



BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA

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In the Matter of the Application of SOUTHERN) Application No. _____
CALIFORNIA EDISON COMPANY (U 338-E))
for a Permit to Construct Electrical Facilities) **A1012016**
With Voltages Between 50 kV and 200 kV:)
Downs Substation Project)

APPLICATION OF SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) FOR A
PERMIT TO CONSTRUCT ELECTRICAL FACILITIES WITH VOLTAGES
BETWEEN 50 KV AND 200 KV:
DOWN'S SUBSTATION PROJECT

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Dated: December 29, 2010

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DOWNS SUBSTATION PROJECT**

I.

INTRODUCTION

Pursuant to California Public Utilities Commission (Commission or CPUC), General Order 131-D (G.O. 131-D), Southern California Edison Company (SCE) respectfully submits this application (Application) for a permit to construct (PTC) authorizing SCE to construct the proposed project known as the Downs Substation Project (Proposed Project). The Proposed Project consists of: (1) upgrading the existing 1-acre, 33/12 kilovolt (kV) Downs Substation into a 115/12 kV substation containing a 33 kV switchrack on 2.5 acres of a 4.6-acre parcel of SCE-owned land adjacent to the existing Downs Substation (located at the southwest corner of Downs Street and Ridgecrest Boulevard in the City of Ridgecrest); (2) looping of the existing Inyokern-McGen-Searles No. 2 115 kV subtransmission line into and out of the expanded Downs Substation; looping will require installation or replacement of five tubular steel poles, two lightweight steel poles, and two wood stub poles along Downs Street, Ridgecrest Boulevard and on the expanded Downs Substation property and installation of a total length of approximately 1,000 feet of circuit (one segment of approximately 800 feet and a second segment of

approximately 200 feet), thereby creating two new overhead 115 kV subtransmission lines (Downs-McGen-Searles and Downs-Inyokern);¹ and (3) installation of approximately 58 miles of new fiber optic telecommunication cable primarily on existing wood poles (six of which would be replaced) to connect the expanded Downs Substation to SCE's existing Searles, McGen, and Inyokern Substations.

II.

BACKGROUND AND SUMMARY OF REQUEST

The purpose of the Proposed Project is to increase capacity to meet forecasted electrical demand and to maintain safe and reliable service to customers in portions of the City of Ridgecrest and the surrounding unincorporated areas of Kern County and San Bernardino County (Electrical Needs Area). The Electrical Needs Area is defined by the area where customers are served from the 12 kV distribution circuits originating from the Downs 33/12 kV Substation.

The existing Downs 33/12 kV Substation currently serves approximately 13,000 SCE metered customers in portions of the City of Ridgecrest and surrounding areas. The Electrical Needs Area is roughly bounded by North Victor Street to the west, the China Lake Naval Air Weapons Station (CLNAWS) to the north, Trona Road to the east, and Motorcross Road to the south.

Downs Substation currently receives its power from two 33 kV distribution circuits originating at Inyokern Substation. At Downs Substation, voltage is reduced from 33 kV to a distribution voltage of 12 kV using two 22.4 megavolt ampere (MVA) transformers. The amount of electrical load that can be served from the existing Downs 33/12 kV Substation is

¹ Equipment at the existing Inyokern, McGen and Searles Substations would also be upgraded with appropriate
Continued on the next page

limited to the total thermal maximum operating limit of 50.8 MVA. Based upon recorded historical peak demand, SCE has determined that the Electrical Needs Area has seen load growth averaging approximately two percent per year over the past five years, despite the intervening economic recession. According to SCE's annual 10-year peak demand forecast, it is anticipated that this load growth will continue to drive the need for the Proposed Project. Among other factors, CLNAWS, located north of Ridgecrest, is also expected to see major growth. This growth is attributed primarily to the Base Realignment and Closure Act (BRAC) initiated by Congress in 2005. Under BRAC, the U.S. military plans to relocate additional personnel to CLNAWS, and construction is already underway on and around CLNAWS. While the Downs Substation does not serve CLNAWS directly, the growth on the base will impact the City of Ridgecrest, which provides many support services to CLNAWS.

In light of this projected growth, area demand is currently forecast to grow by more than 10 percent in 2010 and then over 4 percent per year in the following two years, according to the forecast most recently completed by SCE.² In particular, SCE's forecast shows that demand in the Electrical Needs Area under a 1-in-10-year heat storm would exceed the maximum operating limit (50.8 MVA) of the existing Downs 33/12 kV Substation as early as 2011. The 2009 peak demand, as adjusted for a 1-in-10-year heat storm, was 48.4 MVA. By 2011, the peak demand for a 1-in-10-year heat storm is forecasted to be 53.2 MVA. As discussed above, the maximum capacity of the existing Downs 33/12 kV Substation is limited to 50.8 MVA. In short, the projected peak demand for 2011 would exceed the operating limits of the Downs 33/12 kV

Continued from the previous page

protective relays to protect the two new subtransmission lines.

² Based on preliminary information from the first ten months of 2010, SCE's projected increase in demand for 2010 may not be realized.

Substation, and additional electrical facilities would be required to serve the Electrical Needs Area. Therefore, SCE is proposing a project that would be operational in June 2014 to ensure that safe and reliable electrical service is available to meet customer electrical demand.³

In addition to accommodating future growth within the Electrical Needs Area, the Proposed Project would also address other reliability and operational flexibility issues, including: 1) providing adequate service during an N-1 event (service during an N-1 event likely would be interrupted under the existing configuration); 2) providing greater operational flexibility for the existing 33 kV circuits, which serve a number of substations; 3) providing additional fault protection to the transformers at Downs Substation; and 4) enhancing the protection system on the Inyokern-McGen-Searles No. 2 115 kV subtransmission line by replacing obsolete equipment with upgraded equipment and fiber optic telecommunication cable (the telecommunications system provides the necessary digital communication channel between equipment relays).

Construction of the Proposed Project with these features will ensure that safe and reliable electric service is available to meet customer electrical demand in the Electrical Needs Area. This would be accomplished by: (1) providing sufficient capacity to meet long-term projected electrical demand in the Electrical Needs Area; (2) transferring the 33 kV load at Downs Substation to the 115 kV circuit, thereby reducing capacity on the 33 kV circuits; (3) providing

³ Because the Project would not be in service by 2011 when the forecasted demand for a 1-in-10-year heat storm would exceed the Downs 33/12 kV Substation's maximum operating limit, a contingency project has been proposed for 2011 to provide additional, interim substation capacity when load is at risk of being dropped. The contingency project consists of installing one normally de-energized 115/12 kV, 28 MVA transformer that would be placed within the existing fence line of Downs Substation without a concrete foundation. The transformer would be connected to the 115 kV subtransmission line adjacent to the existing Downs 33/12 kV Substation, but would only be operated on an as-needed basis when demand is anticipated to exceed existing Downs Substation capacity. However, this contingency project would not be sufficient to provide long-term

Continued on the next page

greater operational flexibility; and (4) installing upgraded equipment, including telecommunications equipment, to ensure protection during fault conditions.

The estimated cost of the Downs Substation Project is approximately \$28.7million in 2010 constant dollars.⁴ A Proponent's Environmental Assessment (PEA) prepared for the Proposed Project is attached to this Application. The PEA will be referenced in this Application, where appropriate, as the source of the information required in an Application for a PTC⁵ pursuant to G.O. 131-D, Section IX.B. A complete project description is located in Chapter 3 of the PEA. A statement of purpose and need is located in Chapter 1 of the PEA.

Construction of the Proposed Project is scheduled to begin in August 2013 and to be completed by June 2014. A schedule for the Proposed Project is included in this Application as Appendix C.

Upon completion of its review of this Application and preparation of an initial study, SCE requests that the Commission issue and certify an appropriate environmental document and issue a PTC authorizing SCE to construct the Proposed Project set forth in this Application and the attached PEA within the timelines set forth in Section III.H. of this Application.

Continued from the previous page

reliable service to customers and meet future load growth because it reduces operational flexibility and substation protection.

⁴ This is a conceptual estimate, prepared in advance of final engineering and prior to CPUC approval. Pension and benefits, administrative and general expenses, and allowance for funds used during construction are not included in this estimate.

⁵ Other required information for a PTC application (e.g. Balance Sheet, Articles of Incorporation, etc.) is contained in this Application or its appendices.

III.

STATUTORY AND PROCEDURAL REQUIREMENTS

A. Applicant

The applicant is Southern California Edison Company, an electric public utility company organized and existing under the laws of the State of California. SCE's principal place of business is 2244 Walnut Grove Avenue, Post Office Box 800, Rosemead, California 91770.

Please address correspondence or communications in regard to this Application to:

Marc Luesebrink
Attorney
Southern California Edison Company
Post Office Box 800
Rosemead, California 91770
Phone: (626) 302-6832
Fax: (626) 302-1926

With a copy to:

Case Administration
Southern California Edison Company
2244 Walnut Grove Avenue
Post Office Box 800
Rosemead, California 91770
Phone: (626) 302-3101
Fax: (626) 302-3119

B. Articles Of Incorporation

A copy of SCE's Restated Articles of Incorporation, as amended through June 1, 1993, and as presently in effect, certified by the California Secretary of State, was filed with the Commission on June 15, 1993, in connection with Application No. 93-06-022⁶ and is incorporated herein by reference; pursuant to Rule 2.2 of the Commission's Rules of Practice and Procedure.

C. Balance Sheet And Statement Of Income

Appendix A to this Application contains copies of SCE's balance sheet and statement of income as of September 30, 2010. The balance sheet reflects SCE's utility plant at original cost, less accumulated depreciation.

Since 1954, pursuant to Commission Decision No. 49665 dated February 16, 1954, in Application No. 33952, as modified by Decision No. 91799 in 1980, SCE has utilized straight-line remaining life depreciation for computing depreciation expense for accounting and ratemaking purposes in connection with its operations.

Pursuant to Commission Decision No. 59926, dated April 12, 1960, SCE uses accelerated depreciation for income tax purposes and "flows through" reductions in income tax to customers within the Commission's jurisdiction for property placed in service prior to 1981. Pursuant to Decision No. 93848 in OII-24, SCE uses the Accelerated Cost Recovery System (ACRS) for federal income tax purposes and "normalizes" reductions in income tax to customers for property placed in service after 1980 in compliance with the Economic Recovery Tax Act of 1981, and also in compliance with the Tax Reform Act of 1986. Pursuant to Decision No. 88-01-061, dated January 28, 1988, SCE uses a gross of tax interest rate in calculating the AFUDC Rate, and income tax normalization to account for the increased income tax expense occasioned by the Tax

⁶ Application No. 93-06-22, filed June 15, 1993, regarding approval of a Self-Generation Deferral Agreement between Mobile Oil Corporation Torrance Refinery and Southern California Edison Company.

Relief Act of 1986 provisions requiring capitalization of interest during construction for income tax purposes.

D. Description of Southern California Edison Company

SCE is an investor-owned public utility engaged in the business of generating, transmitting, and distributing electric energy in portions of central and southern California. In addition to its properties in California, it owns, in some cases jointly with others, facilities in Nevada, Arizona, and New Mexico, its share of which produces power and energy for the use of its customers in California. In conducting such business, SCE operates an interconnected and integrated electric utility system.

E. Service Territory

SCE's service territory is located in 15 counties in central and southern California, consisting of Fresno, Imperial, Inyo, Kern, Kings, Los Angeles, Madera, Mono, Orange, Riverside, San Bernardino, Tulare, Tuolumne⁷, and Ventura Counties, and includes approximately 179 incorporated communities as well as outlying rural territories. A list of the counties and municipalities served by SCE is attached hereto as Appendix B. SCE also supplies electricity to certain customers for resale under tariffs filed with the Federal Energy Regulatory Commission.

F. Location Of Items Required In A Permit To Construct Pursuant To G.O. 131-D, Section IX.B

Much of the information required to be included in a PTC application pursuant to G.O. 131-D, Section IX.B is found in the PEA.

⁷ SCE provides electric service to a small number of customer accounts in Tuolumne County and is not subject to franchise requirements.

Required PTC application information has been cross-referenced to the PEA in the following text. The PTC application requirements of G.O. 131-D, Section IX.B are in italics, and the PEA references follow in plain text.

