Roseville Energy Park (03-AFC-1)
CURE Data Requests Set 1

AIR QUALITY

Background – PM10 And PM2.5 Ambient Air Quality Standards

The criteria pollutant dispersion analyses presented by Roseville Electric ("Applicant") in the Application for Certification ("AFC") for the Roseville Energy Park ("REP" or "Project") appear to be incomplete and based on outdated information.

Historically, health impacts due to particulate matter ("PM") were regulated through ambient air quality standards ("AAQS") on particulate matter with an aerodynamic diameter of less than or equal to 10 microns ("PM10"). However, a substantial amount of important new information has been published documenting health impacts at much lower concentrations and for different size fractions of particulate matter than previously known. (U.S. EPA 4/96.[1]) This new research documented that the inhalation of particulate matter, particularly the smallest particles, those with an aerodynamic diameter of less than or equal to a nominal 2.5 microns ("PM2.5"), causes premature mortality, aggravation of respiratory (e.g., cough, shortness of breath, wheezing, bronchitis, asthma attacks) and cardiovascular disease, declines in lung function, changes to lung tissues and structure, altered respiratory defense mechanisms, and cancer, among other effects. (U.S. EPA 4/96; 61 FR 65638.[2])

The U.S. Environmental Protection Agency ("U.S. EPA"), in its review and analysis of this new information on public health impacts from particulate matter, concluded that coarse and fine particles have fundamentally distinct physical and chemical properties and health effects. Thus, the U.S. EPA concluded that these particles are separate classes of pollutants that should be separately regulated and measured so that effective control strategies can be developed. (U.S. EPA 4/96, pp. 13-93.) To address this issue, a new national ambient air quality standard ("NAAQS") for PM2.5 was promulgated in 1997. (62 FR 38652.[3]) Specifically, the U.S. EPA revised the primary (health-based) PM standards by adding a new annual PM2.5 standard set at 15 micrograms per

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[1] U.S. Environmental Protection Agency, Air Quality Criteria for Particulate Matter, Report EPA/600/P-95-001af through 001cF, April 1996.

[2] National Ambient Air Quality Standards for Particulate Matter: Proposed Decision, Federal Register, v. 61, no. 241, December 13, 1996, pp. 65638-65675.

[3] National Ambient Air Quality Standards for Particulate Matter: Final Rule, Federal Register, v. 62, no. 138, July 18, 1997.

cubic meter (µg/m^3) and a new 24-hour PM2.5 standard set at 65 µg/m^3. (62 FR 38652[4].)

In this case, nearly 100% of the Project's operational emissions are combustion emissions. According to California Air Resources Board ("CARB") and EPA, combustion emissions are essentially all PM2.5.[5] The public health impacts from increases in PM2.5 emissions can be significant. For example, the new health studies reviewed above indicate that an increase in 24-hr average PM2.5 concentrations of 10 µg/m^3 increases the daily acute mortality by 0.8% to 2.2%. (U.S. EPA 7/96,[6] Table V-14.) An increase in the 24-hr average PM2.5 concentration of 25 µg/m^3 increases the relative risk of hospitalization by 3% to 16% and of respiratory symptoms by 5% to 82%. (U.S. EPA 7/96, Table V-12.)

Despite these potentially significant impacts, the AFC declined to analyze PM2.5 air quality impacts from the Project, arguing that the "USEPA is delaying implementation of the new standards for an interim period to allow time to establish PM2.5 monitoring networks, designate areas, and develop control strategies. Presently USEPA has very little data to establish the air quality status of areas with regard to PM2.5." (AFC,p. 8.1-6.) This statement in the AFC is incorrect.

Although the new PM2.5 standard was challenged by industry (*American Trucking Associations, Inc. v. United States Environmental Protection Agency*, 195 F.3d 4 (D.C. Cir., May 14, 1999)) and subsequently appealed to the Supreme Court, the standard was recently upheld and implementation is underway. (*American Trucking Associations, Inc. v. United States Environmental Protection Agency*, 283 F.3d 355 *D.C. Cir., March 26, 2002.) Furthermore, the California Environmental Quality Act (CEQA) requires the lead agency to analyze potentially significant public health impacts from PM2.5 emissions from the proposed project. Under CEQA, standards or thresholds that have been adopted to protect the environment are used to determine the significance of project impacts. Where an applicable standard exists, an environmental change which does not comply with the standard is considered significant. "Standard" is

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[4] National Ambient Air Quality Standards for Particulate Matter: Final Rule, Federal Register, v. 62, no. 138, July 18, 1997.

[5] For example, 99.2% of gasoline PM combustion emissions, 96.7% of jet fuel PM combustion emissions, and 100% of natural gas combustion emissions is less than 2.5 microns. CARB, PM Size Fractions from the California Emission Inventory Development and Reporting System (CEIDARS), Updated March 24, 1999.

[6] U.S. EPA, Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information, OAQPS Staff Paper, Report EPA-452/R-96-013, July 1996.

defined to include a quantitative requirement found in a statute, ordinance, resolution, rule, regulation, order, or other standard of general application. (14 Cal. Code Reg. § 15064(h).) As noted above, the U.S. EPA established a new annual PM2.5 standard of 15 µg/m^3 and a new 24-hour PM2.5 standard set at 65 µg/m^3. (62 FR 38652[7].) Thus, the AFC should be revised to include PM2.5 analyses.

Further, the AFC entirely ignored a recent update of State particulate matter standards. Specifically, California has lowered its annual PM10 standard from 30 µg/m^2 to 20 µg/m^3 and adopted a new annual standard for PM2.5 of 12 µg/m^3 on June 20, 2002. (Voting on the proposed 24-hour-average PM2.5 standard of 25 µg/m^3 has been deferred by CARB.[8]) The regulation went into effect on July 5, 2003,[9] and should have been the basis for the ambient air quality impact analysis presented in the AFC, which was published three months after the standard became effective. All State particulate matter standards are substantially lower than their federal equivalents as summarized in the inset table below.

	Ambient Air Quality Standards	
	CAAQS	**NAAQS**
PM10		
24-Hour (µg/m^3)	50	150
Annual (µg/m^3)	20	50
PM2.5		
24-Hour (µg/m^3)	(25)[a]	65
Annual (µg/m^3)	12	15

a Proposed (CARB/OEHHA 3/12/02)

<u>Data Requests – PM10 And PM2.5 Ambient Air Quality Standards</u>

1. Evaluation of the ambient PM10 concentrations recorded at three monitoring stations in the Project vicinity for the years 2000 through 2002 shows that the area is consistently in non-attainment with the new State annual PM10 standard of 20 µg/m^3. (*See* Table

[7] National Ambient Air Quality Standards for Particulate Matter: Final Rule, <u>Federal Register</u>, v. 62, no. 138, July 18, 1997.

