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COMPLIANCE PLAN
FOR THE
SMUDGE NO. 1 GEOTHERMAL PROJECT

(80-AFC-1)

March 25, 1981
(Rewritten 5/83)

California Energy Commission

NOTICE!!

To facilitate the transition to automated data processing, Appendix D to the Final Decision of the SMUDGE No. 1 Geothermal Project, dated March 25, 1981, PSCC-81-003, which is the USGS-CEC Joint Compliance Monitoring Report, has been rewritten and organized into the format now used for California Energy Commission Compliance Plan. This document does not change or modify any terms and conditions of certification contained in the Final Decision.

Additional important information that the reader should remember is that responsibilities which formerly resided with the United States Geological Survey (USGS) now reside with the Bureau of Land Management (BLM) as a result of reorganization within the United States Department of Interior. USGS is used in the compliance plan to distinguish between the responsibilities of the BLM and USGS at the time of the decision.

The mailing address for all compliance matters formerly under the USGS (Item 6 under General Provisions) is now:

Mineral Manager for Geothermal
Bureau of Land Management
2465 E. Bayshore Road, Suite 400
Palo Alto, CA 94303

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TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION AND GENERAL PROVISIONS	
A. Introduction	1
B. General Provisions	3
II. POWER PLANT COMPLIANCE PLAN	
Section 1. Air Quality	6
Section 2. Public Health	14
Section 3. Socioeconomics/Land Use/Transportation	22
Section 4. Cultural Resources	25
Section 5. Biological Resources	26
Section 6. Water Quality, Hydrology, and Water Resources .	39
Section 7. Geotechnical/Seismic Hazards	45
Section 8. Soils	48
Section 9. Civil Engineering/Aesthetics	50
Section 10. Structural Engineering	53
Section 11. Solid Waste Management	64
Section 12. Safety	67
Section 13. Transmission Line Safety and Nuisance	72
Section 14. Transmission Line Engineering	77
Section 15. Transmission Line Biological Resources	78
Section 16. Noise	79
Section 17. Power Plant Efficiency	82
APPENDIX A. Letter of Understanding Between CEC and USGS with Respect to Postlicensing Duties and Re- sponsibilities for the SMUDGE #1 Geothermal Project	83

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A. INTRODUCTION

California Public Resources Code Section 25532 requires the Commission to establish a monitoring system to assure that any facility certified under the Warren-Alquist Act is constructed and is operating in compliance with air and water quality, public health and safety, and other applicable regulations, guidelines, and conditions adopted or established by the Commission or specified in the written decision in the application.

Because the SMUDGE0 #1 power plant is being constructed on federal land, the Commission has joined with the United States Geological Survey (USGS) by a March 2, 1981, Letter of Understanding (see Appendix A) to meet the requirements of PRC Section 25532.

The following report is referenced in the Commission's Decision on the Sacramento Municipal Utility District's Application (80-AFC-1, Publication No. 800-81-001) as Appendix D.

The Compliance Monitoring Program for the SMUDGE0 #1 project is managed by the Deputy Conservation Manager (DCM) for Geothermal, USGS, through his chief, Engineering Section. The manager is responsible for implementing the approved program after OLC certification, maintaining compliance monitoring records for the program, ensuring that all aspects of the program are done in a timely manner, and bringing to the attention of the CEC any need for issue resolution. In cases of dispute the DCM for Geothermal has final authority to resolve the dispute.

All compliance verifications will be part of the public record and will be maintained by United States Geological Survey.

The reader should keep in mind that responsibilities which formerly resided with the United States Geological Survey (USGS) now reside with the Bureau of Land Management (BLM) as a result of reorganization within the United States Department of Interior. USGS is used in the compliance plan to distinguish between the responsibilities of the BLM and USGS at the time of the decision.

