

Appendix A
Page 1

ACRONYMS

A. - Application
AB - Assembly Bill
ALJ - Administrative Law Judge
AMI - Advanced Metering Infrastructure
Anza-Borrego - Anza-Borrego Desert State Park
BLM - Bureau of Land Management
Btu - British thermal units
Cabrillo - Cabrillo Power I LLC
CAISO - California Independent System Operator
Cal Fire - California Department of Forestry and Fire Protection
CARB - California Air Resources Board
CEQA - California Environmental Quality Act
CO₂ - Carbon Dioxide
Comision Federal de Electricidad - Mexican Electricity Commission
Compliance Exhibit - Exhibit Compliance - 1
Conservation Groups - Center For Biological Diversity and the Sierra Club,
San Diego Chapter
CPCN - Certificate of Public Convenience and Necessity
D. - Decision
DRA - Division of Ratepayer Advocates
Edison - Southern California Edison Company
EIR/EIS - Environmental Impact Report/Environmental Impact Statement
EMFs - Electromagnetic Fields
Energy Commission - California Energy Commission
Farm Bureau - California Farm Bureau Federation
FERC - Federal Energy Regulatory Commission
GHG - Greenhouse gas
GWh - gigawatt hour
kV - kilovolt
kWh - kilowatt hour
LEAPS - Lake Elsinore Advanced Pump Storage
LTPP Decision - Long Term Procurement Plan Decision (D.07-12-052)
LSE - Load Serving Entity
Miguel - San Miguel Substation
MMBtu - million British thermal units
Mussey Grade - Mussey Grade Road Alliance
Must Run - Reliability Must Run

Appendix A
Page 2

MW – Megawatt
MWh – Megawatt hour
NEPA – National Environmental Policy Act
NERC – North American Electric Reliability Corporation
Nevada Hydro – Nevada Hydro Company
PEA – Proponent’s Environmental Assessment
PHC – Prehearing Conference
PV – photovoltaic
Rancho Peñasquitos – Rancho Peñasquitos Concerned Citizens
REC – renewable energy credits
Request – Performance Category Upgrade Request
RETI – Renewable Energy Transmission Initiative
RFO – Request for Offers
RPS – Renewable Portfolio Standard
SB – Senate Bill
SDG&E – San Diego Gas & Electric Company
SONGS – San Onofre Nuclear Generating Station
South Bay – South Bay Replacement Project (the party name)
State Parks – California Department of Parks and Recreation
State Parks Foundation – California State Parks Foundation
STEP – Southwest Transmission Expansion Plan
Sunrise – Sunrise Powerlink Transmission Project
TEAM – Transmission Economic Assessment Methodology
TEPPC – Transmission Expansion Planning and Policy Committee
TE/Vs Project – Talega-Escondido/Valley-Serrano Project
WECC – Western Electricity Coordinating Council
WECC Reliability Work Group – WECC Reliability Performance Evaluation
Work Group
UCAN – Utility Consumers' Action Network
Update – Compliance Exhibit Update
US Fish & Wildlife – United States Fish and Wildlife Service

(END OF APPENDIX A)

APPENDIX B – TABLE B-1

MODELING ASSUMPTIONS FOR COMPLIANCE FILING BY CAISO

	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	CASE 10	CASE 11	CASE 12	CASE 13
	<u>Reference Case assumptions</u>	<u>Sunrise per Applicant Enhanced Northern Route</u>	<u>Modified Southern Route</u>	<u>Non-Wires Alternative</u>	<u>Sensitivity Case 1: Higher Renewables Reference Case</u>	<u>Sensitivity Case 1: Higher Renewables with Sunrise per Applicant Enhanced Northern Route</u>	<u>Sensitivity Case 1: Higher Renewables with Modified Southern Route</u>	<u>Sensitivity Case 1: Non-Wires Alternative</u>	<u>Sensitivity Case 2: Higher Renewables with Sunrise per Applicant Enhanced Northern Route (online in 2011)</u>	<u>Sensitivity Case 3: Higher Renewables with Phase 2 CT Costs</u>	<u>Sensitivity Case 3: Higher Renewables with Phase 2 CT Costs</u>	<u>Sensitivity Case 3: Higher Renewables with Phase 2 CT Costs</u>	<u>Sensitivity Case 3: Higher Renewables with Phase 2 CT Costs</u>
					Same assumptions as Case 1 except as shown below	Same assumptions as Case 2 except as shown below	Same assumptions as Case 3 except as shown below	Same assumptions as Case 4 except as shown below	Same assumptions as Case 6 except as shown below	Same assumptions as Case 5 except as shown below	Same assumptions as Case 6 except as shown below	Same assumptions as Case 7 except as shown below	Same assumptions as case 8 except as shown below
POLICY													
RPS Targets													
2010	20%	20%	20%	20%	20%	20%	20%	20%					
2015	20% ¹	20% ¹	20% ¹	20% ¹	27%	27%	27%	27%					
2020	20% ¹	20% ¹	20% ¹	20% ¹	33%	33%	33%	33%					
YEARS MODELED	2012 and 2015	2012 and 2015	2012 and 2015	2012 and 2015									
LOADS													
Base In-Area Loads	CEC 10/2007 forecast of 1-in-10 loads from LTPP	CEC 10/2007 forecast of 1-in-10 loads from LTPP	CEC 10/2007 forecast of 1-in-10 loads from LTPP	CEC 10/2007 forecast of 1-in-10 loads from LTPP									

¹ The CAISO did not perform any production cost modeling (Gridview) assuming 20% RPS targets in 2015 and 2012. For the reasons discussed on the July 2, 2008 all-party conference call, the CAISO will not perform new Gridview runs assuming 20% RPS targets. The CAISO will provide its expert opinion on the affect a 20% RPS target in 2015 and 2020 would have on Gridview results for Cases 1-4.

APPENDIX B – TABLE B-1

	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	CASE 10	CASE 11	CASE 12	CASE 13
Adjustments to Loads													
Demand Response	From LTPP	From LTPP	From LTPP	From LTPP									
Energy Efficiency	From LTPP	From LTPP	From LTPP	From LTPP									
CSI	From LTPP	From LTPP	From LTPP	From LTPP									
Distributed Gen.	From LTPP	From LTPP	From LTPP	From LTPP									
Out-of-Area Loads	Per ISO	Per ISO	Per ISO	Per ISO									
CFE loads ²	Per SDG&E/ UCAN	Per SDG&E/ UCAN	Per SDG&E/ UCAN	Per SDG&E/ UCAN									
FUEL PRICES													
Fuel Prices													
Henry Hub Prices	Per ISO	Per ISO	Per ISO	Per ISO									
AZ gas prices	Per ISO	Per ISO	Per ISO	Per ISO									
All other gas prices	Per ISO	Per ISO	Per ISO	Per ISO									
GENERATION (NON-RENEWABLE)													
Existing In-Area Resources													
Existing South Bay Plant ³	Online through 2012	Online through 2012	Online through 2012	Online through 2012					Online through 2011				
New Generation in SDG&E Area													

² The CAISO will provide its expert opinion on the effects of adopting SDG&E/UCAN assumptions for CFE loads on Gridview results for each case.

³ The online date for the existing South Bay Plant will be considered for local capacity requirements purposes only. For the reasons discussed on the all-party conference call, the CAISO will not perform new Gridview runs assuming South Bay remains online until 2012 but will provide its expert opinion on the effect of South Bat remaining online until 2012 on Gridview results for each case.

APPENDIX B – TABLE B-1

	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	CASE 10	CASE 11	CASE 12	CASE 13
Peakers	Add enough peaking capacity to meet reliability requirements of ISO	Add enough peaking capacity to meet reliability requirements of ISO	Add enough peaking capacity to meet reliability requirements of ISO	Add enough peaking capacity to meet reliability requirements of ISO									
CCs ⁴	Assume Carlsbad Energy Center comes online in 2013	Assume Carlsbad Energy Center comes online in 2013	Assume Carlsbad Energy Center comes online in 2013	Assume Carlsbad Energy Center comes online in 2013									
New Out-of-Area Resources													
Coal generation ⁵	Use ISO assumptions except reduce all coal generation by 75%	Use ISO assumptions except reduce all coal generation by 75%	Use ISO assumptions except reduce all coal generation by 75%	Use ISO assumptions except reduce all coal generation by 75%									
Fill Resources ⁶	Add combined cycles as needed to replace coal plants to meet reliability targets	Add combined cycles as needed to replace coal plants to meet reliability targets	Add combined cycles as needed to replace coal plants to meet reliability targets	Add combined cycles as needed to replace coal plants to meet reliability targets									
Costs of New Generation													

⁴ The addition of the Carlsbad Energy Center in 2013 will be considered for local capacity requirements purposes. For the reasons discussed on the all-party conference call, the CAISO will not perform new Gridview runs assuming the Carlsbad Energy Center comes online in 2013 but will provide its expert opinion on the effect of the Carlsbad Energy Center coming online in 2013 on Gridview results for each case.

