Comment Set PG, Attachment R

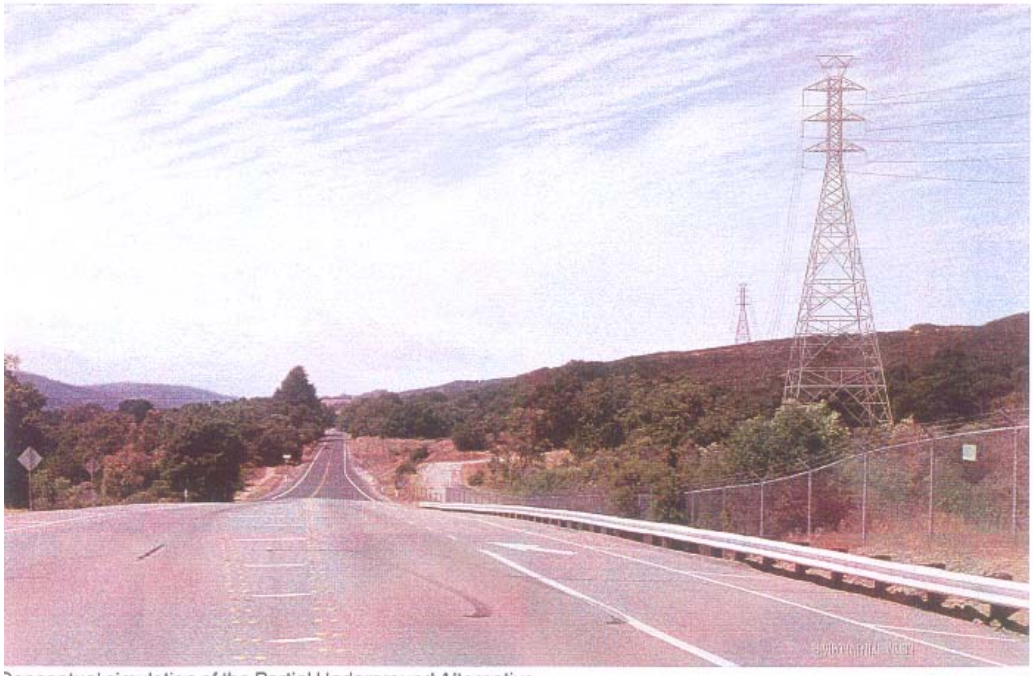
Existing view from northbound Cañada Road south of Edgewood Road

Conceptual simulation of the Partial Underground Alternative

Visual A-7
Visual Simulation of the PUA from northbound Cañada Road
ENVIRONMENTAL VISION CH2MHILL Jefferson - Martin 230kV Transmission Project

Comment Set PG, Attachment S

Existing view from northbound Cañada Road near Edgewood Road



Conceptual simulation of the Partial Underground Alternative

Visual A-8
Visual Simulation of the PUA from northbound Cañada Road
ENVIRONMENTAL VISION **CH2M**HILL Jefferson - Martin 230kV Transmission Project

Comment Set PG, Attachment T

TECHNICAL MEMORANDUM

Feasibility and Impact Issues Regarding the Underwater Crossing Around the Lower Crystal Springs Dam

PACIFIC GAS & ELECTRIC
JEFFERSON-MARTIN 230 kV TRANSMISSION PROJECT

To: Wesley Skow [Latham & Watkins]

From: Lowell Rogers [Black & Veatch]

Cc: Alain Billot [PG&E]
Bob Masuoka [PG&E]
Sheila Byrne [PG&E]
Louis Leonard [L&W]
Lynne Hosley [CH_2M Hill]
Scott Oppelt [CH_2M Hill]
Al Thamish [B&V]

Date: September 3, 2003

After further field review and analysis, PG&E is concerned that Route Option 1B – Underwater Crossing Around Dam (Page D.4-54, Impact B-9) may be technically infeasible and presents potentially significant impacts to biological resources, water quality and worker safety. Directional drilling, as required by Mitigation Measure B-9, may not be possible given the substrate of the reservoir (likely rock), the steep slope of the southern entry point, and the potential for "frac-out" (release of bentonite drilling mud) into the reservoir. PG&E cannot be certain that Mitigation Measure B-9 would not be required due to the potential presence of sensitive habitats. Though the underwater crossing can be designed and constructed to be reliable, the effort and time required for restoration of a cable section in case of failure is significantly greater than the other alternatives. Furthermore, it has the potential to conflict with DEIR water quality and biological mitigation measures and inherently has more potential impacts to worker safety, biological resources, water quality, and reliability than other alternatives.

Directional-Drilling Method

The installation method required by Mitigation Measure B-9a (if sensitive biological resources are present) would require directional-drilling into the reservoir. After further technical analysis, PG&E is concerned that installing the cable into the reservoir by directional drilling may be infeasible for the following reasons: (1) the southern entry point for the directional drill appears to require an entry angle greater than 20 degrees, which is the upper limit of these systems, (2) due to the proximity of the access road to the shore line, and the depth required upon entering the reservoir, a feasible entry angle does not appear to be possible, and (3) once the directional drill "daylights" into the reservoir, a significant amount of drilling mud could potentially enter into the reservoir. The DEIR identifies this type of contamination as a "frac-out" in section D.7 Hydrology and Water Quality and requires mitigation measure B-1h for this impact. Bentonite has to be used for directional drilling and if there is any unconsolidated rock or even bedrock there is a higher likelihood that a frac-out will occur. An underwater frac-out could have the potential to cause water quality impacts in the reservoir; potential mitigation measures such as enclosing the work area within a sediment curtain would contain this potential impact but not eliminate it, given the

Comment Set PG, Attachment T, cont.

TECHNICAL MEMORANDUM

depths of the daylighting area and likelihood of obstacles within the reservoir that could interfere with proper placement and operation of the silt curtain.,

Open-Cut Trenching Method

The method of entering the reservoir via open-cut trench presents both feasibility and environmental impact concerns given the steep slope of the southern entry point. To trench in this area, one or more benches will need to be created in the slope to provide a working platform for excavation equipment. To protect the cable during periods of low water levels, the duct bank will "day-light" into the reservoir at an elevation of approximately 225', which is approximately 38' below the maximum storage elevation. The duct bank will extend between 115' and 155' horizontally into the reservoir before this depth requirement is met. In order to excavate the portions of the trench that are away from the shoreline, excavation equipment will need to be positioned on barges. Excavation in this area is expected to encounter rock, which will require blasting. Trenching or dredging a trench in open water could have significant water quality impacts; however, installations of cofferdams to isolate the work area from the open reservoir in a deep rocky area would be difficult if not impossible.

