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DOCKET
06-AFC-6
DATE NOV 19 2007
RECD. NOV 20 2007

November 19, 2007

California Energy Commission
Docket Unit, MS-4
Attn: Docket No. 06-AFC-6
1516 Ninth Street
Sacramento, California 95814-5512

Re: Eastshore Energy Center, Docket No. 06-AFC-6

Dear Docket Clerk:

Enclosed please find the original of *Eastshore Energy Center's Prehearing Conference Statement November 19, 2007* for filing in the above-entitled matter. This document was e-filed with your office and served on all parties on November 19, 2007.

If you have any questions, please don't hesitate to contact me at (916) 444-1000.

Very truly yours,

DOWNEY BRAND LLP

Jane E. Luckhardt

Jane E. Luckhardt

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Enclosure

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

APPLICATION FOR CERTIFICATION FOR THE EASTSHORE ENERGY CENTER IN HAYWARD BY TIERRA ENERGY	DOCKET NO. 06-AFC-6 (AFC Accepted 11/8/06)

EASTSHORE ENERGY CENTER'S PREHEARING CONFERENCE STATEMENT

November 19, 2007

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Attorneys for Eastshore Energy Center

November 19, 2007

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

APPLICATION FOR CERTIFICATION FOR THE EASTSHORE ENERGY CENTER IN HAYWARD BY TIERRA ENERGY	DOCKET NO. 06-AFC-6 (AFC Accepted 11/8/06)

EASTSHORE ENERGY CENTER'S PREHEARING CONFERENCE STATEMENT

November 19, 2007

I. INTRODUCTION

Pursuant to the Notice of Prehearing Conference dated October 17, 2007 (the "Notice") and Title 20 of the California Code of Regulations § 1718.5, Eastshore Energy Center ("Eastshore") hereby files its Prehearing Conference Statement. Pursuant to the Notice, this Prehearing Conference Statement responds to the eight items listed therein.

II. TOPIC AREAS READY TO PROCEED TO EVIDENTIARY HEARINGS

All topic areas are complete and ready to proceed to evidentiary hearings. The topic areas include the following: Air Quality, Alternatives, Biological Resources, Cultural Resources, Engineering and Facility Design, Hazardous Materials, Land Use, Local System Effects, Noise and Vibration, Public Health, Socioeconomic Resources, Soil and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, Waste Management and Worker Safety.

This proceeding has already taken over a year. California Energy Commission ("Commission") Staff ("Commission Staff") has analyzed all topic areas and Eastshore has provided all necessary information. Therefore, Eastshore sees no reason to further delay the proceedings.

III. TOPIC AREAS NOT READY TO PROCEED TO EVIDENTIARY HEARINGS

As stated above, Eastshore believes that all topic areas are complete and ready to proceed to evidentiary hearings.

IV. TOPIC AREAS REQUIRING ADJUDICATION

Although Eastshore is willing to work with Commission Staff to reach resolution on the topic areas of Air Quality, Alternatives, Land Use, Noise and Vibration, Public Health and Traffic and Transportation, as of the date of this filing, the specific issues identified below remain unresolved.

Disputed Topic Area	Precise Nature of the Dispute
Air Quality	No clause included in Condition of Certification AQ-SC8 regarding Eastshore's best faith effort to procure emission reduction credits. In addition, Eastshore believes the interpollutant trade ratio of 5.3 to 1.0 for SO_2 for PM_{10} is incorrect.
Alternatives	Presentation of the alternatives in light of the aviation issue, with particular regard to the lack of a "no project" alternative.
Land Use	Consistency with local laws, ordinances, regulations and statutes (LORS) based upon impacts to aircraft and the Hayward Executive Airport.
Noise and Vibration	Addition of a new noise limit in Condition of Certification Noise-4.
Public Health	Condition of Certification Public Health-1.
Traffic and Transportation	The impact on aircraft created by project-generated thermal plumes and related impacts on Hayward Executive Airport.

V. EASTSHORE'S WITNESS LIST

Set forth below is a list of hearing topics, associated witnesses, and estimated time for their direct testimony, based upon current information. The witnesses' qualifications are included in Attachment 1. Each witness will testify as to the project's compliance with

applicable LORS, the environmental impacts of the project, and the proposed conditions intended to mitigate potential impacts. In the areas of Air Quality, Alternatives, Land Use, Noise and Vibration, Public Health and Traffic and Transportation, the testimony will also address the issues listed above under Topic Areas Requiring Adjudication.

DIRECT TESTIMONY WITNESS LIST			
Topic	**Witness**	**Summary of Testimony**	**Time**
Air Quality	- Greg Darvin, Atmospheric Dynamics, Inc. - James Westbrook, Westbrook Environmental - David Stein, CH2M HILL	No clause included in Condition of Certification AQ-SC8 regarding Eastshore's best faith effort to procure emission reduction credits. The interpollutant trade ratio of 5.3 to 1.0 for SO_2 for PM_{10} is incorrect. Sponsoring the Application for Certification (AFC), supplement to the AFC and Applicant's Data Responses.	20 minutes
Alternatives	- David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL - Greg Trewitt, Eastshore Energy LLC	Presentation of the alternatives in light of the aviation issue, with particular regard to the lack of a "no project" alternative. Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	15 minutes
Biological Resources	- David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.
Cultural Resources	- David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.
Engineering and Facility Design	- Gary Veerkamp, Veerkamp Engineering - Greg Trewitt, Eastshore Energy LLC	Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.

	- David Stein, CH2M HILL		
Hazardous Materials	- David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.
Land Use	- Jennifer Scholl, CH2M HILL	Analysis of project conformance with local zoning regarding impacts to aircraft and the Hayward Executive Airport. Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	20 minutes
Local System Effects	- Peter Mackin, USE Consulting	Supporting Staff's local system impacts analysis. Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.
Noise and Vibration	- Farshad Farhang, CH2M HILL - Gary Veerkamp, Veerkamp Engineering - David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Addition of a new noise limit in Condition of Certification Noise-4. Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	10 minutes
Public Health	- James Westbrook, Westbrook Environmental - David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Condition of Certification Public Health-1. Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	10 minutes
Socioeconomic Resources	- David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.
Soil and Water Resources	- David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.
Traffic and Transportation	- Greg Darvin, Atmospheric Dynamics, Inc.	Thermal plume analysis.	45 minutes

	- Bill Corbin, Environmental Compliance Solutions - Don Blumenthal, Sonoma Technology, Inc. - Clinton MacDonald, Sonoma Technology, Inc. - Paul T. Roberts, Sonoma Technology, Inc. - Jennifer Scholl, CH2M HILL - Marshall Graves, International Institute for Aviation, Science and Technology	Analysis of thermal plume impact on aircraft in light of Federal Aviation Administration (FAA) and local regulations.	
Transmission Line Safety and Nuisance	- David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.
Visual Resources	- David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.
Waste Management	- David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.
Worker Safety	- David Stein, CH2M HILL - Jennifer Scholl, CH2M HILL	Sponsoring the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes, if not presented by declaration.

VI. CROSS-EXAMINATION

Eastshore anticipates cross-examination requirements for Commission Staff as provided below. At this time, Eastshore does not yet know what other testimony will be submitted beyond that of the Commission Staff. Because Eastshore cannot anticipate the timing or scope of topic areas that may be addressed by other parties, Eastshore hereby reserves the right to cross-examine witnesses introduced by those other parties.

CROSS-EXAMINATION WITNESS LIST			
Topic	**Witness**	**Summary of Cross-Examination**	**Time**
Air Quality	Commission Staff	No clause included in Condition of Certification AQ-SC8 regarding Eastshore's best faith effort to procure emission reduction credits. The interpollutant trade ratio of 5.3 to 1.0 for SO_2 for PM_{10}. Corresponding sections in the AFC, supplement to the AFC and Applicant's Data Responses.	15 minutes
Alternatives	Commission Staff	Presentation of the alternatives in light of the aviation issue.	5 minutes
Land Use	Commission Staff	Conformance with aviation-related LORS.	15 minutes
Noise and Vibration	Commission Staff	Addition of a new noise limit in Condition of Certification Noise-4.	10 minutes
Public Health	Commission Staff	Condition of Certification Public Health-1. Corresponding sections in the AFC, supplement to the AFC and Applicant's Data Responses.	5 minutes
Traffic and Transportation	Commission Staff	Thermal plume analysis. Analysis of thermal plume impact on aircraft in light of Federal Aviation Administration (FAA) and local regulations.	45 minutes

VII. EXHIBIT LIST

The table below sets forth a list of exhibits Eastshore expects to present at the evidentiary hearings. This list is based upon currently available information. As Eastshore's testimony is developed, additional items may be added and unnecessary items may be removed. Eastshore does not know the subject areas or extent of testimony other parties may offer at the evidentiary

hearings. Eastshore anticipates using additional exhibits if other parties offer testimony. Eastshore is not specifically referencing any LORS as exhibits, but plans on using them.

Exhibit	Document Name	Technical Area(s)
Project Owner's Exhibits		
1	Eastshore Energy Center, Application for Certification, September 2006 *Docketed: September 15, 2006*	All Sections
2	Supplement in Response to Data Adequacy Comments on the Application for Certification for the Eastshore Energy Center *http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2006-11-06_SUPPLEMENT_DATA_ADEQUACY.PDF* *Docketed: Oct 31, 2006*	Air Quality, Biological Resources, Transmission System and Engineering, Water Resources
3	City of Hayward Application for Development Permit for the Eastshore Energy Center http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2006-11-02_CITY_HAYWARD_DEV_PLAN.PDF *Docketed: November 2, 2006*	Air Quality, Biological Resources, Cultural Resources, Land Use, Noise, Public Health, Worker Health and Safety, Socioeconomics, Agriculture and Soils, Traffic and Transportation, Visual Resources, Hazardous Materials Handling, Waste Management, Water Resources, Geologic Hazards and Resources, Paleontological Resources
4	Notice of Need for Additional Time to Prepare Responses and Objection to Staff Data Requests 17, 39, and 44. http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2007-01-31_NOTICE_FOR_ADDITIONAL_TIME.PDF *Docketed: December 21, 2006*	Air Quality, Soil and Water Resources, Visual Resources
5	Eastshore's System Impact Study Report – Revision 2 and Facility Study Report, dated January 11, 2007 *Docketed: January 25, 2007*	Transmission System Engineering
6	Eastshore Data Responses Set #1 http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2007-01-15_DATA_RESPONSE_SET_01.PDF *Docketed: January 15, 2007*	Air Quality (1-17), Biological Resources (18), Cultural Resources (19-27), Geology (28), Hazardous Materials Management (29-32), Paleontology (33), Public Health (34-36), Soil and Water Resources (37-41), Transmission System Engineering (42-43), Visual Resources (44), Worker Safety (45-49)
7	Eastshore's Letter to City of Hayward Planning Commission re: Eastshore project's conformance with General Plan and Industrial Zoning District. *Docketed: February 15, 2007*	Land Use

Exhibit	Document Name	Technical Area(s)
8	Eastshore Data Responses Set #2 http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2007-03-14_DATA_RESPONSES_SET_02.PDF *Docketed: March 5, 2007*	Alternatives (50-53), Traffic and Transportation (54-65), Transmission System Engineering (66), Waste Management (67)
9	Eastshore Data Responses Set #3 http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2007-04-04_DATA_RESPONSE_3.PDF *Docketed: April 3, 2007*	Alternatives (68), Land Use (69), Traffic and Transportation (70-73), Waste Management (74-75)
10	Response to Committee Questions in Revised Scheduling Order on Alternatives http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2007-05-04_RESPONSE_TO_CEC_QUESTIONS_ON_REVISED_SCHED_ORDER.PDF *Docketed: May 4, 2007*	Traffic and Transportation, Noise, Visual Resources, Waste Management
11	Cumulative Air Quality Impact Analysis Modeling Files http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2007-05-04_SUPPLEMENT_INFORMATION.PDF *Docketed: May 4, 2007*	Air Quality
12	Supplemental Data Response (March 19, 2007 Workshop Questions 1-17) http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2007-05-07_EASTSHORE_SUPPLEMENTAL_INFORMATION.PDF *Docketed: May 4, 2007*	Alternatives, Air Quality, Traffic and Transportation, Hazardous Materials, Cultural Resources, Visual Resources
13	Comments on the Preliminary Staff Assessment http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2007-09-19_COMMENTS_ON_PSA.PDF *Docketed: September 19, 2007*	All Sections
14	Comments on Continued Schedule Delays http://www.energy.ca.gov/sitingcases/eastshore/documents/applicant/2007-10-16_COMMENTS_ON_CONTINUED_SCHEDULE_DELAYS.PDF *Docketed: October 16, 2007*	All Sections
15	Project Owner's Supplemental Testimony in Air Quality	Air Quality
16	Project Owner's Supplemental Testimony in Alternatives	Alternatives
17	Project Owner's Supplemental Testimony in Land Use	Land Use

Exhibit	Document Name	Technical Area(s)
18	Project Owner's Supplemental Testimony in Noise	Noise and Vibration
19	Project Owner's Supplemental Testimony in Public Health	Public Health
20	Project Owner's Supplemental Testimony in Traffic and Transportation	Traffic and Transportation
21	Declarations of Project Owner's Witnesses	All Sections
Other Entities' Exhibits		
Alameda County Airport Land Use Commission		
22	Letter from the City of Hayward Regarding the Airport Approach Zoning Regulations http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-07-11_CITY_HAYWARD_AIRPORT_APPROACH_ZONING_REGS.PDF *Docketed: June 27, 2007*	Land Use, Traffic and Transportation
23	Letter from Cindy Horvath Regarding Alameda County Airport Land Use Commission Hearing http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-08-02_LETTER_FROM_CINDY_HORVATH_ALUC.PDF *Docketed: August 3, 2007*	Land Use, Traffic and Transportation
24	Alameda County Airport Land Use Commission Resolution for the Russell City Energy Center http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-08-16_ALUC_AIRPORT_LAND_USE_COMMISSION_RESOLUTION.PDF *Docketed: August 16, 2007*	Land Use, Traffic and Transportation
25	Alameda County Airport Land Use Commission Resolution for the Eastshore Energy Center, Resolution 02-2007 http://www.energy.ca.gov/sitingcases/eastshore/documents/intervenors/2007-10-26_RESOLUTION_02-2007_MEETING_OCTOBER_17_2007_TN-43066.PDF Dated: October 17, 2007	Land Use, Traffic and Transportation
Australian Civil Aviation Safety Authority (CASA)		
26	Advisory Circular 139-05(0) Guidelines for Conducting Plume Rise Assessments	Land Use, Traffic and Transportation

Exhibit	Document Name	Technical Area(s)
	Dated: June 2004	
Bay Area Air Quality Management District (BAAQMD)		
27	Bay Area Air Quality Management District's Final Determination of Compliance http://www.energy.ca.gov/sitingcases/eastshore/documents/intervenors/2007-10-17_BAY_AREA_AIR_QUALITY_MGMNT_DIST_FDOC_TN-42950.PDF *Docketed: October 17, 2007*	Air Quality
California Energy Commission (CEC)		
28	CEC's Preliminary Staff Assessment for the Russell City Energy Center http://www.energy.ca.gov/2007publications/CEC-700-2007-005/CEC-700-2007-005-PT1.PDF Dated: April 3, 2007	Land Use, Traffic and Transportation
29	CEC's Final Staff Assessment for the Russell City Energy Center http://www.energy.ca.gov/2007publications/CEC-700-2007-005/CEC-700-2007-005-FSA.PDF Dated: July 2, 2007	Land Use, Traffic and Transportation
30	Katestone Environmental Final Plume Vertical Velocity Assessment for the Russell City Energy Center http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-07-11_RCEC_PLUME_ANALYSIS_FINAL.PDF Dated: July 11, 2007	Land Use, Traffic and Transportation
31	Katestone Environmental Addendum to the Final Plume Vertical Velocity Assessment for the Russell City Energy Center http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-07-11_RCEC_PLUME_ADDENDUM.PDF Dated: July 11, 2007	Land Use, Traffic and Transportation
32	CEC's Errata to the Final Staff Assessment for the Russell City Energy Center http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/2007-07-19_ERRATA_FINALIZED.PDF Dated: July 19, 2007	Land Use, Traffic and Transportation

Exhibit	Document Name	Technical Area(s)
33	Russell City Energy Center July 19, 2007 Evidentiary Hearing Transcript http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/2007-07-19_TRANSCRIPT_EVIDENTIARY_HEARING.PDF Dated: July 19, 2007	Land Use, Traffic and Transportation
34	CEC's Preliminary Staff Assessment for the Eastshore Energy Center http://www.energy.ca.gov/2007publications/CEC-700-2007-017/CEC-700-2007-017-PSA.PDF Dated: August 17, 2007	All Sections
35	September 5, 2007 electronic mail from Will Walters to Gregory Darvin and Eric Knight re: Eastshore Plume Analysis Dated: September 5, 2007	Land Use, Traffic and Transportation
36	CEC Business Meeting Transcript, September 12, 2007 http://www.energy.ca.gov/business_meetings/2007_transcripts/2007-09-12_TRANSCRIPT.PDF Dated: September 12, 2007	Land Use, Traffic and Transportation
37	Letter and two e-mails from Federal Aviation Administration dated September 18 and 19, 2007 RE: FAA Written Response Regarding Hayward Powerplant Issue http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-09-18_FAA_LETTER_EMAIL.PDF *Docketed: September 18, 2007*	Land Use, Traffic and Transportation
38	CEC Business Meeting Transcript, September 26, 2007 http://www.energy.ca.gov/business_meetings/2007_transcripts/2007-09-26_TRANSCRIPT.PDF Dated: September 26, 2007	Land Use, Traffic and Transportation
Federal Aviation Administration (FAA)		
39	FAA's Safety Risk Analysis of Aircraft Overflight of Industrial Exhaust Plumes, Safety Study Report DOT-FAA-AFS-420-06-1 Dated: January 2006	Land Use, Traffic and Transportation
40	FAA's Determination of No Hazard to Air Navigation http://www.energy.ca.gov/sitingcases/eastshore/documents/intervenors/2007-05-	Land Use, Traffic and Transportation

Exhibit	Document Name	Technical Area(s)
	17_FAA_DETERMINATION_NO_HAZARD_AIR_NAVIGATION.PDF *Docketed: May 17, 2007*	
41	FAA's Comments and Position Regarding TFR & NOTAM Flight Issues http://www.energy.ca.gov/sitingcases/eastshore/documents/intervenors/2007-10-16_FAA_STAND_ON_TFR-NOTAM.PDF *Docketed: October 16, 2007*	Land Use, Traffic and Transportation
42	Letter from Federal Aviation Administration Regarding the Exhaust Stacks http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-08-03_LETTER_FROM_FAA_REGARDING_PLUMES.PDF *Docketed: August 3, 2007*	Land Use, Traffic and Transportation
43	Letter from Federal Aviation Administration regarding Russell City Energy Center Impact on Hayward Executive Airport http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-09-25_RUSSELL_CITY_ENERGY_CENTER_IMPACT_HAYWARD_EXECUTIVE_AIRPORT.PDF *Docketed: September 25, 2007*	Land Use, Traffic and Transportation
44	Federal Aviation Administration's Comments on the Eastshore Energy Center *Docketed: October 2, 2007*	Land Use, Traffic and Transportation
45	Letter from Federal Aviation Administration regarding Response to 8-23-07 Request for Comments on the Eastshore Energy Center *Docketed: October 9, 2007*	Land Use, Traffic and Transportation
City of Hayward		
46	City of Hayward Conditions for the Russell City Energy Center http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-05-25_CITY_OF_HAYWARD.PDF *Docketed: May 25, 2007*	All Sections
47	City of Hayward's Response to Eastshore Energy Center and Russell City Energy Center Projects on One Site	Land Use

Exhibit	Document Name	Technical Area(s)
	http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-06-01_COMMENT_LETTER_FROM_CITY_OF_HAYWARD.PDF *Docketed: June 1, 2007*	
48	Letter from City of Hayward to CEC re: Application of Airport Approach Zoning Regulations to the Russell City Energy Center *Docketed: June 27, 2007*	Land Use, Traffic and Transportation
49	City of Hayward City Council, Resolution No. 05-125, Resolution Authorizing the Execution A Cooperation and Option Agreement with the Russell City Energy Center Dated: October 11, 2005	Land Use
Trinity Consultants		
50	Letter Report from Trinity Consultants re: stack modeling Dated: March 8, 2006	Land Use, Traffic and Transportation
Remaining numbers reserved for additional exhibits.		

VIII. REQUEST FOR OVERRIDE

Eastshore will present evidence demonstrating the Eastshore Project does not have a significant adverse impact on aircraft using the Hayward Executive Airport and thus, is consistent with state and local laws and ordinances. If the Committee and ultimately the Commission determines otherwise, Eastshore requests an override in accordance with Public Resources Code Section 25525. Commission Staff was included a local impacts analysis in its Final Staff Assessment and Eastshore will provide testimony supporting Commission Staff's analysis. (Final Staff Assessment, Chapter 5.6, Nov. 2007)

IX. SCHEDULING MATTERS

Eastshore projects the need for no more than two hearing days to complete the testimony. The issues in controversy with Commission Staff could easily be presented in one day leaving an entire second day for the issues of other parties. Eastshore needs additional information regarding receipt of the hearing transcripts to suggest briefing dates.

X. CONDITIONS OF CERTIFICATION

Eastshore's comments on the Conditions of Certification contained in the Final Staff Assessment (FSA) are contained in Attachment 2.

DATED: November 19, 2007 DOWNEY BRAND LLP

By: Jane E. Luckhardt

Jane E. Luckhardt

ATTACHMENT 1

"Eastshore's Witnesses' Qualifications"

Fatuma Yusuf
Economics/Socioeconomics

Education

Ph.D., Agricultural Economics, Washington State University
M.S., Statistics, Washington State University
M.A., Agricultural Economics, Washington State University
B.S., Range Management, University of Nairobi, Kenya

Professional Experience

Project Consultant, CH2M HILL, Sacramento, CA

Relevant Experience

Dr. Yusuf is an economist and statistician. She has conducted economic analyses for water quality, agriculture, transportation, recreation, and energy projects; evaluated project feasibility; and assessed economic impacts associated with project implementation. She has experience in preparing the socioeconomic analysis for power plant permitting and other environmental documents, regional economic impact analysis, cost-benefit analysis, and rate impact analysis. She also has experience in the development of statistical predictive models for condition assessments involving pipeline deterioration and factors leading to pipeline deterioration.

Representative Projects

- **Application for Certification the Eastshore Energy Project in Hayward, CA.** Socioeconomics Task Lead. Prepared the socioeconomics analysis section of the AFC. Also, analyzed the regional economic impacts of the project on employment and income.
- **Application for Certification the South Bay Replacement Project in Chula Vista, CA.** Socioeconomics Task Lead. Prepared the socioeconomics analysis section of the AFC. Also, analyzed the regional economic impacts of the project on employment and income.
- **Sacramento Valley Water Management Authority Proposition 50 Grant Application.** Economics Task Lead. Evaluated the economic analysis that went into the grant application for a number of water agencies north of the Delta. The funding was to be used to develop integrated regional strategies for water resources management that would protect communities from drought, protect and improve water quality, and improve local water security by reducing dependence on imported water.
- **Lower Colorado River Authority (LCRA)-San Antonio Water System (SAWS) Water Project (LSWP).** Regional Economics Task Lead. On-going project. The project aims to develop strategies that would conserve and develop water in the lower Colorado River basin for both regions (LCRA and San Antonio). Strategies include: reducing agricultural irrigation water demand, capturing and storing unused and excess river flows in off-channel storage facilities, and developing groundwater for limited use in agriculture when surface water isn't available. Task is to evaluate the economic impacts

associated with changes brought about by the project to satisfy the required legislative finding that the water transfer will protect and benefit the economic well-being of the lower Colorado River watershed and the LCRA water service area. Economic analysis tools to be used include: benefit-cost analysis, input-output analysis, sector analysis, socioeconomic analysis, recreation benefit analysis, and net environmental benefit analysis.

- **SR 79 Realignment Project Community Impact Assessment (CIA) and EIR/EIS.** Economics/Environmental Justice Task Lead. Prepared the socioeconomics and environmental justice analysis sections of the Draft CIA and EIR/EIS for the SR 79 Realignment Project Domenigoni Parkway to Gilman Springs Road.

- **Upper Yuba River Study Project Economic Analysis.** Economics Task Lead. Prepared the Technical Memorandum on identifying the possible economic impacts from the re-introduction of Chinook salmon and steelhead trout into the Upper Yuba River system.

- **Natural Resources Liability and Asset Management (NRLAM).** Economics task lead. Calculated the human use and ecological service value associated with the natural resource holdings of number of Air Force Bases under the Air Mobility Command (AMC). Primary goal of the valuation was to provide a strategy by which the Bases can use the valuation results to assist in prioritizing and accomplishing its environmental and natural resource goals and mission objectives (e.g., resolving a pending or potential issue with an environmental component). The bases included McChord AFB, Beale AFB, and Fairchild AFB.

- **Base Realignment and Closure (BRAC) at Fort Carson and PCMS, Colorado EIS.** Prepared the socioeconomic analysis associated with implementing the 2005 BRAC and related activities at Fort Carson and PCMS. Also, prepared the regional economic impacts using the EIFS model.

- **Salton Sea Restoration Project Programmatic EIR.** Economics Task Lead. Prepared the Agricultural economics, recreation and employment opportunities sections of the Draft Programmatic EIR.

- **Socioeconomic Study Plan for the SMUD Upper American River Project Iowa Hill Pumped Storage Development Project.** Socioeconomic Task Lead. Prepared the socioeconomic study plan and evaluated the socioeconomic impacts associated with the Iowa Hill Pumped Storage Development Project as part of the SMUD Upper American River Project Hydroelectric relicensing application. Also, analyzed the regional economic impacts of the project on employment and income.

- **Revision of SMUD Upper American River Project Socioeconomic Impact Study Report.** Socioeconomic Task Lead. Prepared Revision 1 of the SMUD UARP Socioeconomic Impact Study Report on the SMUD Upper American River Project Hydroelectric relicensing. Revision 1 involved the verification of the study conducted by CSUS. Also, analyzed the regional economic impacts of the project on employment and income.

- **Economic Analysis for the Calpine LNG Facility and Power Plant in Eureka, CA.**

Project Manager. Provided screening-level economic, socioeconomic and fiscal impact analyses of the construction and operation associated with the Calpine LNG and Power Plant Projects in Eureka, CA.

- **Agricultural Impact Study of the PacifiCorp's Hydroelectric Power Project.** Analyzed the socioeconomic and regional economic impacts associated with the increased energy costs faced by Klamath irrigators. Prepared the regional economic impact report.
- **Economic Assessment of Agriculture on Imperial Sugar Property, Tracy, CA.** Prepared a technical memorandum that evaluated the economic viability of agricultural production on land adjacent to the City of Tracy's existing WWTP. The land would be a potential site that the City could use to dispose of treated water or implement a water reuse program.
- **Klamath Hydroelectric Project Resources Studies and Preparation of Relicensing Documents, PacifiCorp, Upper Klamath River, Oregon and California.** Prepared the Socioeconomic Resources Final Technical Report in support of the FERC application for a new Project license.
- **South Delta Improvement Project Draft EIS/EIR**. Social and Economics Task Lead. Prepared the social and economics analysis section of the Draft SDIP EIR/EIS for the California Department of Water Resources (DWR).
- **Third Party Water Transfer Impacts.** Task Lead. Prepared a report for the Environmental Justice (EJ) Subcommittee of the Bay-Delta Public Advisory Committee (BDPAC) on the third party interest groups' viewpoints on (a) whether compensation for third party impacts resulting from water transfers are needed, (b) who should be compensated, and (c) how to administer a compensation program. Findings of report were presented to the EJ Subcommittee and subsequently posted on the BDPAC website.
- **Oxnard Groundwater Recovery Enhancement and Treatment (GREAT) Program Draft EIS/EIR**. Socioeconomics/Environmental Justice Task Lead. Prepared the socioeconomics and environmental justice analysis sections of the Draft Oxnard GREAT Program EIR/EIS for the City of Oxnard, CA.
- **Application for Certification for a number of energy projects including the San Francisco Electric Reliability Project in San Francisco, CA, and the Walnut Energy Facility in Turlock, CA.** Economics Task Lead. Prepared the socioeconomics analysis section of the AFC. Also, analyzed the regional economic impacts of the project on employment and income.
- **Industrial Siting Application for a number of energy projects in Wyoming including the Medicine Bow Coal to Liquid Project, Wygen III Unit 5, Seven Mile Hill and Glenrock Wind Energy Projects.** Analyzed the regional economic impacts of the projects on employment and income.
- **Hyampon Road Improvement Project, Trinity County, California.** Prepared the regional economic impacts associated with the road improvement in terms of income

and job creation. The project consisted of approximately 8.6 miles of improvements along Hyampon Road, including widening lanes and smoothing of curves.

- **California High Speed Rail Authority (CHSRA) Draft Program EIR/EIS.** Socioeconomics/Environmental Justice Task Lead. Prepared the socioeconomics and environmental justice analysis sections of the Draft Program EIR/EIS for the Los Angeles to San Diego via the Inland Empire region.

- **Economic Assessment of Agriculture on Imperial Sugar Property, Tracy, CA.** Prepared a technical memorandum that evaluated the economic viability of agricultural production on land adjacent to the City of Tracy's existing WWTP. The land would be a potential site that the City could use to dispose of treated water or implement a water reuse program.

- **Water and Sewer Rate Study, Tracy, CA.** Prepared a Demand Fee analysis and an update on the City of Tracy's Sewer and Water Rate studies.

- **Downtown/Natomas/Airport Corridor Alternative Analysis/Draft EIS/EIR.** Economics/Environmental Justice Task Lead. Prepared the economics and fiscal analysis as well as the environmental justice analysis sections of the Alternative Analysis/Draft EIS/EIR. Also, analyzed the regional economic impacts of the project alternatives on employment, income and property taxes.

- **Palos Verde Shelf (PVS) Ecological Risk Assessment**. Statistic Task Lead. Analyzed data on levels of DDT and PCB on marine biota that inhabit or may use the PVS and the Southern California Bight (SCB). The estimated levels of DDT and PCB were used to evaluate baseline or existing exposure and risks to ecological receptors caused by exposure to DDT (and its metabolites) and PCBs, under the existing environmental conditions on the PVS and the SCB.

- **Vallejo Sanitation and Flood Control District, Vallejo, CA**. Statistics Task Lead. Analyzed data on condition of pipelines and wastewater collection systems for the Vallejo Sanitation and Flood Control District (VSFCD. Developed statistical predictive models using SAS (Statistical Analysis System). The predictive models enable VSFCD to better predict pipeline failure and thus plan maintenance work more efficiently.

- **Rehabilitation Program Condition Assessment, County of Sacramento, CA**. Statistics Task Lead. Analyzed data on condition of pipelines and wastewater collection systems for Sacramento County. Developed statistical predictive models using SAS (Statistical Analysis System). The predictive models enable Sacramento County to better predict pipeline failure and thus plan maintenance work more efficiently.

- **Ballona Creek Sediment Study, Los Angeles, CA.** Economics Task Lead. Prepared the economics appendix of the Marina del Rey and Ballona Creek Feasibility Study Sediment Control Management Plan F4 Report for the US Army Corps of Engineers. Project alternatives designed to control and dispose of sediments were evaluated on the basis of Benefit-Cost ratios.

- **Pipeline Valuation.** Economics Task Lead. Prepared the technical memorandum for the City of Santa Rosa, CA. The technical memorandum analyzed the potential costs

associated with incremental capacity increases in the Geysers Pipeline and the City of Santa Rosa's potential capacity and cost sharing options with neighboring cities.

- **Imperial Sand Dunes Recreation Area EIS.** Economics Task Lead. Prepared the socioeconomics section of the EIS for the Imperial Sand Dunes Recreation Area, Imperial County, CA. The EIS was necessitated by the development of a new Resource Management Plan. Also, analyzed the regional economic impacts of the project and its various alternatives on employment and income.

- **Imperial Irrigation District, CA.** Prepared socioeconomics section of the EIR/EIS of the proposed Imperial Irrigation District/San Diego County Water Authority Water Conservation and Transfer Program.

- **Imperial Irrigation District Revenue Certificates of Participation.** Prepared an Independent Engineer's Report for the certificates of participation issue for the Imperial Irrigation District's 2002 Revenue Bonds.

- **Water and Sewer Rate Study, Merced, CA.** Prepared a Demand Fee analysis and an update on the City of Merced's Sewer and Water Rate studies.

- **Central Valley Project Yield Feasibility Investigation.** Project Coordinator. Organized, maintained and updated project information between project task managers.

- **Proposition 13 Groundwater Storage Construction Grant Application.** Collaborated in the preparation of the economic analysis for the Proposition 13 Groundwater Storage Construction Grant application for the Regional Water Authority.

- **Guidance Manual on MTBE, Contra Costa Water District, CA.** Economics Task Lead. Collaborated on a joint U.C. Davis, Contra Costa Water District and CH2M HILL research effort that included the development of a guidance manual for managing MTBE-contaminated water bodies. The guidance manual is targeted at surface water managers who manage these water bodies for domestic as well as recreational use. The guidance manual will provide a policy tool composed of a set of criteria that water managers can use to determine the economic trade-offs between banning or restricting recreational water use (and thus controlling MTBE-contamination in these water bodies) and treatment of the surface water for domestic use.

- **Economic Viability of Open-Field Agriculture in the Carpinteria Valley, CA.** Analyzed the crop costs associated with existing crops and prepared a cost analysis. Also, analyzed, quantified and compared the regional economic value of avocado (open agriculture) production and greenhouse production.

- **U.S. Fish and Wildlife Service, CA.** Prepared a white paper that laid out the strategies needed to acquire supplemental water for the B3 program of the Central Valley Project Improvement Act (CVPIA).

- **Assessment District 12 Project, El Dorado Irrigation District, CA.** Assisted in preparation of cost analysis for large water system expansion project. The project involved 12,500 feet of 12- and 20-inch pressure sewer pipeline, and 17,000 feet of 18- to 33-inch gravity sewer trunks. Also included were 44,000 feet of 14- through 20-inch water transmission pipeline, a 3-MG steel water reservoir, four new pump stations,

modifications to two pump stations, expansion of a wastewater treatment plant, and alternative designs for five types of pipe material.

- **Long-Term Contract Renewal, Reclamation, California.** Assisted in the preparation of a report analyzing the impacts of a proposed change in the pricing structure of CVP water supplies on agricultural, and municipal and industrial CVP contractors, as well as the regional economic impacts of the proposed pricing change.

Mark Bastasch, P.E., INCE

Noise

Education

M.S., Environmental Engineering
B.S. (cum laude), Environmental Engineering

Professional Registrations

- Institute of Noise Control Engineers (INCE)
- Professional Acoustical Engineer: Oregon
- Professional Civil & Environmental Engineer: Oregon
- 40-hour HAZWOPER Certified
- 8-hour HAZWOPER Site Supervisor Certification
- 12-hour Site Safety Coordinator Certification

Distinguishing Qualifications

- Experience includes evaluation and measurements of existing noise levels; feasibility, mitigation design, and fatal flaw siting analysis of power facilities.
- Has conducted many noise studies in accordance with California Energy Commission requirements including both oral and written expert witness testimony.
- Has prepared acoustical analysis or expert testimony for more than 1,500 megawatts (MW) from wind generation facilities and 6,000 MWs from gas fired facilities

Relevant Experience

Mr. Bastasch is a registered acoustical engineer with more than 7 years experience conducting acoustical studies for industrial and municipal clients. Mr. Bastasch's acoustical experience includes preliminary siting studies, regulatory development and assessments, ambient noise measurements, industrial measurements for model development and compliance purposes, mitigation analysis, and modeling of industrial and transportation noise. Specific project experience includes:

Relevant Experience

Walnut Energy Center Turlock Irrigation District (2002 to present). Provided noise support in preparation of the AFC for submittal to the CEC. Tasks include evaluation of applicable regulations, identifying sensitive receptors, background noise measurements, acoustical modeling and determination of mitigation measures. Provided additional support as owners engineer including preparation of acoustical specications for various equipment, enclosures and barriers.

Los Esteros Critical Energy Facility, Calpine (2001). Provided noise support in preparation of the AFC for submittal to the CEC. Tasks include evaluation of applicable regulations,

identifying sensitive receptors, background and equipment noise measurements, mitigation recommendations. Conducted operational compliance monitoring in accordance with Conditions of Certification.

San Francisco Electric Reliability Project (SFERP), City and County of San Francisco (2003 to present). Provided noise support for document preparation for the SFPUC for the application for certification (AFC) for a proposed power plant in City of San Francisco

San Joaquin Valley Energy Center, Calpine (2001 to 2004). Provided noise support in preparation of the AFC for submittal to the CEC. Tasks include evaluation of applicable regulations, identifying sensitive receptors, preparation of expert witness testimony that prevailed over CEC's Staff recommendations.

East Altamont Energy Center, Calpine (2001 to 2003). Provided noise support in preparation of the AFC for submittal to the CEC. Tasks include evaluation of applicable regulations, identifying sensitive receptors, numerous acoustical analysis.

Application for Certification, Salton Sea Unit 6 Geothermal Power Plant, Mid-American Energy Holding Company, Imperial County, California (2002 to 2004). Provided noise support for the licensing of the 185-MW geothermal power plant.

MID Electric Generation Station (MEGS), Modesto Irrigation District (2004 Provided noise support for the preparation of the SPPE.

Metcalf Energy Center, San Jose, California (1998 to present). Provided noise support for a 600-MW power plant. Tasks include the following: evaluating and measuring background noise levels; modeling and comparison of expected noise levels with the City of San Jose, County of Santa Clara standards, and the California Energy Commission's (CEC) 5 dBA over background guideline; recommendations to acquire additional property; preparing Application for Certification submitted to the CEC; regulatory negotiation; and review of Conditions of Certification, testimony at public hearings, and CEC evidentiary hearings, which included detailed cross-examination. Successful negotiations saved the client more than $5 million in capital expenditures.

Delta Energy Center Project in Contra Costa County, California for Calpine/Bechtel, San Francisco, California (1998 to 2000). Provided noise support for a 700+ MW gas-fired power plant licensed by the California Energy Commission.

Cosumnes Power Plant, SMUD (2001 to 2003). Provided noise support in preparation of the AFC for submittal to the CEC. Tasks include evaluation of applicable regulations, identifying sensitive receptors, background noise measurements, expert witness testimony.

Roseville Energy Park, Roseville Electric, Roseville, California (2005). Assisted in the evaluation of noise impacts from the Roseville Energy Park, a natural gas-fired combined cycle power plant.

Confidential Southern California Power Project (2004 to present). Assisted in the evaluation of noise impacts for the application for certification (AFC) for a proposed power plant.

Eastshore Energy Center, Tierra (2006). Provided noise support in preparation of the AFC for submittal to the CEC. Tasks include evaluation of applicable regulations, identifying sensitive receptors, numerous acoustical analysis.

Master Resume

Loren D. Bloomberg, T.E.

Senior Transportation Engineer

Education

M.E., Civil Engineering, University of California, Berkeley, 1994
M.S., Civil Engineering, University of California, Berkeley, 1993
B.S., Systems Engineering, University of Virginia, 1989

Professional Registrations

Professional Engineer: California Traffic (2000; No. 2060)

Distinguishing Qualifications

- Experienced in practical and theoretical applications of traffic operations, particularly for freeways, arterials, and ramp metering
- Broad background in transportation planning, conceptual design, and transportation systems analysis
- Expert in traffic simulation modeling
- More than 15 years of experience, including transportation modeling and analysis for local areas, corridors, and entire regions

Relevant Experience

Mr. Bloomberg is an experienced traffic engineer and transportation planner who has led or played a key role in numerous large-scale planning and operations analyses. He has conducted studies and developed plans for local areas, corridors, and entire regions, including roadways, maritime facilities, and airports. Mr. Bloomberg's technical expertise is in simulation modeling and traffic operations, with a particular focus on conceptual engineering and traffic analysis. He is often called upon as a technical expert for CH2M HILL's modeling projects, and is known as a project manager for his ability to complete traffic analyses accurately, efficiently, and meeting client requirements. Mr. Bloomberg is a member of the Highway Capacity Committee of the Transportation Research Board, the international group of 30 professionals charged with developing and maintaining the *Highway Capacity Manual*.

Representative Projects

Technical Lead, 91 Express Lanes Extension and State Route 241 (SR-241) Connector Feasibility Study, Orange County, California, 2007 to present. Overall CH2M HILL lead on this project to develop concepts for improving the system interchange at SR241 and SR91. Leading the work with the stakeholders in two counties and Caltrans districts to identify critical issues, an evaluation approach, and potential solutions. Leading the team

developing conceptual alternatives, including HOV connectors, toll connectors, express lane extensions, and new alignments.

Project Manager; I-5/710 Alternatives Analysis; Commerce, California, 2005-2006 to. Guided CH2M HILL's efforts on this project to improve the preliminary design concepts for the I-710 corridor, as part of the pre-NEPA/CEQA planning. The overall purpose of the effort was to build consensus from project stakeholders by addressing two key technical issues: reducing right-of-way impacts and develop a better understanding of the traffic operations of the proposed solutions. Directed and participated in two separate teams (design and traffic) to accomplish these objectives. The design team reduced the residential property takes at the I-5/I-710 interchange and improved the functionality of the concepts. The traffic team analyzed the full I-710 corridor using the regional travel demand model and a focused operational analysis using the Synchro model.

Task Lead, Alternatives Analysis and Traffic, SR57-60 Feasibility Study, Diamond Bar, California, 2006 to present. Task lead and deputy project manager on this project to develop concepts for improving the overlapping system interchange at SR57 and SR60. Applying Context Sensitive Solutions (CSS) concepts to work with the stakeholders (cities, Metro, and Caltrans) to identify context, issues and opportunities, an evaluation approach, and potential solutions. Leading the team developing conceptual alternatives, including collector-distributor roads, truck bypasses, grade separations, and HOV connectors. Leading the traffic analysis, including forecasting and VISSIM modeling.

Task Manager, I-5 Corridor Microsimulation Study, Los Angeles County, CA; 2006 to present. Task lead for a comprehensive microsimulation study of the I-5 freeway corridor from SR 91 to I-605, for Caltrans District 7. The study is examining the relative benefits of various project improvements including freeway widening, implementation of HOV lanes, and interchange modifications. Directing all project activities, including development of a baseline VISSIM/VISUM model (12 miles of freeway and over 100 intersections), model calibration, forecasting, application, and reporting. Coordinating the activities of a team in multiple states, and leading all communication with Caltrans.

Task Manager, Adaptive Signal Control System Evaluation, Los Angeles County, CA; 2006 to 2007. Task lead for the performance system evaluation of the "before" condition for five corridors in Los Angeles County (State Routes 1, 66, 72, 107, and 213). Directed the baseline assessment of current traffic operations to enable Caltrans to assess the future benefits of adaptive signal control. Coordinated data collection and evaluation of travel time, travel speed, travel delay and delay cost. Led the statistical analysis and Synchro assessment.

Task Manager, Long Beach Roundabout - Operational Analysis and Design Report , Long Beach, CA; 2006 to 2007. Task lead for the development of solutions to address safety and operational issues at the multi-lane Long Beach roundabout. Led the team developing alternatives focusing on spiral striping in the circulatory roadway to reduce conflicts, promote lane discipline, and ultimately reduce accidents. Key elements of the study included video data collection and origin-destination assessment, traffic analysis (with the RODEL model), roundabout analysis and preliminary design, and recommendations.

Task Manager, SR 52 Managed Lanes, San Diego County, CA; 2006 to present. Directing the value pricing study and traffic analysis as part of the preliminary design of managed lanes (HOV plus toll) for the SR 52 freeway corridor. The value pricing study includes detailed travel demand modeling, economic assessment, stakeholder outreach, focus groups and surveys, operations and systems concept planning, and the development of a recommended concept for the corridor. The traffic analysis supports the engineering design of the corridor, including physical layout, signing and striping, and toll operations. Traffic analysis includes both analytical (HCM) and simulation (CORSIM) methods.

Task Manager, I-210 Ramp Metering Final Design, Los Angeles County, CA; 2006 to present. Task lead for two separate PS&E projects for ramp metering on approximately 50 miles of the I-210 freeway for Caltrans District 7. Design elements include new ramp meters at several system interchanges, new ramp meter installations, and conversion of existing HOV bypass lanes to priority metering and mixed-flow metering. Coordinating all team activities, including electrical design, civil design, traffic design, utilities coordination, and drainage.

Instructor; "Developing Context Sensitive Solutions for California"; California; 2005 to 2007. Served as an instructor for a 3-day training course that covers the Caltrans approach for planning, designing, constructing, maintaining, and operating its transportation system. As part of a two-person team, taught the course in six Caltrans districts throughout the state. Course participants (up to 60 per class) included both Caltrans and local agency staff. Key topics taught include identifying context, developing problem statements, developing alternatives, and alternatives evaluation (safety and operations). Co-leader of the development of a revised version of the course (two days) that was rolled out in October 2007.

Instructor; "Context Sensitive Solutions"; multiple states; 2006 to present. Served as an instructor for two- and three- day versions of the training course for state DOT, FHWA, and local staff. States taught include New York, Georgia, and California.

Traffic Quality Control Lead, Foothill Transportation Corridor; Mission Viejo, CA; 2006 to present. Responsible for traffic analysis and documentation for the extension of the SR-241 toll road in Orange County. Directed subconsultant staff preparing analysis and reports for traffic forecasting and traffic analysis, including freeways, ramps, and intersections. Reviewed and developed updates for all technical analysis, ultimately resulting in the approval of documents by the owner.

Traffic Lead, Pyramid Highway Corridor Management Plan; Reno, NV; 2007. Led traffic analysis and alternatives development for developing a future concept for improvements to the Pyramid Highway corridor. The plan focused on improvements required to address future traffic and access needs, with the ultimate goal of preserving right-of-way as the corridor develops and land use decisions are made by the local entities and developers. Developed concepts for evaluation, assessed traffic operations benefits, and recommended alternatives and right-of-way requirements to the Regional Transportation Commission.

Task Lead, Eastshore Energy Center; Hayward, CA; 2006-2007. Traffic lead for the application for certification (AFC) for a new 115.5-megawatt (MW) intermediate/peaking load facility. Led the assessment of the traffic and transportation impacts associated with the construction and operation of the facility. Assessed traffic operations impacts, transport

of hazardous materials and public safety. Developed strategic approached for the Transportation Management Plan, and represented the applicant (for transportation issues) at California Energy Commission meetings.

Senior Engineer; Transportation Impact Analyses Best Practices; Oregon; 2005 to 2006. Technical lead for this effort to establish a "Best Practices" document for the Oregon Department of Transportation (ODOT) that will guide technical staff in developing future transportation impact analyses (TIAs). Worked with a technical advisory committee of state and local agency staff, developed strategies for identifying and evaluating case studies; led the data collection and evaluation tasks, developed best practice guidelines, and co-authored the final best practices guide.

Project Manager; Broadway-Jackson Feasibility Study; Oakland, California; 2004 to 2006. Project manager on an effort to develop feasible alternatives for the Interstate (I)-880 corridor in downtown Oakland, California. Previous studies had recommended infeasible and/or undesirable alternatives; CH2M HILL was selected to build consensus and develop innovative solutions. Led the development of alternatives and directed the technical work and consensus-building activities. Two sets of advisory panels were engaged: the first includes agency stakeholders (Caltrans, Oakland, and Alameda); the second includes neighborhood groups (e.g., Chinatown, members of business community, and other agencies). The team developed a focused set of alternatives (some of which simplify ramps and provide pedestrian-friendly boulevards).

Traffic Lead, Mission/SR-71 Grade Separation; Pomona, California; 2005 to Present. Traffic lead for this project to build a grade separation at the Mission Boulevard/SR-71 intersection. Led all traffic activities, including developing traffic forecasts and analyses for fact sheets and GADs, developing detour plan concepts, evaluating traffic for pavement design requirements, and leading the development of the Transportation Management Plan.