[8] California Air Resources Board ("CARB") and Office of Environmental Health Hazard Assessment ("OEHHA"), Draft Proposal to Establish a 24-hour Standard for PM2.5, Public Review Draft, March 12, 2002.

[9] California Air Resources Board, Ambient Air Quality Standards for Suspended Particulate Matter (PM) and Sulfates, <u>http://www.arb.ca.gov/regact/aaqspm/aaqspm.htm</u>, accessed May 7, 2004.

8.1-6.) Please revise the modeling analysis to include PM10 air quality impacts based on the new 24-hour PM10 CAAQS.

2. PM2.5 monitoring data are available for 2000 through 2003 from the Roseville North Sunrise Boulevard station, one of the three PM10 monitoring stations presented in the AFC.[10] Analysis of these monitoring data shows that the area is consistently in non-attainment with the new State annual PM2.5 standard of 12 $\mu g/m^3$. Please expand the emissions inventory to include emissions and ambient air concentrations for PM2.5 and include a PM2.5 air quality impact analysis based on the new annual PM2.5 CAAQS and the Federal PM2.5 ambient air quality standards.

Background - PM10 Emissions From Cooling Tower

PM10 emissions from the cooling tower include only drift estimated from a drift fraction, the circulating water flow rate, and the TDS concentration in the circulating water, assuming five cycles of concentration. (AFC, p. 7-8.) The AFC used a conservative approach to estimate cooling tower emissions in that it used a TDS content of 5000 milligrams per liter ("mg/L"), rather than the calculated 1800 mg/L after five cycles of concentration. However, it can not be safely concluded that the AFC's approach is adequately conservative. The AFC did not provide enough detailed information to calculate the TDS concentration in the circulating water and might have omitted some chemicals and waste streams contributing to the circulating water. Thus, the AFC's estimation of cooling tower emissions might underestimate PM10 emissions from the cooling tower, as detailed more fully below.

Data Requests - PM10 Emissions From Cooling Tower

Please provide the following additional information so that cooling tower PM10 (and toxic) emissions can be confirmed:

3. The water balances shown in Figures 7.1-1 through 7.1-4 indicate that a number of waste streams will be routed to the cooling tower, including the HRSG blowdown, crystallizer condensate, brine concentrators excess distillate, oil/water separator wastewater, blowdown filtration reject, and turbine evaporative cooler blowdown (AFC, Tables 7.1-1 through 7.1-4.). Please provide complete chemical composition data for all waste streams that will be routed

[10] California Air Resources Board, Highest 4 Daily PM2.5 Measurements 2000–2003, Roseville-N Sunrise Blvd, http://www.arb.ca.gov/adam, accessed May 7, 2004.

to the cooling tower so that TDS and noncriteria pollutant emissions (AFC, p. 7-8, Table 7.4-1) can be accurately estimated.

4. A number of water conditioning chemicals will be added to the circulating water or to other streams that are ultimately routed to the cooling tower to minimize corrosion and control the formation of scale and biofouling. These include a pH control agent (acid), a mineral scale dispersant (*e.g.*, polyacrylate polymer), corrosion inhibitors (phosphate-based), and biocide (*e.g.*, sodium hydroxide or equivalent). (AFC, p. 7-2.) The cooling tower PM10 and noncriteria pollutant emissions do not appear to include contributions from these chemicals. Please provide the following information required to estimate the contribution of these chemicals to cooling tower emissions:

   a. MSDSs for all brand-name chemicals (e.g., NALCO products) that will end up in the circulating water, and hence, in the drift, to supplement the data included in AFC Table 7.4-1.

   b. An estimate of the feed rate of each chemical or the concentration of each chemical that will be maintained in the circulating water or streams that are routed to the cooling tower.

5. A wet cooling tower moves massive amounts of ambient air from ground level upward. Since the Project is located in a region with hot summers, large amounts of ground-level PM10 is likely entrained by forced-draft cooling towers and emitted along with the drift. Some of this entrained PM10 would likely be emitted directly and some washed out of the air by downward moving water droplets and incorporated into the circulating water where it would contribute to solids and hence PM10 emissions. This additional, entrained PM10 is not included in the cooling tower emissions. Please provide the following information required to estimate this contribution to cooling tower PM10 emissions:

   a. Design inlet air flow rate (and velocity for the proposed towers).

   b. An estimate of the amount of PM10 entrained by cooling tower fans.

   c. Source test data for comparable cooling towers equipped with high efficiency drift eliminators in similar environments that

support an emission rate of 0.7 pounds per hour ("lb/hr") for a 4-cell tower. (AFC, pp. 7-8 and 8.1-18.)

Background – Cooling Tower Sulfate Emissions

The AFC's air quality impact analysis does not analyze sulfate emissions from cooling towers. (AFC, p. 8.1-31, Table 8.1-17.) Cooling tower sulfate emissions often exceed the California 24-hour sulfur dioxide ("SO_2") ambient air quality standard.

Data Request – Cooling Tower Sulfate Emissions

6. Please revise the air quality impact analysis to include cooling tower sulfate emissions.

Background – BACT For Gas Turbines

In response to California Energy Commission ("CEC") Data Request 1, the Applicant states that "[f]or gas turbines and duct burners, the District considers BACT ["Best Available Control Technology"]to be the most stringent level of demonstrated emission control that is feasible." The proposed BACT for carbon monoxide ("CO") from the gas turbines is a CO limit of 4 parts per million ("ppm") achieved through the use of duct burners and an oxidation catalyst. (Response to CEC Data Request 1.) A number of facilities are currently operating at CO levels lower than the proposed CO BACT limit for REP.