- a. *A description of the proposed power line or substation facilities, including the proposed power line route; proposed power line equipment, such as tower design and appearance, heights, conductor sizes, voltages, capacities, substations, switchyards, etc., and a proposed schedule for authorization, construction, and commencement of operation of the facilities.*
- Descriptions of the Proposed Project are found in the Executive Summary, Chapter 2, Chapter 3, and throughout Chapter 4.
- The substation site is described in Section 3.1.1 (“Downs Substation Description”) and illustrated in Figures 3.1-1, 3.1-2, 3.2-1 and 4.4-1.
- The physical characteristics of the proposed upgrades to the substation and equipment are described and illustrated in Section 3.1.1 (“Downs Substation Description”), including Subsections 3.1.1.1 through 3.1.1.5, and Figures 3.1-1, 3.1-2, 3.1-3 and 3.1-4. The physical characteristics and routes of the 115 kV subtransmission line loops and relevant poles are described and illustrated in Section 3.1.2 (“115 kV Subtransmission Line Description”), including Subsections 3.1.2.1 through 3.1.2.2, and Figures 1.1-2, 3.1-4, 3.1-5, 3.1-7 through 3.1-15.
- The Project Schedule is attached to this Application as Appendix C.
- b. *A map of the proposed power line routing or substation location showing populated areas, parks, recreational areas, scenic areas, and existing electrical transmission or power lines within 300 feet of the proposed route or substation.*
- Regional (Figures 1.1-1, 1.3-1, 3.1-8 through 3.1-15, 4.14-1 and 4.16-1) and Proposed Project area (Figures 3.1-1, 3.1-2) maps and aerial photographs showing existing features, including land uses and populated areas, are provided in the PEA.
- Maps of current land uses, including designation of parks, recreational, and scenic areas are provided as Figures 3.1-2, 3.2-1, 4.1-2, 4.10-1, 4.10-2 and 4.14-1.
- Maps of the substation location are provided at Figures 3.1-1 and 3.1-2, and maps of the 115 kV subtransmission line loop route, and proximity to existing electrical transmission and power lines are provided at Figures 1.1-2, 3.1-4 and 3.1-6 through 3.1-15.

- c. *Reasons for adoption of the power line route or substation location selected, including comparison with alternative routes or locations, including the advantages and disadvantages of each.*
- Reasons for the adoption of the site for the proposed substation expansion and 115 kV subtransmission line loops and relevant poles, including the infeasibility and additional environmental impacts associated with alternative sites, are discussed in Section 2.2. As discussed therein, no alternative substation site locations could reasonably be expected to allow for development of the Proposed Project as feasibly as the proposed site while also reducing environmental impacts. Among other things, the existing Downs Substation already houses equipment used for the existing substation, and the expansion work will start with utilizing that existing equipment. In addition, the existing Inyokern-McGen-Searles No.2 115kV subtransmission line runs adjacent to the existing substation site. In contrast, developing the Proposed Project at an alternative location would necessitate additional work and cause additional environmental impacts, and would be less feasible from an economic perspective given that SCE already owns the entire site for which the Proposed Project is currently proposed.
- d. *A listing of the governmental agencies with which proposed power line route or substation location reviews have been undertaken, including a written agency response to applicant's written request for a brief position statement by that agency. (Such listing shall include The Native American Heritage Commission, which shall constitute notice on California Indian Reservation Tribal governments.) In the absence of a written agency position statement, the utility may submit a statement of its understanding of the position of such agencies.*
- SCE met with representatives from the City of Ridgecrest on several occasions in February, May, July, August, September and October 2010. These representatives included Mayor Pro-Tem Ron Carter; Public Works Director Dennis Speer; City Council Member Jerry Taylor; City Council Member Chip Holloway; Mayor Steve Morgan; City Council Member Tom Wiknich; Parks Recreation & Cultural Affairs Director Jim Poney; City Engineer Lauren Culp; and City Manager Kurt Wilson. Proposed Project information, including the location of the Downs Substation and the location and routes of the proposed subtransmission line loops and fiber optic telecommunication cable, was presented and discussed at these meetings. In addition, in October 2010, SCE gave a presentation about the Proposed Project at a regular public meeting of the Ridgecrest City Council, and was agendaized as part of the City Council's regular meeting agenda. Council meetings are publicized on the City's website and are attended by city staff and members of the public. A written statement from the City of Ridgecrest to the California Public Utilities Commission, dated November 9, 2010, is attached to the PEA in Appendix I. In addition, the City of Ridgecrest recently included a positive reference to the Proposed Project in its "State of the City 2010" video. SCE understands the position of the City to be favorable towards the Proposed Project.

- SCE met with representatives from the County of Kern during September 2010, including the Honorable Jon McQuiston, Supervisor from the First District, in whose district the Downs Substation property is located. Proposed Project information, including the location of the Downs Substation and the location and routes of the proposed subtransmission line loop-ins and fiber optic telecommunication cable, was presented and discussed. SCE believes the position of the County of Kern to be favorable towards the Proposed Project.
- SCE met with representatives from the County of San Bernardino, including the Honorable Brad Mitzelfelt, Supervisor from the First District, in whose district the Downs Substation property is located, on December 6, 2010. Proposed Project information, including the location of the Downs Substation and the location and routes of the proposed subtransmission line loop-ins and fiber optic telecommunication cable, was presented and discussed.
- SCE has communicated with representatives from the United States Bureau of Land Management (BLM) regarding the Proposed Project on several occasions. For example, on June 17, 2010, SCE submitted two separate SF299 Applications for Transportation and Utility Systems and Facilities on Federal Lands (“SF299 Applications”) for BLM authorization to consolidate existing right of way grants benefiting SCE (“ROW grants”) into a single grant and to amend the ROW grants to allow the installation of fiber optic telecommunication cable on existing SCE facilities over BLM lands. Copies of the SF299 Applications submitted to BLM are attached to the PEA in Appendix I. In addition, an in-person meeting was held with BLM representative Paul Rodriguez on September 21, 2010. Proposed Project information, including the location of the Downs Substation and the location and routes of the proposed subtransmission line loop-ins and fiber optic telecommunication cable, was presented and discussed. SCE believes the position of the BLM to be favorable towards the Proposed Project.
- SCE sent written correspondence to Captain Jeffrey Dodson, a representative of the United States Department of Navy (“Navy”) and Commanding Officer of CLNAWS, on August 24, 2010. Proposed Project information, including information regarding the Downs Substation and the proposed subtransmission line loop-ins and fiber optic telecommunication cable, was discussed in that correspondence, as was SCE’s request that the Navy review and provide its approval of the SF299 Applications for the portions of the ROW grants applicable to CLNAWS lands. Copies of SCE’s SF299 Applications submitted to BLM for an amendment the existing ROW grants were also included in this written correspondence, which is attached to the PEA in Appendix I. SCE believes the position of the Navy to be favorable towards the Proposed Project.
- On April 20, 2010, a request was made (by facsimile) to the Native American Heritage Commission (NAHC) to conduct a records search of the Sacred Lands File for cultural resources that may be affected by the Proposed Project. The

NAHC responded on May 3, 2010, stating that a search of the Sacred Lands File did not indicate the presence of Native American cultural resources within one-half mile of the Proposed Project site. A list of Native American individuals and organizations that may have knowledge of cultural resources in the Proposed Project area was enclosed in the response from NAHC. Correspondence was initiated on May 7, 2010 with the Tule River Indian Tribe, the Kawaiisu Tribe of Tejon Reservation, Mr. Ron Wermuth, Kitanemuk & Yowlumne Tejon Indians, the Kern Valley Indian Council, the Tejon Indian Tribe, and the Tubatulabals of Kern Valley. The Proposed Project was briefly described and participation in the project review process was encouraged, to enhance preservation of sacred lands or resources that might be present within the Proposed Project area of potential effect. Copies of the May 7, 2010 written correspondence are attached to the PEA in Appendix I. To date, no response has been received.

- e. *A PEA or equivalent information on the environmental impact of the project in accordance with the provisions of CEQA and this Commission's Rules of Practice and Procedure Rule 2.4 [formerly 17.1 and 17.3]. If a PEA is filed, it may include the data described in Items a. through d. above.*
- A PEA is attached to this Application.

G. Compliance With G.O. 131-D, Section X

G.O. 131-D, Section X, requires applications for a PTC to describe measures taken to reduce potential exposure to electric and magnetic fields (EMF) generated by the proposed facilities. A complete description of EMF-related issues is contained in SCE's EMF Field Management Plan for the Proposed Project, which is attached as Appendix F to this Application.

H. Compliance With Rule 2.1(c)

In compliance with Rule 2.1(c) of the Commission's Rules of Practice and Procedure (California Code of Regulations, Title 20), SCE is required to state in this Application "[t]he proposed category for the proceeding, the need for hearing, the issues to be considered, and a proposed schedule." SCE proposes to categorize this Application as a rate-setting proceeding. SCE anticipates that a hearing will not be necessary. This proceeding involves the Commission's: (1) environmental review of the Proposed Project in compliance with the California Environmental Quality Act (CEQA) (Public Resources Code § 21000 et seq.) and the Commission's G.O. 131-D; and (2) issuance of a PTC authorizing SCE to construct the Proposed Project.

SCE suggests the following proposed schedule for this Application:

December 2010	Application filed
January 2011	Application accepted as complete
February 2011	Initial Study issued
December 2011	Draft Mitigated Negative Declaration (MND) issued
March 2012	Final MND issued
June 2012	Proposed Decision issued
July 2012	Final Decision issued

I. Statutory Authority

This Application is made pursuant to the provisions of CEQA, G.O. 131-D, the Commission's Rules of Practice and Procedure, and prior orders and resolutions of the Commission.

J. Public Notice

Pursuant to G.O. 131-D, Section XI.A, notice of this Application shall be given: (1) to certain public agencies and legislative bodies; (2) to owners of property located on or within 300 feet of the project area; (3) by advertisement in a newspaper or newspapers of general circulation; and (4) by posting a notice on-site and off-site at the project location.

SCE has given, or will give, proper notice within the time limits prescribed in G.O. 131-D. A copy of the Notice of Application for a Permit to Construct and list of newspapers which will publish the notice are contained in Appendix D. A copy of the Certificate of Service of Notice of Application for a Permit to Construct and a service list are contained in Appendix E.

K. Supporting Appendices And Attachment

Appendices A through E and the attached PEA listed below are made a part of this Application:

- Appendix A: Balance Sheet and Statement of Income as of September 30, 2010.
- Appendix B: List of Counties and Municipalities Served by SCE
- Appendix C: Downs Substation Project Schedule
- Appendix D: Notice of Application for a Permit to Construct
- Appendix E: Certificate of Service of Notice of Application for a Permit to Construct
- Appendix F: Field Management Plan
- Attachment: Proponent's Environmental Assessment

L. Compliance With Rule 2.5

In accordance with Rule 2.5 of the Commission's Rules of Practice and Procedure, SCE is enclosing a deposit to be applied to the costs the Commission incurs to prepare a negative declaration or an environmental impact report for the Proposed Project.

M. Request For Ex Parte Relief

SCE requests that the relief requested in this Application be provided ex parte as provided for in G.O. 131-D, Section IX.B.6.

N. Request For Timely Relief

SCE requests the Commission to issue a decision within the time limits prescribed by Government Code Section 65920 et seq. (the Permit Streamlining Act) as provided for in G.O. 131-D, Section IX.B.6.

Moreover, as addressed in the same subsection of G.O. 131-D, SCE requests that the Commission refrain from assigning an ALJ to this proceeding, unless a valid protest is received by the Commission, and in the absence of any valid protest allow the Energy Division to process this Application.⁸

^{8/} D.95-08-038, Appendix A, p. 25.

IV.

CONCLUSION

SCE respectfully requests the Commission to issue a PTC authorizing SCE to construct the Downs Substation Project described in this Application and the attached PEA. SCE further requests that the relief be provided ex parte and within the time limits prescribed by the Permit Streamlining Act.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

/s/James A. Kelly

By: James A. Kelly
Senior Vice President

/s/ Marc Luesebrink

By: Marc Luesebrink
Attorney for
SOUTHERN CALIFORNIA EDISON COMPANY
2244 Walnut Grove Avenue
Post Office Box 800
Rosemead, California 91770
Telephone: (626) 302-6832
Facsimile: (626) 302-1926

VERIFICATION

I am an officer of the applicant corporation herein, and am authorized to make this verification on its behalf. I am informed and believe that the matters stated in the foregoing document are true.

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

Executed this 29th day of December, 2010, at Rosemead, California.

