beyond repair during the September 12 Valley fire at the Socrates (Unit 18) power plant Project ("Project").

Geysers Power Company, LLC ("GPC") plans to replace the fire damaged cooling tower structure above the concrete basin. The replacement tower will be functionally equivalent to the cooling tower that existed prior to the fire. The replacement will be the same approximate dimensions, located in the same footprint as the prior structure.

### Units 18

	OLD TOWER	NEW TOWER	Comment
Type	Crossflow	Crossflow	Equivalent
Model	674-5-11	F678A-20-11	Equivalent
Number of Cells	11	11	Equivalent
Structural Material	Treated fir	Fire Resistant FRP	More Fire Resistant
Cooling Tower Length (ft-in)	352'-8"	352'-8"	Equivalent
Cooling Tower Width (ft-in)	79'-1.5"	78'-2"	Equivalent
Discharge Elevation (ft-in)*	64'-4"	61'-7"	Slightly lower
Circulation Rate(gpm)	165,000	165,000	Equivalent



Drift Rate (%)	0.002	0.001	Equivalent and better than the 0.002 permit requirement
Air mass flow discharge per cell (MMlb/hr)	5.4	5.9	Functionally Equivalent or better
Color	Willow Green, Semi-gloss	Gray	Facility not visible to Community
Gear Ratio	12.98	12.98	Equivalent
Number of fan blades	8	8	Equivalent
Shroud Height (ft)	18	13.8	Shorter more rigid; lower noise design

The Unit 18 power plant is a steam limited facility and the replacement tower will not have a significant effect on the operation or megawatt output from the facility. The replacement tower will not result in a significant effect on the environment and will continue to comply with all applicable laws, ordinances, regulations, and standards ("LORS"). The facility will continue to meet all existing emissions limits established in the existing permits.

The proposed 0.001% drift eliminators satisfy the permit requirement of 0.002%. There will be no significant changes to the equipment description or operating conditions of the Permit to Operate for the Project and only one change to the permit will be required.

The replacement tower will differ from the original tower in several minor respects. The original tower was constructed to meet the 1976 California building Code. The replacement tower will meet the 2013 California Building Code. The drift eliminators will be more efficient – at 0.001% - which will more than satisfy the permit requirement of 0.002%. The structural components of the tower will be made of fiber reinforced plastic (rather than wood) and the drift eliminators will be more efficient. The only changes to the Permit to Operate for the project are the addition of annual synthetic minor limits. These limits are not expected to change how the plant is operated and are covered in the review of technical areas below.

### **Review of Applicable Technical Areas**

#### **Air Quality—**

The proposed 0.001% drift eliminators satisfy the permit requirement of 0.002%, and there will be no significant changes to the equipment description or operating conditions of the Permit to Operate for the Project. An Authority to Construct will be required from Northern Sonoma County Air Pollution Control District and one condition will be added including annual limits for hydrogen sulfide, PM10 and PM 2.5.



**Biology**

There will be no new ground disturbance or trenching; existing drill pads will be used for laydown areas during the tower reconstruction; no new laydowns will need to be created. Existing access roads (paved or with road base) will be used for construction access. Construction personnel will be restricted previous developed areas.

**Cultural Resources**

There will be no new ground disturbance or trenching; existing drill pads will be used for laydown areas during the tower reconstruction; no new laydowns will need to be created. Existing access roads (paved or with road base) will be used for construction access. No cultural resources will be impacted.

**Noise**

The Unit 18 cooling tower is located in a valley near Big Sulphur Creek and does not have a community exposure.

**Visual**

The Unit 18 cooling tower is located in a valley near Big Sulphur Creek and does not have a community exposure.

**Water Quality, Hydrology and Water Resources**

The plant yard is surrounded by an impermeable berm and is asphalted. All cooling tower construction activities will occur within the bermed, asphalted area. Any rain/stormwater generated during the cooling tower construction will be captured and sent to reinjection. The facility is a Zero Discharge facility so no stormwater will be allowed to run off the plant site.

**Worker Health (construction)/Safety/Misc**

Reconstruction of the towers will take approximately five months and the number of workers will be an average of 30 and a predicted maximum of 55. There will be on-site security during the operation. Potable water, hygiene facilities and refuse containers will be provided to accommodate the number of workers.