Traffic and Alternatives Analysis Lead; I-5/Carmenita Road Interchange Design Reevaluation Study; Santa Fe Springs, California; 2005. Traffic and alternatives analysis lead for the alternatives evaluation and preliminary engineering of a complex interchange in Santa Fe Springs, California. Led the development of conceptual alternatives, with a focus on reducing right-of-way impacts and maintaining operations and circulation. Directed the activities of the traffic analysis (through a subconsultant).

Traffic and Alternatives Analysis Lead; El Rancho/Sun Valley Intersection Improvements Project; Reno, Nevada; 2004-2005. Was the traffic and alternatives analysis lead on this project to develop intersection improvements (short-, medium- and long-term) for a congested intersection near Reno, Nevada. Led the development of conceptual alternatives, developed and built consensus on traffic forecasts, conducted operations analysis, and completed an alternatives evaluation. The end result was a preferred solution that provided a phased approach to construction, as well as low-cost improvements that could be implemented immediately.

Project Engineer; Walnut Energy Center Traffic Control and Implementation Plan (TCIP); Turlock, California; 2004-2005. Developed the traffic control plan for the utility (potable and recycled water) lines for the Walnut Energy Center in Turlock, California. The TCIP addressed the mitigation of traffic impacts to the existing transportation facilities to satisfy the requirements of the California Energy Commission (CEC) Conditions of Certification.

Traffic Task Lead; Santa Rosa Area Projects and Dutton Meadows Environmental Impact Report (EIR); Santa Rosa, California; 2004. Was the task lead for traffic in developing the EIRs for project- and program-level EIRs to support planned development in Santa Rosa, California. Developed traffic/transportation sections of the California Environmental Quality Act (CEQA) documents, tiering off previous environmental document and technical studies.

Traffic Task Lead; San Francisco Energy Reliability Project; San Francisco, California; 2004-2005. Was the task lead for traffic for completing the traffic and transportation section of the Application for Certification (AFC), a process similar to an EIR. The project is an energy plant in San Francisco, and traffic impacts focused on the construction activities.

Traffic Task Lead; Harbor Boulevard; Costa Mesa, California; 2004. Was the traffic task lead on a project to complete preliminary engineering and environmental documentation on a congested major arterial in Costa Mesa, California. Coordinated data gathering from Caltrans and Costa Mesa, and conducted detailed operations analysis for multiple alternatives. Prepared traffic analysis documentation and coordinated traffic inputs to the design and environmental teams.

Task Lead; Anchorage Long-Range Transportation Plan; Anchorage, Alaska; 2003 to 2005. Task lead for postprocessors, charged with developing and applying tools for assessing the benefits of travel demand management (TDM), intelligent transportation systems (ITS), benefit-cost economic evaluations, and level of service (LOS) assessments. The LOS postprocessor was implemented using a link between TransCAD and a spreadsheet-based LOS evaluation. Coordinated activities between the travel demand forecasting model (TransCAD) development team and the plan development activities.

Project Manager; Port of Oakland Maritime Development Plan Peer Review; Oakland, California; 2003-2004. Was the CH2M HILL project manager and lead for traffic operations for a peer review of the proposed plan for the Port of Oakland blueprint to guide decisions on building and modifying terminal facilities, reallocating terminal space, roadways and access, and rail facilities. Participated in design charrettes and provided senior review on forecasting and traffic engineering analysis.

Traffic Lead; Clinton Keith Initial Study/Environmental Assessment (IS/EA); Riverside County, California; 2002 to Present. Is the traffic lead to complete preliminary engineering and environmental documentation on a new transportation corridor in Riverside County, California. Clinton-Keith Road will be a connection between I-215 and State Route (SR) 79. Led the development of traffic forecasts, including integrating travel demand forecasts from the regional model and traffic impact studies. Conducted traffic analysis and worked with the engineering team to optimize the design. Coordinated traffic inputs to the environmental team.

Senior Traffic Engineer; I-5/Oso Interchange Improvements; Mission Viejo, California; 2004 to 2007. Senior traffic engineer on this project to develop interchange improvements at the I-5/Oso Parkway interchange in Mission Viejo, California. During the Project Report phase, guided data collection and traffic analysis (Synchro and HCS). Assessed mainline, intersection, and ramp operations. During final design, develop traffic staging and detour plans, and led the development of the Transportation Management Plan (TMP).

Traffic Analysis Lead; Meadowood Mall/U.S. 395 Interchange; Reno, Nevada; 2000-2002. Led traffic analysis to support decisionmaking on a stalled interchange design project in Reno, Nevada. With a working group of Metropolitan Planning Organization (MPO) and Department of Transportation (DOT) technical staff, developed methodology and approach for the analysis. Led the development of CORSIM models for the freeway corridor, and presented the findings to reach consensus on the benefits of the preferred alternative.

Task Lead; Devore/I-15 Construction and Traffic Analysis; San Bernardino County, California; 2002-2004. As the task lead, was responsible for directing activities on this $300,000 task to support decisionmaking on a pavement reconstruction project planned for I-15 in San Bernardino County, California. To improve pavement quality and reduce costs, Caltrans was considering extended closures of the freeway (3 to 10 days) as an alternative to extended overnight closures. CH2M HILL worked with Caltrans to determine the increased productivity of contractors using these extended closures, and the associated traffic impacts. Led the traffic team evaluating the impacts (using capacity analysis and the Paramics microsimulation tool) and coordinated the construction analysis evaluation.

Project Manager; I-880 Operations and Safety Study; Oakland, California; 2002-2003. Was the CH2M HILL project manager for this study to evaluate opportunities to enhance the operations, safety, and appearance of the northern segment of I-880 in Oakland. Led the safety evaluation and traffic operations analysis, and played a major role in developing improvement strategies, including conceptual design of interchange improvements. The end product was a set of 10 projects, ready for Caltrans planning and environmental analysis, that were developed with the consensus of a multijurisdictional group of stakeholders.

Traffic Lead; I-680 Corridor Study; Contra Costa County, California; 2003. Was the traffic lead on a project to conduct conceptual engineering on the I-680 freeway corridor in Contra Costa County, California. Conducted freeway analysis of high occupancy vehicle (HOV) alternatives using the FREQ model, including combinations of HOV and general-purpose lane improvements. Played a key role in the development of concepts for HOV and transit line options, and served as senior reviewer for the striping plans.

Task Lead; Philomath Facility Plan; Philomath, Oregon; 2002-2003. Was the task lead for traffic to develop and evaluate alternatives to improve a two-lane main street in Philomath, Oregon. Directed the effort to gather traffic information and forecasts, conduct reconnaissance with local agency staff, and evaluate existing and future traffic. Worked directly with Oregon DOT and project steering committee members (including Philomath residents) to achieve consensus on traffic volumes and forecasts.

Traffic Analysis Lead; New Seward Highway Environmental Impact Statement (EIS); Anchorage, Alaska; 2002 to 2004. Was the traffic analysis lead on a corridor study to evaluate freeway, interchange, and surface street improvements to the New Seward Highway freeway corridor in Anchorage, Alaska. Led a team that developed a system of models (including CORSIM and Synchro) that linked with the regional travel demand model (in TransCAD) to provide LOS analysis and animation of the corridor alternatives.

Project Manager and Traffic Task Lead; U.S. 101 Greenbrae Interchange Interim Planning Study; Marin County, California; 1999-2003. Was the project manager and traffic task lead to develop and assess alternatives for a series of interchanges in Marin County, California. Key role in developing need and purpose, evaluation criteria, and conceptual alternatives.

Led the traffic analysis, including the future forecasts and operations assessment of alternatives. Worked with project advisory committee to refine alternatives and build consensus.

Senior Advisor; Plymouth Road Safety Study; Ann Arbor, Michigan; 2004. Was the senior advisor for this project for the City of Ann Arbor, Michigan, to evaluate pedestrian safety issues and make recommendations for improvements on a five-lane arterial adjoining the University of Michigan campus. Guided existing conditions assessment, strategy development, evaluation framework, and strategy assessment. Conducted workshops with City and University staff to develop and screen alternatives.

Traffic Operations Lead; Pueblo New I-25 Freeway Corridor Study/EIS; Pueblo, Colorado; 2001 to Present. Was the lead for traffic operations as part of the analysis of alternatives for the I-25 freeway corridor through Pueblo, Colorado. Directed a team developing traffic forecasts and traffic operations analysis using TransCAD, Synchro, and CORSIM. Developed performance measures and criteria, and worked with local agency staff to achieve consensus on the analysis inputs and results.

Project Manager; Peninsula Corridor Ramp Metering Study; San Mateo County, California; 2003 to 2005. Was the CH2M HILL project manager to identify and analyze ramp metering alternatives for U.S. 101 and I-280 in San Mateo County, California. Directed the freeway operations analysis (using the FREQ model), including data collection and coding, calibration, and alternatives analysis. Worked with multijurisdictional advisory committees (including Caltrans and city staff) to identify feasible alternatives for ramp metering.

VA Participant, I-15 Bailey Road to Yates Well Road Improvements, San Bernardino, CA; 2006. Traffic operations lead for this three-day Value Analysis (VA) study to evaluate improvements for adding a truck descending lane on I-15 in eastern San Bernardino County. Identified design, operational, and safety issues. Identified, developed, and evaluated potential design improvement concepts. Participated in all team presentations and VA session activities.

Project Manager and Lead Traffic Engineer; Nikon Traffic Study; Belmont, California; 2004. Was the project manager and lead traffic engineer on a project to evaluate traffic impacts of a proposed addition to the Nikon facility in Belmont, California. Led data collection, traffic analysis, and impact assessment as a precursor to the CEQA analysis for the project.

Transportation Analysis Task Lead; Proponent's Environmental Assessment (PEA); San Mateo County, California; 2002-2004. Was the task lead for the transportation analysis to support the PEA and associated EIR for a major utility company. The project involved trenching and overhead construction throughout San Mateo County, with potential impacts to freeways, ramps, surface streets, and Bay Area Rapid Transit (BART). Led the transportation analysis (including evaluation, assessment of impacts, and development of mitigation measures) and was primary author for the transportation section of the environmental document. Led the development of transportation management plans (TMPs) for the multiple jurisdictions.

Traffic Engineer; Council Bluffs Interstate Study; Council Bluffs, Iowa; 2003-2004. Was the traffic engineer to evaluate design alternatives for the freeway system in Council Bluffs, Iowa. Led the evaluation of VISSIM models for the freeway corridors, including the identification of operational deficiencies. Served as senior quality control for the development of the VISSIM models used to evaluate operations.

Traffic Operations Director; First Street Traffic Analysis; Reno, Nevada; 2003. Directed the traffic operations analysis on this study to assess the impacts of closing a section of First Street to traffic in downtown Reno, Nevada. Full closure and a one-way alternative were evaluated, with a focus on traffic operations, traffic circulation, regional access to major activity centers, alley and parking garage access, pedestrian mobility and safety, and emergency routes. Conducted traffic operations and analysis and assessment of the evaluation criteria to provide input to the City Council decision.

Traffic Analysis Lead; Susan Street Traffic Analysis; Orange County, California; 2001-2003. Conducted a traffic analysis of the proposed Susan Street off-ramp at the SR 73/I-405 interchange in Orange County. Analyzed traffic operations impacts of the freeway, distributor road, and surface street intersections using CORSIM and the *Highway Capacity Manual* methodologies. Addressed the traffic impacts of design variations, with a particular focus on weaving in the distributor lanes, where the standard methodologies were not sufficient, and worked with Caltrans to develop a preferred design for the interchange.

Traffic Task Lead; California Federal Highway 114 (FH 114) Hyampom Road; Trinity County, California; 2002 to Present. Was the task lead for traffic as part of the development and evaluation of a rural road in Trinity County, California. Directed the effort to gather traffic information and forecasts, conduct reconnaissance with local agency staff, and evaluate existing and future traffic. Worked with client staff to achieve consensus on future forecasts, and helped craft the purpose and need statement.

Traffic Task Lead; Santiago Canyon Road Capacity Study; Orange County, California; 2001-2004. Was the traffic task lead to assess current and future deficiencies on Santiago Canyon Road (in Orange County, California) and develop improvement strategies. Directed the capacity analysis of the facility, using three different analysis tools (HCS, TWOPAS, and CORSIM) to compare model capabilities and results. Working with a technical group of County staff, directed the operations assessment to develop and analyze potential improvement strategies.

Traffic Lead; SR 237 Guadalupe Bridge Eastbound Bridge Replacement; Santa Clara, California; 2003. Was the traffic lead for the project study report/project report (PSR/PR) and plans, specifications, and estimates (PS&E) to replace the bridge on SR 237 over the Guadalupe River. Developed Transportation Management Plan (TMP), including detour plans and lane closure charts. Conducted operational analysis for staging plans and late lane reopening penalties.

Traffic Operations Task Lead; Route 70/Algodon Road Interchange Traffic Analysis; Yuba City, California; 2002. Served as task lead for traffic operations analysis to support planning efforts for the Route 70/Algodon Road interchange near Yuba City, California. Led the analysis is to assess future operations of the freeway, interchange, and cross streets to identify design improvements.

Project Manager; Caltrans Richmond-San Rafael Bridge Retrofit; San Francisco, California; 2003 to 2004. Project manager on the final stages of this project, providing services during construction (CH2M HILL was the designer of the roadway elements of the project) and coordinating public outreach activities. Served as the single point of contact for requests for information (RFIs) for structural, electrical, utilities, and drainage from the contractor. Managed the team providing public outreach support to Caltrans, including the project website, press releases, and public notices.

Traffic Control Plan Task Lead; Central Freeway Demolition Traffic Control; San Francisco, California; 2003. As part of a task order to support CH2M HILL's work on the Caltrans District 4 Environmental On-Call contract, led traffic control tasks to support geotechnical investigations for the Central Freeway Demolition. Developed traffic control plans to allow drilling on congested San Francisco city streets. Managed staff supervising traffic control in the field. The drilling was completed without any significant traffic impacts or incidents, earning commendation from Caltrans.

Traffic Task Lead; Cheyenne Avenue, Rancho to I-15 Upgrades; Las Vegas, Nevada; 2003. Was the task lead for traffic, directing the operations analysis for operations, safety, and transit improves along Cheyenne Avenue in North Las Vegas, Nevada. Led traffic operations analysis using Synchro and Highway Capacity Software, including developing traffic forecasts using modeled data and other sources. Led the analysis of bus operations impacts, including sketch-level analysis of ridership.

Simulation Task Lead; Freeway System Operational Assessment (FSOA); Wisconsin; 2002 to Present. Serves as the simulation task leader on the FSOA project for Wisconsin DOT. Developed framework for applying Paramics output for the estimation of project level benefits. Coordinated with economics team to develop a practical approach for applying Paramics for cost-benefit analysis.

Traffic Analysis Task Lead; Alameda County Transportation Measure B Technical Analysis; California; 2002-2003. As part of a CH2M HILL effort to provide program management services to support the ACTA Measure B program, supported ACTA with traffic analysis tasks. Work has included traffic analysis on alternatives to the Hayward Bypass, analysis of construction impacts, and review of others' traffic analysis.

Traffic Analyst; South Campus Drive Roundabout Traffic Analysis; Salt Lake City, Utah; 2002. Led the traffic analysis of a proposed roundabout in Salt Lake City at the end of the University light rail transit (LRT) line. Directed traffic simulation analysis using the VISSIM traffic software, including development of the model to include the roundabout, LRT vehicles, and signalized intersections. Several sets of simulations were run to test operations and illustrate the operational feasibility of the proposed project.

Traffic Task Lead; SR 79 Improvement Projects; Riverside County, California; 2002 to Present. Traffic task lead on three corridor studies (Thompson-Domenigoni, Hunter-Thompson, and Domenigoni-Gilman Springs). Directed forecasting and traffic analysis activities (using both in-house staff and subconsultants), facilitated development and refinement of forecasts, developed technical deliverables and performed senior quality control (QC) on traffic analysis, and coordinated input to engineering and environmental teams. Conducted safety assessments. Authored the traffic and transportation sections for the CEQA documentation.

Transportation Engineer; San Francisco Bay Area Water Transit Authority, On-Call Transportation and Environmental Services; San Francisco, California; 2001. Assessed existing and potential demand for ferries (both vehicular traffic and ferry passengers) to support planning efforts for this newly created agency. Identified patterns and deficiencies in Bay Area transportation facilities related to potential ferry services. Developed technical material to support presentations to decisionmakers, associated agencies, and the public.

Task Leader for Traffic Operations; Boulder City/U.S. 93 Corridor Study; Boulder City, Nevada; 2001-2002. Task leader for traffic operations and demand forecasting for the preliminary design and environmental impact statement for the evaluation of corridor alternatives in Boulder City, Nevada. Developed traffic forecasts for several 10- to 15-mile corridors, and achieved consensus on the projected traffic from Nevada Department of Transportation (NDOT) and other agency staff. Directed traffic operations analysis using Synchro, HCS, and CORSIM. Helped refine alternatives and alignments. Provided traffic data for other environmental discipline teams, and led the development of the pedestrian/bike assessment.

Traffic Control Task Lead; Metcalf Energy Center Offsite Utilities; San Jose, California; 2001-2002. Task lead for traffic control. As part of a fast-track, design-build effort to design and construct linear facilities (recycled water, sewer, and potable water) to support a new energy center, led the traffic control task for the project. Developed plans to support two pipeline alignments through 6 to 10 miles of urban streets. Worked with local agencies to develop a transportation management plan (TMP) to support agency requirements and maintain construction schedules.

Traffic Analyst; Aurora Avenue North Pre-Design Study; Shoreline, Washington; 2000. Traffic analysis for the evaluation of alternatives to improve a high-volume section of SR 99 in Shoreline, Washington. Led efforts to develop traffic models for geometric alternatives and evaluate traffic operations and identified deficiencies. Recommended design modifications to support additional turn lanes and extended turn bays, and developed operations analysis to support the recommendations to better accommodate passenger cars and transit vehicles.

Traffic Operations Analyst; Translake/SR 520 Corridor Study; Seattle, Washington; 2001-2002. As part of a multiconsultant team, played a key role in the traffic operations analysis as part of a major planning study for the SR 520 corridor in Seattle. On a fast-track schedule, organized the development of consistent traffic forecasts for freeway and surface street analysis. Led the application of a large CORSIM model that included three major freeways and two system interchanges. Engineered the approach for analyzing and reporting results to a team of agency staff and the public.

Technical Assistant; City of Bellevue INTEGRATION Model; Bellevue, Washington; 2001. Provided technical assistance to the City of Bellevue to support the development and calibration of its citywide traffic assignment and simulation model using INTEGRATION. Advised City staff on coding and calibration techniques for the development of a large (3400-link) model.

Traffic Simulation Analyst; Riverside Drive Traffic Analysis; Juneau, Alaska; 2001. Directed traffic simulation analysis on this study to evaluate the effectiveness of geometric improvements and traffic calming measures on the major north-south corridors in Juneau,

Alaska. Supervised the development of a dynamic traffic assignment model (using INTEGRATION) to evaluate changes in traffic patterns and operations.

Traffic Discipline Lead; Route 17 South (SR 17/SR 85) Improvements Project; California; 2001-2002. Discipline lead for traffic, leading the development of the traffic forecasting and operations studies in support of the PSR/PR for Caltrans. Supervised two subconsultant firms, including developing scope, schedule, and fee; providing technical support and oversight; and coordinating with the design team.

Traffic Task Lead; Kanarraville Exit/Iron Springs Road Environmental Impact Statement; Cedar City, Utah; 2001-2002. Task lead for traffic as part of the alternatives development and evaluation of a new corridor in Cedar City, Utah. Gathered traffic information and forecasts, and conducted reconnaissance with local agency staff. Developed traffic forecasts that were approved by Utah Department of Transportation (UDOT) other affected agencies. Helped craft purpose and need statement.

Traffic Task Lead; Boulder City Strategic Plan; Boulder City, Nevada; 2001-2002. Traffic task lead for this project to develop and quantify strategic objectives (at a policy level) for the town of Boulder City, Nevada. Developed analysis approaches and recommendations for assessing safety and traffic operations and managing traffic control. Conducted a baseline assessment of performance to demonstrate the application of the strategic plan.

Traffic Task Lead; Owens Lake Southern Dust Control Project Environmental Impact Report; Lone Pine, California; 2001. Task lead for traffic as part of the assessment of the impacts of a major hauling operation in the vicinity of Lone Pine, California. Gathered traffic information and forecasts, and conducted reconnaissance with local agency staff. Assessed traffic operations and impacts of the proposed project.

Traffic Operations Lead; Drennan Road Corridor Study; Colorado Springs, Colorado; 2001. Lead for traffic operations as part of the analysis of alternatives for the Drennan Road and Academy Boulevard in Colorado Springs. Coordinated a team developing traffic forecasts and traffic operations analysis using MINUTP, Synchro, and CORSIM. Identified design deficiencies and summarized operational analysis for agency staff.

Traffic Analysis Task Lead; U.S. 18 Traffic Study; Prairie du Chien, Wisconsin; 2002-2003. Task lead for traffic analysis for this traffic study of a 7-mile corridor in Prairie du Chien, Wisconsin. Work activities included existing and future year traffic operations analyses and alternatives development. The traffic analysis included both arterial operations (signalized intersections) and roundabouts, so the tools included Synchro, VIISSIM, and Arcady.

Traffic Analysis Advisor; Park East Freeway Reconfiguration Assessment; Milwaukee, Wisconsin; 2001. Advisor for traffic analysis for the environmental assessment of a project to replace the Park East freeway (in Milwaukee, Wisconsin) with an at-grade arterial. Guided traffic analysis, including CORSIM simulation; interpreted results; and developed summary materials.

Traffic Simulation Lead; U.S. 63/34 Roundabout Traffic Analysis; Ottumwa, Iowa; 2001. Evaluated the benefits of a roundabout at the intersection of two highways in Ottumwa, Iowa. Directed the development and application of a VISSIM simulation model that was applied to evaluate the operational benefits of a roundabout. Analyzed model outputs,

summarized results, and prepared presentation materials (including simulation animation) for Iowa DOT and the public.

Traffic Operations Task Lead; Clear Acre/Sutro Interchange Complex Traffic Analysis; Reno, Nevada; 2000-2001. Task leader for traffic operations analysis of design alternatives for the Clear Acre/Sutro Interchange Complex in Reno, Nevada. Primary responsibility for a fast-track traffic analysis to support decisionmaking on a stalled interchange design project. With a working group of MPO and DOT technical staff, developed alternatives, methodology, and assumptions for the analysis. Developed and updated CORSIM models for the proposed interchange system and alternative design. Analyzed intersection, freeway, and system operations and presented results to a working group of MPO and DOT technical and executive staff. The traffic analysis was met with consensus among MPO and DOT staff, allowing the project to continue.

VE Participant, I-225 Widening Parker Road to 6th Ave, Denver, CO; 2000. Traffic lead for this week-long value engineering (VE) study to evaluate improvements for widening of I-225. Conducted traffic operations assessments and analysis. Identified design, operational, and safety issues. Participated in all team presentations and VE session activities.

Project Technical Manager; I-75 Corridor Study; Dayton, Ohio; 1999-2000. Project technical manager for a planning and operational study of an 11-mile section of the I-75 corridor through Dayton, Ohio. Assessed operational and safety limitations through field review, interviews, and data analysis. Developed and conducted a technical workshop with local traffic engineers to discuss corridor issues and potential solutions. Working with local agency staff, developed a CORSIM model of the freeway to assess operational issues and improvements.

Project Manager; East-Central Traffic Management Study; Concord, California; 2000-2001. Assessed traffic operations strategies for managing traffic flow on a congested arterial. Led the modeling and operations analysis of the roadway, which included developing a calibrated baseline model (using CORSIM and Synchro) and assessing strategies for controlling traffic flow at signalized intersections. Played a key role in working with the project Technical Advisory Committee (TAC) to develop strategies, fine-tune results, and present findings to policymakers and the public.

Project Manager; SR 519 Traffic Operations; Seattle, Washington; 2000. Managed an alternatives analysis of design options for improvements to SR 519 and surrounding roadways in the vicinity of the new Safeco Field in downtown Seattle. Developed and applied CORSIM models of the roadway network alternatives and directed a subconsultant conducting a parallel analysis using the VISSIM model. Developed and applied statistical and sensitivity analyses to the results, and made presentations to Washington State Department of Transportation (WSDOT) and its project partners.

Traffic Analyst; San Diego International Airport Master Plan EIR; San Diego, California; 2001. Led traffic analysis for the EIR of a proposed new north terminal at SAN airport. Helped to develop conceptual alternatives for the new terminal (including an option for a two-level terminal roadway) as well as modifications to the existing south terminal roadways. Led traffic analysis of the alternatives, including curbside operations.

Traffic Analyst; I-75/M-59 Interchange Traffic Analysis; Pontiac, Michigan; 2001. Led traffic analysis for the conceptual design of the I-75/M-59 system interchange in Pontiac, Michigan. Developed an approach for traffic operations analysis of the alternatives, focusing on simulation modeling to assess the operational impacts of design variations. Supervised development of a complex model of the interchange and validation of the coding. Applied the model and presented findings on the results.

Traffic Analyst; Pittsburgh International Airport (PIT) Environmental Assessment; Pittsburgh, Pennsylvania; 2001. Played a key role in the traffic analysis of PIT airport roadways as part of the EA. Conducted operations analysis of State Route 60 and Business Route 60 (approximately 12 interchanges) for multiple horizon years. Identified deficiencies and developed conceptual alternatives to improve operations.

Traffic Operations Lead; Colman Dock Traffic Operations; Seattle, Washington; 2001 to Present. Supported the design of improvements to the Colman Dock, which provides access to passenger and car ferries in downtown Seattle. A key focus was a new Remote Holding Area (RHA) to store vehicles bound for the car ferries. Developed and applied a CORSIM model of the local network to assess the traffic impacts of RHA platoon releases. Developed and applied a deterministic queuing model for the entire system to provide insight into design options for gates, storage, and traffic operations. Assessed alternative strategies (including remote ticketing and reservations) to minimize capital and operational expenditures.

Freeway Operations Analyst; SR 509; Seattle-Tacoma Airport; Seattle, Washington; 1999-2002. Led freeway operations analysis (using FREQ) for the SR 509 Added Access Report for the WSDOT and Federal Highway Administration. SR 509 will provide a critical new connection between I-5 and the Sea-Tac Airport. Developed and applied models to analyze operational benefits of the SR 509 Interchange for build and design years. Participated in week-long value engineering (VE) study with WSDOT staff to identify and assess alignment options.

Operational Simulation Analysis Task Manager; SH 58 Traffic Analysis; Denver, Colorado; 1999-2002. Supported the design of a new system interchange at SH 58/I-70 in Denver. Led a team that developed a CORSIM model of the freeway system and major arterials for a calibrated base year (1999) and horizon year (2020). Led investigations for design options for the system interchange, local interchanges, and surface street alignments.

Traffic Analyst; I-10 Truck Climbing Lane; San Bernardino, California; 2000-2002. Led traffic analysis of alternatives for a truck climbing lane on the I-10 freeway in San Bernardino County, California. Defined a methodology for assessing operations of alternative auxiliary lane designs to support a proposed truck climbing lane. Led traffic operations analysis using both the HCM procedures and the CORSIM model. Prepared summary materials for a technical memorandum that supplements the PSR.

Traffic Analyst; Northwest Arkansas Regional Airport (NWARA) EIS; Arkansas; 2000. Led traffic analysis of the airport access roadway (State Highway 264), as part of an EIS to assess improvements. Developed traffic estimates for multiple future horizon years, based on available forecasts. Applied the TWOPAS model to assess rural two-lane highway operations for various scenarios. Developed and applied a sensitivity analysis assessment and identified deficiencies.

Safety Analysis Lead; Lake County Transportation Improvement Project (LCTIP); Lake County, Illinois; 1998-1999. Led safety analysis of alternatives of major improvements to the Lake County, Illinois, transportation network. Developed a methodology for assessing future year accident rates, using projected travel demand and roadway safety data. Coded and tested the spreadsheet-based safety model, which evaluated expected safety performance of over 5,000 roadway segments. Assessed safety performance of the various alternatives and summarized the results in a detailed technical memorandum.

Software Co-Developer; Airport Landside Operations Model; 2000. Co-developer of a software implementation of procedures for analyzing landside traffic operations at airports. The model provides a standardized methodology for estimating travel demand at airports and includes tools for operations analysis of roadways, curbsides, and parking facilities. The operations analysis includes standard level of service assessments as well as linkages to simulation and animation models for the roadways and curbsides.

Traffic Operations Lead; U.S. 101/SR 85 Interchange Design; Mountain View, California; 1999. Traffic operations lead for a design review of the U.S. 101/SR 85 interchange in Mountain View, California. As part of a multidisciplinary team, reviewed traffic operations, circulation and access, bridges, and cost and quantity elements of a $110 million design for the system interchange and three nearby interchanges. Lead author on the design review report to the design team, which recommended changes or review of 74 elements of the design.

Modeling Expert; I-84 Interchange Design; Boise, Idaho; 1999. Modeling expert for traffic operations analysis of design alternatives for three interchanges in Boise, Idaho. Updated CORSIM models for multiple alternatives including SPUI, parclo, diamond, and other interchange options. Developed and applied a performance evaluation approach.

Technical Lead; Contra Costa Arterial and Freeway Ramp Metering Study; Contra Costa, California; 1997-2001. Technical lead for simulation modeling and analysis. Wrote an extensive overview of ramp metering and presented it to the TAC. Key role in establishing evaluation criteria, defining analysis networks, and developing future demand estimates. Managed the team performing data collection and analysis for the freeway simulation. Technical lead for FREQ modeling and ramp metering analysis of baseline and horizon year scenarios. Presented modeling results and worked with the TAC to develop candidate ramp metering alternatives. Presented results and discussed alternatives with Policy Committee (local elected officials).

Traffic Analyst; Florida Department of Transportation (FDOT) Traffic Analysis Tools; Florida; 1999. Designed and developed a major revision to a set of traffic analysis used statewide by FDOT. These tools include traffic demand trend forecasting, equivalent single-axle load (ESAL) analysis, and intersection turning movement counts forecasting. Developed new user interfaces for all of these tools to address user requirements. Updated analysis methods to reflect current practices and to add functionality.

Experience Prior to CH2M HILL

Project Manager; Salt Lake City Advanced Traffic Management System (ATMS); Salt Lake City, Utah; 1996-1998. Project manager for the development of a regionwide (400 square miles) simulation model using INTEGRATION. Managed project with staff in

California, Salt Lake City, Virginia, and Canada. Led all technical work throughout the project. Reported results to Utah Department of Transportation (UDOT) through regular status meetings throughout the project. Conducted a final project summary and day-long training session for UDOT and Wasatch Front Regional Council staff. Planned and led incident management strategy, and conceptualized an approach for analyzing traffic management strategies for construction evaluation. Lead author on two summary papers, presented at ITE District Conference (July 1997) and Transportation Research Board (January 1998).

Model Developer; Salt Lake City ATMS; Salt Lake City, Utah; 1996. Developed peak-period FREQ models: organized and monitored data collection; and coded, tested, and calibrated models. Supervised development of 24-hour models, including testing and calibration. Prepared and gave presentations on the FREQ models for UDOT staff. Applied the I-15 models to assess ramp metering in Davis County, including iterative analysis of traffic performance, geometric constraints, and cost considerations. Presented findings to UDOT, resulting in approval of the installation of the first ramp meters of Utah, installed in September 1996. Assessed need and effectiveness for ramp metering on I-15, I-215, and I-80; recommended metering locations and geometric improvements based on the results. Analyzed construction plans for traffic impacts for major reconstruction efforts on I-15 and SR 201.

Researcher and Developer; Salt Lake City ATMS; Salt Lake City, Utah; 1997. Researched, wrote, and designed a series of public information brochures on the overall ATMS, variable message signs, closed circuit television, and ramp metering. Developed a detailed primer on ramp metering, which includes significant material on benefits, system elements, communications and control strategies, an algorithm typology, and a detailed analysis of installed control systems.

Transportation Engineer; Capacity and Level of Service Analysis of Freeway Systems; 1997-1999. Played a key role in this project to develop a new freeway systems chapter for the Year 2000 *Highway Capacity Manual*. Lead on simulation analysis using CORSIM, INTEGRATION, and FREQ. Participated in key project team meetings, advising on technical and management issues.

Transportation Engineer; I-15 Design/Build; Salt Lake City, Utah; 1996. Directed team for simulation of single-point urban interchanges (SPUIs) and intersections using NETSIM and HCS. Developed simulation models using NETSIM, applied and analyzed results, and reported results to the design team. Worked with designers to improve designs for operations. Primary author of Design Study Report for signalized intersection operations.

Project Manager; U.S. 101 Highway Operational Analysis; San Mateo, California; 1998. Project manager for an effort to evaluate the effectiveness of freeway improvements, including high occupancy vehicle lanes, high occupancy toll lanes, ramp metering, and auxiliary lanes. Led the initial efforts of a team developing and applying the FREQ simulation model to the U.S. 101 freeway in San Mateo County, California, for current (1998) and horizon (2010) years.

Administrative Project Manager; NCHRP 3-55(4) *Performance Measures and Levels of Service in the Year 2000 Highway Capacity Manual;* 1996. Helped develop an integrated

system of performance measures, measures of effectiveness, and levels of service for the new version of the *Highway Capacity Manual* planned for the year 2000. Served as administrative project manager and lead technical editor on all project deliverables. Developed spreadsheets and users' guides for analytical methods for analyzing queues (LOS F) for both freeways and signal systems.

Transportation Engineer; Portland Traffic System Performance Evaluation; Portland, Oregon; 1995-1996. Researched approaches for applying performance measures and summarized and recommended options for choosing specific measures. Worked with client to refine indicators based on effectiveness, data availability, and costs. Applied all indicators using available data, and coordinated data collection activities for traffic counts and Global Positioning System (GPS) data collection. Developed postprocessing software for GPS data and spreadsheets for conversion to GIS data formats. Wrote the final report (and a similar TRB paper), and presented findings to the project technical advisory committee. Paper was eventually published in Transportation Research Record No. 1603.

Technical Lead; Portland Regional Parking Management Program; Portland, Oregon; 1993-1994. Technical lead on a project to evaluate the number of nonresidential parking spaces per capita in the Portland metropolitan region, with a goal of helping the Metropolitan Planning Organization reduce the number of parking spaces per capita in the region by 10 percent over the next 20 years. Parking management strategies were also identified and evaluated to help achieve the targeted reduction.

Lead Engineer; Central Salem Development Plan Regional Mobility Project; Salem, Oregon; 1994. Lead engineer on a project to help the City of Salem to develop a multimodal mobility plan for its downtown core that included recommendations of needed improvements and appropriate strategies to encourage changes in travel behavior. Analyzed deficiencies and recommended mitigating strategies in a task report, and presented the findings to an advisory committee.

Publications and Presentations

"'Long Enough': The Relationship Between Ramp Merge Length and Performance Per the HCM and Simulation". Presented at the 5th International Symposium on Highway Capacity and Quality of Service, Yokohama, Japan, July 2006.

"58 Things the HCM [Highway Capacity Manual] Can't Do". Invited presentation by the Highway Capacity and Quality of Service Committee. Presented at the 85th Annual Meeting of the Transportation Research Board, Washington, D.C., January 2006.

"Planning Urban Highway Reconstruction with Traffic Demand Affected by Construction Schedule" with Eul-Bum Lee and David Thomas, Journal of Transportation Engineering, October 2005.

"Comparison of Simulation Models and the HCM" with Mike Swenson and Bruce Haldors. Presented at the 82nd Annual Meeting of the Transportation Research Board, Washington, D.C. January 2003.

"An Innovative Approach for Linking TransCAD and CORSIM via Synchro" with Christine Warren and Ed Granzow. Presented at the ITE District 6 Annual Meeting, Palm Desert, California. July 2002.

"Calibrating the INTEGRATION Model." Presented at the HCQS Conference on Simulation Models and Quality of Service, Truckee, California. July 2001.

"Calibrating Simulation Models: Seeing Both the Forest and the Trees." Presented at the ITE District 6 Annual Meeting, Albuquerque, New Mexico. July 2001.

"Freeway Systems Research Beyond the HCM2000" with Adolf May, Nagui Rouphail, Fred Hall, and Tom Urbanik. Presented at the 80th Annual Meeting of the Transportation Research Board, Washington, D.C. January 2001. Accepted for Publication in the Transportation Research Record.

"A Comparison of the VISSIM and CORSIM Traffic Simulation Models" with Jim Dale. Presented at the Annual Meeting of the Institute of Transportation Engineers, Nashville, Tennessee. August 2000.

"A Comparison of the VISSIM and CORSIM Traffic Simulation Models on a Congested Network" with Jim Dale. Presented at the 79th Annual Meeting of the Transportation Research Board, Washington, D.C. January 2000. Accepted for Publication in the Transportation Research Record.

"Validation Results for Four Models of Oversaturated Freeway Facilities" with Fred Hall, Nagui Rouphail, Brian Eads, and Adolf May. Accepted for the 79th Annual Meeting of the Transportation Research Board, Washington, D.C. January 2000.

"Application of the INTEGRATION Model of the Salt Lake Metropolitan Area" with Tony Young and Hesham Rakha. Prepared for the ITE District 6 Annual Meeting, San Jose, California. July 1998.

"Capacity and Level of Service Analysis of Freeway Systems" with Dolf May, Stephen Cohen, Brian Eads, Fred Hall, Ajay Rathi, Nagui Rouphail, and Tom Urbanik. Prepared for the Third Internal Symposium on Highway Capacity, Copenhagen, Denmark. June 1998.

"Micro Simulation of a Large-Scale Network: The Salt Lake City Case Study" with Hesham Rakha, Michel Van Aerde, and X. Peter Huang. Transportation Research Record 1644. Originally prepared for the 77th Annual Meeting of the Transportation Research Board, Washington, D.C. January 1998.

"INTEGRATION Modeling of the Salt Lake Metropolitan Area" with X. Peter Huang and Ryan Christenson. Prepared for the ITE District 6 Annual Meeting, Salt Lake City, Utah. July 1997.

"The Institutional Challenges of Developing a Management Strategy for the San Francisco Bay Area: The Implications of ITS Planning and Deployment" with William R. Loudon. Prepared for the 7th Annual Meeting of ITS America, Washington, D.C. January 1997.

"Development and Application of the Portland Traffic System Performance Evaluation (TSPE) System" with Jamie Throckmorton and Terry Klim. Transportation Research Record 1603. Originally prepared for 76th Annual Meeting of the Transportation Research Board, Washington, D.C. January 1997.

"The Challenges of Developing an Interjurisdictional, Multimodal Transportation Management Strategy for the San Francisco Bay Area" with William R. Loudon. Prepared

for 76th Annual Meeting of the Transportation Research Board, Washington, D.C. January 1997.

"Simulation Modeling of the Santa Monica Freeway" with Adolf D. May. Institute for Transportation Studies working paper, Berkeley, California. 1994.

"Freeway Simulation with the INTEGRATION Model" with Yonnel Gardes, Adolf D. May, and Michel Van Aerde. Prepared for the ITE District 6 Annual Meeting, 1993 Compendium of Technical Papers.

"Freeway Detector Data Analysis for Simulation of the Santa Monica Freeway" (Initial Investigations and Summary Report) with Adolf D. May. Institute for Transportation Studies working papers, Berkeley, California. 1993.

Professional Organizations/Affiliations

Transportation Research Board (TRB), Highway Capacity and Quality of Service Committee member; chair of Traffic Simulation Applications subcommittee; member of Uninterrupted Flow subcommittee

Institute for Transportation Engineers

Supplemental Information

Supplemental—Miscellaneous

Employee Number

17291

Global Employee Number

INC00017291

255 Data

Month and year employed by CH2M HILL: September 1998

Years with other firms: 8

Dates degrees conferred: M.E., 1994; M.S., 1993; B.S., 1989

Date/state of active registration: 2000/California

Registration/certification number: Professional Engineer/2060

Last Updated

March 16, 2006

Matthew M Franck

Education

B.S., Environmental Policy Analysis and Planning

Relevant Experience

Mr. Franck is an environmental planner with CH2M HILL. He has 15 years of experience in managing and writing environmental impact assessment documents in compliance with NEPA and CEQA. He also coordinates local, state, and federal regulatory processes. Mr. Franck's education and multidisciplinary experience, as well as his expertise in land use and resource planning, provide a solid background for evaluating complex environmental policy issues.

Representative Projects

- **AFC for Eastshore Energy Center, Tierra, City of Hayward, California (2006).** Task manager for Applications for Certification before the California Energy Commission; Lead author for Water Resources and Water Supply sections.

- **AFCs for Walnut Creek Energy Park and Sun Valley Energy Project, Edison Mission Energy, City of Industry/Romoland, California (200 to 2006).** Provided support for two Applications for Certification before the California Energy Commission for similarly designed 500-MW natural gas-fired peaking power plants using the GE LMS100 advanced gas turbine technology. These applications were prepared in parallel and were filed at the Energy Commission within one week of one another. The AFCs were filed in December of 2005 and the projects are scheduled to begin construction in 2007.

- **AFC for AES Highgrove Project (2004 to present).** Task Lead for Water Resources section, including analysis of constituent concentrations in effluent under various scenarios. Lead author for water resources section (under preparation).

- **AFC for Roseville Energy Park, Roseville Electric, Roseville, California (2003 to 2005).** Provided support for Application for Certification before the California Energy Commission for a 160-MW natural gas-fired power plant in Roseville, California.

- **AFC for San Francisco Electric Reliability Project, Public Utilities District for the City and County of San Francisco, California (2003 to**

present). Task Manager for the preparation of the Water Resources section of this Application for Certification, a California Energy Commission process that is functionally equivalent to CEQA. The CEQA-equivalent evaluation is focuses on water, wastewater, and stormwater generation and use by the proposed facility in the context of Citywide compliance with the federal Clean Water Act and state Porter-Cologne Water Quality Control Act.

- **SPE for Modesto Irrigation District Electric Generation Station, Modesto Irrigation District, Ripon, California (2003 to 2004).** Task Manager for the preparation of the Water Resources section of this Small Power Plant Exemption, a California Energy Commission process that is functionally equivalent to CEQA. The CEQA-equivalent evaluation focused on water, wastewater, and stormwater generation and use by the proposed facility in compliance with the federal Clean Water Act and state Porter-Cologne Water Quality Control Act.

- **Ongoing Environmental Documentation and Permitting Support, OMI-Thames Water, Stockton, California (2003).** Task Manager for environmental documentation and permitting support for the contract operation of the City of Stockton's wastewater, water, and stormwater infrastructure. To date, the major task in this support effort has been the coordination of a contractor's preparation of an Environmental Impact Report under CEQA for the upgrade of the City's wastewater treatment plant in accordance with Clean Water Act requirements. Another major task is the preparation of an application to the U.S. Coast Guard for a new utility bridge crossing of the San Joaquin River, including a NEPA Environmental Assessment. The utility bridge project has also included extensive agency coordination with the National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Fish and Game, Central Valley Regional Water Quality Control Board, and state and local levee agencies.

- **Bradshaw Interceptor and Road Widening, Sacramento Regional County Sanitation District, Sacramento, California (1996 to 2002).** Task Leader for the coordination of all environmental permit activities to the construction of a large-diameter sewer interceptor along Bradshaw Road in Sacramento County, and the widening of the road from two to four lanes. Permitting agencies include the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, California Department of Fish and Game, Central Valley Regional Water Quality Control Board, and the State Historic Preservation Officer. Managed staff in wetland delineation and special-status species surveys. Also coordinated with the County's Department of Environmental Review

and Assessment to ensure the completion of environmental documentation for the project.

- **Water Treatment Plant Expansion, City of Sacramento, California (2001).** Coordinated preparation of the City of Sacramento's Environmental Impact Report to assess the planned expansion of the E.A. Fairbairn and Sacramento River Water Treatment Plants. Responsible for preparing and coordinating the preparation of all impact sections. The EIR required project-level impact considerations that included the application of PROSIM, a hydrologic model used to simulate Central Valley Project water deliveries.

- **Use Permit for Land Treatment of Agricultural Process Wastewater, Colusa Industrial Properties, Colusa, California (1998 to 2003).** Task Leader for the preparation of a CEQA Initial Study for the use of a parcel of land for land disposal of agricultural process wastewater. The Initial Study was required to satisfy Colusa County Use Permit requirements. Prepared entire Initial Study with the assistance of soil scientists and water quality specialists. Assisted in the regulatory process for the issuance of Waste Discharge Requirements by the Central Valley Regional Water Quality Control Board.

Clint Helton, M.A., RPA Role: Cultural Resources
Location: Santa Ana, CA

Years Experience: 10

Registrations/Certifications:

Registered Professional Archaeologist (No. 11280)

Education:

MA, Anthropology, Brigham Young University

BA, Language and Literature, University of Utah

Distinguishing Qualifications

- *Strong background in environmental impact evaluations, with particular expertise in conducting cultural resources studies in CA, CO, ID, NV, UT, WY*
- *10 years of environmental management experience in the western U.S.*
- *Meets Secretary of Interior Professional Qualification Standards (36CFR61)*
- *Highly experienced managing cultural and paleontological resources studies for large linear transportation and utility projects to meet federal requirements of National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), and standards of Federal Energy Regulatory Commission (FERC).*

Summary of Relevant Work Experience:

Mr. Helton has more than 10 years of environmental management experience in the western United States. He has a strong background in environmental impact evaluations, having directed technical studies; negotiated with lead agencies, responsible agencies and clients; and has written, edited, and produced a substantial number of environmental review and technical documents. His knowledge of regulatory compliance and cultural and paleontological resources enables him to manage National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance activities and document preparation. Mr. Helton is a particularly skilled practitioner of federal regulations governing treatment of cultural resources, especially Section 106 of NHPA (36CFR800) and the Native American Graves Protection and Repatriation Act (NAGPRA) (43CFR10). Additionally, Mr. Helton is experienced with the challenges of preparing environmental documentation for large linear utility projects, including large interstate pipelines, and is familiar with the process and guidelines of the Federal Energy Regulatory Commission (FERC) among others. Mr. Helton has authored numerous environmental technical reports, cultural resources management plans, cultural resources studies, Programmatic Agreements, Memorandums of Understanding (MOU), and contributed to many NEPA documents for a variety of private and public sector clients.

Specific Relevant Work Experience:

Task Manager, Tierra, Eastshore Energy Center, CA. Assisted with preparation of Application For Certification for California Energy Commission in support of this proposed

power generation facility in Hayward, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

Task Manager, State Route 79 Realignment Project, Riverside County, CA. Task Lead, quality control manager, and overall management of cultural and paleontological resources studies for this 19-mile highway realignment project in Riverside County, California. Provide regulatory guidance, regional technical expertise in cultural resources and coordination of subconsultants. The inventory comprises over 7,100 acres in the vicinity of the cities of Hemet and San Jacinto. Frequent consultation and coordination with Riverside County Transportation Commission (RCTC) and Caltrans.

Task Manager, State Route 79 Widening Project, Riverside County, CA. Task Lead, quality control manager, and overall management of cultural resources studies for this highway widening project in Riverside County, California. Provide regulatory guidance, regional technical expertise in cultural resources and coordination of subconsultants. Frequent consultation and coordination with Riverside County Transportation Department (RCTD) and Caltrans.

Technical Specialist, Clinton Keith Road Extension Project, Riverside County, CA. Performed cultural resources survey and report preparation for this road widening and realignment project. Project was generally located between I-215 and SR 79 in the City of Murrieta and in Riverside County.

Deputy Project Manager, AES Pacific Inc., Highgrove Power Plant, CA. Co-managed preparation of environmental analysis component of Application For Certification for California Energy Commission in support of this proposed natural gas fired 300-MW peaking power generation facility in Riverside County, California. Responsible for preparation of cultural resources component of project, as well as an interdisciplinary team of environmental specialists including archaeologists, biologists, and paleontologists.