Data Requests – BACT For Gas Turbines

7. Please explain why the continuous emissions monitoring systems ("CEMS") data and source tests for the following facilities do not establish CO BACT for REP at 2 ppm or less, averaged over 3 hours. Please provide supporting data for any of the following facilities that you believe do not meet a CO BACT limit of 2 ppm or less:

   a. ANP Blackstone, MA

   b. Cogentrix River Road Generating Facility, Vancouver, WA

   c. Calpine Sutter, CA

   d. Calpine Pasadena, TX

e. Duke Ingleside, TX

f. Duke Frontera, TX

g. Kiewit Los Medanos Energy Center, CA

h. Milford Power LLC, CT

i. Lake Road Generating, CT

Background – Ammonia Slip

The AFC proposes an ammonia slip of 10 ppm[11] for either of the proposed turbine configurations. (AFC, p. 8.1-20.) CEC staff requested a cost estimate and performance guarantee for both a 5-ppm and a 10-ppm ammonia slip for the proposed turbine configurations. (CEC Data Request 4.) In response, the Applicant claimed that "[i]t is inappropriate to treat ammonia as a regulated pollutant under the Clean Air Act and thereby requiring a BACT analysis." (REP Response to CEC Data Request 4.) However, the impacts of ammonia slip are normally addressed in the environmental impact analysis required as part of a top-down BACT analysis. (*See* NSR Manual, Section B.[12])

The Applicant further contended that under CEQA, "the feasibility of any mitigation need only be evaluated if such mitigation is proposed as part of the project or is necessary to mitigate a specific impact" and claimed that "with respect to ammonia slip, neither condition exists." (Response to CEC Data Request 4.) However, ammonia slip causes potentially significant air quality impacts.

As CEC staff pointed out in CEC Data Request 4, ammonia is a precursor for the formation of secondary particulate matter, which reacts with nitric and sulfuric acids contained in the exhaust gases and/or ambient air to form PM2.5 and PM10. As discussed above, Placer County is in violation of California PM10 and PM2.5 ambient air quality standards. (*See above* CURE Data Request 1, Background – PM10 And PM2.5 Ambient Air Quality Standards.) Under CEQA, every impact that contributes to an existing violation of an air quality standard must be evaluated and mitigated to the extent feasible. Consequently, a facility that has the potential to increase secondary PM2.5 and PM10 ambient air concentrations, aggravating an existing nonattainment problem, must employ

[11] 10 ppm by volume, dry ("ppmvd"), corrected to 15% oxygen content.

[12] U.S. Environmental Protection Agency, New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting, Draft, October 1990.

all feasible mitigation for precursors of criteria pollutants.

CEQA requires the lead agency to adopt feasible mitigation measures that will substantially lessen or avoid the Project's potentially significant environmental impacts. (Pub. Res. Code §§ 21002, 21081(a).) "Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors. (CEQA Guidelines § 15364.)

Lower ammonia slip levels can be readily and inexpensively achieved using a standard SCR system designed to meet a lower slip. The Applicant argues that "it would be inappropriate to increase the uncertainty associated with compliance of the 2.0 ppm NOx ["oxides of nitrogen"] limit by simultaneously reducing the ammonia slip level." The Applicant ignores that most gas-fired power plant projects in California are required to meet an ammonia slip of 5 ppm. In fact, there are a large number of facilities that are successfully operating with both low NOx and ammonia slip levels. Some of these facilities are continuously monitoring ammonia. A number of recent combined-cycle power plant projects, using similar size and larger gas-fired turbines, have been licensed with an ammonia slip of 5 ppm. (*See* Magnolia Power Project,[13] Mountainview Power,[14] Tesla Power Plant Project,[15] Palomar Energy Project.[16])

Massachusetts, Connecticut, Rhode Island, and other states have established 2 ppm ammonia slip BACT limits for new power plants. Rhode Island requires all power plant permit applicants to justify why they cannot achieve a 2 ppm ammonia slip for SCR as part of their BACT analysis. The Massachusetts Department of the Environmental Protection ("MDEP") has

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[13] South Coast Air Quality Management District, AQMD BACT Determinations, Application No. 386305, Magnolia Power Project, Burbank, CA, http://www.aqmd.gov/bact/386305Magnolia.doc; 181 MW net gas turbine, permitted 3-hr NOx limit 2.0 ppm, permitted 1-hr NH_3 limit 5.0 ppm.

[14] South Coast Air Quality Management District, AQMD BACT Determinations, Application No. 366147, Mountainview Power Co., LLC, San Bernardino, CA, http://www.aqmd.gov/bact/366147_Mountainview_Power.doc; 176 MW net gas turbine, permitted 3-hr NOx limit 2.5 ppm, permitted 1-hr NH_3 limit 5.0 ppm.

[15] California Energy Commission, Tesla Power Project, Application For Certification (01-AFC-21), Alameda County, Presiding Member's Proposed Decision, P800-04-007, February 2004; 1120 MW net gas turbine, proposed 1-hr NOx limit 2.0 ppm, proposed 3-hr NH_3 limit 5.0 ppm.

[16] California Energy Commission, Palomar Energy Project, San Diego County, Application For Certification (01-AFC-24), Final Commission Decision, August 2003, P800-03-009; 550 MW net gas turbine, 1-hr average NOx limit 2.0 ppm (or 3-hr average when duct firing or during transient hours), 1-hr NH_3 limit 5.0 ppmvd and 10.0 ppm during transient hours.

established a "Zero Ammonia Technology" BACT standard for gas turbines larger than 50 Megawatt ("MW").[17]

Several large projects in Massachusetts and Connecticut have been issued Prevention of Significant Deterioration ("PSD") permits specifying a NO_x limit of 2 ppm achieved with a 2 ppm ammonia slip, demonstrated using ammonia continuous emissions monitoring systems ("CEMS") and both averaged over 1 hour. (*For example,* Sithe Mystic Development.[18]) The Massachusetts' permits further require that they retrofit with zero ammonia technology at the end of five years. Two of these facilities are currently operating with NH_3 slip levels less than 1 ppm, demonstrated by CEMS.

The CARB *Guidance for Power Plant Siting and Best Available Control Technology* has recommended that Districts consider permit conditions that limit ammonia slip to 5 ppm and acknowledges that slips as low as 2 ppm can be achieved using standard technology. (CARB 9/99[19].) All of the major SCR vendors will guarantee ammonia slips substantially below 10 ppm. Attachment D to the CARB Guidance Document includes performance guarantees from four of the major SCR vendors for a 5 ppm slip, the only level requested. In addition, all of the major vendors are currently offering performance guarantees of 2 ppm to compete in the New England market.[20]

Data Requests – Ammonia Slip

8. Do you agree that reducing the ammonia slip limit represents a method to mitigate impacts from emissions of particulate matter?

9. If your answer to CURE Data Request 8 is anything other than "yes", please explain why not and provide any evidence you have to support your answer.

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[17] Memorandum from David B. Struhs, Commissioner, Massachusetts Department of Environmental Protection, to Ed Kunch, Re: Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) for Electric Power Generators, January 29, 1999, (Struhs 1/29/99).

[18] South Coast Air Quality Management District, Other LAER/BACT Determinations, Application No. . MBR-99-COM-012, Sithe Mystic Development, LLC, Everett, MA, http://www.aqmd.gov/bact/MBR-99-COM-012-Mystic2.doc; two 250 MW net gas turbines, permitted 3-hr NOx limit 2.0 ppm except during startup, permitted 1-hr NH_3 limit 2.0 ppm except during startup.

