CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512

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03-AFC-2C
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DATE: **December 17, 2010**

TO: Interested Parties

FROM: Christine Stora, Amendment Compliance Project Manager

SUBJECT: **Los Esteros Critical Energy Facility Project (03-AFC-2C)**
Staff Analysis of Proposed Project Modifications

On October 30, 2009, Los Esteros Critical Energy Facility, LLC filed a petition with the California Energy Commission to amend the Energy Commission Decision for the Los Esteros Critical Energy Facility Project. Staff prepared an analysis of this proposed change, and a copy is enclosed for your information and review.

The Los Esteros Critical Energy Facility consists of an operational 180 MW simple-cycle power plant (LECEF Phase 1) that is being converted to a 320 MW combined-cycle plant (LECEF Phase 2). The original 180 MW project was license on July 2, 2002 (Commission Decision 01-AFC-12) and has been operational since March 7, 2003. Under a separate AFC number (03-AFC-2), the Commission approved a license extension to continue to operate LECEF Phase 1 Project beyond June 30, 2005 and to temporarily interconnect to PG&E's 115kV transmission line. In October 2006, the Commission approved a project modification to the existing power plant to convert the project to combined-cycle operation (03-AFC-2). The Project is located in San Jose near the intersection of State Route 237 and Zanker Road.

The modifications proposed in the current petition would:

- Use an underground interconnection similar to what was authorized in the 2002 Decision. This proposed electrical transmission interconnection will connect LECEF to PG&E's grid by way of two new underground three-phase, single circuit, solid-dielectric, copper-conductor circuits between LECEF's Air Insulated Substation (AIS) and the adjacent Los Esteros 115 kV switchyard.
- Add a new breaker and reconductor a 1.1 to 1.3 mile portion of PG&E's San Jose-Trimble 115 kV line as required by the 2008 California Independent System Operator Interconnection Study for the Los Esteros Expansion Project.
- Update existing Air Quality Conditions of Certification to lower the emission limits for carbon monoxide (CO) and Precursor Organic Compounds (POC).

Energy Commission staff reviewed the petition and assessed the impacts of this proposal on environmental quality, public health and safety, and proposes revisions to existing conditions of certification for air quality. It is staff's opinion that, with the implementation of revised conditions, the project will remain in compliance with applicable laws, ordinances, regulations, and standards and that the proposed modifications will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, Section 1769).

The amendment petition and staff's analysis has been posted on the Energy Commission's webpage at http://www.energy.ca.gov/sitingcases/losesteros2/compliance_phase_1/index.html.

The Energy Commission's Order (if approved) will also be posted on the webpage. If you have comments on this proposed modification, please submit them to me at the address below prior to December 27, 2010.

Christine Stora, Amendment Compliance Project Manager
California Energy Commission
1516 9th Street, MS-2000
Sacramento, CA 95814

Comments may be submitted by fax to (916) 654-3882, or by e-mail to cstora@energy.state.ca.us. If you have any questions, please contact me at (916) 654-4745.

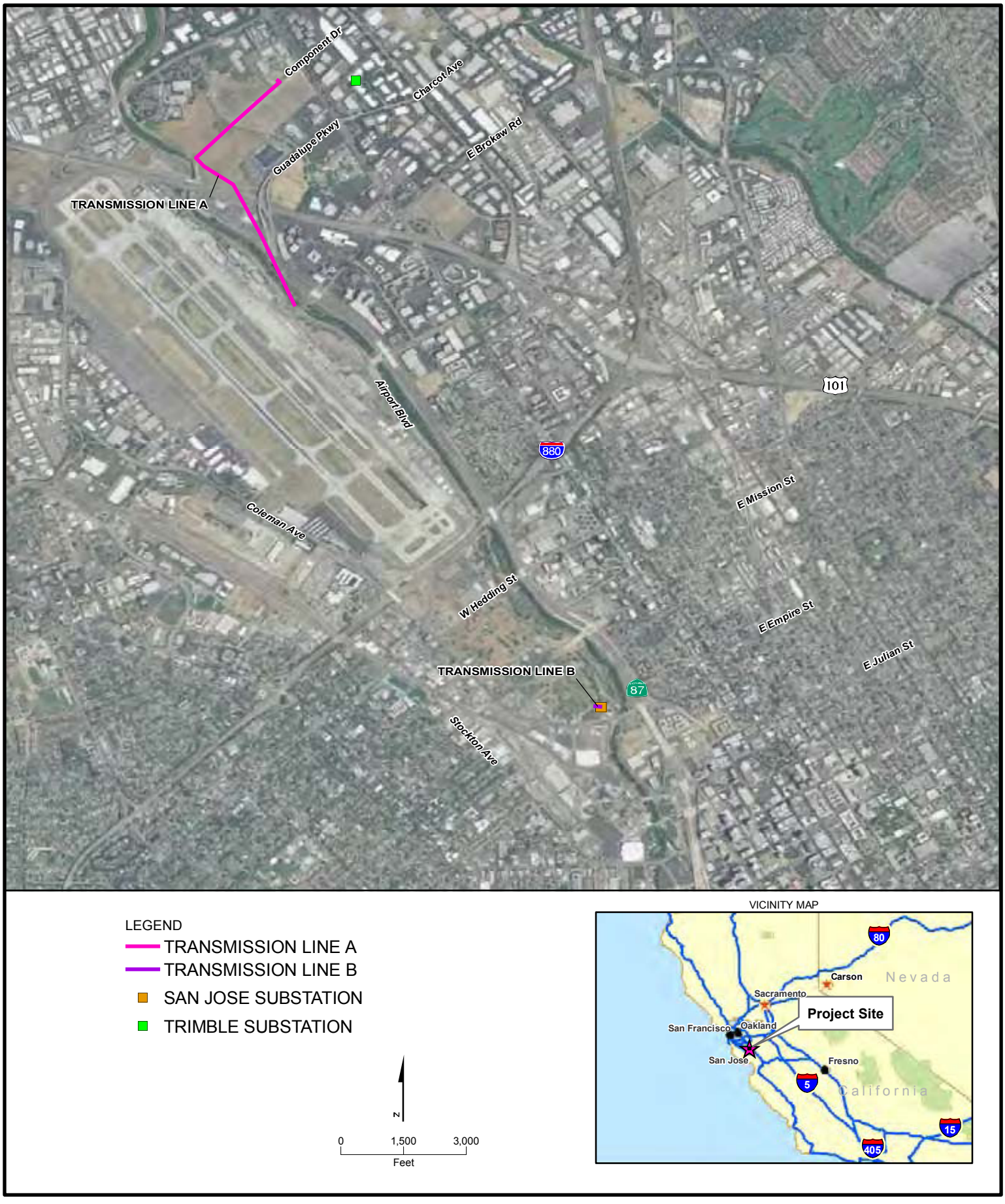
For further information on how to participate in this proceeding, please contact the Energy Commission Public Adviser's Office, at (916) 654-4489, or toll free in California at (800) 822-6228, or by e-mail at publicadviser@energy.state.ca.us. News media inquiries should be directed to the Energy Commission Media Office at (916) 654-4989, or by e-mail at mediaoffice@energy.state.ca.us.

Enclosure

Staff Analysis

APPENDIX A - FIGURE 1

Los Esteos Critical Energy Facility - Downstream Impacts PG&E Trimble - San Jose 115kV Line



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010

SOURCE: CH2MHILL 2009

DOWNSTREAM UPGRADES ANALYSIS

Prepared by Heather Blair

INTRODUCTION AND PURPOSE

The purpose of the downstream upgrades analysis is to examine the potential impacts of transmission line upgrades required to support the interconnection of the Los Esteros Critical Energy Facility (LECEF) Phase 2 to Pacific Gas and Electric Company's (PG&E) transmission system. The upgrades are considered "downstream" because they occur after the first point of interconnection. The objective of this analysis is to assess whether construction and/or operation of the downstream upgrades would result in significant environmental impacts and describe mitigation measures that would reduce potential impacts to less than significant levels.

At the time of the 2006 Energy Commission Decision approving LECEF Phase 2 (03-AFC-2), foreseeable PG&E transmission system upgrades attributable to the proposed project were unknown. In July 2009, the California Independent System Operator (CAISO) concluded in their Transition Cluster Group Phase I Interconnection Study for the LECEF Phase 2 Project that the interconnection of LECEF Phase 2 to the PG&E transmission system would require installing a new breaker at the PG&E Los Esteros Substation and reconductoring a 1.1- to 1.3-mile portion of the existing San Jose B-Trimble 115-kilovolt (kV) transmission line.

In October 2009, LECEF, LLC (applicant) submitted a petition for modification of the Energy Commission's decision to approve the LECEF Phase 2 Project (Order No. 06-1011-05, adopting Commission Decision in 03-AFC-2). In part, the petition requests an amendment to replace a circuit breaker within the existing PG&E Los Esteros Substation and reconductor a 1.1 to 1.3 mile portion of the existing San Jose B-Trimble 115-kV transmission line.

The new breaker and partial reconductoring of the San Jose B-Trimble 115-kV line are reasonably foreseeable indirect consequences of interconnecting LECEF Phase 2 to the PG&E transmission system, and the Energy Commission has a responsibility under the California Environmental Quality Act (CEQA) to analyze the "project as a whole." The Energy Commission's jurisdiction includes "…any electric power line carrying electric power from a thermal power plant …to a point of junction with an interconnected transmission system." (Public Resources Code, Section 25107). Therefore, the proposed downstream upgrades are not under the jurisdiction of the Energy Commission. Permitting of these actions falls under the jurisdiction of the California Public Utilities Commission (CPUC). PG&E is required to apply to the CPUC for a new or amended Certification of Public Convenience and Necessity (CPCN) pursuant to the CPUC's General Order (GO) No. 131-D to reconductor the San Jose B-Trimble 115-kV transmission line. GO No. 131-D requires PG&E to prepare a Proponents Environmental Assessment in accordance with CEQA, which will include an analysis of the proposed project's compliance with all laws, ordinances, regulations, and standards (LORS); this may require acquisition of additional permits (refer to Table 4).

This analysis of downstream impacts and identification of impact avoidance, minimization, and mitigation measures presented herein are intended to inform the

Energy Commission and the general public of the potential environmental and public health effects caused by interconnection of the LECEF Phase 2 to the PG&E transmission system and to satisfy the requirements of CEQA.

IMPACT SUMMARY

Chapters 2 and 3 of this Appendix describe the proposed methods and the potential environmental impacts of reconductoring a portion of the San Jose B-Trimble 115-kV transmission line. Table 1 summarizes the overall impact conclusions for the 13 issue areas analyzed.

Table 1. Summary of Environmental and Engineering Impact Conclusions

Issue Area	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
ENVIRONMENTAL				
Air Quality			X	
Biological Resources		X		
Cultural Resources		X		
Geology and Paleontology				X
Hazardous Materials				X
Land Use				X
Noise			X	
Socioeconomics				X
Soils and Water		X		
Traffic and Transportation			X	
Visual Resources				X
Waste Management			X	
Worker Safety				X

DESCRIPTION OF THE PROPOSED DOWNSTEAM UPGRADES

This section identifies the proposed project location and specific transmission line segments that would be reconductored as well as provides a general description of the proposed reconductoring process.

PROJECT LOCATION

The San Jose B-Trimble 115-kV transmission line comprises two 115-kV electrical circuits (Line A and Line B) between the Trimble Substation and the San Jose B Substation in San Jose, northwestern Santa Clara County, California. Approximately 1.1

to 1.3 miles of transmission line from the Trimble Substation to pole 12/81 (Line A, refer to Figure 1) and 0.07 mile of transmission line from pole 3/23 to the San Jose B Substation (Line B, refer to Figure 1) would be reconductored. No existing transmission line poles would be removed or replaced and no new poles would be installed. In addition, a circuit breaker within the existing PG&E Los Esteros Substation would be replaced to accommodate interconnection of LECEF Phase 2.

The subject portion of Line A begins at the Trimble Substation take-off structure and runs southwest in the center median of Component Drive. The transmission line continues southwest through the intersection of Orchard Parkway and Component Drive through fallow fields for 0.45 mile until it reaches a pole immediately east of the Guadalupe River. At this point, the line turns south-southeast and runs approximately 0.31 mile before crossing Highway 101, west of the intersection of Highway 101 and Highway 87/Guadalupe Parkway. The transmission line continues in a generally southeastern direction, traversing the car rental parking lot at the San Jose International Airport, and continuing roughly parallel to Guadalupe Parkway for approximately 0.25 mile. The transmission line then crosses the canal (channelized Guadalupe River) to its terminus at pole 12/81, which is located north of Brokaw Road, east of Airport Road, and west of Guadalupe Parkway. Along this portion of Line A, the existing towers are located in road medians, fallow fields, parking lots, and a wooded riparian area along the Guadalupe River.

The portion of Line B proposed for reconductoring begins at pole 3/23, which is located north of Coleman Road and east of Vendome Road. The transmission line spans a landscaped area for 0.7 mile before terminating at San Jose B Substation takeoff structure. Both existing poles are in paved areas.

CONSTRUCTION METHODS

Reconductoring a transmission line involves replacing the existing transmission line (also known as wire or conductor) with new conductors. The first step to reconductoring would be to disconnect the existing conductor from its insulator clamps and install stringing sheaves. Stringing sheaves are rollers that are temporarily attached to the lower portion of the insulators at each transmission line support structure to allow conductors to be pulled along the line. Additionally, temporary clearance structures would be erected where required prior to stringing any transmission lines. The temporary clearance structures are erected at road crossings and are typically vertical wooden poles with cross arms or trucks with aerial buckets.