/s/James A. Kelly

James A. Kelly

Senior Vice President

SOUTHERN CALIFORNIA EDISON COMPANY

Telephone: (626) 302-4883

Appendix A
BALANCE SHEET AND STATEMENT OF INCOME
AS OF SEPTEMBER 30, 2010

SOUTHERN CALIFORNIA EDISON COMPANY

BALANCE SHEET

September 30, 2010

A S S E T S

(Unaudited)

(Millions of Dollars)

UTILITY PLANT:

Utility plant, at original cost	\$26,478
Less - Accumulated depreciation	(6,097)
	<hr/> 20,381
Construction work in progress	3,020
Nuclear fuel, at amortized cost	340
	<hr/> 23,741

OTHER PROPERTY AND INVESTMENTS:

Nonutility property - less accumulated depreciation of \$98	69
Nuclear decommissioning trusts	3,347
Other Investments	84
	<hr/> 3,500

CURRENT ASSETS:

Cash and equivalents	857
Short-term investments	4
Receivables, less allowances of \$59 for uncollectible accounts	887
Accrued unbilled revenue	612
Inventory	326
Derivative assets	69
Regulatory assets	404
Other current assets	69
	<hr/> 3,228

DEFERRED CHARGES:

Regulatory assets	5,227
Derivative assets	192
Other long-term assets	339
	<hr/> 5,758
	<hr/> \$36,227

SOUTHERN CALIFORNIA EDISON COMPANY

BALANCE SHEET

September 30, 2010

CAPITALIZATION AND LIABILITIES

(Unaudited)

(Millions of Dollars)

CAPITALIZATION:

Common stock	\$2,168
Additional paid-in capital	566
Accumulated other comprehensive loss	(17)
Retained Earnings	5,496
Common shareholder's equity	<u>8,213</u>
Preferred and preference stock not subject to redemption requirements	920
Long-term debt	7,626
	<u>16,759</u>

CURRENT LIABILITIES:

Accounts payable	1,146
Accrued taxes	150
Accrued interest	98
Customer deposits	224
Derivative liabilities	225
Regulatory liabilities	804
Other current liabilities	513
	<u>3,160</u>

DEFERRED CREDITS:

Deferred income taxes	4,173
Deferred investment tax credits	98
Customer advances	114
Derivative liabilities	1,298
Pensions and benefits	1,757
Asset retirement obligations	3,326
Regulatory liabilities	3,663
Other deferred credits and other long-term liabilities	1,879
	<u>16,308</u>
	<u>\$36,227</u>

SOUTHERN CALIFORNIA EDISON COMPANY

STATEMENT OF INCOME

9 MONTHS ENDED SEPTEMBER 30, 2010

(Unaudited)

(Millions of Dollars)

OPERATING REVENUE	<u>\$7,504</u>
OPERATING EXPENSES:	
Fuel	275
Purchased power	2,337
Operation and maintenance	2,272
Depreciation, decommissioning and amortization	945
Property and other taxes	195
Gain on Sale of assets	<u>(1)</u>
Total operating expenses	<u>6,023</u>
OPERATING INCOME	1,481
Interest income	5
Other income	103
Interest expense - net of amounts capitalized	(315)
Other expenses	<u>(39)</u>
INCOME BEFORE INCOME TAX	1,235
INCOME TAX EXPENSE	<u>338</u>
NET INCOME	<u>897</u>
Less: Dividends on preferred and preference stock not subject to mandatory redemption	<u>39</u>
NET INCOME AVAILABLE FOR COMMON STOCK	<u><u>\$858</u></u>

Appendix B

LIST OF COUNTIES AND MUNICIPALITIES

SOUTHERN CALIFORNIA EDISON COMPANY

Citizens or some of the citizens of the following counties and municipal corporations will or may be affected by the changes in rates proposed herein.

COUNTIES

Fresno	Kings	Orange	Tuolumne*
Imperial	Los Angeles	Riverside	Tulare
Inyo	Madera	San Bernardino	Ventura
Kern	Mono	Santa Barbara	

MUNICIPAL CORPORATIONS

Adelanto	Cudahy	Irwindale	Newport Beach	Santa Barbara
Agoura Hills	Culver City	La Canada Flintridge	Norco	Santa Clarita
Alhambra	Cypress	La Habra	Norwalk	Santa Fe Springs
Aliso Viejo	Delano	La Habra Heights	Ojai	Santa Monica
Apple Valley	Desert Hot Springs	La Mirada	Ontario	Santa Paula
Arcadia	Diamond Bar	La Palma	Orange	Seal Beach
Artesia	Downey	La Puente	Oxnard	Sierra Madre
Avalon	Duarte	La Verne	Palm Desert	Signal Hill
Baldwin Park	Eastvale	Laguna Beach	Palm Springs	Simi Valley
Barstow	El Centro	Laguna Hills	Palmdale	South El Monte
Beaumont	El Monte	Laguna Niguel	Palos Verdes Estates	South Gate
Bell	El Segundo	Laguna Woods	Paramount	South Pasadena
Bell Gardens	Exeter	Lake Elsinore	Perris	Stanton
Bellflower	Farmersville	Lake Forest	Pico Rivera	Tehachapi
Beverly Hills	Fillmore	Lakewood	Placentia	Temecula
Bishop	Fontana	Lancaster	Pomona	Temple City
Blythe	Fountain Valley	Lawndale	Port Hueneme	Thousand Oaks
Bradbury	Fullerton	Lindsay	Porterville	Torrance
Brea	Garden Grove	Loma Linda	Rancho Cucamonga	Tulare
Buena Park	Gardena	Lomita	Rancho Mirage	Tustin
Calabasas	Glendora	Long Beach	Rancho Palos Verdes	Twentynine Palms
California City	Goleta	Los Alamitos	Rancho Santa Margarita	Upland
Calimesa	Grand Terrace	Lynwood	Redlands	Vernon
Camarillo	Hanford	Malibu	Redondo Beach	Victorville
Canyon Lake	Hawaiian Gardens	Mammoth Lakes	Rialto	Villa Park
Carpinteria	Hawthorne	Manhattan Beach	Ridgecrest	Visalia
Carson	Hemet	Maywood	Rolling Hills	Walnut
Cathedral City	Hermosa Beach	McFarland	Rolling Hills Estates	West Covina
Cerritos	Hesperia	Menifee	Rosemead	West Hollywood
Chino	Hidden Hills	Mission Viejo	San Bernardino	Westlake Village
Chino Hills	Highland	Monrovia	San Buenaventura	Westminster
Claremont	Huntington Beach	Montclair	San Dimas	Whittier
Commerce	Huntington Park	Montebello	San Fernando	Wildomar
Compton	Indian Wells	Monterey Park	San Gabriel	Woodlake
Corona	Industry	Moorpark	San Jacinto	Yorba Linda
Costa Mesa	Inglewood	Moreno Valley	San Marino	Yucaipa
Covina	Irvine	Murrieta	Santa Ana	Yucca Valley

*SCE provides electric service to a small number of customer accounts in Tuolumne County and is not subject to franchise requirements.

Appendix C

DOWNS SUBSTATION PROJECT SCHEDULE

Proposed Downs Substation Project Schedule

<u>Date</u>	<u>Event</u>
December 2010	Application filed
January 2011	Application accepted as complete
February 2011	Initial Study issued
December 2011	Draft Mitigated Negative Declaration (MND) issued
March 2012	Final MND issued
June 2012	Proposed Decision issued
July 2012	Final Decision issued
August 2013	Commence construction
June 2014	Operating date

Appendix D

NOTICE OF APPLICATION FOR A PERMIT TO CONSTRUCT

NOTICE OF APPLICATION FOR A PERMIT TO CONSTRUCT

DOWN'S SUBSTATION PROJECT

Date: December 29, 2010

Proposed Project: Southern California Edison Company (SCE) has filed an application with the California Public Utilities Commission (CPUC) for a Permit to Construct (PTC) for the Downs Substation Project (Proposed Project). The Proposed Project includes the following elements:

- Upgrading and expanding the existing Downs 33/12 kV Substation to a 115/12 kV substation containing a 33 kV switchrack on approximately 2.5-acres of a 4.6-acre parcel owned by SCE, generally located south of Ridgecrest Boulevard and west of Downs Street and adjacent to SCE's existing Downs 33/12 kV Substation in the City of Ridgecrest.
- Routing an existing 115 kV subtransmission line into and out of the substation to create two new line segments. The two segments are approximately 800 circuit feet and 200 circuit feet in length.
- Installing approximately 58 miles of fiber optic telecommunication cable primarily on existing wood poles (six of which would have to be replaced) to provide communication circuits for the protection, monitoring, and control of subtransmission and substation equipment.

Demand for electricity in the City of Ridgecrest and the surrounding areas of unincorporated Kern and San Bernardino Counties continues to grow and is projected to exceed the capacity of SCE's local and regional electric system. The increased demand is due in part to growth in existing customer demand, and in part to planned new development projects in the region. SCE forecasts that the projected peak demand for 2011 would exceed the operating limits of the existing Downs 33/12 kV Substation. SCE's existing facilities do not have the capacity to handle the increased demand and load growth. SCE is proposing the Downs Substation Project to meet the growing demand, improve reliability and improve operational flexibility.

Construction is scheduled to begin in the late summer 2013. The Proposed Project is planned to be operational by June 2014.

Environmental Assessment: SCE has prepared a Proponent's Environmental Assessment (PEA) which includes analysis of potential environmental impacts that could be created by the construction and operation of the Proposed Project. The PEA concludes that any potentially significant environmental impacts associated with the Proposed Project would be reduced to a less than significant level through the implementation of Applicant-Proposed Measures (APMs).

EMF Compliance: The CPUC requires utilities to employ "no-cost" and "low-cost" measures to reduce public exposure to electric and magnetic fields (EMF). In accordance with "EMF Design Guidelines" filed with the CPUC in compliance with CPUC Decisions 93-11-013 and 06-01-042, SCE would implement the following measure(s) for the proposed project:

1. Utilizing subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria
2. Utilizing subtransmission line construction that reduces the space between conductors compared with other designs
3. Placing major substation electrical equipment (such as transformers, switchracks, buses and underground duct banks) away from the substation property lines
4. Configuring the transfer and operating buses with the transfer bus closest to the nearest property line

Public Review Process: SCE has filed an application with the CPUC for a PTC for the Proposed Project. Pursuant to the CPUC Rules of Practice and Procedure, any affected party may, within 30 days of the date on this notice (i.e., no later than January 28, 2011), protest, and request that the CPUC hold hearings on the application. If the CPUC as a result of its investigation determines that public hearings should be held, notice shall be sent to each person or entity who is entitled to notice or who has requested a hearing.

All protests must be mailed to the CPUC and SCE concurrently and should include the following:

1. Your name, mailing address, and daytime telephone number
2. Reference to the project name identified above
3. A clear and concise description of the reason for the protest

Protest for this Application must be mailed WITHIN 30 CALENDAR DAYS to:

California Public Utilities Commission Docket Office, Room 2001 505 Van Ness Avenue San Francisco, CA 94102	AND Southern California Edison Co. Law Dept. - Exception Mail 2244 Walnut Grove Avenue Rosemead, CA 91770 Attention: Meraj Rizvi	AND California Public Utilities Commission Director, Energy Division 505 Van Ness Avenue, 4 th Floor San Francisco, CA 94102
-------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------

For assistance in filing a protest, please call the CPUC's Public Advisor in San Francisco at (415) 703-2074 or in Los Angeles at (213) 576-7055.

To review a copy of SCE's Application, or to request further information, please contact:

Daniel Brady

Mammoth Lakes Service Center
3001 Chateau Road
Mammoth Lakes, CA 92595

Phone: (760) 709-1146

Fax: (760) 934-8258

Daniel.Brady@sce.com

LIST OF NEWSPAPER(S)
PUBLISHING THE NOTICE OF APPLICATION
FOR A PERMIT TO CONSTRUCT

Ridgecrest Daily Independent
224 E. Ridgecrest Blvd.
Ridgecrest, CA 93556
Phone: (760) 375-4481
Fax: (760) 375-4880

Appendix E

**CERTIFICATE OF SERVICE OF NOTICE OF APPLICATION
FOR A PERMIT TO CONSTRUCT**

CERTIFICATE OF SERVICE

I hereby certify that, pursuant to the Commission's Rules of Practice and Procedure, I have this day served a true copy of **NOTICE OF APPLICATION OF SOUTHERN CALIFORNIA EDISON COMPANY (U-338-3) FOR A PERMIT TO CONSTRUCT ELECTRICAL FACILITIES WITH VOLTAGES BETWEEN 50 KV AND 200 KV: DOWNS SUBSTATION PROJECT** on all parties identified on the attached service list(s).

Service was effected by one or more means indicated below:

Placing copies in properly addressed sealed envelopes and depositing such copies in the United States mail with first-class postage prepaid to all parties.

Executed this 29th day of December, 2010, at Rosemead, California.