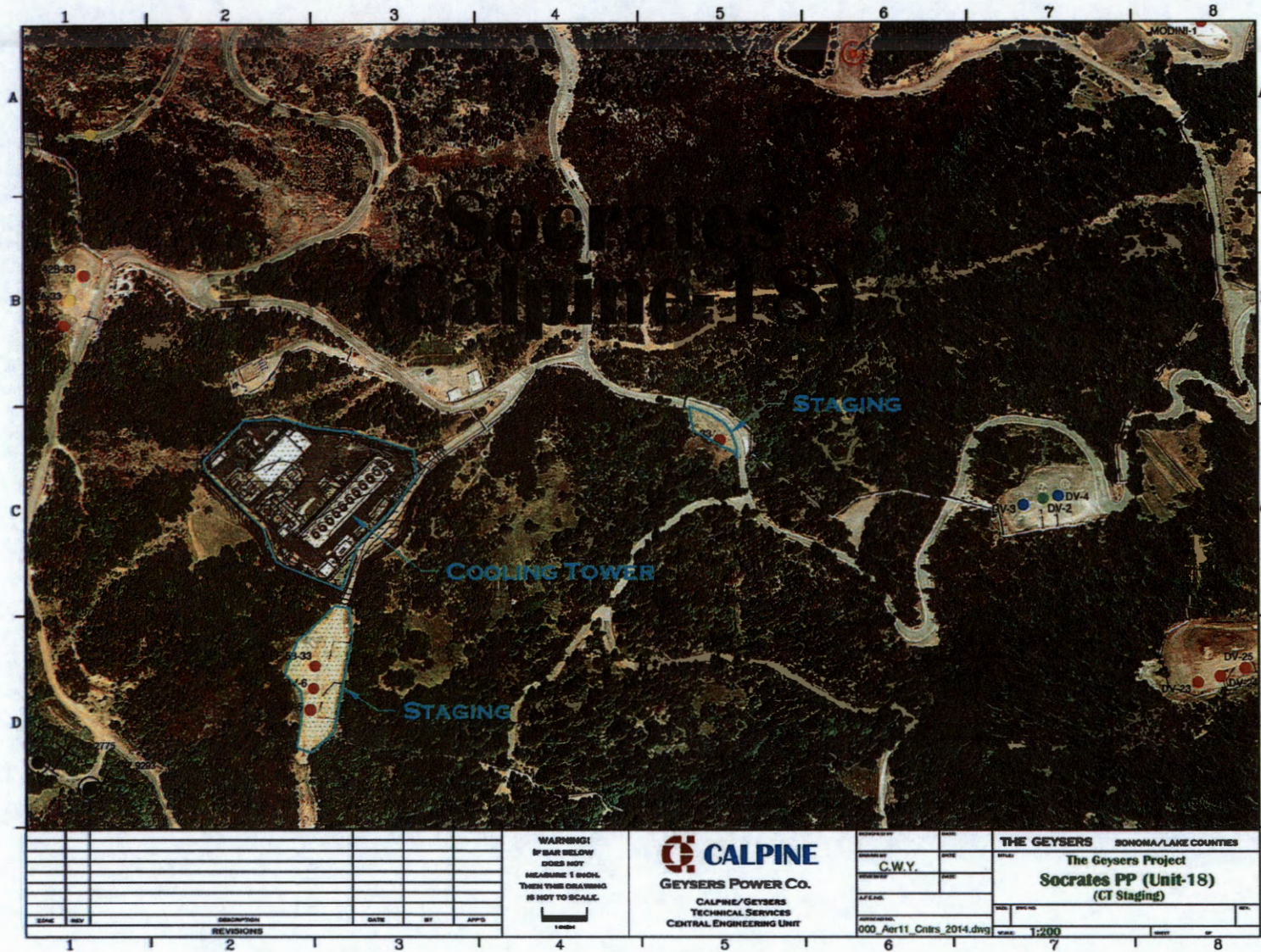
Sincerely yours,



Bruce Carlsen  
Director, Environmental Services



## Socrates Geothermal Power Plant (Unit 18) Cooling Tower Replacement Project





**Geysers Power Company Socrates (Unit 18) Geothermal Project (79-AFC-3C)  
Request for Expedited Processing Pursuant to Executive Order B-36-15**