The mailing address for all compliance matters formerly under the USGS (Item 6 under General Provisions) is now:

Mineral Manager for Geothermal
Bureau of Land Management
2465 E. Bayshore Road, Suite 400
Palo Alto, CA 94303

3. GENERAL PROVISIONS

1. The USGS and the United States Bureau of Land Management (BLM) shall be the responsible agencies for compliance monitoring and enforcement. All submittals of materials shall be directed to the USGS who may then delegate responsibility for review, approval, and enforcement of compliance monitoring submittals to other public agencies to the limit of those agencies' legal authority in lieu of the USGS's and BLM's exclusive authority to approve sites and related facilities. The final recommendation approval shall be from the USGS and the BLM.
2. This document references the laws, ordinances, standards, and conditions for designing, constructing, and operating the power plant and related facilities. This document additionally specified actions, verifications, submittals, and approvals required by the USGS, BLM, and CEC to assure that the facilities are designed, constructed, and operated in compliance with air and water quality, public health and safety, environmental and such other laws, ordinances, and standards specified.
3. This document applies to the Area of Operations which is defined in the Applicant's Plan of Operations and includes the plant site area and the transmission line right-of-way.
4. In the event that the utility and any person with delegated compliance authority determines, after reasonable effort on the part of both parties, that a conflict cannot be resolved, either party may petition the USGS to consider the conflict.

The Deputy Conservation Manager for Geothermal (DCM, Geothermal) will review the petition and, if needed, convene meetings and take any other steps to resolve the conflict. In the event such efforts are not successful, the DCM, Geothermal will, after review, render a decision. This decision is subject to the provisions of appeal as contained in 43 CFR Part 290.

5. Any matter of noncompliance with the terms of the CEC's Certificate, the BLM's License, or the USGS's Geothermal Utilization Permit that comes to the attention of the USGS is subject to review by the USGS, the BLM, and the CEC. Any person may file a complaint with the USGS, the BLM, or the CEC alleging a violation of statute, regulation, order, or decision adopted, administered, or enforced by the USGS, BLM, or the CEC.
6. USGS's mailing address for all compliance monitoring matters is:

Mineral Manager for Geothermal
Bureau of Land Management
2465 E. Bayshore Road, Suite 400
Palo Alto, CA 94303

was formerly:

Deputy Conservation Manager for Geothermal
United States Geological Survey
Conservation Division
2465 E. Bayshore Road, Suite 400
Palo Alto, CA 94303

The CEC's mailing address for compliance monitoring matters is:

Compliance Audit Manager (20-AFC-10)
California Energy Commission (MS 2000)
1516 Ninth Street
Sacramento, CA 95814

7. The utility and county chief building official, if applicable, will maintain for the life of the project, files of all "as-built" documents referenced in this report for the life of the project. USGS, BLM, and CEC staff, upon reasonable notification, will have access to these files.

8. USGS will maintain as a public record:

- o All attestments pertaining to the fulfillment of legal requirements, and

- o All documents relative to complaints filed with the USGS.

9. Any information which Applicant deems proprietary shall be submitted to the USGS pursuant to the Freedom of Information Act (Public Law 93-502). Any information which is determined to be confidential shall be kept confidential as provided for in the Freedom of Information Act.

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Section 1. AIR QUALITY

A. Applicable Laws, Ordinances, Standards, and Practices

- o Northern Sonoma County Air Pollution Control District (NSCAPCD) Rules and Regulations, including but not limited to 220, 230, 400(a), 410(a), 420(d), 430, and 455 (a and b).
- o Clean Air Act and implementing federal regulations.
- o California Health and Safety Code, Sections 40002 and 40701.

B. Requirements

- 1-1. The NSCAPCD shall perform all duties and functions normally conducted by the APCD and shall have authority to issue a Permit to Operate, collect the permit fees, levy fines, order correction of operational or mechanical procedures or functions, and perform compliance tests. The established NSCAPCD appeal procedures shall apply for all contested NSCAPCD actions.

Verification: SMUD shall summarize in an annual compliance report to the CEC any interactions with the NSCAPCD. SMUD shall immediately inform the CEC and ARB in writing of any formal appeals filed with the NSCAPCD.

- 1-2. SMUD shall comply with the requirements specified in the NSCAPCD document entitled, "Determination of Compliance," dated January 28, 1981.

Verification: SMUD shall provide the CEC with copies of all reports submitted to the NSCAPCD and copies of all notices received from NSCAPCD.