/s/Meraj Rizvi

MERAJ RIZVI
Project Analyst
SOUTHERN CALIFORNIA EDISON COMPANY

2244 Walnut Grove Avenue
Post Office Box 800
Rosemead, California 91770

DOWNS SUBSTATION PROJECT AGENCY SERVICE LIST

Hon. Steven Morgan Mayor City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555	Hon. Ron Carter Mayor Pro-Tem City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555	Hon. Thomas Wiknich Vice Mayor City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555
Hon. Chip Holloway Council Member City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555	Hon. Jerry Taylor Council Member City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555	Kurt Wilson City Manager City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555
Dennis Speer Director of Public Works City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555	Jim Ponek Director of Parks, Recreation, and Cultural Affairs City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555	Gary Parsons Economic Development Manager City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555
Jim McRea Director of Public Services City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555	Matthew Alexander City Planner City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555	Nellavan Jeglum, Chair City of Ridgecrest Planning Commission City of Ridgecrest 100 W. California Ave. Ridgecrest, CA 93555
Hon. Jon McQuiston First District Supervisor Kern County 1115 Truxtun Avenue, 5th Floor Bakersfield, CA 93301	Leticia Perez, Chair Kern County Planning Commission 2700 "M" Street, Suite 100 Bakersfield, CA 93301	Hon. Brad Mitzelfelt First District Supervisor San Bernardino County 385 N. Arrowhead Ave., 5th Fl. San Bernardino, CA 92415-0110
Michael Cramer, Chairman San Bernardino County Planning Commission 385 N. Arrowhead Avenue, 1 st Fl. San Bernardino, CA 92415-0182		
Melissa Jones, Executive Director California Energy Commission 1516 Ninth Street Sacramento, CA 95814-5512	Karen Miller, CPUC Public Advisor California Public Utilities Commission 505 Van Ness Avenue San Francisco, CA 94102	Julie Fitch, Energy Division California Public Utilities Commission 505 Van Ness Avenue San Francisco, CA 94102
Karen Clopton, Chief ALJ California Public Utilities Commission 505 Van Ness Avenue San Francisco, CA 94102	Paul Clanon, Executive Director California Public Utilities Commission 505 Van Ness Avenue San Francisco, CA 94102	

Randell Iwasaki, Director California Department of Transportation PO Box 942873 Sacramento, CA 94273-0001	Sandra Shewry, Director Department of Health Services 1501 Capitol Ave., Suite 6001 Sacramento, CA 94234-7320	Lester Snow, Secretary Secretary of the Resources Agency 1416 Ninth St., Suite 1311 Sacramento, CA 95814
Donald Koch, Director Department of Fish and Game Headquarters 1416 Ninth Street Sacramento, CA 95814	Dorothy Rice, Executive Director State Water Resources Control Board 1001 "I" Street Sacramento, CA 95814	Richard Corey, Division Chief California Air Resources Board Stationary Source Division PO Box 2815 Sacramento, CA 95812
Gary Cathey, Division of Aeronautics California Department of Transportation Division of Aeronautics, MS # 40 Acting Chief PO Box 942874	Executive Officer Harold Singer California Regional Water Quality Control Board Victorville Office 14440 Civic Drive, Suite 200 Victorville, CA 92392	Dr. Ray Wolfe, Director California Department of Transportation District 8 464 West 4 th Street San Bernardino, CA 92401
Sharri Bender Ehlert, Interim Director California Department of Transportation District 6 P.O. Box 12616 Fresno, CA 93778-2616	Eldon Heaston, Executive Director Mojave Desert AQMD Mojave Desert Air Quality Management District 14306 Park Avenue Victorville, CA 92392-2310	David L. Jones, Air Pollution Control Officer Eastern Kern County Air Pollution Control District 2700 M Street, Suite 302 Bakersfield, CA 93301-2370
Paul Rodriguez Bureau of Land Management Ridgecrest Field Office 300 South Richmond Road Ridgecrest, CA 93555	China Lake Naval Air Weapons Station Code WR2P60 (Sean Halpin) 429 East Bowen St., Stop 4002 China Lake, CA 93555-6108	

DOWNNS SUBSTATION 300' PROPERTY OWNERS SERVICE LIST

APN	MAILING ADDRESS	MAILING CITY	MAILING STATE	MAILING ZIP	SITE ADDRESS	SITE CITY	SITE STATE	SITE ZIP	SITE COUNTY
067-050-18-00	PO BOX 1627	RIDGECREST	CA	93556		RIDGECREST	CA	93555	KERN
067-050-19-00	PO BOX 1627	RIDGECREST	CA	93556	824 W RIDGECREST BLVD	RIDGECREST	CA	93555	KERN
456-081-12-00	1730 BAY RD 322	EAST PALO ALTO	CA	94303	1026 E RIDGECREST BLVD	RIDGECREST	CA	93555	KERN
456-090-07-00	10801 LINDLEY AVE	GRANADA HILLS	CA	91344		RIDGECREST	CA	93555	KERN
456-090-09-00	1124 DENISE AVE	RIDGECREST	CA	93555		RIDGECREST	CA	93555	KERN
456-090-12-00	1100 W RIDGECREST BLVD	RIDGECREST	CA	93555		RIDGECREST	CA	93555	KERN
477-010-07-00	310 MESQUITE AVE	RIDGECREST	CA	93555	825 W RIDGECREST BLVD	RIDGECREST	CA	93555	KERN
477-010-11-00	501 W RIDGECREST BLVD	RIDGECREST	CA	93555		RIDGECREST	CA	93555	KERN
477-010-15-00	PO BOX 1358	RIDGECREST	CA	93556		RIDGECREST	CA	93555	KERN
477-010-16-00	PO BOX 1358	RIDGECREST	CA	93556		RIDGECREST	CA	93555	KERN
477-010-17-00	PO BOX 1358	RIDGECREST	CA	93556	132 S DOWNS ST	RIDGECREST	CA	93555	KERN
477-010-18-00	PO BOX 1358	RIDGECREST	CA	93556		RIDGECREST	CA	93555	KERN
508-020-04-00	2544 N CROSSGATE ST	ORANGE	CA	92867		RIDGECREST	CA	93555	KERN
508-020-05-00	2544 N CROSSGATE ST	ORANGE	CA	92867		RIDGECREST	CA	93555	KERN
508-020-06-00	2131 WALNUT GROVE AVE 2 ND FLOOR	ROSEMEAD	CA	91770		RIDGECREST	CA	93555	KERN
508-020-07-00	2131 WALNUT GROVE AVE 2 ND FLOOR	ROSEMEAD	CA	91770		RIDGECREST	CA	93555	KERN
508-020-08-00	139 BALSAM ST	RIDGECREST	CA	93555		RIDGECREST	CA	93555	KERN
508-020-10-00	1142 PALOMA DR	ARCADIA	CA	91007		RIDGECREST	CA	93555	KERN

Appendix F

FIELD MANAGEMENT PLAN

Downs 115/12 kV Substation Project

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List of Terms

ACSR	Aluminum Conductor Steel Reinforced
CDHS	California Department of Health Services
C/L	center line
CPCN	Certificate of Public Convenience and Necessity
CPUC	California Public Utilities Commission
ELF	Extremely Low Frequency
EMF	electric and magnetic fields
FRC	Fault Return Conductor
FMP	field management plan
GO	General Order
Hz	Hertz
IARC	International Agency for Research on Cancer
kV	kilovolt
LWS	light weight steel
mG	milliGauss
MVA	megavolt-ampere
MW	megawatt
NIEHS	National Institute of Environmental Health Sciences
NRPB	National Radiation Protection Board
PEA	Proponents Environmental Assessment
PTC	Permit to Construct
RAPID	Research and Public Information Dissemination
ROW	right-of-way
SCE	Southern California Edison
TSP	tubular steel pole
WHO	World Health Organization

I. EXECUTIVE SUMMARY

This document is Southern California Edison Company's (SCE) Field Management Plan (FMP) for the proposed Downs 115/12 kilovolt (kV) Substation Project. SCE proposes to upgrade the existing Downs 33/12 kV Substation (Proposed Project) to meet forecasted electrical demand and maintain safe and reliable service to customers in portions of the City of Ridgecrest and the surrounding areas of unincorporated Kern County and San Bernardino County. In addition to serving the forecasted electrical demand within the Electrical Needs Area, the Proposed Project would improve system reliability and enhance operational flexibility. The Proposed Project would increase capacity at the existing Downs 33/12 kV Substation by replacing transformers and upgrading the Downs 33/12 kV Substation to a 115/12 kV substation. The Proposed Project would be served by looping an existing 115 kV subtransmission line into and out of the Downs Substation. Portions of the existing 115 kV subtransmission pole line are shared by both 33 kV and 12 kV distribution circuits.

The Proposed Project is planned to be operational in the year of 2014 and would include the following major electrical components:

- Upgrading and expanding the existing Downs 33/12 kV Substation to a 115/12 kV substation containing a 33 kV switchrack;
- Routing an existing 115 kV subtransmission line into and out of the proposed substation.

SCE provides this FMP in order to inform the public, the California Public Utilities Commission (CPUC), and other interested parties of its evaluation of “no-cost and low-cost” magnetic field reduction design options for this project, and SCE’s proposed plan to apply these design options to this project. This FMP has been prepared in accordance with CPUC Decision No. 93-11-013 and Decision No. 06-01-042 relating to extremely low frequency (ELF)¹ electric and magnetic fields (EMF). This FMP also provides background on the current status of scientific research related to possible health effects of EMF, and a description of the CPUC’s EMF policy.

The “no-cost and low-cost” magnetic field reduction design options that are incorporated into the design of the Proposed Project are as follows:

- Utilizing subtransmission structure heights that meet or exceed SCE’s preferred EMF design criteria;
- Utilizing subtransmission line construction that reduces the space between conductors compared with other designs;
- Placing major substation electrical equipment (such as transformers, switchracks, buses and underground duct banks) away from the substation property lines;
- Configuring the transfer and operating buses with the transfer bus closest to the nearest property line.

Table 1 on page 8 summarizes “no-cost and low-cost” magnetic field reduction design options that SCE considered for the Proposed Project.

SCE’s plan for applying the above “no-cost and low-cost” magnetic field reduction design options for the Proposed Project is consistent with CPUC’s EMF policy and with the

¹ The extremely low frequency is defined as the frequency range from 3 Hertz (Hz) to 3,000 Hz.

direction of leading national and international health agencies. Furthermore, the plan complies with SCE's EMF Design Guidelines², and with applicable national and state safety standards for new electrical facilities.

² EMF Design Guidelines, August 2006.

Table 1. Summary of “No-cost and Low-cost” Magnetic Field Reduction Design Options

Area No.	Location³	Adjacent Land Use⁴	MF Reduction Design Options Considered	Estimated Cost to Adopt	Design Option(s) Adopted? (Yes/No)	Reason(s) if not adopted
Downs Substation	Located on the southwest corner of Downs Street and Ridgecrest Boulevard in Ridgecrest, California	3,4	<ul style="list-style-type: none"> Placing major substation electrical equipment (such as transformers, switchracks, buses and underground duct banks) away from the substation property lines Configuring the transfer and operating buses with the transfer bus closest to the nearest property line 	<ul style="list-style-type: none"> No-Cost⁵ No-Cost 	<ul style="list-style-type: none"> Yes Yes 	
Loop-in Line Segment 1 Downs-McGen-Searles 115 kV	From the existing 115 kV line along Downs Street south-east of Downs Substation to the switchrack on the west side of the substation.	3,4	<ul style="list-style-type: none"> Utilizing subtransmission structure heights that meet or exceed SCE’s preferred EMF design criteria Utilizing subtransmission line construction that reduces the space between conductors compared with other designs 	<ul style="list-style-type: none"> No-Cost No-Cost 	<ul style="list-style-type: none"> Yes Yes 	

³ This column shows the major cross streets, existing subtransmission lines, or substation name as reference points.

⁴ Land usage codes are as follows: 1) schools, licensed day-cares, and hospitals, 2) residential, 3) commercial/industrial, 4) recreational, 5) agricultural, and 6) undeveloped land.

⁵ Included in the preliminary design

Area No.	Location³	Adjacent Land Use⁴	MF Reduction Design Options Considered	Estimated Cost to Adopt	Design Option(s) Adopted? (Yes/No)	Reason(s) if not adopted
Loop-in Line Segment 2 Downs- Inyokern 115 kV	From the existing 115 kV line along Ridgecrest Boulevard north-west of Downs Substation to the switchrack from the west side of the substation.	3,4	<ul style="list-style-type: none"> Utilizing subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria Utilizing subtransmission line construction that reduces the space between conductors compared with other designs 	<ul style="list-style-type: none"> No-Cost No-Cost 	<ul style="list-style-type: none"> Yes No 	<ul style="list-style-type: none"> Due to engineering requirements

II. BACKGROUND REGARDING EMF AND PUBLIC HEALTH RESEARCH ON EMF

There are many sources of power frequency⁶ electric and magnetic fields, including internal household and building wiring, electrical appliances, and electric power transmission and distribution lines. There have been numerous scientific studies about the potential health effects of EMF. After many years of research, the scientific community has been unable to determine if exposures to EMF cause health hazards. State and federal public health regulatory agencies have determined that setting numeric exposure limits is not appropriate.⁷

Many of the questions about possible connections between EMF exposures and specific diseases have been successfully resolved due to an aggressive international research program. However, potentially important public health questions remain about whether there is a link between EMF exposures and certain diseases, including childhood leukemia and a variety of adult diseases (e.g., adult cancers and miscarriages). As a result, some health authorities have identified magnetic field exposures as a possible human carcinogen. As summarized in greater detail below, these conclusions are consistent with the following published reports: the National Institute of Environmental Health Sciences (NIEHS) 1999⁸, the National Radiation Protection Board (NRPB) 2001⁹, the International Commission on non-Ionizing Radiation Protection (ICNIRP) 2001, the California Department of Health Services (CDHS) 2002¹⁰, and the International Agency for Research on Cancer (IARC) 2002¹¹.

⁶ In U.S., it is 60 Hz.

⁷ CPUC Decision 06-01-042, p. 6, footnote 10

⁸ National Institute of Environmental Health Sciences' Report on Health Effects from Exposures to Power-Line frequency Electric and Magnetic Fields, NIH Publication No. 99-4493, June 1999.