**ATTACHMENT B**

**Application for Authority to Construct Submitted to  
Northern Sonoma County Air Pollution Control District**





NYSE CPN

**GEYSERS POWER COMPANY, LLC**  
10350 Socrates Mine Road  
Middletown, CA 95461

Letter GPP-15-078

October 29, 2015

Alex Saschin  
Air Quality Engineer  
Northern Sonoma County Air Pollution Control District  
150 Matheson Street  
Healdsburg, CA 95448

Subject: Permits: Unit 18 (Socrates) Power Plant Application for Authority to Construct for Replacement of the Cooling Tower Destroyed by the Valley Fire

Dear Mr. Saschin:

Enclosed please find the Geysers Power Company LLC (GPC) Authority to Construct and Temporary Permit to Operate applications for reconstruction of the Socrates Power Plant cooling tower that was destroyed by the Valley Fire this September.

The start date for construction is dependent upon receipt of the building permit, Authority to Construct Permit and California Energy Commission approval to proceed.

Attached is Calpine Corporation's check (No. 1000078339) as payment of \$6,611 for the required application fees calculated for the Authority to Construct and Temporary permit to operate fees.

GPC is asking Northern Sonoma County Air Pollution Control District (NSCAPCD) to commence review of this application at the earliest opportunity. Representatives of the California Energy Commission and Sonoma County have been coordinating with GPC to assist in GPC's recovery efforts as expeditiously as possible.

Please contact me at 707.431.6266, if you need any additional information in support of these permit applications.

Sincerely,

Brian J. Berndt  
Environmental Services Manager, Geysers Region

cc:

Ms. Camille Remy-Obad  
California Energy Commission  
1516 Ninth Street, MS-15  
Sacramento, CA 95814-5512

Mathew Layton  
California Energy Commission  
1516 Ninth Street, MS-15  
Sacramento, CA 95814-551

Attachment & Enclosure



## **Enclosure**

### **Applications For Authority To Construct and Permit To Operate**

- **Application Forms**
- **Project Description**
  - Introduction**
  - Regulatory Background**
  - Past Baseline Actual Emissions for Unit 18**
  - Proposed Replacement of Unit 18 Cooling Tower**
  - Unit 18 Emissions Review**



**NORTHERN SONOMA COUNTY  
AIR POLLUTION CONTROL DISTRICT  
PERMIT APPLICATION FORM**

BUSINESS NAME <u>Geysers Power Company LLC, Unit 18</u>		FACILITY ID # _____	
TYPE OF PERMIT APPLIED FOR: AUTHORITY TO CONSTRUCT <input checked="" type="checkbox"/> PERMIT TO OPERATE <input checked="" type="checkbox"/> TRANSFER OF OWNERSHIP <input type="checkbox"/> PERMIT MODIFICATION <input checked="" type="checkbox"/> Permit # <b>PTO 79-25A</b>		EPA ID _____ SIC CODE <u>4911</u>	
<b>GENERAL INFORMATION</b>			
Other Business Name (if any) <u>Socrates Power Plant - Unit 18</u>		Parent Company <u>Calpine Corporation</u>	
Mailing Address	<u>10350 Socrates Mine Road</u>	<u>Middletown</u>	<u>CA</u> <u>95461</u>
	<small>Street address or P.O. Box</small>	<small>City</small>	<small>State Zip Code</small>
Phone Number:	<u>(707) 431-6266</u>	Fax Number:	<u>(707) 431-6246</u>
Plant Address	<u>Big Sulfur Creek Road, Middletown, CA</u>		
	<small>Street address or P.O. Box</small>	<small>City</small>	<small>State Zip Code</small>
Phone Number:	<u>(707) 431-6781</u>	Fax Number:	<u>(707) 431-6246</u>
Principal Product / Operation:		<u>Geothermal Electric Power Generation</u>	
Name of Responsible Official:		<u>Mike Puccioni</u> Title: <u>General Manager, Area 2</u>	
Total # of Sources:	<u>2</u>	# of Pmt'd Sources	<u>2</u>
# of Exempt Sources	<u>-</u>	Emission Sources:	<u>2</u>
Plant Area (Acres)	<u>5 Acres</u>	# of Employees:	<u>300</u>

Is the business/facility/operation located within 1,000 feet of the outer boundary of a school or school site?

