

EXHIBITS

EXHIBIT LIST

Exhibit 1

Letter (dated May 29, 2007) from Paul C. Richins, Jr., Environmental Protection Office Manager, California Energy Commission, to Jack P. Broadbent, District's Air Pollution Control Officer.

Exhibit 2

Notes (dated November 6, 2008) referenced in *Statement of Basis for Draft Amended Federal "Prevention of Significant Deterioration" Permit* for the RCEC issued by District on December 8, 2008. at page 40 n.31.

Exhibit 3

CAP comments (dated February 5, 2009) on *Statement of Basis for Draft Amended Federal "Prevention of Significant Deterioration" Permit* for the RCEC issued by District on December 8, 2008.

Exhibit 4

Exhibit 6 to CAP comments (dated February 5, 2009) on *Statement of Basis for Draft Amended Federal "Prevention of Significant Deterioration" Permit* for the RCEC issued by District on December 8, 2008.

Exhibit 5

Chabot-Las Positas Community College District comments (dated February 6, 2009) on *Statement of Basis for Draft Amended Federal "Prevention of Significant Deterioration" Permit* for the RCEC issued by District on December 8, 2008.

Exhibit 6

"SU-SD analysis final 4-1-09.pdf" appended to email from Kevin Poloncarz (Calpine's counsel) to Alexander Crockett (District's counsel) (dated April 2, 2009).

Exhibit 7

CAP comments (dated September 16, 2009) on *Additional Statement of Basis, Draft Federal "Prevention of Significant Deterioration" Permit* for the RCEC issued by the District on August 3, 2009.

Exhibit 8

Document entitled "Mankato Energy Center Start profiles for winter months" (undated) from District's *Responses to Public Comments, Federal "Prevention of Significant Deterioration Permit* for the RCEC issued by District in February 2010 at page 114 n.235.

EXHIBIT 1

CALIFORNIA ENERGY COMMISSION

1515 NINTH STREET
SACRAMENTO, CA 95832-0151

May 29, 2007

Mr. Jack P. Broadbent
Executive Officer/Air Pollution Control Officer
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Dear Mr. Broadbent,

**AMENDED PRELIMINARY DETERMINATION OF COMPLIANCE FOR THE
RUSSELL CITY ENERGY CENTER, APPLICATION 15487**

Thank you for the opportunity to comment on the Amended Preliminary Determination of Compliance (PDOC) for the proposed Russell City Energy Center (RCEC), a 600 MW combined cycle project located in the city of Hayward. In the Amended PDOC the District finds that, subject to specified permit conditions, the proposed project will comply with all applicable federal, state and Bay Area Air Quality Management District (District) rules and regulations.

In considering this project, we believe there may be better and more direct ways to reduce or avoid the cumulative impacts from ozone precursor emissions than those proposed by the project owner. We believe that there is current technology that the District should consider requiring as Best Available Control Technology (BACT) that will significantly limit the ozone precursor emissions that result from start-up and load following transitions. We believe that impact avoidance (i.e., preventing emissions) is generally a better approach than impact mitigation of air emissions through the provision of offsets when complying with the requirements of the California Environmental Quality Act.

OFFSETS

The planned operating profile of the project, frequent start-up and shutdown cycles, is creating a significant disparity between the daily emissions and the average daily offsets. The project owner is requesting that no District or Energy Commission conditions be attached to the project that would restrict the number of start-up and shutdown cycles or the annual hours of operation. They would, instead, accept a condition that would limit the facility's annual emissions to 134 tons per year (TPY) of oxides of nitrogen (NOx) and 28.5 TPY of precursor organic compounds (POC).

The Amended PDOC, per the District New Source Review (NSR) regulations, identified That RCEC will surrender emission reduction credits (ERC) in the amounts of 103 TPY of NOx and 80 TPY of POC to offset new emissions of 134 TPY of NOx and 28.5 TPY of POC. On a daily basis, including days that experience ozone violations, staff estimates that the project could emit up to 2,213 lbs of NOx, while the proposed

emission reduction credits provided would amount to only 844 lbs per day. This offset amount mitigates approximately 38 percent (844 lbs/2,213 lbs) of the project's potential emissions for NO_x on any given day. Thus on those days when violations of the ozone air quality standards occur, the project's emissions would contribute to violations of the standard.

BACT

According to the Amended PDOC, each unit of the RCEC must be equipped with BACT for NO_x, carbon monoxide (CO), POC, particulate matter less than 10 microns (PM₁₀), and oxides of sulfur (SO_x). The Amended PDOC states that BACT for each unit is the use of selective catalytic reduction (SCR) and CO oxidation catalyst systems to control NO_x, POC and CO emissions, and the use of natural gas as BACT for PM₁₀ and SO_x.

The SCR system will maintain a normal operation NO_x emissions limit of 2.0 parts per million (ppm) averaged over a one-hour period. The District determined that this meets District guidelines for BACT. Missing from this determination is consideration of the facility's potential high daily NO_x emissions from multiple start-up and shutdown cycles. Energy Commission staff estimates that the facility can potentially emit 2,213 pounds per day of NO_x. The hourly emissions during start-up and shutdown events are much greater than during normal operation since the SCR and ammonia injection system are not at optimal conditions. The resulting daily emissions could have a significant effect on ozone and air quality in the Bay Area air basin because the proposed NO_x emission reduction credits are approximately equivalent to 844 pounds per day, well below the potential emissions of 2,213 pounds per day of NO_x.

Energy Commission staff recommends that the district consider requiring, as part of their BACT analysis, hardware and software modifications to the project that can shorten start-up and shutdown events and optimize emission control systems. There is evidence that start-up and shutdown emissions from the facility can be reduced significantly with design changes to the heat recovery steam generator (HRSG) units that can include the use of the once-through HRSG (Benson Boiler). The start-up time for each turbine/HRSG unit could be reduced from the proposed 6 hours to approximately one hour, resulting in a significant reduction in start-up emissions. If the project is built with the aforementioned Fast-Start technology, the project start-up NO_x emissions are expected to be reduced from the proposed 480 lbs to 22 lbs for each cold start-up event, and from 240 lbs to 28 lbs for hot or warm start-up events. This represents 95 and 88 percent reductions in NO_x emissions per cold and hot or warm start-up events, respectively. In addition to reducing the facility's NO_x emission liabilities, the use of Fast-Start technology at the RCEC project would result in cost savings from less fossil fuel use to create steam that is vented during start-ups. Staff has not estimated the actual fuel saving because this cost will tie directly to how many start-up and shutdown cycles the facility has during a year. According to one manufacturer (Siemens), the cost for the design changes is not significantly higher than the cost of the standard, off the shelf, HRSG.

Mr. Jack P. Broadbent
May 29, 2007
Page 3

Alternatively, the 600 MW combined cycle Palomar Project in Escondido has installed a proprietary control system, OpFlex from General Electric, and injects ammonia earlier to shorten start-up times and reduce start-up emissions at the facility. Preliminary, non-optimized results from their March 7, 2007, Petition for Variance 4703 Extension indicated that they have reduced NOx emissions from 120 lbs to 28 lbs for hot or warm start-up events.

If design or process control changes to reduce the facility's start-up and shutdown emissions are implemented, the RCEC daily emissions can be reduced. These design changes could be found to be cost-effective and included as BACT for the proposed facility.

GENERAL COMMENTS

- Page 2 and page 36 of the Amended PDOC identifies the source S-5, the cooling tower, "with efficiency drift eliminators make and model to be determined" while on page 14 the drift is specified as 0.0005%.
- Page 4, Item 3.c. identifies the POC limit of 1 ppmvd @15% O₂. However, Table 1 on the same page identifies POC limit of 2 ppmv.
- Page 5, Table 2 identifies PM10 emissions from the cooling tower, although drift elimination efficiency was not specified on page 2 and the TDS limits are not provided.
- Page 13 and Condition 20(g) specifies that the project will burn natural gas in the turbine and heat recovery steam generator with an annual average of 0.25 grains sulfur per 100 standard cubic feet. What is the basis for this value and how will it be enforced?

Thank you for the opportunity to provide comments on the District Amended PDOC for the Russell City Energy Center. We believe that design changes to the project could significantly reduce the facility's daily potential to emit, and at the same time address the effectiveness of the applicant's proposed offset mitigation. If you have any questions regarding our comments, please contact Matt Layton at (916) 654-3868.

Sincerely,



PAUL C. RICHINS, JR
Environmental Protection Office Manager

cc: Docket (01-AFC-7)
Proof of Service List
Agency List

EXHIBIT 2

11/6/03 ^{morning}

teleconference

Candido Veiga
Benjamin Beaver
Bob Nishimura
Madhavi Patel
Wayne Lee

No Flex 10 or 30 in operation

10 peaking / intermittent
30 base load

for more recent changes in operation
- more spu & sld

10/30

integrating all components in combined offering
want to have control of all components
all equipment must be designed & specified

Comparison of hardware & software

Flex 10 - 49% 47-48%

Flex 30 - 57%

existing turbine cannot be retrofitted
will kill project because of cost

ctg will be updated prep to ^{installat.} tie line

EXHIBIT 2

11/6/08

Some attendees
+ Brian Lisher

SLU sequence

Flex (10)

5 minutes - synchronize to grid

10 minutes - 150 MW on line

exhaust to air-cooled condenser

12 min. supply of Etg

20 min stack compliance

efficiency 39% first hour (simple cycle)

the 48-49% @ full load

bidding flex 10 on several projects now
~~with an~~ anticipol biddy on flex 30 in future

EXHIBIT 3

Environmental Law and Justice Clinic

February 5, 2009

By E-Mail and U.S. Mailweyman@baaqmd.gov

Weyman Lee, P.E.

Senior Air Quality Engineer

Bay Area Air Quality Management District

939 Ellis Street

San Francisco, CA 94109

Re: Draft PSD Permit for Russell City Energy Center

Dear Mr. Lee:

We are writing on behalf of Citizens Against Pollution (CAP) to provide comments on the draft prevention of significant deterioration (PSD) permit for the proposed Russell City Energy Center. CAP is a grassroots group of Hayward residents, and its members have participated actively in proceedings relating to the Russell City Energy Center to ensure that the proposed power plant complies with the law. The group is pleased to have this opportunity to participate in this permit proceeding and thanks the Bay Area Air Quality Management District for holding the public hearing in Hayward at a time when community members could attend. CAP also appreciates the Spanish interpretation provided at the public hearing and the document repository and information that the District provided through its staff.

Earthjustice is also submitting a letter on behalf of CAP, and we are incorporating the comments in that letter by reference. Sierra Club has already submitted comments, and we adopt them as well. As stated in those comments and here, the District should not issue the permit as proposed because it fails to meet federal PSD and nonattainment new source review (NSR) requirements.

I. THE DISTRICT'S BACT ANALYSIS FOR STARTUP AND SHUTDOWN DOES NOT COMPLY WITH PSD AND NSR REQUIREMENTS.

A. The District Should Provide More Information on the Number of Startup and Shutdown Events to Quantify the Emissions as Accurately as Possible.

Russell City Energy Center (RCEC) is a 600-megawatt natural gas fired combined-cycle power plant proposed to be built in Hayward, California. The operation of the proposed facility "will be dictated by market circumstances and demand." Statement of Basis for Draft Amended Federal "Prevention of Significant Deterioration" Permit (Dec. 8, 2008) at 11 (SOB), *available at* http://www.baaqmd.gov/pmt/public_notices/2008/15487/index.htm. The District expects the facility to operate in base load and load following modes, as well as in partial and full shutdown modes. *Id.* The District explains that "load following" means

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that the facility “would be operated to meet contractual load and spot sale demand, with a total output less than the base load scenario.” *Id.*

There is some information in the California Energy Commission (CEC) docket and in the SOB about what the proposed operation would entail for startup and shutdown events. But the information is incomplete and conflicting. We are unable to determine, for example, the maximum number of such events the proposed permit allows. According to CEC staff, “[t]he project owner has asserted that the more typical, normal operating day of the facility could include a hot startup, about 16 hours of normal operation followed by a shutdown.” CEC Comments, Air Quality, Testimony of Tuan Ngo, P.E., June 2007 at 4.1-8 (CEC 2007 Staff Comments), *available at* [http://yosemite.epa.gov/OA/EAB_WEB_Docket.nsf/Filings%20By%20Appeal%20Number/0CB7FC708E4DB9DC852573EF005A0063/\\$File/Exhibit%2014...16.60000.pdf](http://yosemite.epa.gov/OA/EAB_WEB_Docket.nsf/Filings%20By%20Appeal%20Number/0CB7FC708E4DB9DC852573EF005A0063/$File/Exhibit%2014...16.60000.pdf).

In this regard, the District states that, “[b]ased upon contractual load and spot sale demand, it may be economically favorable to shut down one or more turbine/HRSG [heat recovery steam generator] power trains; this would occur during periods of low overall demand such as late evening and early morning hours.” SOB at 11 (emphasis added). It is therefore entirely possible that the facility would start up and shut down to accommodate two daily periods of low demand, although the maximum mass emissions limit for startup and shutdown (Condition 20, SOB at 73) and daily maximum limit (Condition 22, SOB at 73) may affect that scenario. How the maximum limits affect the scenario, however, is unclear because there does not appear to be any information in the SOB about how many startup and shutdown events are expected to occur on a daily basis.

From the daily limits, it appears that the facility may be allowed to engage in a warm or hot start up and shut down once. This conclusion follows if one assumes that the emissions of 1,093 lbs per day of NOx result from one hot startup followed by 14 hours of normal operation, and that 1,093 lbs are attributable to both trains of turbines and HRSGs. CEC 2007 Staff Comments, at 4.1-8. But it is unclear, at least from reviewing the CEC comments alone, whether those emissions are from a startup of one train or both. Therefore, it is difficult to calculate the maximum startup and shutdown events from the maximum permitted daily emissions.¹

¹ According to yet another scenario, the CEC staff analyzed the project assuming 52 cold starts and 260 hot starts per year. CEC Final Staff Assessment, Russell City Energy Project, June 10, 2002 at 4.1-12, *available at* http://www.energy.ca.gov/sitingcases/russellcity/documents/2002-06-10_FSA.PDF. Based on this estimation, the CEC staff compared emissions from baseload (steady state) operation with emissions from maximum startups and shutdowns:

(con't on next page)

It appears that the facility would be engaged, at the very least, in frequent startup and shutdown events. Because the operating scenario contemplates frequent – even if unquantified to the public – startup and shutdown events, and because emissions are uncontrolled or incompletely controlled during these events, SOB at 38, the BACT analysis for these events is critical to CAP and other members of the public who will be exposed to RCEC’s emissions.

The District should provide more information on the number of maximum predicted startup and shutdown events per day and per year because of the expected health impacts from uncontrolled or partially controlled emissions. Without accurate information on startup and shutdown events, the public is unable to know how much pollutants will be emitted. Without knowing the amount of emissions, neither the District nor the public can assess the true impact of the emissions. The expected operating scenario is also necessary for the BACT analysis and the comparisons that the District made in that analysis.

B. The District’s BACT Analysis for Gas Turbine Startup and Shutdown Is Faulty Because the District’s BACT Analysis Incorrectly Assumes that the Applicant Should Use the Equipment It Purchased in 2002, Before Receiving a PSD Permit.

1. **The proposed permit is the first draft PSD permit, not a “Draft Amended PSD Permit,” as there has not been a valid PSD permit before.**

The District originally issued its Final Determination of Compliance for the facility in March 2002, based on a Preliminary Determination of Compliance issued in October 2001. *See* U.S. EPA – Bay Area Air Quality Management District Agreement for Limited Delegation of Authority to Issue and Modify Prevention of Significant Deterioration Permits Subject to 40 CFR 52.21, dated Jan. 2006 at 4, ¶ 7 (Exhibit 1). The District, however, did not issue a final PSD permit at that time “because of a delay in the issuance of the Biological Assessment associated with the Endangered Species Act Section 7 process.” *Id.* Thus, there was no 2002 permit.

AIR QUALITY Table 9
Project Maximum Annual Emissions
(tons per year [ton/year])

Operational Profile	NOx	SO2	PM10	POC	CO
52 cold starts and 260 hot starts for each CTG, Remainder of year at steady state.	199.0	12.42	83.39	28.67	610.08
Steady state operation, two CTGs, 1 full year	173.79	12.42	83.39	23.09	256.81
Cooling Tower	-	-	3.02	-	-
Emergency Generator (52 hours per year)	0.046	0.0001	<0.0001	0.037	0.0785
Diesel Fire Pump Engine (26 hours per year)	0.101	0.0028	0.0033	0.012	0.0611
Total Maximum Annual Emissions	199.1	12.43	86.42	28.72	610.22
Proposed Emissions Limits	134.6	12.2	86.4	27.8	584.2

Id. at 4.1-15. Note that the emission of NOx and especially CO are considerably higher assuming maximum number of startups and shutdowns.

Nor can the District call the permit it issued in November 2007 a PSD permit. On July 29, 2008, the EPA Environmental Appeals Board (EAB) issued a remand order in response to a petition from a Hayward resident, Rob Simpson, alleging violations of the PSD notice requirements. See *In re Russell City Energy Center* (EPA Environmental Appeals Board), PSD Appeal No. 08-01, available at [http://yosemite.epa.gov/OA/EAB_WEB_Docket.nsf/Filings%20By%20Appeal%20Number/EA6F1B6AC88CC6F085257495006586FB/\\$File/Remand...50.pdf](http://yosemite.epa.gov/OA/EAB_WEB_Docket.nsf/Filings%20By%20Appeal%20Number/EA6F1B6AC88CC6F085257495006586FB/$File/Remand...50.pdf). The EAB remanded Russell City's PSD permit, requiring the District to re-notice the draft permit in accordance with the federal PSD notice provisions. *Id.* at 39, 42. The EAB noted that the District's outreach efforts "fell significantly short of [federal PSD] section 124.10's requirements in numerous important respects." *Id.* at 38. To correct the deficiency, which the EAB characterized as a "complacent compliance approach," the EAB stated that, "the District must scrupulously adhere to all relevant requirements in section 124.10 concerning the initial notice of draft PSD permits (including development of mailing lists), as well as the proper content of such notice." *Id.* at 38, 39. The EAB emphasized that the notice deficiencies were not "harmless error" as the District contended, noting "the pivotal importance to Congress of providing adequate initial notice within EPA's public participation regime." *Id.* at 38.

Thus, the proposed permit is the first draft PSD permit for RCEC, there having been no valid permit issued in 2002 or 2007. This clarification is important because of the legal consequences that may flow from the wrong assumption that there exists a valid PSD permit. At least one consequence may be how we judge the integrity of the District's BACT analysis of the proposed energy production processes, given the District's emphasis on the applicant's purchase of the equipment based on a purported permit in 2002.

The District states that the applicant "purchased its equipment" in or about 2002, "based on the initial permits." SOB at 40 n.31. By "initial permits," the District cannot possibly be referring to a PSD permit since the District did not issue a PSD permit at that time. Because of this existing equipment – which the applicant purchased without a PSD permit – the District appears to have performed its PSD analysis to allow the applicant to retain the equipment. Because the District is required to select production processes and other controls that would achieve "an emissions limitation based on the maximum degree of reduction" in PSD review, *see* 42 U.S.C. § 7479(3) (BACT means "an emission limitation based on the maximum degree of reduction"), performing a BACT analysis with assumptions about specific production processes and equipment violates the law.

By calling the proposed permit a "draft amended PSD permit," and not explaining the full permitting history, the District is incorrectly informing the public that this process amends a valid, existing PSD permit. See SOB at 6-7; SOB at 9. That is not the case, and this mistake should be corrected so that the public can engage in a meaningful review of the District's draft permit.

As discussed below, the District's BACT analysis appears to start with a conclusion that the equipment the applicant purchased in 2002 should be retained. The District thus rejects both once-through steam boiler and turn-down technology, which are technically feasible. Not only are the two technologies feasible, but once-through steam boiler technology is being proposed for two other facilities within the District, and turn-down technology is achieved in practice at

another facility. The District's analysis is thus insufficient and violates PSD and NSR requirements for selecting the most stringent emissions limit.

2. The District incorrectly rejected once-through steam boiler technology based on assumptions about existing equipment, and the District therefore violated the PSD and NSR requirements.

Once-through steam boiler technology uses external steam separators and surge bottles to reduce start-up durations. SOB at 39. The District rejects this technology, even though the District concludes that the technology is "ranked No. 1 in control effectiveness." SOB at 42, 44. A motivation for the decision appears to be the cost of disposing of the existing equipment:

Note that the project was originally permitted in 2002 [note that the project did not receive a PSD permit at that time as explained in Section I above], before Fast Start technology was developed, and the applicant purchased its equipment at that time Retrofitting that equipment now to incorporate Fast Start technology would require a complete redesign of the project and the purchase of new equipment. Furthermore, Siemens stated that emissions performance cannot be guaranteed unless the company supplies a fully integrated power plant with Fast Start technology (*i.e.*, Flex Plant 10). . . . It therefore appears that the facility would have to dispose of the equipment it has already purchased for the project and buy an entirely new integrated system.

SOB at 40 n.31 (emphasis added); *see also* notes of the conversation referred to in n.31 (Exhibit 2) ("existing turbine cannot be retrofitted[;] will kill project because of cost") (emphasis added). The CEC record similarly shows that the primary reason for rejecting available technology was the cost of disposing of the already acquired equipment. Even though the CEC staff was recommending the technology – *see* letter from Paul C. Richins, Jr., Environmental Protection Office Manager, CEC, to Jack P. Broadbent, APCO, dated May 29, 2007, at 2 (Exhibit 3), *available at* http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/2007-05-31_LTR_BROADBENT.PDF – the applicant cited cost as a reason for not implementing it:

Staff proposed technological solutions (Siemens-Westinghouse Fast-Start [once-through steam boiler technology] and General Electric OpFlex) which it believes would significantly reduce emissions from start-up events, but they were rejected by the Applicant for economic reasons.

Final Commission Decision, Russell City Energy Center, Amendment No. 1 (01-AFC-7C) (Oct. 2007) at 77, *available at* <http://www.energy.ca.gov/2007publications/CEC-800-2007-003/CEC-800-2007-003-CMF.PDF>.

This approach gets the PSD analysis backward. Analyzing BACT with specific equipment already in mind violates the mandate for setting the most stringent emissions limit at the time of permit issuance.² A centerpiece of PSD is the BACT requirement, which mandates new facilities

² The 1990 Draft New Source Review Workshop Manual makes it plain that the review of BACT is as of the time of final permit issuance:

to use state of the art technology to prevent significant deterioration of the National Ambient Air Quality Standards.

This approach also gets the Nonattainment NSR analysis backward. (Such analysis is required for NOx, CO and PM2.5 here.) Under NSR, the applicant must meet the lowest achievable emissions rate or LAER. *See* 42 U.S.C. Section 7501(3); BAAQMD Regulation 2-2-314 (incorporating requirements of 40 C.F.R. § 51.165); 40 C.F.R. § 51.165(A)(1)(xlvii)(2)(explaining that State requirements need to be as stringent as the requirements in this section). LAER is defined as the “most stringent emissions limitation.” *See* 40 C.F.R. § 51.165(A)(1)(xiii).