These trenching activities would result in excessive sediment deposition and associated localized increases in turbidity that could create a potentially significant water quality impact. Coordination with SFPUC on obtaining the approvals necessary to place the underwater cable within Crystal Springs Reservoir given these potentially significant impacts could delay construction of the underground line as scheduled.

Worker Safety

Any time a work area involves working on or within bodies of water, the potential for injury or fatalities increase. Diver safety is a significant concern, followed by the safety of those working from the barges. It is possible that before the reservoir was filled, existing trees and brush were left standing, increasing the potential for the underwater cable to become entangled. Divers would need to guide the cable through these potential obstacles, exposing themselves to additional risks. Safety measures will be in effect, but the relative risk level of this alternative to the others is greater.

For these reasons, and the feasibility issues discussed above, PG&E requests elimination of this crossing option as a component of Alternative 1B.

Comment Set PG, Attachment U

United States Department of the Interior

NATIONAL PARK SERVICE
Golden Gate National Recreation Area
Fort Mason, San Francisco, California 94123

IN REPLY REFER TO:

L76 (GOGA-PLAN)

MAR 21 2003

Billie Blanchard
California Public Utilities Commission
c/o Aspen Environmental
235 Montgomery Street, Suite 800
San Francisco, California 94104-2906
FAX: (415) 955-4776

Re: *Scoping Comments on PG&E Jefferson Martin 230 kV Project*

Dear Ms. Blanchard:

The Golden Gate National Recreation Area (GGNRA) submits the following scoping comments on the PG&E Jefferson-Martin 230 kV Transmission Project, which will be the subject of an Environmental Impact Report ("EIR") prepared by the California Public Utilities Commission. The GGNRA has reviewed the Proponent's Environmental Assessment ("PEA") submitted by PG&E to your agency, along with other documents relevant to this project.

1. **The EIR should disclose that the rights held by GGNRA under its easements impose a significant limitation on the types of projects that can occur on Watershed lands.**

The PEA contains a biased and inaccurate discussion of the GGNRA's ability to control this project. The GGNRA administers two easements covering a significant portion of the land on which PG&E plans to construct the proposed project. These easements total approximately 23,000 acres of land, and the lands are commonly referred to as the Peninsula Watershed lands, (The lands are shown in Figure 5-1 of the PEA.) The City and County of San Francisco owns the land and the San Francisco Public Utilities Commission ("SFPUC") maintains the land for the collection, storage, and transmission of water for human consumption. This use by the SFPUC is recognized in the easements. The easements were granted to the United States by the City of San Francisco in 1969 in exchange for increased federal funding for the construction of Highway 280.

The larger 19,000 acre easement is a Scenic Easement and the smaller 4,000 acre easement is a Scenic and Recreational Easement. (Acreages are approximate.) The easements contain largely identical terms. and the purposes of the easements are to "preserve the land in its present state as open space" and to "preserve the scenic and natural resources of the area." (Scenic and Recreation Easement. pages 1 and 4.) The Scenic and Recreational easement includes an

Comment Set PG, Attachment U, cont.

additional purpose which is to provide for "public use and enjoyment" of the land. (Scenic and Recreation Easement, page 1.)

The easements include numerous restrictive covenants limiting the types of activities that can occur on the land. For example, the Scenic and Recreation Easement states:

> The land shall be preserved in its present natural state and shall not be used for any purpose other than for the collection, storage and transmission of water and protection of water quality; outdoor recreation; ecological preservation and other purposes, which shall be compatible with preserving said land as open-space for public use and enjoyment. (Scenic and Recreation Easement, page 5.)

The Scenic Easement contains a nearly identical provision.

The easements contain four additional restrictive covenants. These covenants prohibit projects involving the erection of structures; the granting of further encroachments to adjoining property owners; excavation or topographic changes; and the cutting or removal of timber or brush. These activities are prohibited unless the GGNRA concurs that the activity is compatible with the purposes of the easements. (Scenic and Recreation Easement, pages 5 - 6.)

While the easements include a reservation of rights for the City of San Francisco and its permittees to conduct certain types of activities on the easement lands, the reservation does not extend to activities included within the restrictive covenants.[1] In other words, projects involving topographic changes, the erection of structures and vegetation cutting are not free to proceed without GGNRA's concurrence. California law also provides GGNRA with the ability to prohibit any activity that would constitute "unreasonable interference" with the easements. Camp Meeker Water v. PUC, 274 Cal.Rptr.2d 678, 691 (Cal. 1990).

In addition to administering the Peninsula Watershed lands pursuant to the terms of the easements, the GGNRA also administers the lands pursuant to the federal statute that established the park. The Peninsula Watershed lands were included within the legislative boundaries of the Golden Gate National Recreation Area in 1980. This legislation requires the GGNRA to "administer such land in accordance with the provisions of the documents entitled 'Grant of Scenic Easement' and 'Grant of Scenic and Recreation Easement', both executed on January 15,

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[1] The reservation states: "The Grantor for itself, its representatives and its successors, assigns and permittees reserves all of their rights *not specifically restricted herein*, including without limitation the perpetual right to use the below-described premises for purposes which they may find necessary or desirable for their water or other utility operations as now or hereafter conducted, including without limiting the generality of the foregoing the right to construct, maintain, repair, expand and reconstruct buildings (including caretaker's cottages), storage facilities, reservoirs, pipe systems, cable systems, flumes, head walls, retention walls, bulkheads, cofferdams, pumphouses, dikes, roadways, public utilities and similar improvements upon the below-described premises." (Scenic and Recreation Easement, page 7.)

Comment Set PG, Attachment U, cont.

1969, between the City and County of San Francisco and the United States." 16 U.S.C. § 460bb-2(p). In addition, because the Peninsula Watershed lands are included within the boundaries of the GGNRA, the GGNRA must also administer the lands according to the overriding purpose for which the Golden Gate National Recreation Area was established. That purpose decrees that the GGNRA:

> shall utilize the resources [of the park] in a manner which will provide for recreation and educational opportunities consistent with sound principles of land use planning and management. In carrying out the provisions of this subchapter, the Secretary shall preserve the recreation area, as far as possible, in its natural setting, and protect it from development and uses which would destroy the scenic beauty and natural character of the area.

16 U.S.C. § 460bb.

Both the easements and the GGNRA enabling legislation, invest the GGNRA with the discretionary authority to ensure that activities on the Peninsula Watershed lands are compatible with the purposes of the easements, namely the preservation of open space, scenic values, and natural resources. In the case of the Scenic and Recreation Easement, activities must be compatible with the additional purpose of public use and enjoyment. Projects involving topographic change, vegetation removal, and structural development may not proceed without GGNRA concurrence, and no project may proceed if it would "unreasonably interfere" with the purposes of the easements.