YES \_\_\_\_\_ NO \_\_\_\_\_ X \_\_\_\_\_

Are all major sources (emissions >25 tons per year) owned or operated by application in California in compliance with all air pollution rules and regulations?

YES X NO \_\_\_\_\_ N/A \_\_\_\_\_

If not in compliance above, is(are) the source(s) on a schedule for compliance with all applicable emission limitations and standards?

YES \_\_\_\_\_ NO \_\_\_\_\_ N/A X

Name Brian Berndt Title Environmental Services Manager

(Printed)

Signature  Date 10/28/2015

Fees \$6,611 Receipt # \_\_\_\_\_ Date Received \_\_\_\_\_



# Project Description

## Unit 18 (Socrates) Power Plant Replacement of the Cooling Tower Destroyed by the Valley Fire

### INTRODUCTION

The Valley wildfire of September 2015 resulted in the destruction of cooling towers and associated equipment at five power plants owned by The Geysers Power Company, LLC (GPC). GPC is currently assessing its alternatives for reconstruction or repair of these towers. At this time, GPC has decided to move forward with replacement of Unit 18's (Socrates Power Plant) cooling tower and ancillary equipment with similar like kind and functionally equivalent equipment. GPC is requesting that Northern Sonoma County Air Pollution Control District (NSCAPCD) proceed with review of this application at this time so as to assist GPC in completing replacement of the cooling tower as expeditiously as possible.

### REGULATORY BACKGROUND

According to NSCAPCD rules, "[a]n Authority to Construct, Modify, *Replace*, Operate or Use shall be obtained from the District prior to starting construction, modification, operation or use of any stationary or indirect source which may cause, potentially cause, reduce, control or eliminate the emission of air contaminants."<sup>1</sup> Prior to issuing an authority to construct, the Air Pollution Control Officer (APCO) must make several determinations, including "[w]hether the project is subject to the new source review procedures specified in Rule 220(c)."<sup>2</sup> According to Rule 220, in determining whether emissions from a new or modified source will result in an increase in emissions, the APCO shall compare the emissions during the two years preceding the application date (i.e., the two-year baseline) with the source's potential to emit, as established by permit limits.<sup>3</sup>

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<sup>1</sup> NSCAPCD Rule 200(a) (emphasis added). While the Title V permit for Unit 18 provides that no permit modification is required for "[r]outine maintenance, repair or replacement with identical or equivalent equipment" (see Title V Operating Permit, at § I.A), GPC does not believe it can rely upon this provision to excuse the requirement to obtain an Authority to Construct or that the replacement can be deemed "routine" in these circumstances.

<sup>2</sup> *Id.* at Rule 200(c)(3).

<sup>3</sup> Both the current version of Rule 220 and the version incorporated into the California State Implementation Plan (SIP) include the same substantive calculation procedure. The SIP-approved District Rule 220(a) provides as follows:

For the purposes of emission considerations:

1. Emissions from a proposed new *or modified stationary source* shall be based on the source's *potential to emit* any air contamination subject to regulation under the Clean Air Act of 1977. (40 CFR 52.21(b)(4))
2. Emissions from a proposed modified stationary source shall be based upon the cumulative net emissions increases or reductions that may occur as a result of the modifications and subsequent operating permit conditions, excluding any emission reductions required to comply with federal, state or district laws, rules or regulations. (40 CFR 52.21(b)(2 & 3))
3. Emissions from an existing stationary or previously permitted source shall ~~generally~~ be based on the *actual rate of air contaminant emissions during the two year period of operation prior to the date of application of specific limiting permit conditions*. A different averaging period may be used if the applicant demonstrates to the satisfaction of the Control Officer that it would be more representative of normal source operation.