Once the stringing sheaves and temporary clearance structures are in place, the existing conductor would be pulled through the sheaves and spooled onto a take-up reel. If the existing conductor is in good condition, the new conductor would be attached to its end and pulled into place as the existing conductor is reeled in. Otherwise, the existing conductor would be used to pull a sock line onto the stringing sheaves. The new conductor would then be attached to the sock line and pulled along the sheaves from the opposite direction. Following the initial stringing operation, pulling and tensioning the line would be required to achieve the correct sagging of the transmission lines between support structures. Finally, the tension and sag of conductors and wires would be fine-tuned, stringing sheaves would be removed and the conductors would be permanently attached to the insulators at the support structures.

It is anticipated that the reconductoring would be staged between dead-end structures, where the transmission line is firmly attached to, rather than passing through, the support structures. Dead-end structures are often located at angle towers, where the line changes direction.

Activities between the pull and tensioning sites are generally restricted to accessing the towers (manually by climbing or using a truck-mounted aerial bucket) to disconnect the conductor from the insulators and place the sheaves to begin the reconductor process and to remove the conductor from the sheaves and attach it to the insulators at the end of the process. Work on the tower structure may also be necessary to repair or replace damaged equipment. No ground disturbance would be required.

ANALYSIS OF RECONDUCTORING

As described above, the Energy Commission's licensing authority does not include transmission system upgrades beyond the point of first interconnection (Public Resources Code, Section 25107) and therefore, this document is intended for informational purposes. In conducting this analysis, staff assumes that conditions of certification approved for the LECEF Phase 2 Project (03-AFC-2) would also be implemented, as appropriate, during proposed reconductor activities. As necessary, staff recommends additional measures to reduce potential impacts to less than significant levels for the CPUC's consideration in the CPCN proceeding.

The environmental and engineering disciplines can be divided into those for which potential impacts would be less than significant with mitigation, those for which impacts would be less than significant and do not require mitigation, and those for which no impact would occur. Potentially significant, but mitigable impacts to biological, cultural, and soil and water resources may occur during proposed reconductoring activities and are analyzed in sections 3.1, 3.2, and 3.3, respectively. Rationale for the conclusion that impacts to the remaining issue areas would not occur or would be less than significant without mitigation is presented in the Table 2.

Table 2. Rationale for Less Than Significant or No Impact Conclusions

Issue Area	Less than Significant Impact	No Impact	Impact Conclusion Rationale
Air Quality	X		• Temporary fugitive dust and combustion emissions from construction equipment would occur. • LECEF Phase 2 Conditions of Certification AQ-SC-3 through AQ-SC-5 require diesel-fueled engine control, construction fugitive dust control and dust plume response. Similar measures are recommended for this project by staff. • Staff recommends that the CPUC requires PG&E to demonstrate compliance with applicable air quality LORS.
Geology and Paleontology		X	• No ground disturbance is proposed; therefore, impacts to paleontological resources would not occur. • Reconductoring would not increase the risk to operation of the transmission line from strong ground

			shaking, ground rupture, landslides, or other geologic hazards.
Hazardous Materials		X	• No hazardous materials would be used in amounts approaching reportable quantities.
Land Use		X	• No change in land use or conflicts with land use plans or policies would occur.
Noise	X		• Construction would result in temporarily elevated ambient noise levels. • Proposed reconductor is distant from sensitive receptors and proximate to other noise sources (e.g., Highway 101 and San Jose International Airport). • Staff recommends that the CPUC requires PG&E to demonstrate compliance with applicable local noise LORS.
Socio-economics		X	• Temporary labor required would have little appreciable effect on the area's economy or community services.
Traffic and Transportation	X		• Proposed reconductoring would occur within the median of Component Drive (4-lane) and would span Guadalupe Parkway (2-lane), Orchard Parkway (4-lane), and Highway 101. • Temporary clearance structures would be erected at road crossings. • Staff recommends that the CPUC requires PG&E to demonstrate compliance with applicable traffic LORS.
Visual Resources		X	• No new poles would be constructed or replaced; therefore, visual resources would not change.
Waste Management	X		• The old conductor would require disposal after being replaced. It is anticipated that disposal would occur in an approved facility with adequate capacity. • Staff recommends that the CPUC requires PG&E to comply with applicable local waste LORS.
Worker Safety and Fire		X	• Proposed reconductor activities are not considered worker or fire hazards. • Standard protection measures eliminate hazards to workers or minimize the risk through special training, protective equipment, or procedural controls.

BIOLOGICAL RESOURCES

Environmental Setting

Existing Vegetation and Wildlife

CH2M Hill conducted a field reconnaissance survey in October 2009. The entire length and width of the proposed reconductoring project was surveyed on foot, including a 25-foot buffer on each side of the existing San Jose B-Trimble 115-kV transmission line. Vegetation communities were mapped, observed wildlife and plants were documented, habitat was assessed for the potential to support special-status species, and existing conditions were photographed. The field survey was not conducted during the appropriate time to determine the presence of special-status plants and nesting birds.

The proposed project area comprises urban land uses with patches of sensitive habitat associated with the Guadalupe River. Along the length of the 1.1- to 1.3-mile

reconductor area, vegetation types transition from non-native annual grassland in the north portion of the project area, to a paved parking lot, to riparian and freshwater marsh habitat along the Guadalupe River, to the San Jose International Airport at the southern terminus of the Line A reconductor segment. The Line B reconductor segment is contained within a landscaped and paved urban area.

The developed lands and vacant lots occurring in the northern portion of the project area are dominated by ruderal forbs and non-native annuals that may be mowed on an annual basis. Some of the plant species observed within this vegetation type include wild oats (*Avena fatua*), saltgrass (*Distichlis spicata*), fireweed (*Euthamia ciliatum*), black mustard (*Brassica nig*ra), and Bermuda grass (*Cynodon dactylon*). Sensitive wetland and riparian habitats associated with the Guadalupe River are described below.

Several wildlife species were observed along the Guadalupe River channel and the open vacant lots within the northern portion of the reconductoring project area. Species identified by observation, tracks, or scat include, but are not limited to, California ground squirrel (*Spermophilus beecheyi*), black-tailed jackrabbit (*Lepus californicus*), raccoon (*Procyon lotor*), western scrub jay (*Aphelocoma californica*), white breasted nuthatch (*Sitta carolinensis*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*). Special-status plant and wildlife species are described below.

Special-status Species

Special-status species include those listed as threatened or endangered under the federal or state endangered species acts, species proposed for listing, California species of concern, and other species that have been identified by the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), or California Department of Fish and Game (CDFG) as unique or rare, as well as species included on the California Native Plant Society's (CNPS) list of rare, threatened, or endangered plants in California.

Table 3 identifies the special-status species that were reported or could potentially occur within the project area, including the Guadalupe River. Western burrowing owl (*Athene cunicularia*) was the only special-status species observed during the October 2009 reconnaissance survey. Special-status species with moderate to high potential to occur in the proposed project area are described in more detail below **Table 3**.

BIOLOGICAL RESOURCES Table 3
Special-status Species Potentially Occurring in LECEF Project Area

Common Name	Scientific Name	Status*
Plants		
Congdon's tarplant	*Centromadia parryi* ssp. *congdonii*	CNPS List 1B.2
Hall's bush mallow	*Malacothamnus hallii*	CNPS List 1B.2; HCP
Fish		
Central California coast steelhead	*Oncorhynchus mykiss irideus*	FT; HCP
Central Valley Chinook salmon	*Oncorhynchus tshawytscha*	FT; ST; HCP
Green sturgeon	*Acipenser medirostris*	FT; CSC

Common Name	Scientific Name	Status*
Longfin smelt	*Spirinchus thaleichthys*	ST
Amphibians		
California red-legged frog	*Rana draytonii*	FT; CSC; HCP
Reptiles		
Southwestern pond turtle	*Actinemys marmorata pallida*	CSC
Western pond turtle	*Actinemys marmorata*	CSC; HCP
Birds		
American peregrine falcon	*Falco peregrines anatum*	SE; FP
Bald eagle	*Haliaeetus leucocphalus*	SE; FP
Black skimmer	*Rynchops niger*	CSC
California horned lark	*Eremophila alpestris actia*	CSC
California least tern	*Sterna antillarum browni*	FE; SE; FP
California yellow warbler	*Dendroica petechia*	CSC
Cooper's hawk	*Accipiter cooperii*	CSC
Great blue heron	*Ardea Herodias*	CSC
Loggerhead shrike	*Lanius ludovicianus*	CSC
Northern harrier	*Circus cyaneus*	CSC
Salt marsh common yellowthroat	*Geothlypis trichas sinuosa*	CSC
Sharp-shinned hawk	*Accipiter striatus*	CSC
Short-eared owl	*Asio flammeus*	CSC
Tricolored blackbird	*Agelaius tricolor*	CSC
Western burrowing owl	*Athene cunicularia*	CSC; HCP
White-tailed kite	*Elanus leucurus*	FP
White-faced ibis	*Plegadis chihi*	CSC
Mammals		
Hoary bat	*Lasiurus cinereus*	CSC
Pallid bat	*Antroxous pallidus*	CSC
Townsend's big-eared bat	*Corynorhinus townsendii*	CSC; HCP
Yuma myotis	*Myotis yumanensis*	CSC

***Status Legend** (Federal/State/California Native Plant Society (CNPS) lists, CNPS list is for plants only): **FE** = Federally listed Endangered; **FT** = Federally listed Threatened; **SE** = State-listed Endangered; **ST** = State-listed Threatened; **CSC** = California Species of Concern; **FP** = Fully Protected; **CNPS List 1B** = Rare or Endangered in California and elsewhere; **.2** = Rare, threatened, or endangered in California, more common elsewhere; **HCP** = covered species in the Santa Clara Valley HCP/NCCP. (Sources: CH2M Hill 2009; CDFG 2010; CNPS 2010; SCVHCP 2006).

Rare Plants

Special-status plants were not observed in the proposed project area during the site reconnaissance survey in October 2009, which is outside of the survey period for potentially occurring special-status plants in the region (typically March 1 through July 31). There is high potential for Congdon's tarplant (*Centromadia parryi* ssp*. congdonii*) and Hall's bush mallow (*Malacothamnus hallii*) to occur given the presence of suitable riparian and upland habitat along the Guadalupe River and in the disturbed ruderal

areas in the northern portion of the project area. Both Hall's bush mallow and Congdon's tarplant have been recorded in the project vicinity according to CNDDB (CDFG 2010) and the Consortium of California Herbaria (CCH 2010).

Fishery Resources

Several federally and state-listed anadromous fish are known to inhabit the Guadalupe River during the fall and spring migration periods (typically October 15 through June 15). These species include central California coast steelhead (*Oncorhynchus mykiss irideus*), Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*), green sturgeon (*Acipenser medirostris*), and longfin smelt (*Spirinchus thaleichthys*) (SCVWD 2008).

Western Pond Turtle

There is high potential for western pond turtle (*Actinemys marmorata*) to occur within the proposed project area in the open water, freshwater marsh, and riparian habitats of the Guadalupe River. The Santa Clara Valley Habitat Conservation Plan (2006), which encompasses the proposed project area, targets this species for conservation and recovery.

Special-Status/Migratory Birds

The proposed project area provides suitable nesting and/or foraging habitat for the special-status bird species listed in Table 1 and a variety of migratory birds protected under the federal Migratory Bird Treaty Act and Fish and Game Code section 3503. The riparian woodland provides suitable nesting habitat for Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), California yellow warbler (*Dendroica petechia)*, and white-tailed kite (*Elanus leucurus)*, which also likely forage in adjacent grassland and marsh habitats. Freshwater marsh in the project area provides suitable nesting and foraging habitat for northern harrier (*Circus cyaneus)*, tricolored blackbird (*Agelaius tricolor*), and short-eared owl (*Asio flammeus)*. Non-native annual grassland in the northern portion of the project area provides suitable foraging habitat for the aforementioned species in addition to loggerhead shrike (*Lanius ludovicianus*) and American peregrine falcon (*Falco peregrines anatum)*. Ruderal grasslands in the project area also provide nesting habitat for western burrowing owl, which is discussed below. There were no active or inactive nests observed during the survey; however, the survey was conducted outside the nesting season (typically February 15 through August 31).

Western Burrowing Owl

During the October 2009 reconnaissance surveys, a western burrowing owl was observed flying out of an active burrow within the non-native grassland in the northern portion of the proposed project area. There are 25 records of this species occurring throughout the proposed project region, with several records concentrated near the reconductoring project site (CDFG 2010). Non-native grassland in the northern portion of the proposed project area is considered occupied by western burrowing owl. However, it is not known whether burrowing owls nest onsite because spring protocol surveys were not conducted.

Bats

Riparian woodland within the project area provides suitable roosting habitat and the Guadalupe River provides suitable foraging habitat for hoary bat (*Lasiurus cinereus*) and Yuma myotis (*Myotis yumanensis*). Two CNDDB records were mapped for hoary bat one mile south and west of the project area (CDFG 2010) and a Yuma myotis roosting colony occurs in the abandoned buildings one mile north of the reconductoring project area (SCVWD 2008). Given suitable roosting and foraging habitat within the project area and the known occurrences in the project vicinity, there is high potential for hoary bat and Yuma myotis to occur onsite.

Sensitive Habitat

Sensitive habitats within the proposed project area are confined to the Guadalupe River channel and include freshwater marsh and cottonwood-willow riparian scrub forest.