Task Manager, City of Vernon, Vernon Power Plant, CA. Assisted with preparation of Application For Certification for California Energy Commission in support of this proposed 800-MW power generation facility in Los Angeles County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

Task Manager, Edison Mission Energy, Walnut Creek Energy Park Power Plant, CA. Assisted with preparation of Application For Certification for California Energy Commission in support of this proposed 500-MW power generation facility in Los Angeles County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

Task Manager, Edison Mission Energy, Sun Valley Energy Center Power Plant, CA. Assisted with preparation of Application For Certification for California Energy Commission in support of this proposed 500-MW power generation facility in San Bernardino County,

California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

Project Principal/Quality Control Manager, Western Area Power Administration, Transmission Line Project, Imperial County, CA. Provided overall management of cultural resources services for the Parker-Blythe #1 161-kilovolt (kV) transmission line project. The inventory extended from Blythe, California, to Parker, Arizona. A total of 147 sites (136 in California and 11 in Arizona) were recorded.

Project Manager, Sacramento Municipal Utility District (SMUD) Cosumnes Power Plant and Gas Pipeline Project, Environmental Compliance, Sacramento, CA. Managed interdisciplinary team of over 20 environmental specialists including archaeologists, biologists, and paleontologists during construction of 26-mile gas pipeline and associated power generation plant. Contract value was over $2.0 million.

Project Manager, 700-mile Kern River Pipeline Expansion Project; WY, UT, NV, and CA. Managed major cultural resources services contract with Williams Gas Pipeline, in support of the 700-mile Kern River Pipeline Expansion Project, traversing Utah, Nevada, Wyoming, and California. Mr. Helton was individually sought by Williams Gas Pipeline to provide regulatory guidance, regional technical expertise in cultural resources, project management support, as well as to provide leadership as the agency and subcontractor liaison for the project, given the size, complexity, multistate and multijurisdictional challenges and aggressive schedule of the project. Assisted from project initiation with facilitation of project Programmatic Agreement and led coordination meetings with stakeholder agencies and permitting authorities in California, Utah, Nevada, and Wyoming as well as FERC. Coordinated the activities of three subconsultants as well as the internal project team. Developed creative strategy to mitigate impacts to a large number of National Register eligible cultural sites. Contract value was over $3.0 million.

Project Principal, Williams Pipeline, Rockies Expansion Pipeline Construction, WY, ID. Provided overall management of cultural resources and paleontological resources compliance monitoring services for the Rockies Expansion pipeline construction project.

Project Manager, Adesta Communications Fiber Optic Project, Grand Junction, CO to Salt Lake City, UT. Managed all aspects of cultural and paleontological resources compliance for the 260-mile utility project. Assisted with preparation of environmental assessment (EA) for NEPA compliance. Provided project development, agency coordination, management of project budget and staff, supervision of field crews, identification and recordation of historic and prehistoric resources, laboratory analysis, and report preparation. Contract value was over $1.0 million.

Project Principal, Questar Pipeline Company, Mainline 104 Pipeline Project, UT. Managed cultural resources component of the Mainline 104 natural gas pipeline project, 75 miles of 24-inch-diameter natural gas pipeline from Price to Elberta, Utah, across Carbon, Emery, Sanpete, and Utah Counties, including the Manti-LaSal and Uinta National Forests, BLM, state, and private lands. Coordinated with officials from BLM, State Trust Lands, U.S. Department of Agriculture (USDA) Forest Service, and State Historic Preservation Office (SHPO).

Field Director, Legacy West Davis Highway Excavation Project, Salt Lake City, UT.
Directed field excavation of large Archaic to Late Prehistoric site. Twelve-week test pitting phase included over sixty 2-by-2-meter test pits. Consulted and participated with local Native American Tribal representatives. Laboratory analysis of ceramic, lithic, and bone artifacts. Contributed to final report.

Thomas A. Lae, PG
Project Manager/Geologist

Education

Bachelor of Science – Geology. California State University, Fullerton

Professional Registrations

State of California Profession Geologist, **License No. 7099**

Relevant Experience

Mr. Lae has more than 16 years of experience in environmental geology and project management and is a California Professional Geologist. Mr. Lae serves as a project or task manager on numerous projects for a variety of private, federal and municipal clients. Projects include section preparer for numerous power plant licensing projects, Superfund site investigations, remedial investigations/feasibility studies, underground storage tank/oil water separator closures, landfill groundwater monitoring, phase II environmental assessments, among others.

Representative Projects

- **Electrical Power Plant Application for Certification section preparer.** Mr. Lae has prepared Geologic Hazards and Resources sections for 14 AFCs. These include East Altamont Energy Center (Calpine), Central Valley Energy Center (Calpine), Los Esteros Energy Center (Calpine), Cosumnes Power Plant (SMUD), Woodland II (Modesto Irrigation District), Modesto Electric Generation Station (Modesto Irrigation District), Walnut Energy Center (Turlock Irrigation District), San Francisco Electrical Reliability Project (San Francisco Public Utilities Commission), Highgrove (AES Pacific),Walnut Creek Energy Project (Edison Mission Energy), Sun Valley Energy Project (Edison Mission Energy), Eastshore Energy Project (Tierra), South Bay Energy Facility (Duke) and Chevron SPPE. Mr. Lae is well versed in the assessment of geologic resources and hazards relating to CEQA and NEPA requirements.
- **Superfund Site Investigation Oversight.** CH2M HILL provides oversight support to the USEPA, with Mr. Lae serving as project manager. This project involves the review and comment of reports, white papers, technical memoranda, studies, etc. that are prepared by Aerojet or their contractors and submitted for regulatory oversight. Aerojet is a facility that has been impacted by solvent, fuel, propellant, and metals contamination.
- **Groundwater Study/Well Decommissioning.** Mr. Lae serves as the project manager for TO 467 at Beale AFB. This project involves the installation of groundwater monitoring wells and the collection of groundwater samples to assess the effects of potential impact to the underlying groundwater from a retention pond that receives treated waste water. In addition, this project requires the decommissioning of several former water/agricultural supply wells at the base per County and State destruction protocol.

- **Soil Vapor Extraction System Termination.** Mr. Lae served as the project manager for the IC27 STOP project at former McClellan AFB. This project involved the collection of soil gas samples and the preparation of report documentation to support the SVE system termination (closure). The project successfully met regulatory criteria and system termination was granted. The project also required the decommissioning of the system wells and conveyance pipelines.
- **Superfund Site Investigations.** Mr. Lae serves as a project (site) manager for the Cooper Drum superfund site, located in Southgate, CA. This project involves the evaluation and remedial investigation of soil and groundwater contamination from past releases at a drum recycling center. Mr. Lae also serves as a task manager for the Lava Cap Mine site in Nevada City, CA. This project is a site that has been affected by arsenic contamination from past gold mine processing.
- **Oil /Water Separator Closure Investigation.** Mr. Lae serves as the project manager for three projects at Beale AFB in the evaluation for regulatory closure of 25 former oil/water separators across Beale. The project included the assessment of environmental impacts to underlying soil and groundwater from past releases and preparing closure documentation. Mr. Lae has successfully received closure of 23 OWSs. Two OWSs are undergoing biovent remediation.
- **Groundwater Monitoring.** For the City of Roseville, CA, Mr. Lae serves as the project manager for the Annual and Semi-Annual groundwater reports for the former sanitary landfill. Duties include planning sampling events, evaluation of laboratory data, preparation of graphics and tabular data, and report writing. Mr. Lae also supports landfill gas studies at the site.
- **UST and Oil Water Separator Investigation.** Mr. Lae served as the project manager for three U.S. Navy project sites at Rough and Ready Island, Stockton, CA. These projects involved the evaluation of soil and groundwater contamination at sites with underground storage tanks or oil water separators. Soil and groundwater samples were collected and analyzed to determine the presence or absence of contamination. Each of the three sites was successfully evaluated and a determination of "No Further Assessment" was received by the RWQCB.
- **Phase II Environmental Assessment.** As a project manager, Mr. Lae conducted a Phase II environmental assessment for the City of Roseville of a former tire fire site with lead contamination. Duties include the work plan preparation, conducting field work, data review and report preparation.
- **Remedial Investigations.** Mr. Lae serves as a task manager/team member for several on-going investigations at both Beale AFB and former McClellan AFB, CA. Duties include site supervision of both junior and subcontractor staff, site management, and report writing. Report writing duties include reviewing field and laboratory data; determining nature and extent of contamination; developing graphic aids to illustrate contaminant distributions; identifying data gaps; presenting findings to upper management and clients; creating field sampling plans; and performing third-party document review, among other tasks.
- **Phase 3 Removal Action, Castle Airport, Merced, CA.** Field supervisor of three crews during installation of 18 injection, extraction, and monitoring wells drilled with air rotary casing hammer and mud rotary drilling methods. Duties included preparing schedules, implementing overall project field sampling plans, supervising field staff, reviewing boring logs, overseeing subcontractors, assuring quality compliance of staff

and subcontractors, designing wells, interpreting downhole geophysical logs, conducting well development, serving as laboratory and client project contact, compiling daily and monthly status reports, and tracking budgets.

- **Groundwater Well Installation, Castle Airport, Merced, CA.** Field supervisor for installation of deep groundwater wells to monitor removal action at Castle Airport. The monitoring wells were drilled using mud-rotary drilling equipment, and designs were based on downhole geophysical surveys. Duties included overseeing subcontractor, logging subsurface geologic data, collecting and interpreting in-situ groundwater samples, interpreting geophysical surveys, and designing and developing wells.
- **Field Work, McClellan AFB and Castle AFB, CA.** As staff geologist, duties included providing site reconnaissance and placement of boring/sampling locations; supervising subcontractors; enforcing project quality assurance plan; logging lithologic samples; collecting soil, soil gas, and groundwater samples; ensuring health and safety plan compliance of subcontractors; training new field staff on established protocols; generating daily progress reports; tracking waste containers; assisting in the placement, design, and construction of soil vapor extraction, nested soil vapor monitoring, and groundwater extraction wells; conducting subsequent step, drawdown, and long-term pumping well tests for groundwater wells; and performing SVE tests.
- **Project Geology Tasks, Various Clients and Locations.** Conducted Phase I and Phase II environmental assessments and remedial investigations. Duties included regulatory agency contact, site reconnaissance, historical aerial photograph and map review, report preparation, development of Phase II work plans, preparation of health and safety plans, work plan implementation, data collection and interpretation, and final report preparation. Also provided groundwater well design and installation, including placement of bore locations, soil sampling, logging of drill cuttings, monitor well casing design, groundwater sample collection, conducting slug tests, and report preparation. Provided construction observation of municipal-supply wells for numerous cities and agencies throughout Orange County. Duties included oversight of subcontractors, lithologic collection and description, sieve analyses, geophysical log interpretation, assistance with casing design, well development, test-pump and data collection and interpretation, and report preparations. Performed underground storage tank assessments/removals, including subcontractor coordination, initiating permit acquisitions, soil sampling, and report preparations.

Certifications/Training

OSHA 40-Hour HAZWOPER
OSHA 8-Hour Refresher
OSHA 10-Hour Construction Safety Training
OSHA 8-Hour Supervisor's Training
DOT Sample Packaging and Shipping
Hydrogeology Extension Course (CSUS)
Innovative Soil Gas Monitoring and Remediation Applications (seminar)
Soil Sampling for Volatile Organics (seminar)
Level "B" Experienced
Bloodborne Pathogens

Steve Long
Soils and Agriculture

Education

M.S., Soil Science
B.S., Forest Resources

Professional Registrations

Soil Science Society of Southern New England

Relevant Experience

As an environmental scientist, Mr. Long is responsible for a wide range of tasks associated with natural resource and hydrogeologic environmental evaluations. Duties include evaluating contaminants study results for surface water, sediment and biota, relating land use to surface water quality, preparation of proposals, field data collection, interpretation, and preparation of reports and presentation of results.

His natural resource experience includes 17 years of evaluation of wetland systems. Duties have included delineation and documentation of wetlands by federal and state criteria in California, Nevada, Connecticut, Massachusetts, New York, New Hampshire, and Maine; evaluation of project constraints and development of alternate strategies for local, state, and federal permitting. Recent participation in Superfund site ecological risk assessment for stream impacts and air monitoring programs for public health risk assessments.

Hydrogeological experience includes in-field testing of soil, soil gas and groundwater samples using portable gas chromatograph; in-situ aquifer permeability testing; monitoring subsurface explorations and installations (monitoring wells, piezometers and vapor extraction systems); environmental sampling and analytical testing; and development of contaminant transport hydrogeologic models. Strong skills in onsite chemical testing; description and taxonomic classification of soils, vegetation, and insects; permitting of wetland activities; and statistical analyses of groundwater analytical data.

Representative Projects

Eastshore Energy Center, Tierra (2006). Prepared CEQA-equivalent documentation to support an Application for Certifications (AFC) for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). This documentation also included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from water erosion during construction, and agencies contacts.

Application for Certification, Los Esteros Critical Energy Facility, Calpine C*Power, San Jose, California (2001 to present). Prepared Biological Resources Mitigation and

Monitoring Plan (BRMIMP) for the Los Esteros Critical Energy Facility. Also documented the extent of jurisdictional waters of the U.S. at a stormwater outfall along Coyote Creek. Prepared a Low Effect Habitat Conservation Plan for the Phase II Facility. This plan was submitted for Section 10 consultation with the U.S. Fish and Wildlife Service to secure an incident take permit for Bay Checkerspot butterfly and to offset potential impacts to four endemic serpentine plants under the Endangered Species.

Application for Certification, East Altamont Energy Center, Calpine Corp., Tracy, California (2001 to 2002). Prepared CEQA-equivalent documentation to support an Application for Certifications (AFC) for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). This documentation also included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from wind and water erosion during construction, and agencies contacts. Additionally, conducted field investigations to assess wetlands in proximity to linear routes for the East Altamont Energy Center.

San Joaquin Valley Energy Center, Calpine Corp., City of San Joaquin, California (2001 to 2002). Prepared CEQA-equivalent documentation to support an Application for Certifications (AFC) for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). This documentation also included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from water erosion during construction, and agencies contacts.

Metcalf Energy Center, Calpine Corp., San Jose, California (2001 to present). Conducted field investigations to support Metcalf Energy Center Application for Certification. Field investigations included assessment of riparian biological resources in proximity to site and delineation of wetlands in proposed floodwater retention area. Produced riparian mitigation planting plan. Assisted biological construction monitoring in June 2005 by conducting survey for birds nests along fencing re-alignment.

Delta Energy Center Project in Contra Costa County, California for Calpine/Bechtel, San Francisco, California (1998 to 2000). Completed NPDES permit application for Pittsburgh Delta Energy Center for submittal to Bay Area Regional Water Quality Control Board.

Confidential Southern California Power Project (2004 to present). Prepared CEQA-equivalent documentation to support an Application for Certifications (AFC) for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). This documentation also included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from wind and water erosion during construction, and agencies contacts.

Walnut Energy Center, Turlock Irrigation District (2003). Prepared CEQA-equivalent documentation to support an AFC for review by the California Energy Commission. Prepared AFC section that assessed potential impacts to soil and agricultural resources for the proposed power plant projects including all linear features (transmission lines, water supply and discharge lines, and natural gas supply lines). This documentation also included a summary of applicable laws, ordinances, and regulations (LORS), estimates of soil losses from wind and water erosion during construction, and agencies contacts. Prepared Response to Comments from the CEC.

Sarah Madams

Waste Management
Hazardous Materials

Education

B.S., Environmental Toxicology

Relevant Experience

Ms. Madams has more than 9 years of professional experience including project management, regulatory compliance, permitting, public involvement/community relations, data collection and analysis, database management, compliance audits, document preparation, and technical writing. For the last 4 years, Ms. Madams has served as the Deputy Project Manager for power plant licensing work performed by CH2M HILL. Her expertise includes working with multidisciplinary teams to assess the environmental impacts of power plant projects on the environment. These assessments include impacts to air, biological and cultural resources, land uses, noise, socioeconomics, public health, water and visual resources, soils and geology, and paleontology.

Representative Projects

Eastshore Energy Center, Tierra, Hayward, California (2006). Task coordinator for the AFC. Prepared the Waste Management and Hazardous Materials sections.

Confidential Southern California Power Project (2004 to present). Project Coordinator for the AFC for a 100-MW power plant. She reviewed applications, coordinated multidisciplinary data requests and responses, and served as liaison and coordinated efforts between CEC project management and staff.

Application for Certification, Los Esteros Critical Energy Facility, Calpine C*Power, San Jose, California (2002 to 2003). Project Coordinator for the AFC for a 180-MW power plant. The project required the preparation of numerous other studies/documents to satisfy the CEC staff request. These studies/documents included the preparation of a General Plan amendment and planned development zoning applications, archaeological and paleontological survey reports, and biological resource protection permits. Ms. Madams assisted with the development and implementation of biological, cultural, and paleontological resource monitoring programs; risk management plan; and traffic and transportation management plan. The plant is currently in operation.

Application for Certification, San Francisco Electric Reliability Project, San Francisco Public Utilities Commission, California (2003 to present). Project Coordinator for the AFC for a 145-MW simple-cycle power plant. She reviewed applications, coordinated multidisciplinary data requests and responses, attended public workshops, and prepared a site investigation report for the process water route. Assisted in preparation of Hazardous Materials and Hazardous Waste Sections for the AFC. In addition, she served as liaison and coordinated efforts between CEC project management and staff.

Small Power Plant Exemption, MID Electric Generation Station (MEGS), Modesto Irrigation District, California (2003). Project Coordinator for the SPPE for a 95-MW peaking plant. She reviewed applications, coordinated multidisciplinary data requests and responses, and served as liaison and coordinated efforts between CEC project management and staff.

Application for Certification, Walnut Energy Center, Turlock Irrigation District, California (2002 to 2003). Project Coordinator for the AFC for a 250-MW combined cycle power plant. She reviewed applications, coordinated multidisciplinary data requests and responses, and coordinated efforts between CEC project management and CH2M HILL staff. Ms. Madams assisted with the development of the security plan and emergency response plan.

Application for Certification, Salton Sea Unit 6 Geothermal Power Plant, Mid-American Energy Holding Company, Imperial County, California (2002 to 2004). Project Coordinator for the licensing of the 185-MW geothermal power plant. The power plant design was based on the flash geothermal power plant process, which produces both solid and liquid byproducts that required disposal. The project site was in a rural area of Imperial County, but was adjacent to a National Wildlife Refugee that supports significant populations of avian species. The licensing process involved the review of all environmental areas, and specifically focused on waste disposal, air quality, hazardous materials handling, and biological resources. Ms. Madams was responsible for the development and tracking of data response submittals requested by the CEC. The project was successfully completed, with a license issued by the CEC.

Various Power Plant Applications for Certification (AFCs) – Prepared or assisted on the Worker Health and Safety sections. In addition prepared Field Safety Instructions, Health and Safety Plans and served as the Site Safety Coordinator for the following power plant Applications for Certification:

- San Francisco Electric Reliability Project (2003 to present)
- Walnut Creek Energy Park (2005 to present)
- Sun Valley Energy Project (2005 to present)
- Confidential Southern California Power Project (2004 to present)

Air Quality Audits, SMUD, California (2004). Conducted air quality audits of the Central Valley Finance Authority's Carson Energy Facility and McClellan Gas Turbine Facility. Responsibilities included assisting with the development of the pre-audit checklist and field interview forms, conducting field interviews and audits, and assisting with summarizing and presenting findings in the final audit report.

Initial Study, August Substation, Turlock Irrigation District, California (2004). Managed the preparation of an Initial Study for the construction and operation of a proposed substation in Hilmar. The IS evaluated all environmental resources and identified mitigation for significant impacts. She also prepared the hazardous materials portion of the IS.

Environmental Assessment, Sierra Army Depot, Herlong, California (2003). Assisted in preparation of the hazardous materials impacts and mitigation for the Environmental Assessment for the Child Development Center and Railroad Loop project at Sierra Army

Depot. The EA evaluated the potential impacts on biological resources, hazardous materials, and visual resources for the two proposed projects.

Environmental Assessment, Federal Highway Administration, Hyampom, California (2003 to present). Prepared the hazardous materials impacts and mitigation for the Environmental Assessment for the reconstruction of California Forest Highway 114 in the Shasta-Trinity National Forest. An initial site assessment for the route was prepared in conjunction with the EA.

Health and Safety Audits, Various Clients, Bay Area, California (1998 to 1999). Managed environmental health and safety compliance programs for multiple confidential clients within the San Francisco Bay Area. Performed weekly site inspections of hazardous waste storage facilities and satellite accumulation areas. Reviewed safety plans and conducted safety inspections in preparation for Cal-OSHA audits. Prepared reports of findings, advised clients on compliance deficiencies, and corrected deficiencies prior to audits. Collected, profiled, packaged, and shipped hazardous waste from customer site to Treatment, Storage and Disposal Facilities (TSDF)

Thomas J Priestley

Education

Ph.D., Environmental Planning
M.L.A., Environmental Planning
M.C.P., City Planning
B.U.P., Urban Planning

Relevant Experience

Dr. Priestley has over 25 years of professional experience in urban and environmental planning and project assessment. He has broad knowledge of methods used for siting electric generation, transmission, and substation facilities and mitigating their land use and aesthetic effects. He has specialized expertise in evaluation of project visual impacts, and has been involved in more than 75 visual assessment efforts. As the senior professional in the visual resources practice in CH2M HILL's Western Region, he has oversight of visual resource analysis activities in the western states, with an emphasis on issue scoping, study design, mobilization of appropriate staff and technologies, and senior review of final products.

Representative Projects

- **AFCs for Walnut Creek Energy Park and Sun Valley Energy Project, Edison Mission Energy, City of Industry/Romoland, California (2005 to 2006).** Provided support for two Applications for Certification before the California Energy Commission for similarly designed 500-MW natural gas-fired peaking power plants using the GE LMS100 advanced gas turbine technology. These applications were prepared in parallel and were filed at the Energy Commission within one week of one another. The AFCs were filed in December of 2005 and the projects are scheduled to begin construction in 2007.

- **AFC for Roseville Energy Park, Roseville Electric, Roseville, California (2003 to 2005).** Provided support for Application for Certification before the California Energy Commission for a 160-MW natural gas-fired power plant in Roseville, California.

- **Visual Resource Impact Analyses of Gas-fired Power Plants, Various Locations, California.** As the project analyst, senior advisor/reviewer, or special consultant, involved in the evaluation of the potential visual resources impacts of 18 major gas-fired power plant projects proposed for a variety of urban and rural settings in both Southern and Northern

California. Identified visual issues, designed the analysis strategies, contributed to development of architectural and landscape treatments, prepared visual resource analyses for the Applications for Certification submitted to the California Energy Commission, reviewed and critiqued relevant sections of the Energy Commission's analyses of the projects, and evaluated the visual issues associated with CEC-proposed alternative sites. As an expert witness on visual resources, prepared written testimony and provided oral testimony in hearings before the California Energy Commission. Specific projects for which Dr. Priestley has made major contributions to the evaluation of visual resource issues include:

- Eastshore Energy Center, Hayward, California (2006)
- AES Highgrove Project, San Bernardino County, California (2005)
- Inland Empire Energy Center, Riverside County, California (2001 to 2003)
- Salton Sea Geothermal Unit 6, Imperial County, California (2002 to 2003)
- Metcalf Energy Center, Santa Clara County, California (1998 to present)
- East Altamont Energy Center, Alameda County, California (2001 to 2003)
- Los Esteros Critical Energy Facility, Santa Clara County, California (2001)
- San Francisco Electric Reliability Project, San Francisco, California (2003 to present)
- Modesto Irrigation District Electric Generation Station, San Joaquin County, California
- (2003 to 2004)
- Walnut Energy Center, Stanislaus County, California 2002 to present)
- Woodland Generation Station 2, Stanislaus County, California (2001 to 2003)

- Delta Energy Center, Contra Costa County, California (1998 to 2003)
- Sutter Power Project, Sutter County, California (1997 to 1999)
- Gilroy Energy Center Phase I and Phase II Projects, Santa Clara County, California (2001 to 2002)
- Rio Linda Power Plant, Sacramento County, California (2000 to 2001)
- Newark Energy Center, Alameda County, California (1999)
- Elk Hills Power Project, Kern County, California (1988 to 1989)
- San Joaquin Valley Energy Center AFC (2001 to 2003)
- SMUD Cosumnes Power Plant AFC (2001 to 2003)

- **AFC for Los Medanos Energy Center, Contra Costa County, California (2000).** Provided post-licensing assistance to the client related to visual resource issues associated with this 500-MW combined-cycle power plant located in the City of Pittsburg. Assisted the applicant in selecting color treatment for project facilities and with securing of CEC approval. Consulted on the development of a landscape plan to mitigate the visual effects of a relocated underground transmission line and assisted in securing CEC approval of the mitigation plan.

- **Proponent's Environmental Assessment, Jefferson-Martin Transmission Project, San Mateo County, California (2002 to 2004).** Senior reviewer and consultant for an analysis of the aesthetic issues associated with the proposed replacement of a 14.7-mile segment of an existing transmission line with a 230-kV line on larger towers. The transmission line's location in an open space area prized for its scenic qualities and in proximity to affluent residential areas made the visual issues a sensitive and critical dimension of this project, requiring an intensive degree of analysis.

Jennifer Scholl

Senior Project Manager

Education

B.A. University of California, Santa Barbara, Environmental Studies and Political Science International Relations, 1989

Distinguishing Qualifications

- Project management
- NEPA/CEQA compliance
- Industrial Facility Siting Studies
- Environmental planning and permitting
- Permit compliance management
- Land use planning
- Socioeconomic evaluation
- Public participation and community involvement

Relevant Experience

Ms. Scholl has more than seventeen years of experience in environmental planning and permitting of complex and controversial development projects. Specifically, Ms. Scholl has been involved with the permitting and construction compliance for power generation projects and ancillary facilities (i.e., transmission, gas, water, and sewer lines) and offshore oil and gas facilities with onshore processing and storage components in California. In addition to serving in a management capacity, Ms. Scholl's specific emphasis on these projects has been to conduct the land use and socioeconomic analyses. She also has extensive experience in leading Public Participation Programs. Prior to her work in private consulting, Ms. Scholl managed the permitting and environmental review of major oil and gas development projects, resort and residential developments, and oversaw the implementation of mitigation monitoring plans for the Santa Barbara County Planning and Development Department. Prior work experience includes the following:

Representative Projects and Dates of Involvement

Market Segment Projects

Electric Power Generation Experience

Project Manager; Lompoc Wind Energy Project Environmental Impact Report (EIR); Lompoc, Santa Barbara County; California; August 2006 – Present. Project Manager for preparation of an EIR for the development of a 120 MW wind energy electrical generation project on private ranch land in the Lompoc Valley. Public Draft expected to be released in May 2007.

Assistant Project Manager; Eastshore Energy Center; City of Hayward; Alameda County; California; June 2006 – Present. Assistant Project Manager for preparation of an Application for

Certification (AFC) (CEQA EIR equivalent) to the California Energy Commission (CEC) for a 115 MW peaker power plant in the City of Hayward. Responsible for assisting the Project Manager with day-to-day coordination with the client, CEC, and City of Hayward staff for addressing agency requirements. AFC submitted to the CEC in September 2006 and is expected to go through AFC processing and be approved and in commercial operation in 2009.

Project Manager; Pastoria Energy Facility 160 MW Expansion Project; Calpine Corporation; Kern County; California; October 2004 to August 2006. Project Manager for preparation of an AFC to the CEC for a 160 MW simple cycle addition to the existing Pastoria Energy Facility in southern Kern County. Responsible for day-to-day coordination with the client and CEC staff for addressing agency requirements. AFC submitted to the CEC in April 2005 and is expected to go through AFC processing and be approved and in commercial operation in Summer 2007.

Land Use Task Leader; South Bay Replacement Project; City of Chula Vista; San Diego County; California; June 2006 – Present. Land Use Task Leader for preparation of the Land Use Section of an AFC to the CEC for a 500 MW combined-cycle replacement project for the existing South Bay Power Plant. Responsible for evaluating the land use compatibility issues related to jurisdictional issues associated with the City of Chula Vista, California Coastal Commission, CEC, and the Unified Port of San Diego. AFC submitted to the CEC in June 2006 and currently going through CEC AFC processing.

Project Manager; Pastoria Energy Facility; Enron Capitol and Trade Resources; Kern County California; July 1998 to May 2001. Project Manager for preparation of an AFC to the CEC for a 750 MW cogeneration plant and ancillary facilities in southern Kern County (issue areas covered in the AFC included socioeconomics, land use, air quality, geology, water quality, biology, cultural and paleontological resources, traffic, hazards, public health, and worker safety. Responsibilities also included: preparation of a preliminary siting and issue screening study, and management of post filing activities (data adequacy, data responses, represent project before the CEC, participate in evidentiary hearings, and day-today project management) and pre-construction compliance planning.

Project Manager; Pastoria Energy Facility Construction Compliance; Calpine Corporation (ownership transferred from Enron to Calpine in May 2001); Kern County; California; January 2001 to Summer 2005. Project Manager for environmental compliance for pre-construction and construction activities. Construction was initiated in June 2001 and the project began commercial operations in Summer 2005. Responsibilities included managing the following activities: providing ongoing compliance support, preparing and docketing CEC license amendments, assisting with agency coordination, preparing compliance plans, managing onsite compliance monitors, providing oversight for flood control and geotechnical support, and providing ongoing historical support.

Assistant Project Manager; Pittsburg District Energy Facility/Los Medanos Energy Center; Enron Capitol and Trade Resources; Pittsburg, California; June 1998 to August 1999. Assistant Project Manager for post filing activities (data adequacy, data responses related to socioeconomic and land use information, evidentiary hearings, and management support) for an AFC for a 500 MW cogeneration plant and ancillary facilities in the City of Pittsburg.

Project Manager; Pittsburg District Energy Facility/Los Medanos Energy Center; Enron Capitol and Trade Resources; Pittsburg, California; July 1999 to September 2001. Project Manager for pre-construction and ongoing construction compliance activities including CEC

post-licensing issues, biology, cultural, paleontological, hazardous materials, geotechnical reporting, and process safety management monitoring and reporting.

Task Leader; Roseville Energy Facility; Enron Capitol and Trade Resources; Roseville, California; April 2001 to March 2002. Task Leader for land use, socioeconomic, cumulative, and laws ordinances, regulations, and standards (LORS) for the AFC for a 750 MW cogeneration plant and ancillary facilities in Roseville filed in August 2001. Also assisted client with addressing community land use-related concerns.

Land Use Task Leader; South City Generating Project; Confidential Client; South San Francisco, California; 1999 to 2000. Land Use Task Leader for preparation of an AFC for a 500 MW cogeneration plant and ancillary facilities in San Mateo County (AFC was never submitted).

Land Use Planning Advisor; United American Energy; San Francisco East Bay Area; 2000-2001. Provided land use permitting and CEQA support for electrical power generating projects in California.

Regulatory Advisor; Redondo Beach Generating Station (RGS); AES; Redondo Beach, California; 1999-2000. Served in an advisory capacity to RGS Plant Manager regarding the compatibility of future redevelopment proposals with ongoing and expanded power plant activities.

Assistant Project Manager; Long Beach District Energy Facility; Confidential Client; Long Beach, California; 1998-1999. Assisted project manager with preparation of an AFC for a 500 MW cogeneration plant and ancillary facilities in the Port of Long Beach (AFC was never submitted).

Regulatory Advisor/Siting Study Manager; Additional Support to Cogeneration Proposals in California; Numerous Confidential Clients; California; 1998-Present. Currently supports numerous electrical power generation proposals for multiple clients in California with siting and issue screening, project development, agency coordination, land use permit reconnaissance and strategy for AFC filing. Previous development prospects were in the following areas in California: San Jose, Arcata, Los Banos, Fresno, Antelope Valley, and several sites in southern California.

Task Manager; Antelope Transmission Project; Southern California Edison; Northern Los Angeles County; August 2005. Served as Initial Task Manager for Land Use and Socioeconomics/Environmental Justice and then Senior Technical Oversight Reviewer for two Proponent's Environmental Assessments (PEAs) for Southern California Edison's Antelope Transmission Project (66 kV/500 kV) in Kern and Los Angeles counties to serve existing and planned windfarm developments. PEA prepared for submittal to California Public Utilities Commission.

<u>Oil and Gas Experience</u>

Regulatory Specialist; Vahevala Project; Sunset Exploration, Inc. and ExxonMobil Corporation; Vandenberg Air Force Base, Lompoc, California; July 2004 to Present.

Jennifer Scholl

Assisted the Project Manager with preparation of applications to the County of Santa Barbara and State Lands Commission for the development of offshore oil and gas reserves. Also assisted with researching state and local policy issues.

Project Manager; Development Plan Application for Full Field Development of the South Ellwood Field; Venoco, Inc. Goleta, California; 1998-2000. Project Manager for preparation of the Development Plan application to the County of Santa Barbara and the State Lands Commission for a slant-drilling proposal on offshore Platform Holly in Santa Barbara County.

Project Manager; Gaviota Creek Pipeline Relocation; All American Pipeline; Gaviota, California; 1999-2000. Assisted client in resolving environmental and permitting issues (geology, hydrology, and cultural resources) associated with relocating the crude oil pipeline in Gaviota Creek.

Planner; County of Santa Barbara Energy Division; Santa Barbara, California; 1989-1995. Project Manager responsible for activities associated with the permitting and regulating of onshore components of offshore oil and gas projects within Santa Barbara County. Selected projects included:

- **Mobil Clearview Project.** Managed review of Mobil Oil Co. application for the Clearview project. Included environmental, economic, engineering studies, and safety and oil spill response plans. Represented the County as the Lead Agency for this complicated and controversial project, coordinated the environmental review requirements of permitting agencies, and served as the primary media and public information contact.
- **Gaviota Marine Terminal Facility/Marine Tanker Transport Request.** Managed permitting and environmental review of proposed facility modifications, coordinated multi-agency review for project's commencement of operations and marine tankering.

Environmental Review Experience

Senior Reviewer; Orange County Sanitation District Program EIR for Collection System Upgrades; Orange County; California; June 2006 – Present. Provided technical oversight and senior peer review for the Program EIR that is presently released for public comments.

Technical Reviewer and Land Use Task Leader; Santa Barbara Ranch EIR and Transfer of Development Rights Study; County of Santa Barbara; December 2004-March 2006. Provided technical oversight and served as the Land Use Task Leader for the preparation of this EIR and TDR Study evaluating proposed residential development in the Gaviota Coast area of Santa Barbara County.

Ellwood-Devereux Joint Proposal EIRs. Project Manager and Jurisdictional Coordinator for the preparation of three EIRS and an Open Space and Habitat Management Plan for the County of Santa Barbara, UCSB, and the City of Goleta for development proposed in the Ellwood-Devereux Joint Proposal area. Also coordinated directly with the Ellwood-Devereux Joint Review, comprised of the three jurisdictions, during the preparation of these three EIRs.

Jennifer Scholl

County of Santa Barbara Planning and Development Continuous Improvement Team Member. Currently participating as a public member of the Continuous Improvement Team. This team is a product of the Process Improvement effort, currently underway in the County of Santa Barbara Planning and Development Department. As a team member, Ms. Scholl has had the opportunity to work with Planning and Development staff and managers in addressing cultural change and implementing process improvements in response to County Grand Jury and Board of Supervisor criticism.

Planner; County of Santa Barbara, Planning and Development Department, Development Review Division; Santa Barbara, California; 1995-1997. Managed various permitting, NEPA/CEQA related reviews, and operation and compliance monitoring for projects which had a high level of public controversy including resort developments, and residential subdivisions. Specific project assignments included: Bacara Resort and Spa, Windermere Ranch Peace Retreat, and numerous housing subdivisions. Responsibilities included: organizing public meetings including scoping, environmental review, and public comment hearings, serving as the key media and public outreach contact, preparing initial studies, conducting state and local policy analyses, coordinating local, state and federal agencies, managing consultants, giving presentations to County elected and appointed officials, and reviewing compliance and engineering plans.

Contract Planning, City of Oxnard. Under contract to the City, provided planning support services including review of project applications, preparation of CEQA Initial Studies, processing of minor modifications to existing commercial and residential developments, consistency review of zoning ordinance and general documents, air quality impacts analyses using the URBEMIS model, and plan checking for commercial and residential projects.

Public Participation Experience

Public Participation Coordinator; Yellowstone Pipeline EIS, Lolo National Forest, Montana; June 1997 to June 1998. Managed the public involvement efforts for the NEPA environmental review process for a proposed re-route petroleum products pipeline from Missoula to Thompson Falls, Montana. Tasks included: agency coordination, set-up and logistics for scoping and informational meetings along the project route, meeting facilitation, preparation of all meeting handouts, preparation of project newsletters and public notices, website development, and maintenance of seven project repository sites.

Public Participation Coordinator; Additional Public Participation Coordination; Various Clients; Southern California; June 1997- June 1998. Provided public participation services for Whitewater River / Thousand Palms Flood Control Feasibility Study EIS/EIR under contract to the U.S. Army Corps of Engineers, Los Angeles District, and the Santa Fe Pacific Partners Carson to Norwalk Pipeline Project under contract to the California Public Utilities Commission. Tasks included: managing the public involvement efforts for the NEPA and CEQA environmental review processes, agency coordination, set-up and logistics for scoping and informational meetings, community outreach, meeting facilitation, preparation of all meeting handouts, preparation of project newsletters and public notices, website development, and maintenance of project repository sites.

Independent Contractor; Environmental Advocacy; Various Clients; Washington D.C., Las Vegas, and New Hampshire; 1986-1989. From 1986-1989, served as an independent

contractor involved with environmental advocacy and public involvement in Washington D.C., Las Vegas, and New Hampshire. Responsibilities included: preparation of public information brochures, responding to public information requests, working with the media, organizing press conferences, organizing presidential forums, coordinating volunteers, and managing field offices.

Professional Organizations/Affiliations

Association of Environmental Professionals

American Planning Association

University of California at Santa Barbara Environmental Studies Associates, Founding Board Member

Professional Development

National Charrette Institute, Charette Planner, January 2005

W Geoffrey Spaulding
Paleontological Resources Specialist/Senior Scientist

Education

Ph.D., Geology (Paleobiology), University of Arizona, 1981
M. S., Geology (Palynology & Vertebrate Paleobiology), University of Arizona, 1974
B. A., Anthropology, University of Arizona, 1972

Distinguishing Qualifications

- Specialist Paleontological Resources Management
- Expert in Paleoecology of Western North America
- Specialist in Site Formation Processes, Quaternary Paleobiology, Geoarchaeology, Paleohydrology
- Captain, Signal Corps, U. S. Army Reserve (Retired)

Certifications

- Approved Paleontological Resources Specialist by the California Energy Commission, State of California
- Qualifications as Paleontological Resources Expert Witness accepted by the Attorney General of the State of Washington

Relevant Experience

Dr. Spaulding is a senior scientist and paleontologist with CH2M HILL with extensive experience in paleobiology, paleontology, and paleoecology. He also is accomplished in the study of site formation processes, and the age determinations of archaeological and paleontological sites in the western United States. He has more than three decades of technical experience in the Earth and Life sciences focussing on the deserts of western North America and on California. Representative projects that he has managed in the last 12 years are listed below. Prior to joining private industry, he was on the faculty of the University of Washington, Seattle specializing in paleobiology and paleoecology.

Paleontological Resources Management

California Energy Commission Approved Paleontological Resources Specialist, Multiple Power Generation Projects, California. Develop Paleontological Resources Assessments and prepare Paleontological Resources Impacts Assessment and mitigation measures for the projects' Application for Certification before the California Energy Commission. Determine the relative levels of paleontological sensitivity of Mesozoic through Quaternary rock units in the context of the geological history of the project areas, direct the field survey, and prepare resource specific documentation for more than 16separate projects from San Diego in the south to Arcata in the north. Prepare Paleontological Resources Monitoring and Mitigation Plans for construction-phase compliance activities. These include the Eastshore Energy Center, the Sunshine Energy Center, the San Francisco Energy Reliability Project, the Chula Vista Energy Upgrade project, the Carlsbad Energy Center, among others.

Construction-Phase Paleontological Resources Specialist, Multiple Power Generation Projects, California. Develop and manage paleontological resources monitoring and mitigation programs for the construction of power generation projects including the Walnut Energy Center south of Modesto, the Roseville Energy Park east of Sacramento, and the Gateway Generation Station near Antioch. Prepare the Paleontological Resources Module of the worker education program and visual aids for worker education. Direct the recovery of discovered paleontological resources (Quaternary vertebrate and paleobotanical remains), and consult with client representatives and the California Energy Commission on the adequacy of mitigation efforts. Develop site-specific stratigraphic framework to identify paleontologically sensitive sediments, and to provide client and the CEC with guidance regarding what construction activities need and need not be monitored.

Salton Sea Ecosystem Restoration Project EIR. Geological and paleontological literature review, records search including consultations with California State Paleontologist, to develop large scale paleontological sensitivity assessment of the Salton Trough. Develop impact assessment and mitigation measures for Environmental Impact Report. Develop mitigation measures for eight different action alternatives, and respond to comments on the PEIR.
Paleontological Resources Assessment for Kinder Morgan's EPX Pipeline, Texas, New Mexico, and Arizona. Literature and records review, remote-sensing and map analyses to characterize the affected environment and environmental impacts for a Bureau of Land Management Environmental Assessment for the installation of an interstate petroleum products pipeline. Prepare appropriate sections of the EA, and assemble technical information from museums in three states.
Transportation-Related Paleontological Resources Management Services, southern California. Perform paleontological resources assessments, develop management and monitoring plans, prepare, review and amend subconsultant scopes of work, and provide audit services to clients for paleontological resources management work. Multiple contracts for the City of San Diego, the Regional Transportation Commission, and the Counties of Riverside, San Diego and Orange. Formations addressed included Quaternary terrestrial and lacustrine units, and Tertiary marine and estuarine sediments.
Client Task Oversight & Expert Witness Testimony On Paleontological Resources Sensitivity. Review and develop discovery and mitigation plans, and provide testimony to the Attorney General of the State of Washington. On the paleontological data potential and impacts to Middle Tertiary age fossil resources in the Columbia Basin, and on potential project-related impacts pursuant to Washington's Energy Facility Siting & Environmental Certification process, on behalf of Olympic Pipeline Corporation.
Paleontological Resources Assessment & Mitigation Plan Development, McKittrick Tar Pits, central California. Review the extensive literature; develop a resources assessment and preliminary management plan for paleontological resources in the vicinity of the renowned McKittrick Tar Pits in the Central Valley for a confidential client interested in the development of the oil-rich diatomites and sands of the area.
Duke Energy of North America, Paleontological Support Services for The Potrero and Contra Costa Applications For Certification. Conduct literature reviews, record searches, and site surveys; and prepare appropriate sections of Applications for Certification according to the format and data requirements of the California Energy Commission. Respond to CEC staff questions and requests for additional data. Provide cost-control strategies to client. In support of the relicensing efforts for two power plants in the Bay Area of California.
Owens Lake Air Quality Mitigation Program, Paleontological Resources Review and Strategy Development. Review resource assessments and draft mitigation plans on the clients behalf to assure that mitigation measures called for are consistent with the resources that may be found in the project area. Audit of consultant work to assure economy of scale in mitigation requirements.
Kern River Pipeline Cultural & Paleontological Resources Compliance, California, Nevada, and Utah. Coordination and implementation of cultural resources mitigation and monitoring efforts along a 678-mile pipeline corridor involving up to 160 personnel operating in three states. Consult with state and federal agencies (FERC, Advisory Council on Historic Preservation Bureau of Land Management), and coordinate with client representatives. Direct and participate in state-wide field compliance programs. Participate in and direct technical studies of sites ranging in age from Paleoindian to Formative Periods. Manage the preparation of reports perform the task of senior report editor.
Metropolitan Water District of Southern California, West Valley Lateral and Eastside Reservoir Projects, Cultural and Paleontological Resources Support Services. Design and conduct archaeobotanical, paleoecological, and paleoclimatic studies in support of paleontological and cultural resources testing and mitigation programs for a large reservoir development program. Manage and participate in paleobotanical and archaeobotanical research programs; direct subconsultants in palynological investigations. Develop pioneering reconstructions of inland southern California's climatic and ecological history over the last 40,000 years; consider these in the context of regional environmental changes and the archaeological record.
Los Angeles Department of Water and Power, Mead/McCullough - Victorville/Adelanto Transmission Line. Manage cultural and paleontological resources monitoring and mitigation in conjunction with the construction of a 500 kV power line extending through Nevada and California. Assess levels of significance of paleontological sites discovered during survey and monitoring, implement mitigation measures for affected sites, manage analyses, prepare reports.
City of Mesquite Cultural and Paleontological Resource Compliance. Design and manage resource surveys for linear-facilities rights of way and BLM land exchanges. Bureau of Land Management consultation on mitigation and avoidance measures, coordinate data recovery and analyses, and prepare final reports on discovered Pliocene paleontological sites.

Molycorp, Inc., Ivanpah Valley Geoarchaeological Studies. Plan for and contribute to cultural resources surveys and Phase 2 Testing and Evaluations for a large project involving over 30 Archaic to Late Prehistoric archaeological sites within and on the margins of a presently dry lake bed. Develop and implement special studies in geoarchaeology, paleohydrology, and paleoenvironmental reconstruction. Manage biological resources surveys and monitoring in support of a multiyear remediation effort; consult with land management agencies to assure compliance on behalf of the client.

Pacific Gas & Electric, Pit 3,4,5 Project, Cultural Resources Support Services. Archaeobotanical, paleoecological, and paleohydrologic studies in support of cultural resource mitigation efforts in the vicinity of Lake Britton, California. Develop a 7,000-year paleoecological record directly applicable to the study area. Contract and direct subconsultants in the development of a 1,000-year dendrohydrologic reconstruction of the flow of the Middle Pit River. Compare and contract paleoenvironmental and archaeologoical records to determine possible environmental drivers of cultural change.

U.S. Geological Survey Yucca Mountain Site Characterization Studies. . Multiple contracts for field and laboratory research, report preparation and review focusing on the timing and magnitude of past hydrologic and climatic changes in the Nevada Test Site, Yucca Mountain, and the Amargosa Desert. Assessment of millennial scale variability of groundwater levels and their potential effect on performance criteria for a high-level nuclear waste repository, as well of geomorphic process affecting paleoenvironmental data.

Yosemite National Park Cultural Resources Management Plan & Research Design. Assist in the preparation of the twenty-year update of the National Park Service's *Archaeological Research Design*. Review, evaluate, and provide a comprehensive summary of research in paleoecology, geoarchaeology, Quaternary geology, and tephrachronology. Prepare chapters on for the *Research Design* for NPS use.

National Academy of Sciences, National Research Council Panel On Coupled Hydrologic, Tectonic, and Hydrothermal Processes. Appointed by the National Academy of Sciences to a three-year tenure as an expert panel member to review research and evaluate evidence for changes in water-table elevation in the vicinity of the proposed Yucca Mountain Nuclear Waste Repository.

Yosemite National Park, Upper Tuolumne Meadows Archaeological Testing and Evaluation Program. Field and laboratory studies, and report preparation, focussed on geochronology, tephrachronology, and site formation processes in support of Yosemite National Park's visitor services expansion program. Identification and characterization of accelerated colluvial depositional processes following volcanic ash fall-out in prehistoric times, and possible effects on human occupation of the area.

Other Representative Projects

Boulder City / U.S. 93 Corridor Study Final Environmental Impact Statement (FEIS). Environmental lead in charge of preparation of an FEIS for a major highway project in southern Nevada. Manage the update of the Draft EIS, provide strategic input to client regarding NEPA, NHPA and ESA compliance strategies. Participate in agency consultations with the Environmental Protection Agency, Nevada Department of Wildlife, U.S. Army Corps of Engineers, and the Nevada Historic Preservation Office on behalf of the FHWA and Nevada DOT. Prepare, update, and gain signatures on a six-agency Programmatic Agreement for project-related cultural resources impacts mitigation.