⁵ Changes to “out-of-area” resources would affect production cost modeling. For reasons discussed on the all-party conference call, the CAISO will not perform new Gridview runs adjusting the amount of coal and combined cycle generation but will provide its expert opinion on the affect of such changes on each case.

APPENDIX B – TABLE B-1

	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	CASE 10	CASE 11	CASE 12	CASE 13
CTs	ISO Phase 1	ISO Phase 1	ISO Phase 1	ISO Phase 1						ISO Phase 2	ISO Phase 2	ISO Phase 2	ISO Phase 2
CCs ⁶	ISO Phase 1	ISO Phase 1	ISO Phase 1	ISO Phase 1									
GENERATION (RENEWABLE)													
New Generation in SDG&E Area													
Solar Thermal	None other than current contracts ⁷	None other than current contracts ⁷	None other than current contracts ⁷	Additions consistent with DEIR All-Source Alternative ⁸									
Wind	None other than current contracts ⁷	None other than current contracts ⁷	None other than current contracts ⁷	Additions consistent with DEIR All-Source Alternative ⁸									
Biomass	None other than current contracts ⁷	None other than current contracts ⁷	None other than current contracts ⁷	Additions consistent with DEIR All-Source Alternative ⁸									
Rooftop PV	No incremental beyond CSI from above	No incremental beyond CSI from above	No incremental beyond CSI from above	Per DEIR (net of CSI assumed above)									
New Renewables Outside of SDG&E	ISO assumptions to meet 20% RPS target ⁹	ISO assumptions to meet 20% RPS target ⁹	ISO assumptions to meet 20% RPS target ⁹	ISO assumptions to meet 20% RPS target ⁹	ISO assumptions to meet 33% RPS target								

⁶ CC costs do not affect any of the cases per the CAISO's modeling methodology.

⁷ To the extent SDG&E's "current contracts" are different than the resources previously modeled by the CAISO, such differences would affect production cost modeling. For reasons discussed on the all-party conference call, the CAISO will not perform new Gridview runs but will use SDG&E's current contracts for modeling RPS benefits and will provide its expert opinion on the effects of SDG&E's current contracts on Gridview results for each case.

⁸ The CAISO will add resources identified in the DEIR All-Source Alternative then add additional CT resources (if needed).

⁹ See *supra* note 1.

APPENDIX B – TABLE B-1

	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	CASE 10	CASE 11	CASE 12	CASE 13
Imperial Valley renewables	Only add Add renewables that are in least cost effective order per ISO supply curve	Add renewables in Imperial Valley per ISO Phase 2 assumptions regardless of cost-effectiveness first. Additional renewables added in least cost order per ISO supply curve	Add renewables in Imperial Valley per ISO Phase 2 assumptions regardless of cost-effectiveness first. Additional renewables added in least cost order per ISO supply curve	Only add Add renewables that are in least cost-effective order per ISO supply curve									
Other areas (in or out of CAISO) ¹⁰	Only add Add renewables that are in least cost effective order per ISO supply curve	Only add cost-effective Add renewables in least cost order per CAISO supply curve after adding renewables accounting for additions to Imperial Valley	Only add cost-effective Add renewables in least cost order per CAISO supply curve after adding renewables accounting for additions to Imperial Valley	Only add Add renewables that are in least cost-effective order per ISO supply curve									
Success rate for out-of-state renewables	ISO base case (50%)	ISO base case (50%)	ISO base case (50%)	ISO base case (50%)									
Costs of Renewables	Costs assumed by ISO in its Phase 1 Base Case	Costs assumed by ISO in its Phase 1 Base Case	Costs assumed by ISO in its Phase 1 Base Case	Costs assumed by ISO in its Phase 1 Base Case									

¹⁰ Note: the description of the inputs in this row is functionally equivalent to the description of the inputs in the previous row.

APPENDIX B – TABLE B-1

	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	CASE 10	CASE 11	CASE 12	CASE 13
TRANSMISSION													
Sunrise													
Online Date	No	Yes (SDG&E's Enhanced Northern Route in 2012)	Yes (SDG&E Proposed Southern Route in 2012)	No					Yes (SDG&E's Enhanced Northern Route in 2011)				
RPCC Coastal Alternative	n/a	Yes	Yes	n/a									
Other Bulk Transmission													
IID													
Rating of Path 42	800 -1,200 MW	800 -1,200 MW	800 -1,200 MW	800 -1,200 MW									
Coachella Valley-Devers 2	No	No	No	No									
Green Path North	No	No	No	No									
Dixieland - Imperial Valley	Yes	Yes	Yes	Yes									
CV-Devers 2 / GPN	No	No	No	No									
SCE													
Path 44 upgrades	No	No	No	No									
TE/VS	No	No	No	No									
DPV2 ¹¹	Online in 2013	Online in 2013	Online in 2013	Online in 2013									
SDG&E													
Miguel Import Nomogram eliminated	Yes	Yes	Yes	Yes									

¹¹ The CAISO did not perform any production cost modeling assuming a 2013 online date for DPV2. For the reasons discussed on the all-party conference call, the CAISO will not perform new Gridview runs assuming 2013 online date but will provide its expert opinion on the affect a 2013 online date would have on the Gridview results for each case.

APPENDIX B – TABLE B-1

	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8	CASE 9	CASE 10	CASE 11	CASE 12	CASE 13
Other transmission additions	ISO assumptions	ISO assumptions	ISO assumptions	ISO assumptions									
Transmission System Operation													
1150 MW limit east of Miguel?	Use ISO modeling	Use ISO modeling	Use ISO modeling	Use ISO modeling									
Costs of Sunrise													
Capital Costs	n/a	ISO Phase 2	ISO Phase 2	n/a									
O&M costs	n/a	UCAN	UCAN	n/a									
Sunrise Amortization Period	n/a	58 years	58 years	n/a									
RELIABILITY AND RMR MODELING APPROACH													
Avoided RMR/Capacity Costs	ISO approach	ISO approach	ISO approach	ISO approach									
Model RMR for SDG&E and LA?	yes	yes	yes	yes									
Note: "LTPP" = D.07-12-052													

APPENDIX B – TABLE B-2

IMPACT OF DEMAND RESPONSE ON NOVEMBER 2007 FORECAST OF 1-IN-10 PEAK DEMAND (MW)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
November 2007 1-in-10 Forecast (1)	4,970	5,049	5,127	5,205	5,283	5,358	5,433	5,509	5,582	5,655	5,728	5,801	5,874
Price Sensitive Demand Response (2)	(96)	(230)	(233)	(236)	(240)	(244)	(242)	(245)	(249)	(249)	(249)	(249)	(249)
Interruptible/DR Curtable DR (3)	(39)	(39)	(39)	(39)	(39)	(39)	(39)	(39)	(39)	(39)	(39)	(39)	(39)
Net 1 in 10 Load Forecast	4,835	4,780	48,55	4,930	5,004	5,075	5,152	5,225	5,294	5,367	5,440	5,513	5,586

- (1) California Energy Demand 2008-2018, Staff Revised Forecast, CEC-200-2007-015-SF2, November 2007, 144. Impacts of CSI and Energy Efficiency imbedded in forecast.
- (2) A.06-02-013, SDG&E Long Term Procurement Plan Table V-3.
- (3) A.06-02-013, SDG&E Long Term Procurement Plan Table III-1.

APPENDIX B – TABLE B-3

**Table B-3: Parties’ Final Estimates of Levelized Net Benefits
(\$ millions – see footnotes for details)**

Alternative Name	SDG&E ¹	CAISO ²	UCAN ³	DRA ⁴	TNHC ⁵	South Bay ⁶
Sunrise Relative to Gas Turbine Reference Case	41	145	-	(69.7)	41	< Base Case
SDG&E Enhanced Northern Route	40	143	(74.3)	-	40	-
SDG&E Modified Southern Route	31	-	-	-	31	-
DEIR/EIS Environmentally Superior Southern Route	42	155	(72.3)	(48.7)	42	-
DEIR/EIS Environmentally Superior Northern Route	(88)	13	-	(195.2)	(88)	-
All Source Generation Alternative	(79)	-	46	-	(79)	> Sunrise Case
In-Area Renewable Alternative	(260)	-	-	-	(260)	-
TE/VS	-	(91)	-	-	103	-
TE/VS + LEAPS	(315.9)*	(26)	-	> SDG&E Estimate+	> CAISO & SDG&E*	-
In area CC	72.1*	-	-	> SDG&E Estimate+	-	-
Enpex CC	20.7*	-	-	> SDG&E Estimate+	-	-

¹ SDG&E Exhibit SD-142; * Indicates SDG&E Exhibit SD-26, Exhibit H, Tables H-16 to H-29. Note that this was not relied on by SDG&E in Phase 2 and is included only as a point of reference.