Freshwater Marsh

A wetland assessment, in accordance with the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual guidelines (Environmental Laboratory 1987) and the Arid West Supplement (USACE 2008), was conducted concurrent with the October 2009 reconnaissance survey. Potentially jurisdictional wetlands were mapped in small patches of freshwater marsh adjacent to the open water channel of the Guadalupe River. Dominant wetland species observed include cattail (*Typha* ssp.) and bulrush (*Scirpus* spp.).

Cottonwood-willow Riparian Woodland

Cottonwood-willow riparian woodland, dominated by Fremont's cottonwood (*Populus fremontii*) and various willow species (*Salix* spp.), occurs within the central portion of the project area along the banks of the Guadalupe River. The cottonwood-willow riparian woodland is part of the Guadalupe River riparian canopy and is regulated along with the open water channel by the California Department of Fish and Game under Fish and Game Code section 1602.

Impacts of Reconductoring

Impacts to Special-status Plant Species

There is high potential for Congdon's tarplant and Hall's bush mallow to occur within the reconductoring project area. Direct impacts to plants could occur if crushed or otherwise damaged by construction equipment and vehicle or foot traffic. Rare plant surveys during the appropriate blooming period (March 1 – July 31) are recommended prior to reconductoring activities. If impacts to special-status plant species cannot be avoided, then consultation with CDFG would be necessary prior to reconductoring activities.

Impacts to Sensitive Habitat

Direct impacts to the riparian woodland could occur if trees are substantially trimmed or removed. Permanent disturbance would not occur. However, indirect impacts to the river and wetlands could occur from erosion and sedimentation from soil disturbance. The Guadalupe River and its associated cottonwood-willow riparian woodland and freshwater marsh habitats are regulated by CDFG and the San Francisco Bay Regional

Water Quality Control Board (SFBRWQCB) under Fish and Game Code section 1600 *et seq.*, and the U.S. Army Corps of Engineers (USACE) under the federal clean water act.

Staff recommends that the CPUC require PG&E to conduct a formal wetland delineation as defined by USACE (2008) to further assess potential impacts to jurisdictional wetlands and waters within the Guadalupe River channel. In addition, staff recommends measures to avoid, minimize, and mitigate potential impacts to jurisdictional wetlands, waters, and riparian habitats such as those in LECEF Phase 2 Condition of Certification **BIO-10** (Mitigation Measures) and **BIO-15** (Avoid Impacts to Riparian Communities).

Consultation with CDFG, SFRWQCB, and USACE may be necessary prior to construction to determine if impacts would occur and permits are required. If warranted, acquisition of a Lake and Streambed Alteration Agreement (section 1602 permit), Water Quality Certification (section 401 permit), and USACE section 404 permit would ensure that potential impacts to sensitive habitats are mitigated and LORS compliance achieved.

Impacts to Special-status Wildlife

Fishery Resources

Temporary impacts to federally and state-listed anadramous fish could occur from degradation of water quality from erosion or sedimentation during reconductoring activities. To minimize impacts to migratory fish within the Guadelupe River, work over the open water channel should not be conducted during the migration period (typically October 15 to June 15). Conditions of certification and agency consultation recommended to mitigate potential impacts to jurisdictional wetlands and waters described above would also pertain to special-status fish and are recommended to reduce potential impacts to less than significant levels. In addition, consultation with NMFS and CDFG may be required under the federal and state endangered species acts.

Western Pond Turtle

Degradation of water quality from erosion or sedimentation during proposed reconductoring activities could also adversely affect western pond turtle. Given the potential for western pond turtle to occur within the reconductoring area, a pre-construction survey for this species should be required no more than one week prior to the commencement of reconductoring activities. If western pond turtle is determined to be present in the project area, impact avoidance measures similar to those presented in LECEF Phase 2 Condition of Certification **BIO-5** are recommended by staff. In addition, staff recommends that the CPUC require PG&E to contact CDFG for impact avoidance and minimization guidance if a western pond turtle is encountered. Conditions of certification and agency consultation recommended to mitigate potential impacts to jurisdictional wetlands and waters described above would also pertain to western pond turtle and are recommended to reduce potential impacts to less than significant levels.

Special-Status/Migratory Birds

The loss of active bird nests or young is regulated by the federal Migratory Bird Treaty Act and Fish and Game Code section 3503. Construction activities during the nesting

season could adversely affect breeding birds through direct take or indirectly through disruption or harassment, which may ultimately result in nest failure or abandonment. To minimize impacts to nesting birds, staff recommends that pre-construction surveys for birds, including raptors and migratory birds, be conducted if reconductoring activities occur during the nesting season (typically February 1 through August 30). If the pre-construction surveys identify active nests, staff recommends implementation of measures (e.g., establishing a buffer zone, conducting monitoring) to mitigate potential construction impacts to nesting birds to less than significant.

Western Burrowing Owl

Potential impacts to western burrowing owl include direct mortality from encounters with construction equipment, burrow/nest destruction during equipment staging, entombing burrowing owl adults, eggs, or young, and disruption or harassment. Due to the presence of occupied western burrowing owl habitat in the proposed project area, staff recommends that the CPUC require PG&E to coordinate with CDFG and conduct surveys during the winter season (December 1st-January 31st) and/or breeding season (February 1st – August 31st) prior to reconductoring activities according to survey protocol (CBOC 1993). If active burrows are identified, limited operating periods, no-disturbance buffers, passive relocation, artificial burrow construction, and/or compensatory habitat may be required by CDFG to mitigate impacts to western burrowing owls. Similar measures were required in LECEF Phase 2 Conditions of Certification **BIO-11** (Survey and Provide Habitat Compensation for Burrowing Owls) and **BIO-19** (Burrowing Owl Management Plan). Consultation with CDFG and implementation of recommended measures are expected to reduce potential impacts to burrowing owl to less than significant.

Special-status Bats

Mortality, injury, and harassment of roosting bats could result from removal or trimming of riparian woodland vegetation. Staff recommends that the CPUC require PG&E to conduct bat surveys prior to reconductoring activities to further assess potential project impacts to special-status bat species. If bats occur in the project area, coordination with CDFG is recommended to identify and implement appropriate impact avoidance and minimization measures to reduce impacts to roosting bats to less than significant levels.

CONCLUSIONS AND RECOMMENDATIONS

In summary, staff recommends that the CPUC require PG&E to conduct formal wetland and riparian canopy delineations as well as pre-construction surveys for rare-plants, western pond turtle, nesting birds, and burrowing owl to further define potential impacts to these sensitive habitats and special-status species. Implementation of staff's recommended impact avoidance, minimization, and mitigation measures would reduce potential impacts to biological resources to less than significant levels.

Compliance with applicable biological resource and water LORS, including the federal Clean Water Act, federal and state endangered species acts, federal Migratory Bird Treaty Act, and pertinent sections of the California Fish and Game Code (i.e., section 1600 et seq, 1900 et seq, section 3503, section 3513) is also recommended by staff.

LORS compliance for the proposed project may require acquisition of some or all of the permits listed in **Biological Resources Table 4**.

Biological Resources Table 4. Responsible Agencies and Required Permits

Responsible Agency	Permit/Approval
U.S. Army Corps of Engineers	Section 404 permit may be required for impacts to waters of the U.S. including wetlands
U.S. Fish and Wildlife Service	Consultation with USFWS under section 7 or 10 of the federal Endangered Species Act may be required for impacts to federally-listed species. Early coordination may identify the need for formal or informal consultation.
National Marine Fisheries Service	Consultation with NMFS under section 7 or 10 of the federal Endangered Species Act may be required for impacts to federally-listed anadramous fish. Early coordination may identify the need for formal or informal consultation.
California Department of Fish and Game	Section 1602 Streambed Alteration Agreement of the CDFG Code may be required for impacts to waters of the state, including the Guadalupe River and associated riparian vegetation.
San Francisco Bay Regional Water Quality Control Board	Section 401 Water Quality Certification may be required for impacts to wetlands and waters of the U.S. and state.

CULTURAL RESOURCES

Environmental Setting

A literature search conducted for the proposed for LECEF Phase 1 Project (01-AFC-12) revealed that numerous prehistoric sites have been recorded within a few miles of LECEF Phase 1, which is approximately three miles north of the portion of the San Jose B-Trimble 115-kV transmission line proposed for reconductoring (CEC 2001). Most of these sites are located near Coyote Creek or the Guadalupe River (LECEF 2003). A literature search was not conducted specifically for the proposed reconductor project.

Field Surveys

Cultural resource surveys of the reconductoring project area as well as a 50-foot buffer on either side of the existing transmission line were conducted by CH2M Hill in October 2009. Surveys utilized pedestrian transects spaced no more than 15 meters apart. Exposed soils were examined for archaeological deposits.

The archaeological sensitivity of the project site is considered low based on the large amount of ground disturbance and the modern built environment around the project site. No cultural resources or any prehistoric or historic sites were identified during the pedestrian survey of the reconductoring project area. Both Line A and B are modern transmission lines and are not likely to be considered historic resources. Prior to reconductoring the lines, their age would be determined and evaluated for the potential to be considered historic resources.

Impacts of Reconductoring

Construction activities could encounter buried cultural resources that have not previously been disturbed or destroyed in soils near the ground surface proximate to the Guadalupe River. Because reconductoring projects do not typically require ground disturbance and given the low sensitivity of the project area, unanticipated discoveries and impacts to cultural resources are not expected.

However, staff recommends that the CPUC require PG&E to prepare and implement a construction plan that addresses the unexpected discovery of buried cultural resources. Specifically, staff recommends implementation of measures similar to those in LECEF Phase 2 conditions of certification **CUL-1** through **CUL-4** and **CUL-6**. These conditions require that a designated Cultural Resource Specialist be onsite to investigate any unexpected cultural resource discoveries during construction, outline procedures for hating construction in the event there is an archaeological discovery, and require implementation of a worker training program to ensure that construction workers are aware of these procedures.

Conclusions and Recommendations

Staff recommends that the CPUC require PG&E to develop and implement measures to address unanticipated discovery cultural resources and avoid, minimize or mitigate any potentially resultant impacts. Implementation of these measures would ensure that potential impacts to cultural resources from the proposed project are less than significant.

SOIL AND WATER RESOURCES

Environmental Setting

Climate and precipitation in the proposed reconductoring area is the same as described for the LECEF Phase 2 (CEC 2005). The project area is located within the alluvial plain of the Santa Clara Valley. A portion of the existing San Jose B-Trimble 115-kV transmission line that is proposed for reconductoring spans the Guadalupe River, approximately four miles south of its outfall into the San Francisco Bay. Other surface water features within the proposed project area include areas of freshwater marsh adjacent to the Guadalupe River. The majority of the project area is paved or vacant land with ruderal vegetation absent any surface hydrology.

Impacts of Reconductoring

No ground disturbance is anticipated from proposed reconductor activities; however, if heavy equipment is staged along the bank of the Guadalupe River, eroded soil or sediment entering the river could adversely affect water quality. Potential impacts to water quality could also occur if accidental spills and/or leaks were improperly contained and contaminated surface water or wetlands. Impacts to local or regional water supply and groundwater resources would not occur since the proposed project's water use would be negligible.

LECEF Phase 2 Conditions of Certification **SOIL & WATER-1** and **SOIL & WATER-2** require implementation of sedimentation and erosion controls to prevent sediment-laden runoff from entering any watercourse. These are typically described in the project

Sediment and Erosion Control Plan, which is part of the required Stormwater Pollution Prevention Plan for Construction Activity. Similar requirements are recommended by staff for the proposed reconductor project.

Conclusions and Recommendations

Staff recommends compliance with soil and water LORS, including the federal Clean Water Act and Porter-Cologne Water Quality Control Act. This would include the requirements of the General National Pollution Discharge Elimination System Permit for Discharges of Stormwater Associated with Construction Activity as well as requirements in the Water Quality Certification (section 401 permit) from the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB).

Staff recommends that the CPUC require PG&E to implement measures to minimize erosion and sedimentation into the Guadalupe River. If effective measures are implemented and compliance with soil and water LORS is demonstrated, the proposed project's potential impacts to soil and water resources would be less than significant.

SUMMARY OF CONCLUSIONS

This assessment of environmental impacts from proposed reconductoring of 1.1 to 1.3 miles of the existing San Jose B-Trimble 115-kV transmission line was conducted to inform the Energy Commission and public and to satisfy the Energy Commission's obligations as the lead agency under CEQA for the original LECEF Phase 1 and LECEF Phase 2 proceedings. The proposed project would not result in significant and unmitigable impacts to any issue area. The following issue areas would not be adversely effected by the proposed project: geology and paleontology, hazardous materials, land use, socioeconomics, visual, and worker safety. Due to the temporary nature of the proposed project disturbance, impacts to the following issue areas would be adverse but less than significant, and no mitigation is recommended: air quality, noise, traffic and transportation. Staff recommends avoidance, minimization, and mitigation measures to reduce impacts to biological, cultural, and soil and water resources to less than significant levels. Refer also to Table 1 for a summary of impact conclusions in tabular format.

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AIR QUALITY

Prepared by Jacquelyn Leyva

INTRODUCTION

The Los Esteros facility is located at the intersection of State Route 237 and Zanker Road, in the city of San Jose, in Santa Clara County. It became operational as a simple cycle gas turbine facility in July 2002. The California Energy Commission (Energy Commission) approved its conversion to a combined cycle facility in October 2006, as more fully explained below, but the facility owner has not yet begun construction of this phase of the facility.