In performing the analysis, the District must apply the PSD requirements of Regulation 2-2 and 40 C.F.R. § 52.21 (as well as NSR requirements). *See* U.S. EPA – Bay Area Air Quality Management District Agreement for Delegation of Authority to Issue and Modify Prevention of Significant Deterioration Permits Subject to 40 CFR 52.21, dated Feb. 4, 2008, at 3, *available at* <http://www.epa.gov/region09/air/permit/pdf/baaqmd-delegation-agreement.pdf>, (the District to apply Regulation 2-2 and 40 C.F.R. § 52.21, with exceptions not applicable here).

Regulation 2-2-206 plainly indicates that BACT is “the most effective emission control” or “the most stringent emission limitation,” by defining BACT as “the more stringent of”:

- 206.1 The most effective emission control device or technique which has been successfully utilized for the type of equipment comprising such a source; or
- 206.2 The most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source; or
- 206.3 Any emission control device or technique determined to be technologically feasible and cost-effective by the APCO; or
- 206.4 The most effective emission control limitation for the type of equipment comprising such a source which the EPA states, prior to or during the public

The BACT emission limit in a new source permit is not set until the final permit is issued. The final permit is not issued until a draft permit has gone through public comment and the permitting agency has had an opportunity to consider any new information that may have come to light during the comment period. Consequently, in setting a proposed or final BACT limit, the permit agency can consider new information it learns, including recent permit decisions, subsequent to the submittal of a complete application. This emphasizes the importance of ensuring that prior to the selection of a proposed BACT, all potential sources of information have been reviewed by the source to ensure that the list of potentially applicable control alternatives is complete (most importantly as it relates to any more effective control options than the one chosen) and that all considerations relating to economic, energy and environmental impacts have been addressed.

comment period, is contained in an approved implementation plan of any state, unless the applicant demonstrates to the satisfaction of the APCO that such limitations are not achievable. Under no circumstances shall the emission control required be less stringent than the emission control required by any applicable provision of federal, state or District laws, rules or regulations.

BAAQMD Regulation 2-2 (SIP-approved), *available at* [http://yosemite.epa.gov/R9/r9sips.nsf/AgencyProvision/411642DA93F3D7A4882569900057D386/\\$file/BA+rg2-2sip.PDF?OpenElement](http://yosemite.epa.gov/R9/r9sips.nsf/AgencyProvision/411642DA93F3D7A4882569900057D386/$file/BA+rg2-2sip.PDF?OpenElement).

In the District's own words, "[c]learly the recurring theme in the above definitions of BACT . . . is 'the most effective emission control' or 'the most stringent emission limitation.'" Bay Area Air Quality Management District Best Available Control Technology (BACT) Guideline ("BACT Guideline"), *available at* <http://www.baaqmd.gov/pmt/bactworkbook/default.htm> (definition of BACT and TBACT). Consistent with that theme, the definition reflects the policy choice in the Clean Air Act that BACT be technology forcing. The District indeed recognizes this choice in its BACT Guideline:

For ease in permit application review, the above definition of BACT can be broken down to two general categories: 1) "technologically feasible and cost-effective" and 2) "achieved in practice." The first category is a more stringent level of BACT control and is technology forcing; it generally refers to advanced control devices or techniques.

Id. (Policy and Implementation Procedure, Interpretation of BACT). The choices reflected in the BACT Guideline are consistent with the Top-Down BACT Analysis because it, too, requires the District to select an emissions limitation based on the maximum degree of reduction. SOB at 20.

The District, however, does not use the required approach of selecting an emissions limit for the RCEC based on the maximum degree of reduction. The District identifies Flex Plant 10, a type of once-through steam boiler technology, as "technically feasible" for reducing startup emissions. SOB at 40. But the District rejects this technology apparently because the District improperly – and without adequate information – considers the costs that may result from disposing of existing equipment. *See* SOB at 40 n.31.

The District cannot take into account any loss the applicant may realize from the sale of old equipment in the BACT analysis because the applicant is proposing a new facility, not updating an existing facility. That is, the question is what the most stringent emission limit is, not whether a retrofit of existing equipment is cost effective. In addition, even if the cost information is relevant (which it is not), the District discloses no basis for the conclusion that the sale of existing equipment may result in a loss. There is no analysis of any such claimed loss. Additionally, the applicant purchased equipment when there was no valid PSD permit, and therefore there is no equitable reason to consider the cost of disposing of the equipment, whatever it may be (and, of course, as we stated earlier, BACT does not allow any such consideration).

Indeed, the PSD regulations prevent owners and operators from making irretrievable commitments such as contractual obligations, which cannot be cancelled or modified without substantial loss to the owner or operator, before receiving a PSD permit. *See* 40 C.F.R. § 52.21(b)(9) (definition of commencement of construction). Similarly, the Act bars “commencement of construction” before issuance of PSD and NSR permits. 42 U.S.C. § 7604(a)(3) (providing for citizen suits against those who violate the requirement of a PSD or NSR permit); *Id.* § 7413(b)(3) (federal enforcement for same); and, as earlier noted, commencement of construction is broadly defined to include activities that commit the source to obligations that may result in substantial loss. The purpose of such provisions is to ensure that the relevant agencies do not favor issuance of a permit or permit condition due to the owner or operator’s irretrievable commitment of funds, to the detriment of public health and air quality.

Thus, the District erred in considering the costs, which are not even quantified, of the disposal of existing equipment in permitting a new facility. The District should not issue the permit without considering technology the CEC staff recommended for this project.

3. The District’s energy efficiency and emissions comparison between Flex Plant 10 (once-through steam boiler technology) and the existing equipment is based on operating at maximum capacity and is therefore faulty for a facility that will frequently start up and shut down.

The District concludes that “once-through boiler technology would not be the most appropriate BACT technology because of the loss of efficiency that it would entail.” SOB at 44. To reach this conclusion, the District compares Siemens Fast Start Flex Plant 10 unfavorably with the Siemens-Westinghouse triple-pressure gas turbine equipment that the applicant purchased. SOB at 43-44. The District’s analysis is faulty because the calculations in Table 13, which compare estimated emissions from Flex Plant 10 with those from the triple-pressure system, assume that the plant is operating at maximum capacity. *See* SOB at 43. In fact, the facility will be operating with frequent startup and shutdown events. Such startups and shutdowns will undoubtedly have an effect on energy efficiency and emissions that the District’s analysis fails to consider in its critique of the Flex Plant 10 design. *Id.*

For the District’s rejection of Flex Plant 10 based on “energy efficiency” grounds to be meaningful, the District would have to base its comparison on the efficiency of the triple-pressure system under its true operating scenario, which involves frequent startup and shutdown events. At least one source states that the efficiency of the Westinghouse 501F turbine is between 36.5% and 56%, depending on whether it operates in combined cycle or simple cycle. *See* Alexander’s Gas & Oil Connections Contracts Awarded, Vol. 3, Issue #28 (Dec. 24, 1998), available at <http://www.gasandoil.com/goc/contract/cox85277.htm>. Thus, depending on how the turbines are operating, the efficiency number the District uses, 55.8%, can be different. If the Westinghouse 501F’s efficiency can be lower, Flex Plant 10, with its 48% efficiency, would compare favorably.

Thus, Flex Plant 10 has not been given a fair hearing. For all we know, energy efficiency and emission reductions from Flex Plant 10 during the frequent startups and shutdowns contemplated by this project more than offset the District’s asserted inefficiency of the Flex Plant 10 design

during base load operation. The District therefore should not eliminate Flex Plant 10 from its BACT analysis. *See* SOB at 44.

In fact, the District will soon be evaluating applications proposing Flex Plant 10 for two sites – Willow Pass and Marsh Landing. *See* Willow Pass Generating Station Application for Certification, Executive Summary 1-4 (June 2008), *available at* http://www.energy.ca.gov/sitingcases/willowpass/documents/applicant/afc/Volume_01/2.0%20Project%20Description.pdf (Willow Pass) and http://www.energy.ca.gov/sitingcases/marshlanding/documents/applicant/afc/Volume%20I/2_0%20Project%20Description.pdf (Marsh Landing). It is therefore incumbent on the District to do an adequate review of the technology for its appropriateness at Hayward.

4. The District's elimination of turn-down technology as BACT lacks basis because there is ample information on feasibility.

In addition to Flex Plant 10, the District identifies turn-down technology, such as OpFlex, to control startup and shutdown emissions. SOB at 39-40. According to the manufacturer, "OpFlex™ Turndown technology provides customers with GE's 7FA+e gas turbines greater flexibility in their operations. It's a software solution that optimizes the combustion process, extending low-emissions operation to lower load levels. Customers are able to reduce CO₂ and NO_x emissions, while decreasing fuel expenses and avoiding maintenance costs." *See* product description *available at* <http://ge.ecomagination.com/site/products/opflex.html>.

The District concludes that it has "not found sufficiently strong evidence to conclude that turn-down technologies such as OpFlex are technically feasible at this time for control of start-up emissions." *Id.* at 42. This conclusion appears to be without basis. The technology itself has been in existence since at least December 2005. *See* industry news article, "GE Energy Announces New Startup Improvements For Gas Turbine And Combined Cycle Applications" (Dec. 6, 2005), *available at* <http://news.thomasnet.com/companystory/471615>. In addition, the technology has been achieved in practice at the Palomar Energy Center in San Diego County. SOB at 41. The Palomar facility appears to have employed this technology since at least some time in 2006. *See* "2007 Pacesetter Plant Award Palomar Energy Center, Central stations return to the city," Combined Cycle Journal (Fourth Quarter 2006) at 51 (Exhibit 4), *available at* <http://www.psimedia.info/4Q%202006/406CCJ,%20p%2044-52.pdf>; *see also* CEC Environmental Protection Office Manager's letter at 3 (Exhibit 3), (CEC staff's recommendation that the District consider for RCEC OpFlex and early injection of ammonia used at Palomar). Since the technology has been achieved in practice, it deserves serious consideration in the District's BACT analysis. *See* Regulation 2-2-206.1 (BACT includes "the most effective emission control device or technique which has been successfully utilized for the type of equipment comprising such a source").

But the District summarily rejects the technology. The District states that, because Palomar implemented operating procedures (*i.e.*, early ammonia injection in its Selective Catalytic Reduction system), it is unclear how much of the reductions in startup emissions at Palomar is due to OpFlex. *Id.* at 41-42.

The District's conclusion is based on a faulty assumption about BACT. As the District recognizes elsewhere, BACT is not just technology but can include techniques and methods for controlling emissions. *See, e.g.*, 42 U.S.C. § 7479(3). Thus, there is no reason why the use of OpFlex, together with other operational procedures, could not be considered BACT.

The District's conclusion is also based on a faulty assumption about LAER. The District also needs to comply with the nonattainment requirements since startup and shutdown affect emissions of NOx, POCs and PM. The District's focus on the applicant's equipment is inconsistent with LAER's focus on the end emissions rate. *See* 42 U.S.C. § 7501(3).

The District's conclusion is also based on insufficient information. It appears that the Palomar facility has been reporting emissions since at least April 2007. *Id.* at 41 n.40. Given the passage of time, there should be more than sufficient data to make the determination of OpFlex's effectiveness. But it appears that the District did not seek recent data to make a meaningful determination and hastily rejected OpFlex. (The District's engineer confirmed in response to a request from us that the District reviewed only 2006-2007 data from Palomar and does not have any 2008 data.)

Moreover, because the CEC reports that the applicant rejected OpFlex based on costs (*see* Final Commission Decision, Russell City Energy Center, Amendment No. 1 (01-AFC-7C) (Oct. 2007) at 77, *available at* <http://www.energy.ca.gov/2007publications/CEC-800-2007-003/CEC-800-2007-003-CMF.PDF>), the District must ensure that its analysis is untainted by factors that should not come into play in the BACT analysis, such as the cost of disposing of the existing equipment. Without such analysis, it appears that the District is performing its BACT analysis based on the applicant's equipment rather than on technology now available.

In short, the District has not performed a sufficient analysis to reject OpFlex and other operating procedures as BACT/LAER.

C. The District Should Provide a Factual Basis for the Long Startup Durations.

1. The District should analyze available technology for reducing startup durations.

The District indicates that cold startup time will be up to six hours, and warm and hot startups, up to three hours each. SOB at 13. These periods appear to be excessively lengthy. During these startup times, the emissions from the facility will be higher than during base load operation. SOB at 38-39. Thus, BACT should include methods and/or technology sufficient to minimize these times to protect the public from the harmful air emissions.

A shorter time appears feasible with the use of technology for reducing startup emissions. *See, e.g.*, Combined Cycle Journal, Fourth Quarter article at 51 (Exhibit 4) (with GE's OpFlex, the turbines "are in 6Q mode(full DLN) much sooner than they were initially"); Final PSD Permit issued to Colusa Generating Station on Sept. 29, 2008 at 7, *available at* <http://www.regulations.gov/fdmspublic/component/main?main=DocketDetail&d=EPA-R09-OAR-2008-0436> (a 660-MW power plant with a cold startup duration of 270 minutes; warm,

180 minutes, and hot 90 minutes); Kelly e-mail, (Rapid Response technology “generally reduces SU [startup] time from 110 minutes to 65 minutes for CCGT [combined cycle generating turbine] plants . . . ; it also allows SCR injection [ammonia injection into SCR] to start at 50 to 60% load) (Exhibit 5); Transcript of Informational Hearing Before the California Energy Resources Conservation and Development Commission; In the Matter of Application for Certification for the Willow Pass Generating Station Project (Dec. 18, 2008) at 28-29, *available at* http://www.energy.ca.gov/sitingcases/willowpass/documents/2008-12-18_TRANSCRIPT_INFORMATIONAL_HEARING.PDF (testimony that Flex Plant 10s can achieve base load generation in about an hour and that these start up times are “extremely fast compared to existing units which can take a minimum of three and possibly six hours of time to reach . . . baseload”). While we have not evaluated these technologies ourselves, the District should at the very least evaluate these and other technologies that are available now to do a proper BACT/LAER analysis to reduce startup times.

2. “Best work practices,” reflecting practices used in power plants certified before 2001, may not be the “best.”

Startup Duration: The District’s reliance on records of startup durations from Delta, Los Medanos, Metcalf and Sutter Energy Centers (see SOB at 44-46) is inadequate. Those plants were licensed long ago, and thus the real startup times may not reflect best work practices for power plants that should use the newest equipment. *See* Commission Decision, Application for Certification for the Delta Energy Center, Calpine Corporation and Bechtel Enterprises, Inc. (Feb. 2000) at 11, *available at* http://www.energy.ca.gov/sitingcases/delta/documents/2000-02-09_DELTA_DECISION.PDF; Los Medanos (originally known as Pittsburg District Energy Facility), Commission Decision, Application for Certification, Pittsburg District Energy Facility (Aug. 1999) at 1, *available at* http://www.energy.ca.gov/sitingcases/pittsburg/documents/1999-08-17_DECISION.PDF; California Energy Commission, The Metcalf Energy Center, Commission Decision (Sept. 2001) at 2, *available at* http://www.energy.ca.gov/sitingcases/metcalf/documents/2001-10-05.COMMISSION_DECIS.PDF; Sutter, licensed Apr. 14, 1999, *see* Fact Sheet, *available at* <http://www.energy.ca.gov/sitingcases/sutterpower/index.html> (licensed Apr. 14, 1999).

In addition, the District chose the longest startup duration from even those pre-2001 plants as the best work practice by explaining that “the BACT limit must be achievable at all times throughout the facility’s operational life.” SOB at 45-46. The District somehow believes that “[a] reasonable safety margin must be included so that the facility will be able to comply with its limits during every startup, even if emission for specific startups or as an average for startups as a whole may be less.” SOB at 46. The District has provided no basis to justify this safety margin.

The permitting authority is allowed to adopt a compliance margin based on safety factors “where there is some degree of uncertainty regarding the maximum degree of emission reductions that is achievable.” *See In re Prairie State Generating Co.*, PSD Appeal No. 05-05, 13 E.A.D. ___, *slip. op.* at 72 (EAB Aug. 24, 2006), *aff’d*, *Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007), *reh’g denied and reh’g en banc denied*, 2007 U.S. App. LEXIS 24419 (7th Cir. 2007). But such a margin must be “fact-specific and unique to the particular circumstances of the selected

technology, the context in which it will be applied, and available data regarding achievable emissions.” *Prairie*, 13 E.A.D. __, *slip op.* at 73. Safety factors are allowed, for example, to account for “test method variability, location specific technology variability, and other practical difficulties in operating a particular technology.” *See id.* (citations omitted). There is no factual analysis applicable to the proposed facility that justifies a margin.

The District did not examine the proposed facility’s startup duration in the context of any of the factors mentioned in *Prairie*. Nor did the District review whether the other facilities’ failure to achieve a shorter startup duration was due to those factors. The District, for example, provides no discussion of whether the emissions from the four facilities are from the periods when they were in compliance with their permit limits. Because the District failed to examine the specific factors, it appears that the District merely established the duration solely to provide a cushion. That is not the kind of analysis that *Prairie* contemplates because BACT could then easily turn into Reasonably Available Control Technology. The District should therefore eliminate the margin or do a better analysis of why a margin is justified in setting the best work practices.

Startup Emissions Rate: For the same reasons as a safety margin was inappropriate for startup durations, it is inappropriate for startup emissions rates. The District should therefore eliminate the margin or do a better analysis of why a margin is justified in setting the best work practices.

D. The District Must Include the Startup and Shutdown Durations as Permit Conditions.

The startup and shutdown durations do not appear to be included in the permit conditions. (They are included in the definitions, *see* SOB at 122, but they are not characterized as limits.) Without the durations being included as a condition, they may be practicably unenforceable. If indeed we are correct that such durations are not included in the permit conditions, the District should include the durations not merely as a definition but as permit conditions.³ The District should also review each limit discussed in the SOB to ensure that the permit actually contains the limit. This error may not be an isolated problem.

E. The District Must Perform Its Own Analysis of CO and POC Emissions to Comply with NSR Requirements.

The District has not conducted an analysis of the expected emissions from startup for all of the pollutants. *See* SOB at 12-13. Rather, for CO and POC, the District relied on the emissions numbers “specified by applicant based on operational data,” and, for NO_x, the District relied solely on the “CEC’s conditions of certification.” SOB at 13. This fragmented approach is confusing, incomplete and inadequate. The District is tasked with protecting air quality and assuring that the applicant achieves the lowest achievable emissions rate for NO_x and CO, for which the District is currently in nonattainment. *See* 42 U.S.C. Section 7501(3) (defining lowest

³ We also note that the good air pollution practices requirement of 40 C.F.R. § 60.11(d) is also not made a permit condition. This omission may be because the proposed permit is a PSD permit and not a Title V permit, but CAP wants to be assured that all requirements that apply to the facility will be in a permit so that they can be enforced. *Compare* PSD permit from the Colusa Generating Station, which contains section 60.11(d) requirement.

achievable emissions rate). By blindly relying on the applicant's data and the CEC's analysis, the District has failed to determine whether the startup emission rates for these pollutants are the lowest achievable emissions rate.

II. THE DISTRICT DOES NOT APPEAR TO HAVE SET THE MOST STRINGENT EMISSIONS LIMITS FOR NO_x, CO AND PM FOR THE TURBINES AND HEAT RECOVERY UNITS DURING PERIODS OF BASE LOAD AND LOAD-FOLLOWING OPERATION.

The District's proposed BACT for NO_x, CO, and PM may not reflect the most stringent limitation under the PSD and NSR requirements of Regulation 2-2 and 40 C.F.R. § 52.21 because the District failed to review technology other than that reflected in the applicant's purchased equipment.

As we discussed in Part I above, rather than performing the evaluation of technology-forcing BACT, the District's BACT analysis focuses solely on controls on already purchased equipment. *See, e.g.*, SOB at 22 (NO₂), 29 (CO), 35 (PM). Because the District did not analyze the choice of the turbine itself – and presumably other equipment listed in the SOB at 10 – the District's analysis fails to identify the most stringent emissions limit. Thus, the District should not issue the proposed permit without performing an adequate analysis to set the most stringent emissions limits that comply with PSD and NSR requirements.⁴

III. THE DISTRICT HAS AUTHORITY AND IS REQUIRED TO SET THE "MOST STRINGENT EMISSIONS LIMIT" FOR CO₂.

A. CAP Supports the District's Authority to Perform a GHG Analysis Under the Clean Air Act and the California Health & Safety Code.

Hayward and other Alameda County residents, including CAP members, have long advocated for a greenhouse gases (GHGs) impact analysis and mitigation for the proposed project. Shortly before the issuance of the draft permit, CAP urged the District's Air Pollution Control Officer to consider whether to impose a CO₂ BACT limit and develop an adequate record for its decision. The applicant also requested a BACT analysis for GHGs, according to the District. SOB at 58.

CAP believes that performing a BACT analysis for GHGs is not only legally required but prudent. It is only a matter of time before EPA is compelled to recognize that GHGs are pollutants subject to regulation under the Clean Air Act, despite the memorandum that EPA issued shortly after the issuance of the draft permit (EPA's Interpretation of Regulations that

⁴ In addition, it is unclear whether the District fully reevaluated its BACT determination in the June 19, 2007 FDOC or relied on its previous determination in 2002. Although the hourly rate for NO_x and CO changed in the 2007 FDOC, the annual rate did not change. *Compare* PDOC at 6 (proposed annual rate for NO_x is 134.6 TPY) and PDOC at 11 (proposed hourly rate for NO_x is 2.5 ppmvd NO_x at 15% O₂), *with* FDOC at 5 (annual rate for NO_x listed as 134.6 TPY) and FDOC at 14 (hourly rate listed as 2.0 ppmvd NO_x at 15% O₂). These figures did not change in the current proposal. *See* SOB at 73 (annual rate for NO_x listed as 134.6 TPY); SOB at 72 (hourly rate for NO_x listed as 2.0 ppmvd NO_x at 15% O₂). If the hourly rate changed, the maximum annual rate should also have changed. This error gives the impression that some of the determinations date back to 2002.

Determine Pollutants Covered by Federal Prevention of Significant Deterioration (PSD) Program of December 18, 2008). As Sierra Club and others have persuasively argued, BACT requirements should apply to CO₂. *See, e.g.*, Petition for Reconsideration, which Sierra Club filed before the Administrator of the EPA in January 2009 (attached as an exhibit to Sierra Club's comments).

As the first air pollution control district to assess fees on GHG emissions to fund climate protection activities, the District is more than aware of the importance of its role in GHGs regulation and the critical need to reduce GHGs now. Without immediate reductions in GHG emissions, we are "very likely" to see larger changes in the climate system. *See* Summary for Policymakers in *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (S. Solomon et al. eds. 2007), at 10; *see also* brief of amici curiae James Hansen, Mark Z. Jacobson, Michael Kleeman, Benjamin Santer and Stephen H. Schneider, *California v. US EPA*, No. 08-1178 (D.C. Cir.), filed Nov. 24, 2008, *available at* http://www.ggu.edu/school_of_law/academic_law_programs/jd_program/environmental_law/environmental_law_justice_clinic/attachment/Amici+Brief.pdf.