# Project Description

## Unit 18 (Socrates) Power Plant Replacement of the Cooling Tower Destroyed by the Valley Fire

### PAST BASELINE ACTUAL EMISSIONS FOR UNIT 18

GPC has calculated the baseline actual emissions for Unit 18 for the two preceding calendar years using data obtained through monitoring conducted pursuant to the requirements of the Title V permit. For reference, the cooling tower emissions of PM will be deemed to be equivalent to PM10 and PM2.5 (i.e., no separate speciation of particulate matter is made and all PM is assumed to be either PM10 or PM2.5). Actual H<sub>2</sub>S emissions were based on estimated actual emissions, calculated on a monthly basis using the accepted monitoring methods and hours of operation, while emissions of PM are based on total dissolved solids (TDS), circulating water flow rate and hours of operation. The preceding two years of operational data was used to establish the baseline actual emissions for the facility, as required by Rule 220(a). Table 1 summarizes the 2013 and 2014 actual emissions for H<sub>2</sub>S and the previous 24 months for PM10/2.5.

Table 1 Unit 18 Baseline Actual Emissions	Tower H <sub>2</sub> S (Calculated Actual*)	Tower PM10/2.5 (Calculated Actual)
<b>January – December 2013 Emission (lbs/yr)</b>	30,558	
<b>January – December 2014 Emission (lbs/yr)</b>	27,758	
<b>24 Month Average (lbs/yr)</b>	29,158	
<b>January 2013 – December 2014 Baseline Actual Average (tons per year (tpy))</b>	14.58	
* H <sub>2</sub> S emissions are reported as an estimated actual emission on a Monthly basis.		
<b>September 2013 – August 2014 Emission (lbs/yr)</b>		2,155
<b>September 2014 – August 2015 Emission (lbs/yr)</b>		2,683
<b>24 Month Baseline PM Emissions (lbs/yr)</b>		2,419
<b>September 2013 – August 2015 Baseline Actual Average (tpy)</b>		1.2

The baseline actual emissions of PM ( as PM10 and PM2.5) and H<sub>2</sub>S from cooling tower are significantly lower than Unit 18's potential to emit, as established by the permitted hourly emissions limits for these pollutants. The significant difference between baseline actual emissions, in tons per year (tpy), and Unit 18's potential to emit, as established by the permitted hourly emissions rates, is due to several factors outside of GPC's control, including the inherent variability in monitored hourly emissions, generation need, reservoir variability, and the availability of Santa Rosa treated water. Although annual emissions are significantly lower than Unit 18's potential to emit, due to the variability in hourly emissions, GPC is seeking to maintain its existing hourly limits of 11.46 lb/hr H<sub>2</sub>S and 40 lb/hr PM.

NSCAPCD amended 2/23/82, 2/22/84, SIP-approved Rule 220 (strike-through in original; emphasis added); available at:

[http://yosemite.epa.gov/r9/r9sips.nsf/AgencyProvision/944759A041C7E9718825698F0051C8A6/\\$file/SN+220A.PDF?OpenElement](http://yosemite.epa.gov/r9/r9sips.nsf/AgencyProvision/944759A041C7E9718825698F0051C8A6/$file/SN+220A.PDF?OpenElement).

GPC15-078.docx



# Project Description

## Unit 18 (Socrates) Power Plant Replacement of the Cooling Tower Destroyed by the Valley Fire

### PROPOSED REPLACEMENT OF UNIT 18 COOLING TOWER

The proposed replacement cooling tower for Unit 18 is the same or equivalent to the cooling tower that was destroyed by fire. The replacement of the cooling tower and associated equipment will be with like-kind design. The pre-fire Unit 18 cooling tower design is compared with the proposed replacement cooling tower shown below in Table 2.