The EIR should therefore acknowledge GGNRA's ability to control this project under the terms of the easements and the GGNRA enabling legislation. [2] We anticipate that PG&E may disagree with GGNRA's interpretation of its legal rights, and in that event, the EIR should disclose to the public that there is a disagreement between GGNRA and PG&E over the scope of the GGNRA's rights. Failure to disclose the GGNRA's interpretation of its legal rights would render the EIR a misleading document in that members of the public and the PUC Commissioners would wrongly assume the GGNRA is unable to control projects occurring on easement lands.

2. **The Proposed Project presented in PG&E's PEA unreasonably interferes with the purposes of the easements, and GGNRA would not concur that the project could be built.**

A. Impacts to Scenic Resources

In the PEA, PG&E concludes "*given the existing 60 kV transmission facilities' presence*

2 This authority endows GGNRA with actual control over the proposed project. That is, GGNRA's mandatory duty to administer the land in accordance with the provisions of both its easements and the GGNRA enabling legislation gives GGNRA sufficient control over the project to invoke the procedural requirements of the National Environmental Policy Act ("NEPA"). E.g., Sierra Club v. Hodel, 848 F.2d 1068 (10th Cir. 1988). The GGNRA is engaged in discussions with PG&E regarding NEPA obligations.

Comment Set PG, Attachment U, cont.

within the Segment 1 Project route and the incorporation of mitigation measures described in Subsection 8.4, the Project would not result in significant visual impacts." The GGNRA strongly disagrees with this conclusion.

The project involves the construction of significantly higher and more massive towers on Peninsula Watershed lands. The project also involves the stringing of additional wires, excavation and grading, vegetation clearing, and other construction-related and maintenance-related activities that will adversely affect watershed lands. The impact of the project on scenic vistas and other scenic values would be significant and it is unlikely that any mitigation measures would be available to reduce the intensity of these impacts to a less than significant level.

The mitigation measures proposed by PG&E in Subsection 8.4 largely involve the planting of screening vegetation. Given the mass and height of the new towers, it is extremely unlikely that vegetation would fully screen the towers. Moreover, as PG&E admits in the PEA, PG&E will need to conduct ongoing vegetation clearing and thinning within an expanded right-of-way[3] to reduce fire risks. The need for ongoing vegetation clearing undermines the effectiveness of the proposed mitigation measures. The PEA also does not address the inability of these mitigation measures to reduce impacts from scenic vistas such as Sweeney Ridge, which includes the San Francisco Bay Discovery Site (National Historic Landmark) where viewers would be looking down on watershed lands. Since the towers would protrude above the tree line, even mature trees would not provide effective screening. In addition, non-native grasslands represent the greatest percentage of habitat type located at the towers and pull sites (88%). These areas will not support screening vegetation. These impacts to scenic values and scenic vistas would constitute an unreasonable interference with GGNRA's ability to maintain the scenic values of its easement lands.

B. Impacts to Recreational Resources

The PEA concludes, in Section 5.3.2 (Impact 5.3), that the proposal's construction-related impacts to recreational resources of the watershed lands will be minimal and less than significant. The PEA also concludes that the proposal will have no ongoing operational impacts on recreational resources.[4] The GGNRA disagrees with these conclusions and believes that the proposal is incompatible with the public use and enjoyment goals of the easements.

Construction-related work and noise will be extremely disruptive to the quality of the

---

3 GGNRA would object to the issuance of an expanded right-of-way to PG&E for the proposed project.

4 Section 5.3.3.2 of the PEA states "*Operation of the Project will not impact existing or future recreational uses in affected parks and open-space areas. Segment 1 replaces an existing transmission route in a PG&E transmission-line corridor that does not currently directly affect recreational uses. Existing and proposed recreational trails that will be paralleled or crossed by the Project will not be impacted, because the transmission line will span these areas and no structures will be placed on the trails.*"

Comment Set PG, Attachment U, cont.

re. .ational experience for many users. As to operational impacts, while it may be true that the new towers will not pose a physical barrier to hiking, biking and other forms of recreation, in the long term, the increased mass and height of the towers will substantially impact the quality of the recreational experience for many users. In addition, an expanded vegetation clearing program within a wider right-of-way will directly and adversely impact the quality of the recreational experience. Thus, the GGNRA does not agree that there will be "no" impacts to recreation as a result of the proposed project.

In developing other alternatives to the proposal (see 3 below), the CPUC should evaluate mitigation measures wherein, PG&E would provide funding for the establishment of the Bay Area Ridge Trail's (BART) Cahill Trail through the Watershed. BART has permission from the San Francisco Public Utilities Commission to establish this trail for public access to Watershed lands, and the project requires funding to establish the necessary protection for watershed resources and public access, including fencing, a reservation system, and rangers. The level of funding should be equal to the impact of the selected alternative.[5]

C. Impacts to Natural Resources

(i) Vegetation

In Section 6.9.3 (Impact 6.1), the PEA acknowledges that the watershed lands are heavily)egetated, yet then concludes that the proposed project would have less than significant impacts on trees within the watershed because only a "*few trees, many of which are not native*" would be cut or trimmed. In Section 6.9 (Impact 6.12), the PEA states that "*no new impacts to vegetation will occur as a result of operations and maintenance*" despite the admission that areas around towers will continue to be "*mowed, plowed or cleared*" and that vegetation trimming will expand to cover a 100' wide area rather than a 50' wide area. The GGNRA does not agree that impacts to trees will be limited to only a few non-native trees, nor does the GGNRA agree that there will be no new impacts to vegetation over the long term.

To the extent that the EIR will include alternatives involving vegetation clearing on Watershed lands, the EIR would benefit from a more complete description of the nature and frequency of vegetation clearing activities than what is provided in the PEA. For example, the PEA indicates that trees may be allowed to grow higher because the wires will be higher. But, it is not clear what the height differential is.

Serpentine grassland is a rare and important habitat that supports numerous T/E species and the host plant for the federally threatened Bay Checkerspot butterfly. The PEA estimates that eight percent of the pull sites and 14 percent of the Tower and Tap Study areas are located in serpentine grassland habitat (Table 6-1), including three pull sites in serpentine grassland along Ralston-Pulgas Ridge and Haynes-Black Mountain Road (Watershed lands). These areas of

5 Although these scoping comments suggest various mitigation measures, these suggestions should not be construed as a determination by GGNRA that the mitigation would render any particular alternative compatible with the purposes of the easements.