Los Esteros 1 (Docket 01-AFC-12) was approved by the Energy Commission on July 2, 2002, as a 180 MW "peaker" power plant with a limited three-year period of operation. Due to the limited operating period allowed in the original Decision, it was necessary for the facility owner to submit a new AFC. The new AFC had two parts or phases. Phase 1 of "Los Esteros 2" sought a license (recertification) for continued operation for the full normal service life for the simple cycle facility (Docket 03-AFC-2C). That recertification was approved on March 16, 2005. Then in October of 2006, the Energy Commission approved Phase 2 of the recertification, to convert Los Esteros into a 315 MW combined-cycle facility (Docket 03-AFC-2).

The Bay Area Air Quality Management District (BAAQMD) issued its Authority to Construct (ATC) to allow construction of the Phase 2 portion of the project in August of 2007. However, the ATC was only valid for two years and the facility owner had not yet begun construction near the end of that two year period. To avoid expiration of the ATC, the facility owner submitted another ATC application to the BAAQMD on June 5, 2009, two months prior to the expiration of the initial ATC. The BAAQMD issued its most recent ATC for Los Esteros in November 2010 with more restrictive allowable emissions conditions.

In October 2009, the Los Esteros Critical Energy Facility, LLC (LECEF or petitioner) filed a petition with the Energy Commission requesting to modify the Los Esteros Critical Energy Facility Phase 2 (LECEF Phase 2 or the project) Conditions of Certification to maintain consistency between the BAAQMD and Energy Commission permit conditions. These most recent changes would:

- Lower the allowable emission limits for carbon monoxide (CO)
- Lower the allowable emission limits for Precursor Organic Compounds (POCs)
- Make other conforming changes.

Staff notes that these reductions are made necessary by a requirement of the BAAQMD's rules and the ATC renewal, assuring the source would meet the most current "Best Available Control Technology" (BACT) requirements. These changes have all been approved by the BAAQMD.

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS) COMPLIANCE

The BAAQMD released a renewed ATC on November 2, 2010. This new ATC includes lower allowable emission limits due to technology advancements and the time elapsed since the original ATC for the combined cycle configuration. This new ATC contains the permit conditions specified by the BAAQMD to ensure compliance with applicable federal, state, and local air quality requirements. The conditions include emissions limitations, operating limitations, and testing, monitoring, record keeping and reporting requirements that ensure compliance with air quality laws, ordinances, regulations and standards (LORS). **Air Quality Table 1** summarizes the currently applicable LORS for the facility.

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	**U.S. Environmental Protection Agency**
Federal Clean Air Act Amendments of 1990 (CAAA), Title 40 Code of Federal Regulations (CFR) Part 50	National Ambient Air Quality Standards (NAAQS).
CAA 40 CFR 60 Appendix B and 40 CFR 75 Appendix F (Source Tests, RATA, and CEMS)	Requires Specifications and Test Procedures Continuous Monitoring Systems in Stationary Sources.
State	**California Air Resources Board and Energy Commission**
California Health & Safety Code (H&SC) §41700 (Nuisance Regulation)	Prohibits discharge of such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance.
H&SC §41510	Permitting of source needs to be consistent with approved clean air plan. [BAAQMD Regulation 1-440, 1-441]
Airborne Toxic Control Measure for Stationary Compression Ignition Engines (ATCM, 17 CCR §93115.6)	Establishes operating requirements and emission standards for emergency standby diesel-fueled CI engines [17 CCR 93115.6]. The emission standard is 0.15 g/bhp-hr diesel particulate matter for emergency engines (operated fewer than 50 hours per year for maintenance and engine testing).
Local	**Bay Area Air Quality Management District (BAAQMD)**
BAAQMD Regulation 1 – General	Limits releases of air contaminants to not “cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public.” Prohibits contaminants that may endanger “the comfort, repose, health or safety of any such persons or the public, or cause injury or damage to business or property.”

Applicable Law	Description
BAAQMD Regulation 2, Rule 1 – Permits	General Requirements – Specifies requirements for issuance or denial of permits, exemptions, and appeals against BAAQMD decisions. An Authority to Construct (ATC) is required for any non-exempt source. Natural gas-fired heaters with a heat input rate of less than 10 million Btu per hour are exempt, and stationary internal combustion engines and gas-fired combustion turbines with an output rating of less than 50 horsepower (hp) are exempt.
BAAQMD Regulation 2, Rule 2	New Source Review (NSR) – Requires preconstruction review including Best Available Control Technology (BACT) for sources with the potential to emit more than 10 pounds per day (NOx, POC, PM10, CO, or SO_2). Requires surrendering offsets for facilities with the potential to emit more than 35 tons per year of NOx or POC, or 100 tons per year of PM10 or SOx.
BAAQMD Regulation 2, Rule 5	NSR of Toxic Air Contaminants – Requires preconstruction review for new and modified sources of toxic air contaminants. Contains project health risk limits and requirements for Toxics BACT.
BAAQMD Regulation 2, Rule 6	Major Facility Review – Requires an application be submitted for the federal operating permit within 12 months after commencing operation, as specified by Title V federal Clean Air Act.
BAAQMD Regulation 2, Rule 7	Acid Rain – Requires monitoring, recordkeeping, and holding of allowances for pollutants that contribute to the formation of acid rain, as specified by Title IV of the federal Clean Air Act.
BAAQMD Regulation 6, Rule 1	Particulate Matter – Limits particulate matter and visible emissions to less than 1 opacity. Prohibits emissions from any activity for more than 3 minutes in any one hour that result in visible emissions as dark or darker than Number 1 on the Ringlemann Chart.
BAAQMD Regulation 9, Rule 9	Stationary Gas Turbines – Specifies emission limits of 9 ppmvd NOx or 0.43 pounds NOx per megawatt-hour (lb/MWh), applicable to the proposed combustion turbines.

SETTING

Federal and state ambient air quality attainment status designations have not changed significantly since the 2006 Energy Commission Decision. **Air Quality Table 2** summarizes current area ambient air quality attainment status designations for the BAAQMD.

Air Quality Table 2
Attainment Status Designations for Bay Area Air Quality Management District

Pollutant	Attainment Status	
	State	Federal
Ozone (1-hr)	Nonattainment	No Standard [a]
Ozone (8-hr)	Nonattainment	Nonattainment (Marginal)
PM10	Nonattainment	Unclassified
PM2.5	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment [b]
SO_2	Attainment	Attainment [c]
Sulfates	Attainment	N/A
Lead	Attainment	Attainment
Hydrogen Sulfide	Unclassified	N/A
Vinyl Chloride	"No Information Available"	N/A
Visibility Reducing Particles	Unclassified	N/A

Source: http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm. Accessed November 24, 2010.
Notes:
a. The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.
b. Attainment status relative to the new federal short-term NO_2 standard is scheduled to be determined by January 2012; Air Quality
Table 7 shows that the area is likely to comply with this new standard.
c. U.S. EPA established a new SO2 standard effective June 2, 2010.

ANALYSIS

The Petitioner requests to amend the October 2006 Energy Commission Decision to meet lower allowable emission limits for CO and POCs. These reductions are necessary to meet the BAAQMD's requirements to be granted a renewed ATC. The BAAQMD's ATC will only be issued once assuring the source meets current BACT requirements. This obligation to assure the facility meets all the current BACT requirements must undergo review to confirm that all the standards are met for the federal Clean Air Act's regulations for nonattainment New Source Review. The Energy Commission has final jurisdiction over the siting and permitting of large thermal power plants in California, such as Los Esteros. Therefore, the Energy Commission must adopt the more stringent BAAQMD's air quality conditions that are included in the air district's renewed ATC. The Energy Commission must also include two additional staff conditions for the emergency generator to ensure compliance with the new 1-hr federal NO_2 standard which became effective April 12, 2010.

PROJECT EMISSION PROFILE CHANGES

As explained more fully above, the facility originally certified as Los Esteros 1 was recertified in 2005 to extend its life, and amended in Phase 2 as Los Esteros 2 in 2006 to convert the facility to combined cycle configuration and increase its capacity while reducing its heat rate. The October 2006 Energy Commission Decision included specific daily and annual maximum allowable emission limits for combined cycle operation. In this proposed revision to the 2006 Decision, the facility's current daily emission limits for NOx, PM10, PM2.5 and SO_2 are not changed. The Energy Commission's 2006 Decision continues to meet current BACT requirements, except for

the limits on CO and POCs, which must be reduced, respectively, from 9.0 ppm (3-hour average) to 2.0 ppm (1-hour average) and from 2.0 ppm (3-hour average) to 1.0 ppm (1-hour average), respectively.

ANALYSIS OF SPECIFIC AMENDMENT REQUESTS

1. Permit Limit Modifications

The applicant requests a revision of the permit limits for CO and POCs to be consistent with current air district permit limits and which are current BACT practices.

The Energy Commission issued its license for the Phase 2 combined-cycle conversion project in October 2006, and the BAAQMD issued its ATC for the Phase 2 project in August 2007. This ATC was scheduled to expire in August 2009 but before that could happen, the facility owner submitted an application for renewal for the ATC on June 2009, as required by the BAAQMD regulation 2-1-407.[1] The emission limits for the existing Phase 1 simple cycle configuration are presented in **Air Quality Table 3** below for information. The emission limits for the Phase 2 combined-cycle configuration as currently approved by the Energy Commission in the October 2006 Decision are presented in **Air Quality Table 4**, and the most current ATC limits of the BAAQMD are shown in **Air Quality Table 5.** These values can be compared to see the decreases in allowable short-term emission limits throughout the various stages of the project. However, conversion of the facility from simple cycle to combined cycle increased annual emissions, because the facility would be larger and more efficient, and would likely be operated at a greater capacity factor.

Air Quality Table 3
Existing Emission Limits for the
LECEF Phase 1 Simple Cycle Plant (July 2002)

Pollutant	NOx	POC	PM10	CO	SO_2
Emission Limit	5.0 ppm_vd (3-hr avg.)	2.0 ppm_vd (3-hr avg.)	2.5 lb/hr	4.0 ppm_vd (3-hr avg.)	0.33 lb/hr [a]

[a] Calculated base on an annual average sulfur content of 0.25 gr/100 dscf in natural gas fuel

Air Quality Table 4
Emission Limits for the LECEF Phase 2
Combined Cycle Plant Conversion Project (October 2006)

Pollutant	NOx	POC	PM10	CO	SO_2
Emission Limit	2.0 ppm_vd [a] (1-hr avg.)	2.0 ppm_vd (3-hr avg.)	2.5 lb/hr	9.0 ppm_vd (3-hr avg.)	1.8 lb/hr [b]

[a] With short-term excursion language for transient load conditions that allows up to 5 ppm NOx concentration.

[b] Calculated based on maximum sulfur content of 1.0 gr/100g scf in natural gas fuel.

[1] BAAQMD 2010, page 3

Air Quality Table 5
Lower Emission Limits for the LECEF Phase 2
Combined Cycle Plant Conversion Project ATC Renewal (December 2010)

Pollutant	NOx	POC	PM10	CO	SO_2
Emission Limit	2.0 ppm_vd [a] (1-hr avg.)	1.0 ppm_vd (1-hr avg.)	Technology [b]	2.0 ppm_vd (1-hr avg.)	Technology [b]

[a] With no provision for transient load excursion

[b] BAAQMD has established BACT for PM10 and SO_2 as a control technology and not as a numerical emissions limit. There is no difference in the amount of PM10 and SO_2 that will be emitted (BAAQMD 2010).

The proposed modification to Air Quality Condition of Certification **AQ-19(c)** would lower the CO emission limit from 9.0 ppm (3-hour rolling average) to 2.0 ppm (1-hour rolling average), except during periods of start-up or shut-down. The proposed modification to the Air Quality Condition of Certification **AQ-19(d)** would lower POCs emission limit from 2.0 ppm (3-hour rolling average) to 1.0 ppm (1-hour rolling average), except during periods of start-up and shutdown. The proposed modification to the Air Quality Condition of Certification **AQ-22** will make corresponding changes to the hourly, daily, and annual mass emissions limitations (previously determined to be needed for the combined cycle configuration) to reflect these updated BACT limits. Staff welcomes these emission reductions by the BAAQMD and the applicant. In addition, Calpine has requested that its ammonia slip limit be reduced from 10 ppm to 5 ppm as part of the ATC renewal for this project. This has been determined to be feasible due to conversion from simple cycle configuration to combined cycle configuration, which will allow the use a of low-temperature SCR system with a higher NOx abatement efficiency than the high-temperature SCR system that it will replace.[2]

Staff recommends the revisions because the proposed modifications to the air quality conditions are consistent with the Energy Commission's 2006 Decision to achieve the goal of meeting BACT requirements for all criteria pollutants. The proposed modifications will result in a beneficial change by adopting emission limits substantially lower than those set in the previous 2006 Energy Commission Decision.

2. Revision of ERC's in AQ-SC7 to Reflect Changes to Air District Permit

As established in the October 2006 Energy Commission Decision, federally enforceable emission reduction credits must be provided for NOx and POC increases at a ratio of 1.15: 1.0 and 1.0: 1.0 respectively. Under the renewed ATC, the Phase 2 conversion project will increase annual NOx emissions from 74.9 tons to 95.2 tons, a 20.3 ton increase over the simple cycle configuration of the facility. At a ratio of 1.15:1.0, this increase requires 23.35 tons of NOx ERCs to be provided. The POCs will decrease when the Phase 2 conversion is implemented with the new BACT limits, from 21.0 tons to 12.3 tons, and no additional ERCs would be required[3]. Calpine has surrendered NOx ERCs from Certificate No. 1201 in the amount of 23.35 tons of NOx for this phase of the conversion. The submission of these ERCs satisfies all current offset requirements. The other criteria pollutants ERCs will remain unchanged for CO, SO2, and PM10.