⁹ National Radiological Protection Board, Electromagnetic Fields and the Risk of Cancer, Report of an Advisory Group on Non-ionizing Radiation, Chilton, U.K. 2001

¹⁰ California Department of Health Services, An Evaluation of the Possible Risks from Electric and Magnetic Fields from Power Lines, Internal Wiring, Electrical Occupations, and Appliances, June 2002.

¹¹ World Health Organization / International Agency for Research on Cancer, IARC Monographs on the evaluation of carcinogenic risks to humans (2002), Non-ionizing radiation, Part 1: Static and extremely low-frequency (ELF) electric and magnetic fields, IARC Press, Lyon, France: International Agency for Research on Cancer, Monograph, vol. 80, p. 338, 2002

The federal government conducted EMF research as a part of a \$45-million research program managed by the NIEHS. This program, known as the EMF RAPID (Research and Public Information Dissemination), submitted its final report to the U.S. Congress on June 15, 1999. The report concluded that:

- “The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak.”¹²
- “The NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard.”¹³
- “The NIEHS suggests that the level and strength of evidence supporting ELF-EMF exposure as a human health hazard are insufficient to warrant aggressive regulatory actions; thus, we do not recommend actions such as stringent standards on electric appliances and a national program to bury all transmission and distribution lines. Instead, the evidence suggests passive measures such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. NIEHS suggests that the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards.”¹⁴

In 2001, Britain’s NRPB arrived at a similar conclusion:

“After a wide-ranging and thorough review of scientific research, an independent Advisory Group to the Board of NRPB has concluded that the power frequency electromagnetic fields that exist in the vast majority of homes are not a cause of cancer in general. However, some epidemiological studies do indicate a possible small risk of childhood leukemia associated with exposures to unusually high levels of power frequency magnetic fields.”¹⁵

In 2002, three scientists for CDHS concluded:

¹² National Institute of Environmental Health Sciences, NIEHS Report on Health Effects from Exposures to Power-Frequency Electric and Magnetic Fields, p. ii, NIH Publication No. 99-4493, 1999

¹³ *ibid.*, p. iii

¹⁴ *ibid.*, p. 37 - 38

¹⁵ NRPB, NRPB Advisory Group on Non-ionizing Radiation Power Frequency Electromagnetic Fields and the Risk of Cancer, NRPB Press Release May 2001

“To one degree or another, all three of the [C]DHS scientists are inclined to believe that EMFs can cause some degree of increased risk of childhood leukemia, adult brain cancer, Lou Gehrig’s Disease, and miscarriage.

They [CDHS] strongly believe that EMFs do not increase the risk of birth defects, or low birth weight.

They [CDHS] strongly believe that EMFs are not universal carcinogens, since there are a number of cancer types that are not associated with EMF exposure.

To one degree or another they [CDHS] are inclined to believe that EMFs do not cause an increased risk of breast cancer, heart disease, Alzheimer’s disease, depression, or symptoms attributed by some to a sensitivity to EMFs. However, all three scientists had judgments that were “close to the dividing line between believing and not believing” that EMFs cause some degree of increased risk of suicide, or

For adult leukemia, two of the scientists are ‘close to the dividing line between believing or not believing’ and one was ‘prone to believe’ that EMFs cause some degree of increased risk.”¹⁶

Also in 2002, the World Health Organization’s (WHO) IARC concluded:

“ELF magnetic fields are possibly carcinogenic to humans”¹⁷, based on consistent statistical associations of high-level residential magnetic fields with a doubling of risk of childhood leukemia...Children who are exposed to residential ELF magnetic fields less than 0.4 microTesla or equivalent to 4.0 milliGauss (mG), have no increased risk for leukemia.... In contrast, “no consistent relationship has been seen in studies of childhood brain tumors or cancers at other sites and residential ELF electric and magnetic fields.”¹⁸

In June of 2007, the WHO issued a report on their multi-year investigation of EMF and the possible health effects. After reviewing scientific data from numerous EMF and human health studies, they concluded:

“Scientific evidence suggesting that everyday, chronic low-intensity (above 0.3-0.4 μ T [3-4 mG]) power-frequency magnetic field exposure poses a health risk is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukemia.”¹⁹

¹⁶ CDHS, An Evaluation of the Possible Risks From Electric and Magnetic Fields (EMFs) From Power Lines, Internal Wiring, Electrical Occupations and Appliances, p. 3, 2002

¹⁷ IARC, Monographs, Part I, Vol. 80, p. 338

¹⁸ *ibid.*, p. 332 - 334

¹⁹ WHO, Environmental Health Criteria 238, EXTREMELY LOW FREQUENCY FIELDS, p. 11 - 13, 2007

“In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern.”²⁰

“A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in both children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease”²¹

“Furthermore, given both the weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia, and the limited impact on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus the costs of precautionary measures should be very low.”²²

III. APPLICATION OF THE CPUC’S “NO-COST AND LOW-COST” EMF POLICY TO THIS PROJECT

Recognizing the scientific uncertainty over the connection between EMF exposures and health effects, the CPUC adopted a policy that addresses public concern over EMF with a combination of education, information, and precaution-based approaches. Specifically, Decision 93-11-013 established a precautionary based “no-cost and low-cost” EMF policy for California’s regulated electric utilities based on recognition that scientific research had not demonstrated that exposures to EMF cause health hazards and that it was inappropriate to set numeric standards that would limit exposure.

²⁰ *ibid.*, p. 12

²¹ *ibid.*, p. 12

²² *ibid.*, p. 13

In 2006, the CPUC completed its review and update of its EMF Policy in Decision 06-01-042. This decision reaffirmed the finding that state and federal public health regulatory agencies have not established a direct link between exposure to EMF and human health effects,²³ and the policy direction that (1) use of numeric exposure limits was not appropriate in setting utility design guidelines to address EMF,²⁴ and (2) existing “no-cost and low-cost” precautionary-based EMF policy should be continued for proposed electrical facilities. The decision also reaffirmed that EMF concerns brought up during Certificate of Public Convenience and Necessity (CPCN) and Permit to Construct (PTC) proceedings for electric and transmission and substation facilities should be limited to the utility’s compliance with the CPUC’s “no-cost and low-cost” policies.²⁵

The decision directed regulated utilities to hold a workshop to develop standard approaches for EMF Design Guidelines and such a workshop was held on February 21, 2006. Consistent design guidelines have been developed that describe the routine magnetic field reduction measures that regulated California electric utilities consider for new and upgraded transmission line and transmission substation projects. SCE filed its revised EMF Design Guidelines with the CPUC on July 26, 2006.

“No-cost and low-cost” measures to reduce magnetic fields would be implemented for this project in accordance with SCE’s EMF Design Guidelines. In summary, the process of evaluating “no-cost and low-cost” magnetic field reduction measures and prioritizing within and between land usage classes considers the following:

²³ CPUC Decision 06-01-042, Conclusion of Law No. 5, mimeo. p. 19 (“As discussed in the rulemaking, a direct link between exposure to EMF and human health effects has yet to be proven despite numerous studies including a study ordered by this Commission and conducted by DHS.”).

²⁴ CPUC Decision 06-01-042, mimeo. p. 17 - 18 (“Furthermore, we do not request that utilities include non-routine mitigation measures, or other mitigation measures that are based on numeric values of EMF exposure, in revised design guidelines or apply mitigation measures to reconfigurations or relocations of less than 2,000 feet, the distance under which exemptions apply under GO 131-D. Non-routine mitigation measures should only be considered under unique circumstances.”).

²⁵ CPUC Decision 06-01-042, Conclusion of Law No. 2, (“EMF concerns in future CPCN and PTC proceedings for electric and transmission and substation facilities should be limited to the utility’s compliance with the Commission’s low-cost/no-cost policies.”).

1. SCE's priority in the design of any electrical facility is public and employee safety. Without exception, design and construction of an electric power system must comply with all applicable federal, state, and local regulations, applicable safety codes, and each electric utility's construction standards. Furthermore, transmission and subtransmission lines and substations must be constructed so that they can operate reliably at their design capacity. Their design must be compatible with other facilities in the area and the cost to operate and maintain the facilities must be reasonable.
2. As a supplement to Step 1, SCE follows the CPUC's direction to undertake "no-cost and low-cost" magnetic field reduction measures for new and upgraded electrical facilities. Any proposed "no-cost and low-cost" magnetic field measures, must, however, meet the requirements described in Step 1 above. The CPUC defines "no-cost and low-cost" measures as follows:
 - Low-cost measures, in aggregate, should:
 - Cost in the range of 4 percent of the total project cost.
 - Result in magnetic field reductions of "15% or greater at the utility ROW [right-of-way]..."²⁶

The CPUC Decision stated,

"We direct the utilities to use 4 percent as a benchmark in developing their EMF mitigation guidelines. We will not establish 4 percent as an absolute cap at this time because we do not want to arbitrarily eliminate a potential measure that might be available but costs more than the 4 percent figure. Conversely, the utilities are encouraged to use effective measures that cost less than 4 percent."²⁷

²⁶ CPUC Decision 06-01-042, p. 10

²⁷ CPUC Decision 93-11-013, § 3.3.2, p.10.

3. The CPUC provided further policy direction in Decision 06-01-042, stating that, “[a]lthough equal mitigation for an entire class is a desirable goal, we will not limit the spending of EMF mitigation to zero on the basis that not all class members can benefit.”²⁸ While Decision 06-01-042 directs the utilities to favor schools, day-care facilities and hospitals over residential areas when applying low-cost magnetic field reduction measures, prioritization within a class can be difficult on a project case-by-case basis because schools, day-care facilities, and hospitals are often integrated into residential areas, and many licensed day-care facilities are housed in private homes, and can be easily moved from one location to another. Therefore, it may be practical for public schools, licensed day-care centers, hospitals, and residential land uses to be grouped together to receive highest prioritization for low-cost magnetic field reduction measures. Commercial and industrial areas may be grouped as a second priority group, followed by recreational and agricultural areas as the third group. Low-cost magnetic field reduction measures will not be considered for undeveloped land, such as open space, state and national parks, and Bureau of Land Management and U.S. Forest Service lands. When spending for low-cost measures would otherwise disallow equitable magnetic field reduction for all areas within a single land-use class, prioritization can be achieved by considering location and/or density of permanently occupied structures on lands adjacent to the projects, as appropriate.

This FMP contains descriptions of various magnetic field models and the calculated results of magnetic field levels based on those models. These calculated results are provided only for purposes of identifying the relative differences in magnetic field levels among various

²⁸ CPUC Decision 06-01-042, p. 10

transmission or subtransmission line design alternatives under a specific set of modeling assumptions and determining whether particular design alternatives can achieve magnetic field level reductions of 15 percent or more. The calculated results are not intended to be predictors of the actual magnetic field levels at any given time or at any specific location if and when the project is constructed. This is because magnetic field levels depend upon a variety of variables, including load growth, customer electricity usage, and other factors beyond SCE's control. The CPUC affirmed this in D. 06-01-042 stating:

“Our [CPUC] review of the modeling methodology provided in the utility [EMF] design guidelines indicates that it accomplishes its purpose, which is to measure the relative differences between alternative mitigation measures. Thus, the modeling indicates relative differences in magnetic field reductions between different transmission line construction methods, but does not measure actual environmental magnetic fields.”²⁹

IV. PROJECT DESCRIPTION

Southern California Edison Company (SCE) proposes to upgrade the existing Downs 33/12 kilovolt (kV) Substation (Proposed Project) to meet forecasted electrical demand and maintain safe and reliable service to customers in portions of the City of Ridgecrest and the surrounding areas of unincorporated Kern County and San Bernardino County, as shown in Figure 1, Project Vicinity Map. In addition to serving the forecasted electrical demand within the Electrical Needs Area, the Proposed Project would improve system reliability and enhance operational flexibility. The Proposed Project would increase capacity at the existing Downs 33/12 kV Substation by replacing transformers and upgrading the Downs 33/12 kV Substation to a 115/12 kV substation. The Proposed Project would be served by looping an existing 115 kV subtransmission line into and out of the Downs Substation. Portions of the existing 115 kV subtransmission pole line are shared by both 33 kV and 12 kV distribution circuits.

²⁹ CPUC Decision 06-01-042, p. 11

Map of California showing county boundaries and major highways. The map includes labels for counties such as Fresno Co., Kings Co., Tulare Co., Inyo Co., Kern Co., San Bernardino Co., Los Angeles Co., Santa Barbara Co., and Ventura Co. Major highways are marked with shields (e.g., I-5, I-15, I-40, SR-99, SR-138, SR-14, SR-18, SR-202, SR-246, SR-247, SR-101, SR-154, SR-155, SR-166, SR-178, SR-190, SR-198, SR-201, SR-269, SR-41, SR-43, SR-46, SR-58, SR-63, SR-65, SR-126, SR-137, SR-150, SR-184, SR-199). A red star labeled "PROJECT AREA" is located near Ridgecrest, California, at the intersection of SR-395 and SR-178. A scale bar indicates 1 inch equals 106,600 feet and 1 inch equals 100 miles. A north arrow is also present.