Comment Set PG, Attachment U, cont.

serpentine grassland habitat will be disturbed by construction, including the movement of equipment and vehicles. The mitigation proposed is a temporary fix to the construction effi and does not mitigate for the long-term loss of habitat for a federally threatened species. Alternatives that avoid these impacts to serpentine grassland and the species that depend up should be developed.

(ii) Invasive Species

Ongoing vegetation clearing along the transmission line encourages the establishme invasive species. Seeds of invasive species are spread to disturbed areas from the vehicles PG&E maintenance crews and become established, replacing native species. The proposed project involves more vegetation clearing than what occurs now due to the expanded width right-of-way. Mitigation Measure 6.6 in the PEA is inadequate to mitigate these impacts. Alternatives that avoid the introduction or spread of exotics should be considered. To the e that the EIR will include alternatives that involve vegetation clearing on Watershed lands, t EIR should require resources for the removal of invasive species and the restoration of nati habitats in other areas of the watershed should be provided commensurate with the level of impact. Areas disturbed by construction are especially vulnerable to invasive plant species These areas require intensive ongoing monitoring and maintenance to eliminate invasive e and to prevent them from spreading from the disturbed sites to adjacent natural areas. The Watershed has existing areas where invasive species are targeted for removal and contribut funding or crews to this effort may be an appropriate mitigation measure for the Project.

(ii) Raptors and Other Birds

In Section 6.9.4 (Impact 6.22 and 6.23), the PEA indicates that *"no"* impacts to rap and other birds are anticipated. Also, the PEA indicates that the transmission lines do not c important bird movement corridors. The GGNRA disagrees with these statements. Raptor generally perch on the highest point to hunt, and given the height of the new towers, it is lil that they would be attractive perching locations for birds. If the towers and poles are not constructed properly, bird electrocutions will likely occur. Alternatives that would underg transmission lines would avoid many of these impacts. To the extent the EIR will include alternatives involving new towers, the EIR should reflect that PG&E has entered into a Settlement Agreement with the U.S. Fish and Wildlife Service in USFWS v. PG&E, INV 2000102354 (copy attached) wherein PG&E has identified areas in the Watershed as "Rapt Concentration Zones." The EIR should reflect PG&E's commitment to construct all new t and poles to be "raptor safe" in accordance with Section 2(a)(ii) of the Settlement Agreeme Raptor safe means that new construction should be effective to protect raptors, and this ma mean more than simply framing the poles and towers with a 5' phase separation. The EIR also require more robust mitigation requirements if bird mortality occurs after construction mortality occurs, PG&E should be required to conduct additional mitigation to reduce or eliminate mortality.

The San Francisco Watershed is an important nesting and roosting site for birds, including raptors and songbirds. The PEA, in Impact 6.7, does not evaluate the effects of t

Comment Set PG, Attachment U, cont.

trimming and removal during the nesting season, when bird species are most vulnerable to disturbance and predation. In addition, helicopter flights are also disruptive to nesting activity. These impacts can be detrimental to bird species.

3. **The EIR should analyze a reasonable range of alternatives, including undergrounding the transmission lines along Canada Road.**

To comply with CEQA, an EIR must analyze a reasonable range of alternatives. The GGNRA strongly believes that the alternative of undergrounding both the 60kV and the 230kV transmission lines in a new utility corridor under Canada Road is a reasonable alternative for analysis in the EIR. This alternative would reduce the context, intensity, and duration of new impacts and allow for the reduction of most of the ongoing impacts associated with the 60kV line. Construction impacts would be reduced because the construction would take place within or adjacent to an existing roadway. Long-term impacts from the towers on scenic, natural resource, and recreational values would be eliminated. Long-term impacts associated with tower and transmission line maintenance (such as vegetation clearing) would also be eliminated and the existing transmission tower corridor could be restored. Roads and infrastructure could be obliterated along the abandoned alignment.

In addition, the EIR should also include Alternative 1B, undergrounding only the 230kV line along Canada Road. While not achieving all of the benefits of the alternative discussed in the prior paragraph, Alternative 1B would reduce construction impacts on natural and cultural resources and would reduce visual impacts by eliminating the need to increase the height of the towers by up to 40 feet. However, GGNRA is not at this time prepared to endorse Alternative 1B because an impact analysis of this alternative is not available for our review.

The GGNRA does not support undergrounding the new 230 kV line in the existing corridor in the Peninsula Watershed lands. The trenching associated with this alternative will create unacceptable impacts to natural resources. The relocation of the current overhead alignment to more remote areas of the watershed is also not acceptable to the GGNRA because it would most certainly result in substantial impacts to previously undisturbed areas. These alternatives, therefore, would likely constitute an unreasonable interference with GGNRA's easements.

In addition to the need to consider a reasonable range of alternatives under CEQA, it is important for the CPUC to include alternatives in the EIR that would not constitute an unreasonable interference with GGNRA's easements. (See 1 above.) In other words, if the EIR were only to include alternatives that unreasonably interfered with GGNRA's easements, the GGNRA would have the right to halt implementation of the project. In order to avoid this conflict, the GGNRA is available to discuss particular alternatives at any time. We believe it is important for the CPUC to coordinate early and often throughout this process with other agencies having jurisdiction over the project, such as the GGNRA.

The GGNRA disagrees with the conclusion reached in the PEA related to the impacts of Route Option 1A (replacing overhead utility lines) as compared to Route Option 1B (undergrounding along Canada Road). The PEA reaches the conclusion that Route Option 1A

Comment Set PG, Attachment U, cont.

has "less significant potential environmental impacts than Route 1B (Page 3-12)." It is highly unlikely that underground construction in an existing roadway will entail greater impacts than construction of higher and more massive towers in environmentally sensitive areas. The EIR should re-evaluate this impact analysis.

4. **The EIR should discuss the impacts of each alternative on the GGNRA's easemen in the land use sections of the document.**

The description of the GGNRA's easements in Section 5.2.1.3 of the PEA is biased anc inaccurate. Please revise the description of the easements in accordance with comment 1 abov The list of land use topics in Section 5.3.1.1 of the PEA neglects to list the easements as a land use category. The EIR must address the land use impacts of each alternative on GGNRA's easements. GGNRA encourages the CPUC to coordinate with the GGNRA in developing thes sections of the EIR because the decision of whether a particular alternative unreasonably interferes with the easements rests with the GGNRA.

The Peninsula Watershed lands are part of the United Nations designated Golden Gate Biosphere Reserve. It is one of over 300 "biosphere reserves" in over 100 countries that serve models of how to protect the extraordinary resources of wildlands and protected areas while providing non-destructive human use and enjoyment. The EIR should reflect the biosphere reserve status.