In addition to the critical need to reduce GHG emissions to prevent further – and potentially cataclysmic – disruptions of the climate system, it is important for the District to consider the local impacts of locally-emitted GHGs. According to Dr. Mark Z. Jacobson of Stanford University, emissions of CO₂ accumulate over cities because they do not immediately dissipate, and they intensify local air pollution problems such as ozone pollution. Mark Z. Jacobson, *Testimony for Hearing on Air Pollution Health Impacts of Carbon Dioxide*, U.S. House of Representatives Select Committee on Energy Independence and Global Warming, at 2–3, *available at* <http://www.stanford.edu/group/efmh/jacobson/Testimony0408%202.pdf>. Because the Bay Area is a nonattainment area for 8-hour ozone, *see* 40 C.F.R. § 81.305, it is particularly important to reduce local GHG emissions. CAP therefore supports the District's undertaking the CO₂ BACT analysis.

The District has authority to perform a CO₂ BACT analysis under the Clean Air Act as earlier discussed. (See Sierra Club petition for reconsideration.) The District also has authority under California law to perform the analysis and require measures to reduce CO₂. *See, e.g.*, Cal. Health & Safety Code § 40000 (air districts have primary authority under state law for "control of air pollution from all sources, other than emissions from motor vehicles"). As the California Air Pollution Control Officers Association stated in its white paper, "[t]he term air contaminant or 'air pollutant' is defined extremely broadly Greenhouse gases and other global warming pollutants such as black carbon would certainly be included in this definition." CEQA & Climate Change – Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act at 22, *available at* <http://www.capcoa.org/CEQA/CAPCOA%20White%20Paper.pdf>. While the District asserts that it is performing only a federal PSD review, this California authority is relevant should EPA bar the District from regulating GHGs in the permit for the Russell City project based on the December 18, 2008 EPA Johnson memorandum.

B. The District Is Required to Set the “Most Stringent Emission Limitation” for CO₂.

The District is embarking on a critical task that may set precedents for other PSD permitting actions. The District’s BACT limit for CO₂, however, violates the BACT requirement by failing to set the “most stringent emissions limit” and will set an unfavorable precedent on this important issue. The District, therefore, should not issue the permit as proposed.

1. The District does not provide a proper basis for a compliance margin.

Again, as with other conditions, the District attempts to justify a higher CO₂ limit by adopting a compliance margin based solely on looking at facilities with “similar turbines.” *See* SOB at 63 (“Based on the available data the Air District has reviewed for similar turbines, and incorporating a reasonable compliance margin, the Air District concludes that if BACT is required for CO₂ emissions, an enforceable limit of 1100 lb/MW-hr would best represent the BACT requirement in the PSD regulation.”). The District reviewed two facilities, Delta Energy Center and Metcalf Energy Center, which are 2000 and 2001-certified facilities (see discussion above in Section I.C.2). The District should not limit its review to similar turbines. The District does not explain why it cannot review CO₂ emissions from power plants using more up-to-date technology. (While the District reviewed data compiled by the CEC for the years 2004 and 2005 from an unidentified number of similar facilities, *see* SOB at 62, the District’s failure to identify them deprives the public of evaluating the appropriateness of such a review. The public has no information as to the vintage of these facilities.)

Instead of establishing the most stringent controls, the District merely documents “the general level of CO₂ emissions performance” that is currently achieved by turbines. *See* SOB at 62. This “general level” of performance does not constitute BACT. As the District states, “there have historically been no enforceable emissions limitations on CO₂ emissions.” BACT, however, is defined as “an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation.” Since there have never been emissions limitations imposed for CO₂, the District cannot determine the maximum degree of reductions for the pollutant based on reviewing the performance of other facilities, with no information about whether they are employing the maximum degree of reductions.

The District next attempts to justify the compliance margin by explaining that the District has only a “snapshot of turbine performance and not a continued demonstration of compliance with an enforceable CO₂ emission limitation throughout the turbines’ total operational lifetime.” *See* SOB at 62-63. But the District has only itself to blame for the “snapshot.” The District reviewed only 2006 data from Delta and Metcalf. *See* SOB at 62. The District does not explain why it has not reviewed any 2007 and 2008 data for these facilities, while it obtained emissions data for Metcalf from 2008 and for Delta from 2007 and 2008 for startups and shutdowns, *see* SOB at 45-46. While it is quite possible that 2006 data are representative of those from other years, the District fails to make that determination or seek more data. Using such purported lack of data to justify an undefined compliance margin is inappropriate.

In addition, even if the District concludes that the applicant's existing equipment can achieve BACT limits after a proper PSD review, the District should explore whether the emissions from the other facilities reflect those from periods of compliance or noncompliance with permit limits. If, after all the appropriate review, the District genuinely cannot determine the proper emissions limit for the total lifetime of the facility, the District can set a limit for a select period.

The District's use of an unspecified compliance margin in establishing BACT emission limitations for CO₂ should therefore be revised because the use of a safety factor is inappropriate.

2. The selected emissions limit is not BACT because the most efficient modern combustion turbine combined cycle plant can achieve 800 lbs CO₂/MWhr.

Even assuming that this general level of CO₂ emissions performance constitutes BACT, the District selected a high limit. Even run-of-the-mill combined cycle plants are expected to achieve a much lower emissions limit, and the best combined cycle plant can achieve 800 lbs CO₂ per megawatt hour:

The CPUC staff proposed 1,100 pounds carbon dioxide per megawatt-hour as an Interim Emissions Performance Standard in its October 2, 2006 Final Workshop Report. The standard was selected from proposals ranging from 800 to 1,400 lbs CO₂/MWhr, and the earlier Revised Staff Report's recommendation of 1,000 lbs CO₂/MWhr (0.46 metric tons CO₂/MWhr). The CPUC staff's proposed EPS's of 1,000 or 1,100 lbs CO₂/MWhr (0.50 metric tons CO₂/MWhr) appear to be a compromise between the 800 lbs CO₂/MWhr that the most efficient modern combustion turbine combined cycle plant could achieve, and the 1,400 lbs CO₂/MWhr that might envelope the majority of natural gas burning technologies (e.g., steam cycle boiler, simple cycle combustion turbine, reciprocating engine, and a range of combustion turbine combined cycle units).

"Implementation of SB 1368 Emission Performance Standard," Staff Issue Identification Paper (Nov. 2006) at 13, *available at* <http://www.energy.ca.gov/2006publications/CEC-700-2006-011/CEC-700-2006-011.PDF>. Thus, the District should set a lower BACT limit for CO₂.

3. The District should analyze GHG emissions from startup and shutdown conditions and select BACT to control such emissions.

Startup and shutdown operations produce more greenhouse gases. As EPA explained in its AP-42 document on Natural Gas Combustion, "[m]ethane emissions are highest during low-temperature combustion or incomplete combustion, such as the start-up or shut-down cycle for boilers." See EPA, AP-42 Factors for Natural Gas Combustion, *available at* <http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf>. Methane is a GHG that is 21 times more powerful than CO₂, by weight, in trapping heat. EPA, Methane, *available at* <http://www.epa.gov/methane/scientific.html>. The District should therefore analyze GHG emissions from startup and shutdown conditions and select BACT to control such emissions.

IV. THE DISTRICT SHOULD REDO ANY NONATTAINMENT NSR REVIEW THAT IS MORE THAN 18 MONTHS OLD.

The Air District states that it is not considering any issues unrelated to PSD requirements and that PM 2.5 will be reviewed under PSD. SOB at 8, 17. By engaging in analysis of only PSD issues, the Air District is violating the Clean Air Act's requirement that nonattainment NSR be performed anew when construction fails to commence within 18 months of a previous NSR approval. The policy reason behind this requirement for new analysis is based on the requirement that the emissions limitation reflect the most stringent controls available at the time the permit is issued. Here, it appears that the NSR review was performed on June 19, 2007 and has not been updated. It has now been more than 18 months since that review. The District thus should have redone its LAER (called BACT in the District) analysis for NOx and POCs.

Specifically, the federal NSR regulations require a demonstration of adequacy of previous BACT determinations where 18 months have elapsed without commencement of construction, as is the case here:

For phased construction projects, the determination of best available control technology shall be reviewed and modified as appropriate at the least reasonable time which occurs no later than 18 months prior to commencement of construction of each independent phase of the project. At such time, the owner or operator of the applicable stationary source may be required to demonstrate the adequacy of any previous determination of best available control technology for the source.

40 C.F.R. § 51.166j(4). Other NSR/PSD regulatory requirements also demonstrate that BACT determinations over 18 months old are invalid without commencement of construction. *See* 40 C.F.R. § 52.21(b)(9) & (r)(2); *see also Sierra Club v. Franklin County Power of Illinois*, 546 F.3d 918, 931 (7th Cir. 2008) (affirming invalidation of a PSD permit that was over 18 months old); EPA Region IX Policy on PSD Permit Extensions at 1, *available at* <http://epa.gov/region07/programs/artd/air/nsr/nsrmemos/extnsion.pdf> ("A BACT analysis is required in all permit extension requests, as in an application for a new PSD permit"; "the import of this policy is to ensure that the proposed permit meets the current EPA requirements and that the public is kept apprised of the proposed action (*i.e.*, through the 30-day public comment period)").

Therefore, the District should redo the NSR determination for NOx, POCs and PM.

V. THE DISTRICT SHOULD CALCULATE THE FACILITY'S POTENTIAL TO EMIT HAZARDOUS AIR POLLUTANTS.

The Statement of Basis indicates that the District conducted a review of non-PSD air quality-related requirements applicable to the RCEC project. SOB at 65-66. Yet the District's analysis fails to take into consideration the maximum achievable control technology (MACT) standards for hazardous air pollutants (HAPs). MACT standards would apply to the RCEC if the facility is a "major" source of HAP emissions. *See* 42 U.S.C. § 7412(c)(1). A "major source" is "any

stationary source or group of stationary sources that emits or has the potential to emit 10 tons per year or more of any hazardous pollutant or 25 tons per year or more of any combination of hazardous air pollutants.” *Id.* § 7412(a)(1) (emphasis added).

The proposed facility will emit acetaldehyde, acrolein, benzene, 1,3-butadiene, ethylbenzene, and formaldehyde. Table 6, SOB at 14. All of these are listed as HAPs. *See* 42 U.S.C. §7412(b)(1). There is nothing, however, in the Statement of Basis indicating that the District calculated RCEC’s “potential to emit” HAPs for purposes of determining the applicability of section 112 of the Clean Air Act, 42 U.S.C. § 7412. Without such a calculation, it is impossible to know whether RCEC should be a major source subject to MACT.

The time to do the calculation is now because the BACT analysis must take into account environmental impacts, and the applicant must demonstrate in the PSD process that the proposed emissions will not be in excess of any other applicable emissions standard. *See* 42 U.S.C. § 7475(a)(3) and 7479(3).

VI. THE DISTRICT MUST DISCLOSE WHETHER THE EMISSION REDUCTION CREDITS ARE REQUIRED PURSUANT TO FEDERAL NONATTAINMENT NSR AND, IF SO, OFFSETS MUST COMPLY WITH FEDERAL LAW.

Because the District insists that it need not subject its decision to public review on issues other than PSD, the District has not provided adequate information about the emission reduction credits proposed for the facility. It is unclear whether emissions reductions credits proposed to be used are to satisfy federal or state requirements. Indeed, since nonattainment NSR is required here, any offsets must meet federal requirements for contemporaneousness and on-site generation. *See* Regulation 2-2-605.

VII. THE DISTRICT SHOULD DO A COMPLETE REVIEW OF STATE AND FEDERAL ISSUES BECAUSE OF THE FLAWS IN THE PERMITTING PROCESS, AND WITHDRAW THE DETERMINATION OF COMPLIANCE FROM THE CALIFORNIA ENERGY COMMISSION DOCKET.

CAP renews its request that the Air Pollution Control Officer (APCO) withdraw the Preliminary Determination of Compliance (PDOC) and the Final Determination of Compliance (FDOC) issued for the Russell City project and formally notify the CEC of the withdrawal. CAP made this request originally in a letter to the APCO in December 2008. While the District did not respond to CAP’s letter, the District explains that it is addressing in this proceeding only the issues that the District is obligated to under the EAB remand. SOB at 7. The District further explains that, because “[a]ll appeal avenues have...been exhausted” as to other issues, it will not reopen the state law permitting process. *Id.* The District should reconsider this approach.

The approach does not comport with the duties the District has as a public health agency. Regardless of whether a citizen can enforce the law, the District should comply with the laws applicable to it. The District should note the stark contrast between the last permitting proceeding and this one in deciding whether to redo the permitting proceeding. In the last

permitting proceeding, the District received no comments other than from the applicant and a late comment from the CEC. In this proceeding, a large number of people and representatives from various groups attended the public hearing. The District has also already received many written comments. Interest in this proceeding has been high. It is time for the District to consider why it received so few comments in the last proceeding and why this proceeding is receiving so much attention. It cannot be that the public is participating because this is a PSD proceeding. The public is participating because this is an issue of importance to them of which it has now received notice. In light of this difference in the level of participation, the District should reconsider its duty as a public health agency and redo the state analysis, in addition to the PSD analysis.

The first step in an analysis that comports with the District's duty as a public health agency is to withdraw the PDOC and the FDOC. By failing to withdraw them, the District is allowing the CEC to rely on the District's invalid determination of compliance. This result violates not only the District's duty but also the requirements of the Warren-Alquist State Energy Resources Conservation and Development Act (Warren-Alquist Act), which applies to the District.

The Warren-Alquist Act requires the District to perform a compliance review to ensure that a proposed facility will satisfy all applicable federal, regional, and local laws.⁵ Because the PDOC and the FDOC do not satisfy the PSD requirements of the Clean Air Act for all of the reasons identified here and in other public comments, as well as the notice deficiencies that resulted in the EAB remand, the District can no longer represent to the CEC that the Russell City project "meets the requirements of the applicable new source review rule and all other applicable district regulations." Nor can the CEC complete the certification process without an FDOC that accurately determines compliance. *See* Cal. Code Regs., tit. 20, § 1744.5(b); *see also* "Public Participation in the Siting Process: Practice and Procedure Guide," CEC 700-2006-002 at 49, *available at* <http://www.energy.ca.gov/sitingcases/index.html> ("Delays in obtaining the Determination of Compliance can negatively impact the siting process schedule because the air quality compliance information is needed at the [siting] committee's formal hearings") (emphasis added). The District must therefore withdraw the PDOC and FDOC and notify the CEC of that decision.

Public participation is not merely procedural. Public notice is essential for citizens to participate meaningfully in decisions that affect them. Their comments improve government decision making through tough questions that citizens may ask. Their comments may also point to deficiencies that even the experts may have missed.

Thus, until after this process is complete, the District cannot represent to the CEC that the proposed facility complies with federal air quality requirements. For these reasons, CAP

⁵ The Warren-Alquist Act requires the local air pollution control officer to conduct, for the CEC's certification process, "a determination of compliance review of the application in order to determine whether the proposed facility meets the requirements of the applicable new source review rule and other applicable district regulations." Cal. Code Regs., tit. 20, § 1744.5(b). "If the proposed facility complies, the determination shall specify the conditions, including BACT and other mitigation measures, that are necessary for compliance." *Id.*

requests that the District withdraw the 2006 PDOC and 2007 FDOC, notify the CEC accordingly, and perform a complete review of the permitting issues, both federal and state.

VIII. THE PROPOSED POWER PLANT WOULD POSE INCREASED HEALTH RISKS TO COMMUNITIES THAT ARE ALREADY DISPROPORTIONATELY IMPACTED BY POLLUTION.

The District's analysis of environmental justice impacts fails to meet its obligation under Title VI to ensure that "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." 42 U.S.C. § 2000d.

The District in fact fails to engage in any analysis of the environmental justice impacts of the proposed facility. The District merely states that "there is no adverse impact on any community due to air emissions [and] that therefore there is no disparate adverse impact on an Environmental Justice community located near the facility." See SOB at 66. Such an approach directly contradicts the environmental justice principles because it ignores that environmental justice communities have distinct characteristics that distinguish them from, and make them more vulnerable than, the general population.

Environmental justice communities are characterized primarily as low-income, minority, with English as a second language, and suffering from greater health vulnerabilities. To engage in an environmental justice analysis, the District must therefore examine the specific impacts of the proposed facility on such communities because numerous studies have shown that these communities bear more of the cumulative burden of pollution in California and around the nation. See, e.g., Clifford Rechtschaffen, *The Evidence of Environmental Injustice*, Environmental Law News, Vol. 12, No. 3 (Fall 2003); "Still Toxic After All These Years," available at <http://www.baehc.org/resources>; Toxic Wastes and Race at Twenty, available at <http://www.ucc.org/justice/environmental-justice/pdfs/toxic-wastes-and-race-at-twenty-1987-2007.pdf>.

Specifically, as Sandra Witt, DrPH, Director of Planning, Policy and Health Equity for the Alameda County Public Health Department testified during the Eastshore Energy Center proceedings, the community of Hayward is home to a significantly larger non-white population than Alameda County as a whole. Testimony of Sandra Witt at 2 (Exhibit 6). Furthermore, the residents around the proposed site suffer from significantly higher rates of illness due to respiratory and circulatory system diseases. *Id.* at 3-4. The District's one-sentence discussion of the impacts of RCEC ignores the reality that environmental justice communities suffer from cumulative impacts of pollution. *Id.* at 1-2. Even an insignificant contribution of air emissions for the general population can thus be significant to an already suffering community.

Furthermore, the District's treatment of environmental justice disregards the authority it has under the Clean Air Act and its own policy. See Memorandum, from Gary S. Guzy, General Counsel, Office of General Counsel, re EPA Statutory and Regulatory Authorities Under Which Environmental Justice Issues May Be Addressed in Permitting (Dec. 1, 2000) at 10-12, available

at http://www.epa.gov/compliance/resources/policies/ej/ej_permitting_authorities_memo_120100.pdf (“Guzy Memorandum”) (Exhibit 7); Board of Directors of BAAQMD’s Cumulative Impact Resolution (July 2008) (Exhibit 8) (requiring the District to “continue its commitment to address the cumulative impact of new and existing mobile and stationary sources of air pollution – particularly in disproportionately impacted communities – for sources that on a relative basis contribute most to health risk at a local and regional level”). The District should therefore do an analysis and address the impact of the proposed facility on the affected population.

Since the District has entirely failed to consider the cumulative impacts of increased emissions on what is a particularly vulnerable environmental justice community, it has ignored Title VI and its authority under the Clean Air Act and its Board of Directors’ policy. The District should not issue the permit until it completes a more thorough environmental justice analysis.

IX. THE PERMIT SHOULD BE STRENGTHENED, OR THE DISTRICT SHOULD ADEQUATELY EXPLAIN THE BASIS OF THE PROPOSED CONDITIONS.

A. The Commissioning Time Should Be Reduced.

The District’s analysis of the commissioning time does not demonstrate why a shorter commissioning time is infeasible. *See* SOB at 47-50. Rather, the data presented demonstrate that a shorter commissioning time is feasible. *Id.* at 49-50 (stating that another similar turbine was commissioned in 96 and 207 hours).

B. The District Should Ensure that, for Each Condition, Monitoring, Recordkeeping and Reporting Requirements Exist to Ensure Compliance.

The District’s proposed permit contains monitoring and verification provisions that do not adequately assure that the emissions requirements in the permit will be met at all times.

Sulfur Dioxide: For sulfur dioxide, the District states that it will only require the applicant to monitor the sulfur percentage from the natural gas monthly. *See* SOB at 71. This frequency concerns CAP because the sulfur percentage in natural gas can vary significantly. For example, recent measurements by PG&E show great fluctuation from one quarter to the next. *See* Sulfur Information, available at http://www.pge.com/pipeline/operations/sulfur/sulfur_info.shtml (Exhibit 9). Sulfur dioxide is a precursor to PM_{2.5}, for which the District is currently in non-attainment. *See* http://www.epa.gov/pmdesignations/2006standards/documents/2008-12-2/FR_Final_24hr_PM2.5_Designations_010609.pdf (Dec. 22, 2008 federal register notice designating the Bay Area as non-attainment for PM_{2.5}). Thus, the need for increased accuracy is essential. We request that the content of sulfur in the fuel be measured weekly to assure the accuracy of the sulfur dioxide emissions estimates.

In addition, the District has proposed to allow RCEC to use PG&E’s monthly measurements if Russell City can show the measurements are “representative.” *See* SOB at 71. And yet there is no objective criteria specified in the permit conditions as to what qualifies as “representative.”

Nor is it clear whether RCEC should be able to use PG&E's numbers when PG&E adds chemicals to its natural gas and does not assure the accuracy of its published information. *See Sulfur Information, available at http://www.pge.com/pipeline/operations/sulfur/sulfur_info.shtml* (Exhibit 10).

PM: The District's monitoring requirements for PM are also inadequate. The only measurement that appears to be required for PM is for the heat input, coupled with an emissions factor generated from one annual source test. *See SOB at 71, 76.* This limited information will not accurately predict the PM emissions resulting from this facility. PM generated from natural gas combustion can increase from "poor air/fuel mixing or maintenance problems." *See EPA, AP-42 Factors for Natural Gas Combustion, available at <http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf>.* The District should require more stringent monitoring requirements for particulate matter due to this operational variability and the fact that the District is currently in non-attainment for particulate matter.

C. The District Should Evaluate Control Options for Ammonia Emissions.

The total project ammonia emissions are predicted to be 15.2 lbs/hr, which exceeds the acute trigger level of 7.1 lbs/hr. Table 6, SOB at 14. Inhalation of ammonia can lead to respiratory symptoms such as coughing, wheezing or shortness of breath and decreased lung function. *See ATSDR, Toxicological Profile for Ammonia, available at <http://www.atsdr.cdc.gov/toxprofiles/tp126.html>.* The minimal risk level developed by the ATSDR is 0.1 ppm for chronic exposure. *Id.* The District should translate the high level of ammonia emissions anticipated from this project into projected concentrations to thoroughly analyze potential health impacts from the ammonia emissions. The limited information presented in Table 7 does not assure the community that adverse health effects will not occur from ammonia exposure. *See SOB at 16.* To help reduce these emissions, the District should explore all the potential control options for these emissions, which can include wet scrubbers, condensate systems and recovery systems. The EPA evaluated these types of technology as applied to ammonia emissions in 1995. *See U.S. EPA Control and Pollution Prevention Options for Ammonia Emissions, available at <http://www.epa.gov/ttn/catc/dir1/ammonia.pdf>.*

D. The District Should Evaluate Emission Reduction Levels for POCs and HAPs from Specific Oxidation Catalysts for Reducing CO Emissions.