[19] California Air Resources Board, Guidance for Power Plant Siting and Best Available Control Technology, September 1999.

[20] Personal communications with engineers at Peerless, Engelhard, Hitachi, and Mitsubishi, December 1999.

10. Do you agree that limits of 2 to 5 ppm for ammonia and 2 ppm for NOx have been achieved in practice in gas-fired combined-cycle power plants?

11. Do you agree that limits of 2 to 5 ppm for ammonia and 2 ppm for NOx are technically and economically feasible for this project?

12. If your answer to CURE Data Request 11 is anything other than "yes", please provide all information you have that supports your answer.

13. If your answer to CURE Data Request 11 is anything other than "yes", please explain why the CEMS data and/or source tests for the following projects do not individually establish BACT or in the aggregate, collectively establish BACT for ammonia slip for the REP. Please provide supporting data for any of the following facilities that you believe do not demonstrate a lower ammonia slip limit than 10 ppm:

    a. Lake Road, CT

    b. Milford Power LLC, CT

    c. Wallingford, CT

    d. West Springfield, MA

    e. ANP Blackstone, MA

    f. Cogentrix River Road, WA

    g. University of California, San Diego, CA

    h. Kiewit Los Medanos Energy Center, CA

14. There are two methods that can be used to meet a lower slip limit, increasing the volume of catalyst and using an oxidizing layer downstream of the SCR catalyst to convert ammonia to N_2 and water. The BACT analysis in the AFC, Appx. K-7, did not evaluate either of these two methods of meeting a lower ammonia slip limit than 10 ppm. Please expand the BACT analysis as follows.

a. A standard SCR system can be designed to include an oxidizing layer downstream of the SCR catalyst. The oxidizing layer would oxidize ammonia to nitrogen gas and water. Two major catalyst vendors are commercially offering this system for gas turbines, Cormetech and Engelhard. Near-zero slip levels can be readily and inexpensively achieved using this system. Please expand the BACT analysis to specifically evaluate the use of an oxidizing layer to meet a slip limit of 2 ppm at the REP.

b. A lower slip limit can also be achieved by increasing the SCR catalyst volume. This approach was selected by Calpine in the permitting of its Towantic facility in Connecticut to meet a 2 ppm ammonia slip limit. Please expand the BACT analysis to specifically evaluate increasing the volume of the SCR catalyst to meet a slip limit of 2 ppm.

c. If you fail to evaluate increasing the volume of the SCR catalyst to meet a slip limit of 2 ppm, please explain why this approach is feasible in Connecticut, but not in California on nearly identical projects.

Background – Construction Emissions

The AFC claims that "REP construction site impacts are not unusual in comparison to most construction sites; construction sites that use good dust suppression techniques and low-emitting vehicles typically do not cause violations of air quality standards." (AFC, Appx. 8.1-F, pp. 8.1-F4/5.) This is contrary to our experience with the construction phase of many similar power plant projects. Modeling almost always results in violations of the federal and state 24-hour and annual ambient air quality standards, requiring substantially more mitigation than proposed in the AFC.

In response to CEC Data Request 5, the Applicant provided a series of tables and calculations supposedly representing the construction emission estimates. (Response to CEC Data Request 5, Attachment AIR-3.) The Applicant did not provide a detailed construction schedule, which is necessary to calculate emissions for the different phases of the construction period. Rather, the analysis is based on the assumptions that worst-case daily fugitive dust emissions occur "during the first one to two months of construction when site preparation occurs" and worst-case daily exhaust emissions occur "during the middle of the construction schedule during the installation of the major mechanical equipment." (AFC, Appx. 8.1-F, pp. 8.1-F1.) No explanation was

provided on how the list of construction equipment operating during these two periods was developed.

The Applicant's tables and calculations are incomplete and the calculations difficult to follow. Many of the emission factors and emission control factors presented in the tables lack cross-reference to the references below the tables. The results for the construction emission estimates appear to substantially underestimate exhaust, as well as fugitive dust emissions.

Data Requests – Construction Emissions

15. Construction emissions for the Project were estimated in Appendix 8.1-F and tables and calculations that lack cross-references were provided in response to CEC Data Request 5. Please provide the following information to clarify and support these emission estimates:

    a. Please provide an electronic copy of the spreadsheets used to estimate the construction emission calculations in Response to CEC Data Request 5, Attachment AIR-3.

    b. Please identify the sources for all emission factors and emission control factors used in the fugitive dust emission estimates.

    c. Emission estimates appear to be based on a construction schedule of 8 hours per workday and a 5-day workweek. (Response to CEC Data Request 5, Attachment AIR-3.) Elsewhere, the AFC states:

       "[c]onstruction will typically be scheduled between the hours of 7 am and 7 pm on weekdays, and 8 am and 8 pm on weekends. Additional hours may be necessary to complete critical construction activities. During these periods, some activities will continue 24 hours per day, 7 days per week." (AFC, p. 2-20.)

       Clearly, construction may be conducted for more than 8 hours per day and more than 5 days per week. Without a detailed construction schedule, it is impossible to determine the worst-case scenario for construction emissions. Therefore, please provide a detailed construction schedule.

    d. The list of construction equipment for which diesel exhaust emissions were estimated appears to be incomplete. (Response

to CEC Data Request 5, Attachment AIR-3, Table 1.) The list does not contain pile-drivers, a major source of diesel exhaust emissions, which are used to construct the foundation for the plant, particularly for the turbine pads. The list also does not contain several smaller pieces of equipment that are discussed in the AFC's description of the construction emissions and impact analysis, e.g., diesel-powered welding machines, water pumps, etc. (AFC, Appx. 8.1-F, p. 8.1-F1.) Please revise the construction diesel exhaust emission estimates based on the detailed construction schedule and include exhaust emissions from pile drivers, water pumps, diesel-powered welding machines or any other equipment used during construction.

e. The Applicant's construction fugitive dust emission estimate assumes a 93% emission control of fugitive dust as a result of the implementation of two mitigation measures, watering and speed control. (Response to CEC Data Request 5, Attachment AIR-3, Table 4.) The Applicant applied this control factor uniformly across all fugitive dust emissions, including grading. However, a control efficiency of 93% for fugitive dust from construction through watering is neither achievable nor feasible. Typical control efficiencies of watering at construction sites have been estimated at 50%.[21] The South Coast Air Quality Management District ("SCAQMD"), for example, whose CEQA Guidelines appear to be the source of the emission control factor used in the Applicant's analysis, uses a range of 34% to 68% for mass grading. (SCAQMD 4/93[22], Table 11-4 and Response to CEC Data Request 5, Attachment AIR-3, Table 4.) Also, if 93% control efficiency were to be achieved, massive amounts of water would be required. This much water would make the site inoperable for heavy equipment. Thus, please revise the construction fugitive dust emission estimate based on the detailed construction schedule and using realistic emission reduction factors.

f. If you do not revise the construction fugitive dust emission factors, as requested in CURE Data Request 15.e., please

[21] PEDCo Environmental Specialists, Investigations of Fugitive Dust Sources – Emissions and Control. Prepared for the Environmental Protection Agency, OAQPS, Contract No. 68-02-044, May 1977.