California Desert District's Imperial Sand Dunes Recreation Area Management Plan NEPA Compliance Program. Manage a complex and fast-track NEPA compliance program, direct and participate in the preparation of a Draft Environmental Impact Statement addressing a highly visible and controversial recreational area management measures proposed by the Bureau of Land Management. Direct the final preparation of a Biological Assessment of the project. Organize and attend public meetings as a client representative, including presenting components of the project to the public on behalf of the BLM.

Reliant Energy Southern Nevada Development Program Environmental Compliance & Permitting Services. Initial services include the performance of fatal flaw analyses for multiple siting options in Clark County, consultations with client representatives and land management agencies; preparation of site-specific cost projections for NEPA, ESA, and NHPA compliance programs, as well as State and local permits and entitlements. Continuing services include coordinating Nevada Power Company/Sierra Pacific Resources and Southwest Gas efforts, scheduling tasks and activities for permitting at different sites, and tracking consultant performance on behalf of the client.

Environmental Compliance Services to Del Webb Corporation. Manage and participate in the preparation of multiple NEPA, NHPA, and ESA compliance documents, consult with agencies, and direct the compliance efforts for a complex land exchange program involving properties throughout the State of Nevada. Provide a wide range of support services including biological and cultural resources assessments, preparation of use plans, and assessments of air quality impacts, municipal budgets, and economic effects.
Apex Heavy Use Industrial Park Environmental Compliance & Permitting Assistance. Consult with agencies and facilitate client interests on critical environmental issues including air quality impacts and water resources. Prepare NEPA compliance documents for a 11,200 acre land sale, and assist subsequent infrastructure development.
Hanford Nuclear Reservation Barrier Development Program Peer Review Panel. Reviewing research strategies, team organization, and prototype designs for protective barriers intended for use on high-level and mixed waste repository sites. Reviewing studies of past and potential future environmental change.
U. S. Nuclear Regulatory Commission, Advisory Committee on Nuclear Waste. Preparation of briefing documents, participation in panel meetings, and presentation of oral evaluations of governmental studies on the characterization, data acquisition, and model evaluation of climatic and hydrologic conditions at the proposed Yucca Mountain Nuclear Waste Repository.

Professional History

Environmental Compliance Manager & Senior Scientist, CH2M HILL, Las Vegas, 2001 to present
Manager, Division of Planning & Compliance, URS Corporation, Las Vegas, 2000-2001
Manager, Environmental Services, Dames & Moore, Las Vegas, 1990-2000
Research Professor of Botany, Director of the Laboratory of Arid-lands Paleoecology, Quaternary Research Center, University of Washington, Seattle, 1983-1990
Adjunct Professor, Remote Sensing Laboratory, Department of Geosciences, University of Washington, Seattle, 1985-1990
Post-Doctoral Research Associate, College of Forest Resources, University of Washington, Seattle, 1979-1983
Graduate Research Assistant, Laboratory of Paleoenvironmental Studies, Department of Geosciences, University of Arizona, Tucson, 1974-1978

Countries Worked In

United States, Mexico, Australia

Professional Affiliations

American Association for The Advancement of Science

Selected Publications

2004 - Development of Vegetation in the Central Mojave Desert of California during the Late Quaternary. (with P. A. Koehler and R. S. Anderson). *Palaeogeography, Palaeoclimatology, Palaeoecology* 215:297-311.
2001 – Ploidy Race Distributions since the Last Glacial Maximum in the North American Desert Shrub, *Larrea tridentata* (with K.L. Hunter, J.L. Betancourt, B.R. Riddle, T.R. Van Devender, and K.L. Cole). *Global Ecology & Biogeography* 10: 521-533.
2000 – A Molecular Analysis of Ground Sloth Diet through the Last Glaciation (with M. Hofreiter, H. N. Poinar, K. Bauer, P.S. Martin, G. Possnert, and S. Paabo). *Molecular Ecology* 9: 1975-1984.
1999 - Middle to Late Quaternary Climatic Changes in Death Valley and Vicinity. In *Proceedings of Conference on Status of Geologic Research and Mapping in Death Valley National Park.* U.S. Geological Survey Open-File Report 99-153, pp. 121-124.
1999 - Environmental Imperatives Reconsidered: Demographic Crises in Western North America During The Medieval Climatic Anomaly (with T. L. Jones, G. M. Brown, L. M. Raab, J. L. McVickar, D. J. Kennett, A. L. York, and P. L. Walker). *Current Anthropology* 40(2): 137-170.
1998 - Molecular coproscopy: dung and diet of the extinct Shasta ground sloth *Nothrotheriops shastensis* (with H. Poinar, M. Hoffreiter, P. S. Martin, and S. Paabo). *Science* 281: 402-406.
1996 - Paleobiotic and isotopic analysis of mollusks, fish, and plants from Core OL-92: Indicators for an open or closed lake system (with J. R. Firby, S. E. Sharpe, J. F. Whelan, and G. R. Smith). In *An 800,000-year paleoclimatic record from Owens Lake, California*, edited by G. I. Smith and J. L. Bischoff, pp. 143-160. Geological Society of America Special Paper 317.

1995 - Environmental change, ecosystem responses, and the Late Quaternary development of the Mojave Desert. In *Quaternary Environments and Deep Time: Papers in Honor of Paul S. Martin* (D. S. Steadman and J. I. Mead, eds.), pp 225-256. Fenske Printing, Inc., Rapid City, South Dakota.
1995 - Pika (*Ochotona*) and the Late Quaternary paleoecology of the Great Basin (with J. I. Mead). In *Quaternary Environments and Deep Time: Papers in Honor of Paul S. Martin* (D. S. Steadman and J. I. Mead, eds.), pp 257-283. Fenske Printing, Inc., Rapid City, South Dakota.
1993 - Climatic changes in the western United States since 18,000 yr. B.P. (with R. S. Thompson, C. Whitlock, P. J. Bartlein, and S. P. Harrison) In *Global climates since the last glacial maximum*, edited by H. E. Wright, Jr., J. E. Kutzbach, T. Webb, III, W. F. Ruddiman, F. A. Street-Perott, and P. J. Bartlein, pp. 468-513. University of Minnesota Press, Minneapolis.
1992 - An alternative perspective on Mojave Desert prehistory (with J. H. Cleland). *Society for California Archaeology Newsletter* 26: 1-6.
1992 - *Ground water at Yucca Mountain: How high can it rise?* (with members of the NAS, NRC Panel on Coupled Hydrologic/Tectonic/Hydrothermal Processes at Yucca Mountain). National Academy Press, Washington, D.C.
1992 - Ecological characterization of fossil plants (with S. J. Mazer, T. L. Phillips, R. E. Taggert, and B. H. Tiffney). In *Terrestrial ecosystems through time: Evolutionary paleoecology of terrestrial plants and animals*, edited by A.K. Behrensmeyer *et al.*, pp. 139-180. University of Chicago Press.
1992 - Late Cenozoic terrestrial ecosystems (with R. E. Taggart, J. A. Harris, B. Van Valkenberg, L. D. Martin, J. D. Damuth, and R. Foley). In *Terrestrial ecosystems through time: Evolutionary paleoecology of terrestrial plants and animals*, edited by A. K. Behrensmeyer *et al.*, pp. 419-541. University of Chicago Press.
1992 - Glacial/Interglacial 13C/12C ratios of atmospheric CO2 inferred from carbon in C4 plant cellulose (with B. D. Marino, M. B. McElroy, and R. J. Salawitch). *Nature* 357: 461-466.
1991 - A middle Holocene vegetation record from the Mojave Desert and its paleoclimatic significance. *Quaternary Research* 35: 427-437.
1991 - Pluvial climatic episodes in North America and North Africa: Types and correlation with global climate. *Palaeogeography, Palaeoclimatology, Palaeoecology* 84: 217-227.
1991 - Comparison of pollen and macrofossil based reconstructions of Late Quaternary vegetation in western North America. In *Proceedings of the 7th International Palynological Congress, Brisbane, Australia*, edited by E. M. Truswell and J. A. K. Owen, pp. 359-366. Elsevier, Amsterdam.
1990 - Packrat middens: Their composition and methods of analysis (with K. L. Cole, J. L. Betancourt and L. K. Croft. In *Packrat middens: The last 40,000 years of biotic change*, edited by J. L. Betancourt, P. S. Martin, and T. R. Van Devender, pp. 59-84. University of Arizona Press, Tucson.
1990 - Environments of the last 50,000 years in the vicinity of Yucca Mountain, central-southern Nevada. *High Level Radioactive Waste Management* 2: 1251-1258.
1990 - Vegetation dynamics during the last deglaciation, southeastern Great Basin, U.S.A. *Quaternary Research* 33: 188-203 (1990).
1990 - Vegetational and climatic development of the Mojave Desert: The last glacial maximum to the present. In *Packrat middens: The last 40,000 years of biotic change*, edited by J. L. Betancourt, P. S. Martin, and T. R. Van Devender, pp. 166-199. University of Arizona Press, Tucson.
1988 - Climatic changes of the last 18,000 years: Observations and model simulations (with COHMAP Project Members). *Science* 241: 1043-1052.
1986 - The last pluvial climatic episodes in the deserts of southwestern North America (with L. J. Graumlich). *Nature* 320:441-444.
1985 - *Vegetation and Climates of the last 45,000 years in the vicinity of the Nevada Test Site, south-central Nevada.* U. S. Geological Survey Professional Paper No. 1329.
1983 - Late Wisconsin paleoecology of the American southwest (with E. B. Leopold and T. R. Van Devender). In *The late Pleistocene of the United States*, edited by S.C. Porter, pp. 259-293. University of Minnesota Press, Minneapolis.
1983 - Late Wisconsin macrofossil records of desert vegetation in the American southwest. *Quaternary Research* 19: 256-264.
1979 - Development of vegetation and climate in the western United States (with T. R. Van Devender). *Science* 204: 701-710.

CH2MHILL

David A. Stein, PE

Vice President

Location: Oakland, California

Education

M.S., Environmental Engineering, 1981
B.S., Environmental Engineering, 1977
B.S., Biological Sciences, 1977

Professional Registrations

Registered Professional Engineer, Chemical: California, CH004285, 1984

Distinguishing Qualifications

- Managed over a dozen siting and licensing cases for large power plants (>100 MW) including related transmission lines and other linear features under the California Energy Commission's (CEC) quasi-adjudicatory licensing process
- Expert witness testimony on power plant design, alternatives, air quality, public health, noise, visual resources, and waste management (including landmark Kings County Farm Bureau v. City of Hanford CEQA lawsuit; CEC evidentiary hearings; product liability ligitation and CARB/multiple AQMD and APCD variance and board hearings)
- Air quality expert with regulatory agency (SCAQMD and Kern County APCD), research and industry experience performing toxic and criteria pollutant emission quantification (both stationary and mobile sources), air pollution control technology evaluations, fugitive emissions studies, regulatory compliance audits and analyses, health risk assessments, air quality dispersion modeling, visibility impact modeling, emissions measurement, continuous emissions monitoring and litigation support/expert witness testimony

Relevant Experience

David Stein is a registered chemical engineer with 30 years' experience in managing, staffing, coordinating and conducting large, complex multidisciplinary environmental assessments for power plant projects, transmission lines, gas pipelines and other major development projects in California and the western US. He has managed the preparation of Applications for Certification (AFCs), CEQA and NEPA documents, authored several technical sections of related documents, has extensive experience with legislative advocacy, regulatory negotiations with federal and state air quality, wildlife and land management agencies, and managed environmental compliance during construction on a variety of projects.

Representative Projects

Project Manager; Eastshore Energy Center; Tierra Energy; California. Managed the preparation of an Application for Certification (AFC) for the 115.5 MW (net) Eastshore Energy Center including 14 natural gas-fired reciprocating engines, a 1.1-mile 115 kV transmission line and a 200-foot natural gas line. CH2M HILL completed biological and cultural resources field surveys as well as detailed environmental analysis, evaluation of mitigation measures, community and agency coordination and preparation of expert witness testimony.

Project Manager; Chevron Power Plant Replacement Project; Chevron Richmond Refinery; California. Managed the preparation of a Small Power Plant Exemption Application for the

Chevron Power Plant Replacement Project including a 43 MW natural gas or LPG-fired combustion turbine, a refinery fuel gas-fired heat recovery steam generator, a 17 MW steam turbine generator and reconductoring of approximately 4000 feet of onsite double circuit 115 kV transmission line. CH2M HILL completed biological and cultural resources surveys, detailed environmental analyses, evaluation of mitigation measures and agency coordination.

Principal-In-Charge and Strategic Advisor; Gateway Generating Station, Pacific Gas & Electric Company; California. Provided strategic advice and senior review for post-certification amendments to the Gateway Generating Station project (originally developed by Mirant Delta, LLC as Contra Costa Unit 8). CH2M HILL completed preparation of the AFC amendment petition including an environmental evaluation of the replacement of wet-cooling with dry, air-cooled condenser technology, elimination of San Joaquin River water consumption associated with wet-cooling, elimination of steam augmentation for power generation, relocation of various facility components and a redesigned closed-loop cooling water system.

Program Manager; Various Projects -Environmental Licensing and Permitting Program; Pacific Gas & Electric Company, California. Recent projects have included Humboldt Bay Power Plant AFC preparation, Gateway Generating Station AFC amendment, Jefferson-Martin transmission line environmental permitting, Yolo gas pipeline project environmental permitting, Hunters Point Decommissioning permitting coordination, , NPDES permitting support, and confidential water quality characterization study.

Project Manager, Tracy Peaker Project, Hanford Peaker Project and Henrietta Peaker Project; GWF Energy, LLC, California. Managed preparation of three AFCs for the 169 MW Tracy Peaker Project, consisting of two 84.5 MW (net) natural gas-fired combustion turbines, a 1000 foot water line and a 2 mile transmission line; the 96 MW Hanford and Henrietta Peaker Projects, each consisting of two 48 MW natural gas fired combustion turbines. Projects included extensive field surveying, detailed environmental analysis, mitigation, agency coordination and expert witness testimony in 16 topic areas.

Program Manager; Sunrise Power Project and Transmission Line; Edision Mission Energy/Texaco Power and Gasification, California. Managed preparation of AFC for the 565 MW Sunrise Power Project including a 23-mile 230 kV transmission line, a 15.5 mile water supply pipeline and a 2.5 mile natural gas pipeline. Project including extensive field surveying, mapping, avoidance and mitigation of disturbance of sensitive biological and cultural resources over all project linears as well as detailed environmental analysis, mitigation and expert witness testimony in 16 topic areas. In addition to the CEC AFC, NEPA documentation was prepared for US Bureau of Land Management to allow linear facility construction on Federal land. Successfully licensed the project over the strenuous intervention of California Unions for Reliable Energy (CURE) - one of the most contested licensing cases in CEC history. Other environmental licenses and permits procured for the project included: Prevention of Significant Deterioration (PSD) permit from USEPA (US Environmental Protection Agency) Region IX, Underground Injection Well Permit from USEPA Region IX, Section 7 Consultation and Biological Opinion from US Fish & wildlife Service, Section 2081 (Incidental Take) and 1601 (Streambed Alteration Agreement) Permits from California Department of Fish & Game (CDFG), Section 404 Permit from US Army Corp of Engineers, Section 401 Water Quality Certification from Central Valley Regional Water Quality Control Board, and Determination of Compliance and Authority to Construct from San Joaquin Valley Air Pollution Control District.

René Langis, Ph.D.
Senior Biologist/Wetland Scientist

Education

Ph.D., Water Sciences, University of Québec, Institut National de la Recherche Scientifique (INRS), 1989
M.S., Environmental Engineering, University of Montréal, École Polytechnique de Montréal, 1982
B.S., Environmental Biology, McGill University, MacDonald College, 1979

Distinguishing Qualifications

- Proven experience in coordination of biological issues on large scale projects
- Proven experience in preparation of environmental impact assessments and reports
- Twenty-five years of experience in the area of pure and applied ecology
- Expertise in the functional assessment of restored and constructed wetlands, treatment wetlands, and surface water quality monitoring

Relevant Experience

Tierra Energy Eastshore Energy Center Application for Certification (AFC): Task manager for the preparation of the biology section of the AFC.

Los Esteros Critical Energy Facility Permanent Stormwater Outfall: Task manager for the preparation and coordination of US Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Game (CDFG) permit applications, as well as coordinated with National Marine Fisheries Service (NMFS) and CDFG regarding rare, threatened and endangered species.

Caltrans District 4 On-Call Environmental Services: Senior aquatic biologist – task leader on the preparation of the Redwood Creek Bridge and Maacama Creek Bridge Biological Assessment. Senior review of numerous other biological reports prepared under this contract.

Coyote Watershed Program: As lead environmental coordinator, he was responsible for all environmental compliance, permitting, and mitigation and monitoring for the Coyote Watershed Program projects. This program was set up by the Santa Clara Valley Water District to implement several major flood protection and creek restoration projects within east San Jose and Milpitas. Environmental issues included permitting from USACE, RWQCB, and CDFG, coordination and consultations on rare, threatened and endangered species as well as cold-water fisheries, and preparation of wetland and riparian mitigation and monitoring programs.

Sediment Removal for Channels 12-H, 12-J and 12-K, City of Oakland: Project manager for preparation of an Initial Study/Mitigated Negative Declaration, as well as permitting

documents for the USACE, RWQCB, and CDFG, including coordination and consultations on rare, threatened and endangered species as well as cold-water fisheries, and preparation of wetland and riparian mitigation and monitoring program.

Gilroy Hot Springs Road Repair Project: As project manager, conducted resource agency coordination for the realignment of a section of Coyote Creek following fluvial geomorphic and bio-engineered methods. This project involved the preparation of an Initial Study/Negative Declaration per CEQA and the preparation of USACE, RWQCB and CDFG permits. This project was subject to Section 7 Consultations for the California red-legged frog with the US Fish and Wildlife Service (USFWS) and the preparation of a mitigation plan for the state protected foothill yellow legged frog.

Mokelumne Aqueduct, San Joaquin County, CA. As task manager, prepared USACE, RWQCB, and CDFG permit applications, as well as coordinated with resource agencies such as USFWS, National Marine Fisheries Service (NMFS), and CDFG regarding rare, threatened and endangered species.

Seismic Retrofit of the 13th Street Bridge, Caltrans, District 5/City of Paso Robles, CA. Task manager for environmental permitting effort associated with the seismic retrofit of the 13th Street Bridge in Paso Robles. Prepared permit applications for the USACE, RWQCB, and CDFG. Coordinated with resource agencies as USFWS/NMFS, and CDFG regarding rare, threatened and endangered species.

Richmond-San Rafael Seismic Retrofit Project, Coordinated and participated in the preparation of environmental permits/authorizations, including the USACE Individual Permit (Section 404), Dredge Material Management Office (DMMO) Permit, San Francisco Bay Conservation and Development Commission (BCDC) Major Permit, RWQCB Water Quality Certification Permit (Section 401), USFWS/NMFS Section 7 Consultation per the Endangered Species Act. He also prepared a conceptual mitigation plans for potential negative impacts to eelgrass beds. He coordinated the development of mitigation plans for the endangered peregrine falcon, the Pacific herring, harbor seals (per Incidental Harassment Authorization) and double-crested cormorants. He was responsible for the incorporation of permit requirements in the project plans and specifications.

Sears Point Sewer Relocation Pre-Design Project for the Vallejo Sanitation and Flood Control District: As task manager, prepared Initial Study/Mitigated Negative Declaration, and coordinated preparation of permit applications for USACE, RWQCB, CDFG, and BCDC.

Selected Publications

Langis, R., M. Zalejko and J.B. Zedler. Nitrogen assessments in a constructed and natural salt marsh from San Diego Bay. Ecological Applications 1(1):40-51, 1991.
Busnardo, M.J., R.M. Gersberg, R. Langis, T.L. Sinicrope and J.B. Zedler. Nitrogen and phosphorus removal by wetland mesocosms subjected to different hydroperiods. Ecological Engineering 1 : 287-307, 1992.

Sinicrope, T.L., R. Langis, R.M. Gersberg, M.J. Busnardo and J.B. Zedler. Metal removal by wetland mesocosms subjected to different hydroperiods. Ecological Engineering. 1 : 309-322, 1992.

Gibson, K.D., J.B. Zedler and R. Langis. Limited response of cordgrass (Spartina foliosa) to soil amendments in a constructed marsh. Ecological Applications 4(4): 757-767, 1994.

Zedler, J.B., M. Busnardo, T. Sinicrope, R. Langis, R. Gersberg and S. Baczkowski. Pulse-discharge wastewater wetlands: the potential for solving multiple problems by varying hydroperiod. In: Mitsch, W.J. (ed.) Global Wetlands, Old World and New. Elsevier, Amsterdam: 363-368, 1994.

Langlois, C. and R. Langis. Presence of airborne contaminants in the wildlife of northern Québec. Science of the Total Environment, 160/161: 391-402, 1995.

Langlois, C., R. Langis and M. Pérusse. Mercury contamination in Northern Québec environment and wildlife. Water, Air and Soil Pollution 80: 1021-1024, 1995.

BLUESCAPE
ENVIRONMENTAL

James A. Westbrook, CCM

President

Expertise

Air Quality Permitting & Compliance
Strategic Business and Project Management
Air Mitigation Programs
Greenhouse Gas Management
Air Dispersion Modeling
CEQA Air Quality Impact Analysis
Chemical Spill Risk Management
Health Risk Assessment
Air Emissions Inventories
Emissions Credit Banking

Industry Focus

Power Generation
LNG Facilities
Chemical and Refinery Plants
Aggregate and Asphalt Production
Coating Operations
Building Materials Manufacturing
Aerospace Industry
Metal Plating Operations
General Manufacturing

Education

MS, Environmental Science
BS, Atmospheric Sciences

Certifications

Certified Consulting Meteorologist (CCM)
Certified Permitting Professional (CPP)
Green-e Certified REC Broker

Associations / Memberships

American Meteorological Society
Air & Waste Management Association
California Alliance for Distributed Energy Resources (CADER)
LA Bar Association
CA Climate Action Registry

Work Chronology

BlueScape, 1997 to present
Kleinfelder, 1995 to 1997
ENVIRON, 1991 to 1995
Engineering-Science, 1989 & 1990

Summary of Experience

In 1997, James A. Westbrook, CCM founded BlueScape Environmental (BlueScape) to help businesses achieve practical, cost-effective air quality compliance solutions. Since then, he has independently grown BlueScape by way of exceptional skills in strategic business planning, marketing, and project management. BlueScape currently serves businesses with annual revenues in excess of one billion dollars, including power generation and manufacturing companies, developers and consulting firms.

Mr. Westbrook helps clients to obtain air permits and achieve strategic business goals by drawing upon his expert skills in regulatory analysis & negotiation, air emissions calculations, greenhouse gas emissions management, dispersion modeling, and human health risk and exposure assessment. To provide superior customer service, he has assembled a team of engineers and scientists with a wide range of experience and knowledge with industrial equipment, emission control technologies, computer emissions and dispersion modeling tools, and agency contacts throughout the U.S.

Mr. Westbrook actively speaks to industry trade groups regarding air quality compliance issues. He is the co-instructor for the only publicly available training course on the Hotspots Analysis and Reporting Program (HARP) risk assessment software. His work background includes experience obtained at Kleinfelder in Pleasanton, CA, ENVIRON Corporation in Emeryville, CA, and Parsons Engineering-Science in Pasadena, California.

His formal education includes an M.S. in Environmental Science from Indiana University, Bloomington and a B.S. in Atmospheric Sciences from UCLA. He is a Certified Consulting Meteorologist (CCM) and is recognized as a Certified Permitting Professional (CPP) by the South Coast Air Quality Management District.

Select Project Experience:

Air Dispersion Modeling Analyses

- ***AERMOD Modeling, Bradwood Landing LNG Terminal, Oregon.*** Used the AERMOD model to assess impacts from a proposed Bradwood Landing LNG carrier vessel offloading terminal on the Columbia River. Developed an air dispersion modeling protocol in consultation with the Oregon Department of Environmental Quality. Analyzed impacts of emissions from submerged combustion vaporizers at rugged terrain along the banks of the river. Assisted the design team with exhaust design to optimize engineering design and satisfy applicable air quality thresholds.

- ***LAX Construction Equipment Modeling Study, Los Angeles, California.*** As a subcontractor to ECS, completed a dispersion modeling analysis for the proposed expansion of the Los Angeles International Airport. The majority of emissions resulted from diesel-fueled construction equipment. In order to show compliance with the Federal and State ambient air quality standards, completed ISCST3 air dispersion modeling using the ozone limiting technique for NOx emissions.

- ***PSD Modeling Study, Columbia Ridge Landfill, Arlington, Oregon.*** As a subcontractor to SCS Engineers, managed completion of a dispersion modeling study to assess impacts from increased fugitive PM10 emissions from a landfill. Impacts modeled using AERMOD were compared to the Oregon state ambient standards and increment levels. The project was particularly challenging given the amount of emissions from ground-level sources. Worked closely with the prime contractor to refine the modeling study emissions and source parameter inputs so that future operations will be in compliance with the standards.

- ***Odor Modeling, San Diego Metropolitan Wastewater District (SDMWD), San Diego, California.*** Completed dispersion modeling study using the ISCST3 model to assess potential odor impacts and health risks. The San Diego MWD planned construction of a Wet Weather Storage Facility (WWSF), consisting of two 7 million gallon underground storage tanks, to handle future peak wastewater flows during storm events. Required analysis of potential nuisance odors and health risk impacts as compared to thresholds established by the San Diego APCD under Rule 1200 for surrounding businesses. Developed engineering design data, such as stack height, air flows, and scrubber control efficiency that would be required to meet City's odor design standards of 5 odor units (OU). Used conservative modeling and exposure assumptions, to show that odor impacts and health risks from the Wet Weather Storage Facility would meet design requirements.

- ***Air Dispersion Modeling & Health Risk Assessment, THUMS, Inc., Long Beach, California.*** Owner of natural gas and petroleum production fields, planned to site a 44 MW simple-cycle turbine facility in Long Beach harbor to provide onsite electricity for well pumping. Needed modeling and HRA to show that operation was in compliance with South Coast Air District Rules 1303 and 1401. Modeled impacts from criteria pollutants (NOx, PM10, etc.), ammonia slip, and air toxics found at three candidate site locations. Examined the effect of different stack heights, and the effect of building downwash on air quality impacts. For each candidate site, determined a stack configuration that would result in compliance with the district rules.

- ***Ambient Air Quality Analysis, Motorola 52nd Street, Phoenix, Arizona.*** Lead dispersion modeler for an ambient air quality analyses performed for a semiconductor manufacturing facility. Estimated off-site air quality impacts using the ISCST and SHORTZ dispersion models. From estimates of off-site concentrations and emissions data, compared modeling results to state ambient air quality guidelines. Completed feasibility studies to evaluate the impact of modifying facilities.

- ***Stack Increase Study, Confidential Metal Container Manufacturer, Southern California.*** Entrainment of sulfuric acid emissions released from three stacks into building ventilation intakes was apparently resulting in poor product finish quality for some can batches. As a subcontractor to Kleinfelder, made visual observations at the site and confirmed a potential problem during strong northeast winds. Using the ISCST3 model and ASHRAE guidance, stack height increases needed to avoid intake contamination were estimated. Reconstruction of the stacks was commenced based upon study recommendations.

- ***Indoor Contamination Study, Confidential Hospital, Nevada.*** A hospital in Nevada was evaluating reports of health effects possibly caused by indoor pollutant contamination. An investigation of rooftop stacks revealed that emissions from two boilers were potentially entrained into building ventilation intakes on the lee side (cavity area) of a downwind structure. The ASHRAE ventilation guidance was used to estimate boiler stack height increases recommended to avoid the building cavity zone.

- ***Third-Party Modeling Review; Instantaneous and Short-Term Releases from Multiple Federal Munitions Disposal Facilities, Eastern United States.*** Health risk assessments were performed by the facilities following the USEPA Human Health Risk Assessment Procedures (HHRAP) guidance document. Models proposed for use included OBODM, ISCST3, INPUFF, and TRPUF. Resulting documentation required third-party review by an independent source. The review focused primarily on the appropriateness of modeling input data assumptions, including emissions, source release parameters, and meteorological data. Comments were provided to Booz-Allen, and submitted along with other comments to USEPA and state air pollution agency staff.

- ***Monitoring/Meteorological Data Validation Study, Confidential Municipal Waste Landfill, Southern California.*** Compared vinyl chloride monitoring data to concurrently obtain meteorological measurements. Used on-site meteorological measurements as well as synoptic observations to validate monitoring data.

Air Permitting: Minor New Source Review, PSD and Title V Air Permitting

- ***Hydrogen Plant Permits, Chevron Refinery, El Segundo, California.*** Project Manager for securing installation permits for a new hydrogen plant, including a 780 MMBtu/hr heater, SCR system, process vents and components. The project was required to replace an old, existing plant under an Order for Abatement. Successfully negotiated installation of the project without requiring scarce and expensive emission credits (PM_{10}, 176 lb/day) that would have rendered the project impossible. Functionally identical replacement and concurrent modification offset exemptions were proposed and accepted by the South Coast AQMD. Negotiated permit conditions to provide operational flexibility during commissioning and startup conditions. Completed dispersion modeling using SCREEN3 and ISCST3 to show that short-term and long term operations will not cause or contribute to an exceedance of the health standards. Completed emission calculations and assembled all supporting documentation required as part of the rule review. Permits were issued in only six months, much less than the typical 1-2 years for similar projects, allowing the plant to be built and started as scheduled. BlueScape was a subcontractor to the Denali Group.

- ***CEC Licensing and Air Quality Permits, Eastshore Energy Facility, Hayward, California.*** Air Quality Project Manager for CEC licensing and air quality permitting for a 115.5 MW peaking power plant consisting of 14 natural gas-fired lean-burn engines. CEC application work supported the Air Quality and Public Health sections of the AFC, including construction emissions and modeling and the health risk assessment. Managed air quality modeling work completed by another contractor. Developed a CEQA PM10 mitigation plan provided to CEC. Participated in workshops and public meetings to resolve issues. Developed air permit conditions for the BAAQMD Preliminary Determination of Compliance (PDOC).

- ***PSD Permit, Confidential Fiberglass Manufacturer, Northern California.*** Project Manager for completion of a PSD air permit application for a fiberglass manufacturing facility located in Northern California. Work included an air quality modeling analysis for PM_{10} and CO emissions. The facility's compliance with federal ambient air quality standards and with allowable PSD increment consumption was assessed. Mr. Westbrook assisted with preparation of a PM_{10} pre-construction monitoring and QA/QC plan, addressing monitor siting issues.

- ***Expedited Distributed Generation Air Permits, RealEnergy Inc., California.*** Managed Phase I & II installation of clean gas-fired internal combustion engines in 10 sites located in the South Coast Region and San Diego County of California. Worked with team members Resource Catalysts and Environmental Compliance Solutions under a very aggressive schedule to successfully obtain permits. Providing RealEnergy with ongoing permitting and compliance management support.

- ***CEC Siting Application for a 62 MW Peaker Turbine Facility, RAMCO Inc. & PG&E, California.*** Project leader with team member Resource Catalysts and other consultants; developed and submitted the licensing application for a peaking generation plant under the California Energy Commission 21-day expedited review process.

- ***Backup Diesel Engine Air Permits, EDS Corporation and the U.S. Navy.*** As subcontractor to Rancho Santa Fe Technologies, prepared air permit applications for five 1 MW diesel-fired engines as part of the U.S. Naval global military intranet system called "SPAWARS."

- ***SIP Permit, Confidential Fiberglass Manufacturer, West Virginia.*** Project Manager for completion of air dispersion modeling services for a fiberglass manufacturing facility located in West Virginia. The work was performed to assess the affect of changing the West Virginia State Implementation Plan on attainment of area PM_{10} NAAQS. On-site meteorological data was processed for multiple tower levels. The SCREEN3 model was used to reduce the number of nearby sources to be included in the NAAQS

modeling analyses. The IGM model with ISCST and RTDM was used to model impacts from facility sources. ISCST and COMPLEX I were used to model impacts from nearby sources.

- ***Synthetic Minor Air Permits, Three Prestolite Wire Corporation Facilities in the Midwest and Eastern US.*** Project Manager for completion of synthetic minor air permit applications for telecommunication and automotive wire manufacturing facilities located in Nebraska and Arkansas. Assisted facilities in preparing up-to-date emission inventories and avoiding Title V permitting requirements. For a third facility located in Georgia, negotiated with air pollution control agency staff to obtain an exemption from State air permitting requirements.

- ***PSD Permit, Confidential Fiberglass Manufacturer, Georgia.*** Managed and completed the modeling study to support a PSD application submittal for a fiberglass manufacturing facility located near Atlanta. The facility proposed to add sodium nitrate to raw batch materials to reduce odor-causing emissions of hydrogen sulfide from a melter. As a result, PSD for NO_2 was triggered. The project involved estimating process emissions of criteria pollutants, assessing compliance with NAAQS and increment thresholds for NO_2, and completing other required PSD analyses, including a visibility screening analysis.

- ***Synthetic Minor Air Permit, Fisher-Hamilton Scientific, Two Rivers, Wisconsin.*** Project Manager for completion of a Federally Enforceable State Operating Permit (FESOP) application for a wood furniture manufacturer. Our staff assisted the facility in implementing strategic measures to reduce VOC emissions and avoid Title V permit requirements. Calculations were performed for both actual and potential emissions based on future production scenarios, and drafted permit limits.

- ***Title V Permits, Three California Facilities.*** Assisted with completion of Title V permit applications for the Owens-Brockway glass facility in Tracy, California, the Lodi Metal Tech Facility in Lodi, California, and the Sony Electronics facility in San Diego, California. Lists of Title V-applicable regulations were developed for the facilities, and application forms were completed using client-supplied information.

- ***Air Permits, Confidential Fiberglass Facility, Southern California.*** Assisted a fiberglass facility in obtaining a modified air permit for an increase in production capacity on a highly restricted line. Although no net increase in emissions was expected following regulatory definitions, the permitting agency wanted air emission increases to be calculated using a restrictive methodology. This methodology triggered a Rule 1401 health risk assessment and led to delays in the permitting process. Assisted the facility throughout the process by analyzing the effect of agency requirements and presented ways to express production limits in a manner that would move the project forward. Ultimately, BlueScape succeeded in showing that the facility could expand production without causing significant health risk impacts or requiring emissions offsets. The facility received the modified air permit.

PM_{10} Mitigation Programs

- ***PM_{10} Mitigation Plan, Escondido, California.*** Sempra Energy developed a 500 MW power generation facility in Escondido, California. Sempra was required to fund up to $1.9 million for local PM_{10} mitigation, with a preference for diesel exhaust mitigation. Under contract to City of Escondido, developed a PM_{10} mitigation plan identifying potential sources of local diesel mitigation. The mitigation plan considered the cost-effectiveness of diesel mitigation, as well as reducing emissions from other source types. Helped City of Escondido to apply for up to $500,000 in funding for particulate filters for several on-road and off-road diesel vehicles, and new school buses.

- ***PM_{10} Mitigation Plan, Eastshore Energy Facility, Hayward, California.*** Project Manager for developing a PM_{10} mitigation plan under California CEQA requirements. The Eastshore Energy facility is not required to mitigate PM_{10} under BAAQMD regulations. However, CEC requires that PM_{10} emissions be mitigated, especially during potential non-attainment periods. Developed a two-prong plan that proposes using BAAQMD-banked emission reduction credits, or a wood stove and fireplace replacement program. The mitigation is currently being negotiated with CEC.

- ***LAX PM_{10} Mitigation Study, Los Angeles, California.*** Completed research of PM10 mitigation options for the LAX expansion project. Focus of the research work was on air filtration in air conditioning systems in area schools.

- ***Rule 1309.1 Priority Reserve Rule Review, Southern California.*** For a confidential client, closely following Rule 1309.1 Priority Reserve developments. When Rule 1309.1 is updated in August 2007, many restrictions will be placed on facilities need access to the Priority reserve. This will have a significant impact on the market for PM_{10} Emission Reduction Credits within the SCAQMD.

Greenhouse Gas Management

- ***Greenhouse Gas Emissions Inventory, Independent Power Producer, California.*** Project Manager for completion of a greenhouse gas emissions inventory for six petroleum coke power plants, and three natural gas-fired power plants. The company is facing regulatory compliance under the AB32 program. Perhaps more importantly, the company may soon face contract issues with PG&E, because emissions from the petroleum coke facilities are double the CPUC performance standard of 1,100 lb/MWh CO_2. After developing the baseline greenhouse emissions inventory, strategic solutions will be developed to minimize the risk of greenhouse gas issues.

- ***Greenhouse Gas Emissions Inventory, Johns Manville, California.*** Project Manager for a greenhouse gas inventory for Johns Manville, a global building insulation and roofing manufacturer owned by Berkshire Hathaway. The emissions inventory is being completed for the California Climate Action Registry using CARROT software. The inventory includes one insulation manufacturing facility in Northern California, and a roofing manufacturing facility in Southern California. Developing greenhouse gas emission factors that will be used for John's Manville's corporate greenhouse gas inventory.

Litigation Support

- ***Litigation Support for a Residential Housing Developer, San Diego.*** Project Manager and Expert Witness to support a resdential housing developer as defendant. A resident that lived on the road to a new housing developing sued the developer for dust and diesel emissions entering the property, claiming severe asthma and other health impacts. Developed an analysis of ambient ozone and particulate matter concentrations, and pollen data. Reviewed local wind data and proximity of roadways to the plaintiff's house. The case is pending trial.

- ***Confidential Air Toxics Litigation Case, Southern California.*** Project Manager and Expert Witness for a large toxic tort litigation case in Southern California. The case involved transport of emissions from open burning and open detonation of waste munitions into a residential community. Developed meteorological data for air dispersion modeling using the CALMET system. Dispersion modeling was completed using ISCST3, OBODM, and CALPUFF to assess various historical operational scenarios. Deposed regarding modeling results. Case was settled out of court.

- ***Litigation Support for an Accidental Chemical Release, Confidential Pesticide Manufacturing Company.*** Served as an Expert Witness on behalf of the Defendant, a pesticide manufacturing company, that had released chlorosulfonic acid from a tank. The Plaintiff claimed injury from exposure to hydrochloric acid (HCL) generated from the release. Work involved meteorological data analysis to show that the Plaintiff could not have been in contact with an acid cloud, and SLAB dispersion modeling to predict downwind concentrations of HCL. The case ended in a settlement favorable to the Defendant.

- ***Proposition 65 Risk Assessment, Confidential California Facility.*** Prepared a Proposition 65 health risk assessment for a metal polishing and plating facility that uses perchloroethylene in a vapor degreasing operation. A citizen's group contended that the facility failed to warn off-site receptors of perchloroethylene levels above the no significant risk level (NSRL). BlueScape used refined analysis methods to show that, given very conservative exposure assumptions that overstate actual risk, exposure values above the NSRL were confined to locations very near the emissions source.

- ***Proposition 65 Evaluation Services, Nine Confidential California Companies.*** Project Manager or Technical Lead in Proposition 65 services ranging from due diligence audits to litigation support. Industries served include battery manufacturers, a glass container manufacturer, a golf club manufacturer, two metal plating facilities, an electronics manufacturing firm, and an airplane parts manufacturing company. Completed community exposure assessments using the SCREEN3 and ISCST models. Evaluated representativeness of assumptions used in litigant's and plaintiff's modeling analyses, including meteorological data inputs, monitoring and emissions data referenced, equipment operating schedules, estimates of indoor concentrations of lead relative to outdoor concentrations, and mobility of worker populations.

- ***Litigation Assistance for a Consortium of Confidential Petroleum Refineries, Texas.*** Assisted several petroleum refineries located in Texas in class action litigation involving fugitive benzene emissions from piping and tanks, and chromium emissions from cooling towers. Performed dispersion modeling for benzene impacts using plaintiff's input files and ISCST, but revised benzene emissions estimates reflecting more realistic assumptions. Also, used plaintiffs ISCST and FDM input files to evaluate chromium impacts for various particle sizes and surface roughness lengths.

- ***Air Toxics Litigation, Confidential Chemical Manufacturer, Texas.*** A chemical company in Texas was being sued by nearby residents alleging exposure to benzene and other chemicals was causing various health ailments. Depositions from over 30 litigants were reviewed to develop an exposure parameters database. Used a visual basic-driven system to estimate benzene exposure under various scenarios. The scenarios accounted for population mobility, indoor concentrations relative to outdoor concentrations, and movement of population between various micro-environments.

Human Health Risk and Exposure Assessment

- ***Duwamish Regional Health Risk Assessment, Seattle, Washington.*** Teamed with Dillingham Software Engineering (DSE), the developer of California Air Resources Board Hotspots Analysis and Reporting Program (HARP), to complete a regional health risk assessment for the Duwamish River Valley just to the south of downtown Seattle. The modeling and health risk study included on-road diesel emissions sources, wood stoves, and criteria pollutant and air toxic emissions from more than 200 industrial facilities. BlueScape was responsible for developing the industrial facility air toxics emissions inventory, and completing a report utilizing modeling output provided by DSE. The study was sponsored by the Washington Department of Health.

- ***AB2588 Health Risk Assessments, Multiple California Facilities.*** Project Manager or Technical Lead for more than 20 AB2588 health risk assessment projects for industrial facilities located in Southern California. These included 10 Southern California Edison power plants, a fiberglass manufacturing facility, a spice processing plant, a plumbing supplies plant, the Kwikset manufacturing facility in Anaheim, two petroleum processing/refining facilities, two small parts coatings facilities (hexavalent chromium-based pigments), a resin manufacturer, a specialty resistor manufacturer and two aerospace part manufacturers. Used the SCREEN3 and ISCST3 dispersion models and the ACE2588 and HRA health risk assessment models to calculate and report health risks.

- ***New Source Review Air Permitting Health Risk Assessments, Multiple California Facilities.*** Project Manager or Technical Lead for completing health risk assessments to obtain air permits for a wide range of industrial emission sources located in California, for example, three separate air strippers, a can manufacturing facility, a landfill gas flare, two wood cabinet manufacturing facilities, a fiberglass manufacturing facility, a major refinery, and a power generation company. In the process of obtaining air permits, BLUESCAPE has used techniques ranging from consulting look-up tables and screening dispersion modeling, to full refined dispersion modeling and risk calculations.

- ***Benzene Exposure Analysis, Confidential Refinery, Appalachian Region.*** Lead dispersion modeler for an analysis of potential human exposure to benzene emitted from wastewater processing operations at a medium-sized petroleum refinery. Used the ISCST and COMPLEXI models to estimate ground-level impacts due to fugitive sources such as tanks, pipes, and ponds, as well as point sources such as cooling towers. Estimated potential excess cancer risk under various exposure scenarios, accounting for population mobility, indoor concentrations relative to outdoor concentrations, and movement of population between various microenvironments.

- ***Evaluation of U.S. EPA's use of the HAPEM Exposure Model to Estimate Benzene Emissions from Mobile Sources, Confidential Client.*** Lead modeler for evaluating U.S. EPA's application of the HAPEM exposure model to mobile source pollutants, especially benzene. Downloaded CO monitoring data from the Aerometric Information Retrieval System. Using statistical and graphical methods, analyzed the relationship between ambient measurements of CO and tailpipe benzene emissions to critically evaluate U.S. EPA's methodology.

Accidental Release Offsite Consequence Analyses

- ***RMP Offsite Consequence Analysis, Hill Brothers Chemical Company and Modern Ice and Cold Storage, San Jose, California.*** As a subcontractor to Denali, Inc., completed a CalARP (RMP) modeling study for a chemical company that stores and redistributes for sale anhydrous and aqueous ammonia, and a food cold storage facility. For each facility, assessed the worst-case and alternative release scenarios for each process utilizing ammonia, then calculated the source term (ammonia release rates) for each process. The worst-case and alternative case impacts were determined using the DEGADIS and/or other appropriate models or guidance.

- ***Offsite Consequence Analysis, Microchip, Tempe, Arizona.*** A semiconductor manufacturer needed to update its accidental release management plan for compressed gases, hydrochloric acid, and sulfuric acid. The ISCST3 model with one year of meteorological data was used to model compressed gas releases. DEGADIS was used to model acid spills. The radii of impact,

based upon the distance to IDLH values, were found to be within the facility boundary. A report presenting the results of the analysis and showing the onsite radii of impact was completed.

- ***Risk Management and Prevention Plan, Komag, Fremont, California.*** For development of an RMPP, analyzed meteorological data to determine typical conditions that could occur during an accidental release. Developed a report section describing typical meteorological conditions in the RMPP.

  Accidental Release Models Evaluation, Pure-Etch, Salinas, California. As part of a CEQA study, an etching solution reclaim facility was required to conduct a "customized" accidental release analysis for a mitigated negative declaration. The chemicals at issue were sulfuric acid, hydrochloric acid, and ammonia. Assisted in the project by locating and evaluating candidate dispersion models for completing offsite consequence analyses.

Air Emissions Inventories

- ***Air Emissions Fee Reports, Johns Manville Corporation, Corona, California.*** Assisted a fiberglass company in Southern California in response to SCAQMD's request for revised Rule 301 emissions inventories for the period 1994-1997 and completed the 1997-1998 report. A full air compliance audit initiated the project to verify permit status and emissions source inclusion. Emission factors were updated to reflect recent source tests and a TitleV emissions inventory.

- ***Clean Air Act Emissions Inventory for Two ABEX/NWL Control Systems Facilities.*** Managed the completion of facility-wide emissions inventories for two aerospace component manufacturing facilities located in Michigan and Georgia. The emission inventories were submitted to State agencies and became the basis for determining applicable Clean Air Act requirements, including Title V permitting.

- ***Due Diligence Emissions Inventory, Confidential Golf Club Manufacturer, San Diego, California.*** A golf club manufacturer was interested in estimating air toxic emissions from one of two facilities. Emissions had not been tracked closely in the past. The project proved to be challenging, since many different paint and solvent products were used, usage logs differed between different production areas, and materials were often transferred from another facility. Data gaps were filled to complete the inventory. Results of the due diligence inventory were compared to local air district regulations to assess compliance.

- ***Dehydration Unit Emissions, Confidential Natural Gas Producer, Western U.S.*** Using natural gas composition information supplied by the client, estimated VOC and hazardous air pollutant emissions from triethylene glycol dehydration units at three facilities. The purpose of the project was to determine if Title V permit applicability thresholds were exceeded. The GlyCalc 3.0 model was used to complete emissions estimates.

- ***AB2588 Emissions Inventory, Johns Manville, Willows, California.*** A fiberglass manufacturing facility was required to update its original AB2588 emissions report. Several new source test results had been completed. Using the source test data and other information sources, a comprehensive air toxics inventory was completed and submitted to the Glenn County Air Pollution Control District using FATES. From the results of the analysis, risk prioritization scores were estimated and the facility was counseled on potential updated risk assessment requirements.

- ***AB2588 Emissions Inventory Plans, Calmat, Southern California.*** Completed Air Toxics Inventory Plans for more than 10 sand and aggregate, batch concrete, and batch asphalt plants. Provided detailed information to agencies on processes and emission quantification methods. The plans were the basis for later completion of emissions inventory reports.

Clean Air Regulatory Analyses and Compliance Audits

- ***Regulatory Analysis for the Petroleum Industry, Western States Petroleum Association.*** Conducted a comparative analysis of over 150 environmental regulations affecting petroleum companies in five key areas: air toxics, new source review, endangered species, hazardous materials, and oil spills. Determined reporting requirements, and assessed inefficiencies and overlaps between regulations.

- ***Clean Air Act Compliance Audits, Confidential National Client.*** Task Manager for analyzing the impact of the 1990 Clean Air Act Amendments on over 30 facilities located in 11 states and engaged in a variety of manufacturing activities. Reviewed

emissions and process information to determine the applicability of, and compliance with, Federal, State and local air quality regulations. Prioritized issues and gave recommendations for action.

- ***General Motors Environmental Audit, Flint, Michigan***. As a team member with Golden Environmental, completed the air quality audit portion of the environmental for the maintenance services at "Buick City" located in Flint Michigan.