Table 2 Unit 18 Cooling Tower	Pre-fire Design	Replacement Design	Notes
Type	Crossflow	Crossflow	Equivalent
Model	674-5-11	F678A-20-11	Equivalent
Number of Cells	11	11	Equivalent
Wet Bulb Temperature (WBT °F)	65	65	Equivalent
Water inlet height above basin curb	45'-2 1/2"	45'-2 13/16"	Equivalent
Drift Eliminators	Marley Xcel PVC Cellular	Marley TU12X	Equivalent or better
Drift Rate (%)	0.002	0.001	Equivalent or better
Fan Diameter (ft)	28	28	Equivalent
Gear Ratio	12.98:1	12.98:1	Equivalent
Number of Fan Blades	8	8	Equivalent
Motor Size (hp)	200	200	Equivalent
Shroud Diameter (ft)	31.5	31'-5 5/8"	Equivalent
Shroud Exit Area (ft <sup>2</sup> )	778	<del>778</del> 785	Equivalent**
Air volumetric discharge per cell (cfm)	1,357,325	<del>1,508,300</del> 1,497,000	Equivalent or better**
Air mass flow discharge per cell (lb/hr)	5,096,484	<del>6,014,498</del> 5,923,629	Equivalent or better**
Discharge Velocity (fpm)	1,745	<del>1920</del> 1,906	Equivalent or better**
Maximum Circulation Water Flow Rate (gpm)	165,000	165,000	Equivalent
Discharge Elevation (ft-in)*	64'-4"	61'-7"	2' 9" Lower
Structural Material	Treated Fir	Fiberglass	More fire resistance
Cooling Tower Length (ft-in)	352'-8"	352'-8"	Equivalent
Cooling Tower Width (ft-in)	79'-1.5"	78'-2"	Equivalent
Shroud Height (ft)	18	13.8	Shorter
* ref. Top of basin curb to top of shroud			
** Air Flow calculations amended based on design as of 11/16/2015.			



## Project Description

### Unit 18 (Socrates) Power Plant Replacement of the Cooling Tower Destroyed by the Valley Fire

#### UNIT 18 EMISSIONS REVIEW

The replacement cooling tower will incorporate a higher level of control for particulate matter. Specifically, the cooling tower drift rate will be reduced from 0.002% to 0.001%. Due to the calculation methodology prescribed by the SIP-approved version of Rule 220 and the fact that GPC has operated Unit 18 with emissions significantly below its annual potential to emit, GPC is proposing that it voluntarily take synthetic minor limits on its annual emissions of both H<sub>2</sub>S and PM and thereby avoid triggering NSR as a result of the cooling tower replacement. Unit 18's potential to emit, baseline actual emissions and the proposed annual limits are shown below in Table 3.

<b>Table 3 Unit 18 Emissions</b>	<b>Cooling Tower H<sub>2</sub>S</b>	<b>Cooling Tower PM10</b>	<b>Cooling Tower PM2.5</b>
<b>Current Potential to Emit (Based on Permit Limits) (tpy)</b>	50.2	175.2*	175.2*
<b>24 month Baseline Actual Emissions (annual average (tpy))</b>	14.58	1.2	1.2
<b>Major Modification Threshold (tpy)</b>	10	15	10
<b>Proposed Annual Limit (tpy)</b>	24.4	15.9	11.0

\*PM = PM10 = PM2.5

As suggested above, in requesting these synthetic limits on the annual emissions, GPC proposes to maintain the existing Title V permit hourly emission limits of 11.46 lb/hr H<sub>2</sub>S and 40 lb/hr PM.

Accordingly, upon issuing the requested Authority to Construct for the new cooling tower at Unit 18, GPC is requesting that NSCAPCD establish three (3) new federally enforceable conditions on Unit 18's operations, as follows:

***“Annual emissions from the cooling tower shall not exceed, on a calendar year basis, 24.4 tons per year hydrogen sulfide (H<sub>2</sub>S), 15.9 tons per year particular matter less than 10 microns in diameter (PM10) or 11.0 tons per year particulate matter less than 2.5 microns in diameter (PM2.5).”***

These limits will assure that reconstruction and replacement of the cooling tower can be commenced in compliance with the requirements of NSCAPCD's rules and the California SIP.