² CAISO Exhibit I-13, 22, Table 1 (\$2010-2012); Based on RPS Base Case.

³ UCAN Phase 2 Opening Brief, Attachment 2, Table 11-6.

⁴ DRA Phase 2 Opening Brief, p. 10 (\$2011), Based on “Medium” scenario for 2012 online date; + Indicates DRA Phase 1 Opening Brief, pp. 33-35, * Indicates number from Phase 1 Opening Brief, p. 77 (\$2010) table based on CAISO estimates.

⁵ TNHC Phase 2 Opening Brief, p. 50 (\$2011), 56 (\$2010); * Indicates TNHC Phase 1 Opening Brief, p. 25.

⁶ South Bay Phase 1 Opening Brief, p. 18, 41.

Alternative Name	SDG&E	CAISO	UCAN	DRA	TNHC	South Bay
South Bay Repower	35.2*	104	-	29*	-	-
LEAPS Transmission-Only	(177)	-	-	-	59	-
Sunrise + South Bay Repower	-	229	-	70*	-	-
TE/VS + LEAPS + Green Path	-	131	-	45*	> CAISO & SDG&E*	-
Sunrise + TE/VS	-	8	-	-	> CAISO & SDG&E*	-
Sunrise + TE/VS + LEAPS + Green Path	-	48	-	-	> CAISO & SDG&E*	-
Sunrise + TE/VS + Green Path	-	(22)	-	-	> CAISO & SDG&E*	-
Sunrise + South Bay Repower + Green Path	-	194	-	-	-	-
TE/VS + Green Path (Green Path North)	-	78	-	28*	57	-
Sunrise + Green Path	-	122	-	-	-	-
Sunrise + TE/VS + LEAPS	-	63	-	-	-	-
Path 44 Upgrade	-	-	22	-	-	-
UCAN Route	-	-	(-75.3)	-	-	-
Sunrise Relative to GT-CC Reference Case with 7900 Btu/kWh CC	36	-	6.6	-	-	-
Sunrise Relative to GT-CC Reference Case with 7165 Btu/kWh CC	11	-	32.1	-	-	-
Sunrise Relative to GT-CC Reference Case with 7000 Btu/kWh CC	-	-	36.6	-	-	-
SWPL 2	37.2*	-	-	> SDG&E+	-	-

Appendix C
Page 1

RISK OF FIRE IGNITION

Though some causes of fire ignition are unavoidable, nonetheless, fire risk can be mitigated. Mitigation measures include power line maintenance that reduces the risk of sparking and vegetation control around towers and lines to reduce the possibility that a spark ignites a fire, and that trees and other vegetation fall on power line equipment, causing line failure.

Construction projects may also increase the risk of human-induced fires. Traditional mitigations include prohibiting construction during high fire risk times and at other times ensuring appropriate equipment is available to quickly extinguish any fire that may start. Where power lines cut paths through previously undisturbed areas, or include maintenance access roads, the resulting increase in human access raises the risk of fire due to arson or inadvertent human activity.¹

The predominant causes of power line wildfires are distribution-level power lines (12 kV and under) and low-voltage or “sub-transmission” lines (69-138 kV). Below, we review the physical characteristics that make distribution-level power lines and sub-transmission lines more conducive to sparking and ignition than high voltage lines (230-500 kV).

As an initial matter, the energized conductors on distribution-level power lines and sub-transmission lines are much closer together than on high voltage transmission lines. The distance on the former may be as little as 2 feet, whereas conductors are at least 18 feet apart on 230 kV towers, and 35 feet apart on

¹ See Draft EIR/EIS, Sec. D.15.1.1 for more information on this issue.

Appendix C Page 2

500 kV towers. Fallen or wind-blown tree limbs, wildlife, and debris, such as kites and Mylar balloons, can more easily come into contact with and bridge two distribution-level or sub-transmission line conductor phases,² causing electrical arcs³ that can set fire to woody debris. Because high voltage transmission line conductors are spaced much further apart, this phenomenon is extremely rare on 230 and 500 kV transmission lines.

Because the conductor spacing is closer, distribution-level and sub-transmission lines can spark when they experience conductor-to-conductor contact, also known as “mid-line slap” hazard. This occurs when extremely high winds force two conductors on a single pole to oscillate so much that they contact one another. This phenomenon does not occur on high voltage transmission lines. Further, pursuant to Rule 35 of the Commission’s General Order 95, transmission-level conductors must have higher ground clearance (25 feet) than distribution-level conductors (17 feet). This additional height above the ground can mitigate the risk of ignition, depending upon the terrain.

Differences in power line support structures also affect their fire risk. Distribution-level power lines and sub-transmission lines often are supported by wood poles, which do not withstand the same level of wind loading as the steel monopoles and lattice steel towers used to support extra-high voltage transmission lines. Therefore, wood poles have a higher potential for structural failure during extreme winds, like the Santa Anas. Multiple wood pole failures

² Multiple conducting wires (conductors) on a single transmission or distribution line are clustered in groups of three wires that carry currents alternating at different phases.

³ Electrical arcing is an electric discharge that occurs when electrons are able to jump a gap in a circuit, which often results in a display of sparks.

Appendix C
Page 3

on a single distribution-level or sub-transmission line can result in conductors contacting the ground and igniting nearby vegetation or the wood poles themselves.

Another source of sparking on distribution-level lines is equipment failure associated with the transformers and capacitors mounted on the lines, which may arc and ignite nearby vegetation. Transmission lines of any voltage do not carry this particular risk, because they do not serve customer load directly and are not mounted with transformers and capacitors.

Transmission line protection and control systems are designed to detect faults (such as arcing when debris contacts the line) and to shut off power rapidly (in 1/60 to 3/60 of a second), thus reducing the risk of sparking and ignition. Distribution system faults are harder to detect. The fault current and the normal load current are very close in value, in some cases. Consequently, distribution line protection and control systems are set to allow faults to last longer. Almost all distribution circuits have reclosing equipment that automatically re-energizes a faulted line after a very brief delay of a second or so. If a fault has not cleared, debris tangled in the conductors can cause repeated sparks and ignite nearby vegetation.

While gunshots also have been a cause of power line ignitions, they are more likely to affect distribution-level and sub-transmission lines than higher voltage transmission lines. Support structures for distribution-level and sub-transmission lines are shorter (typically 50-80 feet) than high voltage transmission lines (typically 120 feet for 230 kV and 150 feet for 500 kV). Thus, the insulators on the lower poles make easier targets than those on high-voltage

Appendix C
Page 4

lines. In addition, steel conductors on high voltage lines have much greater structural integrity than sub-transmission conductors, making them less susceptible to harm in the event of a gunshot. Typical 230 kV and 500 kV conductors have circumferences at least three times greater than a typical 69 kV conductor (300 kcmil⁴ for 69 kV vs. 900 kcmil for 230 kV and 1033.5 kcmil for 500 kV), with a correspondingly greater strength.⁵

Finally, vegetation management practices differ for transmission and distribution-level power lines. Typically, utilities completely remove trees and tall shrubs in transmission line corridors. However, they typically trim trees and shrubs near distribution-level conductors, rather than removing them, because the bulk of distribution-level lines are located in more urban areas that seek to preserve vegetation. Because of the comparative closeness of vegetation that can ignite – generally a tree is trimmed to within 4 feet of a distribution-level conductor, whereas vegetation is kept 10 feet away from a 230 kV transmission line and 15 feet away from a 500 kV transmission line – the risk of distribution line ignitions is higher.

Fire risks that appear to apply equally to all power lines include accidents related to airplanes and helicopters contacting conductors, poles, and towers. While theoretically it is possible for equipment failures to occur on lines of any voltage and to cause ignitions, the record provides no example of an equipment failure on a 500 kV line resulting in an ignition. The only 500 kV-related ignition

⁴ Kcmil (1000 cmils) is a measure of the size of a conductor; kcmil wire size is the equivalent cross-sectional area in thousands of circular mils. A circular mil (cmil) is the area of a circle with a diameter of one thousandth (0.001) of an inch.

⁵ Draft EIR/EIS, Sec. D.15.1.1.

Appendix C
Page 5

we have found reported in the United States was caused not by an equipment failure, but by a large tree falling on the transmission line – an event that could be mitigated through proper vegetation management.⁶

The physical impact of fires attributable to power lines between 2004 and 2007 varies greatly. Though more prevalent, distribution system ignitions burned fewer acres (9,818) than sub-transmission system ignitions (198,025.8).⁷ The 2007 Rice Fire burned 9,472 acres -- almost all of the acres attributable to distribution system ignitions during that period. The California Department of Forestry and Fire Protection (Cal Fire) and the Commission's Consumer Protection and Safety Division (CPSD) have determined that the Rice Fire was started when a 12 kV distribution-level line ignited improperly maintained vegetation around the line.⁸ However, the 2007 Witch Fire burned 197,990 acres -- almost all of the acres attributable to sub-transmission system ignitions between 2004 and 2007. Cal Fire and CPSD have determined that a 69 kV sub-transmission line ignited the Witch Fire.⁹ The Witch Fire and the Guejito Fire merged into a single fire, and although Cal Fire reports that the Witch Fire, ignited by a 69 kV sub-transmission line, was the dominant of the two and is named as responsible for all of the acres burned by the two fires in 2007, the Guejito Fire was ignited by cable television lashing wire and a 12 kV distribution

⁶ *Id.*

⁷ *Id.*

⁸ *Id.*

⁹ *Id.*

Appendix C
Page 6

line. The 230 kV transmission system ignitions burned 8.1 acres during the same period.