- Part 1: Proposed Downs Substation 115 kV Loop-in Line Segments
- Part 2: Proposed Downs 115/12 kV Substation Upgrade

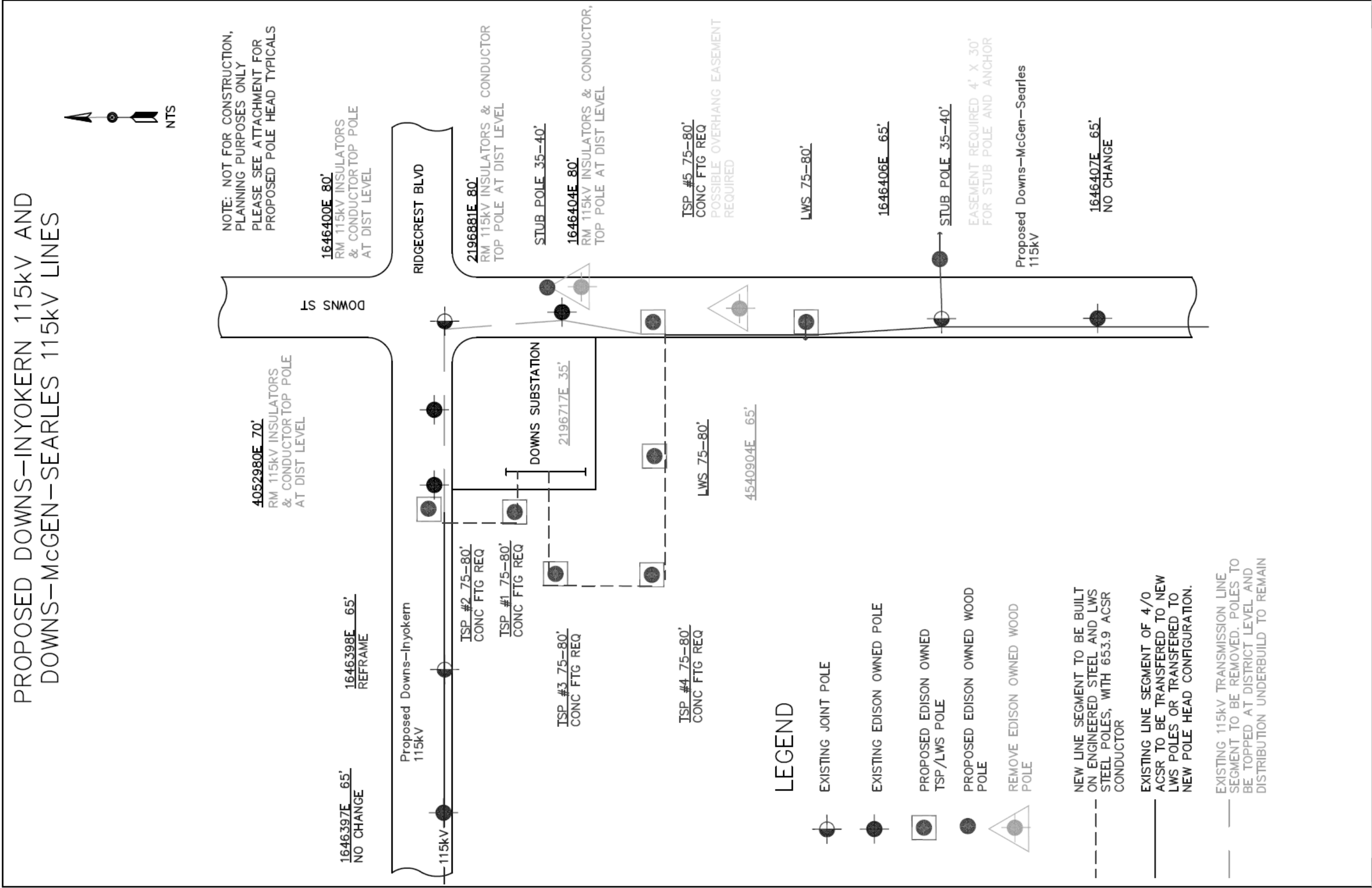
14

The existing Inyokern-McGen-Searles No. 2 115 kV subtransmission line currently runs in a northerly direction along Downs Street to the intersection of Downs Street and Ridgecrest Boulevard, then in a westerly direction along Ridgecrest Boulevard. This line would be rerouted by intercepting the existing 115 kV subtransmission line at the southeast and northwest corners of the proposed Downs Substation expansion area and terminating it into Downs Substation to form the Downs-McGen-Searles and Downs-Inyokern 115 kV subtransmission lines. At the intercept points, SCE would construct two new 115 kV subtransmission line segments to connect the proposed Downs-McGen-Searles and the proposed Downs-Inyokern 115 kV subtransmission lines to the substation, as shown in Figure 2, Proposed Subtransmission Line Route Description.

To loop the proposed Downs-McGen-Searles 115 kV subtransmission line, SCE would intercept the existing Inyokern-McGen-Searles No. 2 115 kV subtransmission line at the southeast corner of the proposed expanded Downs Substation on Downs Street. Under the initial design, the following poles would be installed to create the new subtransmission line; 1) along Downs Street, two wood stub poles, one Light Weight Steel (LWS) pole and one Tubular Steel Pole (TSP); and 2) on the expanded Downs Substation property two TSPs and one LWS Pole. In addition, along Downs Street, two existing wood poles would be topped and the 115 kV conductor and related line hardware would be removed. One existing wood pole would be removed along Downs.

To loop the proposed Downs-Inyokern 115 kV subtransmission line, SCE would intercept the existing Inyokern-McGen-Searles No. 2 115 kV subtransmission line at the northwest corner of proposed Downs Substation expansion on Ridgecrest Boulevard. Under the initial design, the following poles would be installed to create the new subtransmission line; 1) along Ridgecrest

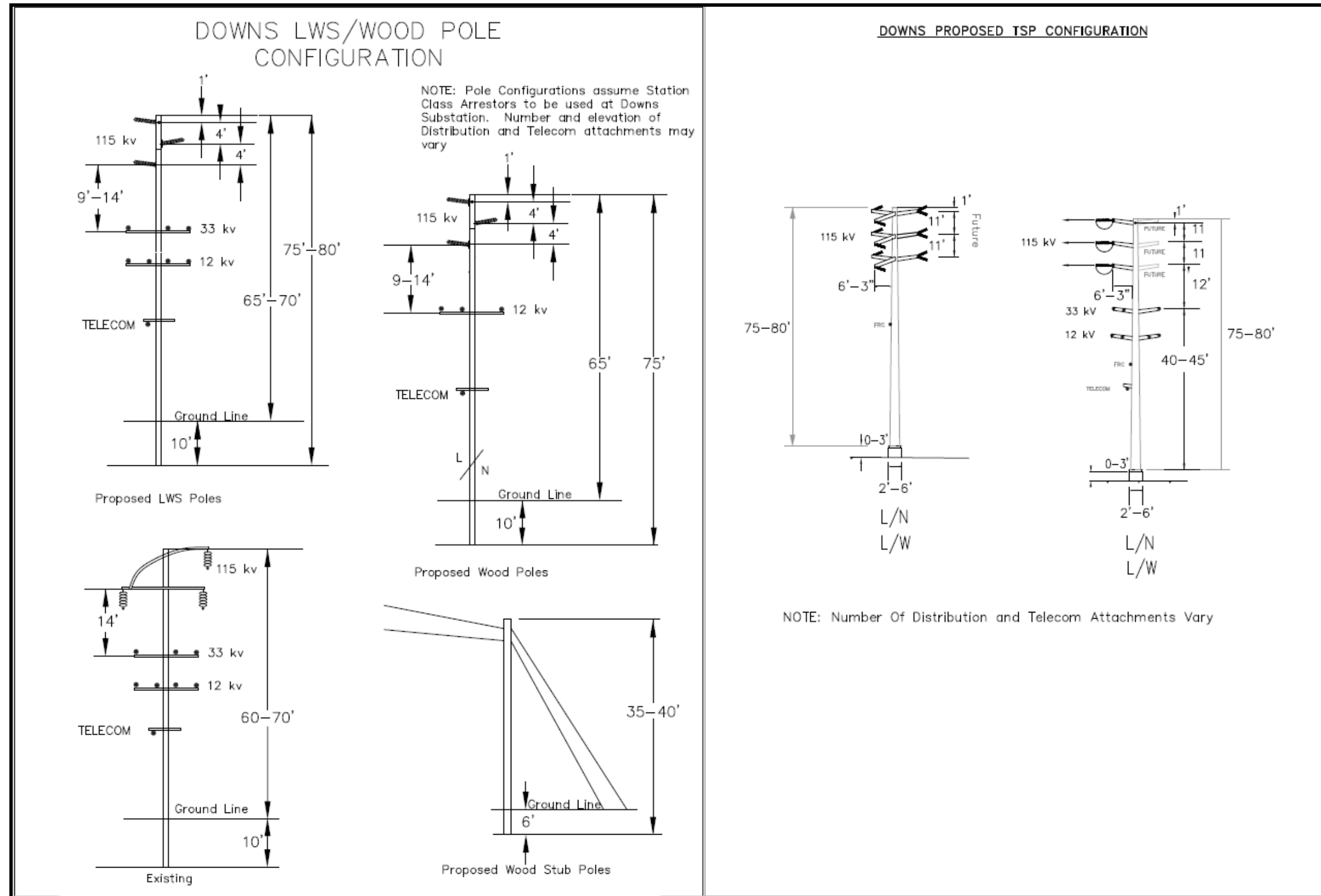
Boulevard, one TSP; and 2) on the expanded Downs Substation property, one TSP. Additionally, one existing wood pole would be reframed.



The added segment to the southerly portion of the Inyokern-McGen-Searles No. 2 115 kV subtransmission line, which forms the proposed Downs-McGen-Searles 115 kV subtransmission line, would be approximately 800 circuit feet in length. The added segment to the westerly portion of the Inyokern-McGen-Searles No. 2 115 kV subtransmission line, which forms the proposed Downs-Inyokern 115 kV subtransmission line, would be approximately 200 circuit feet in length.

The subtransmission line components that would be used to complete the reroute would include wood stub poles, LWS poles and TSPs, 653.9 Aluminum Conductor Steel Reinforced (ACSR), insulators, line hardware, guying, and anchors. Based on initial engineering design, the approximate height above ground of the LWS poles would range between 65 to 70 feet, and the approximate height of the TSPs would range between 75 to 80 feet, as shown in Figure 3, Subtransmission Structure Dimensions.

Figure 3. Subtransmission Structure Dimensions



TSPs utilized for the Proposed Project would be approximately 2 to 4 feet in diameter and extend 75 feet to 80 feet above grade. The TSPs would be attached to the concrete foundations that extend underground approximately 20 to 30 feet, with approximately 0 to 3 feet of concrete visible above grade. In some instances, some TSPs may be installed in direct-buried concrete. TSPs are typically used:

- Where site limitations or restrictions prohibit guy and anchor installation;
- Where strength or height of a wood or LWS pole is exceeded;
- Where TSPs are a condition of the easement; or
- Where the site is subject to extreme or severe environmental conditions such as damage from fire, birds, insects, or weather.

LWS poles utilized for the Proposed Project would be direct buried to a depth of approximately 8 to 10 feet below grade and extend approximately 65 to 70 feet above grade. The diameter of LWS poles would be approximately 2 to 3 feet. It is anticipated that the 115 kV subtransmission structures would be installed within the franchise right-of-way (ROW) of Downs Street and Ridgcrest Boulevard. Acquisition of new right-of-way or easement rights, however, may be required in order to install the wood stub pole and the associated guying. Access to the new 115 kV subtransmission facilities would be from the existing public streets.

Part 2: Proposed Downs 115/12 kV Substation Upgrade

The improvements at Downs Substation would include the addition of a new 115/12 kV unattended, automated 56 MVA low-profile substation (with a 28 MVA N-1 reserve bank). The substation capacity would have the potential to expand to 112 MVA as necessary. The existing

Downs Substation encompasses approximately 1 acre of land within the City of Ridgecrest. The proposed expansion of Downs Substation would require an additional 2.5 acres of a 4.6 acre parcel of SCE-owned land adjacent to the existing Substation. Electrical components of the Downs Substation improvements are provided below; the switchracks, transformers, and capacitor banks.

115 kV Switchrack

The proposed 115 kV low-profile steel switchrack would be up to 35 feet high, 106 feet wide, and 250 feet long. The 115 kV switchrack would consist of eight 30-foot-wide positions: one switchrack position would be used for the Downs-McGen-Searles 115 kV subtransmission line, a second switchrack position would be used for the Downs-Inyokern 115 kV subtransmission line, two switchrack positions would be used for the 115/12 kV transformer banks (Bank No. 1 and Bank No. 2), an additional switchrack position would be used for the 115 kV bus tie position, and three switchrack positions would be reserved as vacant positions for future expansion of the substation.

The operating and transfer buses would each be 240 feet long and consist of two 1590 thousand circular mils (kcmil) ACSR for each of the three electrical phases.