The District evaluates the option of using an oxidation catalyst to reduce CO emissions. SOB at 30-33. The identification of particular types of oxidation catalysts are, however, missing in this analysis, which could be important for reducing POCs and HAPs emissions. For example, the SCONOX system has been shown to reduce VOCs and HAPs emissions, while reducing CO emissions. *See Memorandum from Sims Roy, EPA, re Hazardous Air Pollutant (HAP) Emissions Control Technology for New Stationary Combustion Turbines (Apr. 3, 2002), available at <http://www.epa.gov/ttn/atw/combust/turbine/cttech8.pdf>.* Due to the high levels of HAPs and VOCs emissions involved (*see* Table 6, SOB at 14), the District should evaluate the effect of using different oxidation catalysts on emissions of VOCs and HAPs when it selects BACT for CO. *See Guzy Memorandum at 12 (Exhibit 7), (in establishing BACT for criteria*

pollutants, alternative technologies could be analyzed based on their ability to control HAPs; permitting authority can take into account effects of HAPs that are VOCs).

E. Diesel Fire Engines Should Only Be Used During True Emergencies.

Under the proposed permit, the Fire Diesel Engine's harmful emissions will be uncontrolled. *See* SOB at 78-79. Therefore, the District should reduce the allowable operating time of this engine as much as possible and limit its use to only emergencies. While the District states that it would allow the diesel fire engine to be operated to prevent fires, *see* SOB at 9, there are no permit conditions to ensure that it would in fact be operated in that manner.

The current permit condition allows the Fire Diesel Engine to be used for reliability, which means that the engine could operate during the "maintenance of a primary motor." *See* BAAQMD Regulation 9-8-232. There are at least four primary motors for the proposed facility. *See* SOB at 10-11. Rather than having the diesel engine be a back up for any one of these primary motors, these motors themselves should be back ups to each other. That is because the primary motors can generate more power than the diesel engines. The four primary motors have MMBtu/hr ratings of 2038.6 MMBtu/hr, 200 MMBtu/hr, 2038.6 MMBtu/hr and 200 MMBtu/hr, while the fire pump engine has a rating of 2.02 MMBtu/hr. *See* SOB at 10. Thus, the small amount of power generated by the fire pump diesel engine does not make it a real back up to these primary motors. This way, the fire pump diesel engine will only be used in a real emergency.

We look forward to your responses to our comments. Thank you for considering them.

Very truly yours,



Helen Kang
Deborah Behles
Ashling McAnaney
James Barringer
Ethan Wimert*

* Ethan Wimert is a student waiting for recertification under the State Bar Rules governing the Practical Training of Law Students, working under the supervision of Professor Helen Kang.

EXHIBIT 4



ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
PUBLIC HEALTH DEPARTMENT

David J. Kears, Director
Anthony Iton, Director & Health Officer

1000 Broadway, 5th Floor
Oakland, CA 94607

(510) 267-8000
(510) 267-3212

**“RACE, CLASS, AND THE PATTERNS OF DISEASE DISTRIBUTION IN HAYWARD:
DECISION-MAKING THAT REINFORCES HEALTH INEQUITY”**

Testimony of Sandra Witt, DrPH, Director of Planning, Policy and Health Equity for the
Alameda County Public Health Department

My name is Dr. Sandra Witt, Deputy Director of Planning, Policy and Health Equity for the Alameda County Public Health Department. For the last 7 years, I have directed the Community Assessment, Planning, Evaluation and Education Unit of the Public Health Department. This Unit includes 8 epidemiologists and is responsible for monitoring the health status of all County residents. Over the past 3 years we have produced over 14 technical reports analyzing data from a variety of sources including mortality, births, hospitalizations, health survey data, communicable disease, and census data to identify broad areas of health concern and to monitor the health of our residents, particularly the most socially and economically vulnerable populations in our County. Several of these reports are cited as scientific evidence in the Eastshore Energy Center staff report.

“A condition of environmental justice exists when environmental risks and hazards and investments and benefits are equally distributed with a lack of discrimination, whether direct or indirect, at any jurisdictional level; and when access to environmental investments, benefits, and natural resources are equally distributed; and when access to information, participation in decision making, and access to justice in environment-related matters are enjoyed by all.”¹

In monitoring and analyzing health outcomes for Alameda County residents, one resounding theme stands out: poor health and premature death are by no means randomly distributed in Alameda County. Low-income communities and communities of color in certain specific geographic neighborhoods suffer from substantially worse health outcomes and die earlier. Studies reveal that these inequitable health outcomes are not adequately explained by genetics, access to health care, or risk behaviors, but instead are to a large extent the result of profoundly adverse social and environmental conditions. These adverse environmental conditions are too often an indelible reflection of the way decision-making power is shared with low-income communities.² Historical exclusion from decision-making venues has resulted in communities of

¹ European Workshop on Environmental Justice (Budapest, December 2003)

² Marmot MG and Wilkinson R, eds. 2003. *Social Determinants of Health: The Solid Facts, 2nd ed.* World Health Organization Regional Office for Europe, Copenhagen, Denmark.

Sampson, RJ. “The neighborhood context of well-being.” *Perspectives in Biology and Medicine*; Summer 2003; 46(3):S53.

color and low-income communities that are disproportionately burdened by an abundance of environmental hazards, including toxin-emitting power plants and other sources of noxious pollution. It is incumbent upon public health officials to analyze health data to validate pro-equity policies that will lower the disproportionate burden of pollution and improve health outcomes among all populations.

1. Illness and Death from Air Pollution Associated Conditions is Already Disproportionately Concentrated in the area of Hayward that is in Proximity to the Proposed Power Plant

An environmental justice framework requires examination of the specific impacts of the project on low-income communities and communities of color. In its cursory three-page Final Staff Assessment, the California Energy Commission (CEC) concludes that Eastshore Power Plant project will not contribute significantly to morbidity or mortality in any race or ethnic group residing in the project area, and therefore would not have a disproportional impact on an environmental justice population. However, this seemingly blythe conclusion neglects consideration of published and publicly-accessible Alameda County Public Health Department evidence of the geographic distribution of disease in the area of Hayward within proximity to the proposed power plant site.

In its environmental justice examination, the CEC staff also fail to reference any analysis of the existing burden of toxic pollution in the area of the proposed power plant site and thus effectively ignore the compounding effects of various sources of toxicity (including non-airborne sources) to which residents in the surrounding Hayward community are already exposed. When these two points are appropriately examined, as they are below, it becomes inescapably clear that by approving the Eastshore Power Plant at 25101 Clawiter Road, nearby predominantly low-income communities of color, disproportionately burdened by exposure to environmental toxicity and suffering from higher rates of premature death and chronic diseases known to be exacerbated by air pollution, the California Energy Commission is running the risk of exacerbating conditions that are fundamentally the legacy of discrimination.

• **Hayward is more ethnically diverse than Alameda County**

The City of Hayward is home to a significantly larger non-white population than Alameda County as a whole. Over one-third (34.2%) of Hayward residents are Latino compared to 19.0% countywide, and the proportion of Latino residents is even higher within a three-mile radius of the proposed plant (37.8%). Additionally, Hayward is comprised of 10.6% African Americans, 18.7% Asians, and 29.2% White. In Alameda County, Whites make up 40.9% of the population.

• **Within three miles of the proposed site are several high poverty, high minority, low life expectancy census block groups**

Overall, 10.0% of Hayward residents live in poverty, a slightly lower percentage than the 11.0% countywide. And within a three-mile radius of the proposed plant, 10.4% of residents live in poverty. However, within this three-mile radius, there are three low-income census block groups where at least 20% of residents live in poverty and 80% are non-white (see map in attachments).

The mortality rate within these three block groups was 50% higher in 1999-2001 than the rate of the remaining block groups in the three-mile radius of the proposed plant site: 1,328 per 100,000

compared to 865 per 100,000. In addition, the life expectancy at birth in these three block groups was 73.3 years, five years less than the 78.3 years observed countywide. These three low-income areas also receive a high level of Public Health Department services (see map in attachments).

- **Death rates from air-pollution associated diseases are substantially higher in the three mile radius around the proposed site**

There are numerous scientific studies that document the relationship between air pollution and human disease.³ Common acute non-cancer health effects include asthma, chronic obstructive pulmonary disease, and cardiovascular disease, particularly congestive heart failure. The exacerbation of these existing chronic conditions result in unnecessary morbidity, missed work days, preventable hospitalizations, and premature death. A disproportionate burden of the cost of these preventable hospitalizations, particularly among the uninsured, is borne by Alameda County government.

In order to examine mortality from specific causes, death rates within the three-mile radius around the proposed site were compared to Alameda County rates (combining the low-income block groups with the other block groups in the radius). Rates of death from all causes, coronary heart disease, and chronic lower respiratory disease were all significantly higher within the three-mile radius than those rates for Alameda County, representing an ongoing excess burden of mortality (see attached tables).

The rate of death from all causes within the three-mile radius was 888.4 per 100,000 from 1999 to 2001, statistically significantly higher than the county rate of 792.3 per 100,000. Similarly, the rate of death from chronic lower respiratory diseases was 54.8 per 100,000 within the three-mile radius, significantly higher (by 43%) than the county rate of 38.4. And finally, the coronary heart disease death rate was 216.4 per 100,000 within the three-mile radius, also significantly higher than the county rate of 185.7 per 100,000.

- **Hospitalization due to air pollution associated diseases is substantially higher in the zip codes close to the proposed site**

In order to examine measures of illness (morbidity as opposed to mortality) in the area of the proposed plant, rates of hospitalization for specific diseases in the combined zip codes, 94544 and 94545, were compared to Alameda County rates. From 2003 to 2005, the hospitalization rate for coronary heart disease in the two zip codes was 810.4 per 100,000 people, 60% higher than the county rate of 507.5 per 100,000. Similarly, the rate of chronic obstructive pulmonary disease

³ Epidemiology of chronic obstructive pulmonary disease: health effects of air pollution. Viegi G, Maio S, Pistelli F, Baldacci S, Carrozzi L. *Respirology*. 2006 Sep;11(5):523-32.

Particulate air pollution and hospital admissions for congestive heart failure in seven United States cities. Wellenius GA, Schwartz J, Mittleman MA. *Am J Cardiol*. 2006 Feb 1;97(3):404-8.

Identifying subgroups of the general population that may be susceptible to short-term increases in particulate air pollution: a time-series study in Montreal, Quebec. Goldberg MS, Bailar JC 3rd, Burnett RT, Brook JR, Tamblin R, Bonvalot Y, Ernst P, Flegel KM, Singh RK, Valois MF. *Res Rep Health Eff Inst*. 2000 Oct;(97):7-113; discussion 115-20.

Identification of persons with cardiorespiratory conditions who are at risk of dying from the acute effects of ambient air particles. Goldberg MS, Burnett RT, Bailar JC 3rd, Tamblin R, Ernst P, Flegel K, Brook J, Bonvalot Y, Singh R, Valois MF, Vincent R. *Environ Health Perspect*. 2001 Aug;109 Suppl 4:487-94

(COPD) hospitalization was 316.2 per 100,000 in the two zip codes, 20% higher than the county rate of 264.3. For congestive heart failure the hospitalization rate in the two zip codes was 397.7 per 100,000, 35% higher than the county rate of 295.3. Finally, the asthma hospitalization rate was 179.8 per 100,000, 14% higher than the county rate of 157.3.

All of these differences between the area of the proposed site and Alameda County as a background or reference were found to be statistically significant, which means they did not occur by chance. Based on Census 2000, the population of the two zip codes, as well as Hayward, had an age composition very similar to that for Alameda County—about one-fourth of the population was under age 18 and ten percent was over age 65. Thus the fact that rates of illnesses due to respiratory and circulatory system diseases (most often diseases of the elderly) are significantly higher in the proposed plant area than in the rest of the county suggests a level of vulnerability in this population that is not explained by age.

An environmental justice approach requires an analysis of the relative burden of disease in the population most directly affected by the decision to site this power plant. The presence of a disproportionate concentration of persons with asthma, chronic lung disease, congestive heart failure, and other chronic conditions that are exacerbated by air pollution must factor into the decision of where to site this power plant. These populations are the actual “sensitive receptors” referred to in the *Air Toxics Hot Spots Program Risk Assessment Guidelines*.² They are not distributed through the population randomly but instead are concentrated disproportionately in proximity to the proposed Hayward site. Siting the Eastshore Power Plant in Hayward will disproportionately impact a geographic area not only home to a comparatively high non-white population, but also already burdened by existing poor health outcomes.

2. The CEC environmental justice analysis does not adequately factor in the uneven distribution of exposure to various sources of toxicity in the area in proximity to the proposed power plant site

In its environmental justice examination, the CEC staff fail to reference any analysis of the existing burden of toxic pollution in the area of the proposed power plant site and effectively ignore the compounding effects of various sources of toxicity (including non-airborne sources) to which residents in the surrounding Hayward community are already exposed. CEC staff rely on established risk assessment models to predict health impacts from the proposed power plant. However, there is substantial uncertainty associated with the process of risk assessment. The uncertainty arises from lack of “real world” data in many areas necessitating a heavy reliance upon experimental animal models and a set of basic assumptions. Among the key assumptions underlying the health risk assessment are⁴:

1. Human toxicity from air pollution is additive rather than synergistic.
 2. Animal toxicity data can be readily extrapolated to humans.
- **Human disease due to exposure to multiple toxic pollutants may be synergistic**

⁴ Air Toxics Hot Spots Program Risk Assessment Guidelines. *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. August 2003. California EPA.

The potential for multiple and varied air pollutants to act synergistically, rather than additively as assumed by the CEC health risk assessment, requires that an analysis of the overall toxic burden associated with this Hayward location be performed. Low-income minority populations have historically been exposed to a much higher burden of environmental toxicity. The brief CEC environmental justice analysis does not quantify or otherwise assess the cumulative burden of toxicity in the vicinity of the proposed site.

- **Animal toxicity data may be a poor proxy for human health effects**

There are very few in vivo studies that are designed to establish a safe threshold for human exposure to air pollution, in fact, a recent study by Harvard cardiovascular researchers looking at seven U.S. cities documents a direct association between particulate air pollution and acute hospitalizations for congestive heart failures.⁵ *This effect is seen below the current levels set by US EPA.* Relative exposure limits established in animal models must be interpreted with a great deal of caution when deciding whether new sources of pollution should be sited in low income minority communities.

- **Detailed, publicly available and published data exists with which CEC staff could conduct a more complete and appropriate environmental justice analysis**

Alameda County Public Health Department maintains and publishes detailed age- and race-specific geographic morbidity and mortality data on asthma, chronic obstructive pulmonary disease, cardiovascular disease, and lung cancer for the county, the city of Hayward and for smaller geographic areas including zip code and census tract. CEC staff did not contact Alameda County Public Health Department to obtain critical data on chronic obstructive pulmonary disease, cardiovascular disease, or congestive heart failure. CEC staff did cite Alameda County Public Health Department data on asthma in its public health section, however, the CEC staff report ignores data related to these other serious respiratory and cardiovascular conditions that are known to be associated with ambient air pollution and help more fully characterize the vulnerability of the population residing in the shadow of this proposed site.

“An environmental injustice exists when members of disadvantaged, ethnic, minority or other groups suffer disproportionately at the local, regional (sub-national), or national levels from environmental risks or hazards, and/or suffer disproportionately from violations of fundamental human rights as a result of environmental factors, and/or denied access to environmental investments, benefits, and/or natural resources, and/or are denied access to information; and/or participation in decision making; and/or access to justice in environment-related matters.”⁶ The CEC staff analysis largely ignores profoundly important questions of environmental justice and in so doing contributes to the unfortunate and widely repudiated legacy of racial and class-based discrimination that continues to shape the pattern and burden of disease that compromise the quality of life of residents in the vicinity of the proposed power plant site. Alameda County Public Health Department strongly opposes decision-making based on such an inadequate analysis of critical environmental justice considerations.

⁵ Particulate air pollution and hospital admissions for congestive heart failure in seven United States cities. Wellenius GA, Schwartz J, Mittleman MA. *Am J Cardiol.* 2006 Feb 1;97(3):404-8.

⁶ European Workshop on Environmental Justice (Budapest, December 2003)

Attachments

Mortality rates, 1999-2001
Within a 3-mile radius of proposed site with Alameda County comparisons

Cause of Death	Area	3-Yr Count	Rate**	
All Causes	3 Mile Radius	2,492	888.4	*
	Alameda County	29,525	792.3	
Chronic Lower Respiratory Disease	3 Mile Radius	155	54.8	*
	Alameda County	1,387	38.4	
Coronary Heart Disease	3 Mile Radius	589	216.4	*
	Alameda County	6,769	185.7	

*Statistically significant difference at the $p \leq .05$ level.

**Rates are age adjusted by the direct method to the 2000 US standard population.

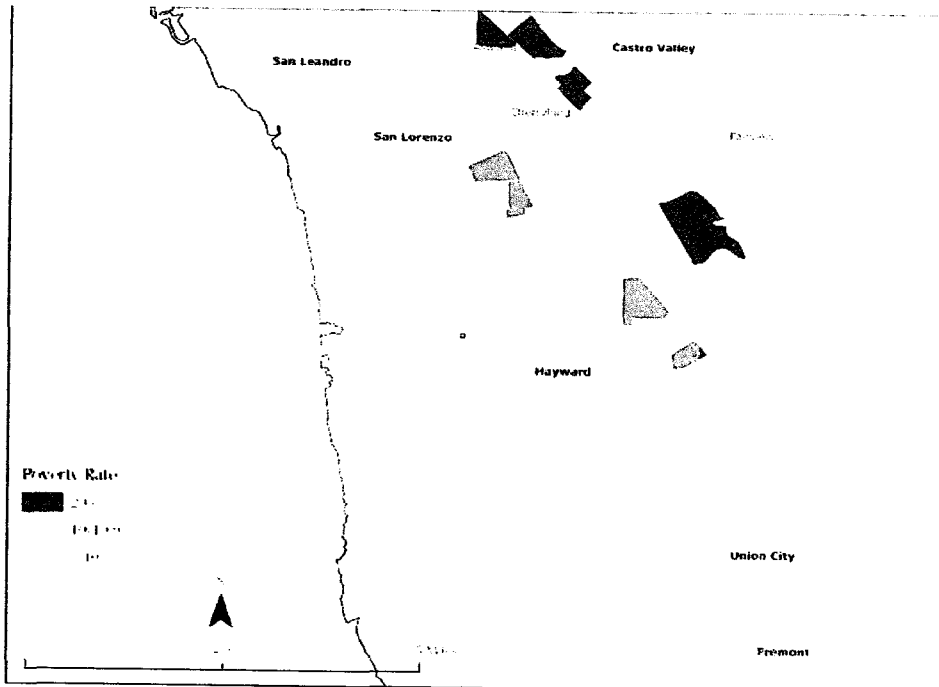
Hospitalization Rates, 2003-2005
94544 and 94545 combined with Alameda County comparisons

Primary Diagnosis	Area	3-Yr Count	Rate**	
Coronary Heart Disease	94544 & 94545	2,133	810.4	*
	Alameda County	20,780	507.5	
Chronic Obstructive Pulmonary Disease	94544 & 94545	891	316.2	*
	Alameda County	11,116	264.3	
Congestive Heart Failure	94544 & 94545	1,024	397.7	*
	Alameda County	11,914	295.3	
Asthma	94544 & 94545	531	179.8	*
	Alameda County	6,792	157.3	

*Statistically significant difference at the $p \leq .05$ level.

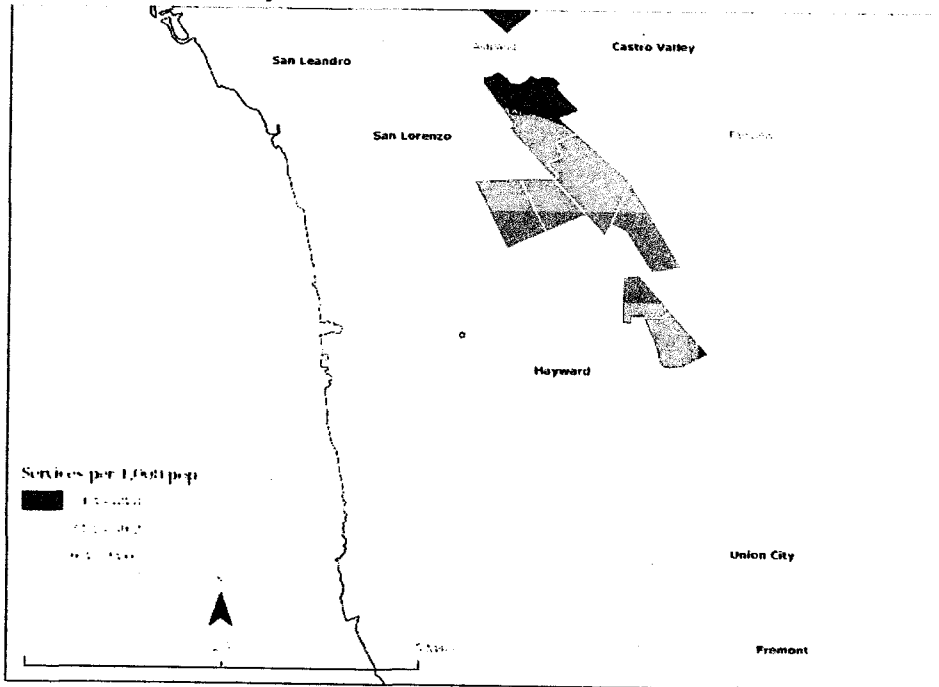
**Rates are age adjusted by the direct method to the 2000 US standard population.

Poverty Rate



Map of Alameda County, California

Public Health Department Service Rate



Map of Alameda County, California

EXHIBIT 5



**CHABOT
LAS POSITAS**

COMMUNITY
COLLEGE
DISTRICT

February 6, 2009

**Via Email weyman@baaqmd.gov
And Via Hand Delivery**

Weyman Lee, P.E.
Senior Air Quality Engineer
Bay Area Air Quality Management District
939 Ellis Street,
San Francisco, California 94109

**Re: Objections And Comments to Draft "Amended Federal
'Prevention of Significant Deterioration' Permit" For The
Russell City Energy Center, BAAQD Application No. 15487**

Dear Mr. Lee:

On behalf of the Chabot-Las Positas Community College District, this is to set forth our objections and comments to the proposed amended Federal Prevention of Significant Deterioration Permit (or PSD permit) which you propose to issue in response to the application by Russell City Energy Center, or more recently identified as Russell City Energy Company (also RCEC), to build a 600 megawatt thermal power plant located approximately just over one mile due west from our Chabot Community College Campus.

Due to the important significant health and safety issues presented to our students, faculty and staff, we have retained counsel who has consulted with an expert on these matters and have the following objections and comments.

Preliminary Considerations:

Initially, we refer you to the attached California Energy Commission staff's February 4, 2008 Memorandum entitled "Final Distances Table" (also docketed that same day) to the hearing officer in the *Eastshore Energy Center*, Application No. 06-AFC-6. This lays out the multiple uses and activities in this metropolitan area bordered by highways Interstate 880 and 92; the San Mateo Hayward Bridge, as well as the close-by Hayward General Aviation and Oakland International Airports.