Of the 12 sub-transmission system (69-138 kV) fires that occurred in SDG&E's service area between 2004 and 2007, Cal Fires reports that:

- Four were caused by Mylar balloons contacting conductors;
- Two were caused by conductor-to-conductor contact;
- One was caused by dust on insulators;
- One was caused by static line failure due to heavy wind and corrosion;
- One was caused by a wire down due to a gun shot;
- One was caused by a wire down due to heavy wind;
- One was caused by a plane crashing into a tower; and
- One was caused by a bird contacting conductors.¹⁰

Of the three 230 kV transmission system fires that occurred in SDG&E's service area between 2004 and 2007, Cal Fires reports that:

- Two were caused by static line failure due to heavy wind and corrosion on the equipment; and
- One was caused by a kite tail becoming entangled in the insulators and arcing across conductor phases.

New SDG&E data on these 230 kV transmission system fires became available after publication of the Draft EIR/EIS and has been included in the Final EIR/EIS.¹¹ These data present a more complete picture of the role inadequate transmission system inspections appear to have played in the cause

¹⁰ *Id.*

¹¹ Final EIR/EIS, Sec. D.15.1.1 and General Response GR-9; Mussey Grade Exhibit MG-20.

Appendix C
Page 7

of fires. With regard to the fires caused by equipment failure (static line failure due to heavy wind and corrosion), SDG&E had inspected both lines from helicopters using infrared technology 4 and 10 months prior to the line failures. The resulting fires, due in large part to corrosion of the transmission equipment, suggest that these inspection methods may be an inadequate means of detecting fire threats posed by such corrosion and should be reviewed.

(END OF APPENDIX C)

APPENDIX D

***** SERVICE LIST *****

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

***** PARTIES *****

Linda A. Carson
Executive Director
ANZA-BORREGO FOUNDATION
PO BOX 2001
BORREGO SPRINGS CA 92004
(760) 767-0446
For: ANZA-BORREGO FOUNDATION

Diana Linsday
ANZA-BORREGO FOUNDATION & INSTITUTE
PO BOX 2001
BORREGO SPRINGS CA 92004
(760) 767-0446
dlindsay@sunbeltpub.com
For: Anza-Borrego Foundation & Institute

Jacqueline Ayer
2010 WEST AVENUE K, NO. 701
LANCASTER CA 93536
(949) 645-7193
AirSpecial@aol.com
For: Jacqueline Ayer

Shawn D. Hagerty
City Of Attorney
BEST BEST & KRIEGER LLP
655 W. BROADWAY, 15TH FLOOR
SAN DIEGO CA 92101-3301
(619) 525-1300
shawn.hagerty@bbklaw.com
For: The City of Santee

Connie Bull
24572 RUTHERFORD ROAD
RAMONA CA 92065
conniebull@cox.net

Kathryn J. Tobias
Attorney At Law
CA DEPT. OF PARKS AND RECREATION
1416 9TH STREET, 14TH FLOOR
SACRAMENTO CA 95814
(916) 651-8772
ktobias@parks.ca.gov
For: CA Department of Parks and Recreation

Sara Feldman
CA STATE PARKS FOUNDATION
714 W. OLYMPIC BLVD., SUITE 717
LOS ANGELES CA 90015
(213) 748-7458
sara@calparks.org
For: CA State Parks Foundation

David Lloyd
Attorney At Law
CABRILLO POWER I, LLC
4600 CARLSBAD BLVD.
CARLSBAD CA 92008
(760) 268-4069
david.lloyd@nrgenergy.com
For: Cabrillo Power I, LLC

Michael L. Wells
CALIFORNIA DEPARTMENT OF PARKS&RECREATION
200 PALM CANYON DRIVE
BORREGO SPRINGS CA 92004
(760) 767-4037
mwells@parks.ca.gov

Bradly S. Torgan
Attorney At Law
CALIFORNIA DEPT. OF PARKS & RECREATION
1416 NINTH STREET, ROOM 1404-06
SACRAMENTO CA 95814
(916) 653-9905
btorgan@parks.ca.gov
For: California Dept. of Parks & Recreation

Karen Norene Mills
Attorney At Law
CALIFORNIA FARM BUREAU FEDERATION
2300 RIVER PLAZA DRIVE
SACRAMENTO CA 95833
(916) 561-5655
kmills@cfbf.com
For: California Farm Bureau Federation

Judith B. Sanders
Attorney At Law
CALIFORNIA INDEPENDENT SYSTEM OPERATOR
151 BLUE RAVINE ROAD
FOLSOM CA 95630
(916) 608-7143
jsanders@caiso.com
For: California Independent System Operator

APPENDIX D

***** SERVICE LIST *****

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

David Hogan
CENTER FOR BIOLOGICAL DIVERSITY
PO BOX 7745
SAN DIEGO CA 92167
(760) 809-9244
dhogan@biologicaldiversity.org

Michael P. Calabrese
Attorney At Law
CITY ATTORNEY, CITY OF SAN DIEGO
1200 THIRD AVENUE, SUITE 1100
SAN DIEGO CA 92101
(619) 533-5872
mcalabrese@sandiego.gov
For: City of San Diego

Frederick M. Ortlieb
Office Of City Attorney
CITY OF SAN DIEGO
1200 THIRD AVENUE, SUITE 1200
SAN DIEGO CA 92101
(619) 236-6318
fortlieb@sandiego.gov
For: City of San Diego

Mary Aldern
CAROLYN MORROW, JOE RAUH
COMMUNITY ALLIANCE FOR SENSIBLE ENERGY
PO BOX 321
WARNER SPRINGS CA 92086
(760) 782-9036
hikermomma1@yahoo.com

Denis Trafecanty
COMMUNITY OF SANTA YSABEL & RELATED COMM
PO BOX 305
SANTA YSABEL CA 92070
(760) 703-1149
denis@vitalityweb.com
For: Self

David Kates
DAVID MARK AND COMPANY
3510 UNOCAL PLACE, SUITE 200
SANTA ROSA CA 95403-5571
(707) 570-1866
dkates@sonic.net
For: The Nevada Hydro Company

Jeffrey P. Gray
Attorney At Law
DAVIS WRIGHT TREMAINE, LLP
505 MONTGOMERY STREET, SUITE 800
SAN FRANCISCO CA 94111-6533
(415) 276-6500
jeffgray@dwt.com
For: California Independent System Operator Corp.

William F. Dietrich
Attorney At Law
DIETRICH LAW
2977 YGNACIO VALLEY ROAD, NO. 613
WALNUT CREEK CA 94598-3535
(415) 297-2356
dietrichlaw2@earthlink.net
For: California State Parks Foundation and Anza-Borrego Foundation

Donald C. Liddell
Attorney At Law
DOUGLASS & LIDDELL
2928 2ND AVENUE
SAN DIEGO CA 92103
(619) 993-9096
liddell@energyattorney.com
For: Stirling Energy Systems

Jeffery D. Harris
Attorney At Law
ELLISON, SCHNEIDER & HARRIS LLP
2015 H STREET
SACRAMENTO CA 95811-3109
(916) 447-2166
jdh@eslawfirm.com

Norman J. Furuta
Attorney At Law
FEDERAL EXECUTIVE AGENCIES
1455 MARKET ST., SUITE 1744
SAN FRANCISCO CA 94103-1399
(415) 503-6994
norman.furuta@navy.mil
For: DEPARTMENT OF THE NAVY

Travis Foss
Legal Division
RM. 5028
505 VAN NESS AVE

APPENDIX D

***** SERVICE LIST *****

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

Vidhya Prabhakaran
GOODIN MACBRIDE SQUERI DAY & LAMPREY LLP
505 SANSOME STREET, SUITE 900
SAN FRANCISCO CA 94111
(415) 392-7900
vprabhakaran@goodinmacbride.com
For: LS Power; South Bay Replacement Project, LLC

Brian T. Cragg
Attorney At Law
GOODIN MACBRIDE SQUERI RITCHIE & DAY
505 SANSOME STREET, SUITE 900
SAN FRANCISCO CA 94111
(415) 392-7900
bcragg@goodinmacbride.com
For: LS Power; South Bay Replacement Project, LLC