- ***Environmental Compliance Audit, Triptych CD, Stockton, California***. Completed the environmental compliance audit for a company located in Stockton, California, which produces compact discs. Evaluated the facility's compliance with applicable air, solid waste, hazardous waste, and water discharge regulations.

- ***Clean Air Act Compliance Audit, Confidential Aluminum Production Facility, South Carolina.*** Completed a review of Clean Air Act regulations that might apply to the facility as part of an environmental audit. Assessed the applicability of NSPS, NESHAP, MACT, CAA Section 112(r) and other requirements.

Environmental Impact Air Quality Analysis

- ***Air Quality Impact Analysis, Homestead Village, San Ramon, California***. Project Manager for completion of an air quality impact analysis for a hotel development, as part of a CEQA environmental impact report. The analysis was completed efficiently using BAAQMD guidance and a study previously completed for a shopping center. Using traffic information supplied by another consultant, insignificant project impacts were estimated.

- ***Environmental and Air Quality Impact Review, City of Antioch and Pittsburg District Energy Facility.*** Project Manager retained by The City of Antioch, and Intervener, to review the California Energy Commission's (CEC) Preliminary Staff Assessment for the Pittsburg District Energy Facility. Worked with team members to developed written testimony regarding potential impacts to air quality, water quality, and infrastructure. Attended workshops and hearings to obtain information and present City of Anitoch's concerns to CEC staff.

- ***Air Quality Modeling Analysis, Alta Ski Resort Draft EIR, Utah.*** Revised the air quality impact section of a draft EIR for the Alta Ski Resort. The section was expanded to address lead agency comments regarding potential impacts on ambient air quality, visibility, and PSD increments. The SCREEN3 model and CALINE4 model were used to estimate impacts from direct and indirect sources. A formal response satisfying the comments was submitted.

- ***Traffic and Air Emissions Study, Reno, Nevada***. As part of the environmental impact report for the Southern Pacific-Union Pacific railroad merger, estimated automobile air emissions due to increased traffic delays caused by train trips in downtown Reno. Estimated emissions using MOBILE5. Train emissions were estimated using emission factors supplied by the Washoe County Air Agency.

- ***Air Quality Impact Analysis, Vintage Faire Mall, Modesto, California.*** The Vintage Faire Mall was planning to expand to include additional services with added parking spaces. An analysis was completed to determine air quality impacts from increased automobile trips. The EMFAC7F model was run to obtain vehicle emission factors. Impacts from CO and other emissions were estimated using the CALINE4 model and CEQA guidance.

Papers and Presentations:

- Westbrook, J.A. 2007. How to Calculate and Reduce Fleet Carbon Emissions. Presented at the National Alternative Fuels & Vehicles Conference, Anaheim, California, April.

- Westbrook, J.A. and Sullivan, P.S. 2006. Fugitive Dust Modeling for PM10 Emissions from a Municipal Waste Landfill. Presented at the "Guideline on Air Quality Models: Applications and FLAG Developments — An A&WMA Specialty Conference", Denver, Colorado, April.

- Westbrook, J.A. and Dillingham, J. 2005. *Rule 1401 Health Risk Assessment Course*. One-day course presented in Anaheim, California.
- Westbrook, J.A. and Dillingham J. 2005. *Air Toxics Health Risk Assessment Featuring HARP Software*. Two-day course presented in Anaheim and San Francisco, California.
- Westbrook J.A. 2004. *Environmental Justice & DER*. Presented at the 2004 California Alliance for Distributed Energy Resources Conference, San Diego, California.
- Tarde J.A. and Westbrook J.A. 2003. *Air Quality Modeling in a Highly Industrialized Valley Regime: A Comparison of AERMOD–PRIME to ISCST–PRIME and ISCST3 Results for PM10 Emissions*. Presented at the "Guideline on Air Quality Models; the Path Forward" Conference, Mystic, Connecticut, October.
- Westbrook, J.A. 1998. *Regional Risk Analysis and CALPUFF: A Review of the Tri-State Initiative*. Presented at the 10th Joint Conference on the Applications of Air Pollution Meteorology with the AW&MA, Phoenix, Arizona.
- Westbrook, J.A. 1998. *Facilitating the Air Permitting Process: Strategic Planning Makes a Difference*. Presented at the 1998 Johns Manville Environmental Coordinator's Conference, Denver, Colorado.
- Westbrook, J.A. 1998. *Air Dispersion Models: Tools to Assess Impacts from Air Pollution Sources*. Natural Resources & Environment New Science and Technology Issue. ABA Section of Natural Resources, Energy, and Environmental Law, Chicago, Illinois, Spring.
- Westbrook J.A., and Tarde J.A., 1995. Dispersion Modeling Techniques for Horizontal, Titled or Capped Emission Sources. Presented at the 88th Meeting of the Air & Waste Management Association, San Antonio, Texas.
- Hayes S.R., and Westbrook J.A. 1992. Analysis of Regulatory Requirements for Petroleum Companies in California. Presented at the DOE California Petroleum Industry Environmental Workshop, Bakersfield, California.

RESUME
JERRY A. ANDERSON
Vice President

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Petaluma, CA 94954-1169
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Fax: 707/665-9800
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Educational Background
B.S. Applied Mathematics, University of Colorado, 1971

Professional Experience

Mr. Anderson is one of the founders of STI and is responsible for STI's financial and personnel management. He is also the project manager for several of STI's field research programs. He was formerly the manager of the Santa Rosa office of Meteorology Research, Inc. (MRI) and has had extensive experience in project and financial management and in contract negotiations.

Mr. Anderson has been the project manager for most of the airborne air quality sampling programs performed by STI. He has accumulated more than 3000 hours of airborne sampling flight time. His involvement included program management, flight direction, instrument operation, calibration, testing, training, data processing, and data analysis. Mr. Anderson also managed numerous air quality and meteorological measurement programs for both STI and MRI. These projects included PSD monitoring studies and tracer studies.

In recent years Mr. Anderson has been the project manager for the 1992 ARB Transport Assessment Study, the Dallas Visibility Study, the NARSTO-Northeast Air Quality Study, and the Paso del Norte Ozone Study aircraft measurements. He also managed over 1000 flight hours of sampling in the Los Angeles Basin. He has been responsible for the development of STI's aircraft data processing software and has developed systems for onsite processing, plotting, and review of the data on a daily basis.

In 1972 and early 1973 he was aviation coordinator in St. Louis for The National Center for Atmospheric Research (NCAR) FAPS (Fate of Atmospheric Pollutants Study) where he was responsible for project aircraft operations. In 1971 and 1972 he worked as a field engineer for the NCAR "National Hail Research Experiment", and from 1969 to 1971, he worked as a research technician for NCAR.

See STI's web site, http://www.sonomatech.com/resumes.htm, for a list of publications.

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WILLIAM E. CORBIN

TITLE: **Associate and Senior Project Scientist**

EXPERTISE: **Air Quality Permitting; Environmental Regulatory Compliance; Air Quality Modeling and Noise Analyses; Meteorological and Air Quality Monitoring/Data Analyses; Computer Applications**

EXPERIENCE:

Air Quality Permitting

- Involved in the preparation or review of over 1000 air permit applications.
- Extensive experience with New Source Review (NSR), Prevention of Significant Deterioration (PSD), New Source Performance Standards (NSPS), 1990 Clean Air Act Amendments (CAAA) including MACT and Title V requirements, and other Federal and many State air regulations.
- Prepared PSD, Title V, and minor source permit applications for a large number of facilities including resource recovery facilities (RRFs), coal-fired power plants, cement kilns, cogeneration facilities, and numerous types of industrial/manufacturing plants including surface coating facilities, graphic arts equipment, boilers, IC-engines, and material handling equipment.
- Extensive experience with RADIUS air permitting software required by the New Jersey Department of Environmental Protection (NJDEP) and numerous other state agencies.
- Reviewed or prepared numerous CAAA environmental submittals such as Annual Compliance Statements, Emission Statements, Title V Semiannual Deviation Reports, and Quarterly Excess Emission Reports (including electronic NJEMS submittals).
- Performed permit audits and emissions estimates/inventories for numerous facilities. Extensive use of USEPA emissions models/references such as Landfill Air Emissions Estimation Model, CHIEF, and AP-42.
- Prepared or reviewed Best Available Control Technology (BACT), Reasonably Available Control Technology (RACT), Lowest Achievable Emission Rate (LAER), and similar engineering analyses for a variety of source types.

Environmental Regulatory Compliance

- Prepared environmental regulatory/applicability analyses for numerous facilities.
- Prepared SARA Title III submittals for both Sections 311/312 (Right-to-Know) and 313 (Toxic Release Inventory) and biennial Hazardous Waste Reports for various clients.
- Prepared NJPDES Discharge Monitoring Reports (DMRs) and Waste Characterization Reports (WCRs) for monthly/quarterly/semiannual surface, stormwater, and groundwater sampling. Prepared NJPDES Permit Applications for several clients.
- Prepared Spill Prevention, Control, and Countermeasure (SPCC) Plans, Stormwater Pollution Prevention Plans (SPPP), and Groundwater Protection Program Plans.
- Assisted in reviewing regulatory and technical issues for environmental hearings, civil suits, and defense against enforcement actions.
- Performed baseline noise surveys and impact assessments for industrial projects and FHWA highway projects. Certified for performing noise surveys under NJDEP procedures.

Air Quality Modeling and Noise Analyses

- Extensive experience with USEPA air dispersion models and associated computer programs such as SCREEN3, ISC3, CALPUFF, AERMOD, BPIP and PRIME as well as specialized models for assessing visibility, photochemical, or transport processes.

Air Quality Modeling and Noise Analyses (Continued)

- Performed numerous mobile source emissions, air dispersion and noise impact modeling analyses using local municipalities, for quantifying secondary growth impacts, and for Federal Highway Administration (FHWA) highway projects.
- Managed or performed air quality modeling analyses for a large number of industrial sources such as RRFs, coal-fired power plants, offshore oil production facilities, natural gas processing plants, and cogeneration facilities. Included preparation/negotiation of modeling protocols with state agencies; Good Engineering Practice (GEP) stack height analyses; meteorological data processing with RAMMET and proprietary programs; and development of proprietary programs for calculating running-hourly and running-monthly averages, deposition, and tabulation and graphical presentation of results. Assessments performed for EIS and PSD/State air permit applications, monitoring plans, net air quality benefit analyses, health risk assessments, and non-attainment area re-designations.

Meteorological and Air Quality Monitoring/Data Analyses

- Prepared numerous baseline air quality and meteorological summaries for site selection studies and air permit applications for RRFs, oil production, petrochemical, cogeneration, gas processing, and other facilities throughout the U.S.
- Supervised air quality data reduction and analysis efforts for numerous PSD monitoring programs. Developed an extensive system of proprietary computer programs to process, edit, and present air quality monitoring data.
- Supervised field efforts for several air quality and meteorological monitoring programs. Before staff expansions, personally responsible for field operations and maintenance of NO_x, SO_2, O_3, CO, TSP, and PM_{10} analyzers and meteorological equipment at several ambient monitoring sites. Performed system and performance audits for several monitoring systems.
- Prepared numerous specialized meteorological and air quality data analyses such as climatology studies, quality assurance evaluations of meteorological data, VOC impact assessments, and preparation of meteorological data for modeling analyses.

Computer Applications

- Programming experience in FORTRAN, BASIC, and other languages as well as various graphics and plotting packages. Operating systems experience in DOS, Windows, and mainframe environments. Experienced in numerous PC-based applications such as Word, WordPerfect, Excel, Lotus, Surfer and ArcView.
- Extensive mainframe and PC experience executing USEPA dispersion models; frequent user of USEPA/Office of Air Quality Planning and Standards and other environmental and federal and state regulatory websites.

PROFESSIONAL BACKGROUND:

- Environmental Compliance Assistance, LLC, Basking Ridge, NJ. Associate.
- Wheelabrator Gloucester Company, L.P., Westville, NJ. EH&S Manager.
- RTP Environmental Associates Inc., Green Brook, NJ. Senior Scientist.
- Dames & Moore, Bethesda, MD; Houston, TX; and Santa Barbara, CA. Project Meteorologist.
- U.S. Nuclear Regulatory Commission, Bethesda, MD. Meteorology Assistant.

ACADEMIC BACKGROUND:

- B.S., Meteorology with distinction, Penn State University, 1980.

PROFESSIONAL AFFILIATIONS:

- Air & Waste Management Association (AWMA).
- American Meteorological Society (AMS).

RESUME
DONALD L. BLUMENTHAL, Ph.D.
Chief Executive Officer

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Educational Background
B.S. Engineering, California Institute of Technology, 1965
Ph.D. Aeronautics, California Institute of Technology, 1970

Professional Experience

Dr. Blumenthal is one of the founders of STI and is responsible for the direction of STI's research and industrial service activities as well as for new business development. Dr. Blumenthal's contributions to the air quality field include his work on understanding the three-dimensional distribution and transport of pollutants; his pioneering use of light aircraft to document pollutant spatial distributions, transport, and transformations; his design and management of large-scale field studies; and his ability to bring together government and industry to jointly and objectively study air quality issues. His technical publications focus on the three-dimensional distribution and transport of pollutants.

Dr. Blumenthal has been principal investigator and/or program manager for many large-scale, successful field research programs over the past 30 years. In recent years, he was the principal investigator for the anchor site measurements for the $3 million California Regional $PM_{10}/PM_{2.5}$ Air Quality Study (CRPAQS) and was technical coordinator for the $12 million NARSTO-Northeast Air Quality Study. He was co-principal investigator of the $3 million Mt. Zirkel visibility study in Colorado; he was a member of the management team for the $12 million Navajo Generating Station Winter Visibility Study; and he helped design the $5 million Gulf of Mexico Air Quality Study. He was the program manager for the design of the $16 million San Joaquin Valley Air Quality Study and was the program coordinator for the $14 million Southern California Air Quality Study. Other projects managed by Dr. Blumenthal include an acid fog study for the Coordinating Research Council, a study of air transport between Los Angeles and Ventura Counties (California), a San Joaquin Valley ozone distribution study, the aerometric aircraft component of the South Central Coast Cooperative Air Monitoring Program (SCCCAMP) for the Western Oil and Gas Association, and tracer and visibility studies for the U.S. Navy at China Lake, California. He also directed portions of the U.S. Environmental Protection Agency (EPA) MISTT, STATE, SCRUB, and VISTTA programs; the EPRI SURE aircraft program; the California Air Resources Board (ARB) Three-dimensional Gradient Study; and numerous other studies for the EPA, ARB, EPRI, and industry throughout the United States.

Prior to founding STI, Dr. Blumenthal was the Director of the Research Division of Meteorology Research, Inc. In the past, his duties have included development of meteorological and air pollution instrumentation and measuring techniques.

Dr. Blumenthal is a long-term member and past chair of the Editorial Review Board of the Journal of the Air & Waste Management Association (A&WMA). He was also awarded the A&WMA's 2001 Frank Chambers Award for outstanding achievement in the science and art of air pollution control.

Dr. Blumenthal is also an instrument-rated commercial pilot.

Memberships
Air & Waste Management Association
American Association for the Advancement of Science

See STI's web site, http://www.sonomatech.com/resumes.htm, for a list of publications.

GREGORY S. DARVIN
Meteorologist

ATMOSPHERIC DYNAMICS
METEOROLOGICAL AND AIR QUALITY MODELING

Summary of Experience

Mr. Darvin has specialized in the meteorological aspects of air quality issues for the last sixteen years. He has extensive experience in air quality management, dispersion modeling, meteorological modeling, monitoring, major source permitting, complex terrain model development and implementation, emission inventory and health risk assessments. Mr. Darvin also has extensive experience in air quality operational permits (Title V), especially for the oil and gas industry. His experience spans more than 25 different states and several countries.

He has been actively involved with recent PSD permits for many large-scale solid fuel and gaseous fuel projects across the United States. Mr. Darvin has performed the following in support of PSD applications for utilities: baseline air quality and air quality modeling analyses (including preparation and negotiation of the modeling protocol), prepared the PSD and air permit regulatory applicability analyses, managed the preparation of the air quality emissions inventory, and assisted with the Best Available Control Technology (BACT) evaluations.

Specific project experience includes emissions calculations, modeling of impacts, evaluation of regulatory applicability and compliance, New Source Review (NSR) and Prevention of Significant Deterioration (PSD) permitting, and minor source permitting. He has used and is thoroughly familiar with a number of air quality models, including AERMOD, ISC3, CALPUFF, CALMET, COMPLEX I AND II, IGM, FDM, RTDM, CTSCREEN, CTDMPLUS, UAM, DEGADIS, SPILLS, VISCREEN, PLUVUEII, MESOPUFF, INPUFF, BLP, PAL, CAMEO, CALINE4, OCD5, RAM, TRACE, MM5, SLAB, and the Paris Airshed Model. These models have been used in scientific and development settings as well as in regulatory settings.

Education
M.S. Atmospheric Science, San Francisco State University, Candidate 1993
B.A. Physical Geography/Meteorology, University of California, Santa Barbara, 1985.

Professional Affiliations
Air and Waste Management Association
American Meteorological Society

Select Project Experience
A representative selection of Mr. Darvin's projects is included below.

MMC Chula Vista Energy Upgrade Project AFC (August 2006-Present). Air Quality Project Manager and lead modeler for preparation of the AFC and SDAPCD permit application for the upgrade of the facility utilizing two GE LM-6000 natural gas turbines. The project was ruled complete within 30 days of application submittal.

Select Project Experience (continued)

Otay Mesa Generating AFC, Calpine. (1999 to present). Lead Meteorologist and Project Manager for permitting a combined cycle power plant, located near San Diego, Ca. Project included Class I impacts, a nitrogen deposition impact assessment, and a downwash analysis in complex terrain. Modeling was used to prepare PSD permit application as well as the AFC application, which was submitted to CEC.

Walnut Creek and Sun Valley Energy Project AFCs, Edison Mission Energy (August 2005 to Present). Air Quality Project Manager and lead air quality modeler for preparation of two simple cycle AFC's for over 1000 MW of generation in the South Coast Air Basin. Project includes permit negotiation, ERC/RECLAIM review, and preparation of visible cooling tower plume analyses.

San Diego Gas and Electric Palomar (2006), Lead air quality modeler for calculation of impacts from the proposed changes to the turbine startup emissions. Several modeling scenarios were developed to incorporate ozone limiting to demonstrate the potential impacts from revising the startup emissions.

Mountainview Power Plant – SCE (2005 to Present). Project Manager for preparing an air quality permit modification related to commissioning activities and plant startup/shutdown. The project includes preparing a CEMS certification protocol, siting a meteorological tower, and ongoing compliance and regulatory consulting.

Roseville Electric Project AFC, City of Roseville, Ca. (January 2003 to Present). Air Quality Project Manager for air quality analysis related to a proposed new 200 MW natural gas fired power plant. Analysis included evaluation of Class I impacts, visibility impacts, complex terrain, and cooling tower plume modeling.

Pico Power Project AFC, City of Santa Clara. (January 2002 to November 2004). Air Quality Project Manager and lead air quality modeler for permitting a 180 MW power plant in the City of Santa Clara, Ca. Prepared and negotiated air quality permit with BAAQMD and prepared air section(s) of AFC for the California Energy Commission.

Russell City Energy Center AFC, Calpine (January 1999 to November 2002, September 2006-Present). Air Quality Project Manager for obtaining PSD permit and AFC for a large natural gas fired power plant, located near Hayward, Ca. Project required detailed emission calculations, air quality modeling, combined impact assessments, BACT analysis and demonstration, Title IV compliance, and Title V compliance issues.

Metcalf Energy Center AFC, Calpine. (1998 to 2003) Lead air quality modeler for modeling a large natural gas fired power plant, located near San Jose, Ca. Project included using refined modeling techniques to determine nitrogen deposition impacts, Class I analysis, and downwash analysis.

Select Project Experience (continued)

San Joaquin Energy Center AFC (2001-2002) Lead Meteorologist for permitting large power plant, located near the town of San Joaquin in the San Joaquin Valley. Project included preparing modeling assessments for toxics and criteria pollutants, meteorological data set assessments, construction impacts, and plume visibility assessments for the CEC and local air agency.

Prevention of Significant Deterioration (PSD) Permit Modification, Kettle Falls Generating Station, Avista Corporation, Kettle Falls Washington. Prepared a PSD application for modification to the Kettle Falls Generating Station, a wood-waste fired generating facility to address emission increases resulting from a capacity increase modification at the facility. Air quality modeling analyses were required to assess compliance with ambient air quality standards and PSD increments. A toxic air pollutant evaluation was also prepared.

PSD Permitting and EIS For 2000-MW Coal-Fired Power Plant, Sierra Pacific Resources, Nevada. Managed the preparation of a Prevention of Significant Deterioration (PSD) permit application for a 2000-megawatt coal-fired power plant in northeastern Nevada proposed by Sierra Pacific Resources. Evaluation of PSD increments involved extensive air quality modeling for regions with complex terrain. Detailed air quality analyses were performed to address complex issues including: long-range transport of pollutants and subsequent effects on acid deposition, effects of plant emissions on visibility in nearby and distant Class I areas, evaluation of pollutant buildup during stagnation conditions and its effect on visibility, dust emissions from the construction and operation of the power plant, and ambient air quality standards and PSD increments. As part of the state's permitting requirements, an evaluation of air toxics was performed.

PSD Permitting for Rinker Materials Cement Kiln in Brooksville, Florida. Mr. Darvin performed the baseline air quality and air quality modeling analyses, prepared the PSD and air permit regulatory applicability analyses, managed the preparation of the air quality emissions inventory and assisted with the Best Available Control Technology (BACT) evaluation. The project fuel sources included coal, oil, and natural gas.

Air Quality Permitting for an Ammonia/Urea Plant, Btu Nitrogen Company, Wallula, Washington. Prepared a Notice of Construction application for the proposed Btu Nitrogen Plant near Wallula, Washington which included a 600 ton per day ammonia plant and 1,000 ton per day urea fertilizer plant. The facility was to be located in a PM_{10} nonattainment area. Air quality modeling was used to demonstrate compliance with PM_{10} requirements and air quality standards for criteria and toxic air pollutants. Additionally, Best Available Control Technology analyses were prepared for both criteria and toxic air pollutants.

Select Project Experience (continued)

Power Generation Facility – 1250 MW Combined-Cycle, PSD Air Quality Permitting, Kootenai Generation LLC, Rathdrum, Idaho. Managed preparation of a PSD permit application for a proposed 1,250 MW gas-fired combined-cycle turbine power generation facility to be located in Rathdrum, Idaho. Evaluation of local and regional air quality impacts were assessed with the ISCST3 model and CTSCREEN model for impacts in complex terrain. Potential impacts on regional haze and acid deposition on distant federal Class I areas were evaluated with the CALPUFF modeling system. Other air quality evaluations required for the PSD permit application include evaluation of impacts from toxic air pollutants and evaluation of Best Available Control Technology (BACT).

Clean Fuels Refinery Modification, Chevron, Los Angeles, California. Lead air quality modeler for preparation of an Environmental Impact Report (EIR) and New Source Review permit for a large refinery modification in Los Angeles to support the Clean Fuels Program. Project also included toxic emissions calculations and preparation of a Health Risk Assessment.

Prevention of Significant Deterioration - Calpine Rocky Mountain Energy Center. Project manager for preparing PSD application for a 620 MW power plant, located near Hudson Colorado. Project required completion of a PSD permit application, air quality impact modeling analysis in both near and distant from the source, BACT demonstration, and assessment of Class I area impacts. Project was deemed complete by agency in less than 4 weeks.

Arctic Ocean Permitting, Arco Alaska. Task Leader and lead modeler for the first OCS permit ever submitted to the USEPA. Permit was for several off-shore oil exploration drilling platforms in the Arctic Ocean off Alaska. Project involved use of OCD to calculate impacts from exploratory drilling rig and support vessels. Impacts at ANWR were also assessed.

Mesoscale Complex Terrain Model Development, Italian Government and Alyeska. Developed a mesoscale complex terrain wind field model to determine impacts of topographically induced winds on a large man-made lake in the Italian Alps. This model has also been used to diagnose trajectories of potential oil spills in Alaskan waters.

Lead Dispersion and Deposition Study, ASARCO, Leadville, Colorado. Lead scientist for assessing potential deposition of lead from smelting operations over a 130-year period. Results of emissions calculations, modeling and deposition were used to develop a soils sampling program and subsequent cleanup criteria.

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Education and Professional Training

Academic: MSEME (Mechanical Engineering, Automotive), University of Michigan
BSEME (Mechanical Engineering, Automotive), University of Michigan

Training: Aviation Safety Officer (Contractor Flight Operations), Naval Postgraduate School, Monterey, CA
Government Contract Administration, General Services Administration, Washington, DC
Government Aircraft Cost Accounting, General Services Administration, Washington, DC
Fleet Air Modernization, General Services Administration, Washington, DC

Flight Experience

4050 Total Hours
1880 Airplane Multi-Engine Hours
1950 Helicopter Hours
1200 Flight Test Hours (Maintenance)
180 Airplane Multi-Engine (Jet) Hours

FAA Certificates (partial)

Airline Transport Pilot, Airplane Multi-Engine Land
Commercial Pilot, Helicopter with Instrument Rating
FEX Written, 100%

Credentials

Commander, U.S. Navy / Career Naval Aviator
Designated Aerospace Engineering Subspecialist, U.S. Navy
Registered Professional Engineer, Mechanical, California
Certified Acquisition Professional, U.S. Navy
Joint Service Standardization Instructor Pilot (U.S. Navy), All Models UH-60 Helicopters
Top Secret Security Clearance, Presidential (inactive)

Relevant Experience

Aviation and Technology Consultant (current)
Director of Operations, Union Flights
Emerging Technology Working Group, California Governor's Office of Planning and Research
Director of Aviation, Intel Corporation
Chief of Aviation, California Department of Forestry and Fire Protection

Director of Operations, Naval Aviation Depot, Alameda, CA
Executive Officer, Naval Plant Representative Office, Sikorsky Aircraft Company
Air Operations Officer, USS Ranger / USS Peleliu Carrier Battle Group, U.S. Pacific Fleet

Achievements

United States Congressional Citation, 1995
Awarded for outstanding public service to the citizens of Alameda and the San Francisco East Bay communities during the Naval Air Station Alameda base closure process.

Society of Automotive Engineers Ralph R. Teeter Award, 1981
Chosen as one of the 25 Outstanding Engineering Educators in the United States and Canada while assigned to the faculty of the U.S. Naval Academy

Top Graduate, Naval Aviation Officer Candidate School, 1972
Ranked number 1 of 43 Naval Aviation Officers in commissioning class 38-71

Civilian Experience

President / CEO, International Institute for Aviation, Science and Technology Current
Perform aviation program and aviation safety reviews for domestic and international aviation programs (flight operations, aircraft maintenance, logistics support, crew training, contractor staffing, and safety program management). Review and write standard operating procedures and training manuals. Write and evaluate proposals for contractor flight operations. Director of Operations for Union Flights. Organized Emergency Response Aviation Human Factors, Aviation Operational Risk Management, and Government Aviation Business Practices courses for the University of California, Davis Extension.

Executive Director, California Commission on Tax Policy in the New Economy 2002-2003
Coordinated activities for nine (9) Commissioners appointed by the Governor and the Legislature and nine (9) ex-officio members assigned by statutory authority. Principal liaison to California Senate and Assembly members and their staffs to evaluate proposals for revising California tax and revenue policies. Drafted press releases. Published *Interim Report, Options for Revising the California Tax System*, and *Final Report*.

California State Fellow, American Society of Mechanical Engineers 2001-2002
Fellowship sponsored by the California Technology Trade and Commerce Agency. Provided engineering analyses and policy guidance in support of advanced technology programs for the executive and legislative branches of California state government. Member of the Governor's Emerging Technology Working Group.

Director of Aviation, Intel Corporation 2000-2001
Implemented an in-house, regional jet, air shuttle program connecting five (5) city pairs, providing scheduled aviation services for 175,000 passengers on an annual basis. Accountable for all flight operations, aircraft maintenance, logistics support, aviation safety, aircraft security, Hazmat programs, Injury and Illness Prevention Program (industrial safety), line service, reservation systems, and customer relations. Negotiated multi-year aviation services contract for contractor flight support. Managed a $33 million annual operating budget.

Chief of Aviation, California Department of Forestry and Fire Protection 1996-2000
Responsible for 24 hour / day flight operations, maintenance, and safety programs for 55 airplanes and helicopters deployed to 22 California air attack bases. Accountable for a $200 million aircraft and aircraft parts inventory. Directed a $72 million aircraft modernization program for 14 OV-10s and 23 S-2Ts. Flew back-up fire suppression missions in OV-10s. Represented the western states and Alaska on the U.S. Interagency Airtanker Board. Member of the General Services Administration

Interagency Committee for Aviation Policy (ICAP), Public Use Aircraft Working Group. Managed a $49 million operating budget.

Base Reuse and Closure Consultant, Private Practice 1995-1996
Evaluated the Naval Air Station Alameda CA industrial complex for the Alameda Reuse and Redevelopment Authority during base closure. Inventoried and appraised several thousand machine tools in 90 buildings worth more than $100 million. Analyzed Cal-OSHA compliance upgrade requirements for selected buildings and processes. Assisted private investor teams in developing and implementing business plans for reuse strategies.

Military Experience

Director of Operations, Naval Aviation Depot, Alameda, CA 1990-1995
Commander, U. S. Navy. Supervised 2,500 civilian employees overhauling S-3, P-3, and A-6 aircraft. Maintained engineering, modification, and structural repair standards for 120 S-3 and 500 P-3 aircraft in the Navy inventory. Flew test flights in S-3 and A-6 jets. Team leader for Cal-OSHA and Fed-OSHA compliance programs. Hazmat and Bay Area Air Quality Management District permitting officer. Liaison to San Francisco and Oakland / East Bay communities during base closure. Accountable for a $350 million budget.

Powerplants Class Desk, Commander, Naval Air Force, U.S. Pacific Fleet 1987-1990
Responsible for all levels of maintenance and for approving all powerplant changes for 6,000 Pacific Fleet aircraft engines worth $4.2 billion. Developed integrated logistics support plans for the Navy fleet introductions of the F404 jet engine (F/A-18 fighter), the T700 engine (SH-60B helicopter), and the T427 engine (E-2C turboprop). Supervised a direct staff of eight and indirect staff (U.S. and Western Pacific) of several hundred.

Executive Officer, Naval Plant Representative Office, Sikorsky Aircraft, Stratford, CT 1984-1987
Administered world-wide Department of Defense and Coast Guard production and overhaul contracts worth $1.8 billion. Directly supervised the White House contract for the overhaul of the U.S. Presidential helicopter fleet. Top Secret Security Clearance, Presidential. Coordinated field team repair efforts overseas. Joint Service Standardization Instructor Pilot for all models of the H-60 helicopter. Flew test flights in H-60 Blackhawks, SH-60 Seahawks and Presidential VH-3D executive helicopters.

Air Operations Officer, Amphibious Squadron Seven 1982-1984
Planned and executed all flight operations for a combined USS Peleliu and USS Ranger amphibious / carrier battle group in preparation for combat operations in Lebanon. Responsible for Battle Group threat assessment and countermeasures. Accountable for flight deck certifications of all ships capable of supporting helicopter flight operations. Flew combat assault and search and rescue missions in UH-1N helicopters. Aviation Liaison Officer to Japanese, Korean, Australian, and Canadian forces during joint amphibious assault exercises.

Instructor, Mechanical Engineering, U. S. Naval Academy, Annapolis, MD 1979-1982
Taught courses in Compressible Flow and Turbomachinery, Fluid Mechanics, Thermodynamics, and Statics. Flew aviation indoctrination flights and taught seamanship for midshipmen during summer recess.

Combat Pilot, Helicopter Antisubmarine Warfare Squadron Thirty Six 1976-1979
Officer-in-Charge Detachment Six. Deployed with USS Saratoga Battle Groups. Flew combat support from Navy destroyers and cruisers in SH-2F helicopters. Navy finalist for astronaut training.

Operational Test and Evaluation Pilot, Air Test and Evaluation Squadron One, Patuxent River, MD 1973-1976
Flew antisubmarine test flights in S-2E/G airplanes, SH-3H and SH-2F helicopters. Wrote test plans, analyzed test data, and drafted final reports. Top Secret publications, cryptography, and equipment control officer.

RESUME
PAUL T. ROBERTS
Executive Vice President, Business Area Development/
Chief Scientific Officer

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Educational Background
B.A. Chemical Engineering, Rice University, 1969
M.Ch.E. Chemical Engineering, Rice University, 1970
Ph.D. Environmental Engineering Science, California Institute of Technology, 1975

Professional Experience

Dr. Roberts joined STI in 1986. At STI, he has designed and managed a number of air quality field, data management, and data analysis projects. Most of these projects involve the use of field data and analysis methods to understand important meteorological, air quality, and exposure phenomena; to develop, apply, and evaluate meteorological, photochemical, and exposure models; and to evaluate the effectiveness of ambient air quality and meteorological networks in meeting various regulatory requirements. These projects have focused on a range of issues, including ozone, PM_{10} and $PM_{2.5}$, visibility, toxics, carbon monoxide, and meteorology. Dr. Roberts was the Technical Coordinator for the California Regional $PM_{10}/PM_{2.5}$ Air Quality Study (CRPAQS) Anchor Site Operations and was the project technical expert for several of the PM and gaseous instruments for CRPAQS. Dr. Roberts was the Principal Investigator for the MMS-sponsored Boundary Layer Study over the Central and Western Gulf of Mexico, and the Breton Aeromatic Monitoring Study – Phase II. He had major responsibility for program management and participant coordination for the Southern California Air Quality Study (SCAQS). He designed and managed the field measurements and data analyses for the Sacramento Area Ozone Study, the MMS-sponsored Gulf of Mexico Air Quality Study, the EPA-sponsored Paso del Norte Ozone Study, special VOC measurements to help understand ozone formation in Houston, a long-term epidemiologic study in Southern California, and the exposure measurements for the Fresno Asthmatic Children's Environment Study (FACES). He was the Observations Coordinator for the 1995-1997 NARSTO-Northeast Air Quality Studies and helped plan the data management, observation, QA, and data analysis activities. Dr. Roberts co-led the air quality and meteorological field measurement and data analysis efforts for the 1996-1997 Clark County CO study.

Dr. Roberts designed and managed the preliminary data analysis activities and the analysis of boundary condition field data for the San Joaquin Valley Air Quality Study. He managed two major projects to quantify the contribution of transported pollutants to downwind ozone violations in California air basins. He led analyses of meteorological and air quality data for the SCAQS, Lake Michigan Ozone Study, CRPAQS, and NARSTO-Northeast Air Quality Studies. Dr. Roberts also co-led the development and presentation of a three-day PAMS data analysis workshop and a PM workshop for EPA.

Dr. Roberts was the Measurement Coordinator for the multiyear SCENES Visibility Study in the southwestern United States. He managed STI's activities in the Sacramento, San Diego, Lower Lake Michigan, Gulf Coast, and San Luis Obispo Ozone Scoping Studies and the RESOLVE Study data management and case study analysis.

From 1981 to 1986, Dr. Roberts was chairman of several oil-industry trade association committees that sponsored air quality research, was a consultant to the environmental affairs group of Chevron, and testified at Federal hearings. From 1975 to 1986, he planned and directed research and development projects at Chevron Research Company and helped apply the results to operating plants in various Chevron refineries. He also led Chevron's process research efforts on tar sands and coal gasification and was involved in numerous methods development and methods evaluation projects.

In graduate school, Dr. Roberts developed the flash vaporization technique for measuring nanogram levels of particulate sulfur and carried out research on the transformation of SO_2 to particulate sulfur in Los Angeles. He also participated in the ARB ACHEX and the EPA RAPS.

Dr. Roberts was a member of the California Inspection and Maintenance Review Committee in 1994-1995, has served on various EPA peer-review panels since 1995, including the external Peer-Review Panel for EPA's "Air Quality Criteria for Carbon Monoxide" published in 2000, and is a member of the Air & Waste Management Association. He is also an expert on Victorian architecture in the San Francisco Bay Area.

See STI's web site, http://www.sonomatech.com/resumes.htm, for a list of publications.

GREGORY D. TREWITT
"GREG"
EASTSHORE ENERGY CENTER - PROJECT

QUALIFICATIONS SUMMARY

Mr. Trewitt has over 20 years of power industry experience in project development, permitting, engineering, operations, and asset management of power projects in US regulated and US non-regulated as well as southern cone region of Latin American industry environments.

His experience includes managing up to 1000 MW of generation fleets of independent power projects in both the Western Electric Coordinating Council (WECC) states as well as in the country of Argentina.
Mr. Trewitt has working industry knowledge and experience with current technologies of power generation including coal, natural gas, hydro, wind, and wind-gas/diesel.

Mr. Trewitt's experience includes electric generation in regulated environments with investor owned utilities as well as non-regulated independent power producers and wholesale markets. In addition, Mr. Trewitt is experienced in financial modeling and analysis, air permitting, water supply and procurement, fuel supply and procurement, engineering, marketing of physical electric generation, power purchase agreements, operations, maintenance, and proposal development to utilities, distribution companies, Latin American governments and industrial end-users.

POSITIONS HELD

2006 - Present	Vice President, Development and Engineering	Tierra Energy (Eastshore Owner)
2003 - 2006	Director, Operations and Asset Management	Black Hills Energy
2001 – 2003	President, Corporacion Independiente de Energia	Xcel Energy, Subsidiary
2000 – 2001	Director, IPP Services, Denver Office	Utility Engineering Corporation
1997 – 2000	Plant Manager/Asset Manager	Independent Power Americas
1995 – 1997	Regional Manager, Peaking/Standby Generation Sales	Alliant Energy, Industrial Energy Applications, Inc.,
1989 - 1995	Performance Engineer/Marketing	Public Service Company of Colorado
1998 – 1999	Reliability Engineer, Defense Avionics	Honeywell
1984 – 1986	Plant Engineer/Performance Engineer	Public Service Company of Colorado

EDUCATION

B.S. Electrical Engineering	New Mexico State University, 1987
B.S. Mechanical Engineering	New Mexico State University, 1984

ASSOCIATIONS & SEMINARS

Rocky Mountain Electric League, Member since 1987
Wind-Diesel, Anchorage, Alaska, 2004
Power Gen Conference, Las Vegas, Nevada 2005
Power Gen Conference, Las Vegas, Nevada 2003
Siemens/Westinghouse – Technology Seminar, Orlando, Florida, 2001
GlobalCon, Denver, Colorado, March, 1996
General Electric – Technology Seminar, Dana Point, California, 2001
Exposición Internacional del Mercado Eléctrico Argentino, Buenos Aires, Argentina, 1998
Partners in Energy, Oil Producers and Cooperatives, Casper, Wyo., Feb., 1996
Utah Industrial End User Conference, Salt Lake City, June, 1996
Power Contracts, *Executive Enterprises,* San Francisco, Ca., December, 1995
Power Gen Conference, Orlando, Florida, 1995
Effective Negotiating, Karauss, San Francisco, Ca., December, 1995
Executive Training Course on Public Utilities, Public Service of Colorado, Denver, 1994
Power Gen Conference, Dallas, Texas, 1993
Cogeneration, University of Wisconsin-Madison, Seattle, Washington, 1993
Management Assessment/Training Center, Public Service of Co., Denver, Co., June, 1991
Steam Turbine Performance, K.C. Cotton, Kansas City, Mo., 1990
Creep Fatigue Failure Prediction of PTH Solder Joints, Honeywell, Alb., N.M., 1988
Fire-side Optimization of Boiler Control Systems, EPRI, Philadelphia, PA., 1988
Process Control Engineering, Foxboro Corp., Foxboro, Mass., 1985
Vibration Modal Analysis, Bruel & Kajer, Denver, Co., 1985
Vibration Analysis, I.R.D. Mechanalysis, Denver, Co., 1983

LANGUAGES

Fluent in **English** (home language) and **Spanish** (4 years living & working in Argentina)

SELECTED PROJECT EXPERIENCE

Vice President, Development and Engineering, Tierra Energy, Denver, Colorado

Client: ***Tierra Energy Holdings, LLC***
Project: ***Wholesale IPP Plant, PG&E Tolling Plant (116MW)***
Date: ***2006 -Present***

Mr. Trewitt is currently directed development and project management of Eastshore Energy Center. Eastshore is a 116 MW reciprocating, lean burn, natural gas engine peaking project in PG&E east-bay territory in Hayward, California. He has successfully negotiating the equipment supply agreement and managing the California Energy Commission Application for Certification process.

Director Operations & Asset Management, Black Hills Energy Corp., Golden, Colorado

Client: *Black Hills Energy Corp.*
Project: *Wholesale IPP Fleet, Western USA (1000MW)*
Date: *2003 -2006*

Mr. Trewitt directed operations and asset management functions of a fleet of 1000 MW including gas turbine simple and combined cycle technologies at 8 facilities in the western US including Colorado, Idaho, Nevada and California. He successfully completed a short term 100 MW tolling agreement in Southern California Edison service territory in 2004. He completed a divestiture of 40 MW gas fired combined cycle asset in New England ISO in 2005.

President, Corporacion Independiente de Energia S.A., Buenos Aires, Argentina

Client: *Xcel Energy*
Project: *Wholesale IPP Fleet, Gas/Hydro Fired Assets in Argentina (750MW)*
Date: *2001 - 2003*

Mr. Trewitt presided over three power plant assets in Argentina for Xcel Energy International. Responsible for all aspects of company operations and asset management in Argentina. Assets included 2x320 MW gas fired bottoming cycle; 2x32 MW gas fired simple cycle and 48 MW hydro-electric plant. Mr. Trewitt's responsibilities include managing all operational aspects of each plant as a general manager of operations company in Buenos Aires, Argentina.

Director, IPP Services, Utility Engineering, Denver, Colorado

Client: *Newport Generation*
Project: *Wholesale IPP, Combined Cycle, 1300 MWe, 4x2, Wallula, Washington, USA*
Date: *2000-2001*

Mr. Trewitt was responsible for directing the engineering efforts for preliminary design and energy facility siting evaluation council (EFSEC) approval and permitting of a gas fired 4x2 combined cycle plant in Washington State. Responsible for plant thermal design and modeling, site arrangements and layouts, water supply, wastewater effluent, noise analysis, transmission routing of gas and electric, socio-economic impact data, air/water emissions, evaluation of cooling methods and designs to meet client's site specific needs. He was responsible for permit application write-ups for Energy Facility Siting and Evaluation Council (EFSEC). Mr. Trewitt was responsible for review and negotiation of combustion turbine power island agreements with OEM and client.

Client: *Coastal Energy/City of Colorado Springs Utilities*
Project: *Combined Cycle, 480 MW, 2x1, GE 7FA, Colorado Springs, Colorado, USA*
Date: *2000*

Mr. Trewitt was responsible for plant thermal modeling and design to meet client's site specific needs. He was responsible for design integration and optimization of the thermal cycle and mechanical equipment. He was responsible for Steam Turbine, HRSG, Air Cooled Condenser and other BOP major equipment specification and integration to maximize plant output and heatrate. Mr. Trewitt is also responsible for providing strategic leadership in the coordination of management and of engineering activities related to IPP projects.

Consultant, TREW Energy, Denver, Colorado

Client: *NRG, Inc.*
Project: *Combined Cycle re-power, 360 MW, 2x1, GE 7FA, El Segundo, California, USA*
Date: *1999/2000*

Mr. Trewitt was responsible for plant thermal modeling and design feasibility of re-powering to meet client's site specific needs. He was responsible for design integration and optimization of the thermal cycle.

Client: *Northern States Power Company*
Project: *290 MW, 1x1 Westinghouse 501F Repowering, Minneapolis, Minnesota, USA*
Date: *1999*

Mr. Trewitt was responsible for plant thermal modeling and design feasibility of repowering to meet client's site specific needs. He was responsible for design integration and optimization of the thermal cycle. Mr. Trewitt was responsible for Request for Proposal (RFP) technical specification document development for EPC contract submittal.

Client: *Independent Power Americas*
Project: *640 MW, Supercritical, Bottoming Cycle, Bahia Blanca, Argentina*
Date: *1997-1999*

Mr. Trewitt was Operations Manager/Asset Manager of a 620 MW, gas-fired, super-critical, thermal power plant in Argentina. He directed operations and maintenance technical services. Mr. Trewitt participated in plant budgeting, daily operations scheduling with country's ISO and short and long term maintenance scheduling. He was also involved in asset management, the marketing of physical electric generation, and proposal development to local industrial end-users and the open market in Argentina. He provided project development, feasibility, financial pro-forma analysis, and market due diligence to the client for various gas-fired power plant acquisitions in Argentina. Mr. Trewitt also provided consulting services to U.S. utilities and industrial end-users for electric power sales/procurement strategies including distributed generation, aggregation, etc.

Regional Manager, Marketing

Client: *Alliant Energy, Industrial Energy Applications, Denver, Colorado*
Project: *Western Region USA*
Date: *1995-1997*

Mr. Trewitt managed gas transmission and gathering pipeline acquisition. He performed financial modeling, and the development of contract sales and purchase agreements. He also managed subsequent asset operations for one year. Mr. Trewitt was also responsible for standby, backup, and cogeneration project development to cooperatives, REA's, and large industrial customers in Northwest U.S. including California.

He was also responsible for regional and corporate business development of electric generation/thermal projects and acquisition of existing facilities. Mr. Trewitt provided technical expertise in acquisitions of coal, hydro, gas-fired generation facilities.

Various Engineering /Marketing Assignments

Client: *Public Service Company of Colorado (PSCo), Xcel Energy, Denver, Colorado*
Project: *All Public Service Company Plants and IPPs/Major PSCO customers*
Date: *1989-1995*

As Team Lead, Client Solutions, Mr. Trewitt was involved in project and proposal development of customer sited energy solutions in the areas of electric generation, back-up generation, steam and chilled water systems. He participated in and planned development for end-use energy technologies.

As Special Project Engineer, Mr. Trewitt participated in cogeneration project and proposal

development for the elimination of industrial customers' self-generation, third party threats, and the possibility of retail wheeling. He determined technical and financial feasibility of customer sited cogeneration facilities. He also developed cost allocation methods to determine rate structure for regulated and non-regulated electric and steam pricing. Mr. Trewitt developed financial models for purchase of customer sited steam, chilled water, and compressed air utilities. Mr. Trewitt worked with CU Boulder Facility, Brush Cogeneration Power Partners, Thermo Facilities, IBM Boulder and others.

As Senior Performance Engineer, Mr. Trewitt coordinated performance testing and analysis of all PSCo power generation facilities including 500 kW to 540 MW coal-fired, combustion turbine, and hydropower facilities. He analyzed turbine cycles, boiler combustion optimization, condenser performance, cooling tower performance with regard to maintenance and overall plant performance optimization. He also performed steam path appraisals of turbine blades, packing, and tip seals to determine generation and efficiency losses. Mr. Trewitt recommended maintenance and operational improvements for I&C and plant equipment to station management. He prepared financial analysis (factor analysis) for repair/replacement options of plant equipment in order to increase plant efficiency and generating capability.

Reliability Engineer

Client: ***Honeywell, Defense Avionics Systems Division, Albuquerque, New Mexico***
Project: ***C-17 Air Cargo***
Date: ***1998-1999***

Mr. Trewitt managed failure modes, effects and criticality analysis (FMECA) for various defense aircraft avionics systems including flight control computers (FCCs). This included MIL-std-1629 functional FMECA of C-17 Air Cargo spoiler, flap and slat control computer. Performed piece part FMECA of C-17 Air Cargo auto-throttle, autopilot actuators along with the force feel control stick assembly. Predict MTBF of mechanical actuators, and force feel control stick assemblies. Mr. Trewitt defined the effects of all equipment failure modes on mission success.

Plant Engineer/Performance Engineer

Client: ***Public Service Company of Colorado (Xcel Energy), Denver, Colorado***
Project: ***Comanche-700MW/Arapahoe-240 MW Stations, Coal Fired***
Date: ***1984-1986***

Mr. Trewitt performed plant wide vibration and modal analysis for Comanche steam electric generation station (750 MW, coal fired, plant). Designed and coordination of plant engineering projects such as soot-blow inter-tie between plant units, coordination of electro-static precipitator cleaning during outages, plant wide support of overhauls, plant preventative maintenance programs.