**CHABOT-LAS POSITAS
COMMUNITY COLLEGE DISTRICT
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In addition to Chabot's approximate 15,000 student body, supported by approximately 1,100 faculty and staff, the CEC Staff's February 4, 2008 report reflects the presence of several other schools in the area, both large elementary and high schools. As we argued in the *Eastshore* proceeding before the CEC, an environmental justice analysis must be applied to this application in light of the demography of this area.

As I noted in my oral comments at your January 22, 2009 public hearing, many of our students who attend Chabot are non-white and lack medical insurance coverage, consisting of groups who are particularly sensitive to such external environmental degradation which would result due to the emissions from the RCEC facility in an area which is not in attainment under the national ambient air quality standards (NAAQS) for both ozone 8 and PM 2.5. In this regard, we were disturbed by your hearing officer's announcement at the January 22, 2009 hearing that the area was in attainment when in fact it is not. We also refer you to the testimony of Dr. Sandra Witt of Alameda County's Public Health Department presented at the *Eastshore* evidentiary hearing concerning the chronic health issues presented to the families in the nearby communities entitled "Race, Class, and the Patterns of Disease Distribution in Hayward; Decision - Making that Reinforces Health Inequality."¹

A. Incorporation Of Comments By Other Organizations

Initially this is to also refer to and incorporate by reference the other comments that are being or have been submitted to you on behalf of the Sierra Club and by Earthjustice and the Environmental Law Clinic of Golden Gate University on behalf of Citizens Against Pollution. We fully agree that the District should not issue this PSD permit as proposed because it fails to satisfy federal PSD and nonattainment new source review requirements. Specifically, we also agree that given the lapse of eighteen months as discussed by the Law Clinic, as a matter of law this the new source review permit must be revisited.

We also agree that in particular this PSD permit as proposed fails to satisfy the requirements of best available control technology (BACT) requirements and that this failure will cause and contribute to violations of the Clean Air Act. We also agree that there was no 2002 PSD permit issued, and therefore it is incorrect to title or approach this application as an "amended" PSD permit. Additionally, as discussed below, given the significant change in the load duty cycle now proposed, this must be viewed as an entirely new application unrelated to the 2002 proceedings resulting in review of a different project in another location.

¹ This is attached as Exhibit 6 to the comments by the Environmental Law Clinic of Golden Gate Law School on behalf of Citizens Against Pollution.

We also agree with the County of Alameda that a second public hearing should be scheduled to allow the public an adequate opportunity to meaningfully participate in these proceedings.

B. The Proposed Load Duty Cycle Is Inconsistent With RCEC's Baseload Design Which Necessitates BACT Requirements For Start Ups And Shut Downs To Prevent The High Emission Spikes Presenting Health Hazards To The Community.

1. The Proposed Permit Imposes No Limitations On Start Up And Shut Downs And Allows Very High Daily Emissions To Accommodate High Emission Spikes Due To Unlimited Start Ups And Shut Downs.

Presently this permit imposes no limit on the number of high emission startups, apparently intended to provide maximum operational flexibility. The permit states:

To provide maximum operational flexibility, **no limitations will be imposed on the type, or quantity of gas turbine start-ups or shutdowns.** Instead, the facility must comply with daily and annual (consecutive twelve-month) mass emission limits at all times.

(BAAQMD Statement of Basis (SOB), p. 121.)

The permit allows very high daily emissions, 4,805 lb/day (2.4 tons/day) NO_x, 20,000 lb/day (10 tons/day) CO, and 495 lb/day (0.5 tons/day) VOC,² although establishing annual limits that reflect continuous baseload operation at relatively low emission levels with relatively few startups/shutdowns. Annual emission limits are 134.6 tons per year (tpy) NO_x, 389.3 tpy CO, and 28.5 tpy VOC.³

The very high daily emission limits for NO_x, CO, and VOC in the proposed permit, however, effectively represents *no* daily limit. There is no credible mix of cold startup, hot startup, shutdown, and steady-state operating scenarios that could come close to generating 2.4 tons/day NO_x, 10 tons/day CO, and 0.25 tons/day of VOC. The probable approach RCEC will use to allow frequent startups with high short-term (3-6 hours) emissions while staying under the annual emissions cap is to slightly over control NO_x emissions during steady-state operation.

Projected startup/shutdown NO_x emissions, at 70 tons per year ("tpy"), will be approximately 60 percent of the potential NO_x emissions of 115 tpy generated during

² SOB, p. 125, condi. 10. Lower daily emission limits apply under certain conditions, SOB, p. 127, condi. 22.

³ SOB, 128, condi. 23.

normal operation.⁴ Carbon monoxide (CO) emissions will be generated overwhelmingly by startup/shutdown events, at 1,197 tpy, compared to 140 tpy of CO emissions during normal operations. The high startup/shutdown NOx and CO emissions are a result of attempting to adapt a combined cycle plant designed for baseload duty to cycling duty without any modifications or upgrades to minimize startup/shutdown emissions.

As your Statement of Basis acknowledges, p. 10, this facility is designed for conventional baseload operation using Siemens' *older* Westinghouse 501FD2 gas turbines.⁵ Baseload operation, meaning continuous operation at or near the design output of the plant, generally results in only a handful of startups and shutdowns each year. Startup/shutdown emissions may be a relatively minor component of overall annual emissions in a baseload application, even if individual startup/shutdown events produced significant emissions. However the proposed duty cycle described by RCEC for this permit is "intermediate to baseload," with the *potential* for *daily* startups and extended weekend downtime following by a cold start.⁶

A review of over three years of continuous emissions monitoring data for the functionally identical Metcalfe Energy Center, from June 2005 through August 2008, shows a typical NOx level at steady-state of 1.7 ppm and CO level of 0.0 to 0.5 ppm. (We refer you to the June 2005 through August 2008 monthly BAAQMD CEMS reports for Metcalf Energy Center.) RCEC could readily maximize the number of high emission startups by over controlling NOx emissions during steady-state operation, for example from 1.7 ppm to 1.2 ppm, and thereby create "space" under the annual emissions RCEC cap for frequent high emission startup events.⁷

2. High Emission Spikes Which Present Health Hazards To The Surrounding Communities Also Directly Contributes To Short Term Exceedances Of The 8 Hour Ozone Standards In Violation Of The Clean Air Act.

⁴ Startup and shutdown emissions calculated from data provided in CEC July 2007 Final Staff Assessment and Table 2 and Table 3 of SOB, pp. 12-13. See Attachment for details of startup and shutdown emission calculations.

⁵ That these are "older Westinghouse 501F2 units" is acknowledged by Siemens representatives as well as the reflected by other comments by industry representatives.

⁶ Barbara McBride of Calpine's November 13, 2008 E-mail to Weyman Lee entitled "RCEC vs. FP 10 emissions."

⁷ Based on our information, selective catalytic control (SCR) vendors generally design the SCR to achieve NOx control levels well below the actual guarantee to ensure that the SCR can meet the guarantee level under all foreseeable conditions. The NOx control level is controlled by the amount of ammonia injected to the SCR – therefore the greater amount of ammonia injected and released, a recognized toxic and hazardous element, the greater the NOx control.

We object to the proposed permit's above approach as fundamentally flawed since it would expose the local population, including our students, faculty and staff, to frequent high emission "spikes" from the RCEC on an hourly or daily basis, although the *annual* emissions would be comparable to those of similar plants operating in a continuous baseload mode. Requiring state-of-the-art startup/shutdown Best Available Control Technology (BACT) control technology for the RCEC would dramatically reduce these startup emission spikes and provide increased protection to sensitive populations living and working in the neighboring vicinity of the RCEC.

Likewise, as the District is aware, NOx and volatile organic chemicals (VOC) are precursors to ozone. Also, NOx and VOC are components of secondary PM 2.5 formation. High emissions of NOx and VOC during a cold startup of over 6 hours (or 360 minutes) or a hot start of over 3 hours (180 minutes) as allowed by this proposed permit as proposed would directly impact and aggravate the short term non-attainment exceedances of the 8-hour ozone standard contrary to the Clean Air Act which you have been delegated to enforce for the District. The PM2.5 standard is also a short-term standard measured over a 24-hour period. The BAAQMD is in non-attainment of 8-hour ozone and PM 2.5.⁸ Rigorous startup/shutdown BACT requirements must be imposed on RCEC to minimize the impact of RCEC emissions on 8-hour ozone standard and 24-hour PM 2.5 standard exceedance events.

C. The Statement Of Basis Is Seriously Flawed In That It Mistakenly Asserts That Siemens Equipment Is Not Available When In Fact It And Other Alternatives Are Commercially Available And In Operation.

The Statement of Basis states the following at page 41:

Siemens, whose equipment is being proposed for the Russell City Energy Center, is developing a low-load operation flexibility (LLOF) system for its turbines, but it has not yet been validated and is not commercially available at this time.

This statement allegedly attempts to excuse the RCEC from achieving low startup emissions requirements so that Calpine can utilize older turbines at RCEC. This excuse is reflected in footnote 31 on page 40 of the Statement of Basis:

Note that the project was originally permitted in 2002, before Fast Start technology was developed, and **the applicant purchased its equipment at that time based on the [what would otherwise be now expired] initial permits. Retrofitting that equipment now to incorporate Fast "Start technology would require a complete redesign of the project and the purchase of new equipment.** Furthermore, Siemens stated that emissions performance cannot be guaranteed unless

⁸ BAAQMD webpage, "Ambient Air Quality Standards & Bay Area Attainment Status": http://www.baaqmd.gov/pln/air_quality/ambient_air_quality.htm

the company supplies a fully integrated power plant with Fast Start technology (i.e. Flex Plant 10).

As I pointed out at the January 22, 2009 hearing, the District's delegated duty is to enforce the Clean Air Act. As the U.S. Supreme Court observed in *Alaska Department Of Environmental Conservation v. Environmental Protection Agency et al.* (2004) 540 U.S. 461, economic considerations must be justified within a larger context of satisfying the Clean Air Act. As the Court explained:

The Clean Air Act's (CAA or Act) Prevention of Significant Deterioration (PSD) program, 42 U. S. C. §7477, was designed to ensure that the air quality in "attainment areas," i.e., areas that are already "clean," *will not degrade*, see §7470(1). The program ***bars construction of any major air pollutant emitting facility not equipped with "the best available control technology"*** (BACT). §7475(a)(4). The Act defines BACT as "an emission limitation based on the **maximum degree of [pollutant] reduction ... which the [state] permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable** for [the] facility." §7479(3).

(Emphasis added.) Your duty is "to protect public health and welfare from any actual or potential adverse effect . . ." (42 U.S.C. §7470.) Here, in an almost "*Don Quixote*" story, this permit appears based on a mistaken underlying presumption that BACT must be built around out of date equipment. We submit that this alone establishes that this permit as proposed as a matter of law fails to satisfy the minimum analysis required under the Clean Air Act. (See *Department of Alaska, supra*, affirming EPA's stop work order on ground that BACT analysis adopting "economically less onerous" technology violated Clean Air Act.)

Additionally, the statement that "a low-load operation flexibility (LLOF) system for its turbines. . . . it has not yet been validated and is not commercially available at this time" simply is factually wrong. Given this mistake would result in unnecessary and substantial emissions, the District must revisit these points.

Several years ago Siemens developed fast-start technology for its combined cycle plants to address a power market where high natural gas prices make combined cycle plant operation uncompetitive during periods of low electricity demand (nighttime hours). Two combined cycle fast start plant models were developed. The Flex-Plant (FP)⁹ 10 for peaking to intermediate duty applications, using a simplified once-through heat recovery steam generator (HRSG), and the FP 30 high efficiency fast start plant using a high efficiency HRSG for intermediate to baseload applications. Siemens

⁹ The Flex-Plant or FP is a trade-mark technology. All references to "FP" are to the trade marked technology.

explains the philosophy behind the fast-start turbine concept in its 2005 paper entitled “Fast Cycle Capability for New Plants and Upgrade Opportunities”.¹⁰

Nowadays, many operating combined cycle plants are shifted to intermediate load and new plants are specified for cycling load regimes because of today’s high gas prices. Therefore features for high operational flexibility like short start-up and shutdown times are emphasized by customers. Also the focus of Siemens Reference Power Plant (RPP) development changed according to these market requirements. In the past, the RPPs were designed for baseload operation with a low number of starts per year. *Start-up time for a 400 MW single shaft plant after overnight shutdown (approx. eight hours) was 90 minutes. As an answer to the changed market requirements, Siemens developed a fast start-up concept and implemented it into the RPPs. With this design, a reduction of the single shaft start-up time after overnight shutdown of approx. 50% is achieved.* Target of the development of a cycling plant was to ensure highest operating flexibility without baseload disadvantages.

(Emphasis and italics added.) Siemens describes the specific attributes of the FP 10 and FP 30 now present on the market as follows:

- SCC6-5000F 2x1 Flex-Plant 30TM, a highly efficient (57+% net) 590 MW plant, which can be started up in half the time of traditional F-class plants.
- SCC6-5000F 1x1 Flex-Plant 10TM, a 275 MW plant with 48% net efficiency, which can generate 150 MW within 10 minutes.

The applicant (or Calpine) proposes to use the older Siemens-Westinghouse 501FD2 turbines at RCEC which represents the “traditional F-class plant” that the FP 30 was designed to supersede. Based on our investigation, **hot startup emissions for FP 30 plants result in 28 lb NO_x and approximately 250 lb CO. This is a dramatic reduction over the District’s determination of hot startup BACT for RCEC turbines of 125 lb NO_x and approximately 2514 lb CO.**¹¹ Identifying Siemens FP 30 fast start technology as startup BACT for RCEC would result in a nearly 80 percent reduction

¹⁰ H. Emberger, E. Schmid, E. Gobrecht – Siemens Power Generation Germany, *Fast Cycling Capability for New Plants and Upgrade Opportunities*, published by Siemens AG, 2005.

¹¹ Jan. 29, 2009 telephone conversation with John Copen, author of “Introduction to the Complementary Fired Combined Cycle Power Plant,” Siemens technical paper presented at PowerGen International 2006, Orlando, Florida in November 2006.

in NOx and a 90 percent reduction in CO from hot startups, the primary source of startup emissions.¹²

The Statement of Basis, p. 13, also identifies as a component of startup/shutdown BACT for the RCEC turbines a cold startup interval of 360 minutes and a hot startup interval of 180 minutes. (See discussion above concerning direct impact on exceedances of the federal 8-hour ozone standard.) This likewise needs to be revisited. As the CEC's Final Staff Assessment for Metcalfe reflects, the main Siemens competitor in the "F-class" combined cycle power plant market is General Electric (GE). GE has developed fast startup capability for its new F-class combined cycle power plants using the trade name Rapid Response. The GE Rapid Response 530 MW combined cycle plant is designed for intermediate or baseload duty and has a full-load efficiency of 56.4 percent. GE states the Rapid Response combined cycle plant can reach 60 percent of full load within 17 minutes of a hot start and 100 percent of full load within 45 minutes of a cold start.¹³ Such reductions in start up times, of course, drastically reduce the amount of emissions released.

GE also has developed retrofit turn-down software for existing GE F-class combined cycle plants that dramatically reduce startup emissions. This software is known as OpFlex.¹⁴ OpFlex has demonstrated the capacity, when combined with early injection of ammonia to the NOx catalytic control system (known as "selective catalytic reduction" – or SCR), to achieve hot startup NOx levels equivalent to those achieved with FP 30 fast start technology, 28 lb NOx per hot startup, which is far better than the 125 lb NOx which this permit presently contemplates.¹⁵

Alternatively, the District should examine requiring RCEC startup/shutdown emissions to meet the same levels being achieved in-practice on older model F-class turbines with OpFlex equivalent upgrade software and early ammonia injection. If the LLOF does not fully achieve the emission reductions already achieved in practice with

¹² Perhaps the District's error may be attributable to the fact that Siemens has also developed OpFlex-equivalent software to reduce air emissions during startup events. From what we understand from Mr. Copen, this software was developed for newer versions of the Siemens-Westinghouse 501FD turbine only, specifically the 501FD3 and the 501FD4. It is not currently available for the earlier (or older) models of the 501FD, such as the 501FD2, which Calpine proposes for the RCEC.

¹³ H. Elahi – GE Energy, Generation Technologies Complimenting Large Penetration of Renewables, Power Point presentation, Increasing Renewable Energy In the Western Grid Summit, Ft. Collins, Colorado, September 28, 2007, p. 5.

¹⁴ OpFlex is another trademark product and all future references to "OpFlex" are to that trademarked product.

¹⁵ SDG&E 2007 Quarterly Variance Reports submitted to the San Diego Air Pollution Control District.

OpFlex and early ammonia injection, then the number of startups and shutdowns authorized for RCEC should be proportionately reduced to provide the same startup/shutdown emissions reduction achievable with OpFlex and early ammonia injection.

We submit that based on our investigation, there are many off-the-shelf alternatives, both new F-class combined cycle alternatives and upgrade packages to operational facilities, that dramatically reduce startup/shutdown emissions relative to the startup/shutdown emission limits identified by the District as startup/shutdown BACT for RCEC. We submit, however, that this Statement of Basis fails to provide any sound technical basis for concluding that by simply following "operating instructions" for the older 501FD2 gas turbine, this represents state-of-the-art startup/shutdown BACT for the RCEC gas turbines. This simply is wrong.

D. State Of The Art BACT Must Be Required To Address The District's Present Short Term Non-Attainment Problems Which Will Become Worse With RCEC's Frequent Startup/Shutdowns Characteristic Of Load-Following Combined Cycle Plants As Proposed.

The Statement of Basis asserts at page 19 the following:

Because emissions are greater during startups, shutdowns and combustor tuning periods than during steady-state operation, **the BACT limits established in the previous sections for steady-state operations are not *technically feasible* during these periods. As these limits are not "achievable" during these operating modes, they are not "Best Available Control Technology" as defined in the Federal PSD Regulations. Therefore, alternate BACT limits must be specified for these modes of operation.** To do so, the Air District has conducted an additional Top-Down BACT analysis specifically for startups, shutdowns, and tuning periods.

(Emphasis added.) We seriously disagree that BACT limits are not "technically feasible" during startups and shutdowns. We refer the District to the over two year public record history of Palomar Energy in San Diego.

First, the NOx emissions limit identified in the Statement of Basis as Permit Condition 23, 134.6 tons per year (tpy), is equivalent to the steady-state NOx limit of 2 ppm being met continuously over a projected 8,324 hours per year of operation. This NOx limit will put startup/shutdown emissions under a *de facto* plantwide emissions cap. Again, this will allow RCEC the option of over controlling NOx emissions (and therefore release additional ammonia) during steady-state operation to compensate for high startup/shutdown emissions instead of utilizing state-of-the-art startup/shutdown BACT on the RCEC turbines.¹⁶

¹⁶ This is reflected in condition no. 23:

Further, we object placing startup/shutdown emissions under such a plantwide cap given its failure to protect the neighboring community from short-term high emissions and health risks generated during startup events. Such an annual cap as presently proposed does not protect the public from short-term high emissions generated during startup events. As reflected by the District's publication entitled "A Day in the Life of Ozone," at http://www.baaqmd.gov/pio/ozone_day.htm, and "Particulate Matter," <http://www.baaqmd.gov/pln/pm/index08212008.htm>, it is NOx and volatile organic compounds (VOX) emitted from fossil fuel plants such as RCEC as proposed which are the precursors to ambient PM which presents serious health risks.

In this regard, we refer you to the attached copy of Alameda's County Public Health Department's July 18, 2008 correspondence from Dr. Anthony Iton in the *Eastshore* proceeding asking the CEC to "**postpone approval of any new power plant**" until the findings of the California Air Resources Board Study receive "full review and consideration by the community, the environmental science and public health community," among others.

Likewise, in *Indeck-Niles Energy Center*, PSD Appeal No. 04-01 (2004), slip. Opn. p. 13, there the EAB relied on *MDEQ v. Browner* (6th Cir. 2000) 230 Fed.3d 181, 183-186, where the Court affirmed the EPA's rejection of Michigan's Clean Air Act's (CAA) rules as not meeting the Clean Air Act's requirements because of the improper exclusions of startup/shutdown emissions. In doing so, the EAB specifically noted: "Notably, Petitioner did not raise in his appeal an issue directly related to the potential applicability of the permit's short-term BACT concentrations limits during periods of turbine startup and shutdown." (*Ibid.*) Most significantly, the EAB noted that such an attempted exemption, such as here, "is potentially a much more serious concern that the issue of public review" than presented by that particular appeal. (*Ibid.*)

The District's Statement of Basis, page 41, attempts to justify this effective exemption by contending there is insufficient available data examining alternatives. The Statement relies on a April 2007 letter to assert that only a few months of data are available for Palomar Energy, in San Diego, which optimized its operating procedures and reduced its startup emissions by applying the OpFlex control software and early ammonia injection. Although the District admits Palomar's success is "encouraging," it claims supporting data is limited and therefore it is not possible to determine what reductions are attributable to the OpFlex control software and early ammonia injection.

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23. The owner/operator shall not allow cumulative combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3 & S-4), S-5 Cooling Tower, and S-6 Fire Pump Diesel Engine, including emissions generated during gas turbine start-ups, combustor tuning, and shutdowns to exceed the following limits during any consecutive twelve-month period:
- | | | |
|-----|--|----------------------------|
| (a) | 134.6 tons of NOx (as NO ₂) per year | (Offsets, PSD) |
| (b) | 389.3 tons of CO per year | (Cumulative Increase, PSD) |
| (c) | 28.5 tons of POC (as CH ₄) per year | (Offsets) |
| (d) | 86.8 tons of PM ₁₀ per year | (Cumulative Increase, PSD) |
| (e) | 12.2 tons of SO ₂ per year | (Cumulative Increase, PSD) |

This is simply an incorrect summary of the documented success of the changes made at Palomar Energy. Most significantly, *twenty two months have elapsed since that April 2007 letter* and there are now approximately 30 months of data documenting these efforts. In fact, based on our examination, San Diego Gas & Electric (SDG&E) provides an exact breakdown for emissions reductions attributable to OpFlex and early ammonia injection. This system has been in operation nearly 30 months, not “a few months,” and has performed consistently throughout this period. We refer you to SDG&E Report, entitled “OpFlex and Early Ammonia Effects on Startup emissions,” San Diego County APCD Variance No. 4073, dated March 6, 2007, which documents the breakdown for emissions reduction.¹⁷

The Statement of Basis also asserts the following:

Without a *manufacturer* guarantee, the Air District cannot conclude with any certainty that this technology will obtain the predicted reductions. Predictions of potential performance are not, by themselves, sufficient evidence on which to require this technology as BACT.

(SOB, p. 41, italics added.) This is incorrect. The District is within its regulatory authority to use over two years of continuous emissions monitoring system (“CEMS”) data from Palomar Energy, a similar facility, as the basis for startup/shutdown limits at RCEC without a manufacturer guarantee.