The two 115 kV subtransmission line positions and the two 115 kV transformer bank positions would each be equipped with a circuit breaker and three group operated disconnect switches. The 115 kV bus tie position would be equipped with a circuit breaker and two group-operated disconnect switches.

115/12 kV Transformers

Three 28 MVA, 115/12 kV transformers would be installed, each equipped with group-operated isolating disconnect switches on the high voltage and low voltage side, surge arresters, and neutral current transformers. The transformer structures would occupy an area approximately 74 feet long and 120 feet wide. The transformer equipment would be approximately 34 feet in height. Two 12 kV underground power cables would connect the transformers to the existing 12 kV switchrack positions 5A and 11A via power cable trench.

33/12 kV Transformers

Remove the existing two 33 kV/12 kV, 22.4 MVA transformers and one spare 33 kV/12 kV, 14 MVA transformer.

12 kV Switchrack

The existing 12 kV operating and transfer buses would be extended one position. Two 12 kV bank positions in the 12 kV switchrack would be equipped with 3500 amp rated circuit breakers and disconnect switches.

12 kV Capacitor Banks

A total of two 12 kV 4.8 megavolt-amperes reactive (MVAR) capacitor banks would be installed within Downs Substation. Each of these capacitor banks would be approximately 15 feet high, 17 feet long, and 13 feet wide.

V. EVALUATION OF “NO-COST AND LOW-COST” MAGNETIC FIELD REDUCTION DESIGN OPTIONS

Please note that following magnetic field models and the calculated results of magnetic field levels are intended only for purposes of identifying the relative differences in magnetic field levels among various subtransmission line and subtransmission line design alternatives under a specific set of modeling assumptions (see §VII-Appendix A for more detailed information about the calculation assumptions and loading conditions) and determining whether particular design alternatives can achieve magnetic field level reductions of 15 percent or more. The calculated results are not intended to be predictors of the actual magnetic field levels at any given time or at any specific location when the Proposed Project is constructed.

- **Part 1: Proposed Downs 115 kV Loop-In Line Segments**

- Segment 1 – Downs-McGen-Searles 115 kV Subtransmission Line Segment**

The typical design used for Segment 1 is shown in Figure 4, Proposed Downs-McGen-Searles 115 kV Subtransmission Line. The proposed 115 kV subtransmission line will be constructed on single-circuit structures. Based on preliminary designs, the wood and LWS poles will be approximately 65 to 70 feet in height above ground, and TSPs will be approximately 75 to 80 feet in height above ground. The poles will be located in utility franchise ROW. For EMF analysis, calculated field levels were evaluated at 10 feet from the center line (C/L) of the structure for a single circuit. Currently, there are no schools or residences along the Segment 1 of the Proposed 115 kV subtransmission line route. The proposed route for Segment 1 is mostly within the Downs Substation property. The land uses in the area are commercial/industrial and recreational.

No-Cost Field Reduction Measures: The proposed design for Segment 1 includes the following no-cost field reduction measure:

1. Utilizing structure heights that meet or exceed SCE's EMF preferred design criteria.
2. Utilizing subtransmission line construction that reduces the space between conductors compared with other designs

Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including structure heights that meet or exceed SCE's EMF preferred design criteria, no further low-cost reduction measures such as utilizing taller structures were considered for this segment of the Proposed Project.

Magnetic Field Calculations: Figure 5, Calculated Magnetic Field Levels for the Proposed Downs-McGen-Searles 115 kV Subtransmission Line and Table 2, Calculated Magnetic Fields Levels for Segment 1, show the calculated magnetic field levels for proposed design. These calculations were made using the proposed TSP design with a minimum height of 75 feet above ground.

Figure 4. Proposed Downs–McGen–Searles 115 kV Subtransmission Line (Segment 1)

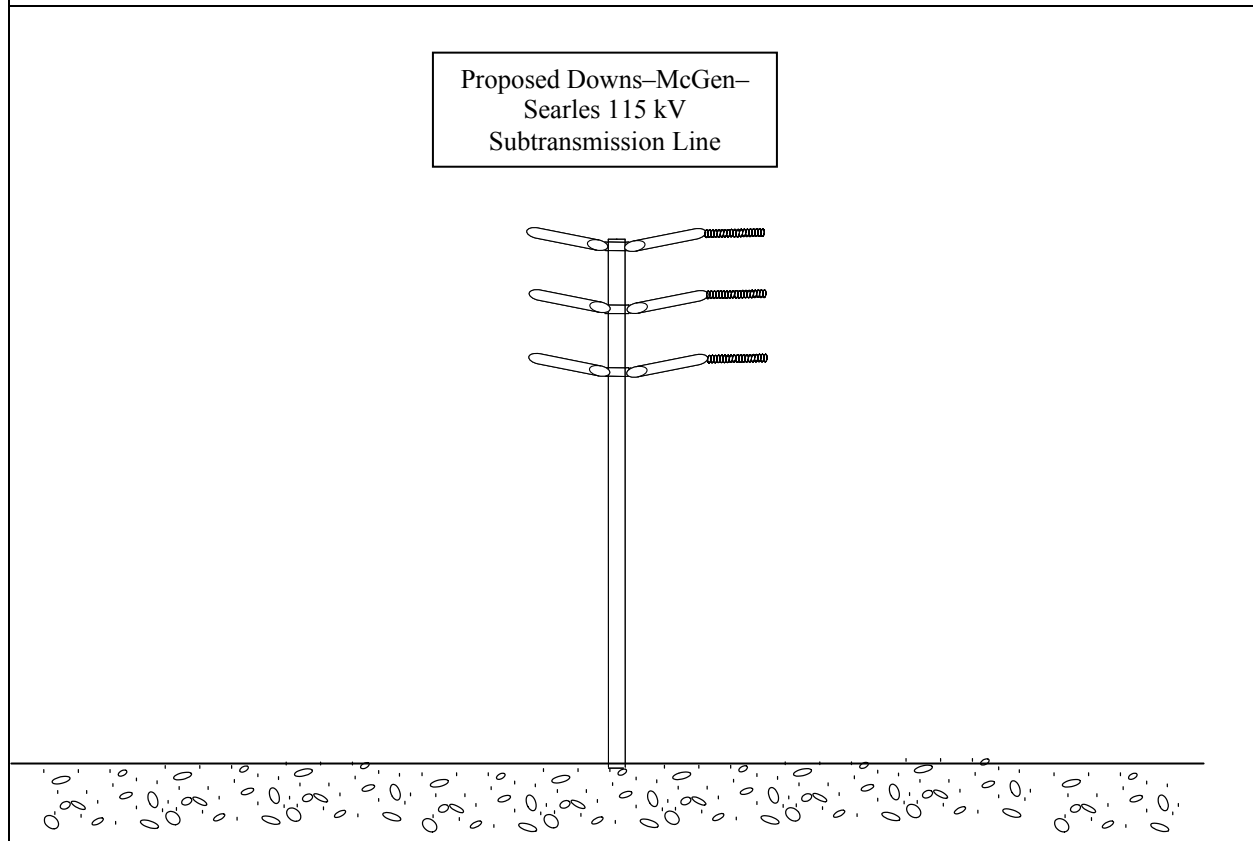


Figure 5. Calculated Magnetic Field Levels³⁰ for the Proposed Downs–McGen–Searles (Segment 1)

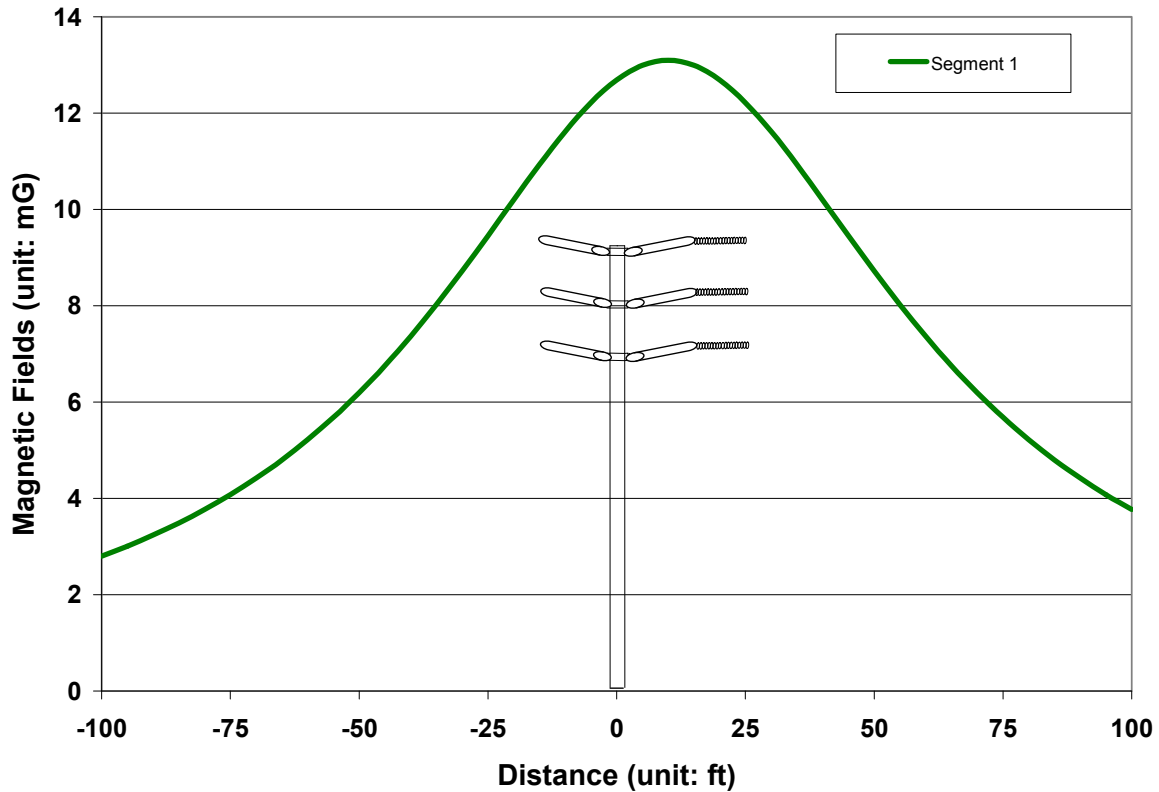


Table 2. Calculated Magnetic Field Levels³¹ for Segment 1

Design Options	10 Feet Left of C/L (mG)	% Reduction	10 Feet Right of C/L (mG)	% Reduction
Proposed Downs-McGen-Searles 115 kV Line Design	11.6	N/A	13.1	N/A

³⁰ This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

³¹ This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Recommendations for Segment 1: *The proposed design includes no-cost field reduction measures. Because the proposed design already incorporates structures with heights meeting or exceeding SCE's preferred design criteria, no further low-cost field reduction measures are recommended.*

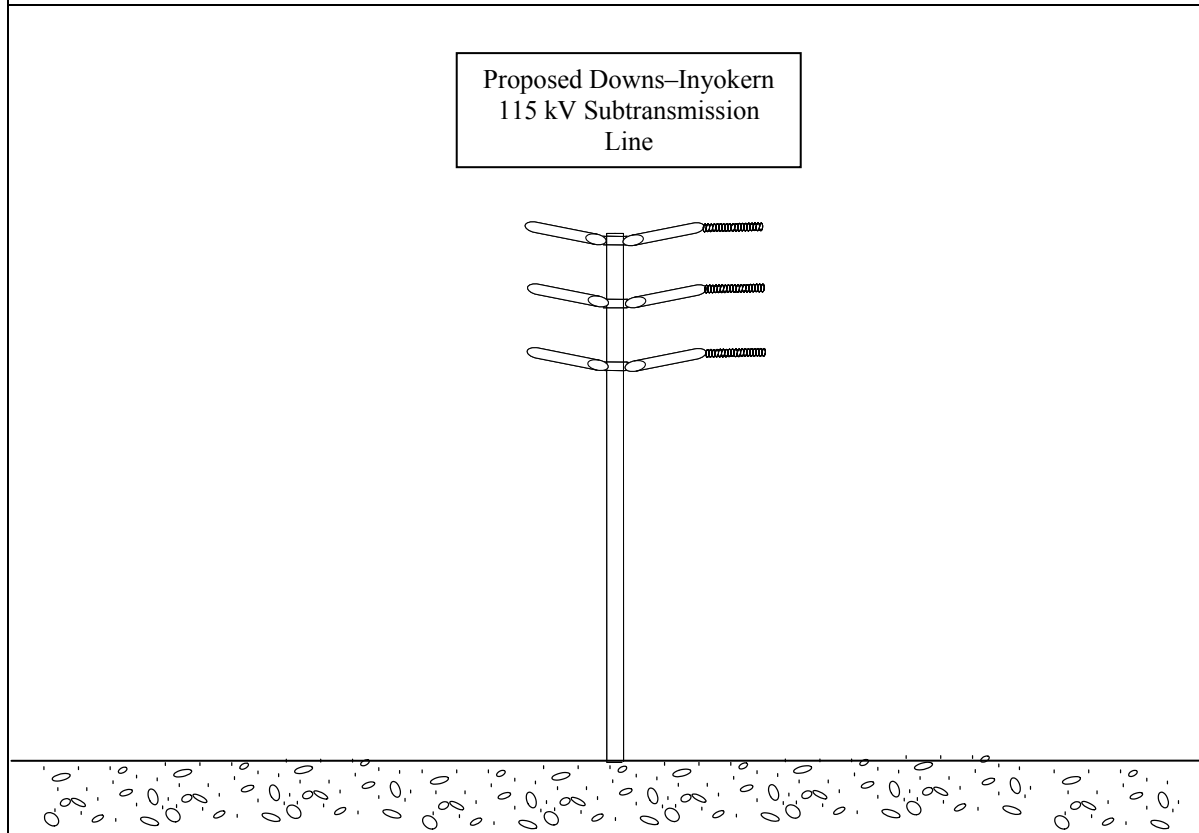
Segment 2 - Downs-Inyokern 115 kV Subtransmission Line Segment

The typical design used for Segment 2 is shown in Figure 6, Proposed Downs-Inyokern 115 kV Subtransmission Line. The proposed 115 kV subtransmission line will be constructed on single-circuit structures. Based on preliminary designs, the TSPs will be approximately 75 to 80 feet in height. The poles will be located in utility franchise ROW and Downs Substation property. For EMF analysis, calculated field levels were evaluated at 10 feet from the center line (C/L) of the structure for a single circuit. Currently, there are no schools or residences along the Segment 2 of the Proposed 115 kV subtransmission line route. The proposed route for Segment 2 is mostly within the Downs Substation property. The land uses in the area are commercial/industrial and recreational.