Kevin Lynch
IBERDROLA RENEWABLES INC
1125 NW COUCH ST., SUITE 700
PORTLAND OR 97209

Stephen Keene
Attorney At Law
IMPERIAL IRRIGATION DISTRICT
333 EAST BARIONI BLVD., PO BOX 937
IMPERIAL CA 92251
(760) 339-9550
sjkeene@iid.com
For: Imperial Irrigation District

Heidi Farkash
JOHN & HEIDI FARKASH TRUST
PO BOX 576
RANCHO SANTA FE CA 92067
(858) 756-3594
jhfark@pacbell.net
For: Farkash Ranch in Santa Ysabel

Richard W. Raushenbush
Attorney At Law
LATHAM & WATKINS LLP
505 MONTGOMERY STREET, SUITE 2000
SAN FRANCISCO CA 94111
(415) 395-8237

San Francisco CA 94102 3298
(415) 703-1998
tff@cpuc.ca.gov
For: Consumer Protection and Safety Division

Carrie Downey
LAW OFFICES OF CARRIE ANNE DOWNEY
1313 YNEZ PLACE
CORONADO CA 92118
(619) 522-2040
cadowney@san.rr.com
For: Imperial Irrigation District

John W. Leslie, Esq.
Attorney At Law
LUCE, FORWARD, HAMILTON & SCRIPPS, LLP
11988 EL CAMINO REAL, SUITE 200
SAN DIEGO CA 92130
(858) 720-6352
jleslie@luce.com
For: Coral Power, LLC and Energia Azteca/Energia de Baja California
(La Rosita)

S. Nancy Whang
DAVID L. HUARD, RANDALL W. KEEN
Attorney At Law
MANATT, PHELPS & PHILLIPS, LLP
11355 WEST OLYMPIC BLVD.
LOS ANGELES CA 90064
(310) 312-4377
nwhang@manatt.com
For: The City of Santee

Scot Martin
PO BOX 1549
BORREGO SPRINGS CA 92004
(760) 767-1045
scotmartin478@msn.com

Joetta Mihalovich
11705 ALDERCREST POINT
SAN DIEGO CA 92131

Arthur Fine
DOUGLAS W. BORDEWIECK
MITCHELL SILBERBERG & KNUPP LLP
11377 W. OLYMPIC BLVD.
LOS ANGELES CA 90064-1683
(310) 312-2000
sptp@msk.com
For: David H. Batchelder

APPENDIX D

***** SERVICE LIST *****

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

richard.raushenbush@lw.com
For: San Diego Gas & Electric

Diane J. Conklin
Spokesperson
MUSSEY GRADE ROAD ALLIANCE
PO BOX 683
RAMONA CA 92065
(760) 787-0794
dj0conklin@earthlink.net
For: MUSSEY GRADE ROAD ALLIANCE

Don Wood Sr.
PACIFIC ENERGY POLICY CENTER
4539 LEE AVENUE
LA MESA CA 91941
(619) 463-9035
dwood8@cox.net

Michael Page
17449 OAK HOLLOW ROAD
RAMONA CA 92065-6758
(760) 788-9319
oakhollowranch@wildblue.net
For: Starlight Mountain Estates Owners

Bill Powers
POWERS ENGINEERING
4452 PARK BLVD., SUITE 209
SAN DIEGO CA 92116
(619) 295-2072
bpowers@powersengineering.com
For: Powers Engineering

Marion Peleo
Legal Division
RM. 4107
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-2130
map@cpuc.ca.gov
For: Division of Ratepayer Advocates

Elizabeth Edwards
RAMONA VALLEY VINEYARD ASSOCIATION
26502 HIGHWAY 78
RAMONA CA 92065
(760) 789-8673
edwrdsgrfx@aol.com
For: Ramona Valley Vineyard Assoc.

Harvey Payne
RANCHO PENASQUITOS CONCERNED CITIZENS
13223 - 1 BLACK MOUNTAIN ROAD, 264
SAN DIEGO CA 92129
(619) 794-4307
hpayne3@gmail.com
For: RANCHO PENASQUITOS CONCERNED CITIZENS

Rory Cox
AARON QUINTANAR/BILL POWERS
RATEPAYERS FOR AFFORDABLE CLEAN ENERGY
311 CALIFORNIA STREET, SUITE 650
SAN FRANCISCO CA 94104
(415) 399-8850 X 302
rcox@pacificenvironment.org
For: C/O Pacific Enviroment

Keith Ritchey
Powerlink Issues Manager
8744 CREEKWOOD LANE
SAN DIEGO CA 92129
(858) 484-4429
kritchey@san.rr.com
For: West Chase Homeowner's Association

Billy Blattner
Manager Regulatory Relations
SAN DIEGO GAS & ELECTRIC COMPANY
601 VAN NESS AVENUE, SUITE 2060
SAN FRANCISCO CA 94102
(415) 202-9986
wblattner@semprautilities.com
For: San Diego Gas & Electric Company

E. Gregory Barnes
W. SMITH
Attorney At Law
SAN DIEGO GAS & ELECTRIC COMPANY
101 ASH STREET, HQ 13D
SAN DIEGO CA 92101
(619) 699-5019
gbarnes@sempra.com
For: San Diego Gas & Electric

APPENDIX D

***** SERVICE LIST *****

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

Kevin O'Beirne
SAN DIEGO GAS & ELECTRIC COMPANY
8330 CENTURY PARK COURT, CP32D
SAN DIEGO CA 92123
(858) 654-1765
ko'beirne@semprautilities.com
For: San Diego Gas & Electric

Patricia C. Schnier
BARBARA E. SCHNIER, ESQ.
14575 FLATHEAD RD.
APPLE VALLEY CA 92307
(760) 240-7668
barbschnier@yahoo.com
For: Self

Osa L. Wolff
Attorney At Law
SHUTE, MIHALY & WEINBERGER, LLC
396 HAYES STREET
SAN FRANCISCO CA 94102
(415) 552-7272
wolff@smwlaw.com
For: Cities of Temecula, Murrieta & Hemet

Thomas A. Burhenn
SOUTHERN CALIFORNIA EDISON
2244 WALNUT GROVE AVENUE
ROSEMEAD CA 91770
(626) 302-9652
thomas.burhenn@sce.com
For: Southern California Edison

Nicholas Sher
Legal Division
RM. 4007
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-4232
nms@cpuc.ca.gov

Michel Peter Florio
Attorney At Law
THE UTILITY REFORM NETWORK
711 VAN NESS AVENUE, SUITE 350
SAN FRANCISCO CA 94102
(415) 929-8876 X302

James F. Walsh
SAN DIEGO GAS & ELECTRIC COMPANY
101 ASH STREET
SAN DIEGO CA 92101
(619) 699-5022
jwalsh@sempra.com
For: San Diego Gas & Electric Company

Michael Shames
Attn: Michael Shames
UCAN
3100 FIFTH AVENUE, SUITE B
SAN DIEGO CA 92103
(619) 696-6966
mshames@ucan.org
For: UTILITY CONSUMERS' ACTION NETWORK

Pam Whalen
24444 RUTHERFORD ROAD
RAMONA CA 92065
(760) 440-0202
pwhalen2@cox.net

Arnold B. Podgorsky
WRIGHT & TALISMAN, P.C.
1200 G STREET, N.W., SUITE 600
WASHINGTON DC 20005
(202) 393-1200
Podgorsky@wrightlaw.com
For: The Nevada Hydro Company

Michael J. Thompson
Attorney At Law
WRIGHT & TALISMAN, PC
1200 G STREET, N.W., STE 600
WASHINGTON DC 20005
(202) 393-1200
thompson@wrightlaw.com
For: The Nevada Hydro Company

***** STATE EMPLOYEE *****

Susan Lee
ASPEN ENVIRONMENTAL GROUP
235 MONTGOMERY STREET, SUITE 935
SAN FRANCISCO CA 94104
(415) 955-4775 X 203
slee@aspeneg.com

APPENDIX D

***** SERVICE LIST *****

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

mflorio@turn.org
For: TURN

Tom Murphy
Vp., Sacramento Operations
ASPEN ENVIRONMENTAL GROUP
8801 FOLSOM BLVD., SUITE 290
SACRAMENTO CA 95826
(916) 379-0350
tmurphy@aspeneg.com

Billie C. Blanchard
Energy Division
AREA 4-A
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-2068
bec@cpuc.ca.gov

Laurence Chaset
Legal Division
RM. 5131
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 355-5595
lau@cpuc.ca.gov

Traci Bone
Legal Division
RM. 5206
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-2048
tbo@cpuc.ca.gov

Matthew Deal
Executive Division
RM. 5215
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-2576
mjd@cpuc.ca.gov

Clare Laufenberg
CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET, MS 46
SACRAMENTO CA 95814
(916) 654-4859
Claufenb@energy.state.ca.us

Janet A. Econome
Administrative Law Judge Division
RM. 5116
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-1494
jjj@cpuc.ca.gov