The Statement concludes “that OpFlex and similar low-load turn-down technologies are not technically feasible for use in reducing startup emissions at this time.” (SOB, p. 42.) Again, this assertion is contradicted by the public records available for Palomar Energy. Two years of startup/shutdown CEMS data for Palomar Energy is a sufficient record upon which to establish startup/shutdown emission limits for RCEC based on the use of OpFlex (or the Siemens equivalent) and early ammonia injection.

Further, SDG&E has developed an exact apportionment of emission reductions attributable to OpFlex and early ammonia injection that can be directly transferred to the RCEC permit. SDG&E has established an extensive and verifiable record demonstrating

¹⁷ The following is one of the tables provided summarizing the reduction results:

Regular Startup Summary Table:

	Startup Emissions before Opflex/Early NH3	Reduction Attributable to Early NH3 Inj.	Reduction Attributable to OpFlex	Recent Regular Startup Results – Note 1 (Nov. 2006 – Feb. 2007)
NOx (lbs.)	120	45	47	28
CO (lbs.)	35	0	25	10

Note 1: Excludes startups after lengthy shutdown (>24 hours) or after HRSG forced cool down for maintenance.

the technical feasibility of OpFlex and early ammonia injection at Palomar Energy. The Statement of Basis's determination that OpFlex and similar low-load turndown technologies are not technically feasible at RCEC is without support and contradicted by the public record that demonstrates the performance of OpFlex on a combined cycle plant nearly identical to RCEC. Clearly, this analysis must be revisited.

In the Statement of Basis's effort to justify its failure to apply BACT, page 43, the District asserts that the EPA Region 9 as a permitting agency "has considered whether it should be required as BACT, but concluded that it should not." Cited in support in footnote 41 is the "Region 9's May 2008 Ambient Air Quality Impact Report, Colusa Generating Station," Clean Air Act PSD Permit No. SAC 06-01. The footnote, however, contradicts the assertion in the text: "The record from that permitting action shows that EPA Region 9 considered OpFlex and the Palomar facility in response to a comment on the startup BACT issue. That comment was subsequently withdrawn and *so EPA never responded to it formally on the record.*" (Italics added.) We submit that simply because the permit at issue in Colusa did not require it does not mean that it is "evident" that Region 9 does not require it – *particularly under these circumstances where the applicant proposes to build a large facility in a populated metropolitan area that is not in attainment for PM 2.5 and ozone 8 with old equipment, the County Public Health Officer has sought a suspension of any such construction and there are ample energy reserves.* (See below for discussion on energy forecast and status.)

In its evaluation of "most effective controls and document results," the Statement asserts at page 44 that "the only type of once-through boiler technology that is technically feasible at this time is a single-pressure system, the Siemens Flex Plant 10." Additionally, the Statement contends that "The Air District has concluded that the adverse impacts of requiring a single-pressure steam turbine design (FP 10) outweigh the additional startup benefits that can be achieved. The Air District will continue to monitor the development of once-through boiler technologies, in particular the Siemens Flex Plant 30 design using a triple-pressure steam boiler. Such future developments could change the analysis regarding the tradeoffs between overall energy efficiency and startup performance."

The District's rationale for not requiring fast start Siemens combined cycle technology at RCEC is based on the incorrect assumption that only lower efficiency FP 10 fast start combined cycle technology is currently available from Siemens. According to the Statement, that is what Siemens told the District. (See SOB, pp. 40-41 & fn. 32.) This information came from the same Siemens representative who also told the District's permitting engineer, according to those handwritten notes, that the existing (RCEC) turbines cannot be retrofitted and *that any changes* to the RCEC project as proposed would "kill the project" because of the additional cost. (This is quoted directly from an examination of the handwritten teleconference notes of Weyman Lee dated November 6, 2008, with Siemens Northwest Regional Vice President and Siemens Pacific Northwest Sales Manager Benjamin Beaver.) It was in this same telephone conversation that Siemens stated that the RCEC turbines would need to be "updated" prior to installation. Absent from these notes or the Statement of Basis is "what updates" would be required or

whether that “update” will impact the quantity of startup/shutdown emissions projected for RCEC. This needs to be thoroughly examined.

Based on our review, this erroneous assumption apparently is the sole reason the District limits its fast start turbine analysis to the lower efficiency FP 10. We refer you to the following projects which should be examined:

The Lake Side Power Plant in Utah - a 2x1 combined cycle project utilizes FP 30 technology and has been in operation since December 2007; and

The Caithness Energy Long Island Power 1x1 combined cycle plant currently under construction also is permitted to use FP 30 technology.

Siemens stated to the District that the efficiency of the FP 30 is 57 percent. The FP 30 efficiency is higher than the 55.8 percent efficiency stated for the RCEC. (*Compare* Nov. 6, 2008 handwritten notes with SOB p. 43.)¹⁸ Siemens FP 30 combined cycle technology is a commercially proven, higher efficiency alternative to the proposed RCEC with much lower startup and shutdown NOx and CO emissions, reductions which are crucial for our community’s health and safety and to address global warming.

F. Calpine’s Claim That Emissions From Auxiliary Boiler Associated With FP 10 And FP 30 Fast Start Technology Could Offset Emissions Benefits Of Fast Start Capability Is Incorrect – The Fast Start FP 30 Combined Cycle Plan Is More Efficient Than The Old Turbines Proposed By RCEC With Far Lower Startup/Shutdown Emissions.

According to RCEC’s “confidential memo” provided to the District dated September 10, 2008, entitled “Evaluation of the use of Siemens ‘Fast Start’ Technology at Calpine’s Russell City Energy Center (RCEC),” Siemens states that, *depending on the frequency of use* (which here is “at will”), the auxiliary boiler associated with the FP 10 or FP 30 fast start combined cycle plants could potentially offset any emissions benefits from the use of fast start technology. This is an incorrect statement. The UDEQ permit for the Lakeside Power Plant FP 30 includes a potential to emit estimate for the auxiliary boiler. The air emissions from an auxiliary boiler would be *de minimus* relative to the startup emission reduction benefits realized by requiring fast start Siemens FP 30 combined cycle technology. (*See* discussion above setting forth the dramatic comparison.)

Calpine also states that there is no room for an auxiliary boiler at RCEC. Given no supporting information or basis is provided by Calpine for this claim, it likewise must be disregarded.

¹⁸ The Nov. 6, 2008 Notes state “Flex 30-57 percent efficiency, Flex 10 – 49 percent (47-48 percent).”

The applicant and District compare the performance of the RCEC to a Siemens FP 10 fast start combined cycle configuration. This is an error. Siemens specifically identifies the FP 10 as the appropriate configuration for a plant that will operating in a “*peaking duty to intermediate duty*” range of operation. However, RCEC states that “The Siemens 501FD technology selected for RCED is designed for an intermediate to baseload type of operation.” (Barbara McBride of Calpine’s November 13, 2008 email to Weyman Lee entitled “RCEC vs. FP 10 emissions.”)

The FP 10 is not utilized for this type of application. The FP 10 uses a very fast start once-through heat recovery steam generator design. This once-through HRSG design is less efficient than the HRSG used in baseload combined cycle plant designs. At least two plants in California, Carlsbad Energy Center and Mirant Moss Landing, have filed applications to build FP 10 power plants.

Siemens markets the FP 30 combined cycle plant configuration for intermediate to baseload operation applications. The FP 30 uses the same 2x1 configuration that RCEC is proposing to utilize. The FP 30 also uses fast start technology. However, the FP 30 uses a more complex HRSG than the FP 10 that allows the FP 30 to achieve the same efficiency as a conventional baseload combined cycle plant like the RCEC, while also achieving much faster startups and *much lower startup emissions*, than that presently proposed for RCEC.

Both the applicant and the District state that the lower efficiency of the FP 10 negates the fast start emissions benefits of the FP 10 plant design, and therefore there is no basis to identify the FP 10 as BACT for startup/shutdown emissions in this case. However, missing from this Statement is any examination of applying the FP30 technology also available from Siemens that negates such an argument.

G. Unsupported Assertions That Changes to RCEC Turbines Will “Kill the Project” May Not Eliminate The Necessary Statutory BACT Analysis.

Apparently, Calpine has insisted that the District define BACT for startup/shutdown solely based on the operating capabilities of older Westinghouse 501FD2 turbines because Calpine purchased them many years ago under completely different market conditions. According to the November 2008 Notes, the District was told that any substantive changes to the proposed project necessitated by District to comply with the Clean Air Act would kill the project. Likewise, Calpine has asserted that its tentative PPA with PG&E will be invalidated if any changes to the RCEC project are necessary. (See p. 2 of Sept. 10, 2008 letter from Calpine to the District entitled “Applicability to Russell City,” although identified “confidential,” disclosed in response to a public record request.)

Calpine implies that the existence of a preliminary PPA with PG&E signifies that the RCEC project is critical to meeting PG&E customer power needs. This is incorrect. Not only have California investor-owned utilities signed many preliminary PPAs that are never consummated for a variety of reasons, but our research establishes that PG&E’s

territory has a very high reserve margin for grid reliability purposes. There is no imminent shortage of electric power supplies in PG&E service territory that might provide some coherent “force majeure” rationale for fast-tracking RCEC at the expense of the public’s health and safety by employing unlimited startup/shutdowns emissions for this project. In effect, we object to allowing RCEC to emit 100s of tons of additional air pollutants annually to compensate for a questionable equipment investment made many years ago. Obviously, to do so results in clearly disparate treatment on our community in violation of environmental justice and the Clean Air Act.

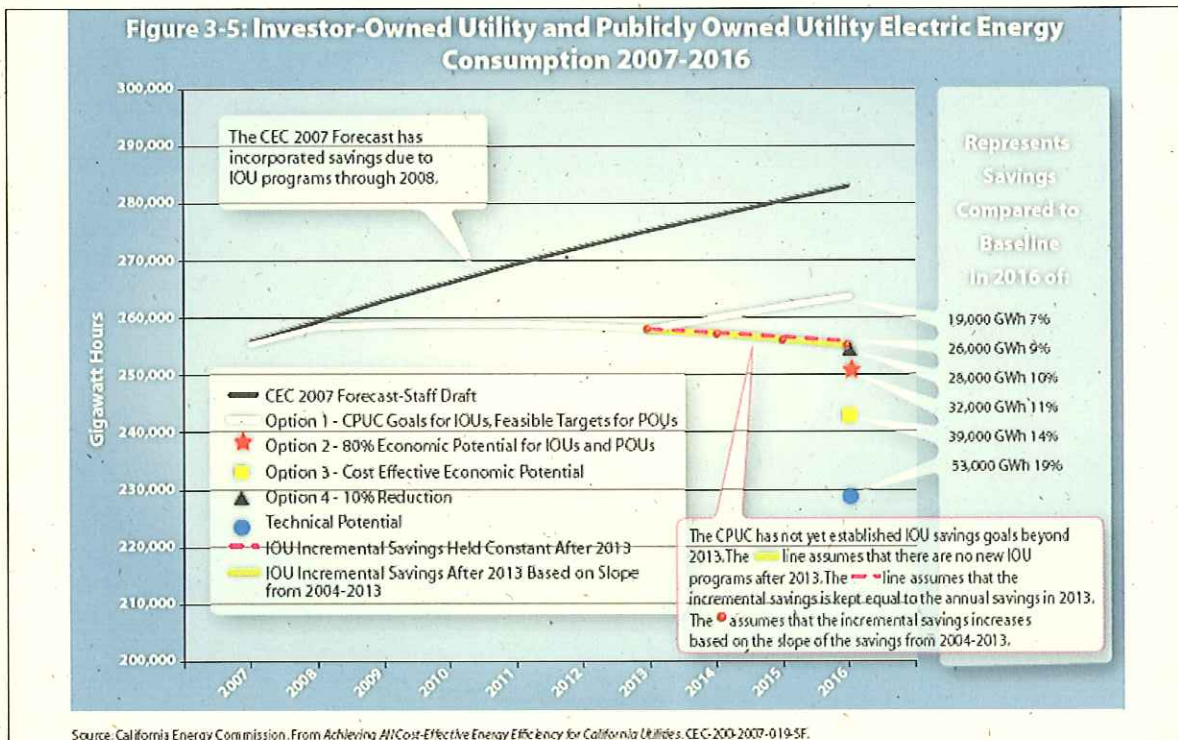
In this regard, we refer you to the CEC’s April 2008 electricity demand forecast and April 2008 electricity demand forecast by CAISO indicating high reserve margins, especially in PG&E territory. Calpine’s at-risk purchase of major hardware for the RCEC project many years ago does not exempt it from complying with BACT to control startup/shutdown emissions in an application analyzed in 2009 to comply with the Clean Air Act at a time when there is no imminent power shortage and ample power supplies.

This is to also bring to your attention the California Public Utilities Commission’s decision D.07-10-032 issued on October 18, 2007. This now requires that investor-owned utilities such as PG&E achieve *100 percent* of cost-effective energy efficiency measures by 2020.¹⁹ This CPUC decision requires much more aggressive energy efficiency measures by California’s investor-owned utilities, likely rendering earlier demand growth forecasts obsolete.

The CEC’s 2007 Integrated Energy Policy Report (IEPR) includes graphs showing the significance on electricity consumption and peak demand of the October 18, 2007 CPUC energy efficiency decision. Copied from the IEPR are Figures 1 and 2 below. Statewide annual energy consumption declines from approximately 260,000 gigawatt-hours per year in 2008 to approximately 240,000 gigawatt-hours per year in 2016 (Figure 1). Significantly applicable to this analysis is that peak statewide energy demand remains unchanged from 2008 to 2016 at about 62,000 MW (Figure 2).

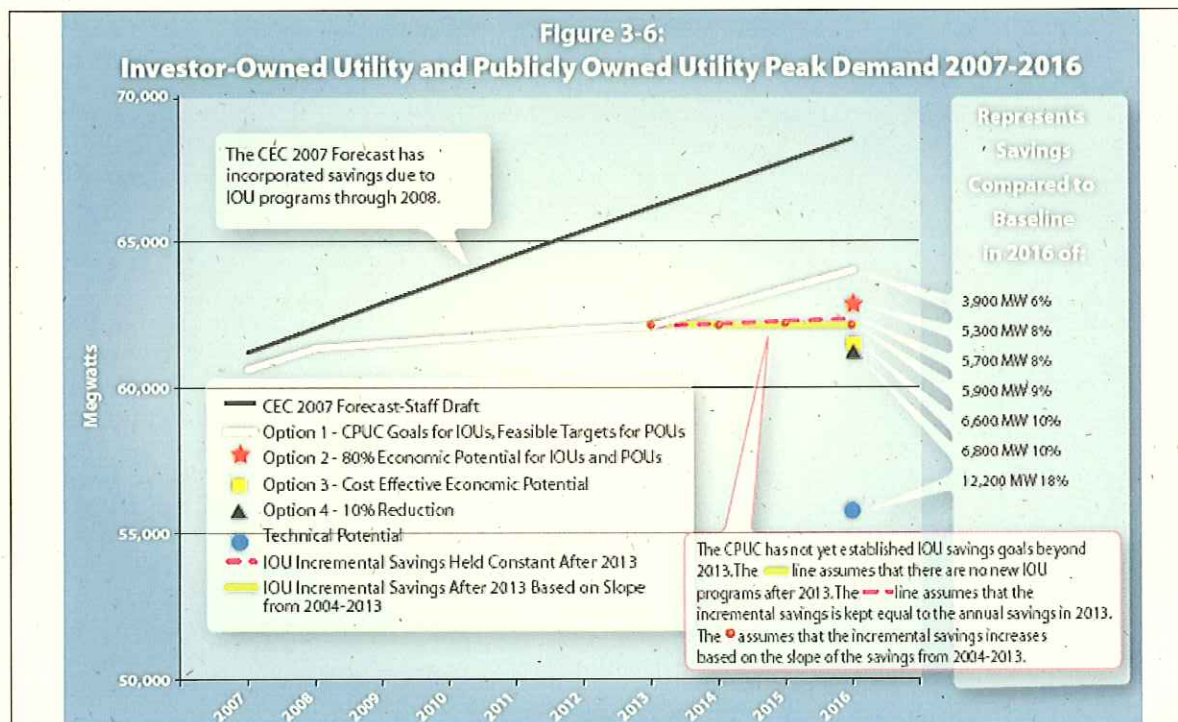
Figure 1. CEC projection in 2007 IEPR of impact of varying levels of energy efficiency (EE) on electric energy consumption by California utilities – yellow square represents achievement of 100% of cost-effective EE measures

¹⁹ CPUC Decision 07-10-032, October 18, 2007.



Source: This is Figure 3-5 in the CEC’s 2007 Integrated Energy Policy Report, December 2007, p. 84.

Figure 2. CEC projection in 2007 IEPR of impact of varying levels of EE on peak demand by California utilities – yellow square represents achievement of 100% of cost-effective EE measures



Source: This is Figure 3-6 in the CEC’s 2007 Integrated Energy Policy Report, December 2007, p. 85.

F. The Selection Of “Best Work Practices” As BACT For Startup/Shutdown Based On Operational Plants Using Decade-Old Version of Westinghouse 501D Turbine Technology and Work Practices for Compliance While Dismissing Superior Technically Feasible Alternatives Is Not BACT.

1. Alternative Turbines Identified By CEC Staff And The 2002 CEC License.

In reviewing this application, we would alert the District that it should not view the earlier proposed PSD permit which Calpine asserts it had as binding or limiting the District in any way. Not only do we agree with other commentaries that there was no earlier PSD permit issued, but the project approved by the CEC in 2002 was proposed with a fundamentally different operating objective and baseload operation than the current cycling duty project. In effect, the applicant threw any earlier PSD permit and this District has an obligation to treat this as a new application, which it is.

2. The Selection Of “Best Work Practices” As BACT Is Fundamentally Flawed.

The detailed startup/shutdown analysis conducted by the District is framed by the presumption that startup/shutdown BACT is good work practices and the only refinement necessary is analyzing operational startup/shutdown data from operational similar plants to assure that proposed startup/shutdown limits for individual events are not too lax. Evaluated are the startup/shutdown emissions data for other similar facilities designed/constructed in the Year 2000 timeframe (Metcalf, Sutter, Delta, Los Medanos). Proposed is simply tightening the warm/hot startup BACT limit and the shutdown BACT limit based on this analysis. No change to the cold startup limits are proposed as a result of analysis of cold startup emissions at operating plants using older model 501FD turbines. In light of the other technically feasible alternatives readily available on the commercial market, we find this wholly inadequate and unfair to our community.

In this regard, we refer you to the CEC staff's 2000 final staff analysis for Metcalf, p. 620, which recognizes that another option for this facility is the General Electric Frame 7FA, another F-class gas turbine with a 2x1 configuration. The Frame 7FA also is utilized by Palomar and which the CEC staff recognizes works well with the OpFlex system which will substantially reduce start up and shut down emissions.

The District concludes that it “is proposing the most stringent emission limits for startups, shutdowns, and tuning event that can reasonably be achieved by the proposed Russell City Energy Center, based on a review of actual operating data and experiences from similar facilities.” This conclusion, however, is self-limited by examining only Calpine’s already purchased older-model Westinghouse 501FD2 turbine, and by ignoring early injection of ammonia to the SCR and available turn-down software enhancements to improve startup and shutdown emissions performance.

In effect, the District attempts to “back-in” to the RCEC startup/shutdown BACT limits based on the demonstrated performance of the 501FD2 turbine at operating plants. This is a startup/shutdown BACT determination that has been tailored to the limitations the older turbine technology Calpine proposes to deploy at RCEC. Instead of RCEC conforming to achievable *present day* startup/shutdown levels for combined cycle gas turbine power plants, this startup/shutdown BACT analysis is made to conform with the “out-of-the-box” older gas turbines” RCEC happened to purchase years ago and that sat apparently in storage for an otherwise abandoned project. As the District is aware, this is not a permit sought for an existing facility, this is a permit sought for a *new* facility.

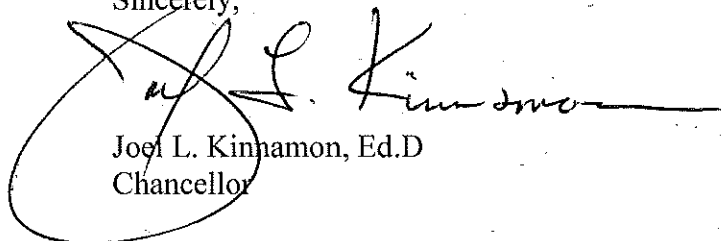
The EAB has remanded state agency decisions for similarly failing to examine and apply BACT to startup/shutdown emissions. In *Tallmadge Generating Station* (Michigan), PSD Appeal No. 02-12, slip opn., p. 26, relying on *In re RocGen Energy Center*, 8 E.A.D. 536 (EAB 1999) the EAB remanded the PSD permit approved by the local district which, “like RockGen’s, exempts the permittee from complying with BACT and other emission limits during startup and shutdown events, as long as the permittee has prepared a plan, approved by the permit issuer, to minimize emissions during those events.” A basis for remand is “an administrative record . . . lacking in evidence that . . . sufficiently considered design or other possible changes to the proposed facility to eliminate excess emissions.” (*Tallmadge, supra*, slip opn. pp. 25-26.)

CONCLUSION

Based on this present administrative record, legitimate startup/shutdown BACT alternatives have been eliminated for improper or unjustifiable reasons. In light of incorrect information having been provided to the District, such as the high efficiency Siemens FP 30 fast start unit not being commercially available or developed to apply to these older turbines, clearly the District must re-examine its analysis. Additionally, the District’s analysis concerning early ammonia injection and OpFlex successfully used at Palomar Energy likewise must be re-examined given the mistaken assumption that the system was in operation “for a few months,” when in fact OpFlex has been in operation for over two years since the Statement of Basis was published in December 2008.

Given the failure of the proposed permit's failure to satisfy the Clean Air Act and requirement that new source review be performed since the elapse of eighteen months since the prior NSR approval, this proposed permit and NSR must be revisited to properly comply with the Clean Air Act's requirements.

Sincerely,

A handwritten signature in black ink, appearing to read "Joel L. Kinnamon", is written over a circular stamp. The stamp is partially obscured by the signature and contains the text "Joel L. Kinnamon, Ed.D" and "Chancellor".