[22] South Coast Air Quality Management District ("SCAQMD"), CEQA Air Quality Handbook, April 1993.

provide support for the assumed 93% control efficiency with vendor information and/or engineering calculations.

g. If, in response to CURE Data Request 15.e., you provide support for the 93% control efficiency, please estimate the average annual and maximum daily amount of water that will be required to achieve 93 % control efficiency, using a method such as that presented in Cowherd et al. (1988).[23] Your answer should include a fully documented engineering calculation that identifies all assumptions, including the water application rate, application frequency, capacity of water trucks, and assumed precipitation and evaporation rates.

h. The AFC's equipment inventory and usage rates are inconsistent with similar information presented in other siting cases. It does not appear that the Project could be built with the equipment and usage rates assumed in the construction emissions. Please support the construction emission estimates by providing the following information:

    i. An inventory of equipment that would be deployed for each month of the construction period for the main plant site and all linears. An equipment inventory is routinely provided in AFCs to support construction emissions; and

    ii. If not clarified by the response to subpart (i), please provide the basis of the number of equipment shown in Response to CEC Data Request 5, Attachment AIR-3, Tables 1, 5 and 6.

i. Please explain why MVE17G version 1.0c was used to estimate emissions for delivery trucks and worker travel emissions, rather than EMFAC2000. (Response to CEC Data Request 5, Tables 5 and 6.)

j. The Applicant's fugitive dust emission modeling relies on emission factors from U.S. EPA's Compilation of Air Pollutant Emission Factors, AP-42, (AP-42[24]), and from the MRI report

[23] C. Cowherd, G.E. Muleski, and J.S. Kinsey, Control of Open Fugitive Dust Sources, Report EPA-450/3-88-008, September 1988.

[24] U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources.[24].

(MRI 3/96[25]) prepared for the SCAQMD to provide more specific emission factors than those presented in AP-42. (Response to CEC Data Request 5, Attachment AIR-3, Table 4, notes.) Instead of using the emission factor recommended by the MRI report for projects where only the construction area and duration is known, as is the case here, the Applicant estimated PM10 emissions from a TSP factor based on the disturbed acreage and the construction time, which was then converted to PM10 emissions with a conversion factor of 0.69. (Response to CEC Data Request 5, Attachment AIR-3, Table 4.) The emissions modeling resulted in a maximum uncontrolled fugitive PM10 dust emissions from onsite construction of 55.2 pounds per **day**. (AFC, Table K.2-1.) The MRI report indicates that fugitive PM10 emissions from five similar construction sites range from 18 pounds per **hour** to 793 pounds per **hour**. Therefore, please answer the following:

i. For projects where only the construction area and duration is known, the MRI report recommends using an emission factor of 0.11 ton/acre-month for average conditions and 0.42 ton/acre-month for worst-case conditions for PM10 construction emissions. (MRI 3/96, Table ES-2.) Please provide all evidence that explains why emission modeling was not performed with the emission factor recommended by the MRI report, when the Applicant relied on factors from the MRI report elsewhere.

ii. Please provide all evidence that explains why fugitive PM10 emissions from the construction of REP would be substantially lower than those reported in the MRI report for five other similar projects.

iii. The AFC appears to omit emissions associated with the construction of linear facilities, i.e., the 5.8 to 6.4 mile gas pipeline (AFC, p. 2-14), the recycled water pipeline from the Pleasant Grove Wastewater Treatment Plant ("PGWWTP") (AFC, p. 8.15-10), and the transmission line connecting the REP switchyard to the 60-kiloVolt ("kV")

[25] Midwest Research Institute ("MRI"), Improvement of Specific Emission Factors, BACM Project No. 1, Final Report, South Coast Air Quality Management District Contract No. 95040, MRI Project No. 3855, March 29, 1996.

transmission line constructed as part of the West Roseville Specific Plan ("WRSP") build-out. (AFC, p. 2-12.)

Please provide an emission estimate for the construction of linear facilities and include the construction period in the to-be-provided construction schedule, in response to CURE Data Request 15.c., the following additional, essential equipment or explain why this equipment is not required:

a. Flatbed trucks to import pipe;
b. Pipe-stringing trucks to transport pipe from the shipment point or storage yard to the pipeline right-of-way ("ROW");
c. Bending machines to conform the pipe to the terrain;
d. Welding trucks and rigs to weld the pipe;
e. Side-boom tractors to lift and lower the pipe into the ditch;
f. Dump trucks to remove dirt displaced by the pipe;
g. Jack hammers;
h. Pavement saw to remove asphalt;
i. Dump trucks to haul away broken asphalt and to return fresh asphalt;
j. Asphalt rollers;
k. Asphalt trucks in blacktop spreads;
l. Buses to transport workers to remote areas;
m. Specialty equipment for boring under roads and creeks; and
n. Any other support equipment that the Applicant intends to use, including an A-frame truck, boring machine, coating truck, ditcher, mechanics rig, a parts van, slurry truck, pumps, air compressor, portable generators, and x-ray trucks, among others.

iv. In excavation for pipelines, dirt from the trench is piled alongside the trench. Please include windblown dust from these storage piles in the construction emission calculations for linear facilities.

v. Windblown dust from constructing the linear facilities would result in newly disturbed area, which will remain disturbed until the entire linear facility ROW is successfully revegetated, which would likely not occur over the 20 month construction period. Thus, the maximum daily disturbed area would be the entire linear facility ROWs. Thus, please incorporate windblown dust fugitive PM10 emissions in the construction emission estimate for linear facilities for a realistic disturbed area.

vi. Please perform the above calculations additionally for the case where the WRSP is not built-out and the REP is connected directly to the Fiddyment Receiving Station via a new radial double-circuit 60-kV transmission line. (*See* AFC, p. 2-12.)

k. Emissions from worker travel do not include fugitive dust emissions from travel on unpaved roads. (Response to CEC Data Request 5, Attachment AIR-3, Table 5.) Please revise the construction fugitive dust emissions to include emissions from worker travel including travel to and from the plant site and the construction of the linear facilities.