Judy Grau
CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET MS-46
SACRAMENTO CA 95814-5512
(916) 653-1610
jgrau@energy.state.ca.us

Robert Elliott
Energy Division
AREA 4-A
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-2527
rae@cpuc.ca.gov

Marc Pryor
CALIFORNIA ENERGY COMMISSION
1516 9TH ST, MS 20
SACRAMENTO CA 95814
(916) 653-0159
mpryor@energy.state.ca.us

Thomas Flynn
Energy Division
770 L STREET, SUITE 1050
Sacramento CA 95814
(916) 324-8689
trf@cpuc.ca.gov

Paul C. Richins Jr.
CALIFORNIA ENERGY COMMISSION
1516 9TH STREET
SACRAMENTO CA 95814
(916) 654-4074
prichins@energy.state.ca.us
For: CALIFORNIA ENERGY COMMISSION

Julie Halligan
Consumer Protection & Safety Division
RM. 2203
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-1587
jmh@cpuc.ca.gov

APPENDIX D

******* SERVICE LIST *******

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

Scott Cauchois
Division of Ratepayer Advocates
RM. 4103
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-1525
wsc@cpuc.ca.gov
For: DRA

Gregory Heiden
Legal Division
RM. 5039
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 355-5539
gxh@cpuc.ca.gov

Jeanette Lo
Consumer Protection & Safety Division
RM. 2253
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-1825
jlo@cpuc.ca.gov

Jean Vieth
Administrative Law Judge Division
RM. 5010
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-2194
xjv@cpuc.ca.gov

Scott Logan
Division of Ratepayer Advocates
RM. 4209
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-1418
sjl@cpuc.ca.gov
For: DRA

Steven A. Weissman
Administrative Law Judge Division
RM. 5107
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-2195
saw@cpuc.ca.gov

Helen M. Mickiewicz
Legal Division
RM. 5123
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-1319
hmm@cpuc.ca.gov

Keith D White
Energy Division
AREA 4-A
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 355-5473
kwh@cpuc.ca.gov

David Ng
Executive Division
RM. 5207
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-1791
dhn@cpuc.ca.gov

Linda J. Woods
Consumer Protection & Safety Division
AREA 2-A
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-1177
ljw@cpuc.ca.gov

******* INFORMATION ONLY *******

Marcus Nixon
Consumer Service & Information Division
RM. 500
320 WEST 4TH STREET SUITE 500
Los Angeles CA 90013
(213) 576-7057
mrx@cpuc.ca.gov

Jaleh (Sharon) Firooz, P.E.
ADVANCED ENERGY SOLUTIONS
17114 TALLOW TREE LANE
SAN DIEGO CA 92127
(858) 229-0023
jfirooz@iesnet.com

Terrie D. Prosper
Executive Division
RM. 5301
505 VAN NESS AVE

Brewster Birdsall
ASPEN ENVIRONMENTAL GROUP
235 MONTGOMERY STREET, SUITE 935
SAN FRANCISCO CA 94104

APPENDIX D

***** SERVICE LIST *****

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

San Francisco CA 94102 3298
(415) 703-2160
tdp@cpuc.ca.gov

Donald R. Smith
Division of Ratepayer Advocates
RM. 4209
505 VAN NESS AVE
San Francisco CA 94102 3298
(415) 703-1562
dsh@cpuc.ca.gov

Bob & Margaret Barelmann
6510 FRANCISCAN ROAD
CARLSBAD CA 92011
(760) 497-7777

Jim Bell
4862 VOLTAIRE ST.
SAN DIEGO CA 92107
(619) 758-9020
jimbellel@cox.net

Pat/Albert Biane
1223 ARMSTRONG CIRCLE
ESCONDIDO CA 92027
patricia_fallon@sbcglobal.net

Eileen Bird
12430 DORMOUSE ROAD
SAN DIEGO CA 92129
(858) 538-9595
sanrocky@aol.com

Donna Tisdale
BOULEVARD SPONSOR GROUP
PO BOX 1272
BOULEVARD CA 91905
(619) 766-4170
donnatisdale@hughes.net

David Branchcomb
BRANCHCOMB ASSOCIATES, LLC
9360 OAKTREE LANE
ORANGEVILLE CA 95662
(916) 988-5676
david@branchcomb.com

Phillip & Eliane Breedlove
1804 CEDAR STREET
RAMONA CA 92065
(858) 618-5087
wolfmates@cox.net

(415) 955-4775
bbirdsall@aspenerg.com

Philippe Auclair
11 RUSSELL COURT
WALNUT CREEK CA 94598
(925) 588-9109
phil@auclairconsulting.com

Thomas Zale
BUREAU OF LAND MANAGEMENT
1661 SO. 4TH STREET
EL CENTRO CA 92243
(760) 337-4420
Thomas_Zale@blm.gov

Kelli McDowell
CA DEPT. OF PARKS AND RECREATION
1416 NINTH STREET, ROOM 1404-06
SACRAMENTO CA 95814
KMCDO@parks.ca.gov

G. Alan Comnes
CABRILLO POWER I LLC
3934 SE ASH STREET
PORTLAND OR 97214
(503) 239-6913
alan.comnes@nrenergy.com

Robin Harrington
CAL. DEPT OF FORESTRY AND FIRE PROTECTIO
PO BOX 944246
SACRAMENTO CA 94244-2460
(916) 653-0922
robin.harrington@fire.ca.gov

John Sthura
CALIFORNIA BOTANICAL HABITAT
PO BOX 1032
HEMET CA 92546
(641) 715-3900
c@californiabotanicalhabitat.com
For: California Botanical Habitat

Irene Stillings
Executive Director
CALIFORNIA CENTER FOR SUSTAINABLE ENERGY
8520 TECH WAY, SUITE 110
SAN DIEGO CA 92123
Irene.stillings@energycenter.org

APPENDIX D

***** SERVICE LIST *****

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

John&Phyllis Bremer
PO BOX 510
SANTA YSABEL CA 92070
gecko_greens@juno.com

Lynda Kastoll
Realty Specialist
BUREAU OF LAND MANAGEMENT
EL CENTRO FIELD OFFICE
1661 SOUTH 4TH STREET
EL CENTRO CA 92243

Sephra A. Ninow
Policy Analyst
CALIFORNIA CENTER FOR SUSTAINABLE ENERGY
8690 BALBOA AVENUE, SUITE 100
SAN DIEGO CA 92123
(858) 244-1186
sephra.ninow@energycenter.org

J.A. Savage
CALIFORNIA ENERGY CIRCUIT
3006 SHEFFIELD AVE
OAKLAND CA 94602
(510) 534-9109
editorial@californiaenergycircuit.net

James W. Reede Jr. Ed.D
CALIFORNIA ENERGY COMMISSION
1516 - 9TH STREET
SACRAMENTO CA 95814
(916) 653-1245
jreede@energy.state.ca.us
For: CALIFORNIA ENERGY COMMISSION

CALIFORNIA ENERGY MARKETS
425 DIVISADERO ST.
SAN FRANCISCO CA 94117
(415) 963-4439
cem@newsdata.com

Nancy J. Saracino
Attorney
CALIFORNIA INDEP. SYSTEM OPERATOR CORP.
151 BLUE RAVINE ROAD
FOLSOM CA 95630
(916) 351-4400
For: CALIFORNIA INDEP. SYSTEM OPERATOR CORP.

Legal & Regulatory Department
CALIFORNIA ISO
151 BLUE RAVINE ROAD

Jennifer Porter
Policy Analyst
CALIFORNIA CENTER FOR SUSTAINABLE ENERGY
8690 BALBOA AVENUE, SUITE 100
SAN DIEGO CA 92123
(858) 244-1177
jennifer.porter@energycenter.org

Justin Augustine
CENTER FOR BIOLOGICAL DIVERSITY
351 CALIFORNIA STREET, SUITE 600
SAN FRANCISCO CA 94104
(415) 436-9682
jaugustine@biologicaldiversity.org
For: Center for Biological Diversity

Steven Siegel
Staff Attorney
CENTER FOR BIOLOGICAL DIVERSITY
3421 PARK PLACE
EVANSTON IL 60201
(847) 491-1437
ssiegel@biologicaldiversity.org
For: Center for Biological Diversity

Tom Blair
Energy Administrator
CITY OF SAN DIEGO
9601 RIDGEHAVEN COURT, SUITE 120
SAN DIEGO CA 92123-1636
(858) 492-6001
tblair@sandiego.gov

Dahvia Locke
Enironmental Resource Manager
COUNTY OF SAN DIEGO
5201 RUFFIN ROAD, SUITE B
SAN DIEGO CA 92123-1666
(858) 694-3075
Dahvia.Lynch@sdcounty.ca.gov

Sabrina Ozturk
Mscp Division
COUNTY OF SAN DIEGO
5201 RUFFIN ROAD, SUITE B
SAN DIEGO CA 92123
(858) 694-3004
sabrina.ozturk@sdcounty.ca.gov