Mr. Trewitt was promoted to Performance Engineer for the Arapahoe steam electric generation station (240 MW, coal fired, plant). Duties included management and reporting of plant-wide efficiency and heat rate program. Including steam path appraisals and other efficiency programs.

Gary Veerkamp
Veerkamp Engineering
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Fair Oaks, CA 95628
707-365-6850 (cell)

Mr. Veerkamp has spent over 32 years in the power generation design, construction, and project management fields, and in support of associated regulatory filings and litigation. A graduate of the University of California at Davis with both Bachelors (with High Honors) and Masters degrees in Mechanical Engineering, Gary began his career with the Pacific Gas & Electric Company in 1975 as a piping design engineer and stress analyst, designing underground hot oil and nuclear piping systems. From there Mr. Veerkamp progressed through various levels of responsibility, including:

- Over 8 years designing, procuring, programming, installing, and commissioning computer-based control systems for fossil retrofits and new units, and supervising the work of other controls engineers. This included the design and procurement of entire plant control systems for PG&E's prior geothermal facilities at The Geysers.
- Over 9 years in increasing levels of supervisory responsibility managing and coordinating the design and installation of various mechanical systems and plant retrofits, concentrating in large programs such as PG&E's fossil fleet NOx retrofit program in the mid-90s.
- Coordination of the technical aspects associated with PG&E's fossil unit divestiture efforts in the late-90s. Gary was subsequently involved in litigation support at the FERC associated with the Reliability Must Run (RMR) contracts that had been assigned to several of the new owners of the former PG&E fossil and geothermal power plants.

Gary left the utility in January of 2000 and joined the Dispersed Generating group of PG&E's National Energy Group (NEG). While with NEG, Gary was initially responsible for control system procurement, installation, and commissioning for three simple cycle peaking facilities in Ohio that employed refurbished aero-derivative engines (GE Frame 5 LAs and Westinghouse 301Gs). Gary subsequently was assigned overall responsibility for management of the design, construction, and commissioning of two peakers in the San Diego area, again using refurbished aero-derivative engines, in this case P&W FT4s.

Gary left NEG in November of 2002 and joined RealEnergy. While at RealEnergy, his responsibilities were focused on the management of combined heat and power (CHP) projects in Northern California. These CHP installations were typically in the electrical size range of 800 kW to slightly over 1 MW, providing both power along with chilled and/or heating hot water to the host (typically either high rise buildings or large retail shopping complexes).

In November of 2003 Gary left RealEnergy and established Veerkamp Engineering. Veerkamp Engineering's primary focus is on providing third party power plant development support, and for those projects that are executed, design and construction management support. One of these development efforts that was recently executed and

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completed involved design and construction management for the Miramar Energy Facility, a nominal 46 MW simple cycle intermediate/peaking load facility based on a single GE LM6000 Sprint prime mover. The ultimate owner of this facility was San Diego Gas & Electric. Mr. Veerkamp has more recently supported the development of Eastshore Energy Center - a 115 MW reciprocating engine project in Northern California that will operate under a 20 year PPA with PG&E. He is also lead technical coordinator for the development of a bid that was submitted to and has been short-listed by Southern California Edison in their current RFO solicitation, and is also supporting several other projects that are in various stages of early development.

Mr. Veerkamp has published several articles, both in the fields of Project Management and in NOx retrofit assessment and application for fossil boilers; is a member of the Tau Beta Pi engineering honor society; and is a lifelong private pilot.

Utility System Efficiencies, Inc.

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R. Peter Mackin

Vice President, Reliability Services & Principal Electrical Power Systems Analyst

ACADEMIC BACKGROUND

M.S., Electric Engineering, Montana State University, 1982
B.S., Civil Engineering, Montana State University, 1981

PROFESSIONAL EXPERIENCE

Peter Mackin has over 24 years of power system planning and computer application development experience and has been involved in WSCC/WECC planning and operating activities since 1985. In April of 2006, Mr. Mackin joined Utility System Efficiencies, Inc. as Vice President, Reliability Services and Principal Electrical Power Systems Analyst.

While employed at Navigant Consulting, Mr. Mackin performed several transmission and resource integration studies for the Alberta Electric System Operator (AESO) as well as generation interconnection studies and transmission feasibility analyses for other clients. Mr. Mackin was a member of the NERC Version 0 and Phase III/IV Standards drafting teams. In addition, Mr. Mackin provided expert witness testimony at FERC in Docket no. ER01-1639-006.

While employed by the California ISO (Cal-ISO), Mr. Mackin performed or reviewed system planning studies for Reliability Must Run generation requirements, new generator interconnection studies, as well as Participating Transmission Owner annual Transmission Assessments. In addition, Mr. Mackin helped develop the Cal-ISO's New Facility Interconnection Policy and Long-Term Grid Planning Policy. Mr. Mackin has provided expert witness testimony regarding six new generation projects before the California Energy Commission.

While employed by Pacific Gas and Electric Co. (PG&E), Mr. Mackin was the lead transmission planning engineer performing transient stability simulations for the 500-kV California – Oregon Transmission Project. In addition, Mr. Mackin performed, supervised or reviewed studies to determine simultaneous import capabilities into California from the Pacific Northwest and the Desert Southwest. For two years, he served as chairman of the work group that undertook these studies comprised of utilities from California, the Northwest, and the Southwest.

Utility System Efficiencies, Inc. — 2006-Present

- **California ISO CSRTP Studies. 2006.** Assisted the California ISO with the CAISO South Regional Transmission Planning (CSRTP) studies. These studies were performed to determine the reliability benefits of three major proposed transmission and generation projects in southern California. The projects assessed were the SDG&E Sunrise Powerlink 500 kV transmission line, the LEAPS pumped storage and 500 kV transmission project, and the Tehachapi wind resource area 230 and 500 kV transmission reinforcements.
- **Eastern Plains Transmission Project (EPTP). 2006.** Supervised system studies for Tri-State Generation and Transmission Association for their proposed EPTP and its associated new generation resources. These studies were performed to determine the appropriate project line configuration and series compensation levels for EPTP.

- **WECC Three Phase Rating Process. 2006-2007.** Led the WECC Project Review Group and performed and supervised the WECC Phase 2 rating studies for the Montana Alberta Tie Ltd. (MATL) project. The MATL project is a proposed 230 kV tie line between Lethbridge, Alberta and Great Falls, Montana. This project has a proposed bidirectional rating of 300 MW. The MATL project achieved WECC Phase 3 status in August, 2007.

- **APS SIL Study 2006-2007.** Supervised studies performed for APS to establish the Simultaneous Import Limits for APS. These studies were performed in accordance with established FERC guidelines as part of a FERC market power filing.

- **Interconnection Application Assistance. 2007.** Provided assistance developing data for interconnection applications for various generator developers in California and Nevada. The data developed included models for both steady state and dynamic simulations.

- **Islanding Studies. 2007.** Performed studies to determine appropriate operating limits for either the Burbank system or the combined Burbank and Glendale systems to minimize loss of load and to speed load restoration under various scenarios in which the Burbank or Burbank and Glendale systems become islanded from the rest of the WECC. As part of this analysis, developed a detailed dynamic load model representations for the Burbank and Glendale power systems. Also, developed a reduced equivalent of the WECC system to reduce the time needed to perform the dynamic simulations for this study.

- **High Plains Express. 2007.** Is currently leading the feasibility study effort for the High Plains Express (HPX) project. The HPX project is a proposed 500 kV transmission project extending from Wyoming to Arizona. HPX is being designed to enable the delivery of renewable resources in Wyoming, Colorado, and New Mexico to load centers in Colorado, New Mexico and Arizona.

- **NorthWestern Energy MSTI Project. 2007.** Is currently assisting NWE with the WECC Regional Planning Process and the WECC Project Rating Review Process for the Mountain States Transmission Intertie (MSTI). MSTI is a proposed 500 kV line from western Montana to south central Idaho that is being proposed to provide an outlet for new generation proposed in Montana.

- **Eastshore Energy Center. 2007.** Is currently assisting Tierra Energy, the project developer, in the subject areas of transmission system engineering and local system effects (a.k.a., system benefits) for the Eastshore Energy Center license application before the California Energy Commission.

Navigant Consulting, Inc. 2001-2006

- **California Power Authority. 2001.** Reviewed or supervised the review of the transmission system impact of 60 proposed projects submitted to the California Power Authority. This review was designed to discover any potential fatal flaws in the transmission interconnection for each project. This information along with input from other critical subject areas was used to rank the viability of each project.

- **Open Access Tariff Review. 2001.** Reviewed the Open Access Tariff (OAT) of SaskPower to determine compliance with FERC Order 888 and the NERC Available Transmission Capacity (ATC) calculation methodology.

- **Alberta 500 kV System Studies. 2001-2002.** Was the lead technical manager on a project to evaluate 500 kV transmission alternatives for the Alberta Transmission Administrator. This project included steady state, post-transient, and transient simulations to determine power system performance under various scenarios. The objective of this project was to develop preferred alternatives for three different generation development scenarios in the Province of

Alberta. Additional analysis performed for these studies included EMF and SSR calculations and EMTP simulations.

- **Independent Consultant's Report for the California Department of Water Resources. 2001-2002.** Revised all major WECC transmission path limitations for input into the production simulation models used to by NCI help evaluate the power purchase contracts signed by CDWR on behalf of the people of the State of California.

- **Other Generation Projects (NCI). 2001-2002.** Reviewed studies and other information to provide clients with feasibility analysis regarding transmission interconnection for various potential generation projects. Also developed dynamic models for some projects to be able to model transient behavior of the new generation project. These potential generation projects ranged in size from 35 MW to over 600 MW.

- **Transmission Project Feasibility Analysis. 2001-2002.** Performed a feasibility analysis for a confidential client to determine the viability of a potential merchant transmission project. Reviewed the transmission studies and supervised the production simulation studies that were used to evaluate the economic potential of the project.

- **Silicon Valley Power Pico Project. 2002.** Was the project manager for the system studies being performed on behalf of Silicon Valley Power to determine the impacts of the Pico Project on the transmission systems of PG&E and Silicon Valley Power. The Pico Project is a 150 MW combined cycle power plant that is located in the City of Santa Clara, California.

- **NERC Facility Ratings Standard Authorization Request Drafting Team. 2003.** Was a member of the team that drafted the Standard Authorization Request (SAR) for NERC Standards FAC-008 to FAC-013 (Determine Facility Ratings, System Operating Limits, and Transfer Capability). This SAR was used as the basis for the new NERC Standards that were recently approved.

- **Alberta Transmission Development – Strategy and Conceptual Studies. 2003.** Was the project manager on a project to evaluate various transmission and generation development scenarios for the Alberta Electric System Operator (AESO). This project determined the transmission reinforcements needed to reliably serve Alberta load under various generation development and power export scenarios. The capital and O&M costs of the needed transmission reinforcements and the market price of the generation were combined in a financial model to determine the NPV for each scenario. These scenarios were then used to show the benefits to Alberta ratepayers of having adequate transmission available to accommodate a generation development near the low cost fuel supply sources.

- **Edmonton – Calgary Transmission Needs Assessment. 2003-2004.** Supervised and performed system planning studies in support of the Alberta Electric System Operator's (AESO) Edmonton-Calgary 500 kV Transmission Development Need Application to the Alberta Energy and Utilities Board. These studies involved powerflow and dynamic simulations of the Alberta electric system to help determine the short-term and long-term reinforcements needed to reliably and economically serve Alberta load while simultaneously minimizing the amount of congestion on the transmission system.

- **NERC Version 0 Standards Drafting Team. 2004.** Was a member of the team that revised the North American Electric Reliability Council's (NERC) Planning Standards and Operating Practices to create the Version "0" set of NERC Reliability Standards. The Planning Standards and Operating Policies were modified so that they contained only requirements that are needed to maintain power system reliability. These new Reliability Standards will form the foundation of any reliability requirements that might be mandated via federal legislation.

- **Reliability Must Run (RMR) Generation Expert Witness Testimony. 2004-2005.** Provided expert witness testimony for the Western Area Power Administration (WAPA) in FERC Docket ER01-1639-006. Supervised a series of RMR studies that demonstrated the reliability benefits provided to the system by generation units controlled by WAPA. Quantified these RMR benefits using a methodology similar to that used by the ISO to determine the RMR contract payments for RMR generation. All parties to this case agreed to a settlement after the hearing but prior to the issuance of the ALJ's decision.

- **NERC Phase III/IV Standards Drafting Team. 2005.** Is currently vice chairman of the NERC Phase III/IV Standards Drafting Team. This team is responsible for revising the NERC Phase III/IV Standards to be clear and enforceable, while incorporating the concerns of the industry as reflected in comments that have been received on all previous postings of these standards.

- **Montana Alberta Tie Ltd (MATL). 2005-2006.** Lead the first phase of the WECC Project Rating Review process as well as the WECC Regional Planning Project Review process for the MATL project. Successfully obtained WECC Phase 2 status for this project. The MATL project is a proposed 230 kV tie line between Lethbridge Alberta and Great Falls Montana. This project is has a proposed bidirectional rating of 300 MW.

California ISO Grid Planning 1997-2001

- **1998 Reliability Must Run Study. 1997-1998.** Performed all analyses to determine the minimum generation requirements for the Humboldt, North Valley, Sacramento, Sierra, North Bay and North Coast divisions of Pacific Gas and Electric Co. This work involved steady state powerflow, voltage stability and transient stability analyses. The results of these studies were used by the California ISO Board of Governors to determine the RMR requirements for the ISO control area and to designate generators that would become RMR units for each year. In addition, evaluated proposals for Local Area Reliability Services (LARS) that could serve as alternatives to RMR contracts for maintaining system reliability. These alternatives were evaluated based on, among other criteria, effectiveness, cost, environmental impact, safety, and impact on markets.

- **Alturas Project. 1997-1998.** Represented the ISO on the WSCC review group reviewing the system studies for the Alturas Transmission Project. The Alturas Transmission Project is a 345-kV transmission line that runs from Hilltop substation in northern California to Valley Road Substation west of Reno, NV. As the ISO representative, had significant input into ISO policy regarding the Alturas Transmission Project and its effects on other transfer paths in the WSCC.

- **Transmission Expansion Plans. 1998-2000.** Responsible for reviewing transmission studies and recommended transmission expansion plans for various areas of the ISO controlled grid. For the 1999 Transmission Expansion Plan, reviewed studies and recommended transmission expansion plans for PG&E's North Valley, Sacramento, Sierra, Stockton, Stanislaus, Yosemite, Fresno, and Kern divisions. For the 2000 Transmission Expansion Plan, reviewed studies and recommended transmission expansion plans for PG&E's Humboldt, North Valley, Sacramento, Sierra, Stockton, and Stanislaus divisions.

- **Los Medanos Energy Center (a. k. a., Pittsburg District Energy Facility). 1998-2001.** The Los Medanos Energy Center is a 555 MW combined cycle generator project currently operating in Pittsburg, California. Was responsible for reviewing all system impact and facility studies associated with this project to make sure that the project would meet all applicable local and regional reliability criteria. In addition, provided expert witness testimony before the California Energy Commission in the subject area of Transmission System Engineering. Also worked with PG&E and Calpine to develop operating procedures to allow the full output of the

plant to be available to serve load following system condition changes that were not studied in the system impact and facility studies.

- **Delta Energy Center. 1998-2001.** The Delta Energy Center is an 880 MW combined cycle generator project located in Pittsburg, California. Was responsible for reviewing all system impact and facility studies associated with this project to make sure that the project would meet all applicable local and regional reliability criteria. In addition, provided expert witness testimony before the California Energy Commission in the subject area of Transmission System Engineering. Also worked with PG&E and Calpine to develop additional mitigation plans to allow the full output of the plant to be available to serve load following system condition changes that were not studied in the system impact and facility studies.

- **Three Mountain Power Project. 1998-2001.** The Three Mountain Power Project is a proposed 500 MW combined cycle generator project located in Burney, California. Was responsible for reviewing all system impact and facility studies associated with this project to make sure that the project would meet all applicable local and regional reliability criteria. In addition, provided expert witness testimony before the California Energy Commission in the subject area of Transmission System Engineering. Also assisted in negotiations between TANC, PG&E, and TMPP, regarding the issues of congestion management, curtailment priorities, and Existing Transmission Contracts.

- **Computer Model Development. 1999.** Developed an "EPCL" model for the GE PSDS program to simulate the fast governor response of the Humboldt Bay Power Plant to system line faults or system under-frequency events. This model was required to correctly model the power system in PG&E's Humboldt Division, and use of this model allows for more accurate unit commitment in the area.

- **Moss Landing Power Plant Project. 1999-2000.** The Moss Landing Power Plant Project is a 1060 MW combined cycle generator project currently operating east of Moss Landing, California. Was responsible for reviewing all system impact and facility studies associated with this project to make sure that the project would meet all applicable local and regional reliability criteria. In addition, provided expert witness testimony before the California Energy Commission in the subject area of Transmission System Engineering.

- **Metcalf Energy Center. 1999-2001.** The Metcalf Energy Center is a 600 MW combined cycle generator project in southern San Jose, California. Responsible for reviewing all system impact and facility studies associated with this project to make sure that the project would meet all applicable local and regional reliability criteria. In addition, provided expert witness testimony before the California Energy Commission in the subject areas of Alternatives, Transmission System Engineering and Local System Effects. The Local System Effects testimony was based on studies performed by Mr. Mackin (with assistance from CEC Staff) to determine the local and regional electrical benefits that would result from the construction and operation of the Metcalf Energy Center.

- **Policy Development. 1999-2001.** One of the primary developers of the California ISO's New Generation Interconnection Policy and the ISO's Long-Term Grid Planning Policy. In addition to developing the policies, had significant input in to the development of the Tariff language implementing both policies. Both policies were developed through a comprehensive stakeholder process involving representatives from generators, transmission owners, loads, and regulators.

- **El Segundo Modernization Project. 2000-2001.** The El Segundo Modernization Project is a 280 MW (net increase) combined cycle generator project planned to be located at the site of the existing El Segundo Generating Station located in the city of El Segundo, California. Was responsible for reviewing all system impact and facility studies associated with this project to make sure that the project would meet all applicable local and regional reliability

criteria. In addition, provided expert witness testimony before the California Energy Commission in the subject area of Transmission System Engineering.

- **Other Generation Projects. 2000-2001.** While at the ISO, was responsible for reviewing all studies for each individual generation project to ensure that the project was in compliance with local and regional reliability criteria. During 2000 and 2001, was responsible for 36 different generation projects (six of these are listed above). In addition to reviewing studies, was also responsible for tracking internal ISO processes to make sure that when each of these generators was ready to synchronize to the ISO controlled grid, all internal ISO requirements had been met.

- **August 10 Validation Study and System Model Development. 2000-2001.** Was one of six task force members that developed "interim" modeling recommendations for WSCC operating transfer capability studies. The task force investigated various model parameters (e. g, induction motor models, motor inertia, multi-terminal DC, gas turbine, steam and hydro governors among others) before developing a recommendation that all operating study cases should model induction motors for approximately 20% of the system load. This recommendation was then benchmarked against a well-documented system disturbance, the August 10, 1996 collapse of the WSCC system. The task force is currently investigating additional load modeling parameters, and is working on developing a long-term load modeling recommendation for the WSCC system.

Pacific Gas and Electric Co. 1983-1997

- **Computer Model Development. 1985-1995.** Helped develop a revised Static VAr Compensator model for the WSCC transient stability program. This revised model incorporated a non-windup limiter on the firing angle control of the SVC. Also helped develop the "MaxFlow" program. This program is a DC powerflow model that uses linear programming techniques to determine the maximum flow on any particular system element for any possible combination of a defined list of system inputs. This model is especially useful in determining the system impact of transmission contracts that allow any load to be served from any generation source.

- **California – Oregon Transmission Project. 1985-1993.** Was the lead transmission planning engineer for PG&E performing transient stability simulations for the 500-kV California – Oregon Transmission Project. The California – Oregon Transmission Project is a 340-mile, 500-kV transmission line between Oregon and California. This project was placed in service in March of 1993.

- **California Simultaneous Import Studies. 1991-1994.** Performed, supervised or reviewed operating studies to determine simultaneous import capabilities into California from the Pacific Northwest and the Desert Southwest. For two years, served as chairman of the work group that undertook these studies. The study work group was comprised engineers from utilities in California, the Northwest, the Rocky Mountain region, and the Southwest.

- **Transmission Oriented Production Simulation. 1993-1994.** Lead PG&E representative on the WSCC Transmission Oriented Production Simulation Program Development Task Force. This task force developed a recommendation to WSCC management regarding program requirement to accurately model transmission system constraints in a production simulation program. In addition, this task force evaluated products on the market or under development to develop a recommendation to WSCC management regarding program packages that could potentially meet the requirements developed in the first recommendation.

- **Area Planning. 1995-1997.** Responsible for all Area Transmission planning activities for PG&E's North Valley Division. This work included forecasting division transmission loads, basecase development, contingency analysis, problem identification, solution development,

and recommendation to Management on the appropriate projects to maintain system reliability.

- **Simultaneous Transfer Limit Studies. 1997.** Served as a PG&E representative on Operating Capability Study Group (OCSG), a work group of utility engineers that was formed following the major WSCC system disturbances on July 2, July 3, and August 10, 1996. The OCSG developed modeling and study methodologies to ensure that simultaneous transfer limits determined from the studies would be conservative and not result in system collapse if a major disturbance were to occur while operating at the determined limits.

Power Systems Analysis Tools

- General Electric PSLF/PSDS - 9 *Years*
- WSCC Interactive Power Flow System (IPS) and WSCC Stability - *12 Years*
- Power Technologies, Inc. PSS/E - *2 Years*

Professional Associations and Committee Memberships

- WECC Disturbance Monitoring Work Group, Chair, 2004 – Present
- WECC Planning Coordination Committee, Member, 2004 - Present
- WECC/WSCC Technical Studies Subcommittee, Member, 2001 - 2005
- WSCC Modeling and Validation Work Group, Member, 1997 – 2001
- Sacramento Area Transmission Planning Group, Member, 1998 – 2001
- Sacramento Valley Study Group, Member, January 1999 – 2001
- Operating Capability Study Group (OCSG), Member, 1997
- Operating Studies Subcommittee (OSS), Member, 1994 –1997, 2001 - 2006
- WSCC Transmission Oriented Production Simulation Program T.F., Member, 1993–1994
- WSCC PAST Technical Studies Work Group, Chairman, 1991-1992
- WSCC PAST Subcommittee, Member, 1991-1992
- WSCC PAST Study Methodology Review Work Group, Member, 1991-1994
- WSCC Program Work Group, Member, 1985-1990
- IEEE Power Engineering Society, Senior Member

Publications and Presentations

"AN INTERIM DYNAMIC INDUCTION MOTOR MODEL FOR STABILITY STUDIES IN THE WECC" L. Pereira, D. Kosterev, P. Mackin, D. Davies, J. Undrill, and W. Zhu, IEEE Transactions on Power Systems, pgs 1108-1115, November 2002

"Grid Planning and Generator Interconnection In California", P. Mackin, EUCI Congestion Management Conference, Denver, CO; June 22-23, 2000

"Power System Stability Controls in a Restructured Industry – The California ISO Perspective", P. Mackin, IEEE/PES 1998 Summer Power Meeting, San Diego, CA; July 13-17, 1998

"SUBTRANSMISSION REDUCTION FOR VOLTAGE INSTABILITY ANALYSIS"; J. McCalley, J. Dorsey, J. Luini, P. Mackin, G. Molina; IEEE/PES 1992 Winter Power Meeting; New York, NY; January 26-30, 1992

RESUME
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Educational Background

B.S. Atmospheric Science, University of California at Davis, 1993
M.S. Atmospheric Science, University of California at Davis, March 1998

Professional Experience

Mr. MacDonald joined STI in 1996. He manages meteorological and air quality analysis and diagnostic modeling projects; performs data analysis to characterize pollutant transport and dispersion; and conducts field programs involving upper-air meteorological measurements.

As part of his work with upper-air measurements, Mr. MacDonald serves on the Application Advisory Group for STI's participation in a Cooperative Research and Development Agreement (CRADA) to commercialize the National Oceanic and Atmospheric Administration's (NOAA) boundary layer radar wind profiler technology. His role in the CRADA is to identify new applications for radar wind profiler (RWP) products and to design and oversee the creation of RWP application software. In addition, he recently led the deployment and operations of two RWPs, one mini-sodar, and two surface meteorological stations for the Texas Air Quality Study II (TexAQS-II) field study, is currently the Principal Investigator for the RWP maintenance and operations project for South Coast Air Quality Management District (SCAQMD), and is currently managing a RWP data monitoring project for the Texas Commission of Environmental Quality.

Mr. MacDonald led the Mineral Management Service's Atmospheric Boundary Layer Study in the Western and Central Gulf of Mexico. This project included the development of a database and software system to store and display surface meteorological and air quality data, and RWP/RASS data. Using this data, he calculated, evaluated, and analyzed surface fluxes and scaling parameters using the latest techniques developed during the TOGA COARE experiments. Mr. MacDonald also used this data to characterize the atmospheric boundary layer (ABL); evaluate annual, seasonal, and diurnal variations in ABL structure; describe processes that influence ABL structure and variations in the Western and Central Gulf of Mexico; and develop a three-dimensional diagnostic wind field to perform trajectory and dispersion analyses.

As part of the 1997 Southern California Ozone Study (SCOS) and the 2000-2001 California Regional $PM_{10}/PM_{2.5}$ Air Quality Study (CRPAQS), Mr. MacDonald led the production of hourly three-dimensional wind fields using the CALMET diagnostic wind model driven by RWP/RASS data. For the SCOS study, he and other STI staff developed transport trajectories and analyzed the trajectories to explain the observed biogenic and anthropogenic volatile organic compound (VOC) composition and concentrations at specific sites in the Los Angeles Air Basin. Mr. MacDonald has performed a wide range of data analysis activities for other studies such as the 1996 and 1997 Paso del Norte Ozone Studies; the Kansas City Scoping Study; the San Antonio Ozone Study; the Northern Front Range Air Quality Study; the NARSTO-Northeast 1995 Study; the Integrated Monitoring Study in the San Joaquin Valley, California; and an ozone study for the State of North Carolina.

Mr. MacDonald co-authored the U.S. Environmental Protection Agency (EPA) guidance document on developing an air quality forecasting program. He developed and taught numerous courses including (1) the EPA's short course on air quality forecasting at EPA's 2002, 2003, and 2004 National Air Quality Forecasting Conferences; (2) the EPA-sponsored 2003 Regional PM Air Quality Forecasting workshops; and (3) the 2003 American Meteorological Society short course entitled "Profiler Observations, Applications, and Analysis" where he explained how to use sodar, radar wind profiler, and radio acoustic sounding system data to understand the phenomena that influence air quality.

See STI's web sit, www.sonomatech.com, for a list of publications.

ATTACHMENT 2

"Eastshore's Comments on the Conditions of Certification"

Proposed Revisions to Conditions of Certification – Eastshore Energy Center 06-AFC-6

Staff-Recommended Conditions of Certification

Air Quality

AQ-SC1 **Air Quality Construction Mitigation Manager (AQCMM):** The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with conditions AQ-SC3, AQ-SC4 and AQ-SC5 for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM delegates. The AQCMM and AQCMM delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the construction project manager (CPM).

Verification: At least 45 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM delegates. The AQCMM and all delegates must be approved by the CPM before the start of ground disturbance.

AQ-SC2 **Air Quality Construction Mitigation Plan (AQCMP):** The project owner shall provide, for approval, an AQCMP that details the steps to be taken and the reporting requirements necessary to ensure compliance with conditions of certification AQ-SC3, AQ-SC4 and AQ-SC5.

Verification: At least 45 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The CPM will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt. The AQCMP must be approved by the CPM before the start of ground disturbance.

AQ-SC3 **Construction Fugitive Dust Control:** The AQCMM shall submit documentation to the CPM in each monthly compliance report (MCR) that demonstrates compliance with the following mitigation measures for purposes of preventing all fugitive dust plumes from leaving the project site and linear facility routes. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a. All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply with the dust mitigation objectives of AQ-SC4. The frequency of watering may be either reduced or eliminated during periods of precipitation.

b. No vehicle shall exceed 10 miles per hour within the construction site.

c. The construction site entrances shall be posted with visible speed limit signs.

d. All construction equipment vehicle tires shall be inspected and washed as necessary to be free of dirt prior to entering paved roadways.

e. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

f. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

g. All construction vehicles shall enter the construction site through the treated entrance roadways unless an alternative route has been submitted to and approved by the CPM.

h. Construction areas adjacent to any paved roadway shall be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.

i. All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

j. At least the first 500 feet of any public roadway exiting from the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or run-off from the construction site is visible on the public roadways.

k. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered or treated with appropriate dust suppressant compounds.

l. All vehicles that are used to transport solid bulk material on public roadways and that have the potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks to provide at least two feet of freeboard.

m. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The project owner shall include in the MCR: (1) a summary of all actions taken to maintain compliance with this condition; (2) copies of any complaints filed with the air district in relation to project construction; and (3) any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 **Dust Plume Response Requirement:** The AQCMM or an AQCMM delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes with the potential to be transported off the project site, 200 feet beyond the centerline of the construction of linear facilities, or within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not providing effective mitigation. The AQCMM or delegate shall then implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed.

Step 1: The AQCMM or delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or delegate shall direct implementation of additional methods of dust suppression if Step 1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2 specified above fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or delegate to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMP shall include a section detailing how additional mitigation measures will be accomplished within specified time limits.

AQ-SC5 **Diesel-Fueled Engine Control:** The AQCMM shall submit to the CPM, in the MCR, a construction mitigation report that demonstrates compliance with the following mitigation measures for purposes of controlling diesel construction-related emissions. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

b. All construction diesel engines with a rating of 100 hp or higher shall meet, at a minimum, the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless certified by the on-site AQCMM that such engine is not available for a particular item of equipment. In the event that a Tier 2 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a Tier 1 engine. In the event a Tier 1 engine is not available for any off-road

engine larger than 100 hp, that engine shall be equipped with a catalyzed diesel particulate filter (soot filter) unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is "not practical" for the following, as well as other, reasons.

1. There is no available soot filter that has been certified by either the California Air Resources Board or U.S. Environmental Protection Agency for the engine in question; or

2. The construction equipment is intended to be on site for 10 days or less.

3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not possible.

c. The use of a soot filter may be terminated immediately if one of the following conditions exists, provided that the CPM is informed within 10 working days of the termination:

1. The use of the soot filter is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.

2. The soot filter is causing or is reasonably expected to cause significant engine damage.

3. The soot filter is causing or is reasonably expected to cause a significant risk to workers or the public.

4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

d. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (b) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

e. All diesel heavy construction equipment shall not idle for more than five minutes, to the extent practical.

Verification: The project owner shall include in the MCR: (1) a summary of all actions taken to maintain compliance with this condition; (2) a list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that the equipment has been properly maintained; and (3) any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner shall provide emission reduction credits (ERCs) to offset NOx and POC emissions. The project owner shall demonstrate that NOx and POC emission reduction credits are provided in the form and amount required by the District. The project owner shall surrender the ERCs from among those that are listed in the table below or a modified list, as allowed by this condition. If additional ERCs are submitted, the project owner shall submit an updated table including the additional ERCs to the CPM. The project owner shall request CPM approval for any substitutions, modifications, or additions to the listed credits. The CPM, in consultation with the District, may approve any such change to the ERC list provided that the project remains in compliance with all applicable laws, ordinances, regulations, and standards, and that the requested change(s) will not cause the project to result in a significant environmental impact. The District must also confirm that each requested change is consistent with applicable federal and state laws and regulations.

Emission Reduction Certificate Number, Location	Amount (tpy)	Pollutant
823, Crown Cork & Seal Company, Union City	71.000	POC
1015, Koch Supply and Trading LP, Fremont	22.778	POC
1016, Koch Supply and Trading LP, Fremont	15.518	POC
1017, Koch Supply and Trading LP, San Leandro	4.4	POC
1022, Koch Supply and Trading LP, Cupertino	19.718	POC
1019, Koch Supply & Trading LP, Milpitas	15.856	POC
1006, Koch Supply and Trading LP, Union City	23.4	POC

Verification: The project owner shall submit to the CPM records showing that the project's offset requirements have been met prior to initiating construction. If the CPM approves a substitution or modification to the list of ERCs, the CPM shall file a statement of the approval with the project owner and commission docket. The CPM shall maintain an updated list of approved ERCs for the project.

AQ-SC7 Deleted.

AQ-SC8 The project owner shall obtain and surrender emission reduction credits (ERCs) to offset 20.4 tons per year of PM10 emissions and 3.0 tons per year of SO2 emissions. The emission reduction credits **(ERCs)** shall originate**, to the extent feasible,** from sources in the areas of Oakland, Hayward, Fremont, San Jose, and San Francisco**. If project owner is unable to obtain ERCs from the aforementioned areas despite a good faith effort to do so, project owner shall be permitted to provide ERCs from any location within the BAAQMD.**

PM10 emissions during the November 1 through February 28 PM10 nonattainment season shall not exceed 6.8 tons and SO2 emissions shall not exceed 1.0 tons except as provided below. SO2 ERCs may be substituted for

PM10 ERCs at a ratio of **3.0**~~5.3~~-to-1.0. Compliance with this condition will be established by use of the most recent District-approved source test data, and the average load-based (grams/bhp-hr) PM10 and SO2 emission rates from all engines tested.

The project owner shall notify the CPM if the project exceeds the PM10 emission limit in this condition. The owner shall surrender additional ERCs or other CPM-approved mitigation for any excess emission (equaling the difference between calculated actual emissions and the emission limit). Surrendering additional ERCs will establish a new, annual emission limitation equal to 6.8 tons PM10 and 1.0 tons SO2 plus the quantity of reductions surrendered for November 1 through February 28.

Fireplace or wood burning stove retrofits for Hayward residents**, or other CPM-approved mitigation,** may be used to satisfy any additional mitigation requirement and shall be credited using the following factors for each certified unit retrofit: 2 lb PM10/PM2.5 per year per fireplace without insert, 19 lb PM10/PM2.5 per year per fireplace with insert, and 24 lb PM10/PM2.5 per year per wood stove. The program may be made available to all residents in the cities of Fremont, Newark, Union City, San Leandro, Oakland, Emeryville, Albany, Piedmont, Berkeley, Alameda, and the unincorporated areas of Alameda County west of the Oakland/East Bay hills after twelve (12) months from the start date of the **mitigation** ~~fireplace retrofit /woodstove replacement~~ program. The emission reductions from any **CPM-approved mitigation program** ~~fireplace or wood-burning stove retrofits~~ , must occur in accordance ~~to~~ with the following schedule:

a. achieving 15% of the mitigation (3.1 tons per year) of PM10 within six (6) months after start of construction,

b. achieving 30% of the mitigation (6.2 tons per year) of PM10 within nine (9) months after start of construction.

c. achieving 50% of the mitigation (10.2 tons per year) of PM10 within twelve (12) months after start of construction.

d. achieving 80% of the mitigation (16.3 tons per year) of PM10 within eighteen (18) months after start of construction.

e. achieving 100% of the mitigation (20.4 tons per year) within twenty four (24) months after start of construction.

During the 24-month period following the start of construction, ERCs may also be used to supply additional mitigation.

Verification: **At least ninety (90) days before the start of construction,** ~~T~~the project owner shall submit to the CPM **a plan detailing the fireplace/woodstove replacement program, or other proposed mitigation, for approval. The plan should include at a minimum, the description of the program, the amount of rebates or other mitigation funding provided, the person (or agency) who oversees program implementation, the responsible person who reports to the CPM on the progress of the program implementation, the target**

milestones, and procedures to follow if target milestones have not been met. ~~prior to initiating construction evidence of surrendering the emission reduction credits or evidence that sufficient emission reductions from any fireplace or wood stove retrofit program will be achieved in accordance with the specified schedule.~~ The project owner shall notify the CPM within 10 days of exceeding the PM10 emission limit in this condition. The owner shall surrender additional ERCs or other CPM-approved mitigation for any excess emission (equaling the difference between calculated actual emissions and the emission limit) within 60 days of the date that actual emissions exceed the limit in this condition. Quarterly status reports on the program meeting the milestones following the start of construction shall be submitted to the CPM.

AQ-SC9 The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. EPA, and any revised permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any proposed air permit modification to the CPM within five working days of its submittal either by: 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC10 The project owner shall comply with all staff (AQ-SC) and District (AQ) conditions of certification. The CPM, in consultation with the District, may approve as an insignificant change, any change to an air quality condition of certification, provided that: (1) the project remains in compliance with all applicable laws, ordinances, regulations, and standards; (2) the requested change clearly will not cause the project to result in a significant environmental impact; (3) no additional mitigation or offsets will be required as a result of the change; (4) no existing daily, quarterly, or annual permit limit will be exceeded as a result of the change; and (5) no increase in any daily, quarterly, or annual permit limit will be necessary as a result of the change.

Verification: The project owner shall notify the CPM in writing of any proposed change to a condition of certification pursuant to this condition and shall provide the CPM with any additional information the CPM requests to substantiate the basis for approval.

AQ-SC11 Until the California Global Warming Solutions Act of 2006 (AB32) is implemented, the project owner shall either participate in a greenhouse gas (GHG) registry approved by the CPM, or report on a annual basis to the CPM the quantity of greenhouse gases emitted as a direct result of facility electricity production.

The project owner shall maintain a record of fuels types and carbon content used on-site for the purpose of power production. These fuels shall include but are not limited to each fuel type burned: (1) all fuel burned in internal combustion engines; (2) fuel used in fuel gas heaters and emergency

equipment; and (3) all fuels used in any capacity for the purpose of facility startup, shutdown, operation, or emission controls.

The project owner may perform annual source tests of CO2 and CH4 emissions from the exhaust stacks while firing the facility's primary fuel, using the following test methods or other test methods as approved by the CPM. The project owner shall produce fuel-based emission factors in units of lbs CO2 equivalent per mmBtu of fuel burned from the annual source tests. If a secondary fuel is approved for the facility, the project owner may also perform these source tests while firing the secondary fuel.

Pollutant	Test Method
CO2	EPA Method 3A
CH4	EPA Method 18 (POC measured as CH4)

As an alternative to performing annual source tests, the project owner may use the Intergovernmental Panel on Climate Change (IPCC) Methodologies for Estimating Greenhouse Gas Emissions (MEGGE). If MEGGE is chosen, the project owner shall calculate the CO2, CH4 and N2O emissions using the appropriate fuel-based carbon content coefficient (for CO2) and the appropriate fuel-based emission factors (for CH4 and N2O).

The project owner shall convert the N2O and CH4 emissions into CO2 equivalent emissions using the current IPCC Global Warming Potentials (GWP). The project owner shall maintain a record of all SF6 that is used for replenishing on-site transformers. At the end of each reporting period, the project owner shall total the mass of SF6 used and convert that to a CO2 equivalent emission using the IPCC GWP for SF6. The project owner shall maintain a record of all PFCs and HFCs used for replenishing on-site refrigeration and chillers directly related to electricity production. At the end of each reporting period, the project owner shall total the mass of PFCs and HFCs used and convert that mass to a CO2 equivalent emission using the IPCC GWP.

On an annual basis, the project owner shall report the CO2 and CO2 equivalent emissions from the described emissions of CO2, N2O, CH4, SF6, PFCs, and HFCs.

Verification: The project annual greenhouse gas emissions shall be reported, as a CO2 equivalent, by the project owner to a climate action registry approved by the CPM, or to the CPM as part of the fourth quarterly operation report (AQ-SC12) or the annual air quality report, until such time that GHG reporting requirements are adopted and in force for the project as part of the California Global Warming Solutions Act of 2006.

AQ-SC12 The project owner shall submit to the CPM quarterly operation reports following the end of each calendar quarter that include operational and emissions information as necessary to demonstrate compliance with the

conditions of certification. The quarterly operation report will specifically note or highlight incidences of noncompliance.

Verification: The project owner shall submit quarterly operation reports to the CPM and APCO no later than 30 days following the end of each calendar quarter. The report for the fourth quarter can be an annual compliance summary for the preceding year. This information shall be maintained on site for a minimum of five years and shall be provided to the CPM and District personnel upon request.

District-Recommended Conditions of Certification

The following sources would be subject to the proposed conditions of certification.

S-1 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-1 Selective Catalytic Reduction System and A-15 Oxidation Catalyst

S-2 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-2 Selective Catalytic Reduction System and A-16 Oxidation Catalyst

S-3 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-3 Selective Catalytic Reduction System and A-17 Oxidation Catalyst

S-4 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-4 Selective Catalytic Reduction System and A-18 Oxidation Catalyst

S-5 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-5 Selective Catalytic Reduction System and A-19 Oxidation Catalyst

S-6 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-6 Selective Catalytic Reduction System and A-20 Oxidation Catalyst

S-7 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-7 Selective Catalytic Reduction System and A-21 Oxidation Catalyst

S-8 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-8 Selective Catalytic Reduction System and A-22 Oxidation Catalyst

S-9 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-9 Selective Catalytic Reduction System and A-23 Oxidation Catalyst

S-10 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-10 Selective Catalytic Reduction System and A-24 Oxidation Catalyst

S-11 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-11 Selective Catalytic Reduction System and A-25 Oxidation Catalyst

S-12 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-12 Selective Catalytic Reduction System and A-26 Oxidation Catalyst

S-13 Natural Gas Fired Engine Generator Set, 8.4 MW (gross), 11,660 HP, Wärtsilä Model 20V34SG, abated by A-13 Selective Catalytic Reduction System and A-27 Oxidation Catalyst

S-14 34SG, abated by A-14 Selective Catalytic Reduction System and A-28 Oxidation Catalyst

S-15 Emergency Standby Generator Set; Diesel Engine; Caterpillar Model C9ATAAC, 369 HP

Conditions for the Engines S-1 through S-14 during the Commissioning Period

AQ-1 The owner/operator of the Eastshore Energy Center (EEC) shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 through S-14 Lean Burn Internal Combustion Engines to the maximum extent possible during the commissioning period.

a. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall tune each engine S-1 through S-14 after first fire to minimize the emissions of carbon monoxide and nitrogen oxides during commissioning.

b. At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall install, adjust, and operate A-1 through A-14, SCR Systems, and A-15 through A-28, Oxidation Catalyst systems, to minimize the emissions during commissioning.

c. The owner/operator of the EEC shall submit a plan to the District Engineering Division and the CEC CPM prior to the firing of any of the engines that shall describe the process to be followed during the commissioning of each engine. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, engine tuning activities (such as air/fuel ratio settings, engine timing, turbocharger pressure); the installation, tuning, and operation of the SCR systems and oxidation catalysts; the installation, calibration, and testing of the CO and NOx continuous emission monitors; and any activities requiring the firing of the IC engines without abatement by their respective abatement devices. None of the engines shall be fired sooner than 28 days after the District receives the commissioning plan. (Basis: BACT, Offsets)

Verification: The project owner shall submit a monthly compliance report to the CPM during the commissioning period demonstrating compliance with this condition.

AQ-2 During the commissioning period, the owner/operator of the EEC shall demonstrate compliance with Condition AQ-6 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

a. Firing hours for each engine

b. Fuel flow rates to each engine

c. Stack gas nitrogen oxide emission concentrations at P-1 through P-14

d. Stack gas carbon monoxide emission concentrations at P-1 through P-14

e. Stack gas oxygen concentrations at P-1 through P-14

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the engines. The owner/operator shall use District-approved methods to calculate heat input rates, NOx mass emission rates, carbon monoxide mass emission rates, and NOx and CO emission concentrations, summarized for each calendar day. All records shall be retained on site for at least 2 years from the date of entry and made available to District staff upon request. (Basis: BACT, Offsets)

Verification: The project owner shall submit a monthly compliance report to the CPM during the commissioning period demonstrating compliance with this condition.

AQ-3 The owner/operator shall install, calibrate, and make operational continuous emission monitors for NOx, CO and O2 for each engine prior to first firing of that engine. After first firing of an individual engine, the detection range of the continuous emission monitor for that engine shall be adjusted as necessary to accurately measure the resulting range of CO and NOx emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval. (Basis: BACT, Offsets)

Verification: The project owner shall submit a monthly compliance report to the CPM during the commissioning period demonstrating compliance with this condition. In addition, the project owner shall provide evidence of the District's approval of the emission monitoring system to the CPM prior to first firing of each engine.

AQ-4 The owner/operator shall operate the facility such that the total number of firing hours of each Engine S-1 through S-14 without abatement of nitrogen oxide and CO emissions by its SCR System and Oxidation Catalyst System shall not exceed 300 hours per engine during the commissioning period. Such operation of S-1 through S-14 without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Engineering Division and Enforcement and Compliance

Division and the unused balance of the 300 firing hours per engine without abatement shall expire. (Basis: BACT, Offsets)

Verification: The project owner shall submit a monthly compliance report to the CPM during the commissioning period demonstrating compliance with this condition.

AQ-5 The owner/operator shall use District approved calculation methods to estimate the total mass emissions of NOx (as NO2), CO, POC, PM10, and SO2 that are emitted by Engines S-1 through S-14 and S-15 during the commissioning and facility startup period. These emissions count towards the consecutive twelve-month emission limitations specified in Condition AQ-13. Emission totals shall include emissions during the startup and shutdown of the engines.

Verification: The project owner shall submit a monthly compliance report to the CPM during the commissioning period demonstrating compliance with this condition.

AQ-6 The owner/operator shall not operate the engines S-1 through S-14 in a manner such that the combined pollutant emissions from these sources will exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the engines S-1 through S-14.

NOx (as NO2) 3058.4 pounds per calendar day

CO 4033.5 pounds per calendar day

POC (as CH4) 975.1 pounds per calendar day

Total Particulate Matter 757.8 pounds per calendar day

PM10 757.8 pounds per calendar day

PM2.5 757.8 pounds per calendar day SO2 79.53 pounds per calendar day (Basis: BACT, Offsets)

Verification: The project owner shall submit a monthly compliance report to the CPM during the commissioning period demonstrating compliance with this condition.

Conditions for the Engines S-1 through S-14 Post-Commissioning Period

AQ-7 The owner/operator shall ensure that S-1 through S-14 IC Engines are fired on PUC natural gas exclusively. (Basis: BACT for PM10, Cumulative Increase for SO2)

Verification: The project owner shall complete, on a monthly basis, a laboratory analysis showing the sulfur content of natural gas being burned at the facility. The sulfur analysis reports shall be incorporated into the quarterly operation reports (AQ-SC12).

AQ-8 The Owner/operator shall operate each engine such that the heat input rate for each engine S-1 through S-14 is less than or equal to 72.8 MMBtu/hr (HHV, 72.1 MMBtu/hr for Annual Average), averaged over an hour period, including startup/shutdown periods. The owner shall obtain heating value data for the natural gas on a monthly basis from the gas supplier. The heating value data shall be used to calculate a monthly average for heating value that may be used to demonstrate compliance with these conditions. (Basis: BACT, Cumulative Increase)

Verification: Information on the date, time, and duration of any violation of this permit condition shall be incorporated into the quarterly operation reports (AQ-SC12).

AQ-9 The Owner/operator shall operate each engine such that the heat input rate for each engine S-1 through S-14 is less than or equal to 1730 MMBTU/day per calendar day, including startups/shutdowns. (Basis: Cumulative Increase)

Verification: Information on the date, time, and duration of any violation of this permit condition shall be incorporated into the quarterly operation reports (AQ-SC12).

AQ-10 The Owner/operator shall operate each engine such that the heat input rate for all engines S-1 through S-14 combined is less than or equal to 4,036,480 MMBTU/yr on a rolling 12-month average basis, including startups/shutdowns. (Basis: Offsets)

Verification: Information on the date, time, and duration of any violation of this permit condition shall be incorporated into the quarterly operation reports (AQ-SC12).