Joel L. Kinnamon, Ed.D
Chancellor

Cc: Deputy County Counsel,
Lindsey Stern
Dr. Anthony Iton,
Public Health Director of Alameda County

State of California

DOCKET	
06-AFC-6	
DATE	FEB 04 2008
RECD.	FEB 04 2008

The Resources Agency of California

Memorandum

To: **Hearing Officer Susan Geffer**

From: **Bill Pfanner** *Bill Pfanner*
California Energy Commission
 1516 Ninth Street
 Sacramento CA 95814-5512

Telephone: (916) 654-4206

Subject: **Comments on Eastshore Energy Center (06-AFC-6) Final Distances Table**

Hearing Officer Geffer:

Energy Commission staff has reviewed the draft measurements, prepared by the applicant and the City of Hayward, that identify the distance from the proposed Eastshore site to various locations in and around the Hayward area. Many of the applicant's measurements provide a relatively accurate approximation of the site's proximity to the identified locations. However, due to the size of the Eastshore site, as well as facilities such as Chabot College, Eden Gardens, and Ochoa Middle School campuses; Hayward Executive Airport, Alameda County Redevelopment planning areas, and Russell City Energy Center, measurements taken from the center of the Eastshore site to the center of these facilities may present an inaccurate impression of the project's proximity and potentially understate the project impacts. In other instances, use of site boundaries are more appropriate to accurately reflect areas of concern, such as those reflected in the FAA's recommendations to avoid overflight of the "site". These measurements also more accurately reflect the methods and results used by Energy Commission staff during the environmental analysis and preparation of the Preliminary and Final Staff Assessment and Evidentiary Hearing testimony.

Therefore, Energy Commission staff, as well as the County of Alameda, Group Petitioners, and Chabot-Las Positas Community College District, prepared responses to the draft. These delineated areas of agreement and identified measurements (or measurement methods) that were not acceptable to the various parties. For the most part, Energy Commission staff measurements agree with or were accepted by all parties except the applicant. Adjustments proposed by Alameda County, the Group Petitioners, and Chabot College are also acceptable to CEC Staff. However, none of these alternate measurements were incorporated in the applicant's final table (submitted by email to all parties on February 1, 2008).

Energy Commission staff have revised the original CEC Staff draft, incorporating input from all parties, including the applicant and City of Hayward, in the attached Table. Graphics supporting the measurements, or other sources, have been attached or referenced. The method of and justification for the calculations are discussed under 'Description'. Measurements where the applicant and CEC staff agree are marked with an *.

We concur with the applicant's assessment that agreement on the aviation distance measurements or calculation methods is unlikely, but there are other locations, such as the schools, residences, and planning areas listed above, where we also do not agree.

Finally, the applicant's discussion indicates that the area outside the six safety zone sectors is not considered to be a safety compatibility area. This description of the Safety Compatibility Zones is inappropriate, inaccurately represents the intent of the Zones,

PROOF OF SERVICE (REVISED 1/16/08) FILED WITH ORIGINAL MAILED FROM SACRAMENTO ON 2/4/08

completely ignores the intent of the ALUPP General Referral Area designation and City of Hayward Municipal Code §10-6, and does not appropriately address the question posed by the Committee. Only the Traffic Pattern Zone was referenced in evidence and testimony, as it related to the City of Hayward's contention that the Traffic Pattern Zone and AAZP are synonymous. For clarity, it should be noted that Safety Compatibility Zones, as depicted in EEC FSA Land Use Figure 5, primarily address risks which aircraft accidents pose for people and property on the ground and the general design is loosely based on a nationwide accident distribution grid. A separate set of safety compatibility concerns involve land use characteristics which can cause an aircraft accident or contribute to its consequences for people on board the aircraft and are reflected in airport land use plans or policies, zoning codes, and federal regulations and advisories.

Bill Pfanner/Shaelyn Strattan

February 4, 2008

EASTSHORE ENERGY CENTER – DISTANCES IN QUESTION

Prepared by CEC Staff as of February 4, 2008

* Indicates measurements provided by the Applicant and acceptable to CEC Staff as a generally accurate representation of site proximity.

Distances in Question per the request of Hearing Officer Gelter	Feet (rounded to the nearest foot)	Description
Distance of Eastshore to the Hayward Executive Airport	5,606 feet	Distance measured from Eastshore site boundary to closest point of the Hayward Executive Airport property boundary.
Distance of Eastshore to the Oakland International Airport	41,920*	Distance measured from center of Eastshore site to Oakland International Airport using reference points from City of Hayward, R. Baumann.
Distance of Eastshore from Hayward Airport airspace	0	The Eastshore site is within the boundaries of the Hayward Airport airspace (EEC FSA, Exn. 200, Land Use Figures 4 & 6). Hayward's Class D/E airspace extends from the surface to 1,500 feet msl.
Hayward Airport takeoff and landing flight patterns	0	There is no quantifiable boundary to a traffic pattern for any airport. The traffic pattern, as defined in the FAA Pilot/Controller Glossary (http://www.faa.gov/airports/airtraffic/air_traffic/publications/ATpubs/PCG/T/HIM), is the traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach. Aircraft generally enter and depart the traffic flow for the Hayward airport approximately 1-2 miles from the airport, at altitudes below 1,000 feet msl. Most aircraft enter the traffic pattern in this general vicinity, which includes locations immediately over the EEC site (Exhibits 417 & 418).
Hayward Airport Traffic Pattern Zone	279	Distance measured from Eastshore site boundary to closest point of the Traffic Pattern Zone (EEC FSA, Exn. 200, Land Use Figure 5). The Traffic Pattern Zone depicts an approximate one-mile radius from the primary runway (Runway 10R/28L). The EEC site boundary was used because proposed FAA flight restrictions for flights over power plants apply to the site, not just the stacks.
Hayward Airport Zoning Plan (AAZP) area and Alameda County ALUPP General Referral/Hazard Prevention Zone	0	The Eastshore site is within the boundaries of the Hayward AAZP area (EEC FSA Traffic & Transportation Figure 6) and the ALUPP General Referral/Hazard Prevention Zone (aka Airport Influence Area) (EEC FSA Land Use Figure 3)
Distance of Eastshore from Oakland International Airport airspace	0	The Eastshore site is within the boundaries of the Oakland Airport airspace (EEC FSA, Exn. 200, Land Use Figure 4). Oakland's Class C airspace overlies the Hayward airspace and extends from 1,500 feet msl to 3,000 feet msl.

Distances in Question per the request of Hearing Officer Gelter	Feet (rounded to the nearest foot)	Description
Hospitals	3,192	Distance measured from Eastshore site boundary closest to Anthony w. Ochoa School boundary (per measurement provided by Group Petitioners/Google Earth).
	5,624*	Distance measured from center of Eastshore site to center of Leat's Montessori located at 26236 Adrian Avenue.
	7,977*	Distance measured from center of Eastshore site to center of Kaiser Hospital.
	7,559*	Distance measured from center of Eastshore site to center of Kaiser Medical Center.
	9,636*	Distance measured from center of Eastshore site to center of St. Rose Hospital.
	3,218*	Distance measured from center of Eastshore site to center of Eden West Convalescent Hospital.
Office buildings	0	Fremont Bank Operations Center is located on adjoining property, immediately adjacent to the Eastshore site's southern boundary.
Commercial entities	0	Service Station (gas card facility) located on adjoining property, immediately adjacent to the Eastshore site's northwest boundary.
Industrial entities	0	Warehouse and light industrial facilities located on adjoining property, immediately adjacent to the Eastshore site's north and west boundaries. (see FSA, Exhibit 200, Land Use section, p. 4.5-25 re "Sensitive Receptors"; see Applicant's Distance Table for additional commercial & industrial locations)
Height of existing industrial stacks within the AAZP area	180*	Rohm & Haas (single stack)
	228*	KFFAX radio broadcast antennae
Current zoning height limitations		The AAZP (EEC FSA, Exh. 200, Traffic and Transportation Figure 6)

Distances in Question per the request of Hearing Officer Gelfer	Feet (rounded to the nearest foot)	Description																
		<p>encompasses nine zoning district designations (EEC FSA, Exn. 200, Land Use Figure 2). The EEC site is within the Industrial zoning district and there are no height restrictions within the City of Hayward Zoning Code for that area. Height limitations for the remaining zoning districts are as follows:</p> <table border="1" data-bbox="548 1031 1305 1908"> <thead> <tr> <th>Zoning Designation</th> <th>Height Limitation</th> </tr> </thead> <tbody> <tr> <td>Single Family Residential (HMC §10-1.235)</td> <td>Maximum Bldg. Height: 30 feet Max. Accessory Bldg. Height: 14 feet/1 story</td> </tr> <tr> <td>Medium Density Residential. (HMC §10-1.235)</td> <td>Maximum Bldg. Height: 40 feet Max. Accessory Bldg. Height: 14 feet/1 story</td> </tr> <tr> <td>High Density Residential (HMC §10-1.535)</td> <td>Maximum Bldg. Height: 40 feet Max. Accessory Bldg. Height: 14 feet/1 story</td> </tr> <tr> <td>Planned Development (HMC §10-1.535)</td> <td>Standards of the zoning district and other applicable plans, guidelines, and the General Plan governing uses most similar in nature and function to the uses proposed in the PD District.</td> </tr> <tr> <td>Mobile Home Park (HMC §10-1.735)</td> <td>Maximum Bldg. Height: 40 feet Max. Accessory Bldg. Height: 14 feet/1 story</td> </tr> <tr> <td>Flood Plan (HMC §10-1.2135)</td> <td>Maximum Bldg. Height: 40 feet Max. Accessory Bldg. Height: 26 feet</td> </tr> <tr> <td>Other (HMC §10-1.2135)</td> <td>Alameda County jurisdiction; subject to Alameda County standards for the zoning district and other applicable plans, guidelines, and the General Plan; as well as compatibility with surrounding City of Hayward properties.</td> </tr> </tbody> </table> <p>The EEC site is within the boundaries of the Hayward airport conical zone (EEC FSA Land Use Figure 6). Restrictions imposed by the FAA (14 CFR 77) limit the height of obstructions within this zone, but only apply to physical structures, such as the stacks of the Eastshore facility.</p>	Zoning Designation	Height Limitation	Single Family Residential (HMC §10-1.235)	Maximum Bldg. Height: 30 feet Max. Accessory Bldg. Height: 14 feet/1 story	Medium Density Residential. (HMC §10-1.235)	Maximum Bldg. Height: 40 feet Max. Accessory Bldg. Height: 14 feet/1 story	High Density Residential (HMC §10-1.535)	Maximum Bldg. Height: 40 feet Max. Accessory Bldg. Height: 14 feet/1 story	Planned Development (HMC §10-1.535)	Standards of the zoning district and other applicable plans, guidelines, and the General Plan governing uses most similar in nature and function to the uses proposed in the PD District.	Mobile Home Park (HMC §10-1.735)	Maximum Bldg. Height: 40 feet Max. Accessory Bldg. Height: 14 feet/1 story	Flood Plan (HMC §10-1.2135)	Maximum Bldg. Height: 40 feet Max. Accessory Bldg. Height: 26 feet	Other (HMC §10-1.2135)	Alameda County jurisdiction; subject to Alameda County standards for the zoning district and other applicable plans, guidelines, and the General Plan; as well as compatibility with surrounding City of Hayward properties.
Zoning Designation	Height Limitation																	
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Other (HMC §10-1.2135)	Alameda County jurisdiction; subject to Alameda County standards for the zoning district and other applicable plans, guidelines, and the General Plan; as well as compatibility with surrounding City of Hayward properties.																	
Number of Conditional Use Permits (CUPs) granted to allow the height variances in the AAZP area.	0	<p>Since there is no City of Hayward zoning code height restriction for the Industrial Zoning District, CUPs or variances based on proposed structural heights would not be required. The number of CUPs or variances applied for or</p>																

Distances in Question per the request of Hearing Officer Gelfer	Feet <small>(rounded to the nearest foot)</small>	Description
Oakland Airport's takeoff and landing flight patterns		As noted above, there is no quantifiable boundary to a traffic pattern for any airport. However, flights arriving/departing high intensity Runway 11/29 fly directly over the Hayward Airport at altitudes at or above 1,500 feet msl.
Distance of Eastshore from Russell City Energy Center (RCEC) site	2,942	Distance measured from the Eastshore western site boundary to the RCEC eastern site boundary.
Distance of Eastshore from Chabot College campus (include size of the campus)	2,826	Distance measured from the Eastshore site boundary to the closest point of the Chabot College campus boundary. Due to the size of Chabot College (approximately 90+ acres), measurements taken from the center of the EEC site to the campus center would minimize the proximity of the college and potentially understate the project's impacts.
Distance of RCEC from Chabot College campus	6,762	Distance measured from the RCEC site boundary to the closest point of the Chabot College campus boundary.
Location of Chabot College campus center relative to RCEC and Eastshore	N/A	Generally northeast of both RCEC and Eastshore. The Eastshore facility would sit approximately midway between the RCEC and Chabot College.
Distance of Eastshore from Alameda County's Redevelopment Agency's nearest projects	1,115	Distance measured from the eastern Eastshore site boundary to closest Alameda County Redevelopment County project area boundary (per Mt. Eden Redevelopment Sub-Area Distances map, provided by the County of Alameda; Jan. 31, 2008).
Distance of Eastshore from nearest: Residences	1,120	Distance measured from closest Eastshore site boundary to closest residential lot boundary at 2765 Depot Road (distance is approximate/Google Earth).
Schools	2,171	Distance measured from Eastshore eastern site boundary to western boundary of Waterford Apartment complex (per measurement provided by Group Petitioners/Google Earth).
	919*	Distance measured from center of Eastshore site to center of Life Chiropractic College.
	4,769*	Distance measured from center of Eastshore site to center of ITT Technical Institute.
	3,664	Distance measured from Eastshore site boundary closest to Eden Gardens School boundary (per measurement provided by Group Petitioners/Google Earth).

Distances in Question per the request of Hearing Officer Getter	Feet (rounded to the nearest foot)	Description
Height and number of RCEC exhaust stacks and distance of RCEC from Hayward Executive Airport	2 @ 145 ft	<p>There are two 145-foot tall exhaust stacks associated with the RCEC project. The distance from the center of the RCEC site to the Hayward Executive Airport is 9569 feet (measured based upon the runway end coordinates provided by R. Baumann, City of Hayward).</p> <p>granted for other zoning districts was not applicable to the proposed project site and was not addressed.</p>

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

APPLICATION FOR CERTIFICATION
FOR THE EASTSHORE ENERGY CENTER
IN CITY OF HAYWARD
BY TIERRA ENERGY

Docket No. 06-AFC-6

PROOF OF SERVICE
(Revised 1/18/2008)

INSTRUCTIONS: All parties shall either (1) send an original signed document plus 12 copies or (2) mail one original signed copy AND e-mail the document to the address for the Docket as shown below, AND (3) all parties shall also send a printed or electronic copy of the document, which includes a proof of service declaration to each of the individuals on the proof of service list shown below:

CALIFORNIA ENERGY COMMISSION

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ENERGY COMMISSION

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DECLARATION OF SERVICE

I, Christina Flores, declare that on February 4, 2008, I deposited copies of the attached Comments on Eastshore Energy Center (06-AFC-6) Final Distances Table in the United States mail at Sacramento, CA, with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

Transmission via electronic mail was consistent with the requirements of the California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.



Christina Flores

Attachment: Projected RCEC PTE NOx, VOC, and CO Emissions including Startup/Shutdown

IA. RCEC - normal operation:

assumptions: 7,116 hours/year of normal steady-state operation and lb/hr emission estimates from July 2007 CEC Final Staff Assessment for RCEC, p. 4.1-68.

Parameter	ppm	lb/hr normal each turbine	hr/yr each turbine	ton/yr normal both turbines
NOx	2.0	16.2	7,116	115.1
VOC	1.0	2.8	7,116	20.1
CO	4.0	19.7	7,116	140.1

IB. RCEC - startup/shutdown:

assumption each turbine: 52 cold starts, 260 hot starts, 312 shutdowns = 1,248 hr/yr.
 source startups/shutdown emissions: BAAQMD Statement of Basis, Tables 2 and 3.
 source, # startups/shutdowns: July 2007 CEC Final Staff Assessment for RCEC, p. 4.1-67.

Parameter	units	cold start per turbine	warm start per turbine	hot start per turbine	shutdown per turbine	ton/yr SSD both turbines
NOx	pounds	480	125	125	40	69.9
VOC	pounds	83	79	35.3	16	18.5
CO	pounds	5,028	2,514	2,514	902	1,196.5
# of events each turbine	na	52	0	260	312	
	hr per event	6	3	3	0.5	
duration	total hr/yr each turbine	312	0	780	156	

2. RCEC total emissions - normal + startup/shutdown:

Parameter	normal emissions, ton/yr	startup/shutdown emissions, ton/yr	total RCEC emissions, ton/year
NOx	115.1	69.9	185.0
VOC	20.1	18.5	38.6
CO	140.1	1,196.5	1,336.6



**ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
PUBLIC HEALTH DEPARTMENT**

David J. Kears, Director

1000 Broadway, 5th Floor
Oakland, CA 94607
510-267-8000

Anthony Iton, MD, JD, MPH
Director and Health Officer

July 18, 2008

Commissioner Jeffrey Byron
Commission Docket Unit
1516 Ninth Street, MS-15
Sacramento, CA 95814

Subject: Eastshore Energy Center (06-AFC-6)

Dear Commissioner Byron,

The Alameda County Public Health Department recommends that the California Energy Commission consider the findings of a new California Air Resources Board study released in draft form May 22, 2008. CARB scientists concluded that fine particle emissions carry a much greater risk of premature death than they had previously estimated. Therefore, the Alameda County Public Health Department requests that the Energy Commission postpone approval of any new power plant proposals until the findings of this report receive full review and consideration by the community, the environmental science and public health community, and other interested parties.

This study, entitled *Methodology for Estimating Premature Deaths Associated with Long-term Exposures to Fine Airborne Particulate Matter in California*, is more far-reaching in its conclusions than the West Oakland Health Risk Assessment in that 1) it estimates pollution-related mortality regionally in California, and 2) it estimates the effect of fine particle pollution, not limited to diesel particulate matter, and 3) it estimates the ultimate health outcome, death. We understand from speaking with CARB staff that their focus in this report on mortality impact of PM2.5 will be expanded to include PM2.5 impact on morbidity (including cancer incidence and other non-cancer health effects such as respiratory and cardiovascular disease hospitalizations).

The new CARB study employed a panel of experts reviewing many epidemiological cohort studies conducted worldwide in recent years. The CARB report issued two important findings. The first was that PM2.5 exposure increases the risk of death in the population by 10% for every 10 microgram per cubic meter increase in concentration. The previous estimate was 6%. Therefore the estimated effect was increased by 66.7%, which translated to a doubling or tripling of the number of deaths due to PM2.5 exposures depending on the level of certainty

employed. CARB estimated that 8,200 premature deaths occurred annually in California because of PM2.5 in 1999-2000. Based on current pollution levels, which are much improved since then, and the new effect estimate, the number of deaths due to PM2.5 exposure is estimated to be between 14,000 and 24,000 per year (a 70% to 292% increase).

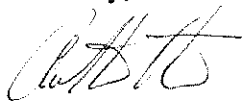
The second important finding in the new report was that there is no evidence in the literature for a threshold below which exposure is safe. While the science to date has not documented effects below 7 micrograms per cubic meter, the consensus of the scientific panel was that there is no reason to assume safe levels exist above the background level of 2.5 micrograms per cubic meter. Thus the new threshold recommended is a range between 2.5 and 7 micrograms per cubic meter of fine particle concentration. In contrast, the prior standard employed by CARB was the established state standard of 12 micrograms per cubic meter. This new threshold represents a huge reduction in what exposure is considered safe, a reduction of 40% to 80%.

The California Energy Commission should keep in mind prior Environmental Justice testimony by Dr. Sandra Witt of the Alameda County Public Health Department. In this testimony she concluded that citing the Eastshore Power Plant in Hayward would disproportionately impact an area not only home to a comparatively large non-white population, but also one already burdened by existing poor health outcomes. We clearly address this phenomenon in our recently released executive summary, *Life and Death from Unnatural Causes: Health and Social Inequity in Alameda County* (full report in press):

Access to proven health protective resources like clean air, healthy food, and recreational space, as well as opportunities for high quality education, living wage employment, and decent housing, is highly dependent on the neighborhood in which one lives. These inequities cluster and accumulate over people's lives and over time successfully conspire to diminish the ultimate quality and length of life in these neighborhoods. (p. 1)

Surely, if we have new evidence showing that vulnerable populations are more adversely affected by air pollution than previously thought, then the California Energy Commission should be conservative in its approach to this issue. The conclusions of this new CARB study may have major significance for how health risk assessments are conducted in the future. It is therefore critical that the implications of this study be given full consideration by scientists and community members alike.

Sincerely,



Anthony Iton, M.D., J.D., MPH
Director and Health Officer

cc: Eastshore POS

Enclosures

EXHIBIT 6

Russell City Energy Centre
Anticipated Yearly Operating Regime

6X16 Operation

	Number per Turbi	Hours	Numbers for 2 turb	NOx emissions lbs	Total lbs	CO Emissions lbs	Total Lbs
Base/peak Load Operation		5050	10100	16.5	166650	20	202000
Hot Starts	250		500	125	62500	720	360000
Warm Starts	50		100	125	12500	1225	122500
Cold Starts	3		6	480	2880	5028	30168
Shutdowns	303		606	40	24240	106	64236
				Total NOX in tons	134.385	Total CO in Tons	389.452
				Limits	134.6		389.3

Base Load Operation

CO Hot start based on 50% of highest average Delta hot start which assumes 50% catalyst efficiency.
CO warm start based on 50% of max Delta hot start data.
Shutdown based on 50% of estimated shutdown data from engineering analysis.

CO Start Values based on DEC values

	CO avg	Co max	50% reduction	
2005	1309	1936	654.5	968
2006	1391	1863	695.5	931.5
2007	1402	2156	701	1078
2008	1437	2446	718.5	1223
average	1384.75	2100.25	692.375	1050.125

Engineering d

Hot Start	1,291.7
Warm Start	2514
Shutdown	212

6X16

New Limits

Based on new CO and Nox start limit

	Number per Turbi	Hours	Numbers for 2 turb	NOx Emissions lbs	Total lbs	CO Emissions lbs	Total Lbs
Base/peak Load Operation		5050	10100	16.5	166650	10	101000
Hot Starts	250		500	95	47500	720	360000
Warm Starts	50		100	125	12500	1225	122500
Cold Starts	3		6	480	2880	5028	30168
Shutdowns	303		606	40	24240	106	64236
				Total NOX in tons	126.885	Total CO in Tons	338.952

Base Load Operation

EXHIBIT 7

Environmental Law and Justice Clinic

September 16, 2009

By E-Mail and U.S. Mail

weyman@baaqmd.gov

Weyman Lee, P.E.

Senior Air Quality Engineer

Bay Area Air Quality Management District

939 Ellis Street

San Francisco, CA 94109

Re: August 2009 Draft PSD Permit for Russell City Energy Center

Dear Mr. Lee:

We are writing on behalf of Citizens Against Pollution (CAP) to provide supplemental comments on the draft prevention of significant deterioration (PSD) permit for the proposed Russell City Energy Center (RCEC). CAP appreciates that BAAQMD issued an Additional Statement of Basis for the changed draft permit conditions. Earthjustice is submitting a separate letter, also on behalf of CAP, and we are incorporating the comments in that letter by reference.