Thank you for working the GGNRA on this Project. Please call Jonathan Gervais on my staff a (415) 561-4841 with questions.

Sincerely,

Mai-Liis Bartling
Acting General Superintendent

Comment Set PG, Attachment V

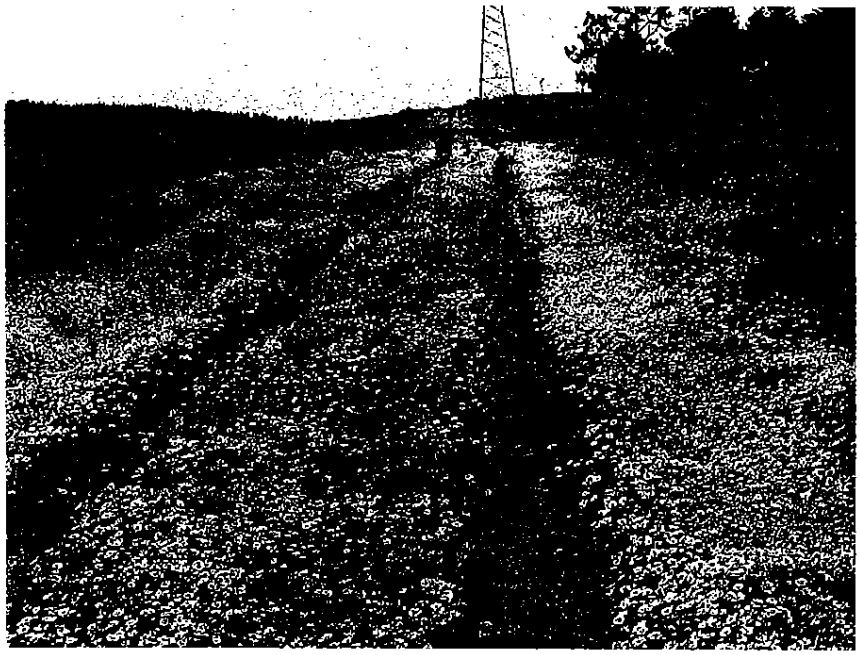

Figure 3. View North from Ralston Substation shows plant communities within the existing roadbed.

Comment Set PG, Attachment W

September 10, 2001

Dr. Raymond Neutra
Division of Environmental and Occupational Disease Control
California Department of Health Services
1515 Clay Street, Suite 1701
Oakland, California 94612

Dear Dr. Neutra:

The California Department of Health Services (CDHS) has requested comments on their *draft* EMF Report: "An Evaluation of the Possible Risks From Electric and Magnetic Fields (EMFs) From Power Lines, Internal Wiring, Electrical Occupations and Appliances" (*draft* 3, April 2001) and the Draft "Policy Options In the Face of Possible Risk from Power Frequency Electric and Magnetic Fields (EMF)" (collectively "Draft"). The Draft was prepared at the request of the California Public Utilities Commission (CPUC) in its Decision No. 93-11-013 (November 2, 1993) and may serve as the basis for the CPUC's further consideration and implementation of EMF policy within California.

These comments are submitted jointly on behalf of the following utilities: Los Angeles Department of Water and Power; Pacific Gas and Electric; Modesto Irrigation District; PacifiCorp; Sacramento Municipal Utility District; San Diego Gas and Electric; Sierra Pacific Power Company; and Southern California Edison. Collectively, these utilities serve over 20 million customers in California with electricity.

We appreciate the hard work and long hours CDHS staff have given to this important project. Our comments on the Draft will be made in three different ways. First, in this letter, we provide summary comments to focus CDHS's approach towards appropriate revisions to the Draft. We also provide recommendations on how to improve the CDHS process to revise and finalize the report. Second, we have funded ten independent experts who have reviewed the Draft and who will submit their comments on specific sections of the Draft directly to CDHS. Third, we are members of organizations that will also be submitting comments (e.g., EPRI and Edison Electric Institute).

Our key points are:

1. The process used to prepare the Draft is neither an appropriate nor a reliable way to assess public health risks;
2. The Draft is neither consistent with the available science nor in agreement with other international reports prepared by independent experts;
3. The authors do not have the expertise in all of the relevant scientific disciplines to fully evaluate the EMF literature, such as expertise in laboratory experiments, whole animal bioassay, and biophysics;
4. The risk communication messages have not been tested and are likely to be confusing and misleading, particularly to the general public;

We provide an elaboration of these points in Appendix A. With respect to the 'policy evaluation' report, the CDHS policy options evaluation uses risk evaluation outputs that consistently overestimate risks from EMF exposures. In addition, 'EMF Mitigation' costs are consistently underestimated. The result is an erroneous policy options evaluation that grossly overestimates the value of EMF "mitigation" measures, particularly with regard to 'property value impacts' and undergrounding of electrical facilities. Decision-making based on these faulty assumptions will adversely impact the siting of new electrical facilities, construction schedules, ratepayer costs, and electrical system reliability.

Comment Set PG, Attachment W, cont.

Unless the deficiencies in the report are effectively addressed, our common goal of developing appropriate and sound public policy on EMF in California, factoring in both public health and public utility considerations, will be made more difficult and will be substantially delayed. For CDHS, this may mean a loss of confidence in your agency's ability to assess public health risks, an inappropriate consideration of EMF risks relative to other health risks, as well as the larger concern of establishing a precedent of using a flawed risk assessment process for the evaluation of other health risks. For the CPUC, flawed decision-making may adversely impact the operation and costs of the electricity supply system by, for example, making it more difficult to site new electrical facilities that will be needed to connect new generation facilities to the grid. For utility customers, flawed decision-making will increase the costs of electricity without adding corresponding value to consumers.

We are recommending that CDHS:

1. Broaden the authorship to include perspectives from independent scientists who have working knowledge of relevant epidemiology, laboratory experiments, whole animal bioassays, and biophysics;

2. Carefully review the comments from independent scientific experts, and use this information to revise the report so that it reflects the existing EMF literature;

3. Increase the quality of 'Peer Review' independent of CDHS (and with more involvement of the CDHS EMF Science Advisory Panel).

The California electric utilities have been leaders in establishing an effective, proactive California EMF program. We have supported EMF research since 1979; performed health studies of our workforce; helped sponsor studies of childhood cancer in our service area; worked with the California Department of Education in the siting of new schools; actively communicated with our customers; and since 1992, adopted a policy of choosing options to lower magnetic fields from new electric utility facilities. CDHS has been an important partner over these past fourteen years. We believe that, moving forward; we can and should continue to work together to respond to the scientific uncertainty associated with the EMF issue by establishing sound and responsible EMF policies. To do this, California decision makers need the CDHS EMF reports to be technically correct, to be consistent with the available scientific information, and to communicate the key issues fairly in a way that is useful to the public and California decision makers.