AQ-11 The owner/operator shall limit the total annual operating hours for engines S-1 through S-14 to 56,000 hours. (Basis: Offsets, Cumulative Increase)

Verification: Information on the date, time, and duration of any violation of this permit condition shall be incorporated into the quarterly operation reports (AQ-SC12).

AQ-12 The owner/operator shall properly operate and maintain the A-1 to A-14 Selective Catalytic Reduction (SCR) Systems, except as provided during the Commissioning Period, whenever fuel is combusted at the corresponding source S-1 through S-14, respectively, and the individual catalyst bed has reached minimum operating temperature specified by the abatement device manufacturer. The owner/operator shall not inject ammonia into the SCR units (A-1 through A-14) until the catalyst bed reaches the minimum operating temperature specified by the abatement device manufacturer (Basis: BACT for NOx).

Verification: Information on any non-operation of the selective catalytic reduction systems or operation of the ammonia injection prior to the catalyst bed reaching the minimum operating temperature shall be incorporated into the quarterly operation reports (AQ-SC12). The information shall include, at a minimum, the date and description of the problem and the steps taken to resolve the problem.

AQ-13 The owner/operator shall ensure that the cumulative combined emissions from S-1 through S-14 Engines and S-15 do not exceed the following limits during any consecutive twelve-month period, including emissions generated during engine startups and shutdowns:

54.35 tons of NOx (as NO2) per rolling 12 month period;

84.45 tons of CO per rolling 12 month period;

76.11 tons of POC (as CH4) per rolling 12 month period;

40.31 tons of Total Particulate Matter per rolling 12 month period; and

40.31 tons of PM10 per rolling 12 month period; and

40.31 tons of PM2.5 per rolling 12 month period; and; and

6.63 tons of SO2 per rolling 12 month period.

(Basis: Offsets, Cumulative Increase)

Verification: The project owner shall submit to the CPM the quarterly operation reports (AQ-SC12).

AQ-14 The owner/operator shall comply with requirements (a) through (e) below under all operating scenarios, except during engine startup and shutdown (although startup and shutdown emissions shall be included in determining compliance with the facility-wide daily Total Particulate Matter emissions limit as set forth in subsection (c)).

a. The nitrogen oxide concentration at each point P-1 through P-14 shall not exceed 5 ppmv, on a dry basis, corrected to 15% O2, averaged over any 1-hour period. (Basis: BACT for NOx)

b. The carbon monoxide concentration at each point P-1 through P-14 shall not exceed 13 ppmv, on a dry basis, corrected to 15% O2, averaged over any 1-hour period. (Basis: BACT for CO)

c. Total Particulate Matter, PM10, and PM2.5 emissions from any engine shall not exceed 1.3 lb/hr except as provided in Condition 16, and in any event shall not exceed 1.9 lb/hr. Total Particulate Matter, PM10, and PM2.5 emissions from all fourteen engines shall not exceed 461.65 lb/day. (Basis: BACT, Cumulative Increase)

d. The POC concentration at each point P-1 through P-14 with the corresponding engine operating at 75% or more of full load shall not exceed 25 ppmv on a dry basis, corrected to 15% O2, averaged over any 1-hour period. (Basis: BACT for POC)

e. Ammonia (NH3) emission concentrations at each point P-1 through P-14 shall not exceed 10 ppmv, on a dry basis, corrected to 15% O2, averaged over any rolling 3-hour period. The owner/operator shall quantify, by continuous recording, the ammonia injection rate to A-1 through A-14 SCR Systems. The correlation between the engine heat input and the SCR System ammonia injection rates as determined in accordance with Condition AQ-19 shall be used to calculate the corresponding ammonia emission concentration at emission points P-1 through P-14. The facility will notify the Engineering Division Permit Evaluation Manager in writing when any engine operates for 3 consecutive hours at a calculated ammonia slip rate equal to or greater than 10 ppmvd corrected to 15% O2 (in addition to any reporting required by District Regulation 1). The notification shall be provided to the District within one week of an engine operating at a calculated slip rate equal to or greater than 10 ppmvd corrected to 15% O2. If the parametric monitoring indicates a corresponding ammonia slip of 10 ppm corrected to 15% O2 for 3 consecutive hours, then the District may require a District approved source test for ammonia slip to demonstrate ongoing

compliance and to update the parametric monitoring correlation as necessary. (Basis: Regulation 2, Rule 5)

Verification: The quarterly operation reports (AQ-SC12) shall include the following information:

a. operating parameters of emission control equipment, including but not limited to ammonia injection rate, NOx emission rate, and ammonia slip;

b. total plant operation time (hours), number of start-ups, hours in start-up, and hours in shutdown;

c. date and time of the beginning and end of each start-up and shutdown period;

d. average plant operation schedule (hours per day, days per week, weeks per year);

e. all continuous emissions data reduced and reported in accordance with the district-approved CEMS protocol;

f. maximum hourly, maximum daily, total quarterly, and total calendar year emissions of NOx, CO, PM10, POC and SOx (including calculation protocol);

g. a log of all excess emissions, including the information regarding malfunctions/breakdowns;

h. any permanent changes made in the plant process or production that would affect air pollutant emissions, and indication of when changes were made; and

i. any maintenance to any air pollutant control system (recorded on an as-performed basis).

AQ-15 The owner/operator shall demonstrate compliance with Conditions AQ-13 and AQ-14 by using properly operated and maintained continuous monitors during all hours of operation including equipment start-up and shutdown periods for all of the following parameters:

a. Firing Hours and Fuel Flow Rates for each source

b. Carbon Dioxide (CO2) or Oxygen (O2) concentrations, Nitrogen Oxides (NOx) concentrations, and Carbon Monoxide (CO) concentrations at emission points P-1 through P-14

c. Ammonia injection rate at A-1 through A-14 SCR Systems The owner/operator shall record all of the above parameters every fifteen (15) minutes (excluding normal calibration periods) and shall summarize all of the above parameters in accordance with the relevant permit limits. The owner/operator shall use the parameters measured above and District approved calculation methods to calculate the following parameters for each engine:

d. Corrected NOx concentrations, NOx mass emissions (as NO2), corrected CO concentrations, and CO mass emissions at each emission point for every 1-hour period

e. Total Heat Input Rate for every clock hour

f. The cumulative total Heat Input (MMBTU) for each calendar day for each engine

g. Calculate NOx mass emissions (as NO2) and CO mass emissions, for each calendar day for each engine, and for the previous consecutive twelve-month period using CEM data.

h. Calculate the mass emissions of PM-10, POC, and SOx (as SO2) for each calendar day for each engine and for the previous twelve-month period using District approved emission factors. (Basis: 1-520.1, 9-9-501, BACT (except for SOx), Offsets, Cumulative Increase)

Verification: The project owner shall submit to the CPM the quarterly operation reports (AQ-SC12). At least 30 days before first fire, the project owner shall submit to the CPM a plan on how the measurements, recordings, and calculations required by this condition will be performed. Prior to first fire, the project owner shall provide evidence of the District's approval of the calculation methods to the CPM.

AQ-16 The owner/operator shall demonstrate compliance with the 1.3 lb/hr Total Particulate Matter emissions limit in Condition AQ-14(c) by performing tests for Total Particulate Matter emissions as required by these conditions. If Total Particulate Matter emissions for an engine generator set exceed 1.9 lb/hr, then that engine generator set shall be deemed to be in violation of Condition AQ-14(c). If Total Particulate Matter emissions for any engine generator set exceed 1.3 lb/hr, but do not exceed 1.9 lb/hr, then that engine generator set shall not be considered to be in violation of Condition AQ-14(c) if the owner/operator can demonstrate, subject to approval by the APCO, that the engine has been installed, operated, and maintained properly in accordance with all manufacturer's specifications and instructions. The owner/operator shall so demonstrate by:

(i) retesting emissions within 45 days after receiving the final test report from the initial test exceeding 1.3 lb/hr, unless the APCO determines that a retest for Total Particular Matter is not appropriate (in accordance with the source testing requirements set forth in Condition AQ-20);

(ii) submitting to the APCO, within 30 days after receiving the final test report from the initial test exceeding 1.3 lb/hr, adequate documentation to verify that the engine has been installed, operated, and maintained properly in accordance with all manufacturers' specifications and instructions.

Within 30 days of receipt of the results of the retest and the documentation required by subsections (i) and (ii) above, the APCO shall make a determination whether the engine has been installed, operated, and maintained in accordance with manufacturers' specifications and instructions. If the APCO determines that the engine has been properly installed, operated, and maintained, then the engine shall be deemed not to be in violation of the single-engine hourly emission limit in Condition AQ-14(c) (although emission from the engine will still be counted for purposes of the facility-wide limit). If the APCO determines that the given engine has not been properly installed, operated, and maintained, then the engine shall be deemed to be in violation of Condition AQ-14(c). Engines that operate pursuant to

the provisions of this Condition AQ-16 shall continue to be tested on a regular basis according to these Conditions.

Verification: The project owner shall submit to the CPM the quarterly operation reports (AQ-SC12).

AQ-17 Within 136 days of the beginning of the startup period (start of commissioning period for a given engine) for each engine at EEC, the Owner/operator shall conduct a District-approved initial source test for Particulate Matter, and POC on the corresponding emission point P-1 through P-14 with the corresponding source engine operating at least 80% of full load to determine compliance with these Permit Conditions. The Owner/operator shall conduct a District-approved initial source test for SOx on one of the fourteen emission points with the corresponding source engine operating at least 80% of full load to determine compliance with these Permit Conditions. (Basis: 2-1-411).

Verification: No later than 20 working days before the commencement of the source tests, the project owner shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this condition. The project owner shall provide evidence of the District's approval of the source test plan to the CPM prior to executing the tests. The project owner shall notify the District and the CPM at least seven working days prior to the planned source test date, and source test results shall be submitted to the District and the CPM within 60 days of completing the tests.

AQ-18 Prior to the end of the commissioning period, the Owner/operator shall conduct a District and CEC Compliance Program Manager (CPM) approved source test to establish emissions during startup and shutdown. The source test shall determine NOx, CO, POC and PM10 emissions during cold startup of the engines. The source test shall measure PM10 emissions during a cold startup of no fewer than 3 engines; one 30 minute test run shall be conducted per engine. The source test shall determine NOx, CO, and POC emissions during shutdown of the engines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. Twenty (20) working days before the execution of the source tests, the Owner/operator shall submit to the District and the CEC CPM a detailed source test plan designed to satisfy the requirements of this Condition, including specification of the number of tests. The Owner/operator shall notify the District and the CEC CPM at least seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District within 60 days of the date that source testing is completed at the facility.

Verification: No later than 20 working days before the commencement of the source tests, the project owner shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this condition. The project owner shall provide evidence of the District's approval of the source test plan to the CPM prior to executing the tests.

AQ-19 The owner/operator shall conduct an initial District-approved source test to determine the SCR System ammonia injection rate and the corresponding NH3 emission concentration at two of the fourteen emission points P-1 through P-14. The

source test shall be conducted over the expected operating load range of the engines (including, but not limited to, 75% and 100% load) to establish the ammonia injection rates necessary to achieve NOx emission limits while maintaining ammonia slip levels. A correlation between NOx ppmv stack exit concentration, ammonia injection rate, heat input, and ammonia exit concentration shall be established for the two engines that were source tested. The test data shall be used as input for the calculation for the remaining engines. Ongoing compliance shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. (Basis: Regulation 2, Rule 5).

Verification: Within 136 days of start-up of the facility, the source test to satisfy this condition shall be conducted. No later than 20 working days before the commencement of the source tests, the project owner shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this condition. The project owner shall provide evidence of the District's approval of the source test plan to the CPM prior to executing the tests.

AQ-20 The owner/operator shall obtain approval for all source test procedures from the Technical Services Division prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as approved by the Technical Services Division. Twenty (20) working days before the execution of source testing, the owner/operator shall submit to the District and the CEC CPM a detailed source test plan designed to satisfy the requirements of any of these Conditions, including specification of the number of tests. The Owner/operator shall notify the District at least seven (7) working days prior to the planned source test date. Source test results shall be submitted to the District and the CEC CPM within 60 days of completing the tests. (Basis: BACT)

Verification: The project owner shall provide evidence of the District's approval of all source test procedures to the CPM prior to executing the tests.

AQ-21 The owner/operator shall conduct a District approved source test no later than 365 days after than the initial Total Particulate Matter source test. The District approved source test shall determine the NH3 emission concentration from two of the fourteen emission points to demonstrate ongoing compliance and to verify the parametric monitoring correlation. The District approved test shall measure the Particulate Matter mass emission rate and POC emission concentration at emission points P-1 through P-14 with the corresponding source engine operating at least 80% of full load to determine compliance with these Permit Conditions. (Basis: Cumulative Increase, BACT)

Verification: The project owner shall notify the District and the CPM at least seven working days before conducting the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests. The project owner shall provide evidence of the District's approval of all source test procedures to the CPM prior to executing the tests.

AQ-22 After completion of the initial source test and the first annual source test, the owner/operator shall conduct a District approved source test on each engine every 8,760 hours of operation or every 3 years whichever comes first. The District approved source test shall determine the NH3 emission concentration from two of the fourteen emission points to demonstrate ongoing compliance and to verify the parametric monitoring correlation. The District approved source test shall measure the Total Particulate Matter mass emission rate and POC emission concentration at emission points P-1 through P-14 with the corresponding source engine operating at least 80% of full load to determine compliance with these Permit Conditions. (Basis: Cumulative Increase, BACT)

Verification: The project owner shall notify the District and the CPM at least seven working days before conducting the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests. The project owner shall provide evidence of the District's approval of all source test procedures to the CPM prior to executing the tests.

AQ-23 The owner/operator shall not allow the maximum projected annual toxic air contaminant emissions from all emission points P-1 through P-14 combined to exceed the following limits:

1,3-Butadiene 872 pounds per year
Formaldehyde 11,200 pounds per year
unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment to determine the total facility risk using the emission rates determined by source testing and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. The owner/operator shall submit the risk analysis to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will not result in a significant cancer risk, the District and the CEC CPM may administratively adjust the carcinogenic compound emission limits listed above. (Basis: Regulation 2, Rule 5)

Verification: The project owner shall notify the District and the CPM at least seven working days before conducting the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests. The project owner shall provide evidence of the District's approval of all source test procedures to the CPM prior to executing the tests.

AQ-24 Within 136 days of start-up of the facility, the owner/operator shall conduct an initial District-approved source test on one of the fourteen emission points P-1 through P-14 with the corresponding engine operating at least 80% of full load to demonstrate compliance with Condition AQ-23 and to demonstrate that the facility complies with Regulation 2, Rule 5. The initial District approved source test for toxic air contaminants shall quantify the emission rates from one engine of the following

compounds: 1,3 Butadiene, Formaldehyde, Acetaldehyde, Benzene, Toluene, Xylene, and Polycyclic Aromatic Hydrocarbons. The toxic air contaminant source test results will be converted into emission factors in units of lb/MMBtu, and the annual firing rates for each of the fourteen engines will be used to calculate annual emissions of toxic air contaminants from the facility. The owner/operator shall use the results of the initial source test for toxic air contaminants to perform a health risk assessment to determine the total facility risk using District approved procedures and unit risk factors.

Verification: The project owner shall notify the District and the CPM at least seven working days before conducting the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests. The project owner shall provide evidence of the District's approval of all source test procedures to the CPM prior to executing the tests. Health risk assessment results shall be submitted to the District and to the CPM within 90 days of the date of the tests.

AQ-25 The owner/operator shall conduct an additional District approved source test within 3 years of the initial test on one of the fourteen emission points P-1 through P-14 with the corresponding engine operating at least 80% of full load to demonstrate compliance with Condition AQ-23. The toxic air contaminant source test results will be converted into emission factors in units of lb/MMBtu, and the annual firing rates for each of the fourteen engines will be used to calculate annual emissions of toxic air contaminants from the facility. (Basis: Regulation 2, Rule 5)

Verification: The project owner shall notify the District and the CPM at least seven working days before conducting the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests. The project owner shall provide evidence of the District's approval of all source test procedures to the CPM prior to executing the tests.

Conditions for S-15 Emergency Stand-by Generator at all Times

AQ-26 Operation of S-15 for reliability-related activities is limited to 50 hours per year. (Basis: Stationary Diesel Engine ATCM, 17 C.C.R. § 93115(e)(2)(A)(3).)

Verification: The project owner shall submit to the CPM the quarterly operation reports (AQ-SC12).

AQ-27 The owner/operator shall operate engine S-15 only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, state or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating hours while mitigating emergency conditions or while emission testing to show compliance with District, state or Federal emission limits is not limited. (Basis: Stationary Diesel Engine ATCM, 17 C.C.R. § 93115(e)(2)(A)(3).)

Verification: The project owner shall submit to the CPM the quarterly operation reports (AQ-SC12).

AQ-28 The owner/operator shall operate engine S-15 only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained. (Basis: Stationary Diesel Engine ATCM, 17 C.C.R. § (e)(4)(G)(1).)

Verification: The project owner shall submit to the CPM the quarterly operation reports (AQ-SC12).

AQ-29 Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 36 months from the date of entry. Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.

a. Hours of operation of S-15 for reliability-related activities (maintenance and testing).

b. Hours of operation of S-15 for emission testing to show compliance with emission limits.

c. Hours of emergency operation of S-15.

d. For each emergency, the nature of the emergency condition.

e. Fuel usage for S-15. (Basis: Stationary Diesel Engine ATCM, 17 C.C.R. § 93115(e)(4)(I).)

Verification: During site inspection, the project owner shall make all records and reports available to the District, ARB, U.S. EPA or Energy Commission staff.

AQ-30 At School and Near-School Operation: If S-15 is located on school grounds or within 500 feet of any school grounds, the owner/operator shall not operate it for non-emergency use, including maintenance and testing, during the following periods:

a. Whenever a school-sponsored activity is taking place a the school (if the engine is located on school grounds).

b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session. "School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, playground, athletic field, or other areas of school property but does not include unimproved school property. (Basis: Stationary Diesel Engine ATCM, 17 C.C.R. § 93115(e)(2)(A)(1).)

Verification: The project owner shall submit to the CPM the quarterly operation reports (AQ-SC12).

Biological Resources

Designated Biologist Selection

BIO-1 The project owner shall submit the resume, including contact information, of the proposed designated biologist to the compliance project manager (CPM) for approval.

Verification: The project owner shall submit the specified information at least 60 days before the start of any site (or related facilities) mobilization. Site and related facility activities shall not begin until an approved designated biologist is available on site.

The designated biologist must meet the following minimum qualifications:

1. A Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. Three years of experience in field biology or current certification of a nationally recognized biological society such as The Ecological Society of America or The Wildlife Society; and
3. At least one year of field experience with biological resources found in the project area.

If a designated biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least 10 working days before the termination or release of the preceding designated biologist.

Designated Biologist Duties

BIO-2 The designated biologist shall perform the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities.

1. Advise the project owner's construction/operation manager and supervising construction and operations engineer on the implementation of the biological resources Conditions of Certification;
2. Be available to supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources such as wetlands and special status species or their habitat;
3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
4. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification; and
5. Respond directly to inquiries of the CPM regarding biological resource issues.

Verification: The designated biologist shall maintain written records of both the tasks described above and the summaries of these records. Both shall be submitted in the monthly compliance reports.

During project operation, the designated biologist shall submit record summaries in the annual compliance report.

Biological Monitor Qualifications

BIO-3 The project owner's CPM - approved designated biologist shall submit the resume, at least three references, and the contact information for the proposed biological monitors to the CPM for approval. The resume shall demonstrate, to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks.

Biological monitor(s)' training by the designated biologist shall include familiarity with the Conditions of Certification and the biological resources mitigation implementation and monitoring plan (BRMIMP), worker environmental awareness program, and all permits.

Verification: The project owner shall submit the specified information to the CPM for approval at least 30 days before the start of any site (or related facilities) mobilization. The designated biologist shall submit a written statement to the CPM confirming that individual biological monitors have been trained, including the date when training was completed. If additional biological monitors are needed during construction, the specified information shall be submitted to the CPM for approval 10 days before their first day of monitoring activities.

Designated Biologist and Biological Monitor Authority

BIO-4 The project owner's construction/operation manager shall act on the advice of the designated biologist and biological monitor(s) to ensure compliance with the biological resources Conditions of Certification.

If required by the designated biologist and biological monitor(s), the project owner's construction operation manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the designated biologist.

The designated biologist shall:

1. Require a halt to all activities in any area when he or she determines that there would be an unauthorized adverse impact to biological resources if the activities continued;
2. Inform the project owner and the construction/operation manager when to resume activities; and
3. Notify the CPM if there is a halt to any activities and advise the CPM of any corrective actions that have been taken, or will be taken, as a result of the work stoppage.
4. If the designated biologist is unavailable for direct consultation, the biological monitor shall act on behalf of the designated biologist.

Verification: The project owner shall ensure that the designated biologist or biological monitor notifies the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt to any site mobilization, ground disturbance, grading, construction, and/or operation activities. The project owner shall notify the CPM of the circumstances and actions taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

Biological Resources Mitigation Implementation and Monitoring Plan

BIO-5 The project owner shall submit to the CPM for review and approval a copy of the final BRMIMP and, once approved, shall implement the measures identified in the plan.

Protocol: The BRMIMP shall identify:

a. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;

b. All biological resource conditions included in the Energy Commission's final decision;

c. All locations, on a map of suitable scale, of areas requiring temporary protection and avoidance during construction;

d. Duration for each type of monitoring and a description of monitoring methodologies and frequency;

e. Performance standards used to help decide if/when proposed mitigation is or is not successful;

f. All performance standards and remedial measures implemented if performance standards are not met;

g. A discussion of biological resource-related facility closure measures;

h. A process for proposing plan modifications to the CPM;

i. A discussion of bird flight diverters and how they will be installed, replaced, and maintained during the life of the project; and

j. Detailed descriptions of all measures that will be implemented to avoid and/or minimize impacts to special status species and reduce habitat disturbance.

Verification: At least 30 days before the start of any site mobilization activities, the project owner shall provide the CPM with the final version of the BRMIMP for the project and the CPM will determine the plan's acceptability. The project owner shall notify the CPM five working days before implementing any CPM-approved modifications to the BRMIMP.

Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and what mitigation and monitoring plan items are still outstanding.

Worker Environmental Awareness Program

BIO-6 The project owner shall develop and implement a CPM-approved worker environmental awareness program in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or related facilities during construction and operation, are informed about sensitive biological resources associated with the project.

The worker environmental awareness program must:

i. Be developed by the designated biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;

ii. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;

iii. Present the reasons for protecting these resources;

iv. Present the meaning of various temporary and permanent habitat protection measures; and

v. Identify whom to contact if there are further comments and/or questions about the material discussed in the program.

The specific program can be administered by a competent individual(s) acceptable to the designated biologist.

Each participant in the on-site worker environmental awareness program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

Verification: No fewer than 30 days before the start of any site mobilization activities, the project owner shall provide copies of the worker environmental awareness program and all supporting written materials prepared by the designated biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the monthly compliance report the number of persons who have completed the training in the prior month, and keep a record of all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six months after their termination.

Impact Avoidance Measures

BIO-7 Anytime the project owner modifies or finalizes the project design, he or she shall incorporate all feasible measures that avoid or minimize impacts to the local biological resources, including the following:

1. Design, install, and maintain transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources;
2. Design, install, and maintain transmission lines and all electrical components in accordance with the Avian Power Line Interaction Committee's (APLIC) Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006, to reduce the likelihood of the electrocution of large birds;
3. Eliminate any California exotic pest plants of concern (CalEPPC) List A species from landscaping plans;
4. Prescribe a road sealant that is non-toxic to wildlife and plants and use only fresh water when adjacent to wetlands, rivers, or drainage canals;
5. Design, install, and maintain facility lighting to prevent side casting of light; and
6. Install bird flight diverters at 5-meter intervals on aboveground transmission lines.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP. The Designated Biologist shall report implementation of the measures in the Monthly Compliance Reports. Within thirty (30) days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

Facility Closure

BIO-8 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address local biological resources. The biological resource facility closure measures will also be incorporated into the project BRMIMP.

Verification: At least 12 months (or a mutually agreed upon time period) before the beginning of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a biological resources element. The biological resources element will be incorporated into the facility closure plan and include a complete discussion of both local biological resources and proposed facility closure mitigation measures.

Bird Flight Diverters

BIO-9 Bird flight diverters shall be placed on the overhead ground wire associated with the Eastshore transmission line. During construction of the transmission line, bird flight diverters shall be installed to the manufacturer's specifications. Energy Commission staff will provide the final approval of the bird flight diverter to be installed.

Verification: No fewer than 30 days before energizing the new Eastshore transmission line, the project owner will provide photographic verification to the Energy Commission CPM that bird flight diverters have been installed to the manufacturer's specifications. A discussion of how the bird flight diverters will be maintained during the life of the project will be included in the project's BRMIMP.

Burrowing Owl Mitigation

BIO-10 Burrowing owl surveys shall be conducted before any ground disturbing activities. Survey methods shall be consistent with those described in the CDFG's Staff Report on Burrowing Owl Mitigation (CDFG 1995), and shall include winter surveys (December 1 through January 31) and nesting season surveys (April 15 through July 15). If resident burrowing owls or active burrow nest sites are discovered within approximately 500 feet from proposed construction activities avoidance and mitigation measures outlined in CDFG's Staff Report on Burrowing Owl Mitigation (CDFG 1995) shall be implemented before performing ground-disturbing activities.

Verification: Survey results shall be provided to the CPM within 14 days for the completion of surveys. If burrowing owls are found on the project site, a report on the mitigation measures implemented and the results of those measures shall be provided to the CPM within 14 days of completion.

Cultural Resources

CUL-1 Prior to the start of preconstruction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the project owner shall obtain the services of a Cultural Resources Specialist (CRS), and one or more alternates, if alternates are needed. The CRS shall manage all monitoring, mitigation, curation, and reporting activities required in accordance with the Conditions of Certification (Conditions). The CRS may elect to obtain the services of Cultural Resources Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility to the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner (Discovery). No preconstruction site mobilization; construction ground disturbance; construction grading, boring and trenching; or construction shall occur prior to CPM approval of the CRS, unless such activities are specifically approved by the CPM. Approval of a CRS may be denied or revoked for non-compliance on this or other projects.

Cultural Resources Specialist

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in the Code of Federal Regulations, 36 CFR Part 61. In addition, the CRS shall have the following qualifications:

1. The CRS's qualifications shall be appropriate to the needs of the project and shall include a background in anthropology, archaeology, history, architectural history, or a related field; and

2. At least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California.

The resume of the CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS on referenced projects, and demonstrate that the CRS has the appropriate education and experience to accomplish the cultural resources tasks that must be addressed during ground disturbance, grading, construction, and operation.

Cultural Resources Monitors

CRMs shall have the following qualifications:

1. a BS or BA degree in anthropology, archaeology, historical archaeology or a related field and one year experience monitoring in California; or

2. an AS or AA degree in anthropology, archaeology, historical archaeology or a related field, and four years experience monitoring in California; or

3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology or a related field, and two years of monitoring experience in California.

Cultural Resources Technical Specialists

The resume(s) of any additional technical specialists, e.g., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval.

Verification:

1. At least 45 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall submit the resume for the CRS, and alternate(s) if desired, to the CPM for review and approval.

2. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural documents, field notes, photographs, and other cultural materials generated by the project.

3. At least 20 days prior to preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the CRS shall provide a letter naming any CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this Condition. If additional CRMs are obtained during the project, the CRS shall provide additional letters to the CPM identifying the CRMs and attesting to the qualifications of the CRMs, at least five days prior to the CRMs beginning on-site duties.

4. At least 10 days prior to beginning tasks, the resume(s) of any additional technical specialists shall be provided to the CPM for review and approval.

5. At least 10 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources Conditions.

CUL-2 Prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, if the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, and confidential cultural resources reports for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1″ = 200′) for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction activities shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings, not previously provided, shall be submitted prior to the start of each phase. Written notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification:

1. At least 40 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall provide the AFC, data responses, and confidential cultural resources documents to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

2. If there are changes to any project-related footprint, revised maps and drawings shall be provided at least 15 days prior to start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction for those changes.

3. If project construction is phased, if not previously provided, the project owner shall submit the subject maps and drawings 15 days prior to each phase.

4. On a weekly basis during preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, email, or fax.

5. Within five days of identifying changes, the project owner shall provide written notice of any changes to scheduling of construction phase.

CUL-3 Prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall be provided in the Archaeological Resource Management Report (ARMR) format, and, per ARMR guidelines, the author's name shall appear on the title page of the CRMMP. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each monitor, and the project owner's on-site construction manager. No preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, or construction shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. A prescriptive treatment plan may be included in the CRMMP for limited resource types. A refined research design will be prepared for any resource where data recovery is required.

2. The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The Conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the Conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A."

3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during ground disturbance, construction, and post-construction analysis phases of the project.

4. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

5. A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

6. A description of all impact-avoidance measures (such as flagging or fencing), to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of construction and how long they would be needed to protect the resources from project-related effects.

7. A statement that all cultural resources encountered shall be recorded on a State of California Department of Parks and Recreation DPR-523 form, mapped and photographed. In addition, all archaeological materials collected as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the State Historical Resources Commission's Guidelines for the Curation of Archaeological Collections, into a retrievable storage collection in a public repository or museum.

8. A statement that the project owner will pay all curation fees and a copy of an agreement with, or other written commitment from, a curation facility to accept artifacts from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

9. A statement that the CRS has access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resources materials encountered during construction.

10. A description of the contents and format of the Cultural Resources Report (CRR), which shall be prepared according to ARMR guidelines.

Verification:

1. At least 30 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall submit the subject CRMMP to the CPM for review and approval. Preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, or construction may not commence until the CRMMP is approved, unless specifically approved by the CPM.

2. At least 30 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, a letter shall be provided to the CPM indicating that the project owner agrees to pay curation fees for any materials collected as a result of the archaeological investigations (survey, testing, data recovery).

CUL-4 The project owner shall submit the Cultural Resources Report (CRR) to the CPM for approval. The CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The CRR shall report on all field activities including dates, times and locations, findings, samplings, and analyses. All survey reports, DPR-523 forms, and additional research reports not previously submitted to the California Historical Resources Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as an appendix to the CRR.

If the project owner requests a suspension of construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification:

1. Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.
2. Within 10 days after CPM approval, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the SHPO, the CHRIS, and the curating institution, if archaeological materials were collected.
3. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.

CUL-5 Prior to and for the duration of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt construction in the area of a Discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;
4. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources Discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;

5. An informational brochure that identifies reporting procedures in the event of a Discovery;

6. An acknowledgement form signed by each worker indicating that they have received the training; and

7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, shall occur prior to implementation of the WEAP program, unless specifically approved by the CPM.

Verification:

1. At least 30 days prior to the beginning of pre-construction site mobilization, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval, and the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

2. On a monthly basis, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor preconstruction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction full time, to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner (Discovery), anywhere there is excavation into undisturbed native soils on the plant site, at the HDD bore pits, and at each location where a new transmission line pole is installed or an old transmission line pole is removed along the transmission line route.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of all native-soil–removing activities on the construction site or along the linear facility routes for as long as the activities are ongoing. Full-time archaeological monitoring shall require at least one monitor per excavation area where machines are actively removing native soils. If an excavation area is too large for one monitor to effectively observe the soil removal, one or more additional monitors shall be retained to observe the area.

In the event that the CRS determines that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended. The CRS or alternate CRS shall report daily to the CPM on the status of cultural resources-related activities at the construction site, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff (Staff).

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts have been discovered. Informational lists of concerned Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored.

Verification:

1. At least 30 days prior to the start of preconstruction site mobilization; construction ground disturbance; construction grading, boring and trenching; and construction, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log. While monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS.

2. Daily, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail, or in some other form acceptable to the CPM. If the CRS concludes that daily reporting is no longer necessary, a letter or e-mail providing a detailed justification for the decision to reduce or end daily reporting shall be provided to the CPM for review and approval at least 24 hours prior to reducing or ending daily reporting.

3. At least 24 hours prior to implementing a proposed change in monitoring level, documentation justifying the change shall be submitted to the CPM for review and approval.

CUL-7 The project owner shall grant authority to halt construction to the CRS, alternate CRS, and the CRMs in the event of a Discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event cultural resources over 50 years of age or considered exceptionally significant are found, or impacts to such resources can be anticipated, construction shall be halted or redirected in the immediate vicinity of the Discovery sufficient to ensure that the resource is protected from further impacts. The halting or redirection of construction shall remain in effect until the CRS has visited the Discovery, and all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the Discovery, or by Monday morning if the cultural resources Discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the Discovery (or changes in character or attributes), the action taken (i.e. work stoppage or redirection), a recommendation of eligibility, and recommendations for mitigation of any cultural resources Discoveries, whether or not a determination of significance has been made.

2. The CRS has completed field notes, measurements, and photography for a DPR 523 primary form. The "Description" entry of the 523 form shall include a recommendation on the significance of the find. The project owner shall submit completed forms to the CPM.

3. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the Discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

Verification:

1. At least 30 days prior to the start of preconstruction site mobilization, construction ground disturbance, construction grading, boring and trenching, and construction, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt construction activities in the vicinity of a cultural resources Discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a Discovery, or by Monday morning if the cultural resources Discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

2. Completed DPR form 523s shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the

completion of data recordation/recovery, whichever is more appropriate for the subject cultural material.

Hazardous Materials Management

HAZ-1 The project owner shall not use any hazardous materials not listed in Appendix B, below, or in greater quantities or strengths than those identified by chemical name in Appendix B, below, unless approved in advance by the Compliance Project Manager (CPM).

Verification: The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility.

HAZ-2 The project owner shall concurrently provide a Business Plan and a Risk Management Plan (RMP) prepared pursuant to the California Accidental Release Program (CalARP) to the Hazardous Materials Division of the Hayward Fire Department and the CPM for review. After receiving comments from the Hazardous Materials Division of the Hayward Fire Department and the CPM, the project owner shall reflect all recommendations in the final documents. Copies of the final Business Plan and RMP shall then be provided to the Hazardous Materials Division of the Hayward Fire Department for information and to the CPM for approval. Verification: At least thirty (30) days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Business Plan to the CPM for approval. At least thirty (30) days prior to delivery of aqueous ammonia to the site, the project owner shall provide the final RMP to the CUPA for information and to the CPM for approval.

Verification: At least thirty (30) days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Business Plan to the CPM for approval. At least thirty (30) days prior to delivery of aqueous ammonia to the site, the project owner shall provide the final RMP to the CUPA for information and to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of aqueous ammonia and other liquid hazardous materials. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials including provisions to maintain lockout control by a power plant employee not involved in the delivery or transfer operation. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least thirty (30) days prior to the delivery of any liquid hazardous material to the facility, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 The aqueous ammonia storage tank shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank and the tanker truck transfer pad shall include a subsurface or covered secondary

containment basin capable of holding 125 percent of the storage volume or the storage volume plus the volume associated with 24 hours of rain assuming the 25-year storm. The tank and transfer pad shall also be equipped with ammonia sensors. The final design drawings and specifications for the ammonia storage tank, secondary containment structure, and the number, location, and specifications of the ammonia sensors shall be submitted to the CPM.

Verification: At least thirty (30) days prior to delivery of aqueous ammonia to the facility, the project owner shall submit final design drawings and specifications for the ammonia storage tank, the secondary containment structure, and the number, location, and specifications of ammonia sensors to the CPM for review and approval.

HAZ-5 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles which meet or exceed the specifications of DOT Code MC-307.

Verification: At least thirty (30) days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

HAZ-6 The project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM. Trucks will travel on SR-92 and exit at the Clawiter Road interchange and then travel north along Clawiter Road to the plant site. When aqueous ammonia is transported to the power plant, the project owner shall provide a flagman on Clawiter Road to stop traffic and assist the tanker truck in making the left turn into the power plant site. The project owner shall obtain approval of the CPM if an alternate route is desired.

Verification: At least thirty (30) days prior to receipt of any hazardous materials on site, the project owner shall submit copies of the required transportation route limitation direction to the CPM for review and approval.

HAZ-7 Prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval. The Construction Security Plan shall include the following:

1. Perimeter security consisting of fencing enclosing the construction area;
2. Security guards;
3. Site access control consisting of a check-in procedure or tag system for construction personnel and visitors;
4. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;
5. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
6. Evacuation procedures.

Verification: At least thirty (30) days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

HAZ-8 The project owner shall also prepare a site-specific security plan for the commissioning and operational phases that will be available to the CPM for review and approval. The project owner shall implement site security measures that address physical site security and hazardous materials storage. The level of security to be implemented shall not .be less than that described below (as per NERC 2002).

The operation security plan shall include the following:

1. permanent full perimeter fence or wall, at least 8 feet high;
2. main entrance security gate, either hand operated or motorized;
3. evacuation procedures;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. written standard procedures for employees, contractors, and vendors when encountering suspicious objects or packages on site or off site;
6. (A) a statement (refer to sample, Attachment A), signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to determine the accuracy of employee identity and employment history, and shall be conducted in accordance with state and federal laws regarding security and privacy; (B) a statement(s) (refer to sample, Attachment B), signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner), that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractors who visit the project site;
7. site access controls for employees, contractors, vendors, and visitors;
8. a statement(s) (refer to sample, Attachment C), signed by the owners or authorized representative of hazardous materials transport vendors, certifying that they have prepared and implemented security plans in compliance with 49 CFR 172.880, and that they have conducted employee background investigations in accordance with 49 CFR Part 1572, subparts A and B;
9. closed circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) capable of viewing, at a minimum, the main entrance gate and the ammonia storage tank; and

10. additional measures to ensure adequate perimeter security consisting of either:

    a. a security guard present 24 hours per day, 7 days per week;

    <u>or</u>

    b. power plant personnel on site 24 hours per day, 7 days per week, and all of the following:

        1. the CCTV monitoring system required in number 9., above, shall include cameras able to pan, tilt, and zoom, have low-light capability, are recordable, and are able to view 100 percent of the perimeter fence, the ammonia storage tank, the outside entrance to the control room, and the front gate from a monitor in the power plant control room; and

        2. perimeter breach detectors or on-site motion detectors.

    The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to those security plans. The CPM may authorize modifications to these measures, or may require additional measures such as protective barriers for critical power pant components --e.g., transformers, gas lines, and compressors -- depending upon circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with both appropriate law enforcement agencies and the applicant.

Verification: At least thirty (30) days prior to the initial receipt of hazardous materials on site, the project owner shall notify the CPM that a site-specific operations site security plan is available for review and approval. In the annual compliance report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and that updated certification statements have been appended to the operations security plan. In the annual compliance report, the project owner shall include a statement that the operations security plan includes all current hazardous materials transport vendor certifications for security plans, and employee background investigations.

Land Use

LAND-1 The project owner shall ensure that the project and its associated facilities, including the temporary construction parking and laydown area(s), are constructed and operated in compliance with the city of Hayward's Industrial Zoning District's lot and yard requirements, height limits, and minimum design and performance standards; and other applicable municipal code requirements.

The project owner shall submit a development plan to the city of Hayward Planning Department in sufficient time for review and comment, and to the Energy Commission's Compliance Project Manager (CPM) for review and approval prior to the proposed start of construction. The development plan shall

include all elements normally required for review and permitting of a similar project, including site plan, structural dimensions, design and exterior elevation(s), and proof of any required permits.

Verification: At least ~~90~~ 45 calendar days prior to the start of construction, including any grading or site remediation on the power plant project site or its associated easements, the project owner shall submit the proposed development plan to the city of Hayward Planning Department for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to the city of Hayward.

At least 30 calendar days prior to the start of construction, the project owner shall provide copies of any comment letters received from the local jurisdiction, along with any changes to the proposed development plan, to the CPM for review and approval.

Noise and Vibration

NOISE-1 At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within one-half mile of the site and the linear facilities, and Fremont Bank's Operations Center at 25151 Clawiter Road in Hayward, by mail or by other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours a day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction where it is visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: Prior to ground disturbance, the project owner shall transmit to the compliance project manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed, and describing the method of that notification. This communication shall also verify that the telephone number has been established and posted at the site, and shall provide that telephone number.

Noise Complaint Process

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The project owner or authorized agent shall:

- use the Noise Complaint Resolution Form (below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- attempt to contact the person(s) making the noise complaint within 24 hours;
- conduct an investigation to determine the source of noise in the complaint;

- if the noise is project related, take all feasible measures to reduce the source of the noise; and
- submit a report documenting the complaint and actions taken. The report shall include: a complaint summary, including the final results of noise reduction efforts and, if obtainable, a signed statement by the complainant stating that the noise problem has been resolved to the complainant's satisfaction.

Verification: Within five days of receiving a noise complaint, the project owner shall file a Noise Complaint Resolution Form, shown below, with both the local jurisdiction and the CPM, that documents the resolution of the complaint. If mitigation is required to resolve the complaint, and the complaint is not resolved within a three-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is performed and complete.

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high (above permissible) noise levels during construction in accordance to the applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit the noise control program to the CPM. The project owner shall make the program available to Cal-OSHA upon request.

Noise Restrictions

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the noise levels due to plant operation alone, ~~during the four quietest consecutive hours of the nighttime,~~ to exceed an average of ~~46~~**49** dBA measured at or near monitoring location R1 (2765 Depot Road). **No new pure-tone components at R1 shall be caused by the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.** The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the exterior noise levels due to plant operation alone to exceed an hourly average of ~~60~~ **70** dBA measured at the northern wall of the north building of the Fremont Bank's Operational Center (25151 Clawiter Road).

~~No new pure-tone components shall be caused by the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.~~

A. When the project first attains a sustained output of 95 percent or higher of its rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring location R1, **or at other locations acceptable to the CPM.** ~~or at a closer location acceptable to the CPM.~~ This survey during the power plant's full-load operation shall also include the measurement of one-

third octave band sound-pressure levels to ensure that no new pure-tone noise components have been caused by the project.

The measurement of power plant noise for the purposes of demonstrating compliance with this condition of certification may alternatively be made at a location, acceptable to the CPM, that is closer to the plant (for example, 400 feet from the plant boundary). This measured level will then be mathematically extrapolated to determine the plant noise contribution at the affected residence. The character of the plant noise shall be evaluated at the affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

B. During the period of this survey, the project owner shall conduct a short-term noise survey during the daytime hours, from 7 a.m. to 10 p.m., at or near the northern wall of the north building of the Fremont Bank's Operational Center, or at another location acceptable to the CPM, in order to measure the power plant's contribution to the exterior noise level at the Bank. This survey during the power plant's full-load operation shall also include the measurement of one-third octave band sound-pressure levels to ensure that no new pure-tone noise components have been caused by the project.

C. If the results from the noise survey indicate that the power plant average noise levels at the affected receptor sites exceed the above values during the above specified time periods, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

D. If the results from the noise survey indicate that pure tones are present **at R1**, mitigation measures shall be implemented to eliminate those pure tones.

Verification: The survey shall take place within 30 days (or when otherwise approved by the CPM) when the project first attains a sustained output of 95 percent or higher of its rated capacity. Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing those measures. When these measures are in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

NOISE-5 Following the project's attainment of a sustained output of 95 percent or greater of its rated capacity, the project owner shall conduct an occupational noise survey to identify any noise hazardous areas in the facility.

The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures to be employed in order to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

Construction Restrictions

NOISE-6 Heavy equipment operation and noisy construction work relating to any project features shall be restricted to the times delineated below, unless a special permit has been issued by the City of Hayward:

Any day except Sundays and holidays:	7 a.m. to 7 p.m.
Sundays and holidays:	10 a.m. to 6 p.m.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

Public Health

PUBLIC HEALTH-1 The project owner shall, within 270 days of starting commercial operations, provide the results of a source test on the number of engine exhaust stacks required below and a human health risk assessment (HRA) to the Compliance Project Manager (CPM). The source test and human health risk assessment shall be conducted according to protocols reviewed and commented on by the Bay Area Air Quality Management District and reviewed and approved by the CPM, and shall be submitted to the CPM not less than 60 days after the date of starting commercial operations. The source test and HRA shall include the quantitative analysis and assessment of the following toxic air contaminants: acetaldehyde, ~~acrolein,~~ benzene, 1,3-butadiene, ethyl benzene, formaldehyde, naphthalene and all PAHs (including speciation of all PAHs emitted in the gaseous and particulate phases), propylene, toluene, and xylenes. **Acrolein shall be included in source testing if the Bay Area Air Quality Management District or California Air Resources Board have developed an acceptable test method by the date source testing is completed.** The source test results and human health risk assessment shall confirm that the theoretical maximum cancer risk at the point of maximum impact is less than 10 in one million and the acute and chronic Hazard Indices are less than 1.0. If the health risk assessment shows a cancer risk greater than 10 in one million or a Hazard Index greater than 1.0, operation of the power plant shall be restricted to the number of engines that the CPM determines will represent a risk of less than 10 in one million or a Hazard Index of less than 1.0

until the project owner can certify that the risk of operating all engines does not create a theoretical maximum cancer risk greater than 10 in one million or an acute or chronic Hazard Index greater than 1.0 at the point of maximum impact.

~~The number of engine exhaust stacks to be sampled shall be determined in the following manner:~~

~~1. Four (4) engines shall be randomly chosen by the owner for stack testing and approved by the CPM. If stack testing results for each contaminant described above on all four engines falls within two standard deviations of the arithmetic mean of each individual contaminant, no further engines need be tested.~~

~~2. If any contaminants measured in the stack test fall outside two standard deviations of the arithmetic mean for that contaminant, an additional four (4) engines, chosen at random by the owner and approved by the CPM, shall be stack tested for all contaminants that fell outside two standard deviations of the arithmetic mean. If stack testing results for each contaminant described above on all eight engines tested fall within two standard deviations of the arithmetic mean of each individual contaminant, no further engines need be tested. The project owner may request relief from further stack testing requirements by providing the CPM a written request with documentation explaining that further testing would not result in a significant change in the health risk assessment results.~~

~~3. This process shall be continued until either the results for all engines tested fall within two standard deviations of the arithmetic mean of each individual contaminant for all engines tested or all fourteen (14) engines are tested.~~

One engine exhaust stack shall be sampled for valid data in three test runs, according to Bay Area Air Quality Management District-approved standards and procedures. If source testing is deemed valid by BAAQMD, non-detect data will be considered valid data. If testing of an engine yields non-valid test results for any single test run, additional engines will be tested until three valid test runs for all compounds are obtained from a single engine.

~~4.~~ The HRA described above shall be based on **the mean of** all **valid** data produced for **the** ~~all~~ engine(s) tested under this protocol. **Not detect values will be handled according to BAAQMD policies and procedures.**

Verification: Not less than sixty (60) days after the start of commercial operations, the project owner shall provide a copy of the source test and human health risk assessment protocols to the BAAQMD for review and comment and to the CPM for review and approval. Included in the test protocol shall be **a description of** the ~~list of four (4)~~ engine(s) ~~randomly~~ chosen for the initial sampling. ~~Subsequent to the initial testing, any additional engines chosen for testing shall be submitted to the CPM for review and approval. Not less than thirty (30) days after each group of source tests has been completed, the project owner shall provide the source test results to the BAAQMD and the CPM. If the source testing is consistent with item #2 above, t~~The owner shall submit ~~the HRA to the BAAQMD for review and comment and to the CPM for review and approval not later than sixty (60) days after the date of the test. If additional tests are required, the project owner shall submit in~~

~~sequence the next set of randomly chosen engines for testing to the CPM for approval until either all testing conforms to the protocol described above or all 14 engines are tested. When the project owner has fulfilled the requirement for testing as described above, the project owner shall submit all~~ test results and the HRA to the BAAQMD for review and comment and to the CPM for approval within sixty (60) days of the date of the last test or not later than 270 days after the date of starting commercial operations, whichever is sooner.

Socioeconomics

Socio- 1 The project owner shall pay the one-time statutory school development fee to the Hayward Unified School District, as required by Education Code Section 17620.

Verification: At least 30 days prior to start of project construction, the project owner shall provide the Compliance Project Manager proof of payment of the statutory development fee.