[2] BAAQMD 2010, page 6.

[3] BAAQMD 2010, page 33.

Staff recommends the revision, because the proposed modifications to the air quality conditions are consistent with all offsets required and submitted. The proposed modifications do not negatively impact the air quality and will result in a full offset package, consistent with what was required in the October 2006 Decision.

3. Federal NO_2 Standard

Los Esteros Critical Energy Facility (LECEF) performed a dispersion modeling analysis to evaluate potential air quality impacts to show compliance with the new Federal 1-hour NO_2 standard of 188 µg/m^3. The modeling analysis was performed using the techniques and methods outlined by the EPA in the June 2010 "*Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program*" (EPA, June 2010). Even though the LECEF Phase 2 licensing process does not require a federal Prevention of Significant Deterioriation (PSD) permit, for California Environmental Quality Analysis (CEQA) purposes the Energy Commission must evaluate all applicable standards including federal standards. The federal NO_2 standard of 188 µg/m^3 is much lower than the 339 µg/m^3 state 1-hour NO_2 standard. It also requires federal guidance to evaluate a project's impact relative to the new standard because the format of the new federal standard is the 98th percentile of the daily maximum 1-hour value averaged over 3 continuous years, not the maximum 1-hour value of the year, as required by the state standard.

Dispersion Modeling Assessment

Atmospheric Dynamics, Inc provided, on November 1, 2010, a modeling analysis of operating period facility emissions[4] to show compliance with the new federal 1-hour NO_2 standard (AD 2010). This modeling analysis, using the **A**merican Meteorological Society/**E**nvironmental Protection Agency **R**egulatory **Mod**el (AERMOD) dispersion model (version 09292), includes the use of the Plume Volume Molar Ratio Method (PVMRM) approach which limits the conversion of NO to NO_2 based on the amount of ambient ozone within the volume of the plume. At the stack exit, approximately 90 percent of NOx is NO and the remainder is NO_2. As the pollutants disperse downwind, ambient ozone interacts with NO emitted from the stack to form more NO_2. The meteorological and receptor data sets used in this analysis were based on data used in the May 2005 Phase 2 Assessment (AD 2010). The BAAQMD provided meteorological data for the Alviso Monitoring site maintained by the BAAQMD for the years 1997 through 2000. The Alviso monitoring site location is identical to the dispersion conditions at both the project site and the regional area in general and are consistent with the hourly average wind speed, wind direction, dispersion sigma theta, temperature and solar isolation. The meteorological data was processed using the United States Environmental Protection Agency (USEPA) AERMOD preprocessor program **A**merican Meteorological Society/**E**nvironmental Protection Agency **R**egulatory Model **Met**eorology preprocessor (AERMET) (version 06341).

With the PVMRM method, the NO_2/NOx ratio was used with concurrent hourly 1-hour ozone concentrations to calculate the 1-hour NO_2 concentrations using the AERMOD PVMRM method. For this modeling analysis, the applicant obtained hourly monitored ozone concentrations from the San Jose 4th street station for the same time period as

[4] The United States Environmental Protection Agency does not require modeling analyses to be performed for project construction emissions because they are short-term.

the meteorological data (1999 to 2000). Missing ozone data for periods of 1 hour were interpolated from the San Jose data before/after the missing period. Missing data for longer periods were replaced with data from the nearest monitoring site.

Two operating profiles were assessed for compliance with the federal 1-hour NO_2 standard (AD 2010):

(1) Four turbines in base load operation with a 1-hour weekly test of the diesel engine driving the emergency fire pump
(2) Four turbines in base load operation with a 1-hour cold startup mode but without the concurrent operation of the weekly 1-hour emergency fire pump test.

The fire pump will not be tested during periods when the turbines are in a startup mode (**AQ-SC-12**). The fire pump testing period will also be limited to daylight hours only (**AQ-SC13**). The stack parameters were those used in the LECEF Phase 2 application. Additionally, to minimize air quality impacts during weekly routine fire pump engine testing, LECEF has agreed to Staff Conditions of Certification **AQ-SC12** and **AQ-SC13** that would limit the timing of routine testing. Dispersion modeling shows that higher concentrations of NO_2 occur during the early morning and late evening hours due to atmospheric stability. When the air is more stable, there is less turbulence and less mixing, resulting in less air pollutant dispersion and therefore usually increased air quality impacts near any single air pollution source. This is the reason **AQ-SC13** is needed.

Background 1-hour NO_2 Monitoring Data

The nearest and most representative NO_2 air quality monitoring site is the San Jose 4th Street monitoring station. The San Jose 4th street monitoring site is located in the center of northern Santa Clara Valley, in a commercial and residential part of downtown San Jose. The air quality in this location is representative of a large part of the valley due to the diurnal up valley and down valley air flow, which mixes the pollutants throughout the valley (AD 2010). The use of the San Jose 4th Street monitoring station satisfies the USEPA's new requirements for the placement of NO_2 monitors, which states: *In urban areas, monitors are required near major roads as well as in other locations*[5] *where maximum concentrations are expected*. Major roadways are defined as those with at least 250,000 annual average daily traffic and monitors for this exposure condition must be located within 50 meters of the monitoring station. The use of the San Jose 4th Street monitoring station for NO_2 background data satisfies the revised USEPA monitoring station requirements for the new 1-hour NO_2 standard.

For information purposes, **Air Quality Table 6** below shows the monitoring data from the San Jose 4th street monitoring site, maximum monitored values for each year. However, 98th percentile values were used in the calculation of the project's impacts, as described below.

[5] http://www.epa.gov/oaqps001/nitrogenoxides/pdfs/20100122fs.pdf

Air Quality Table 6
Monitoring data summary (first high monitored values)

Pollutant	Site	Avg. Time	2007	2008	2009
NO_2 (ppb)	San Jose 4th Street	1-hr	65	80	69

Source: AD 2010

The applicant determined final NO_2 impacts using a conservative Tier 1 approach, where the highest 1-hour modeled project NO_2 impacts from emissions scenarios described above are added to background values represented by the three-year average of the annual 98th percentile maximum daily 1-hour NO_2 concentrations for 2007 through 2009 from the San Jose 4th Street monitoring station. The 98th percentile maximum 1-hour background concentration were added to the maximum (first high) modeled concentrations to calculate a total impact.

Air Quality Table 7 presents the applicant's 1-hour NO_2 modeling results for the project for the 1-hour Federal NO_2 standard. This modeling analysis indicates that the project would not cause an exceedance of the Federal 1-hour NO_2 standard. The maximum modeled concentration occurred during simultaneous startup of the four gas turbines and not during normal operation of the turbines along with the weekly simultaneous 30 minutes test of the fire pump engine.

Staff has been able to obtain only limited guidance from the USEPA or from any other regulatory body regarding how to evaluate a project's impact related to this new federal ambient air quality standard. As explained above, the new standard is expressed in a statistical fashion using the eighth highest daily maximum 1-hour value, averaged over three years.

Air Quality Table 7
Project Operation Impacts

Pollutant	Avg. Period	Maximum Project Impact ($\mu g/m^3$)	98th Percentile Background [c] ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Percent of Standard
Start-Up NO_2	1-hr Fed	114.31 [a]	56	170.3	188	90.5%
Routine Operation NO_2	1-hr Fed	90.53 [b]	56	146.5	188	78%

[a] This value represents the project's maximum 1-hour impact from the simultaneous startup of four turbines during a 1-hour period. All 1-hour NO2 modeled concentrations were calculated with plume molar ratio method.

[b] This value represents normal operational impacts, including routine testing of the fire pump diesel engine. The testing will not occur during turbine startup operations and will only occur during daylight hours.

[C] NO2 final Design values by state for Santa Clara County. EPA Jan 22, 2010. http://www.epa.gov/air/nitrogenoxides/pdfs/NO2_final_designvalues_0608_Jan22.pdf

Source: AD 2010.

The Fire Pump Diesel Engine could potentially create significant NO_2 impacts. To minimize these impacts, BAAQMD Condition **AQ-39** would limit operation of the Fire Pump Diesel Engine to no more than 50 hours per year. Also, the Fire Pump Diesel

Engine would not be operated for routine weekly reliability testing or for emission testing during the nighttime hours which are the periods with the highest modeled NO_2 impacts. They will also not be tested during turbine start-up periods. Staff conditions **AQ-SC12 and AQ-SC13** would impose these limits.

Additional details for the air quality modeling analysis including source parameters, receptor grid and meteorology are given in the 2010 report (AD 2010). Staff reviewed the applicant's modeling analysis and found the procedures and inputs to be acceptable specifically for the LECEF project for the assessment of potential CEQA impacts.

CONCLUSIONS AND RECOMMENDATIONS

- The project would most likely comply with all applicable BAAQMD Rules and Regulations, including New Source Review requirements. However, the final BAAQMD permit for the project is not yet available.

- The amended project would result in decreased emissions and will be consistent with BACT limits and the resulting air quality impacts would be less than significant.

- Staff reviewed the applicant's 1-hour federal Nitrogen Dioxide (NO_2) air dispersion modeling analysis and found the procedures and inputs to be acceptable specifically for the LECEF project relative to the assessment of potential CEQA impacts.

- With the adoption of the two additional staff conditions recommended in this Staff Analysis, which the applicant agrees are needed, CEQA impacts of the LECEF project relative to the federal 1-hour NO_2 standard would be less than significant.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

Below is a list of the revised Air Quality Conditions of Certification, which were originally contained in the Decision for LECEF Phase 2 (Energy Commission 2006b), and a brief discussion of the proposed changes. The BAAQMD issued a renewed ATC engineering analysis including permit conditions and these are included below as Air Quality Conditions of Certification. Strikeout is used to indicate deleted language and **underline and bold** is used for new language.

Conditions of Certification that will be amended by this amendment request:

- Impose a new limit of 4.68 lb/hr for NOx limits in **AQ-19(a)**.
- Lower ammonia emission limits from 10 ppmvd to 5 ppmvd in **AQ-19(b)**.
- Lower the CO and POC emissions limits in **AQ-19(c) and (d),** respectively.
- Revise Condition of Certification **AQ-19 (c) and (d)** to eliminate references of rolling 3-hour period; change to 1-hour rolling average.
- Lower the CO and POC emissions limits in **AQ-22** per turbine/HRSG Power Train, and all four turbine/HRSG Power Trains in pounds per day and tons per year.

- NOx tons per year (tpy) ERCs required would be decreased from 27.945 to 23.35 tpy per BAAQMD permit part 35 and would be implemented through a change in **AQ-SC7**. This change is due to lower allowable start-up emission limits in **AQ-20**.
- Delete **AQ-37** to eliminate reference to title IV and title V permit submittal since the title IV and V permit applications have already been submitted to the BAAQMD.
- Add **AQ-SC12** and **AQ-SC13** to limit the timing of routine testing of S-5 Fire pump diesel engine to ensure compliance with Federal 1-hour standard for NO_2.
- Administrative changed for the SCR and OC systems' numbering (applies to conditions **AQ-3** and **AQ-4** equipment descriptions).
- Delete **AQ-10(d)** and **(e)** daily emission limits for PM10, and SO_2. The facility will only be required to have annual emission limits.
- Clarify basis for conditions in BAAQMD permit to conform with new regulations (i.e. SIP 6-301, BAAQMD regulation 6-1-301, regulation 2-5, and BACT) – various conditions would be affected, **AQ-18, AQ-19(b), AQ-20, AQ-23, AQ-26(b), AQ-27, AQ-43, AQ-44, AQ-45**).
- Delete **AQ-19(e), (f)**, and **(g).** These are no longer needed because excursion language is not consistent with current BACT and should be removed from the current conditions[6].
- Add start-up and shutdown allowable emissions limits established in the BAAQMD permit for BACT in **AQ-20** and **AQ-21**.
- Decrease mass emission limits in **AQ-22** for all criteria pollutants and ammonia (SOx and PM10 will no longer be required to have daily limits but will have a decrease in the annual limits for these pollutants).
- Make **AQ-SC7** and **AQ-35** consistent with the lower allowable tons per year of NOx emission reduction credits.
- Include new language in **AQ-39, AQ-40, AQ-41**, and **AQ-42** to meet State ATCM regulations for the fire pump diesel engine.
- Decrease maximum allowed total dissolved solids (TDS) in **AQ-46** from 10,000 ppm_w (mg/l) to 6,000 ppm_w (mg/l), measured at the base of the cooling towers.

Other administrative elements that will be amended:

- Start-up mode would be redefined as the first 120 minutes of continuous fuel flow to a gas turbine after fuel flow is initiated or until the gas turbine achieves to continuous emissions monitoring system data points which show compliance with Conditions of Certification **AQ-19(a)** through **AQ-19(d)**.
- Shutdown mode would be redefined as the lesser of the 30 minute period prior to termination of fuel flow to a gas turbine or the period of time from non-compliance with any condition listed in Conditions of Certification **AQ-19(a)** through **AQ-19(d)**.
- The previous fire pump engine (S-5) would be replaced with an equivalent fire pump diesel engine, but of a different make and model.

[6] BAAQMD 2010, page 14

- Administrative Changes to the equipment description stationary permitted sources' subparts numbering as seen below.