APPENDIX D

***** SERVICE LIST *****

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

FOLSOM CA 95630
e-recipient@caiso.com
For: CALIFORNIA ISO

Monica Argandona
Desert Program Director
CALIFORNIA WILDERNESS COALITION
167 NORTH THIRD AVENUE, STE M
UPLAND CA 91786
(909) 946-1855
margandona@calwild.org

Cassandra Sweet
DOW JONES NEWSWIRES
201 CALIFORNIA ST., 13TH FLOOR
SAN FRANCISCO CA 94111
(415) 439-6468
Cassandra.sweet@dowjones.com

Glenn E. Drown
PO BOX 330
SANTA YSABEL CA 92070
(760) 765-3381
gedrown@mindspring.com

Audra Hartmann
DYNEGY, INC.
980 NINTH STREET, SUITE 2130
SACRAMENTO CA 95814
(916) 441-6242
Audra.Hartmann@Dynegy.com

Joseph Paul
Senior Corporate Counsel
DYNEGY, INC.
4140 DUBLIN BLVD., STE. 100
DUBLIN CA 94568
(925) 829-1804 X-105
joe.paul@dynegy.com

E. Craig Smay
E. CRAIG SMAY PC
174 EAST SOUTH TEMPLE
SALT LAKE CITY UT 84111
(801) 539-8515
For: William and Shannon Davis

Andrew B. Brown
Attorney At Law
ELLISON SCHNEIDER & HARRIS, LLP
2015 H STREET

George Courser
3142 COURSER AVENUE
SAN DIEGO CA 92117
(858) 273-2426
gcourser@hotmail.com

David W. Carey
DAVID CAREY & ASSOCIATES, INC.
PO BOX 2481
JULIAN CA 92036
(760) 765-3266
dandbcarey@julianweb.com

Dan Perkins
ENERGYSMARTHOMES.NET
983 PHILLIPS ST.
VISTA CA 92083
(760) 639-0945
dan@energysmarthomes.net

Rebecca Pearl
Policy Advocate, Clean Bay Campaign
ENVIRONMENTAL HEALTH COALITION
401 MILE OF CARS WAY, STE. 310
NATIONAL CITY CA 91950
(619) 474-0220
rebeccap@environmentalhealth.org
For: ENVIRONMENTAL HEALTH COALITION

Epic Intern
EPIC/USD SCHOOL OF LAW
5998 ALCALA PARK
SAN DIEGO CA 92110
(619) 260-4806
usdepic@gmail.com

Steve/Carolyn Esposito
37784 MONTEZUMA VALLEY ROAD
RANCHITA CA 92066
(760) 782-9011
cesposit@sdcoe.k12.ca.us

Julie L. Fieber
FOLGER LEVIN & KAHN LLP
275 BATTERY STREET, 23RD FLOOR
SAN FRANCISCO CA 94111
(415) 365-7823
jfieber@flk.com

Diane I. Fellman
Director, Regulatory Affairs
FPL ENERGY PROJECT MANAGEMENT, INC.

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***** SERVICE LIST *****

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

SACRAMENTO CA 95811
(916) 447-2166
abb@eslawfirm.com

Kelly Fuller
ENERGY AND NATURE
PO BOX 6732
MINNEAPOLIS MN 55406
kelly@kellyfuller.net

Bonnie Gendron
4812 GLENSIDE ROAD
SANTA YSABEL CA 92070
(760) 765-2132
bgendron@nethere.com

Richard Lauckhart
GLOBAL ENERGY
2379 GATEWAY OAKS DRIVE, SUITE 200
SACRAMENTO CA 95833
(916) 609-7769
rlauckhart@globalenergy.com

Carolyn Morrow
GOLIGHTLY FARMS
36255 GRAPEVINE CANYON ROAD
RANCHITA CA 92066
(619) 977-9961
Csmmarket@aol.com

Laurel Granquist
PO BOX 2486
JULIAN CA 92036
celloinpines@sbcglobal.net

Kim Kiener
504 CATALINA BLVD
SAN DIEGO CA 92106
(619) 990-6627
kмкиener@cox.net

Glenda Kimmerly
PO BOX 305
SANTA YSABEL CA 92070
kimmerlys@yahoo.com

Brian Kramer
PO BOX 516
JULIAN CA 92036-0516
(760) 765-3177
colobiker@gmail.com

Henry Martinez
LADWP

234 VAN NESS AVENUE
SAN FRANCISCO CA 94102
(415) 703-6000
Diane.Fellman@fpl.com

Darrell Freeman
1304 ANTRIM DR.
ROSEVILLE CA 95747
ddfreesman@yahoo.com

Patricia Guerrero
Attorney At Law
LATHAM & WATKINS
600 WEST BROADWAY, SUITE 1800
SAN DIEGO CA 92101-3375
patricia.guerrero@lw.com
For: San Diego Gas and Electric Company

Julie B. Greenisen
LATHAM & WATKINS LLP
SUITE 1000
555 ELEVENTH STREET, NW
WASHINGTON DC 20004-1304
(202) 637-2142
julie.greenisen@lw.com

Michael J. Gergen
LATHAM & WATKINS LLP
SUITE 1000
555 ELEVENTH STREET, NW
WASHINGTON DC 20004-1304
(202) 637-2200
michael.gergen@lw.com

Elizabeth Klein
LATHAM & WATKINS, LLP
555 11TH STREET NW, STE. 1000
WASHINGTON DC 20004
(202) 637-2200
elizabeth.klein@lw.com

Janice Schneider
LATHAM & WATKINS, LLP
555 11TH STREET NW, STE 1000
WASHINGTON DC 20004
(202) 637-2200
janice.schneider@lw.com

Jason M. Ohta
LATHAM & WATKINS LLP
600 WEST BROADWAY, SUITE 1800
SAN DIEGO CA 92101-3375
(415) 391-0600

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A0608010 LIST

A0512014

111 N. HOPE ST., ROOM 921
LOS ANGELES CA 90012
(213) 367-4435
Henry.Martinez@ladwp.com

Gregory T. Lambron
LAMBRON LAKESIDE RANCH, LLC
PO BOX 15453
SAN DIEGO CA 92175-5453
(619) 583-1226

Randy S. Howard
LOS ANGELES DEPT. OF WATER AND POWER
111 NORTH HOPE STREET, ROOM 921
LOS ANGELES CA 90012
(213) 367-0381
randy.howard@ladwp.com

Joseph W. Mitchell, Ph. D.
M-BAR TECHNOLOGIES AND CONSULTING
19412 KIMBALL VALLEY RD
RAMONA CA 92065
(760) 703-7521
jwmitchell@mbartek.com

Joseph W. Mitchell, Phd
M-BAR TECHNOLOGIES AND CONSULTING
19412 KIMBALL VALLEY RD.
RAMONA CA 92065
(760) 703-7521
jwmitchell@mbartek.com
For: M-BAR TECHNOLOGIES AND CONSULTING

Randall W. Keen
Attorney At Law
MANATT PHELPS & PHILLIPS, LLP
11355 WEST OLYMPIC BLVD.
LOS ANGELES CA 90064
(310) 312-4361
rkeen@manatt.com
For: City of Santee

David L. Huard
Attorney At Law
MANATT, PHELPS & PHILLIPS, LLP
ONE EMBARCADERO CENTER, 30TH FL.
SAN FRANCISCO CA 94111
(415) 291-7410
dhuard@manatt.com
For: City of Santee

jason.ohata@lw.com
For: San Diego Gas and Electric Company

Lara Lopez
16828 OPEN VIEW RD
RAMONA CA 92065
soliviasmom@gmail.com

MRW & ASSOCIATES, INC.
1814 FRANKLIN STREET, SUITE 720
OAKLAND CA 94612
(510) 834-1999
mrw@mrwassoc.com

Louis Nastro
PO BOX 942896
SACRAMENTO CA 92860-0001
(916) 653-0524
Lnastro@parks.ca.gov

James B. Woodruff
Vice President Regulatory And Govt Affai
NEXTLIGHT RENEWABLE POWER, LLC
101 CALIFORNIA STREET, STE 2450
SAN FRANCISCO CA 94111
(626) 404-6860
jwoodruff@nextlightrp.com

Dave Downey
NORTH COUNTY TIMES
207 E. PENNSYLVANIA AVENUE
ESCONDIDO CA 92025
(760) 740-5442
ddowney@nctimes.com

Deanna Spehn
Policy Director
OFFICE OF SENATOR CHRISTINE KEHOE
39TH STATE SENATE DISTRICT
2445 5TH AVENUE, SUITE 200
SAN DIEGO CA 92101
(619) 645-3133
deanna.spehn@sen.ca.gov

Peter Schultz
OLD JULIAN CO.
PO BOX 2269
RAMONA CA 92065
(760) 789-0987
oldjulianco@integrity.com