Background – Significance of Construction Impacts and Mitigation Measures

The AFC does not provide an evaluation of whether construction emissions are significant. Construction emission estimates are typically compared to significance thresholds for criteria pollutant mass emissions, as set forth in federal and state ambient air quality standards and in the respective Air District's CEQA guidelines. The AFC fails to even mention CEQA Guidelines published by the Placer County Air Pollution Control District ("PCAPCD"). When CEQA guidelines do not contain significance thresholds, as is the case in the PCAPCD's CEQA guidelines, thresholds from neighboring air districts or comparable airsheds are typically used. Placer County is part of the Sacramento Air Basin and the AFC should have compared construction mass emissions to the significance thresholds set forth in the CEQA guidelines released by the Sacramento Metropolitan Air Quality Management District ("SMAQMD").

The SMAQMD's CEQA Guidelines specify a significance threshold for construction for NOx of 85 pounds per day ("lb/day"), *i.e.* 3.5 lb/hr. (SMAQMD

4/02.[26]) Construction emissions from the Project, which are 240 lb/hr, far exceed this threshold. (Response to CEC Data Request 5, Attachment AIR-3, Table 3.)

Further, as the AFC admits, project construction emissions plus the background concentration will also exceed the state 24-hour PM10 ambient air quality standard. (AFC, p. 8.1-F4.) Project construction emissions plus background will also exceed the new state annual PM10 ambient air quality standard. (*See above* CURE Data Request 1.) The AFC appears to argue that these are not significant impacts because existing ambient air quality already exceeds state standards. (AFC, Appx. 8.1, pp. 8.1-F.) The SMAQMD CEQA Guidelines define the substantial contribution threshold for criteria pollutants as follows: "A project is considered to contribute substantially to an existing or projected violation of a CAAQS if it emits pollutants at a level equal or greater than five (5) percent of the CAAQS." (SMAQMD 4/02.) Considering this significance threshold, Project emissions exceed the 1-hour NO_2, the 1-hour and 24-hour SO_2, and the 24-hour and annual PM10 state ambient air quality standards. The air quality analyses in the AFC indicate that maximum construction impacts contribute at least 10 % and up to 60 % of the total impact, including background concentrations. (AFC, Attachment F, p. 8.1-F4, Table 8.1-F.) Therefore, under SMAQMD's CEQA Guidelines, Project construction air quality impacts are significant and must be mitigated. We expect that when construction emissions are revised, as discussed above, NO_2 ambient air quality standards will also be exceeded. (*See above*, CURE Data Request 15.)

Under CEQA, the lead agency must adopt feasible mitigation measures that will substantially lessen or avoid the Project's potentially significant environmental impacts. Whether state standards are already exceeded without the project is irrelevant under CEQA. (AFC, Attachment F, p. 8.1-F4.) All feasible mitigation must be incorporated to mitigate significant impacts from Project construction.

Data Requests – Significance of Construction Impacts and Mitigation Measures

16. Please provide an evaluation of whether construction emissions are significant in comparison to significance threshold for criteria pollutant mass emissions, as set forth in federal and state ambient

[26] Sacramento Municipal Air Quality District, Memorandum from Norm Covell, Air Pollution Control Officer, to Lead and Responsible Agencies, Consultants, and Interested Persons, California Environmental Quality Act (CEQA) Revised Significance Criteria for Air Quality, April 12, 2002. http://www.airquality.org/ceqa/index.shtml, accessed May 9, 2004.

air quality standards and in the respective or neighboring Air District's CEQA guidelines.

17. Please identify feasible mitigation measures that will substantially lessen or avoid the Project's potentially significant environmental impacts, in light of the revised construction emissions provided in response to CURE Data Request 15.

Background – Cumulative Impact Analysis

The AFC claims that "[a]n analysis of potential cumulative air quality impacts that may result from the REP and other reasonably foreseeable projects is generally required only when project impacts are significant." (AFC, p. 8.1-42.) This statement is completely contrary to the intended purpose of a cumulative impact assessment. While a single project may not result in a condition that results in unacceptable air quality impacts, the cumulative exposure to REP and other projects in Roseville and Placer County may result in cumulatively significant health impacts.

Data Requests – Cumulative Impact Analysis

18. Please perform a cumulative impact analysis and include air quality impacts from the following sources:

    a. The Pleasant Grove Wastewater Treatment Plant ("PGWWTP");
    b. The development approved in the WRSP;
    c. Any and all other sources that have received permits authorizing construction, but are not yet in operation; and
    d. Any and all sources which have commenced operation, subsequent to the data used to establish background air quality levels, i.e. after the year 2002.

PUBLIC HEALTH

Background – Toxic Emissions From Cooling Tower

Toxic emissions from the cooling tower are based on the projected water quality parameters of the PGWWTP recycled water and 5 cycles of concentration (AFC, Appx. 8.1-G, Table 8.1-G3 and AFC, p. 8.15-12, Table 8.15-3.) This method underestimates toxic emissions from the cooling towers. This method does not include contributions from waste streams that would be routed to the cooling tower basin, does not include conditioning chemicals that would be added to the circulating water, and does not include entrained dust. Please respond to the following questions on this issue:

Data Requests – Toxic Emissions From Cooling Tower

19. The AFC does not contain any support for the emissions in Appendix 8.1-G, Table 8.1-G3, and omits many toxic substances that are likely to be present. The limited data reported in Table 8.1-G3 is not adequate to estimate cooling tower emissions. Please provide analyses for emissions of pesticides and other organic compounds and metals, including arsenic, cadmium, mercury, nickel, copper, zinc, selenium, beryllium, chromium (III & IV), thallium, and boron. (Note that the metals data in Table 5.4-6 are incomplete and that it is REP effluent mixed with PGWWTP recycled water that would be used in the cooling tower.)

20. Pharmaceuticals, personal care products, hormones, endocrine disrupters, and other synthetic chemicals, as well as bacteria and viruses are present in reclaimed water and would be emitted from the cooling tower. Please revise the risk assessment to consider the public health implications of emission of these substances.

21. Please revise the cooling tower toxic emissions to include conditioning chemicals, their reaction products, e.g., chloroform and other chlorination or bromination byproducts, and waste streams routed to the cooling tower basin.

22. If the cooling tower packing is wood, preservative chemicals would be leached from the wood and emitted with the drift. Please respond to the following questions on this issue:

    a. Will wood packing be used?

b. If the answer to subpart (a) is yes, please identify the preservative chemicals that may leach into the circulating water and estimate concentrations.