Equipment Description Changes

S-1 Combustion Gas Turbine #1 with Water Injection and high efficiency inlet air filter, General Electric LM6000PC Sprint, natural gas fired, 49.4 MW, 500 MM Btu/hr (HHV) maximum heat input rating; abated by A ~~1~~ **9** Oxidation Catalyst and A-~~2~~ **10** Selective Catalytic Reduction System

S-2 Combustion Gas Turbine #2 with Water Injection and high efficiency inlet air filter, General Electric LM6000PC Sprint, natural gas fired, 49.4 MW, 500 MM Btu/hr (HHV) maximum heat input rating; abated by A- ~~3~~ **11** Oxidation Catalyst and A- 4 **12** Selective Catalytic Reduction System

S-3 Combustion Gas Turbine #3 with Water Injection and high efficiency inlet air filter, General Electric LM6000PC Sprint, natural gas fired, 49.4 MW, 500 MM Btu/hr (HHV) maximum heat input rating; abated by A-~~5~~ **13** Oxidation Catalyst and A- ~~6~~ **14** Selective Catalytic Reduction System

S-4 Combustion Gas Turbine #4 with Water Injection and high efficiency inlet air filter, General Electric LM6000PC Sprint, natural gas fired, 49.4 MW, 500 MM Btu/hr (HHV) maximum heat input rating; abated by A- ~~7~~ **15** Oxidation Catalyst and A- ~~8~~ **16** Selective Catalytic Reduction System

S-5 ~~Fire Pump Diesel Engine, John Deere Model JDFP-06WR, 290 bhp, 13.5 gal/hr~~. **Fire Pump Diesel Engine, Clarke Model JW6H-UF40, 300 BHP, 14.5 gal/hr** fuel consumption rate.

S-7 Heat Recovery Steam Generator #1, equipped with low-NOx Duct Burners, 139 MM Btu/hr (HHV) abated by A ~~1~~ **9** Oxidation Catalyst and A-~~2~~ **10** Selective Catalytic Reduction System

S-8 Heat Recovery Steam Generator #2, equipped with low-NOx Duct Burners, 139 MM Btu/hr (HHV) abated by A-11 Oxidation Catalyst, and A- ~~3~~ **11** Oxidation Catalyst and A- 4 **12** Selective Catalytic Reduction System

S-9 Heat Recovery Steam Generator #3, equipped with low-NOx Duct Burners, 139 MM Btu/hr (HHV) abated by A-~~5~~ **13** Oxidation Catalyst and A- ~~6~~ **14** Selective Catalytic Reduction System

S-10 Heat Recovery Steam Generator #4, equipped with low-NOx Duct Burners, 139 MM Btu/hr (HHV) abated by A- ~~7~~ **15** Oxidation Catalyst and A- ~~8~~ **16** Selective Catalytic Reduction System

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

PROPOSED ADDITIONAL CONDITIONS OF CERTIFICATION

The following new conditions of certification would be amended in the October 2006 Final Commission Decision for the Los Esteros Critical Energy Center to ensure compliance with all applicable LORS. These are in addition to those contained in the previous Decision. ~~Strikethrough~~ is used to indicate deleted language and **bold underline** for new language.

Conditions of Certification AQ-SC7, AQ-SC12, and AQ-SC13, apply to required ERCs and the Diesel Fire Pump Engine, respectively. Conditions of Certification AQ-3 through AQ-4, AQ-6 through AQ-8 and AQ-10 apply to Commissioning. AQ-18 to AQ-24, AQ-27, AQ-35, AQ-37, AQ-39 through AQ-46 apply to Operations.

CHANGED CONDITIONS OF CERTIFICATION:

AQ-SC7 The project shall surrender the emission offset credits listed below or a modified list, as allowed by this condition, at the time surrender is required by condition AQ-35 (district permit Part 35). The project owner may request CPM approval for any substitutions or modification of 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, the requested change(s) clearly will not cause the project to result in a significant environmental impact, and each requested change is consistent with applicable federal and state laws and regulations.

Required Emission Reduction Credits

ERC Number	Source Location (City)	Date Banked	Source Type	NOx (TPY)	POC (TPY)
724	Palo Alto	3/13/96	Cardinal Cogen	7.100	
856	San Pablo	4/23/02	Myer Container		26.522
~~896~~ **1201**	San Francisco	9/30/85	Potrero Power Plant	304.594	
Total ERCs Available				311.694	26.522
Los Esteros Phase 2 ERC Requirement				~~27.945~~ **23.35**	~~7.5~~

Verification: The project owner shall submit to the CPM a list of ERCs to be surrendered to the District at least 60 days prior to initial startup. If the CPM, in consultation with the District, approves a substitution or modification, the CPM shall file a statement of the approval with the commission docket and mail a copy of the statement to every person on the post-certification mailing list. The CPM shall maintain an updated list of approved ERCs for the project.

AQ-SC12 The project owner shall not operate S-5 Fire Pump Diesel Engine for 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) simultaneously with the operation of any gas turbine (S-1, S-2, S-3, or S-4) in start-up mode.

Verification: As part of the quarterly and annual compliance reports as required by AQ-34, the project owner shall include information on the date, time, and duration of any violation of this permit condition.

AQ-SC13 The project owner shall limit the operation of S-5 Fire Pump Diesel Engine to the hours between 8 a.m. and 5 p.m. for reliability-related activities (maintenance and other testing, but excluding emission testing or emergency operation).

Verification: As part of the quarterly and annual compliance reports as required by AQ-34, the project owner shall include information on the date, time, and duration of any violation of this permit condition.

Commissioning Permit Conditions:

AQ-3 At the earliest feasible opportunity and in accordance with the recommendations of the equipment manufacturers and the construction contractor, the project owner shall install, adjust and operate the SCR Systems (A-~~2~~ **10**, A-~~4~~ **12,** A-~~6~~ **14**& A-~~8~~ **16**) and OC Systems (A-~~1~~ **9**,A-~~3~~ **11**, A-~~5~~ **13** & A-~~7~~ **15)** to minimize the emissions of nitrogen oxides and carbon monoxide from S-1, S-2, S-3 and S-4 Gas Turbines and S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators. (Basis: cumulative increase.)

Verification: The project owner shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by AQ-5 and AQ-10 respectively.

AQ-4 Coincident with the steady-state operation of SCR Systems (A-~~2~~ **10**, A-~~4~~ **12,** A-~~6~~ **14**& A-~~8~~ **16**) and OC Systems (A-~~1~~ **9**,A-~~3~~ **11**, A-~~5~~ **13** & A-~~7~~ **15)** pursuant to AQ-3,the project owner shall operate the facility in such a manner that the Gas Turbines (S-1, S-2, S-3 and S-4) comply with the NO_x and CO emission limitations specified in AQ-19a and AQ-19c. (Basis: BACT, offsets.)

Verification: The project owner shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by AQ-5 and AQ-10 respectively.

AQ-6 During the commissioning period, the project owner of the Los Esteros Critical Energy Facility shall demonstrate compliance with AQ-8 through AQ-10 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

a) firing hours
b) fuel flow rates
c). stack gas nitrogen oxide emission concentrations,
d). stack gas carbon monoxide emission concentrations
e) stack gas oxygen concentrations.

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 S-1, S-2, S-3 and S-4 Gas Turbines and S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators. The project owner shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO_x and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and available to District personnel upon request. **If necessary to ensure that accurate data is collected at all times, the project owner shall install dual span emission monitors.** (Basis: cumulative increase.)

Verification: The project owner shall specifically demonstrate compliance with this Condition of Certification as part of the Commissioning Plan and Monthly Commissioning Emissions Reports required by AQ-5 and AQ-10 respectively.

AQ-7 The project owner shall install, calibrate and make operational the District-approved continuous monitors specified in AQ-6 prior to first firing of each turbine (S-1, S-2, S-3 and S-4 Gas Turbines) and HRSG (S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators). After first firing of the turbine, the project owner shall adjust the detection range of these continuous emission monitors 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. **If necessary to ensure accurate data is collected at all times, the project owner shall install dual-span monitors.** (Basis: BAAQMD 9-9-501,BACT, offsets.)

Verification: The project owner shall notify the District and CPM of the date of expected first fire at least 30 days prior to first fire and shall make the project site available for inspection if desired by either the District or CPM.

AQ-8 The project owner shall not operate the facility such that the number of firing hours of S-1, S-2, S-3 and S-4 Gas Turbines and/or S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators without abatement by SCR or OC systems exceed 250 hours **for each power train** during the commissioning period. Such operation of the S-1, S-2, S-3 and S-4 Gas Turbines without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or OC system in place. Upon completion of these activities, the project owner shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 250 firing hours without abatement shall expire. (Basis: offsets.)

Verification: The project owner shall provide written notice to the CPM and the District Permit Services & Enforcement Divisions within five business days of completion of all commissioning activities, at which time the unused balance of the 250 firing hours without abatement shall expire.

AQ-10 The project owner shall not operate the facility such that the pollutant mass emissions from each turbine (S-1, S-2, S-3, and S-4 Gas Turbines) and corresponding HRSG (S-7, S-8, S-9, and S-10 Heat Recovery Steam Generators) exceed the following limits during the commissioning period.

These emission limits shall include emissions resulting from the start-up and shutdown of the S-1, S-2, S-3, and S-4 Gas Turbines.

	Without Controls		With Controls	
a. NO_x (as NO_2)	1464 lb/day	102 lb/hr	1464 lb/day	61 lb/hr
b. CO	1056 lb/day	88 lb/hr	984 lb/day	41 lb/hr
c. POC (as CH_4)	288 lb/day		114 lb/day	
~~d. PM_{10}~~	~~60 lb/day~~		~~60 lb/day~~	
~~e. SO_2~~	~~53.6 lb/day~~		~~53.6 lb/day~~	

(basis: cumulative increase)

Verification: The project owner shall submit to the CPM for approval, a Monthly Commissioning Emissions Report that includes fuel use, turbine operation, post combustion control operation, ammonia use and CEM readings on an hourly and daily basis.

Normal Operation Permit Conditions:

AQ-18 Visible Emissions: The project owner shall insure that no air contaminant is discharged from the LECEF into the atmosphere for a period or periods aggregating more than three minutes in any one hour, which is as dark or darker than Ringlemann 1 or equivalent 20% opacity. (Basis: BAAQMD 6-**1**-301; **SIP 6-301**)

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

AQ-19 Emissions Limits: The project owner shall operate the facility such that none of the following limits are exceeded:

a. The emissions of oxides of nitrogen (as NO_2) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10,respectively) each shall not exceed 2.0 ppmvd @ 15% O_2 (1-hour rolling average), except during periods of gas turbine startup and shutdown **and shall not exceed 4.68 lb/hour (1-hour rolling average) except during periods of gas turbine startup as defined in this permit.** The NO_x emission concentration shall be verified by a District-approved continuous emission monitoring system (CEMS) and during any required source test.
(Basis: BACT.)

b. Emissions of ammonia from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed ~~10~~ **5** ppmvd @ 15% O_2 (3-hour rolling average), except during periods of start-up or shut-down as defined in this permit. The ammonia emission concentration shall be verified by the continuous recording of the ratio of the ammonia injection rate to the NO_x inlet rate into the SCR control system (molar ratio). The maximum allowable NH3/NO_x molar ratio shall be determined during any required source test, and shall not be exceeded

until reestablished through another valid source test. (Basis: ~~BAAQMD Toxics Risk~~ **Regulation 2-5)**

c. Emissions of carbon monoxide (CO) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed ~~9~~**2**.0 ppmvd @ 15 % O_2 (~~3~~**1**-hour rolling average), except during periods of start-up or shut-down as defined in this permit**; and shall not exceed 2.85 lb/hr (1-hour rolling average) except during periods of start-up as defined in this permit.** The CO emission concentration shall be verified by a District-approved CEMS and during any required source test. (Basis: BACT.)

d. Emissions of precursor organic compounds (POC) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed ~~2~~ **1** ppmvd @ 15% O2 (~~3~~**1**-hour rolling average), except during periods of gas turbine start-up or shut-down as defined in this permit**; and shall not exceed 0.81 lb/hr (1-hour rolling average) except during periods of start-up as defined in this permit**. The POC emission concentration shall be verified during any required source test. (Basis: BACT.)