APPENDIX D

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A0608010 LIST

A0512014

David Marcus
PO BOX 1287
BERKELEY CA 94701
(510) 528-0728
dmarcus2@sbcglobal.net

K. Renee Martin
PO BOX 1276
POWAY CA 92074
(760) 789-0802
Reneeandbear@aol.com

David T. Kraska
Attorney At Law
PACIFIC GAS AND ELECTRIC COMPANY
PO BOX 7442, 77 BEALE ST, B30A
SAN FRANCISCO CA 94105
(415) 973-7503
dtk5@pge.com

Jason Yan
PACIFIC GAS AND ELECTRIC COMPANY
77 BEALE STREET, MAIL CODE B13L
SAN FRANCISCO CA 94105
jay2@pge.com

Katarzyna M. Smolen
PACIFIC GAS AND ELECTRIC COMPANY
77 BEALE STREET, MC B9A
SAN FRANCISCO CA 94105
(415) 973-4784
kmsn@pge.com

Michael S. Porter
PACIFIC GAS AND ELECTRIC COMPANY
77 BEALE ST., MAIL CODE 13L RM 1318
SAN FRANCISCO CA 94105
(415) 973-6625
mspe@pge.com

Scott Kardel
PALOMAR OBSERVATORY
PO BOX 200
PALOMAR MOUNTAIN CA 92060
(760) 742-2111
WSK@astro.caltech.edu

Nancy Parinello
PO BOX 516
JULIAN CA 92036-0516
(760) 765-3177
nparinello@gmail.com

John Raifsnider

Case Coordination
PACIFIC GAS AND ELECTRIC COMPANY
PO BOX 770000; MC B9A
SAN FRANCISCO CA 94177
(415) 973-4744
regrelcpuccases@pge.com

Joseph Rauh
RANCHITA REALTY
37554 MONTEZUMA VALLEY RD
RANCHITA CA 92066
(760) 782-3632
joe@ranchitarealty.com
For: RANCHITA REALTY

Aaron Quintanar
RATE PAYERS FOR AFFORDABLE CLEAN ENERGY
311 CALIFORNIA STREET, STE 650
SAN FRANCISCO CA 94104
(415) 399-8850 X302
rcox@pacificenvironment.org

Paul Ridgway
3027 LAKEVIEW DR.
PO BOX 1435
JULIAN CA 92036-1435
cpuc@92036.com

Stephen Rogers
1340 OPAL STREET
SAN DIEGO CA 92109
srogers647@aol.com

Susan Freedman
Senior Regional Energy Planner
SAN DIEGO ASSOCIATION OF GOVERNMENTS
401 B STREET, SUITE 800
SAN DIEGO CA 92101
(619) 699-7387
sfr@sandag.org

Central Files
SAN DIEGO GAS & ELECTRIC
CP31-E
8330 CENTURY PARK COURT
SAN DIEGO CA 92123
(858) 654-1148
centralfiles@semprautilities.com

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A0608010 LIST

A0512014

PO BOX 121
JULIAN CA 92036-0121
(760) 765-2722
skyword@sbcglobal.net

Carolyn A. Dorroh
RAMONA COMMUNITY PLANNING GROUP
17235 VOORHES LANE
RAMONA CA 92065
(760) 789-4429
carolyn.dorroh@cubic.com

J. Harry Jones
SAN DIEGO UNION TRIBUNE
800 WEST VALLEY PARKWAY, SUITE 114
ESCONDIDO CA 92025
(760) 737-7553
jharry.jones@uniontrib.com

Kimbelry Schulz
10303 CANINITO ARALIA NO 96
SAN DIEGO CA 92131

Kellie Smith
SENATE ENERGY/UTILITIES & COMMUNICATION
STATE CAPITOL, ROOM 4038
SACRAMENTO CA 95814
(916) 651-4107
kellie.smith@sen.ca.gov

Paul G. Scheuerman
SHEUERMAN CONSULTING
3915 RAWHIDE RD.
ROCKLIN CA 95677
(916) 630-7073
PGS@IEEE.org

Sheridan Pauker
SHUTE,MIHALY & WEINBERGER LLP
396 HAYES STREET
SAN FRANCISCO CA 94102
(415) 552-7272
wolff@smwlaw.com
For: Cities of Temecula, Hemet and Murrieta

Micah Mitrosky
SIERRA CLUB
3820 RAY STREET
SAN DIEGO CA 92104-3623
(619) 299-1797
mmitrosky@sierraclubsandiego.org

Matthew Jumper
SAN DIEGO INTERFAITH HOUSING FOUNDATION
7956 LESTER AVE
LEMON GROVE CA 91945
mjumper@sdihf.org
For: SAN DIEGO INTERFAITH HOUSING FOUNDATION

Bruce Foster
Senior Vice President
SOUTHERN CALIFORNIA EDISON COMPANY
601 VAN NESS AVENUE, STE. 2040
SAN FRANCISCO CA 94102
(415) 775-1856
bruce.foster@sce.com

Case Administration
SOUTHERN CALIFORNIA EDISON COMPANY
LAW DEPARTMENT, ROOM 370
2244 WALNUT GROVE AVENUE
ROSEMEAD CA 91770
(626) 302-6838
Case.Admin@sce.com

Clay E. Faber
SOUTHERN CALIFORNIA GAS COMPANY
555 WEST FIFTH STREET, GT-14D6
LOS ANGELES CA 90013
(213) 244-5129
cfaber@semprautilities.com
For: San Diego Gas & Electric Company

Wally Besuden
President
SPANGLER PEAK RANCH, INC
PO BOX 1959
ESCONDIDO CA 92033
(702) 429-7525

Bruce V. Biegelow
Staff Writer
THE SAN DIEGO UNION TRIBUNE
PO BOX 120191S
SAN DIEGO CA 92112-0191
(619) 293-1314
bruce.bigelow@uniontrib.com

APPENDIX D

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A0608010 LIST

A0512014

Katharine Wolfrom
SIERRA CLUB OF SAN DIEGO
3802 RAY STREET
SAN DIEGO CA 92104
(650) 387-5540
sierraclubintern@yahoo.com

Darell Holmes
Transmission Manager
SOUTHERN CALIFORNIA EDISON
2244 WALNIT GROVE AVE, 238M, QUADB, G01
ROSEMEAD CA 91770
(626) 302-6498
darell.holmes@sce.com

J. Sthura
UNDERGROUND POWER ASSOCIATION
PO BOX 1032
HEMET CA 92546
up@undergroundpower.us
For: UNDERGROUND POWER ASSOCIATION

Martha Baker
VOLCAN MOUNTAIN PRESERVE FOUNDATION
PO BOX 1625
JULIAN CA 92036
(760) 765-2300
vmp@sbcglobal.net

David Voss
502 SPRINGFIELD AVENUE
OCEANSIDE CA 92057
(760) 630-1070
dwvoss@cox.net

Lon W. House
WATER & ENERGY CONSULTING
4901 FLYING C RD.
CAMERON PARK CA 95682
(530) 676-8956
lonhouse@waterandenergyconsulting.com

Ron Webb
PO BOX 375
SANTA YSABEL CA 92070
webron7@yahoo.com

Daniel Suurkask
WILD ROSE ENERGY SOLUTIONS, INC.
430 8170 50TH STREET
EDMONTON AB T6B 1E6
CANADA
daniel@wildroseenergy.com

Paul C. Lacourciere
THELEN REID BROWN RAYSMAN & STEINER
101 SECOND STREET, SUITE 1800
SAN FRANCISCO CA 94105
(415) 369-7601
placourciere@thelenreid.com
For: The Nevada Hydro Company

William Tulloch
28223 HIGHWAY 78
RAMONA CA 92065
(760) 789-3854

Kevin Woodruff
WOODRUFF EXPERT SERVICES, INC.
1100 K STREET, SUITE 204
SACRAMENTO CA 95814
(916) 442-4877
kdw@woodruff-expert-services.com

Henry Zaininger
ZAININGER ENGINEERING COMPANY, INC.
1718 NURSERY WAY
PLEASANTON CA 94588
hzaininger@aol.com

Ziad Alaywan
ZGLOBAL INC. ENGINEERING AND ENERGY
193 BLUE RAVINE RD, STE 120
FOLSOM CA 95630
(916) 985-4259
ziad@zglobal.biz
For: ZGLOBAL INC. ENGINEERING AND ENERGY

APPENDIX D

******* SERVICE LIST *******

Last Updated on 27-OCT-2008 by: JVG

A0608010 LIST

A0512014

Suzanne Wilson
PO BOX 798
IDYLLWILD CA 92549
(951) 492-9836
swilson@pcta.org

W. Kent Palmerton
WK PALMERTON ASSOCIATES, LLC
2106 HOMEWOOD WAY, SUITE 100
CARMICHAEL CA 95608
kent@wkpalmerton.com

(END OF APPENDIX D)