Background – Health Hazards From Legionella Bacteria Cooling Tower Emissions

The drift from the Project's wet cooling system would contain viruses and bacteria that could affect public health. Legionella, a bacterium that thrives in water between 68°F and 115°F, the usual temperature of circulating water, has been detected in about 40% to 60% of cooling towers tested nationwide.[27] It causes a respiratory disease similar to pneumonia with symptoms including high fever, chills, headache and muscle pain, dry cough, and breathing difficulty. Some 4,000 people die in the U.S. each year from Legionnaire's Disease caused by the Legionella bacteria. (CTI Guidelines 2/00.[28])

The CTI Guidelines are explicit that, "since no fixed danger level can be assigned, it also follows that no specific level of the organism can be assigned as safe." CTI has developed rigorous chemical dosing guidelines designed to minimize (though not eliminate) the propagation of the Legionella bacteria in cooling towers. Cooling tower drift, in the form of easily inhaled aerosols, is the exposure pathway. This issue is especially significant if a new power plant is being located near existing residential areas, as is the case of the REP, which will border the WRSP area. The CTI recommendations have been incorporated in the CEC's proposed guidelines for wet and hybrid cooling towers at power plants.[29]

The AFC does not address the health risks associated with Legionella bacteria potentially emitted with cooling tower emissions. Therefore, please answer the following questions on this issue:

Data Requests - Health Hazards From Legionella Bacteria Cooling Tower Emissions

23. Please explain what precautions will be taken to reduce potential Legionella emissions from the cooling tower.

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[27] William Wurtz, Why Power Plants Use Dry Cooling, Air & Waste Management Association Symposium on Dry Cooling for Power Plants—A Proven Alternative, May 31, June 1, 2002.

[28] Cooling Tower Institute ("CTI"), Guideline: Best Practices for Control of Legionella, February 2000.

[29] California Energy Commission, Staff Biocide Monitoring Program Guidelines For Wet and Hybrid Cooling Towers at Power Plants, Draft Version 1.0, May 15, 2003.

24. Is the Applicant willing to accept a COC requiring the implementation of the CTI and/or CEC guidelines regarding the prevention of Legionella bacteria from cooling towers?

Background – Health Risk Assessment

The AFC failed to include health risks for diesel exhaust emissions from the 750-MW standby diesel generator and fire-water pumps in the screening health risk assessment. Also not evaluated are the acute health risks associated with startup, during which large quantities of aldehydes, e.g., acrolein, are emitted. (*See* Tables 8.1-17 and 8.1-18 and AFC, Appx. 8.1-G.)

Data Requests – Health Risk Assessment

25. Please revise the screening health risk assessment to include toxics from diesel generator and fire-water pump exhaust emissions.

26. Please perform an acute health risk assessment for plant startup.

27. Please perform a health risk assessment for diesel exhaust emissions associated with construction.

Background – Substitution Of Aqueous Ammonia With Urea

The AFC proposes to use a 28% aqueous ammonia solution, stored in a 10,000-gallon tank on site, as the source of ammonia vapor injected into the SCR system. (AFC, pp. 2-17 and 8.5-3.) Aqueous ammonia solutions in strengths above 20% present significant danger to human health and are classified by OSHA as hazardous chemicals. Hazards from exposure vary from minor discomfort to toxic poisoning. The partial pressure of ammonia in a 19% to 20% ammonia solution is high enough to form large and hazardous ammonia vapor clouds if an accidental release occurred along transportation corridors, during unloading, or during storage and use at the site. The transportation, storage and handling of aqueous ammonia triggers serious safety and environmental regulatory requirements for risk management plans, accident prevention programs, emergency response plans and release analysis.

Data Requests – Substitution Of Aqueous Ammonia With Urea

28. The Applicant prepared an offsite consequence analysis ("OCA") resulting from a loss-of-containment incident for aqueous ammonia. (Response to CEC Data Request 40.) This analysis concluded that

such an incident would result in no offsite ammonia concentrations above the specified levels of concern.

The Applicant calculated an ammonia emission rate using the National Oceanic and Atmospheric Administration ("NOAA") evaporation calculator, which is primarily used as input to NOAA's hazardous release dispersion model, ALOHA (Areal Locations of Hazardous Atmospheres).[30] However, rather than using ALOHA, the Applicant's OCA is based on the SLAB numerical dispersion model.

In this case, the choice of the dispersion model has a significant impact on the results of the offsite consequence analysis. Applying the same chemical, meteorological, and source data as presented in the response to CEC Data Request 40, we modeled the downwind impacts using ALOHA. A comparison of the SLAB and ALOHA predicted ammonia concentrations are presented in the inset table below.

Model	Distance to 2000 ppm (m)	Distance to IDLH of 300 ppm (m)	Distance to EPA/CalARPTE of 200 ppm (m)	Distance to CEC Significance Value of 75 ppm (m)
SLAB	**27.73**	**32.17**	**32.75**	**33.49**
ALOHA	**465**	**1200**	**1500**	**2700**

The Response to CEC Data Request 40 states that it is 47.24 meters from the nearest plant boundary to the center of the ammonia storage tank. Using the NOAA ALOHA model, consistent with the NOAA ammonia evaporation calculator applied by the applicant, indicates that significant offsite ammonia concentrations will occur and will be significant considerably beyond the REP site boundary.

a. Please provide the input and output files used in the SLAB modeling prepared for the Response to CEC Data Request 40.

b. Please provide evidence that justifies using the SLAB model instead of ALOHA.

[30] http://response.restoration.noaa.gov/cameo/evapcalc/doc.html.

c. Please explain why the NOAA emission calculator was deemed appropriate for the REP offsite consequence analysis, but the NOAA ALOHA dispersion model (which is also part of the CAMEO system) was not.

29. The hazards associated with transporting, unloading, and storing of aqueous ammonia can be eliminated by using urea, $CO(NH_2)_2$, as feedstock. Urea is a stable, white, crystalline solid that is widely used as a fertilizer and is nonhazardous. The solid is transported and stored in silos as granules or pills. Urea can be safely transported, stored and handled at the plant site without special precautions. In this case, there is no need to transport and store a dangerous chemical and the amount of ammonia at the power plant at any moment is significantly smaller than the EPA reportable spill quantity. Replacement of aqueous ammonia with urea is feasible and operating experience of urea as ammonia source for SCR systems is available for combined-cycle power plants.