No-Cost Field Reduction Measures: The proposed design for Segment 2 includes the following no-cost field reduction measure:

1. Utilizing structure heights that meet or exceed SCE's EMF preferred design criteria.

Figure 6. Proposed Downs–Inyokern 115 kV Subtransmission Line (Segment 2)



Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including structure heights that meet or exceed SCE’s EMF preferred design criteria, no further low-cost reduction measures such as utilizing taller structures were considered for this segment of the Proposed Project.

Magnetic Field Calculations: Figure 7 , Calculated Magnetic Field Levels for the Proposed Downs-Inyokern 115 kV Subtransmission Line and Table 3, Calculated Magnetic Field Levels for Segment 2, show the calculated magnetic field levels for proposed design. These calculations were made using the proposed TSP design with a minimum height of 75 feet above ground.

Figure 7. Calculated Magnetic Field Levels³² for the Proposed Downs-Inyokern 115 kV Subtransmission Line (Segment 2)

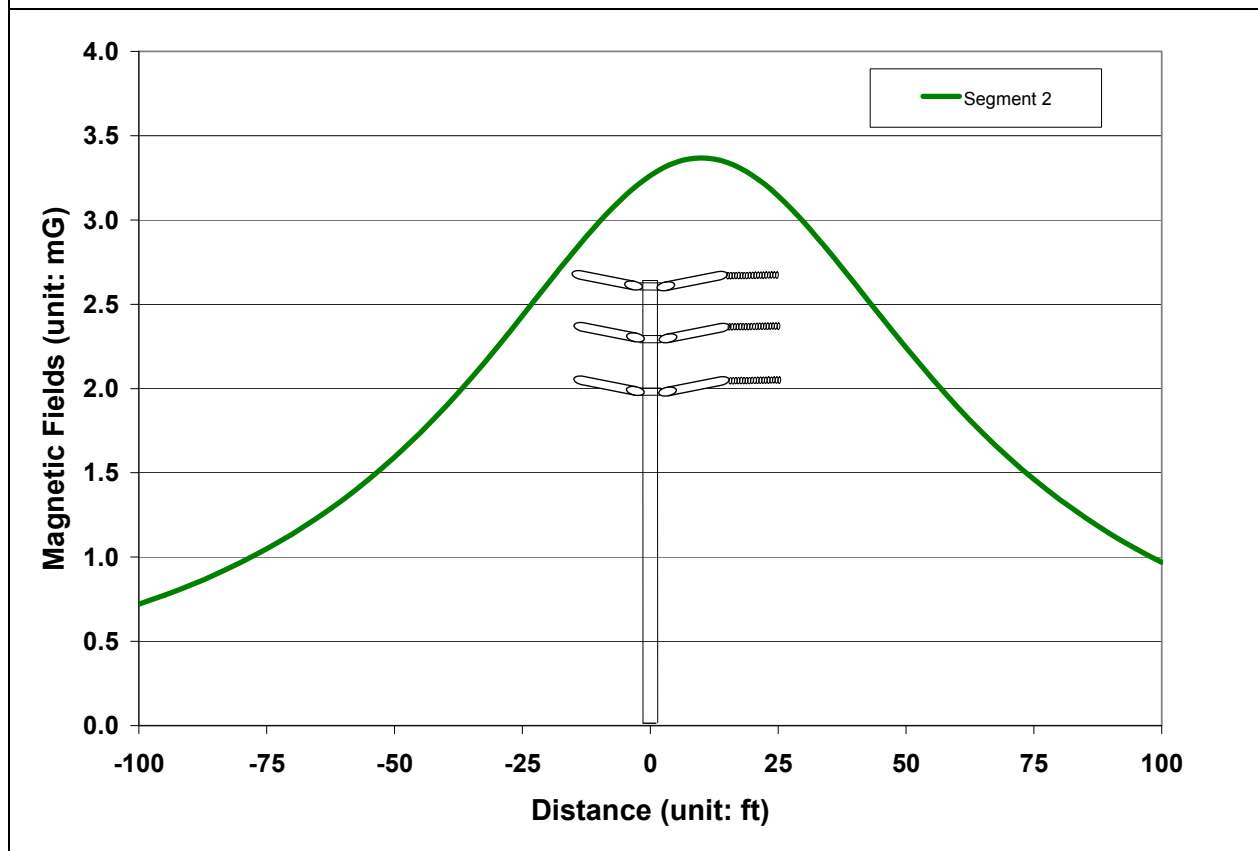


Table 3. Calculated Magnetic Field Levels³³ for Segment 2

Design Options	10 Feet Left of C/L (mG)	% Reduction	10 Feet Right of C/L (mG)	% Reduction
Proposed Downs-Inyokern 115 kV Line Design	3.0	N/A	3.4	N/A

³² This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

³³ This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Recommendations for Segment 2: *The proposed design includes no-cost field reduction measures. Because the proposed design already incorporates structures with heights meeting or exceeding SCE's preferred design criteria, no further low-cost field reduction measures are recommended.*

Part 2: Downs 115/12 kV Substation

Generally, magnetic field values along the substation perimeter are low compared to the substation interior because of the distance from the perimeter to the energized equipment. Normally, the highest magnetic field values around the perimeter of a substation result from overhead power lines and underground duct banks entering and leaving the substation, and are not caused by substation equipment. Therefore, the magnetic field reduction design options generally applicable to a substation project are as follows:

- Site selection for a new substation;
- Setback of substation structures and major substation equipment (such as bus, transformers, and underground cable duct banks, etc.) from perimeter;
- Field reduction for transmission lines and subtransmission lines entering and exiting the substation.

A Substation Checklist, as shown in Table 4, Substation Checklist for Examining No-cost and Low-cost magnetic Field Reduction Design Options, is used for evaluating the no-cost and low-cost design options considered for the substation project, the design options adopted, and reasons that certain design options were not adopted if applicable.

Table 4. Substation Checklist for Examining No-cost and Low-cost Magnetic Field Reduction Design Options			
No.	No-Cost and Low-Cost Magnetic Field Reduction Design Options Evaluated for a Substation Project	Design Options Adopted? (Yes/No)	Reason(s) if not Adopted
1	Are 115 kV rated transformer(s) 15 feet or more from the substation property line?	Yes	
2	Are 115 kV rated switch-racks, capacitor banks & bus 8 feet (or more) from the substation property line?	Yes	
3	Are 115 kV rated transfer & operating buses configured with the transfer bus facing the nearest property line?	Yes	
4	Are underground cable duct banks greater than 12 feet from side of property line?	Yes	

VI. FINAL RECOMMENDATIONS FOR IMPLEMENTING “NO-COST AND LOW-COST” MAGNETIC FIELD REDUCTION DESIGN OPTIONS

In accordance with the “EMF Design Guidelines”, filed with the CPUC in compliance with CPUC Decisions 93-11-013 and 06-01-042, SCE would implement the following “no-cost and low-cost” magnetic field reduction design options for Proposed Project:

For Proposed Downs-McGen-Searles 115 kV Loop-In Segment (Segment 1):

- Utilizing structure heights that meet or exceed SCE’s EMF preferred design criteria
- Utilizing subtransmission line construction that reduces the space between conductors compared with other designs

For Proposed Downs-Inyokern 115 kV Loop-In Segment (Segment 2):

- Utilizing structure heights that meet or exceed SCE’s EMF preferred design criteria

For Proposed Downs 115/12 kV Substation:

- Placing major substation electrical equipment (such as transformers, switchracks, buses and underground duct banks) away from the substation property lines
- Configuring the transfer and operating buses with the transfer bus closest to the nearest property line

The recommended “no-cost and low-cost” magnetic field reduction design options listed above are based upon preliminary engineering designs, and therefore, they are subject to change during the final engineering designs. If the final engineering designs are different than preliminary engineering designs, SCE would implement comparable “no-cost and low-cost” magnetic field reduction design options. If the final engineering designs are significantly different (in the context of evaluating and implementing CPUC’s “no-cost and low-cost” EMF Policy) than the preliminary designs, a Final FMP will be prepared.

SCE’s plan for applying the above “no-cost and low-cost” magnetic field reduction design options uniformly for the Proposed Project is consistent with the CPUC’s EMF Decisions No. 93-11-013 and No. 06-01-042, and also with recommendations made by the U.S. NIEHS. Furthermore, the recommendations above meet the CPUC approved EMF Design Guidelines as well as all applicable national and state safety standards for new electrical facilities.

VII. APPENDIX A: TWO-DIMENSIONAL MODEL ASSUMPTIONS AND YEAR 2014 FORECASTED LOADING CONDITIONS

Magnetic Field Assumptions:

SCE uses a computer program titled “MFields”³⁴ to model the magnetic field characteristics of various transmission designs options. All magnetic field models and the calculated results of magnetic field levels presented in this document are intended only for purposes of identifying the relative differences in magnetic field levels among various subtransmission line and subtransmission line design alternatives under a specific set of modeling assumptions and determining whether particular design alternatives can achieve magnetic field level reductions of 15 percent or more. The calculated results are not intended to be predictors of the actual magnetic field levels at any given time or at any specific location if and when the project is constructed.

Typical two-dimensional magnetic field modeling assumptions include:

- All subtransmission lines were modeled using forecasted peak loads (as shown in Table 5, Year 2014 Forecasted Loading Conditions for Proposed Subtransmission Lines)
- All conductors were assumed to be straight and infinitely long
- Average conductor heights accounted for line sag used in the calculation for the proposed Downs–McGen–Searles 115 kV and Downs–Inyokern 115 kV subtransmission line segments
- Magnetic field strength was calculated at a height of three feet above ground
- Resultant magnetic fields values were presented in this FMP
- All line currents were assumed to be balanced (i.e. neutral or ground currents are not considered)
- Terrain was assumed to be flat
- Project dominant power flow directions were used.

³⁴ SCE, MFields for Excel, Version 2.0, 2007.

Table 5. Year 2014 Forecasted Loading Conditions for Proposed Subtransmission Lines	
Circuit Name	Current (Amp)
Proposed Downs–McGen–Searles 115 kV Subtransmission Line	350
Proposed Downs –Inyokern 115 kV Subtransmission Line	90

Notes:

1. Forecasted loading data is based upon scenarios representing load forecasts for the second quarter of 2014. The forecasting data is subject to change depending upon availability of generations, load increase, changes in load demand, and by many other factors.
2. All existing line loading data is derived from historical data.
3. Load flow for Table 5 is assumed in the same direction

CERTIFICATE OF SERVICE

I hereby certify that, pursuant to the Commission's Rules of Practice and Procedure, I have this day served a true copy of the **APPLICATION OF SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) FOR A PERMIT TO CONSTRUCT ELECTRICAL FACILITIES WITH VOLTAGES BETWEEN 50 KV AND 200 KV: DOWNS SUBSTATION PROJECT** on the parties identified below. Service was effected by placing the copies in properly addressed sealed envelopes and causing such envelopes to be delivered via overnight courier to the offices of the following individuals:

Karen Clopton Chief Administrative Law Judge California Public Utilities Office 505 Van Ness Avenue Sna Francisco, CA 941202	Melissa Jones Executive Director California Energy Commission 1516 9 th Street, MS3-39 Sacramento, CA 95814-5512
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Executed this 29th day of December, 2010, at Rosemead, California.

/s/Meraj Rizvi

MERAJ RIZVI
Project Analyst
SOUTHERN CALIFORNIA EDISON COMPANY

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