# Project Description

## Unit 18 (Socrates) Power Plant Replacement of the Cooling Tower Destroyed by the Valley Fire

### Attachment 1

Unit 18 Cooling Tower Summary of Reported Source Test Results							
January - December 2013 Hydrogen Sulfide				January - December 2014 Hydrogen Sulfide			
Estimated Actual Emissions (Kg/hr)	Report	hours	Estimated Actual Emissions (Lbs/Q)	Estimated Actual Emissions (Kg/hr)	Report	hours	Estimated Actual Emissions (Lbs/Q)
1.0	GPC-13-060			2.7	GPC-14-037		
2.7	GPC-13-060	2068	9877	1.9	GPC-14-037	2140	11482
2.8	GPC-13-060			2.7	GPC-14-037		
2.0	GPC-13-074			0.7	GPC-14-074		
0.9	GPC-13-074	2127	5314	0.4	GPC-14-074	2139	3143
0.5	GPC-13-074			0.9	GPC-14-074		
0.4	GPC-13-086			0.0	GPC-14-086		
0.6	GPC-13-086	2207	2271	0.4	GPC-14-086	2192	1450
0.4	GPC-13-086			0.5	GPC-14-086		
2.5	GPC-14-002			0.5	GPC-15-002		
2.2	GPC-14-002	2121	13096	3.6	GPC-15-002	2208	11683
3.7	GPC-14-002			3.1	GPC-15-002		
Summary (lbs/year)			30,558	Summary (lbs/year)			27,758
2013/2014 Actual Average H2S Emissions (lb/yr)				29,158			
24 month Baseline Actual H2S Emissions (annual average (tpy)				14.58			
Major Modification Threshold (tpy)				10			
Proposed Annual Limit (tpy)				24.4			



# Project Description

## Unit 18 (Socrates) Power Plant Replacement of the Cooling Tower Destroyed by the Valley Fire

September 2013 – August 2015 Unit 18 Cooling Tower PM10/2.5							
ID	Sample Date	Unit 18 TDS	Circ. water flow rate (gpm)	drift eliminator rate	lb/hr	Operation hours/mo	lb/mo
3188	25-Aug-15	615	84000	0.00002	0.514	733.3	377
3171	28-Jul-15	554	84000	0.00002	0.464	734.1	340
3156	24-Jun-15	748	84000	0.00002	0.626	720.0	451
3134	27-May-15	220	84000	0.00002	0.184	731.1	135
3117	29-Apr-15	242	84000	0.00002	0.202	612.2	124
3101	31-Mar-15	263	84000	0.00002	0.220	744.0	164
3088	23-Feb-15	399	84000	0.00002	0.334	672.0	225
3064	26-Jan-15	118	84000	0.00002	0.099	744.0	74
3044*	16-Dec-14	262	84000	0.00002	0.219	744.0	163
3025*	24-Nov-14	261	84000	0.00002	0.219	720.0	157
3009*	28-Oct-14	372	84000	0.00002	0.312	744.0	232
2993*	24-Sep-14	412	84000	0.00002	0.344	704.4	243
2905	26-Aug-14	252	84000	0.00002	0.211	744.0	157
2979**	24-Jul-14	610	84000	0.00002	0.510	744.0	380
2965	30-Jun-14	248	84000	0.00002	0.207	720.0	149
2952	27-May-14	218	84000	0.00002	0.182	739.7	135
2938*	23-Apr-14	404	84000	0.00002	0.338	678.9	230
2928*	26-Mar-14	356	84000	0.00002	0.297	744.0	221
2921*	24-Feb-14	253	84000	0.00002	0.212	672.0	142
2914	27-Jan-14	264	84000	0.00002	0.221	724.3	160
2835*	23-Dec-13	257	84000	0.00002	0.215	735.2	158
2819*	26-Nov-13	260	84000	0.00002	0.218	642.3	140
2804*	23-Oct-13	331	84000	0.00002	0.277	744.0	206
2789	24-Sep-13	129	84000	0.00002	0.108	720.0	78
Sum						17,211	4,838
September 2013 – August 2014 Emission (lbs/yr)						2,155	
September 2014 – August 2015 Emission (lbs/yr )						2,683	
24 month Actual Average PM Emissions (lb/yr)						2,419	
24 month Baseline Actual PM Emissions (annual average (tpy)						1.2	
						PM10	PM 2.5
Major Modification Threshold (tpy)						15	10
Proposed Annual Limit (tpy)						15.9	11.0
<p>* Total solids (TSDS) data are calculated from analytical results of hotwell water samples and analysis of concentration cycles.</p> <p>** Total solids (TSDS) data are calculated from IC analytical results of Circulation water samples and analysis of concentration cycles.</p>							