DOC Conditions

1. As originally proposed in the AFC, SMUDCEO #1 (at 72.3 MW-hr) would operate at 100 gm/gMW-hr H₂S. The NSCAPCD determines that operation at 100 gm/gMW-hr would likely cause or contribute to a violation of the state ambient air quality standard for H₂S.
2. The Applicant (per telephone call with Don Martin October 9, 1980) will amend the AFC for SMUDCEO #1 such that SMUDCEO #1 will emit no more than 50 gm/gMW-hr H₂S.
3. The NSCAPCD staff has reviewed the above amendment, and has concluded that if SMUDCEO #1 is operated at 50 gm/gMW-hr for hydrogen sulfide emissions it might possibly prevent the attainment or interfere with the maintenance of the state ambient air quality standard for H₂S, and therefore the project must employ BACT (Best Available Control Technology) of 5 lb/hr emission rate.
4. The NSCAPCD recognizes the uncertainty in numerical modelling and concludes SMUDCEO #1 should be designed and planned to operate at 5 lb/hr emission rate (BACT), but could emit at 50 gm/gMW-hr, if the background H₂S is as low as anticipated.
5. At this time, it appears that a secondary H₂S control system will be needed to achieve the emissions level of 5 lb/hr.
6. Applicant proposes to meet the applicable H₂S emissions limitation by employing a surface condenser, Stretford unit, and secondary H₂S control system, if needed.
7. NSCAPCD Rule 455 (2) limits geothermal power plant emissions of sulfur compounds, calculated as SO₂, to 1,000 ppm or less.
8. SMUDCEO #1 will emit less than 1,000 ppm of sulfur compounds, calculated as SO₂.

9. NSCAPCD Rule 420(d) limits geothermal power plant emissions of particulate matter to whichever is the lesser of: a) 0.20 grains per actual cubic foot (ACF), or b) for a source with a process weight rate of 60,000 pounds per hour or more, 40 lb/hr.
10. Under worst case conditions, SMUDGECO #1 will emit less than .20 grains of particulate matter per actual cubic foot and less than 40 lbs/hr (provided the Stretford balance tank cooling tower is properly designed).
11. In the event of any unscheduled outage at SMUDGECO #1 once it is operational, the Applicant agrees immediately to notify the steam supplier for SMUDGECO #1.
12. The NSCAPCD believes that it is reasonably likely that the steam supplier for SMUDGECO #1 will be able to secure the necessary permits for steam field development.
13. Based upon the review of the Applicant's amendment to the APC, the NSCAPCD has determined the following conditions to be necessary to assure compliance with applicable air quality standards:

- A. Hydrogen sulfide emissions from the power plant shall be no greater than 5 lb/hr but could emit at 50 gm/gMW-hr provided SMUD shows to the satisfaction of the APCO that, from normal geothermal operations (namely power plant as well as stacking operations), H_2S impacts in the Anderson Springs area do not equal or exceed 22 ppb:

- (a) For two years prior to operation or,

- (b) In the event of nonattainment of (a), for two years after commencement of operation (based on the fact significant source reductions will occur from other sources mid-1984 and after).

An increase in the allowable emission rate for H_2S will be granted in writing by the NSCAPCD, CEC, and ARE if either (a) or (b) is attained.

The hydrogen sulfide monitoring program shall consist of up to three (3) monitoring stations and shall be approvable by the CEC, ARE, NSCAPCD, and LCAPCD.