As before, the draft permit once again fails to meet federal PSD, and therefore BAAQMD should not issue the permit as proposed. In addition to complying with the Clean Air Act's PSD provisions, BAAQMD should take care to ensure compliance with the nonattainment new source review (NSR) requirements. BAAQMD has failed in responding to CAP's comments as to NSR even though BAAQMD has a regulatory responsibility over the Act's NSR requirements. BAAQMD's statement – that any appeal period for challenging the NSR provisions has expired – is irresponsible. The public who will bear the burden of breathing pollution from the proposed power plant deserves a meaningful response, not a legalistic and technical response. BAAQMD should provide a response befitting its role as a public health and regulatory agency with the responsibility over NSR compliance, particularly given that asthma is a serious concern to residents nearby and students at Chabot-Las Positas Community College District, and asthmatics are susceptible to adverse health impacts from exposure to ground-level ozone, a pollutant governed by the NSR provisions.

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I. THE DISTRICT'S BACT ANALYSIS SUFFERS FROM THE FUNDAMENTAL MISTAKE THAT ACHIEVABLE MEANS ACHIEVED LIMITS (WITH OPERATING DATA OVER A LONG TIME, PLUS A LARGE COMPLIANCE MARGIN).

The Supreme Court has noted that in establishing National Ambient Air Quality Standards, the Clean Air Act amendments were intended to be “technology-forcing.” *Train v. Natural Resources Defense Council*, 421 U.S. 60, 91 (1975). The Act’s requirements “are expressly designed to force regulated sources to develop pollution control devices that might at the time appear to be economically or technologically infeasible.” *Union Elec. Co. v. E.P.A.*, 427 U.S. 246, 257 (1976). Consistent with the Act, BACT is thus “principally a technology-forcing measure that is intended to foster rapid adoption of improvements in control technology.” *In re: Columbia Gulf Transmission*, 1989 EPA App. LEXIS 26, *10. *See also In re: Tennessee Valley Auth.*, 2000 EPA App. LEXIS 25, *78-79 (“the program Congress established was particularly aggressive in its pursuit of state-of-the-art technology at newly constructed sources”). Thus, the best *achieved* control technology is not necessarily the best *achievable* technology, and therefore does not constitute BACT.

The proposed emissions are not technology forcing and therefore do not comply with the Act’s BACT requirements. In determining BACT limits, the District improperly relied not only on emissions limits *achieved* at existing facilities but on *maximum* achieved limits. Moreover, the District added a “compliance margin” of unexplained origin on top of those maximum achieved emissions limits. In so doing, BAAQMD rejected realistically *achievable* limits. It is hard to imagine how technological improvements envisioned by BACT requirements would ever be incorporated into new sources, if permitting authorities solely rely on maximum achieved emissions, with a wide compliance margin, to set BACT. The District’s BACT analysis suffers from this defect throughout.

A. CO Limits

BAAQMD examined the permit conditions for several other facilities, and concluded that 2.0 ppm was the “emerging consensus” and seemingly achievable. Additional Statement of Basis for Draft Federal “Prevention of Significant Deterioration” Permit (August 3, 2009) [ASOB] at 47, *available at* http://www.baaqmd.gov/pmt/public_notices/2008/15487/index.htm. This determination was based on already existing facilities, however, and ignores that lower BACT limits for CO have been issued to other similar facilities, such as Kleen Energy Systems and CPV Waren. *Id.* Again, it is improper to rely on an assumption that the lowest achieved limits are the lowest achievable.

BAAQMD justifies ignoring the lower limits in existing permits by explaining that “the mere issuance of a permit [does not establish] that limit as BACT, without some further demonstration that the limit is achievable.” *Id.* BAAQMD states that facilities with lower CO limits are not yet built, and therefore there is no operating data on which to determine achievability. *Id.*

The District has misapprehended its burden. To reject existing limits as BACT, the District must do more: “a permit requiring the application of a certain technology or emission limit to be achieved for such technology usually is sufficient justification to assume the technical feasibility of that technology or emission limit.” New Source Review Workshop Manual (Draft Oct, 1990) [NSR Manual], at B.7. The NSR Manual explains that, where a permit limit has been established elsewhere, a permitting agency must rely on more than simply that there are no operating data to reject the limit:

A demonstration of technical infeasibility should be clearly documented and should show, based on physical, chemical, and engineering principles, that technical difficulties would preclude [implementation].

For example, in cases where the level of control in a permit is not expected to be achieved in practice (e.g., . . . the project was canceled, or every operating source at that permitted level has been physically unable to achieve compliance with the limit), and supporting documentation showing why such limits are not technically feasible is provided, the level of control . . . may be eliminated from further consideration.

NSR Manual at B.7.

The Manual goes on to give other examples of circumstances where a limit higher than has previously been required may be appropriate, *id.* at B.23:

[T]he consideration of a lower level of control for a given technology may be warranted in cases where past decisions involved different source types [or] where the applicant can demonstrate to the satisfaction of the permit agency that other considerations show the need to evaluate the control alternatives at a lower level of effectiveness.

Manufacturers’ data, engineering estimates and the experience of other sources provide the basis for determining achievable limits.

[I]t is presumed that the source can achieve the same emission reduction level as another source unless the applicant demonstrates that there are source-specific factors or other relevant information that provide a technical, economic, energy or environmental justification to do otherwise.

Id. at B.24.

Neither the applicant nor the District has met the burden that is required for a higher limit than that already contained in other permits. If the District could simply reject established permit limits because of lack of operating data, one could never rely on permit limits in proposed projects because operating data necessarily do not exist in those cases. But the regulations and the NSR Manual make clear that such permit limits are to be considered BACT. Thus, the absence of operating data alone is not an adequate justification for rejecting such limits as BACT. That approach indeed makes

sense: BACT is not backward looking, based on operating data of other facilities. It is intended to be technology forcing, focused on the best technology for pollution control.

B. PM Limits

In determining the BACT limit for particulate matter (PM), BAAQMD relied on testing from similar facilities to determine BACT to be 7.5 lb/hr. ASOB at 51. The average PM emissions from these source tests varied from 4.58 lb/hr to 10.65 lb/hr. *Id.* BAAQMD eliminated the highest 5% of the test results, believing them to be anomalies, and based BACT on the remaining 95% of results, but the District does not explain the basis for choosing this percentage. *Id.* Again, neither the applicant nor the District has pointed to any source-specific factors for relying on such a lenient standard. *See* NSR Manual at B.7, B.23-24.

Furthermore, total PM emissions from certain facilities – which were built long ago – were well below the 7.5 lb/hr limit, which the District determines is BACT. *See* “Summary of Filterable PM₁₀” (the spreadsheet referenced in ASOB at 51 n.98). The District has not explained why a newly proposed facility could not meet the lower range of those emissions.

Once again, BACT cannot properly be determined based solely on the operating data of facilities that have been built long ago. In addition, BACT cannot ignore the lowest limit currently achieved by such power plants.

C. GHG Limits

The facility is estimated to emit nearly 2 million metric tons per year of CO₂ equivalents. ASOB at 27. The emission limits for GHGs are set assuming approximately 9% total degradation over the lifetime of the equipment. *Id.* at 28. What is the basis for this large degradation figure?

II. THE DISTRICT’S BACT ANALYSIS FOR STARTUP AND SHUTDOWN DOES NOT COMPLY WITH PSD AND NSR REQUIREMENTS.

A. Startup and Shutdown Emissions Limits Are Backward Looking Rather than Technology Forcing and Therefore Do Not Comply with the Clean Air Act’s BACT Requirements.

As with other limits, in determining startup NO_x limits, BAAQMD improperly relied on *maximum* limits *achieved* at existing facilities and added a compliance margin. In so doing, BAAQMD rejected realistically *achievable* limits set at other facilities.

1. NO_x Limits

Cold Startup Limits

In determining the NO_x startup limits (as NO₂), BAAQMD dismissed limits that have been achieved in fact and are lower than the proposed limit of 480 lbs. per startup

event. The facilities, even those where construction commenced as long ago as 2000, have demonstrated that they can emit as low as 86 pounds. *See* Statement of Basis for Draft Amended Federal “Prevention of Significant Deterioration” Permit (Dec. 8, 2008), [SOB] at 45, *available at* http://www.baaqmd.gov/pmt/public_notices/2008/15487/index.htm. The average emissions per startup event are in the range of 183 to 193 lbs. *See* ASOB at 61. The proposed limit of 480 lbs is in fact the second highest emissions demonstrated at Sutter, which commenced construction in 1999. SOB at 45. In explaining its rejection of lower emissions performance levels in the range, BAAQMD states that a compliance margin is reasonable to “accommodate the variability in emissions among startup events over time.” ASOB at 62. BAAQMD’s analysis, however, makes no effort to determine any cause of such variability, such as practices that might have contributed to the range.

BAAQMD’s analysis does not meet BACT requirements because it fails to demonstrate that there are “source-specific factors or other relevant information that provide a technical, economic, energy or environmental justification” to increase the limit from the emissions levels in the lower range of those that are achieved in fact by other power plants. NSR Manual at B.24 (“Control Techniques with a Wide Range of Emissions Performance Levels”). There is nothing in the SOB or the ASOB that attempts a source-specific explanation other than the unexplained need to provide a compliance margin. BAAQMD fails even to explain why the margin must be so wide, or why BAAQMD could not have set both an average and maximum emissions limit, rather than a limit that is effectively a maximum limit that is generally higher than all of the maximum emissions.¹

Hot Startup Limits

As with cold startup limits, the District ignored average emissions from even the 2000-vintage plants like Delta (25 to 29.8 lbs) to set the proposed limit at 95 lbs. ASOB at 62-63.² Rather, the District relied on maximum emissions and then provided an unexplained margin to set BACT. The proposed limit is thus three times the average NOx emissions. And yet there is no justification provided for this large margin. For all of the reasons that the District failed to comply with BACT requirements as to cold

¹ The data BAAQMD has gathered for cold startup emissions (lbs per startup) from vintage power plants (other than Palomar, which is of more recent vintage) are summarized as follows:

Power Plant	Average Emissions	Maximum Emissions
RECE	-----	480
Palomar	182.8	375 or 437, depending on calculation
Metcalf	185 (low of 86, SOB)	281
Delta	193 (low of 86, SOB)	335
Sutter (271-499, with 480 being the highest)		

² When we refer to commencement of construction dates of other power plants in California, we have drawn that information from the website maintained by the California Energy Commission. *See* http://www.energy.ca.gov/sitingcases/all_projects.html.

startup limits, the District has failed to comply with BACT requirements as to hot startup limits.

2. Use of Auxiliary Boiler

BAAQMD rejects auxiliary boilers as BACT, even though they are demonstrated as feasible since they are used at the Lake Side and Caithness plants, and “data show that using the auxiliary boiler will reduce fuel usage (and consequently emissions) by approximately 18% for warm startups and approximately 31% for cold startups.” ASOB at 69.

BAAQMD’s explanation for rejecting the use of auxiliary boilers is its cost-effectiveness analysis. The analysis does not comply with BACT requirements because it is based on a faulty and baseless assumption about the number of cold startups and warm startups. BAAQMD assumes “an annual operating profile containing 6 cold startups and 100 warmup startups.” ASOB at 69. But there is no limit to startup and shutdown events, and therefore it is unclear how the District derived these numbers. Even assuming that daily NOx and CO limits provide an upper limit to the number of daily startup events, calculations show that CO limits prove to be the more limiting factor. (The maximum daily CO limit divided by the maximum CO emissions from a startup and shutdown event yields 2.8 startup and shutdown events. Assuming 2 startup and shutdown events per day there could be far more than 700 warm startup and shutdowns per year. Since the District’s data show that not all startup events produce the maximum emissions proposed in the draft permit, 700 warm startup and shutdowns are rather conservative as an estimate.)

Thus, the assumption on which BAAQMD relies to calculate the cost-effectiveness is faulty, and the District’s BACT analysis therefore does not meet the BACT requirements of the Act.

3. Flex Plant 10 Technology

BAAQMD claims that Flex Plant 10 technology is inappropriate because it is for peaking to intermediate-duty baseload operations. This claim begs the question. Neither the applicant nor the District has provided a credible startup and shutdown scenario. Various scenarios are possible: from two daily startup and shutdown of varying kinds (cold, warm, or hot); 52 cold starts and 260 hot starts per year; and 365 hot startups and shutdowns per year. See our comments dated February 5, 2009; *see also* CEC Staff Assessment - Part 1 and 2 Combined (June 29, 2007), *available at* <http://www.energy.ca.gov/2007publications/CEC-700-2007-005/CEC-700-2007-005-FSA.PDF>, at 4.1-8. The District has now added another scenario, although without any reference to its source: 6 cold startups and 100 warm startups. ASOB at 69. Unless there is a credible determination of the likely scenario of startup and shutdown events, no one can legitimately evaluate which technology should be applied to achieve the lowest emissions mandated by BACT requirements.

4. Startup and Shutdown Durations

BAAQMD argues that startup and shutdown durations are not subject to BACT requirements. ASOB at 66. On the contrary, such durations should be subject to BACT because they are a “devise or technique” (BAAQMD Regulation 2-2-206) or a method, system, work practice, or operational standard (NSR Manual at B.1-B.2) and therefore are covered in the definition of BACT.

Despite its initial argument that startup and shutdown durations are not subject to BACT, BAAQMD nevertheless has provided a substantive reason for failing to set the durations as permit limits or to set shorter durations. BAAQMD explains that the emissions limits are regardless of the duration of the startup and shutdown events and therefore the duration should not matter.

BAAQMD is right on this matter only if the hourly emissions during a shorter startup duration are higher than the hourly emissions during a longer duration. The District has provided nothing to back up this assumption.³ Indeed, logic would dictate that a longer startup duration means that the limits applicable during normal operations do not apply for that much longer. As the District has acknowledged, “there may be partial or no abatement for NOx and Co for a portion of the startup period.” SOB at 38; *see also* 2007 CEC Staff Report at 4.1-8 (“hourly start-up emissions rates are six, seven and 68 times higher than normal operations for NOx, POC and CO, respectively”). Thus, the District’s assumption that the duration has no impact on the emissions limit is unsupported. (If the District is right, why did the Colusa permit pick the shorter duration?)

In fact, if durations are not set based on what the best technology can achieve, how will the District be able to know when the pollution controls can work at its optimum and therefore the source should comply with limits applicable during non-startup operations?

BAAQMD also states that the shorter startup duration in the Colusa permit does not provide any “hard evidence” on which to conclude that such durations are achievable. ASOB at 67 n.119. BAAQMD states that there are no actual operating data showing that the limits are achievable and that the permitting agency explained that the “limits might not turn out to be achievable,” and if so they will be reevaluated. *Id.* Based on this explanation, BAAQMD fails to set a shorter startup duration. More is necessary to come to that conclusion, according to the NSR Manual. *See* NSR Manual at B.7.

³ The following example illustrates this problem. The first scenario makes the assumption the District makes.

	1st Hr.	2d Hr	3d Hr	Total Emissions
2 hours of startup	$95/2 = 47.5$	$95/2 = 47.5$	16.5	111.5 lbs
3 hours of startup	$95/3 = 31.7$	$95/3 = 31.7$	$95/3 = 31.7$	95 lbs

If, however, the two hours of startup, the emissions are the same as the hourly rates of 31.7 lb, then the total emission equal 70.9 lbs [that is, $31.7+31.7+16.5$], which is less than 95 lbs.

BAAQMD has documented only speculation. BAAQMD has not documented that equipment that meets BACT is physically unable to achieve a shorter startup duration. On the contrary, the NSR Manual dictates that the Colusa permit is sufficient justification to assume the technical feasibility of the shorter duration.

B. CEC's Staff Analysis

The District's protestations to the contrary, the BACT analysis is skewed to retaining the applicant's equipment, which it already has purchased without ever having had a valid PSD permit. The District should in fact review the CEC's staff analysis about the various alternative equipment and explain the differences in the two agencies' positions.

For example, the CEC staff opined that because of high startup emissions, various alternatives be implemented:

Staff found that if the project used the Siemens-Westinghouse Benson Once-Through boiler technology, start-up and shutdown emissions would be significantly reduced Alternatively, some projects have incorporated an auxiliary boiler or solar array to provide steam that can shorten start-up times.

According to a vendor of this technology, the Siemens-Westinghouse, Benson Once-Through or Fast-Start technology can be designed to fit the proposed 501 FD combustion turbines without additional capital costs above that of the standard, off-the-shelf, HRSG that the project owner has proposed. If the project is built with the aforementioned Fast-Start technology, the project start-up NO_x emissions are expected to be reduced . . . to 22 lbs for each cold start-up event, and . . . 28 lbs for hot or warm start-up events. This represents a 95 percent and 88 percent emission reduction of NO_x for cold, and hot or warm start-up events, respectively.

CEC Staff Report at 4.1-8 to 9; *see also* discussion on Palomar.

III. DRY COOLING SHOULD HAVE BEEN CONSIDERED IN THE COOLING TOWER ANALYSIS.

Nowhere does the District analyze whether dry cooling should be considered BACT. The District simply states that the applicant is proposing to use a wet cooling tower system and does not evaluate alternative technologies. As the District's Air Pollution Control Officer has stated, however, either dry cooling or wet/dry cooling would be technically feasible. *See* letter from Jack P. Broadbent to Bruce Wolfe, Executive Officer, San Francisco Bay Regional Water Quality Control Board, dated September 25, 2006 (attached). "[U]nlike dry cooling, wet/dry cooling uses an evaporative cooling process that vents vapor containing fine particulate matter (PM₁₀) to the atmosphere." *Id.* The draft permit fails to meet BACT requirements without the required analysis of alternatives to wet cooling.

IV. THE DISTRICT SHOULD REDO ANY NONATTAINMENT NSR REVIEW THAT IS MORE THAN 18 MONTHS OLD.

The District fails to respond to any comments about non-attainment NSR. The District ought to respond to public comments in a timely fashion. If the District believes that it should respond outside of the PSD process, that would be acceptable to Citizens Against Pollution. But the District must respond.

We look forward to your responses to our comments. Thank you for considering them.

Very truly yours,

/s/ Helen Kang

/s/ Eric Kaplan

Helen Kang
Eric Kaplan
John Harrington
Shufan Sung

EXHIBIT 8

Mankato Energy Center Start profile for winter months

No Auxiliary Boiler						With Auxiliary Boiler					
			Hot						Hot		
Hour	CT Gas	AXB Gas	CT %load	STG %load	AGC Available	Hour	CT Gas	AXB Gas	CT %load	AGC Available	
1	1200	0	60	0		1	1200	0	60		
2	1450	0	60	35	2650	2	1450	0	60		
Fuel	2650	0		Total Fuel	2650	Fuel	2650	0			
Warm						Warm					
1	1000	0	30	0		1	0	70	0		
1.55	1450	0	60	0		2	1000	70	30		
2	1450	0	60	0		2.55	1450	70	60		
3	1450	0	60	10		3	1450	5	60		
4	1450	0	60	35	6800	4	1450	5	60		
Fuel	6800	0		Total Fuel	6800	Fuel	5350	220			
Cold						Cold					
1	1000	0	30	0		1	0	70	0		
2	1000	0	30	0		2	0	70	0		
3.05	1450	0	60	0		3	1000	70	30		
4	1450	0	60	0		4	1000	70	30		
5	1450	0	60	10		5.05	1450	5	60		
6	1450	0	60	20		6	1450	5	60		
6.5	675	0	60	35		6.5	675	5	60		
Fuel	8475	0		Total Fuel	8475	Fuel	5575	295			
AGC Available						AGC Available					

Hot = Steam turbine offline less than 8 hours - CT in compliance within 60 minutes
 Warm = Steam turbine offline between 8 and 48 hours - CT in compliance within 95 minutes
 Cold = Steam turbine offline more than 48 hours - CT in compliance within 185 minutes
 Fuel is based on 20 degrees F ambient and in the units of MMBTU

Summary:

Total fuel to AGC in MMBTU			
	W/O AXB	W/AXB	
Hot	2650	2650	
Warm	6800	5570	
Cold	8475	5870	

Above "Assume starts" is based on a plant dispatch of 3 time a week.

CO Nox CO lbs saved Nox saved
 869.8144752 79.30856585

LMEC Aux Boiler 320

5-119

1122.725 85.48254509
1111.589 85.49034296
1100.453 85.49814083
1089.317 85.50593869
1078.18 85.51373656
1067.044 85.52153443
1055.908 85.5293323
1044.772 85.53713017
1033.636 85.54492803
1022.5 85.5527259
1011.364 85.56052377
1000.228 85.56832164
989.0917 85.5761195
977.9556 85.58391737
966.8195 85.59171524
955.6834 85.59951311
944.5473 85.60731098
933.4112 85.61510884
922.2751 85.62290671
911.139 85.63070458
900.0029 85.63850245
888.8668 85.64630032
877.7307 85.65409818
866.5946 85.66189605
850.5137 85.00047651
834.4328 84.33905698
818.3519 83.67763744
802.271 83.01621791
786.1901 82.35479837
770.1092 81.69337883
754.0282 81.0319593
737.9473 80.37053976
721.8664 79.70912022
705.7855 79.04770069
689.7046 78.38628115
673.6237 77.72486161
657.5428 77.06344208
641.4619 76.40202254
625.381 75.74060301
609.3 75.07918347
593.2191 74.41776393
577.1382 73.7563444
561.0573 73.09492486
544.9764 72.43350532

528.8955 71.77208579
512.8146 71.11066625
496.7337 70.44924671
480.6528 69.78782718
464.5718 69.12640764
448.4909 68.46498811
432.41 67.80356857
416.3291 67.14214903
400.2482 66.4807295
384.1673 65.81930996
384.1673 65.81930996
384.1673 65.81930996
384.1673 65.81930996
382.5264 65.13730136
380.8854 64.45529276
379.2445 63.77328415
377.6036 63.09127555
375.9627 62.40926695
374.3218 61.72725835
372.6809 61.04524975
371.0399 60.36324115
369.399 59.68123254
367.7581 58.99922394
366.1172 58.31721534
364.4763 57.63520674
362.8354 56.95319814
361.1944 56.27118954
359.5535 55.58918093
357.9126 54.90717233
356.2717 54.22516373
354.6308 53.54315513
352.9899 52.86114653
351.3489 52.17913793

104377.7 9517.027902

869.8145 79.30856585

STG % load	0	AGC Available
Total Fuel	35	2650
STG % load	0	
Total Fuel	10	
STG % load	0	
Total Fuel	35	AGC Available
STG % load	0	5570
Total Fuel	0	
STG % load	0	
Total Fuel	0	
STG % load	0	
Total Fuel	10	
STG % load	20	
Total Fuel	35	AGC Available
STG % load	0	5870
Total Fuel	0	

mmbtu/hr

lb/mmbtu

0.0109375
0.036875

Nox
CO

505

Emissions Saved Warm Starts *	Emissions 50 Warm Starts	Aux Boiler Emissions Warm Start	Total Aux Boiler 50 starts	Total Warm Start Emissions
405	20250	10.325	516.25	19734
30	1500	3.0625	153.125	1347

nts on the SU/SD spreadsheet.