Specific responses to the specific questions raised in the conclusion of the Draft are provided in Attachment B. Please contact us if you would like additional information to support our recommendations.

Sincerely,

John Dawsey
San Diego Gas & Electric

Randy Erickson
Modesto Irrigation District

Michael Herz
Pacific Gas & Electric

Enrique Martinez
Los Angeles Department of Water and Power

Kent Jaffa
PacifiCorp

Kuldip Sandhu
Sierra Pacific Power

Jon Sirugo
Southern California Edison

cc: Mr. Paul Clanon, CPUC
Ms. Judith Ikle, CPUC

Comment Set PG, Attachment W, cont.

Appendix A. Elaboration On Summary Points

1. **The process used to prepare the Draft is neither an appropriate nor a reliable way to assess public health risks.** While innovative, the 'Risk Evaluation Guidelines' used by CDHS do not represent established practice for public health risk assessment. You also used a procedure modeled on an 'International Agency for Research on Cancer (IARC) Monograph Review', but is substantially different from the formal IARC process. Importantly, however, the IARC procedures are not designed to provide a formal risk assessment. Second, the failure to use the same method as employed by IARC makes it inappropriate to suggest that an IARC-type assessment has been completed. Third, in order to allow objective assessment of the report's conclusions, the key differences between the CDHS process and the IARC process (which convenes an international panel representing a wide range of scientific disciplines) should be made explicit. Fourth, the Bayesian method that was originally intended requires a level of quantification that cannot be achieved for EMF, because key information is lacking (e.g., there is no reliable way of assigning 'exposure' or assessing 'dose').

2. **The Draft is neither consistent with the available science nor in agreement with other international reports prepared by independent experts.** The authors' main argument is that since exposure has not been proven to be safe, this increases the likelihood that EMF is a health hazard. This is tantamount to turning "ignorance into knowledge." Since the absence of causation is virtually "unprovable" for most environmental agents, use of this line of reasoning sets dangerous precedent for the evaluation for this and other public health issues addressed by the CDHS. Too much weight is given to the epidemiological results, and too little weight is given to the results from laboratory studies, whole animal bioassays, mechanistic studies and physical theory. Many of the conclusions reached by the authors are not scientifically supportable and are not in line with the conclusions of other scientific bodies. In fact, the conclusions in the Draft are at odds with those of all other risk assessments conducted by state, national and international agencies and major scientific organizations. This includes recent assessments by agencies with access to the same data (e.g., Virginia Dept of Health, National Radiological Protection Board (UK), the Health Council of the Netherlands, and the World Health Organization's International Agency for Research on Cancer).

   For example, CDHS used the criteria of the World Health Organization's International Agency for Research on Cancer (WHO/IARC) to classify EMF; they came to substantially different conclusions. With respect to childhood leukemia, the three DHS reviewers classified EMF risk as "possible," "probable," and "virtually certain". Since the time DHS completed its evaluation, the actual 20-member IARC panel reviewed the same EMF data and unanimously classified EMF risk for leukemia "possible," not probable or likely (IARC Press Release for Monograph 80, July 2001). Further, IARC found no consistent evidence with regard to all other childhood and adult cancers.

3. **The authors do not have expertise in all of the relevant scientific disciplines (expertise in laboratory experiments, whole animal bioassay, and biophysics needs to be added).** The CDHS committee that prepared the draft report is not representative of the wider scientific community with expertise in this area. The three authors are all from the same discipline (i.e., epidemiology), work in the same division, and two of the authors report to the third. In addition, for the miscarriage risk assessment, the suggestion for a problem comes only from recently published reports funded and written by these same individuals. While we are not impugning the qualifications of these scientists, a proper review of the extensive literature needs a broad range of expertise and institutional affiliations.

4. **The risk communication messages have not been tested and are likely to be confusing and misleading.** As currently drafted, this will pose particular problems with the general public. This confusion may inappropriately shape individual views of EMF risk and result in inappropriate public policy decisions. It should be recognized that there are adverse public health consequences from over-estimation of risk as well as from under-estimation of risk. The point is that CDHS's risk communication methods are not policy-neutral, and are likely to result in a substantial over-estimation of public health impacts. This, by itself, can adversely impact public health priorities.

Comment Set PG, Attachment W, cont.

Appendix B. Response to Specific Questions Raised by CDHS

CDHS specifically requested answers on the following questions:

1. We have taken the position that we are not greatly influenced by arguments based on physics and simplified biological models that suggested that residential and occupational levels of EMFs can't possibly produce bio effects. We say that theories should be used to predict results that are falsifiable and should not be used to discount evidence. Thus, our prior degree of confidence is not vanishing small. Do you agree? Please comment.

   Our Response:

   > We disagree with your use of biophysical evidence. First you misconstrue the argument, saying that since 'biophysics does not prove that EMF is safe, then this stream of evidence is not valuable'. You also discount biophysical theory by over-looking the substantial base of direct, reproducible experimental 'observation' that was used to construct these theories. The point isn't that your prior degrees of confidence are too low; it is that the three reviewers give too much weight to a highly selected set of 'new epidemiological information'. You fail to recognize the added importance of biophysical plausibility when the epidemiology conclusions are based on small numbers and weak effects, and no specific magnetic field parameter has been identified. In sum, you have consistently underestimated the value and relevance of the established biophysical theory in your evaluation of the epidemiological data and the whole animal bioassays to your risk assessment.

2. Each of the three core reviewers has laid out their initial (prior) degree of confidence that residential or occupational EMFs could produce relative risks of various sizes. These estimates are constrained by what we know about animal bioassays for cancer and by the lack of dramatic change in disease rates after the introduction of electricity and as the use of electricity increased. Reasons are given for these judgments. Do they seem reasonable? How much higher or lower would your priori degree of confidence be for any environmental/occupational agent? For EMFs? Why?

   Our Response:

   > Your method of risk assessment is neither scientifically sound nor defensible. You have wrapped yourself in Bayesian methods, without actually performing Bayesian analysis. First, the CDHS draft report did not follow the procedures outlined in the CDHS EMF Risk Evaluation Guidelines. Second, the risk assessment methods used are not considered standard practice for evaluation of potential public health risks. Third, the methods used are not useful for performing scientific risk assessments. CDHS should use established risk assessment methods. CDHS should also increase the number of authors by including scientists with expertise in the disciplines that are relevant to the available scientific information. This also will help to make the assessments more representative of the wider scientific community and to improve the relative weighting of data from the various scientific disciplines (e.g., laboratory experiments, whole animal bioassay, epidemiology, and biophysics).