~~e. Emissions of particulate matter less than ten microns in diameter (PM_{10}) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 2.5 pounds per hour. The PM_{10} mass emission rate shall be verified during any required source test. (Basis: BACT & cumulative increase.)~~

~~f. Emissions of oxides of sulfur (as SO_2) from emission points P-1, P-2,P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 1.8 pounds per hour. The SO_2 emission rate shall be verified during any required source test. (Basis: BACT & cumulative increase.)~~

~~g. Compliance with the hourly NO_x emission limitations specified in part 19(a), at emission points P-1, P-2, P-3, and P-4, shall not be required during short-term excursions, limited to a cumulative total of 320 hours per rolling 12 month period for all four sources combined. Short-term excursions are defined as 15-minute periods designated by the Project owner that are the direct result of transient load conditions, not to exceed four consecutive 15-minute periods, when the 15-minute average NO_x concentration exceeds 2.0 ppmv, dry @ 15% O_2. Examples of transient load conditions include, but are not limited to the following:~~

~~(1) Initiation/shutdown of combustion turbine inlet air cooling~~
~~(2) Initiation/shutdown of combustion turbine water mist or steam~~

~~injection for power augmentation~~
~~(3) Rapid combustion turbine load changes~~
~~(4) Initiation/shutdown of HRSG duct burners~~
~~(5) Provision of ancillary services and automatic generation control at the direction of the California Independent System Operator (Cal-ISO)~~

~~The maximum 1-hour average NO_x concentration for short-term excursions at emission points P-1, P-2, P-3, and P-4 each shall not exceed 5 ppmv, dry @ 15% O_2. All emissions during short-term all be included in all calculations of hourly, daily and annual mass emission rates as required by this permit.~~

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

AQ-20 **Turbine Start-up: The project owner shall ensure that the regulated air pollutant mass emission rates from each of the Gas Turbines (S-1 & S-3) during a start-up does not exceed the limits established below. (Basis: Cumulative increase, BACT)**

	Duration (Minutes)	NOx (lb/Event)	CO (lb/event)	POC (lb/event)
Start-Up	120	41	20	2

~~The owner operator shall operate the gas turbines so that the duration of a startup is kept to a minimum, consistent with good engineering practice. The startup period begins with the turbine's initial firing and continues until the unit is in compliance with all applicable emission concentration limits. For purposes of this condition, a startup period of 240 minutes or less shall be considered kept to a minimum consistent with good engineering practice. Should it be determined that good engineering practice requires a different time period for a startup, the project owner may operate the gas turbines such that startups do not exceed that time period, as approved in writing by the APCO.(Basis: BACT.)~~

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

AQ-21 **Turbine Shutdown: The project owner shall operate the gas turbines so that the duration of a shutdown does not exceed 30 minutes per event, or other time period based on good engineering practice that has been approved in advance by the BAAQMD. Shutdown begins with the initiation of the turbine shutdown sequence and ends with the cessation of turbine firing. (Basis: Cumulative increase)**

~~Turbine Shutdown: The owner operator shall operate the gas turbines so that the duration of a shutdown is kept to a minimum, consistent with good engineering practice. Shutdown begins with the initiation of the turbine shutdown sequence and ends with the cessation of turbine firing. For~~

~~purposes of this condition, a shutdown period of 30 minutes or less shall be considered kept to a minimum consistent with good engineering practice. Should it be determined that good engineering practice requires a different time period for a shutdown, the project owner may operate the gas turbines such that shutdowns do not exceed that time period, as approved in writing by the APCO. (Basis: BACT.)~~

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

AQ-22 **Mass Emission Limits**: The project owner shall operate the LECEF so that the mass emissions from the S-1, S-2, S-3 & S-4 Gas Turbines and S-7, S-8, S-9, & S-10 HRSGs do not exceed the daily and annual mass emission limits specified below. The project owner shall implement process computer data logging that includes running emission totals to demonstrate compliance with these limits so that no further calculations are required.

Mass Emission Limits (Including Gas Turbine Start-ups and Shutdowns)

Pollutant	Each Turbine/HRSG Power Train (lb/day)	All 4 Turbine/HRSG Power Trains (lb/day)	All 4 Turbine/HRSG Power Trains (ton/yr)
NOx (as NO_2)	~~252.4~~**175.6**	~~1,009.6~~**702.4**	~~99~~**94.1**
POC	~~80.2~~**20.2**	~~320.8~~**80.8**	~~28.3~~**12.3**
CO	~~417.2~~**97.0**	~~1,668.8~~**388.0**	~~98.5~~**53.4**
SOx (as SO_2)	~~41.6~~	~~166.4~~	~~8.48~~**6.43**
PM_{10}	~~60~~	~~240~~	~~43.8~~**38.5**
NH_3	~~198~~**104**	~~792~~**416**	~~118~~**56.9**

The daily mass limits are based upon calendar day per the definitions section of the permit conditions. ~~The annual mass limit is based upon a rolling 8,760-hour period ending on the last hour.~~ Compliance **with the daily limits** shall be based on calendar average one-hour readings through the use of process monitors (e.g., fuel use meters) CEMS, source test results, and the monitoring, record keeping and reporting conditions of this permit. If any part of the CEM involved in the mass emission calculations is inoperative for more than three consecutive hours of plant operation, the mass data for the period of inoperative shall be calculated using a District-approved alternate calculation method. **The annual mass limits are based upon a rolling 8,760-hour period ending on the last hour. Compliance with the annual limits for NOx, POC, and SOx shall be demonstrated in the same manner as for the daily limits. Compliance with the annual emissions limits for PM_{10} and SO_2 from each gas turbine shall be calculated by multiplying turbine fuel usage times an emission factor determined by source testing of the turbine conducted in accordance with Part 26 of the BAAQMD permit.**

The emission factor for each turbine shall be based on the average of the emissions rates observed during the 4 most recent source tests on that turbine (or, prior to the completion of 4 source tests on a turbine, on the average of the emission rates observed during all source tests on the turbine). (Basis: cumulative increase, record keeping.)

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

AQ-23 Sulfuric Acid Mist Limit: The project owner shall operate the LECEF so that the sulfuric acid mist emissions (SAM) from S-1, S-2, S-3, S-4,S-7, S-8, S-9, and S-10 combined do not exceed 7 tons totaled over any consecutive four quarters. (Basis: ~~PSD~~ **Regulation 2-2-306**)

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

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

a. Heat input limits (Higher Heating Value):

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

b. Only PUC-Quality natural gas (General Order 58-a) shall be used to fire the gas turbines and HRSGs. The total sulfur content of the natural gas shall not exceed 1.0 gr/100 scf. **To demonstrate compliance with this sulfur content limit, the project owner shall sample and analyze the gas from each supply source at least monthly to determine the sulfur content of the gas, in addition to any monitoring requirements specified in condition 29. (Basis: BACT for SO_2 and PM_{10}.)**

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

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

AQ-27 Within 60 days of start-up of the LECEF in combined-cycle configuration and on a semi-annual basis thereafter, the project owner shall conduct a District approved source test on exhaust points P-1, P-2, P-3, and P-4 while each Gas Turbine/HRSG power train is operating at maximum load to demonstrate compliance with the SAM emission limit specified in AQ-23. The project owner shall test for (as a minimum) SO_2, SO_3 and SAM. After acquiring one year of

source test data on these units, the project owner may petition the District to switch to annual source testing if test variability is acceptably low as determined by the District. (Basis: **Regulation 2-2-306**~~PSD Avoidance~~ SAM Periodic Monitoring)

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

AQ-35 **Emissions Offsets**: The project owner shall provide ~~7.3 tons of valid POC emission reduction credits and 27.945~~**23.35** tons of valid NOx emission reduction credits prior to the issuance of the Authority to Construct. The project owner shall deliver the ERC certificates to the District Engineering Division at least ten days prior to the issuance of the Authority to Construct. (Basis: Offsets.)

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

AQ-37 ***Deleted*** ~~Title IV and Title V Permits: The owner/operator must deliver applications for the Title IV and Title V permits to the District prior to first fire of the turbines. The owner/operator must cause the acid rain monitors (Title IV) to be certified within 90 days of first-fire. (Basis: BAAQMD Regulation 2, Rules 6 & 7.)~~

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

AQ-39 **The project owner shall not operate S-5 Fire Pump Diesel Engine more than 50 hours per year for reliability-related activities. (Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3)or (e)(2)(B)(3), offsets).** ~~The owner/operator shall insure that the S-5 Fire Pump Diesel Engine is fired exclusively on diesel fuel with a maximum sulfur content of 0.05% by weight. (Basis: TRMP, cumulative increase)~~

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

AQ-40 **The project owner shall operate S-5 Fire Pump Diesel Engine 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" section 93115, title 17, CA Code of Regulations, subsection 9e)(2)(A)(3) or (e)(2)(B)(3)).** ~~The project owner shall operate the S-5 Fire Pump Diesel Engine for no more than 100 hours per year or 45 minutes per day for the purpose of reliability testing and~~

~~non-emergency operation. (Basis: cumulative increase, Regulation 9-8-231 & 9-8-330)~~

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

AQ-41 **The project owner shall operate S-5 Fire Pump Diesel Engine 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" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(G)(1), cumulative increase).**~~The project owner shall equip the S-5 Fire Pump Diesel Engine with a non-resettable totalizing counter that records hours of operation. (Basis: BACT)~~

Verification: The project owners shall make access available to the facility and records upon request as set forth in Condition of Certification AQ-15 and submit photos of the meter in quarterly reports.

AQ-42 **Records: The project owner shall maintain the following monthly records in a District-approved log for at least 60 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 for reliability-related activities (maintenance and testing).
b. Hours of operation for emission testing to show compliance with emission limits.
c. Hours of operation (emergency).
d. For each emergency, the nature of the emergency condition.
e. Fuel usage for each engine(s).

(Basis:"Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(I), cumulative increase)~~The project owner shall maintain the following monthly records in a District-approved log for at least 5 years and shall make such records and logs available to the District upon request:~~
~~a. Total number of hours of operation for S-5~~
~~b. Fuel usage at S-5~~
~~(Basis: BACT)~~

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

AQ-43 The project owner shall operate the facility such that maximum calculated annual toxic air contaminant emissions (pursuant to part 4~~8~~**5**) from the gas turbines and HRSGs combined (S-1, S-2, S-3, S-4, S-7, S-8, S-9, and S-10) do not exceed the following limits:

6490 pounds of formaldehyde per year

3000 pounds of acetaldehyde per year

3.2 pounds of Specified polycyclic aromatic hydrocarbons (PAHs) per year
65.3 pounds of acrolein per year unless the following requirement is satisfied:

The project owner shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. This analysis shall be submitted to the District and the Energy Commission CPM within 60 days of the source test date. The project owner may request that the District and Energy Commission CPM revise the carcinogenic compound emission limits specified above. If the project owner demonstrates to the satisfaction of the APCO that these revised emission limits will result in a cancer risk of not more than 1.0 in one million, the District and Energy Commission CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (Basis: ~~TRMP~~ **Regulation 2-5**)

Verification: See Condition of Certification AQ-44.

AQ-44 To demonstrate compliance with AQ-43, the project owner shall calculate and record on an annual basis the maximum projected annual emissions for the compounds specified in AQ-43 using the maximum heat input of 18,215,000 MMBtu/year and the highest emission factor (pound of pollutant per MMBtu) determined by any source test of the S-1, S-2, S-3 & S-4 Gas Turbines and S-7, S-8, S-9, and S-10 HRSGs. If this calculation method results in an unrealistic mass emission rate the applicant may use an alternate calculation, subject to District approval. (Basis: ~~TRMP~~ **Regulation 2-5.)**

Verification: Within 60 days of the completion of any health risk assessment, the project owner shall submit a complete report to the District and the CPM for review.

AQ-45 Within 60 days of start-up of the Los Esteros Critical Energy Facility and on a biennial (once every two years) thereafter, the project owner shall conduct a District-approved source test at exhaust point P-1, P-2, P-3, or P-4 while the Gas Turbines are at maximum allowable operating rates to demonstrate compliance with Part 4~~3~~4. If three consecutive biennial source tests demonstrate that the annual emission rates for any of the compounds listed above calculated pursuant to part 4~~3~~5 are less than the BAAQMD Toxic Risk Management Policy trigger levels shown below, then the project owner may discontinue future testing for that pollutant.

Formaldehyde < 132 lb/yr
Acetaldehyde < 288 lb/yr
Specified PAHs < 0.18 lb/yr
Acrolein < 15.6 lb/yr
(Basis: BAAQMD 2-1-316, ~~TRMP~~ **Regulation 2-5**)

Verification: At least 20 days prior to the intended source test date, the project owner shall submit a source testing methodology to the District and CPM for review and approval. Within 30 days of the source testing date, all test results shall be submitted to the District and the Energy Commission CPM.

AQ-46 The project owner shall properly install and maintain the cooling towers to minimize drift losses. The project owner shall equip the cooling towers with high-efficiency mist eliminators with a maximum guaranteed drift rate of 0.0005%. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the wastewater facility shall not be higher than ~~10,000~~ **6,000** ppmw (mg/l). The project owner shall sample and test the cooling tower water at least once per day to verify compliance with this TDS limit. (Basis: BACT, cumulative increase.)

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

DEFINITIONS

Clock Hour:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time.
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf.
Firing Hours:	Period of time, during which fuel is flowing to a unit, measured in fifteen-minute increments.
MMBTU:	million British thermal units
Gas Turbine Start-up Mode:	**The lesser of the first 120 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of conditions 19(a) and 19(c) and is in compliance with the emission limits contained in 19(a) through 19(d).** ~~The time beginning with the introduction of continuous fuel flow to the Gas Turbine until the requirements listed in AQ-19 are satisfied. In no case shall the duration of a startup exceed 240 minutes.~~
Gas Turbine Shutdown Mode:	**The lesser of the 30 minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in Conditions 19(a) through 19(d) until termination of fuel flow to the Gas Turbine.** ~~The time from non-compliance with any requirement listed in AQ-19 until termination of fuel flow to the Gas Turbine, but not to exceed 30 minutes.~~
Corrected Concentration:	The concentration of any pollutant (generally NO_x, CO or NH_3) corrected to a standard stack gas oxygen concentration. For a~~n~~ **Gas Turbine** emission point ~~(exhaust of a Gas Turbine)~~, the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis.
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems.
Commissioning Period	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system completed, or when a gas turbine is first fired following the installation of the duct burners and associated equipment, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation, and has initiated sales ~~to the~~ **of** power **to the grid** ~~exchange~~. The Commissioning Period shall not exceed 180 days under any circumstances.
Alternate Calculation:	A District approved calculation used to calculate mass emission data during a period when the CEM or other monitoring system is not capable of calculating mass emissions.

Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate.

REFERENCES

AD 2010 - Atmospheric Dynamics, Inc.1-Hour NO_2 Modeling Assessment for the Los Esteros Critical Energy Facility Amendment. November 2010. Received November 1, 2010.

ARB - California Air Resources Board, Ambient Air Quality Standards, Area Designations http://www.arb.ca.gov/desig/desig.htm October 2010.