Soil and Water Resources

SOIL & WATER-1 The project owner shall comply with the requirements of the General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Stormwater Associated with Construction Activity. The project owner shall develop and implement a Stormwater Pollution Prevention Plan (SWPPP) for the construction of the Eastshore site, laydown area, and all linear facilities. The construction SWPPP shall abide by the city of Hayward's (city) Stormwater Management and Urban Runoff Control Ordinances (Chapter 11, Article 5) set forth in NPDES Permit No. CA0029831 and San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) Order R2-2003-0021.

Verification: The project owner shall submit to the CPM a copy of the construction SWPPP that has been reviewed and approved by the SFBRWQCB which includes the requirements of Hayward Municipal Code Chapter 11, Article 5, for Stormwater Management and Urban Runoff Control (Provision C.3 requirements) prior to site mobilization, and retain a copy on site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the SFBRWQCB about the construction SWPPP within 10 days of its receipt or submittal. The project owner shall submit copies to the CPM of all correspondence between the project owner and the city about the city's Stormwater Management and Urban Runoff Control Ordinances within 10 days of its receipt or submittal. This information shall include copies of the Notice of Intent and Notice of Termination for the project.

SOIL & WATER-2 Prior to site mobilization, the project owner shall obtain CPM approval for a site-specific Drainage, Erosion and Sedimentation Control Plan (DESCP), which will ensure the protection of water quality and soil resources at the Eastshore site, laydown area, and all linear facilities for both the mobilization and construction of the project. The DESCP shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in the potential for off-site flooding, meets the County of Alameda (county) Development Services Department grading and drainage requirements, and identifies all monitoring and maintenance activities. The plan shall be consistent with the grading and drainage plan as required by

Condition of Certification CIVIL-1, and may incorporate by reference any Stormwater Pollution Prevention Plan (SWPPP) developed in conjunction with any NPDES permit. At a minimum, the DESCP shall contain the following elements.

A. **Vicinity Map** – A map(s) at a minimum scale of 1"=100' shall be provided that shows the location of all project elements, with depictions of all significant geographic features including swales, storm drains, and sensitive areas.

B. **Site Delineation** – All areas subject to soil disturbance for the Eastshore project (project site, laydown area, all linear facilities, landscaping areas, and any other project elements) shall be delineated showing the boundary lines of all construction areas and the locations of all existing and proposed structures, pipelines, roads, and drainage facilities.

C. **Watercourses and Critical Areas** – The DESCP shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches, as well as indicate the proximity of those features to the Eastshore project construction, laydown, and landscape areas and all transmission and pipeline construction corridors.

D. **Drainage Map** – The DESCP shall provide a topographic site map(s) at a minimum scale 1"=100' showing all existing, interim, and proposed drainage systems and drainage area boundaries. On the map, spot elevations and contours shall be extended off site for a minimum distance of 100 feet.

E. **Drainage Narrative** – The DESCP shall include a narrative of the drainage measures to be taken to protect the site and downstream facilities. The narrative should include the summary pages from the hydraulic analysis prepared by a professional engineer/erosion control specialist. The narrative shall also state the watershed size(s) in acres used in the calculation of drainage control measures. The hydraulic analysis should be used to support the selection of BMPs and structural controls to divert off-site and on-site drainage around or through the Eastshore project construction and laydown areas.

F. **Clearing and Grading Plans** – The DESCP shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and the extent of all proposed grading as shown by contours, cross sections, or by other means. The locations of any disposal areas, fills, or other special features will also be shown. It shall also illustrate existing and proposed topography, tying in proposed contours with existing topography.

G. **Clearing and Grading Narrative** – The DESCP shall include a table with the quantities of material excavated or filled for the site and all project elements of the Eastshore project (project site, laydown areas, transmission corridors, and pipeline corridors). This shall include those materials removed from the site due to demolition, whether such excavations or fill are temporary or permanent, in addition to the amount of material to be either imported or exported. The table shall distinguish whether such excavations or fill are

temporary or permanent, and the amount of material to be either imported or exported.

H. **Best Management Practices** – The DESCP shall identify on the topographic site map(s) the location of the site-specific BMPs to be employed during each phase of construction (initial grading/demolition, excavation and construction, and final grading/stabilization). Treatment control BMPs used during construction should facilitate the testing of stormwater run-off prior to discharge to the storm-water system. BMPs shall include measures designed to prevent wind and water erosion in areas with existing soil contamination. Treatment control BMPs used during construction should facilitate the testing of both groundwater and stormwater. If run-off shows unacceptable levels of contaminants including petroleum hydrocarbons, VOC, or insecticide constituents, the run-off must be treated to acceptable levels before it is discharged.

I. **Best Management Practices Narrative** – The DESCP shall show the location (as identified in H., above), timing, and maintenance schedules of all erosion and sediment control BMPs to be used prior to initial grading/demolition and during project excavation and construction, final grading/stabilization, and post-construction. Separate BMP implementation schedules shall be provided for each project element for each phase of construction. The maintenance schedule should include the post-construction maintenance of structural control BMPs, or provide a statement when the information is available.

Verification: No later than 90 days prior to the start of site mobilization, the project owner shall submit a copy of the DESCP to the county's Development and Services Department for review and comment that meets the county's grading and drainage requirements and includes a completed Drainage Review Checklist. No later than 60 days prior to the start of site mobilization, the project owner shall submit the DESCP and the county's comments to the CPM for review and approval. The CPM shall consider comments received from the county on the DESCP before issuing his or her approval. The DESCP shall be consistent with the grading and drainage plan as required by Condition of Certification CIVIL-1, and relevant portions of the DESCP shall clearly show approval by the Chief Building Official. The DESCP shall be consistent with the SWPPP developed in conjunction with the city's municipal NPDES Permit No. CA0029831 for Construction Activity. The project owner shall provide a narrative in the monthly compliance report on the effectiveness of the drainage, erosion, and sediment control measures, the results of monitoring and maintenance activities, and the dates of any dewatering activities.

SOIL & WATER- 3 The project owner shall comply with the requirements of the General NPDES Permit for Discharges of Stormwater Associated with Industrial Activity. The project owner shall develop and implement a Stormwater Pollution Prevention Plan (SWPPP) for operation of the Eastshore project. The Industrial SWPPP shall abide by the city of Hayward's Stormwater Management and Urban Runoff Control Ordinances (Chapter 11, Article 5) set forth in NPDES Permit No. CA0029831.

Verification: The project owner shall submit to the CPM a copy of the Industrial SWPPP, including all requirements of Hayward Municipal Code Chapter 11, Article 5 for Stormwater Management and Urban Runoff Control that has been review and approved by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) prior to commercial operation, and retain a copy on site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the SFBRWQCB about the Industrial SWPPP within 10 days of its receipt or submittal. The project owner shall submit copies to the CPM of all correspondence between the project owner and the city about the city's Stormwater Management and Urban Runoff Control Ordinance within 10 days of its receipt or submittal. The Industrial SWPPP shall include a copy of the Notice of Intent for the project.

SOIL & WATER-4 Prior to site mobilization, the project owner shall provide the CPM with two copies of an executed and final Water Supply Agreement in accordance with the city of Hayward (city) Municipal Code Section 11, Article 2, and any other service agreements with the city for obtaining potable water for the construction and operation of the Eastshore project. The agreement(s) shall detail any requirements, conditions, or restrictions on the project owner for the use of potable water. The project owner shall not connect to the city's potable water system without final approval from the city. The project owner shall provide the CPM copies of the final approval from the city and all monitoring or other reports required by the agreement(s). The project owner shall notify the CPM of any violations of the agreement(s) terms and conditions, the actions taken or planned to bring the project back into compliance with the agreement(s) and the date(s) compliance was reestablished.

Verification: At least 60 days prior to site mobilization, the project owner shall submit to the CPM two copies of the executed water supply agreement and any other service agreements between the project owner and the city for obtaining potable water for construction and operation of the Eastshore project, in accordance with the city of Hayward Municipal Code Section 11, Article 2. The project owner shall submit results of any water quality monitoring required by the city to the CPM in the annual compliance report. The project owner shall submit any notice of violation of the agreement's terms and conditions to the CPM within 10 days of receipt and fully explain the corrective actions taken in the next monthly compliance report or annual compliance report, as appropriate.

SOIL & WATER-5 Prior to commercial operation, the project owner shall provide the CPM and the city of Hayward (city) with all information and data necessary to satisfy city of Hayward Municipal Code Section 11, Article 3, for the discharge of sanitary and plant wastewater into the city's municipal sewer system. During operation, any monitoring reports provided to the city shall also be provided to the CPM. The CPM shall be notified of any violations of discharge limits or amounts.

Verification: At least 60 days prior to commercial operation, the project owner shall submit the information and data required to satisfy city of Hayward Municipal Code Section 11, Article 3, to the city for review and comment, and to the CPM for review and approval. During operations, the project owner shall submit any water quality monitoring required by the city to the CPM in the annual compliance report. The project owner shall

submit any notice of violations from the city to the CPM within 10 days of receipt and fully explain the corrective actions taken in the annual compliance report.

SOIL & WATER-6 The project owner shall use potable water supplied by the city of Hayward (city) for construction and operation of the Eastshore project. Prior to the use of potable water from the city, the project owner shall install and maintain metering devices as part of the water supply and distribution system to monitor and record (in gallons per day) the total volume of water supplied to the Eastshore project. These metering devices shall be operational for the life of the project.

The project owner shall prepare an annual water use summary, which will include both the monthly range and monthly average of daily potable water consumption (in gallons per day), and total water used by the project on a monthly and annual basis, expressed in acre feet. Potable water use on site shall be recorded monthly. For subsequent years, the annual water use summary shall also include both the yearly range and the yearly average water use by the project. The annual water use summary shall be submitted to the CPM as part of the annual compliance report.

Verification: At least 60 days prior to mobilization for the Eastshore project, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational on the potable water supply and distribution system. Potable water use may be based upon either metering or billing statements from the city.

The project owner shall submit a water use summary to the CPM in the monthly compliance report during project construction and in the annual compliance report during project operation. The project owner shall also provide a report on the servicing, testing, and calibration of the metering devices in the annual compliance report.

Traffic and Transportation

TRANS-1 The project owner shall prepare a traffic control and implementation plan for the project and its associated facilities, containing, as proposed by the applicant:

- A Traffic Management Plan (TMP) addressing the movement of vehicles and materials, including arrival and departure schedules, designated workforce and delivery routes, hazardous materials delivery schedules and coordination with Caltrans, and other traffic-related activities and resulting impacts during both construction and operation of the proposed facility.
- A Heavy Haul Plan (HHP), addressing the transport and delivery of heavy and oversized loads requiring permits from Caltrans or other state and federal agencies.

The project owner shall consult with the City of Hayward Public Works Department and Caltrans (if applicable) in the preparation of the traffic control and implementation plan and shall submit the proposed traffic control plan to the City of Hayward Public Works Department and Caltrans (if applicable) in sufficient time for review and comment, and to the Energy Commission's Compliance Project Manager (CPM) for review and approval prior to the

proposed start of construction. The traffic control plan shall include all elements normally required for review and permitting of a similar project. The project owner shall provide a copy of any written comments from the City of Hayward or Caltrans and any changes to the traffic control plan to the CPM prior to the proposed start of construction.

Verification: At least 90 calendar days prior to the start of construction, including any grading or site remediation on the power plant project site or its associated easements, the project owner shall submit the proposed traffic control and implementation plan to the City of Hayward Public Works Department and Caltrans for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to the City of Hayward and Caltrans requesting review and comment.

At least 30 calendar days prior to the start of construction, the project owner shall provide copies of any comment letters received from either the City of Hayward or Caltrans, along with any changes to the proposed development plan, to the CPM for review and approval.

TRANS-2 The project owner shall consult with the City of Hayward in the preparation of a parking and staging plan for the pre-construction, construction, and operation phases of the project and shall submit the parking plan to the City of Hayward Planning Department in sufficient time for review and comment and to the Energy Commission's Compliance Project Manager (CPM) for review and approval prior to the proposed start of construction. The project owner shall provide a copy of any written comments from the City of Hayward or Caltrans and any changes to the traffic control plan to the CPM prior to the proposed start of construction.

The parking plan shall include all elements normally required for review and permitting of a similar project. The parking plan shall also include a policy, to be enforced by the project owner, stating all project-related parking would occur on-site or in designated off-site parking areas as shown on the plan.

The parking plan shall provide a plot plan showing the location of the proposed parking area(s); parking spaces, including ADA-compliant, van-accessible spaces; travel aisles and circulation patterns, car/van pool loading and unloading area(s), signage, height restrictions, and any other City of Hayward standards. Dimensions shall be shown for all parking spaces, travel lanes, encroachments, loading/unloading ramps, and turning radii, in accordance to the requirements stipulated in the applicable City of Hayward parking standards

Verification: At least 90 calendar days prior to the start of construction, including any grading or site remediation on the power plant project site or its associated easements, the project owner shall submit the proposed parking and staging plan to the City of Hayward Public Works for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to the City of Hayward requesting review and comment.

At least 30 calendar days prior to the start of construction, the project owner shall provide copies of any comment letters received from the City of Hayward, along with any changes to the proposed development plan, to the CPM for review and approval.

TRANS-3 Prior to any ground disturbance or obstruction of traffic (e.g., detours, temporary delays) within any public road, easement, or right-of-way, the project owner or its contractor(s) shall coordinate with the City of Hayward or Alameda County Public Works Department and Caltrans (if applicable) and obtain all required permits (e.g., encroachment). All activities by the project owner or its contractor(s) shall comply with the applicable requirements of any affected local jurisdiction and Caltrans.

Verification: Prior to ground disturbance or interruption of traffic in or along any public road, easement, or right-of-way, the project owner shall provide copies of all permit(s) received from Caltrans or other affected jurisdiction to the CPM. In addition, the project owner shall retain copies of the issued/approved permit(s) and supporting documentation in its compliance file for a minimum of 180 calendar days after the start of commercial operation.

TRANS-4 The project owner shall restore all public roads, easements, and rights-of-way that have been damaged due to project-related construction activities to original or near original condition in a timely manner.

Prior to the start of site mobilization, the project owner shall consult with Alameda County, the City of Hayward, and Caltrans (if applicable) and notify them of the proposed schedule for project construction. The purpose of this notification is to request the local jurisdiction(s) and Caltrans consider postponement of public right-of-way repair or improvement activities in areas affected by project construction until construction is completed and to coordinate any concurrent construction-related activities that are planned or in progress and cannot be postponed with the project owner.

Verification: Prior to the start of site mobilization, the project owner shall photograph or videotape all affected public roads, easements, and right-of-way segment(s) and/or intersections and shall provide the CPM, the affected local jurisdiction(s), and Caltrans (if applicable) with a copy of these images.

Within 60 calendar days after completion of construction, the project owner shall meet with the CPM, the affected local jurisdiction(s), and Caltrans (if applicable) to identify sections of public right-of-way to be repaired. At that time, the project owner shall establish a schedule to complete the repairs and to receive approval for the action(s). Following completion of any public right-of-way repairs, the project owner shall provide a letter signed by the affected local jurisdiction(s) and Caltrans stating their satisfaction with the repairs to the CPM.

Transmission Line Safety and Nuisance

TLSN-1 The project owner shall construct the proposed transmission lines according to the requirements of CPUC GO-95, GO-52, GO-131-D, Title 8, and Group 2. High voltage electrical safety orders, sections 2700 through 2974 of the California Code of Regulations, and PG&E's EMF-reduction guidelines.

Verification: At least 30 (or fewer, as mutually agreed between the project owner and the compliance project manager) days before beginning construction of the transmission line or its related structures and facilities, the project owner shall submit to the compliance project manager a letter signed by a California-registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the condition.

TLSN-2 The project owner shall ensure that every reasonable effort will be made to identify and correct, on a case-specific basis, any complaints of interference with radio or television signals from the operation of project-related lines and associated switchyards. The project owner shall maintain written records, for a period of five years, of all complaints of radio or television interference attributable to plant operation, together with the corrective action(s) taken to address each complaint. All complaints shall be recorded to include notations of corrective actions taken. Complaints not resulting in a specific action, or for which there was no resolution, should be both noted and explained. The record shall be signed by both the project owner and the complainant, if possible, to indicate concurrence with the corrective action or agreement with the justification for a lack of action.

Verification: All reports of line-related complaints shall be summarized for project-related lines and included, during the first five years of plant operation, in the annual compliance report.

TLSN-3 The project owner shall hire a qualified consultant to measure the strength of EMFs both before and after the line is energized. The measurements shall be made according to American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures at the locations of maximum field strengths along the proposed route. These measurements shall be completed no later than six months after the beginning of operations.

Verification: The project owner shall file copies of the pre- and post-energization measurements with the CPM within 60 (or fewer, as mutually agreed between the project owner and the compliance project manager) days after completion of those measurements.

TLSN-4 The project owner shall ensure that the rights-of-way of the proposed transmission line are kept free of combustible material, as required under the provisions of Section 4292 of the Public Resources Code and Section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five years of plant operation, the project owner shall provide a summary of inspection results along with all fire prevention activities carried out along the right-of-way, and provide those summaries in the annual compliance report.

TLSN-5 The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded according to industry standards, regardless of ownership. In the event of a refusal by any property owner to permit this grounding, the project owner shall notify the CPM. This notification shall include, when possible, the owner's written objection. Upon receipt of this notice, the CPM may waive the requirement for grounding the object involved.

Verification: At least 30 (or fewer, as mutually agreed between the project owner and the compliance project manager) days before the lines are energized, the project owner shall transmit, to the CPM, a letter confirming compliance with this condition.

Visual Resources

Surface Restoration

VIS-1 The project owner shall remove all evidence of construction activities, and shall restore the ground surface to the original condition or better condition, including the replacement of any vegetation or paving removed during construction where project development does not preclude this. The project owner shall submit to the Compliance Project Manager (CPM) for review and approval a surface restoration plan the proper implementation of which will satisfy these requirements. The project owner shall complete surface restoration within 60 days after the start of commercial operation.

Verification: At least 60 days prior to the start of commercial operation, the project owner shall submit the surface restoration plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the surface restoration plan are needed, within 30 days of receiving that notification the project owner shall submit to the CPM a plan with the specified revisions.

The project owner shall complete surface restoration within 60 days after the start of commercial operation. The project owner shall notify the CPM within seven days after completion of surface restoration that the restoration is ready for inspection.

Surface Treatment of Project Structures and Buildings

VIS-2 The project owner shall color and finish the surfaces of all project structures and buildings visible to the public to ensure that they: (1) minimize visual intrusion and contrast by blending with the landscape; (2) minimize glare; and (3) comply with local design policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive.

The project owner shall submit a surface treatment plan to the CPM for review and approval. The treatment plan shall include:

A. A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes;

B. A list of each major project structure, building, tank, pipe, and wall; transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each. Colors must be identified by vendor, name, and number; or according to a universal designation system;

C. One set of color brochures or color chips showing each proposed color and finish;

D. One set of 11" x 17" color photo simulations at life size scale of the proposed treatment for project structures, including structures treated during manufacture at the least from the selected KOP 3 (Visual Resources Figure 18);

E. A specific schedule for completing the treatment; and

F. A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not request vendor treatment of any buildings or structures during their manufacture, or perform final field treatment on any buildings or structures, until the project owner has received treatment plan approval by the CPM.

Verification: At least 45 days prior to specifying vendor color(s) and finish(es) for structures or buildings to be surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM for review and approval and simultaneously to the city of Hayward Community and Economic Development, Planning Division for review and comment. The project owner shall provide the CPM with the city's comments at least 30 days prior to the estimated date of providing paint specification to vendors.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) for review and approval by the CPM before any treatment is applied. Any modifications to the treatment plan must be submitted to the CPM for review and approval.

Within ninety (90) days after the start of commercial operation, the project owner shall notify the CPM that surface treatment of all listed structures and buildings has been completed and is ready for inspection; and shall submit one set of electronic color photographs from selected KOP 3 at the least.

The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify a): the condition of the surfaces of all structures and buildings at the end of the reporting year; b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

Permanent Exterior Lighting

VIS-3 To the extent feasible, consistent with safety and security considerations and commercial availability, the project owner shall design and install all permanent exterior lighting such that a) light fixtures do not cause obtrusive spill light beyond the project site; b) lighting does not cause excessive reflected glare; c) direct lighting does not illuminate the nighttime sky; d) illumination of the project and its immediate vicinity is minimized, and e) lighting complies with local policies and ordinances. The project owner shall submit to the CPM for review and approval and simultaneously to the city of Hayward Community and Economic Development, Planning Division for review and comment a lighting mitigation plan that includes the following:

A. A process for addressing and mitigating complaints received about potential lighting impacts;

B. Lighting shall incorporate commercially available fixture hoods/shielding, with light directed downward or toward the area to be illuminated;

C. Light fixtures shall not cause obtrusive spill light beyond the project boundary;

D. All lighting shall be of minimum necessary brightness consistent with operational safety and security; and

E. Lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have (in addition to hoods) switches, timer switches, or motion detectors so that the lights operate only when the area is occupied.

Verification: At least 45 days prior to ordering any permanent exterior lighting, the project owner shall contact the CPM to determine the required documentation for the lighting mitigation plan.

At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and approval and simultaneously to the city of Hayward Community and Economic Development, Planning Division for review and comment a lighting mitigation plan. The project owner shall provide the city's comments to the CPM at least 10 days prior to the date lighting materials are ordered.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval by the CPM.

The project owner shall not order any exterior lighting until receiving CPM approval of the lighting mitigation plan.

Prior to commercial operation, the project owner shall notify the CPM that the lighting has been installed and is ready for inspection. If after inspection the CPM notifies the project owner that modifications to the lighting are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed and are ready for inspection.

Within 10 days of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form report as specified in the Compliance General Conditions including a proposal to resolve the complaint, and a schedule for implementation. The project owner shall notify the CPM within 10 days after completing implementation of the proposal. A copy of the complaint resolution form report shall be submitted to the CPM within 30 days of complaint resolution.

Landscaping

VIS-4 The project owner shall provide landscaping consistent with the conceptual landscape plan, dated May 4, 2007, shown on Visual Resources Figure 16. The landscaping shall comply with the city of Hayward municipal code requirements stipulated in section 10-1.1645 l. Landscaping.

The project owner shall submit to the CPM for review and approval and simultaneously to city of Hayward Community and Economic Development,

Planning Division for review and comment a landscaping plan whose proper implementation will satisfy these requirements.

The project owner shall not implement the plan until the project owner receives approval of the plan from the CPM. The planting must be completed by the start of commercial operation, and the planting must occur during the optimal planting season.

Verification: Prior to commercial operation and at least 45 days prior to installing the landscaping, the project owner shall submit the landscaping plan to the CPM for review and approval and simultaneously to city of Hayward Community and Economic Development, Planning Division for review and comment. The project owner shall provide the city's comments 30 days prior to the installation of the landscaping.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM and city of Hayward Community and Economic Development, Planning Division a plan with the specified revision(s) for review and approval by the CPM before the plan is implemented.

The project owner shall simultaneously notify the CPM and city of Hayward Community and Economic Development, Planning Division within seven days after completing installation of the landscaping, that the landscaping is ready for inspection.

Outdoor Storage

VIS-5 Minor open storage shall be a secondary use permitted on the project site provided the materials, products, or equipment stored are necessary to the operations of the use being conducted on the site. Open storage shall not be placed within the yard or parking areas stipulated by the city's Industrial Zone. Open storage shall be visually compatible with adjoining land uses (for example, adequately screened, set back or not too high, and not visually unpleasant as with outside storage of appliances in conjunction with applicant sales/service). Open storage conducted on the project site shall be subject to the review and approval of the CPM.

Verification: Prior to start of commercial operation, the project owner shall inform the city of Hayward Community and Economic Development, Planning Division and the CPM of the location of proposed open storage area(s), if any, on the project site.

The project owner shall provide any letters pertaining to open storage received from the city of Hayward Community and Economic Development, Planning Division (comments or complaints) to the CPM.

If the CPM notifies the project owner that modifications to the proposed open storage are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed.

Signage

VIS-6 The project owner shall install minimal signage visible to the public, which shall a) have unobtrusive colors and finishes that prevent excessive glare; and b) be consistent with the policies and ordinances of city of Hayward Community and

Economic Development, Planning Division. The design of any signs required by safety regulations shall conform to the criteria established by those regulations. The project owner shall submit a signage plan for the project to the CPM for review and approval and simultaneously to city of Hayward Community and Economic Development, Planning Division for review and comment. The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: Prior to the start of commercial operation and at least 60 days prior to installing signage, the project owner shall submit the signage plan to the CPM for review and approval and simultaneously to city of Hayward Community and Economic Development, Planning Division for review and comment.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) for review and approval by the CPM before any signage visible to the public is installed.

The project owner shall provide the CPM with electronic color photographs after completing installation of signage.

Waste Management

WASTE-1 The project owner shall provide the resume of a Registered Professional Engineer or Geologist, who will be available for consultation during soil excavation and grading activities, to the CPM for review and approval. The resume shall demonstrate experience in remedial investigation and feasibility studies.

The registered professional engineer or geologist shall be given full authority by the project owner to oversee any earth-moving activities that could disturb contaminated soil.

Verification: At least 30 days before the start of site mobilization, the project owner shall submit the resume of the Registered Professional Engineer or Geologist to the CPM for review and approval.

WASTE-2 If potentially contaminated soil is unearthed during excavation at either the proposed site or at linear facilities, as indicated by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and to the CPM stating his or her recommended course of action.

Depending upon the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the City of Hayward Fire Department and the CPM for guidance and possible oversight.

Verification: The project owner shall submit any final reports filed by the Registered Professional Engineer or Geologist to the CPM within five days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-3 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste during operations.

Verification: The project owner shall keep its copy of the identification number on file at the project site and notify the CPM of its receipt in the relevant monthly compliance report.

WASTE-4 Upon learning of any impending waste management-related enforcement action by any local, state, or federal authority for violation of requirements imposed by federal law, the project owner shall notify the CPM of any action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM, in writing within 10 days of learning of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required to the manner in which project-related wastes are managed.

WASTE-5 The project owner shall prepare both a Construction Waste Management Plan and an Operation Waste Management Plan for all wastes generated during construction and operation of the facility, and shall submit both plans to the CPM for review and approval. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including temporary on-site storage, treatment methods, and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No fewer than 30 days before the start of site mobilization, the project owner shall submit the Construction Waste Management Plan to the CPM for approval.

The Operation Waste Management Plan shall be submitted to the CPM no fewer than 30 days before the start of project operation for approval. The project owner shall submit any required revisions within 20 days of notification by the CPM.

In the annual compliance reports, the project owner shall document the actual waste management methods used during the year and provide a comparison of the actual methods used with those proposed in the original Operation Waste Management Plan.

WASTE-6 The project owner shall ensure that the site is properly characterized and remediated. The project owner shall ensure that a clean-up plan or soil management plan is developed describing the number and location of samples of soil, soil gas, and groundwater to be obtained and analyzed, and soil removal

and disposal plans. The project owner shall assure this plan is submitted to the City of Hayward Fire Department for review and comment, and to the CPM for review and approval. Sampling related to the potential migration of chemicals from within the building shall be conducted at the time the building is demolished and concrete flooring removed. If contaminated soil is found, the project owner shall contact the City of Hayward Fire Department and the CPM for further guidance and possible oversight. In no event shall any project construction commence that involves either the movement of contaminated soil or construction on contaminated soil until the CPM has determined that all necessary remediation has been accomplished.

Verification: Following demolition and at least 30 days before the start of construction, the project owner shall provide documentation that the site has been appropriately characterized and remediated to the CPM for review and approval. The project owner shall provide a copy of all correspondence with the City of Hayward Fire Department to the CPM within 10 days of its receipt. In the event that certain specific site activities need to start before full characterization and remediation, the project owner shall request review and approval from the CPM.

WASTE-7 Before demolition of the building, the project owner shall conduct an asbestos survey to determine if lead-based paint and/or asbestos-containing material are present in the building. The project owner shall remove any such materials, and any other regulation building materials such as lead-based-paints, following the proper removal and disposal practices defined in the BAAQMD Regulation 11-2 procedures.

Verification: At least 60 days before the start of site mobilization, the project applicant shall provide any results submitted to the BAAQMD to the CPM for review and comment.

Worker Safety and Fire Protection

WORKER SAFETY-1 The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Injury and Illness Prevention Program;
- A Construction Emergency Action Plan; and
- A Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring Program, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval concerning compliance of the program with all applicable Safety Orders. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the Hayward Fire Department for review and comment prior to submittal to the CPM for approval.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the Hayward Fire Department stating the Fire Department's comments on the Construction Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan;
- An Emergency Action Plan;
- Hazardous Materials Management Program;
- Fire Prevention Program (8 CCR § 3221); and
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the CPM for review and comment concerning compliance of the program with all applicable Safety Orders. The Operation Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the Hayward Fire Department for review and comment.

Verification: At least 30 days prior to the start of first-fire or commissioning, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the Hayward Fire Department stating the Fire Department's comments on the Operations Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have over-all authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA & federal regulations related to power plant projects;
- Assure that all construction and commissioning workers and supervisors receive adequate safety training;
- Complete accident and safety-related incident investigations, emergency response reports for injuries, and inform the CPM of safety-related incidents; and
- Assure that all the plans identified in Worker Safety-1 and-2 are implemented.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement (CSS) shall be submitted to the CPM within one business day.

The CSS shall submit in the Monthly Compliance Report a monthly safety inspection report to include:

- Record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- Summary report of safety management actions and safety-related incidents that occurred during the month;
- Report of any continuing or unresolved situations and incidents that may pose danger to life or health; and
- Report of accidents and injuries that occurred during the month.

WORKER SAFETY-4 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO, and will be responsible for verifying that the Construction Safety Supervisor, as required in Worker Safety 3, implements all appropriate Cal/OSHA and Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: Prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that a portable automatic cardiac defibrillator is located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During construction and commissioning, a representative number of workers consistent with American Heart Association guidelines shall be trained in its use. During operations, all power plant employees shall be trained in its use. The training program shall be submitted to the CPM for review and approval.

Verification: At least 30 days prior to the start of site mobilization the project owner shall submit to the CPM proof that a portable automatic cardiac defibrillator exists on site and a copy of the training and maintenance program for review and approval.

WORKER SAFETY-6 The project owner shall immediately notify the Hayward Fire Department and the CPM of any incident involving fire, hazardous materials, or an Emergency Medical Service response, however small or short-lived, that occurs within the power plant site, as soon as power plant personnel become aware of the incident.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM a copy of the Policy and Procedures that direct all power plant personnel to immediately notify the Hayward Fire Department and the CPM when an incident occurs within the project site.

Facility Design

GEN-1 The project owner shall design, construct and inspect the project in accordance with the California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval. (The CBSC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.) The project owner shall insure that all the provisions of the above applicable codes be enforced during any construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility [2001 CBC, Section 101.3, Scope]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall insure that all contracts with contractors, subcontractors and suppliers shall clearly specify that all work performed and materials supplied on this project comply with the codes listed above.

Verification: Within 30 days after receipt of the Certificate of Occupancy, the project owner shall submit to the Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [2001 CBC, Section 109 – Certificate of Occupancy].

Once the Certificate of Occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility which may require CBO approval for the purpose of complying with the above stated codes. The CPM will then determine the necessity of CBO approval on the work to be performed.

GEN-2 Prior to submittal of the initial engineering designs for CBO review, the project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List and a Master Specifications List. The schedule

shall contain a list of proposed submittal packages of designs, calculations and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

Verification: At least 60 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the Master Drawing List and the Master Specifications List of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in Facility Design Table 1 below. Major structures and equipment shall be added to or deleted from the table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Structures and Equipment List

Equipment/System	Quantity (Plant)
Engine Genset w/ Auxiliary Module Foundation and Connections	14
Selective Catalytic Reduction Unit Foundation and Connections	14
Oxidation Catalyst Unit Foundation and Connections	14
Exhaust Stack Structure, Foundation and Connections	14
Closed-Loop Cooling System Structure, Foundation and Connections	2
Main Step-up Transformer Foundation and Connections	2
Auxiliary or Station Service Transformer Foundation and Connections	2
Fuel gas Heater Foundation and Connections	1
Fire Protection System	1
~~Raw Water Storage Tank Foundation and Connections~~	~~1~~
Aqueous Ammonia Storage Tank Foundation and Connections	2
Aqueous Ammonia Handling System Foundation and Connections	1
Waste Water Holding Tank Foundation and Connections	1
Clean Lube Oil Storage Tank Foundation and Connections	1
Dirty Lube Oil Storage Tank Foundation and Connections	1
Engine Hall, Warehouse/Shop, and Control Room Structure, Foundation and Connections	1
Start Air System	2
Instrument and Service Air System	1
Miscellaneous Ancillary Equipment	1 Lot
Black Start Emergency Diesel Generator Foundation and Connections	1
Potable Water Systems	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
Plant Control System	1 Lot
HVAC and Refrigeration Systems	1 Lot
1 Lot Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
Building Energy Conservation Systems	1 Lot
Switchyard, Buses and Towers	1 Lot
Electrical Duct Banks	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 2001 CBC [Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees], adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be as otherwise agreed by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities)]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the Transmission System Engineering section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

The RE shall:

1. Monitor construction progress of work requiring CBO design review and inspection to ensure compliance with LORS;

2. Ensure that construction of all the facilities subject to CBO design review and inspection conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;

3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;

4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;

5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and

6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; and B) a soils engineer, or a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the Transmission System Engineering section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all responsible engineers assigned to the project [2001 CBC, Section 104.2, Powers and Duties of Building Official].

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

1. Review the Foundation Investigations Report, Geotechnical Report or Soils Report prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;

2. Design, or be responsible for design, stamp, and sign all plans, calculations and specifications for proposed site work, civil works and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and

3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes in the construction procedures.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports;

2. Prepare the Foundation Investigations Report, Geotechnical Report or Soils Report containing field exploration reports, laboratory tests and engineering analysis detailing the nature and extent of the soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load [2001 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations];

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2001 CBC, Appendix Chapter 33; Section 3317, Grading Inspections (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both); and

4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations [2001 CBC, section 104.2.4, Stop orders].

C. The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;
3. Monitor construction progress to ensure compliance with engineering LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications and calculations.

D. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

E. The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer and soils (geotechnical) engineer assigned to the project.

At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be

responsible for the special inspections required by the 2001 CBC, Chapter 17 [Section 1701, Special Inspections; Section 1701.5, Type of Work (requiring special inspection)]; and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the Transmission System Engineering section of this document.

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

2. Observe the work assigned for conformance with the approved design drawings and specifications;

3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action [2001 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]; and

4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

   A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

Verification: At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend the corrective action required [2001 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall be

submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next Monthly Compliance Report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project [2001 CBC, Section 106.4.2, Retention of Plans].

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next Monthly Compliance Report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing final approved engineering plans, specifications and calculations as described above, the project owner shall submit to the CPM a letter stating that the above documents have been stored and indicate the storage location of such documents.

CIVIL-1 The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils Report, Geotechnical Report or Foundation Investigations Report required by the 2001 CBC [Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations].

Verification: At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions.

The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area [2001 CBC, Section 104.2.4, Stop orders].

Verification: The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 2001 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO and the CPM [2001 CBC, Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final **as-built** grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans [1998 CBC, Section 3318, Completion of Work].

Verification: Within 30 days (or project owner and CBO approved alternative timeframe) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes, with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any construction of any major structure or component listed in Facility Design Table 1 of Condition of Certification GEN-2, above, the project owner shall submit to the CBO for design review and approval the proposed

lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be submitted for the following items (from **Table 1**, above):

1. Major project structures;
2. Major foundations, equipment supports and anchorage; and
3. Large field fabricated tanks. Construction of any structure or component shall not commence until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

Construction of any structure or component shall not commence until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations and specifications [2001 CBC, Section 108.4, Approval Required];
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [2001 CBC, Section 106.4.2, Retention of plans; and Section 106.3.2, Submittal documents];
4. Ensure that the final plans, calculations and specifications clearly reflect the inclusion of approved criteria, assumptions and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [2001 CBC, Section 106.3.4, Architect or Engineer of Record]; and

   Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to the applicable LORS [2001 CBC, Section 106.3.4, Architect or Engineer of Record].

Verification: At least 60 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of construction of any structure or component listed in Facility Design Table 1 of Condition of Certification GEN-2 above, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next Monthly Compliance Report a copy of a statement from the CBO that the proposed structural plans, specifications and calculations have been approved and are in compliance with the requirements set forth in the applicable engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2001 CBC, Chapter 17, Section 1701, Special Inspections; Section 1701.5, Type of Work (requiring special inspection); Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM [2001 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 2001 CBC, Chapter 1, Section 106.3.2, Submittal documents and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 2001 CBC shall, at a minimum, be designed to comply with the requirements of that Chapter.

Verification: At least 30 days (or project owner and CBO approved alternate timeframe) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in Facility Design Table 1, Condition of Certification GEN-2, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of said construction [2001 CBC, Section 106.3.2, Submittal Documents; Section 108.3, Inspection Requests; Section 108.4, Approval Required; 2001 California Plumbing Code, Section 103.5.4, Inspection Request; Section 301.1.1, Approval].

The responsible mechanical engineer shall stamp and sign all plans, drawings and calculations for the major piping and plumbing systems subject to the CBO design review and approval, and submit a signed statement to the CBO when the said proposed piping and plumbing systems have been designed, fabricated and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards [Section 106.3.4, Architect or Engineer of Record], which may include, but not be limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);

- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- Specific City/County code.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [2001 CBC, Section 104.2.2, Deputies].

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of major piping or plumbing construction listed in Facility Design Table 1, Condition of Certification GEN-2 above, the project owner shall submit to the CBO for design review and approval the final plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [2001 CBC, Section 108.3, Inspection Requests].

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [2001 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for electrical equipment and systems 480 volts and higher, listed below, with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC 2001, Section 106.3.2, Submittal documents]. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [2001 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
2. system grounding drawings.

B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements; and
7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the Monthly Compliance Report:

1. Receipt or delay of major electrical equipment;
2. Testing or energization of major electrical equipment; and
3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

Geology and Paleontology

General conditions of certification with respect to Geology are covered under proposed Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **Facility Design** section. Proposed paleontological conditions of certification follow.

PAL-1 The project owner shall provide the Compliance Project Manager (CPM) with the resume and qualifications of its Paleontological Resource Specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall submit to the CPM to keep on file resumes of the qualified Paleontological Resource Monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. institutional affiliations, appropriate credentials and college degree;
2. ability to recognize and collect fossils in the field;
3. local geological and biostratigraphic expertise;
4. proficiency in identifying vertebrate and invertebrate fossils; and
5. at least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontologic resource monitors (PRMs) shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year experience monitoring in California; or
- AS or AA in geology, paleontology or biology and four years experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification:

1. At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.
2. At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM no later than one week prior to the monitor beginning on-site duties.
3. Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction laydown areas, and all related facilities. Maps shall identify all areas of the project where ground

disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and can be at a scale of 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the power plant or linear facility changes, the project owner shall provide maps and drawings reflecting these changes to the PRS and CPM.

If construction of the project will proceed in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Prior to work commencing on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings to the PRS and CPM.
2. If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ground disturbance.
3. If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3 The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting and sampling activities and may be modified with CPM approval. This document shall be used as a basis for discussion in the event that on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of Vertebrate Paleontology (SVP, 1995) and shall include, but not be limited to, the following:

1. Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to the PRMMP procedures;

2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the Conditions of Certification;

3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;

4. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;

5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for the monitoring and sampling;

6. A discussion of the procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;

7. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontology standards and requirements for the curation of paleontological resources;

9. Identification of the institution that has agreed to receive any data and fossil materials collected, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and

10. A copy of the paleontological Conditions of Certification.

Verification: At least 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for all recently employed project managers, construction supervisors and workers who are involved with or operate ground disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of an initial in-person PRS training during the project kick-off for those mentioned above. Following initial training, a CPM-approved video or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern. If appropriate, multi-lingual training shall be provided for workers not fluent in

English. No ground disturbance shall occur prior to CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Good quality photographs or physical examples of vertebrate fossils shall be provided for project sites containing units of high paleontologic sensitivity;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A Certification of Completion of WEAP form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification:

1. At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP including the brochure with the set of reporting procedures the workers are to follow.
2. At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning on using a video for interim training.
3. If the owner requests an alternate paleontological trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.
4. In the Monthly Compliance Report (MCR) the project owner shall provide copies of the WEAP Certification of Completion forms with the names of those trained and the trainer or type of training (in-person or video) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in

areas where potentially fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring different from the accepted schedule presented in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and included in the Monthly Compliance Report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.

2. The project owner shall ensure that the PRM(s) keeps a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.

3. The project owner shall ensure that the PRS immediately notifies the CPM within 24 hours of the occurrence of any incidents of non-compliance with any paleontological resources Conditions of Certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the Conditions of Certification.

4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours or Monday morning in the case of a weekend when construction has been halted due to a paleontological find.

The project owner shall ensure that the PRS prepares a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports (MCR). The summary will include the name(s) of PRS or PRM(s) active during the month, general descriptions of training and monitored construction activities and general locations of excavations, grading, etc. A section of the report shall include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan

identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the project construction.

Verification: The project owner shall maintain in their compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resource Report (See **PAL-7**). The project owner shall be responsible to pay any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and submitted to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated below the level of significance.

Verification: Within 90 days after completion of ground disturbing activities, including landscaping, the project owner shall submit the Paleontological Resources Report under confidential cover to the CPM.

Power Plant Efficiency

No conditions of certification are proposed.

Power Plant Reliability

No conditions of certification are proposed.

Transmission System Engineering

TSE-1 The project owner shall provide the Compliance Project Manager (CPM) and the Chief Building Official (CBO) with a schedule of transmission facility design submittals, a master drawing list, a master specifications list, and a major equipment and structure list. The schedule shall contain both a description and a list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days (or fewer, if mutually agreed upon by the project owner and the CBO) before the start of construction, the project owner shall submit the schedule, a master drawing list, and a master specifications list to both the CBO and the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in Table 1: Major Equipment List below). Additions and deletions shall be made to the table only with both CPM and CBO approval. The project owner shall provide schedule updates in the monthly compliance report.

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects
Take-off facilities
Electrical Control Building
Switchyard Control Building
Transmission pole/tower
Grounding system

TSE-2 Before the start of construction, the project owner shall assign to the project an electrical engineer and at least one of each of the following:

A. a civil engineer;

B. a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering;

C. a design engineer who is either a structural engineer or a civil engineer and fully competent and proficient in the design of power plant structures and equipment supports; or

D. a mechanical engineer (Business and Professions Code Sections 6704 et seq. require state registration to practice as either a civil engineer or a structural engineer in California).

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers as long as each engineer is responsible for a particular segment of the project, e.g., proposed earthwork, civil structures, power plant structures, or equipment support. No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical, or civil and design engineer, assigned as required by Facility Design Condition GEN-5, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO, for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earth work and require changes; if site conditions are unsafe or do not conform with the predicted conditions used as the basis for design of earth work or foundations.

The electrical engineer shall:

1. be responsible for the electrical design of the power plant switchyard, outlet, and termination facilities; and

2. sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or fewer if mutually agreed to by the project owner and the CBO) before the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action (2001 California Building Code, Chapter 1, section 108.4, approval required; Chapter 17, section 1701.3, *Duties and Responsibilities of the Special Inspector*; Appendix Chapter 33, section 3317.7, *Notification of Noncompliance*). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and refer to this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for the disapproval, along with the revised corrective action required to obtain the CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any construction until plans for that increment of construction have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the monthly compliance report:

A. receipt or delay of major electrical equipment;

B. testing or energization of major electrical equipment; and

C. the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or fewer if mutually agreed to by the project owner and the CBO) before the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, and outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer verifying compliance with all applicable LORS, and send the CPM a copy of the transmittal letter in the next monthly compliance report.

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities will conform to all applicable LORS, and the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations, as determined by the CBO.

A. The Eastshore project will be interconnected to PG&E's Eastshore Substation via a single 115 kV transmission line, approximately 1.2 miles long, with 715 kcmil aluminum conductor or conductor with a higher rating.

B. The generation tie line will require the replacement of 10 to 12 transmission poles that accommodate both the 12 kV and 115 kV lines.

C. The existing Eastshore Substation will require a new 115 kV generation tie breaker and associated protective relays to facilitate interconnection of the project.

D. The proposed protection requirements will consist of a fully redundant, double-pilot current differential protection scheme.

E. The power plant outlet line shall meet or exceed the electrical, mechanical, civil, and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the High Voltage Electric Safety Orders, California ISO standards, National Electric Code (NEC) and related industry standards.

F. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

G. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.

H. The project conductors shall be sized to accommodate the full output of the project.

I. Termination facilities shall comply with applicable PG&E interconnection standards.

J. The project owner shall provide to the CPM:

i. the final Detailed Facility Study (DFS), including a description of facility upgrades, operational mitigation measures, and/or special protection system sequencing and timing if applicable;

ii. executed project owner and California ISO facility interconnection agreement.

K. A request for minor changes to the facilities described in this condition may be allowed if the project owner informs the CBO and CPM and receives approval for the proposed change. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

Verification: At least 60 days before the start of construction of transmission facilities (or fewer days if mutually agreed upon by the project owner and CBO), the project owner shall submit to the CBO for approval:

A. Design drawings, specifications, and calculations conforming with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the High Voltage Electric Safety Orders, CA ISO standards, National Electric Code (NEC) and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment;

B. for each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"1 and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the High Voltage Electric Safety Orders, California ISO standards, National Electric Code (NEC), and related industry standards;

C. electrical one-line diagrams signed and sealed by the registered professional electrical engineer in charge, a route map, and an engineering description of the equipment and configurations covered by requirements TSE-5 a) through k), above;

D. the final DFS, including a description of facility upgrades, operational mitigation measures, and/or SPS sequencing and timing if applicable, shall be provided concurrently to the CPM;

E. at least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes which may not conform to the facilities described in this condition and request approval to implement such changes.

TSE-6 The project owner shall provide the following notice to the California ISO prior to synchronizing the facility with the California electric transmission system:

A. at least one week prior to synchronizing the facility with the grid for testing, provide the California ISO with a letter stating the proposed date of synchronization; and

B. at least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the California ISO's outage coordination department.

Verification: The project owner shall provide copies of the California ISO letter to the CPM when it is sent to the California ISO one week before initial synchronization with the grid. The project owner shall contact the California ISO's outage coordination department (Monday through Friday, between the hours of 7:00 a.m. and 3:30 p.m. at (916) 351-2300) at least one business day prior to synchronizing the facility with the grid for testing. A report of that conversation with the California ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California electric transmission system for the first time.

TSE-7 The project owner shall be responsible for inspection of the transmission facilities during and after project construction, and for any subsequent CPM- and CBO-approved changes, to ensure conformance with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the High Voltage Electric Safety Orders, California ISO standards, National Electric Code (NEC) and related industry standards. In cases of non-conformance, the project owner shall inform the CPM and CBO, in writing and within 10 days of the discovery of such non-conformance, and the actions that will be taken to correct it.

Verification: Within 60 days after the first synchronization of the project, the project owner shall transmit to the CPM and CBO:

A. "as built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in charge. A statement verifying conformity with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the High Voltage Electric Safety Orders, California ISO standards, National Electric Code (NEC) and related industry standards;

B. an "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in charge or an acceptable alternative verification. "As built" drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit, as set forth in the compliance monitoring plan;

C. a summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

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 (AFC Accepted 11/8/06) **PROOF OF SERVICE**

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
Attn: Docket No. 06-AFC-6
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
Docket@energy.state.ca.us

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DECLARATION OF SERVICE

I, Dawn L. Willis, declare that on November 19, 2007, I deposited copies of the attached Eastshore Energy Center's Prehearing Conference Statement November 19, 2007 in the United States mail at Sacramento, California, 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.

Dawn Willis

Dawn L. Willis

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