Several commercial systems are currently in use in the United States. The Urea-to-Ammonia-Generation-Process or U_2A^{TM} and the Ammonia-on-Demand or AOD system created ammonia as needed by mixing the dry urea with heated, deionized water to form a 40% to 50% solution. The mixture is fed to a hydrolyzer where heat and pressure are applied. The urea mixture is then hydrolyzed to ammonium carbamate, which decomposes into ammonia gas and carbon dioxide. Steam is used to strip out the ammonia gas, and the steam/ammonia mixture is then piped to the SCR as in a conventional SCR. Fuel Tech's NOxOUT ULTRA® system, thermally converts urea to ammonia and inorganic acid (HNCO) for SCR use. It has been successfully demonstrated at a 130-MW combined cycle cogeneration facility, which generates 90 MW from a GE Frame 7EA gas turbine and 40 MW from a GE steam turbine.[31]

a. Is the Applicant willing to use urea instead of aqueous ammonia as ammonia source for injection into the SCR? If your answer is anything other than "yes", please explain your answer and provide all evidence justifying your answer.

[31] Fuel Tech's Urea-Based SCR Reagent Feed System, FGD and DeNOx Newsletter No. 30, January 2004.

WATER QUALITY/WATER RESOURCES

Background – Potable Water Supply

Until the build-out of the WRSP and the connection to the City's drinking water supply, REP's potable water will be supplied by one of three on-site wells. If the WRSP is not developed, potable water will continue to be drawn from one of the on-site wells. (AFC, pp. 2-14 and 7-1; AFC, p. 8.5-10.) The AFC maintains that the City of Roseville has tested one of the three existing wells on the parcel and has determined that its quality and pressure are sufficient to serve the Project. (AFC, p. 8.15-11.) The AFC does not contain sufficient information on these wells to evaluate the impact of using them to supply the Project.

Data Requests – Potable Water Supply

30. Please provide a map that locates each well.

31. Please provide a well log for each well, or, in the alternative, its diameter, depth, and yield.

32. Please provide the surrounding aquifer properties, including transmissivity, porosity, etc.

33. Please provide a drawdown analysis that evaluates the impacts of project pumping on surrounding wells. This analysis should identify current uses of the three on-site wells, current pumping rates, and include a map that shows all wells within a 1-mile radius.

34. The REP has an average operational demand of potable water of 0.5 gallons per minute ("gpm".) (AFC, p. 7-7.) The AFC does not contain any information on the peak potable water demand of the Project. Please provide information on the worst-case peak potable water demand.

35. The AFC does not contain any flow test results for the wells. Flow testing is necessary to determine whether the wells can provide a sustainable flow, as claimed in the AFC, especially if the WRSP is not built and the Project will not be connected to the City of Roseville's drinking water supply. Please provide test results to demonstrate that the wells are able to provide a sustainable supply of potable water for peak potable water demand, as well as

sustainable supply of the average water demand for the life of the Project.

36. Construction of the REP will require a water supply of 200 gpm. (AFC, p. 8.5-12.) Presumably, the water would be provided from the on-site wells, although the AFC does not specify the source for construction water. If the water during the construction phase is, in fact, supplied by the on-site wells, please provide information to demonstrate that the wells are able to meet the increased water demand during the construction phase without negatively impacting other wells, e.g., agricultural wells for livestock, in the vicinity. If water for construction is supplied from another source, please specify.

37. The groundwater under the Project site is part of the Sacramento Valley groundwater basin. Within 5 miles of the REP site, groundwater contamination such as heavy metals, organic solvents, and coliform bacteria have been detected. (AFC, p. 8.15-7.) Because the Sacramento Valley groundwater basin is underlying extensive areas of agriculture and the site is located in an area of active livestock grazing, there is a potential for water contamination with pesticides and microorganisms. The City of Roseville has tested a very limited number of inorganic constituents in one sample from one of the three wells. (AFC, Appx. 8.15-A.) This is not adequate to evaluate the water quality of all three wells, particularly if they are completed in different geologic formations. Thus, please provide complete chemical and physical tests results for each well. This data should include all constituents for which drinking water standards have been established, including, but not limited to additional metals (list), microorganisms, radionuclides, and organic chemicals to demonstrate that its constituents do not exceed maximum contaminant levels ("MCLs"). These data are also required to determine if the salt cake is a hazardous waste. (See CURE Data Requests 39 and 40.)

38. The AFC provides no description of the treatment of the well water for use as a potable water supply. Please provide an adequate description how well water will be treated and the disposition of treatment residuals.

Background – Zero Liquid Discharge System

The AFC proposes a zero-liquid discharge ("ZLD") system for the Project, which results in the generation of salt cake of approximately 127 lb/hr during average ambient conditions and 303 lb/hr during summer ambient conditions. (AFC, pp. 7-2 and 7-8.) On an annual basis, REP is estimated to generate up to 121 tons/year of salt cake. Depending on the concentration constituents in the salt cake, the salt cake might have to be deposed of as a hazardous waste, according to Section 66261.24 of Title 22 of the California Code of Regulations. The AFC contains no provisions for handling and disposing of salt cake as a hazardous waste. Further, the AFC does not contain sufficient information to determine if salt cake would be a hazardous waste.

Data Request - Zero Liquid Discharge System

39. The summary of the salt cake constituents presented in the AFC does not contain chemical composition data for most of the constituents, e.g., Pb, Ni, Zn, Se, Cr, that are regulated under Section 66261.24 of Title 22 of the California Code of Regulations. If the concentration of these constituents exceed Total Threshold Limits Concentrations ("TTLCs") or Soluble Threshold Limits Concentrations ("STLCs"), the salt cake would be classified as a hazardous waste. This would require special handling and disposal, which is not described in the AFC. (AFC, p. 7-9, Table 7.4-2.) Therefore, please provide a complete analysis of all constituents of the salt cake that have TTLCs and STLCs to demonstrate that salt cake will not represent a hazardous waste. Please include significance thresholds in the table and demonstrate that constituents of the salt cake do not exceed their respective thresholds.

40. Please provide calculations that show how the salt cake composition data in Table 7.4-2 were calculated, starting with the feed water quality data. Please provide documentation for all of your assumptions.

Background – Watershed Impacts

The REP is proposing to use tertiary treated recycled water provided by the PGWWTP. (AFC, p. 7-7.) The Project will use a maximum of 1.71 million gallons per day ("mgd"). (AFC, p. 8.15-10.) The AFC did not evaluate the impacts of evaporating this large a quantity of water rather than using it for different

purposes, e.g., watering of golf courses or public lands, where it would ultimately recharge the groundwater or directly discharging it into the watershed.

Data Requests – Watershed Impacts

41. Please provide an analysis of the impacts of withdrawing a maximum of 1.71 million gallons per day ("mgd") from the watershed by evaporation.