ARB 2010 - California Air Resources Board, Historical Air Quality Data, Top 4 Summary http://www.arb.ca.gov/adam/topfour/topfourdisplay.php. October 2010.

BAAQMD 2010 – Bay Area Air Quality Management District, Authority to Construct, November, 2010.

CEC 2005a - California Energy Commission, Final Staff Assessment of Los Esteros 2 Critical Energy Facility (01-AFC-02). May 27, 2005.

CEC 2006- California Energy Commission, Final Commission Decision, Los Esteros Critical Energy Facility (03-AFC-2C), October 2006.

EPA Guidance, 2010e – Environmental Protection Agency, Memorandum: Applicability of the Federal Prevention of Significant Deterioration Permit Requirements to New and Revised National Ambient Air Quality Standards, April 1, 2010.

LECEF 2009 – Los Esteros Critical Energy Facility, LLC, Los Esteros Critical Energy Facility Amendment #4 for 1-AFC-12. October, 2009.

TRANSMISSION SYSTEM ENGINEERING

Prepared by Sudath Edirisuriya and Mark Hesters

INTRODUCTION

The existing Los Esteros Critical Energy Facility (LECEF) project is a natural gas-fired 180 Megawatt (MW) simple-cycle power plant located in the City of San Jose. The commission granted the original license for the project on July 2, 2002. In the original license, the applicant was permitted to construct and operate Phase I LECEF and temporarily connect the plant to the Pacific Gas and Electric (PG&E) Los Esteros – Nortech 115 kV line via an overhead tap-line. In March 2005, the commission granted a license to convert the project to combined-cycle operation and remain interconnected to the PG&E 115kV Los Esteros-Nortech transmission line until the project is converted. The proposed amendment consists of converting a four unit simple-cycle plant to a combined-cycle plant by adding one steam turbine generator and four heat recovery steam generators with a total maximum output of 123 MW to the California ISO grid. The proposed construction start date for the project is June 1, 2011. With the plant expansion, the existing Los Esteros critical energy facility tap to the Los Esteros-Nortech 115kV line will be removed. The project would be connected to the existing 115kV Los Esteros substation via two 0.7 mile long underground 115kV generator tie lines. The detailed amended project description has been discussed in the Los Esteros Critical Energy Facility amendment number four, section 1.1 to 1.13.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS) COMPLIANCE

The LORS that apply to the transmission facilities associated with the proposed project are:

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), *Rules for Overhead Electric Line Construction*, sets forth uniform requirements for the construction of overhead lines. Compliance with this Order ensures adequate service and the safety of the public and the people who build, maintain, and operate overhead electric lines.
- CPUC General Order 128 (GO-128), *Rules for Construction of Underground Electric Supply and Communications Systems*, sets forth uniform requirements and minimum standards for underground supply systems to ensure adequate service and the safety of the public and the people who build, maintain, and operate underground electric lines.
- The National Electrical Safety Code, 2007, provides electrical, mechanical, civil, and structural requirements for overhead electric line construction and operation.
- The combined North American Electric Reliability Corporation/Western Electricity Coordinating Council (NERC/WECC) planning standards provide system performance standards for assessing the reliability of the interconnected transmission system. These standards require continuity of service and the preservation of interconnected operation as the first and second priorities, respectively. Some aspects of NERC/WECC standards are either more stringent or more specific than either agency's standards alone. These standards are designed to ensure that transmission systems can withstand both forced and maintenance outage system contingencies while operating reliably within

equipment and electric system thermal, voltage, and stability limits. They include reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on Section I.A of *NERC and WECC Planning Standards* and the *WECC Disturbance-Performance Table of Allowable Effects On Other Systems* and on Section I.D, *NERC and WECC Standards for Voltage Support and Reactive Power.* The standards require that power flows and stability simulations verify defined performance levels. Performance levels are defined by specifying allowable variations in thermal loading, voltage and frequency, and loss of load that may occur during various disturbances. Performance levels range from no substantial adverse effects inside and outside a system area during a minor disturbance (such as the loss of load from a single transmission element) to a catastrophic loss level designed to prevent system cascading and the subsequent blackout of islanded areas and millions of consumers during a major transmission disturbance (such as the loss of multiple 500-kV lines along a common right-of-way, and/or of multiple large generators). While the controlled loss of generation or system separation is permitted under certain specific circumstances, a major uncontrolled loss is not permitted (WECC, 2008).

- NERC's reliability standards for North America's electric transmission system spell out the national policies, standards, principles, and guidelines that ensure the adequacy and security of the nation's transmission system. These reliability standards provide for system performance levels under both normal and contingency conditions. While these standards are similar to the combined NERC/WECC standards, certain aspects of the combined standards are either more stringent or more specific than the NERC performance standards alone. NERC's reliability standards apply to both interconnected system operations and to individual service areas (NERC, June 2010).

ANALYSIS AND IMPACTS

SYSTEM RELIABILITY

The Transition Cluster Phase I (Phase I and Phase II) Studies analyze the grid with and without the generation queue projects in the group one cluster, which includes the proposed project, under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds through which grid reliability is determined. The studies must analyze the impact of the project for the first year of operation and thus are based on forecasts of loads, generation, and transmission. Load forecasts are developed by the interconnecting utility and the California ISO. Generation and transmission forecasts are established by an interconnection queue. The studies are focused on thermal overloads, voltage deviations or reactive power deficiency, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads, or cascading outages), short-circuit duties, and substation evaluation.

If the Phase I and Phase II studies show that the interconnection of the cluster queue projects causes the grid to be out of compliance with reliability standards, then the studies will identify mitigation alternatives or ways in which the grid could be brought into compliance. According to the Phase I study results, staff will analyze the

transmission impacts caused by the group one cluster projects and determine whether or not the identified impacts are foreseeable consequences of the addition of the proposed project. If the mitigation identified by California ISO or interconnecting utility includes downstream transmission facilities, modifications, or additions that require CEQA review for potential indirect impacts of the project as part of the "whole of the action," the Energy Commission must analyze the environmental impacts of these modifications or additions according to CEQA requirements.

SCOPE OF TRANSITIONAL CLUSTER STUDY

The Phase I study was performed by PG&E at the request of Calpine Corporation to identify the transmission system impacts of group one cluster projects on the PG&E 115/230/500 kV system. The study included power flow, short circuit studies, and transient and post-transient analyses. Transition cluster projects are initially grouped for study purposes according to their geographical locations. There were 12 generation projects, including this project, located in the Greater Bay Area that were assigned to the transition group one cluster for the Phase I study. The study modeled the project with a net output of 123 MW. The base case was developed from WECC's 2013 summer peak and 2013 summer off-peak base case series, included all major PG&E transmission projects, and modeled all proposed higher-queued generation projects that will be operational by 2013. The power flow studies were conducted with and without proposed group one cluster projects using 2013 summer peak and 2013 summer off-peak base cases. The 12 group one projects total 4707 MW connected to the PG&E grid at each project's interconnection switchyard, Some generation projects that are electrically far from the proposed project were either turned off or modeled with reduced generation to balance the loads and resources in the power flow model. The detailed study assumptions are described in the study. The power flow study assessed the group one cluster projects' impacts on thermal loading of the transmission lines and equipment. Transient and post-transient studies were conducted using the 2013 summer peak base case to determine whether the group one cluster projects would create instability in the system following certain selected outages. Short circuit studies were conducted to determine if group one cluster projects would overstress existing substation facilities. (PG&E, Transitional Cluster Study 2009a)

THE SPECIFIC FINDINGS ATTRIBUTAL TO THE LECEF PROJECT

The applicant will design, construct, own and maintain the two new underground 115kV, 0.7 mile long generator tie lines from the project facility to the 115kV Los Esteros substation. The conductors should be rated to carry the full output of the project and should be constructed with 2000 kcmil copper or equivalent conductors. The existing Los Esteros substation should be modified to include a new bay with three, 115kV breakers and protection devices to interconnect the generator tie-line. As a result of the pre-project and N-1 overloads, PG&E must re-conductor the 1.1 to 1.3 mile portion of the San Jose-Trimble 115kV line with 477 kcmil aluminum conductor steel supported (477 ACSS) conductors. PG&E will rerate the new 477 ACSS conductors with 4 feet per second wind speed and the underground cable to match the ratings of the overhead conductors. Additionally, the applicant is responsible for installing the Special Protection System (SPS) to mitigate the N-1 overloads caused by the project on Martinez-Alhambra tap #2 and Eastshore-Dumbarton 115kV lines.

TRANSITIONAL CLUSTER STUDY RESULTS:

The Phase I study identified pre-project overload criteria violations under the 2013 summer peak and 2013 summer off-peak study conditions. Pre-project overloads are caused by either existing system conditions or by projects with higher positions in the PG&E's generator interconnection queue. The study concludes that the addition of the group one cluster projects would cause a number of pre-existing normal and/or emergency overloads to increase and would cause some new normal and emergency overloads.

Detailed study results could be found in the Phase I study report. Where potential overloads are identified, mitigation is proposed that would eliminate the potential impact to reliability.

Summer Peak and Summer Off-Peak overloads:

Normal conditions (N-0); the power flow study results indicated that the group one cluster projects caused seventeen new normal overloads. Under projected 2013 summer–off peak conditions, the group one cluster projects caused four new normal overloads which are already shown in the summer peak condition. The normal overloads are summarized in the table 6-1 of the cluster study report.

> Mitigations: The proposed methods of mitigation are congestion management, installing a switching station with a 3-bay, breaker and-a-half configuration (BAAH), looping the circuits into the switchyard, and re-conductoring the overload lines with higher capacity conductors.

Contingency (N-1); The power flow study results indicated that the group one cluster projects caused 35 new overloads under selected single-element outages. Under projected 2013 summer-off peak conditions the group one cluster projects caused nine new N-1 emergency overloads in addition to the summer peak condition. The category N-1 emergency overloads are summarized in the table 6-2-2, pages 11 to 14 of the Phase 1 study.

> Mitigations: The proposed methods of mitigation are congestion management, replace the switches to utilize the emergency conductor ratings, modifying the existing bay arrangement with new breakers, looping the circuits into the existing substation, re-conductoring the overload lines with higher capacity conductors.

Contingency (N-2); The power flow study results indicated that the group one cluster projects caused 39 new (N-2) overloads under selected double-element outages. The transmission facility overloads are attributable to the integration of the group one cluster projects. A summary of the transmission facility overload is provided in pages 15 to 18 of the group one cluster study report.

> Mitigations: The proposed methods of mitigation are load shedding or generation dropping. PG&E, California ISO, or both may require new generators to take part in and be responsible for the costs of operating procedures and/or Special Protection Schemes (SPS) for the category N-2 emergency overloads caused by the projects.

Transient Stability Analysis results:

Stable and adequately damped transient stability performances were achieved following all of the outages simulated using both the pre-and post-cluster base cases. The power flow studies of N-1 and N-2 contingencies showed that the project would not cause voltage drops of five percent or more from the pre-project levels or cause the PG&E system to fail to meet applicable voltage criteria. No transient frequency criteria violations were observed for all simulated contingencies. The transient stability study projected that the transmission system's performance relative to the applicable reliability guidelines would not be adversely affected by the group one cluster projects due to selected disturbances.

Post-Transient Stability Analysis results:

Post-transient stability analysis was conducted using the 2013 summer peak full loop base cases to ensure that the transmission system remains in operating equilibrium, as well as operating in a coordinated fashion through abnormal operating conditions after the group 1 projects begin operation. The study concluded that the project would not cause the transmission system to be unstable under the N-1 and N-2 emergency outages. The study results can be found in Appendix F, 2009a, group one cluster study report.

Short Circuit Study Results:

Short circuit studies were performed to determine the degree to which the addition of group one cluster projects would increase fault duties at PG&E's substations, adjacent utility substations, and the other 115 kV, 230 kV and 500 kV busses within the study area. For the buses at which faults were simulated, the maximum three-phase and single-line-to-ground fault currents, both with and without the project, and information on the breaker duties at each location are summarized in Appendix H, short circuit study results of the Phase I study report. The interconnection of the LECEF project will cause the San Jose "B" substation 115 kV circuit breaker to exceed its interruption capability. Therefore, this breaker should be replaced with a breaker which has a higher interrupting capability.

CONCLUSION AND RECOMMENDATIONS

- As a result of the pre-project and N-1overloads, PG&E must re-conductor the 1.1 to 1.3 mile portion of the San Jose-Trimble 115kV line with 477 ACSS overhead conductors.
- The LECEF project is responsible for installing the SPS to mitigate the overloads on Martinez—Alhambra tap #2 and Eastshore-Dumbarton 115kV lines.
- Some downstream upgrades would be required in the PG&E system for the reliable interconnection of the group one cluster projects, but the selected mitigation measures are appropriate to offset the impacts. Therefore, staff considers the study results and selected mitigation measures are acceptable.
- The proposed interconnection will not affect the project ability to comply with all applicable laws, ordinances, regulations and standards (LORS). Therefore, staff proposes no changes to the Transmission System Engineering Conditions of Certification from the final decision of the Los Esteros Phase one project.

REFERENCES

PG&E (Pacific Gas and Electric) 2009a, Pacific Gas and Electric; Transitional Cluster Study (Phase I) submitted to the California Energy Commission.

Los Esteros Critical Energy Facility amendment #4 2009b, Los Esteros Critical Energy Facility, LLC submitted to the California Energy Commission, October 2009.

NERC (North American Electric Reliability Council). 2010. NERC Reliability Standards for the Bulk ElectricSysterms of North America, June 1, 2010.

WECC (Western Systems Coordinating Council) 2008. *NERC and WECC Planning Standards*.