3. We were not deeply convinced of mechanistic explanations of how EMFs could cause bioeffects nor were we convinced of a chain of events that led to pathology. Yet we did not let this pull our degree of confidence in the epidemiology down much on the grounds that lack of mechanistic understanding is not sensitive or specific. Do you agree? Please comment.

   Our Response:

   > No, we do not agree with your analysis. You have missed the key point. The important aspect of the available scientific literature is not that there is no established biophysical mechanism for the health risks suggested in the epidemiological literature (even though scientists have looked for such a mechanism for many years). Rather, it is that there are very well accepted biophysical mechanisms for the interaction of ELF/EMF and human cells. This is supported by the vast experimental literature and

Comment Set PG, Attachment W, cont.

the results of numerous, and relevant, whole animal bioassays. The epidemiological data are less plausible given this available knowledge. In addition, your confidence in the epidemiology is misplaced. While the epidemiological literature can be described as 'limited,' we do not believe that, as scientists, you can confidently assert that we can rule out bias, confounding, or chance as plausible explanations for the observed associations in the pooled analysis (for exposures above 4 mG).

4. We viewed the animal pathology literature as largely null, with the exception of the breast cancer promotion studies of the Soviets and Loescher's group and the various experiments with chick embryos. Once again because of arguments given we did not let this pattern of evidence pull down our degree of confidence in the epidemiological literature much and for some of us it actually increased the degree of confidence somewhat. Do you agree? Please comment.

Our Response:

You are alone in viewing the Loescher work as either relevant to cancer promotion or of value in addressing the question of potential health risks. The published reports from Loescher do not support any 'effect', the studies were not replicated, and there are results from other, well-designed and conducted studies that do not show any health effects. Your reliance on the 'Henhouse' studies is inappropriate. In 1997, a group of experts including two of the DHS reviewers unanimously concluded that the chick assay studies are equivocal and not a good assay for human risk assessment. The exposures for these studies are also not relevant to those found in community or occupational environments. You discount the lack of results from the majority (and best designed and conducted studies) of the animal bioassays by creating vague theories of disease causation. Even though these vague theories of causation were not addressed in the available literature, and you have no data to support them, you assume that the 'theory' supports the epidemiological literature.

5. Not all epidemiologists would agree with our position that relative risks between 1 and 2 should be taken seriously unless there is specified evidence for confounding or bias to explain it away. Do you agree? Please comment

Our Response:

We disagree. We know from experience that there is a poor predictive value of epidemiological results for low estimated Relative Risks (e.g., review the contents of *American Journal of Epidemiology* or *Epidemiology* over the last ten years for studies that report estimated RR at these levels and note how the results are described). Your view is especially flawed in the context that there are small numbers of high exposed subjects and there is a lack of biophysical, experimental and animal support. With regard to small numbers, the pooled analysis by Ahlbom *et. al.*, reports that only 0.8% of subjects had exposure above 0.4 μT. The large majority of these subjects come from the study by Linet *et. al.*, who have demonstrated that participation bias and confounding occur in this study. In addition, no specific exposure parameter has been identified. In such cases, it is inappropriate to over-interpret the epidemiology.

6. We said that a lack of specificity in the association of EMFs with subtypes of cancer and evidence for effects on various types of disease did not pull down our degree of confidence and might even increase our degree of confidence that epidemiological associations between disease X and EMF are causal in nature. Do you agree? Please comment.

Our Response:

We disagree. It is implausible that EMF is a 'general health hazard.' First the scientific data do not support this (e.g., neither laboratory experiments nor whole animal bioassays find robust suggestions for adverse effects on intact cells or tissues). Second, if EMF were a 'general health hazard,' this would imply that the disease model would be more conspicuous, which would suggest the whole animal bioassay and the laboratory experiments would find more robust results. This should either be neutral to your weight of evidence or diminish your confidence. Over the last thirty years, a vast number of exposures and different

Comment Set PG, Attachment W, cont.

disease types have been evaluated. None of the earlier suggestions for an effect, including the '2 mG MF level' suggested by Wirtheimer and Leeper (1979), have held up to better studies. In contrast, Reviewer 1 uses this line of thinking to increase his belief that EMF is linked to health impacts. There is no evidence for a common biological model between the six diseases that Reviewer 1 concluded were likely to be caused by EMF exposure (i.e., childhood leukemia, adult leukemia, adult brain cancer, female breast cancer, spontaneous abortion and ALS). While Reviewer 1 concludes that he is virtually certain that EMF exposure is not a 'Universal Carcinogen', he does maintain that three fundamentally different cancer sites are linked to EMF exposure. A fair reading of the available scientific data does not support this.

7. Have we done an adequate job in presenting the arguments for and against causality or are we assigning weak arguments to the "con" or the "pro" position?

Our Response:

You have presented the arguments, but you fail to assign sufficient value to the 'con' arguments and give too much credit to the 'pro' arguments. The analysis also lacks scientific rigor and does not give sufficient weight to key aspects of the scientific literature.

8. Our Risk Evaluation Guidelines (REGs) define some "plain language phrases" to express our degrees of confidence. However, when we actually applied them we found they were not problem free:

a) Some of these phrases are not mutually exclusive. For example, Possible >50% overlaps "highly probable" and virtually certain." "Possible <51%" overlaps "Possible >50%". In this case, the overlap is slight, but important, since it is about the "balance of probability".

b) These phrases are grammatically awkward and they are not really "user friendly". How could we rephrase them, without violating the spirit of the REGs? Please write any suggestions next to each phrase:

Confidence range	Current Phrase	Suggested alternative
>98%	Virtually certain	
90-98%	Highly probable	
50-90%	Possible >50%	
10-50%	Possible <51%	
2-10%	Very improbable	
<2%	Virtually certain that it is not causal	

Our Response:

There is no scientific justification for these categories. These are not consistent with the text used to describe the assessments of any other independent expert panel. For example, based on the same epidemiological data, the National Institutes of Environmental Health Sciences (NIEHS) concluded that:

> The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak.

Comment Set PG, Attachment X

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EARL WARREN HALL
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31 May 2002

Diana Bonta, R.N., Dr.P.H.
Director, California Department of Health Services
714 P Street, Room 1253
Sacramento, CA 95814

Dear Dr. Bonta:

The Electric and Magnetic Field (EMF) Scientific Advisory Panel (SAP) held its final meeting on 9 May 2002 in Oakland California. The purpose of this meeting was to review the fourth draft report on the evaluation of the potential hazards of EMF's prepared by your staff. The members of the committee were asked to individually comment on this draft. Following the individual comments of the SAP, the public was given an opportunity to present their views. The SAP then voted on the following issues,

1) Did the Department of Health Services (DHS) reviewers follow the EMF Risk Evaluation Guidelines?
2) Was their use of the guidelines to reach a conclusion logical and within the range of reasonable scientific discourse?
3) Does the policy options document provide a balanced account of the options and is it consistent with the scientific evidence?

All ten SAP voting members were present and voted on all three questions. For each of the above questions, a summary of the vote and the issues raised in the members' discussions before the vote are summarized below.

1) Did the DHS reviewers follow the EMF Risk Evaluation Guidelines?

The panel was satisfied that the reviewers followed the guidelines sufficiently and unanimously voted yes on this question. In discussions supporting their vote, members noted that the document presented an excellent compendium and evaluation of the available literature, displayed an effective and innovative use of a qualitative Bayesian-like process, and communicated uncertainties effectively—especially with graphical presentations expressing confidence ranges. Members also noted that the evaluation process used by each reviewer was transparent and well documented in the final report.

2) Was their use of the Guidelines to reach a conclusion logical and within the range of reasonable scientific discourse?

The panel all agreed that the conclusions were logically supported within the range of reasonable scientific discourse and the panel unanimously voted yes on this question. But there was consensus among the SAP members that different evaluators with the same or different professional backgrounds may use the DHS guidelines and arrive at different numerical confidence estimates, perhaps substantially different. Although they had access to reviewers in toxicology, biophysics and occupational medicine, all three evaluators were

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Comment Set PG, Attachment X, cont.

primarily epidemiologists, with secondary specializations in medicine, physics and toxicology. Based on a sample of only three evaluators sharing a similar professional background, the conclusions drawn by these evaluators might not generalize to those from other professions or to the general public. A minority of SAP members, while endorsing the integrity of the DHS evaluation process, was not sufficiently persuaded by the extensive discussions in the document on issues of biophysics, mechanistic research, and animal pathology to arrive at the same conclusions as the three DHS evaluators. These members believe that if they were to carry out their own extensive review using the same assessment guidelines, they might come to somewhat different conclusions and arrive at lower estimates of risks from EMFs. In raising this issue these panel members considered the following factors:

1. EMFs have very low energy;
2. Biological effects of exposure to EMF's have not been demonstrated in animal models;
3. Consistent dose-response relations have not been demonstrated between EMF exposure and several health outcomes;
4. These SAP members give more weight to negative studies than did the DHS reviewers,
5. Given the lack of a biological mechanism, these SAP members gave more credence to the possible effects of "confounders" than did the DHS reviewers.

3) Does the policy options document provide a balanced account of the options and is it consistant with the scientific evidence?

Although there was limited discussion of the policy options document, the SAP unanimously voted yes and expressed support for both the procedures used and the completeness of the options presented

The several public commentators were invited to submit their observations in writing to the Department.

On behalf of all the members of the SAP, may we take this opportunity to thank you for the opportunity to participate in this important public health effort.

Sincerely yours,

Warren Winkelstein by TMcK

Warren Winkelstein, Jr.
Chairman, Scientific Advisory Panel
(Dr. Winkelstein is working in London and has read and approved this letter)

Thomas E. McKone
Co-Chairman

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Comment Set PG, Attachment Y

Technical Memorandum

To: J. Wesley Skow, Latham & Watkins

From: Lowell D. Rogers, Black & Veatch

Re: San Andreas Fault Crossing: Engineering Underground Duct Bank

Pacific Gas & Electric Jefferson-Martin 230 kv Transmission Project
The San Andreas Fault is a right-lateral type fault (west side is moving north compared to east side) that is expected to displace on the order of up to ten feet during a major seismic event, based upon the 1906 earthquake. The direction of this movement will be roughly perpendicular to Sneath Lane and the duct bank. As such, this duct bank will need to resist extraordinary shear forces for the cables to remain intact and the Jefferson-Martin transmission line in service.

Two design principles can be employed for the duct bank which could be used to protect the cables during a major event. One principle is to provide enough flexibility in the duct bank and cable system so that it will yield easily to the ground movement. The other principle is to provide for a very rigid duct bank that will essentially cut through the soil.

Flexible System
A flexible duct bank system could be constructed in one of two configurations.

One configuration would consist of a very weak duct bank that incorporates a number of "S" curves in the area of the fault. The purpose of these "S" curves is to create enough slack in the cable that a failure of the cable splices might be prevented. In the section of duct bank where the "S" curves are incorporated, a very wide trench (approximately 15ft.) will be excavated and backfilled with a weak material. This would possibly allow the cable to move with the earth and prevent any stress points.

This system would require a very wide temporary construction and permanent right-of-way and would require any other utility to be relocated so it would not impede the cable's ability to move freely.

Another configuration would also employ the wide trench with weak backfill, but the duct bank would be straight. On opposite sides of the fault, large cable vaults could be installed. Inside these vaults, slack cable would be provided in such a way that it could be pulled out of the vault and into the duct bank to accommodate movement.

This system would also require a very wide temporary construction and permanent right-of-way. The vaults would also require additional ROW.

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Comment Set PG, Attachment Y, cont.

Rigid System
A rigid duct bank system would rely on the strength of the duct bank to displace the soil as the earth moves. Since the earth on one side of the fault would be displaced relative to the other, the duct bank would need to be designed as a beam that is fixed at each end. The duct bank would experience a curvature type deflection, but should stay intact. Slack should be added to the cable to prevent any additional tension.

This duct bank would need to be constructed in a straight line and could not be routed around other utilities.

Expectations
None of these configurations should be expected to be 100% reliable during a major seismic event. These systems will likely not behave exactly as expected; for instance, the flexible system relies on the free movement of the cable through the earth. This is unlikely due to the soil compacting over time and other items in the soil that could pinch the cable, such as rocks and unknown utilities (existing and future). The rigid duct bank may also fail due to unforeseeable reasons. If the rigid duct bank were to fail, given its strong construction, it will be a very difficult and lengthy repair.

Therefore, when crossing the San Andreas Fault in an underground configuration, one must be ready to accept the likelihood that the cable will fail during a major seismic event. To prepare for this, repair material (i.e. cable, spices, etc.) and a repair plan must be at the ready. Even under the best scenario, the repair would take up to a week or more. It is probable that a significantly longer outage (of several weeks or more would be expected.

The only reliable method to cross the fault in this location is by an overhead system that provides the flexibility needed to withstand this type of movement.

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