- B. Applicant shall return all untreated steam and/or condensate to injection points such that hydrogen sulfide will be treated up to the standard of Rule 455(a) during normal power plant operation, plant start-up and plant shut-down. Furthermore, the Applicant shall return all condensates to the condenser in such a fashion so that residual H_2S is stripped and properly conveyed to the ejector/vacuum system.
- C. Mechanical vacuum pumps must be designed such that oil vapors/mist will not be carried to the Stretford facility if the oil would materially decrease the Stretford control efficiency or if particulate emissions to the atmosphere will result (see finding F).
- D. The evaporative cooler on the Stretford equipment will be designed to comply with particulate emission standards of Rule 420(d).
- E. Applicant shall install and operate a continuous H_2S monitoring device in the off-gas vent to the cooling tower. The gas analyzer shall have an accuracy of plus or minus 10 percent of full scale for the 0 - 50/ppmv range. Data shall be logged on a strip chart or other similar device which will be available for inspection on sight upon request. Applicant shall design for a target data capture of 85 percent on an annual basis. An audible alarm for H_2S above 10 ppmv shall be incorporated.
- F. Although SMUDGE #1 may be licensed on the basis of hydrogen peroxide/catalyst and Stretford/surface condenser system, the Applicant may use other means to comply with the hydrogen sulfide emissions limitation of 5 lbs/hr. The Applicant will submit, no later than two years prior to the scheduled commercial operation date of SMUDGE #1 project, the conceptual design of the finally selected abatement system, including data demonstrating that compliance with the emissions limitation of 5 lbs/hr can be met. Such data shall be submitted to the CEC, the APE, and the NSCAPCD at least 30 days prior to the date intended for commencement of the design of the proposed system. Design shall not proceed until the NSCAPCD APCD determines that the material submitted is adequate to demonstrate compliance with the H_2S emissions limitation. The APCD shall render a determination no later than 15 days following the receipt of the material from the Applicant.

- G. Applicant approved-for-construction drawings of the secondary abatement system shall be submitted to the CEC, ARE and the NSCAPCD at least 30 days prior to the date intended for the commencement of the system. Construction shall not proceed until the NSCAPCD APOC determines that the drawings submitted are adequate to demonstrate compliance with the applicable limitations. The APOC shall render a determination no later than 15 days following the receipt of the material from the Applicant.
- H. Applicant shall:
- a. By September 1, 1982, determine the feasibility of a continuous, condensate monitoring system for H_2S , including estimated costs, which is capable of plus or minus 20 percent accuracy and which requires reasonable maintenance. The Applicant shall submit quarterly reports to the APOC, the ARE, and the CEC on its efforts toward these determinations.
 - b. In the event that a continuous monitoring system is infeasible or requires unreasonable maintenance, the Applicant shall be required to install an alternative system approved by the APOC.
- I. Applicant shall, during the construction period, appropriately treat the construction site to prevent excessive fugitive dust emissions.
- J. Applicant, within 60 days of commercial operation, shall demonstrate that the applicable emissions limitations of NSCAPCD rules are being maintained during normal power plant operations. Applicant shall submit a detailed performance test plan to the NSCAPCD at least 30 days prior to such tests. Applicant's proposed test plan must receive NSCAPCD approval before such tests may be conducted to achieve compliance. During performance of the compliance testing a representative of the NSCAPCD shall have the right to be present.

For purposes of these conditions, "normal" operation is defined as operation of the facility with all abatement equipment installed and operating (including plant start up and shut down) to specifications enumerated herein.

1-3. SMUD shall obtain written approval from both NSCAPCD and CEC before using any abatement systems other than the hydrogen peroxide/catalyst, Stratford/surface condenser, and turbine bypass system, as approved in the CEC certification, to control H_2S emissions.

Verification: SMUD shall file a copy of the written approval from the NSCAPCD with the CEC and the CCS prior to beginning construction of any alternative H_2S emissions abatement system.

1-4. SMUD shall submit approved-for-construction drawings of the power plant secondary H_2S control system to the CEC only if requested by the CEC.

Verification: If requested, SMUD shall submit such drawings to the CEC at least 30 days prior to commencing construction of the system.

1-5. DOC Conditions 13E, 13H, and 13J require submittal of a detailed plan for testing the performance of the SHUTCEO #1 H_2S emissions abatement systems at normal full load operation. If continuous H_2S monitors are available, SMUD shall ensure that the detailed plan includes the following test parameters: (1) the test data shall reflect a minimum of 90 - 110 percent of the gross electricity generating capacity; and (2) in the event that at least 30 days of qualifying data could not be obtained during the 60-day test period specified in the Determination of Compliance, SMUD shall continue to

collect test data until the required information has been obtained. The application for a Permit to Operate shall be filed as specified in NSCAPCD rules and regulations.

Verification: SMUD shall provide the CEC with a copy of the detailed plan submitted to the NSCAPCD for review and approval and a copy of the plan as approved. In addition, if the test period extends beyond the initial 60 days after commercial operation, SMUD shall file a supplementary report with the CEC and the NSCAPCD which reflects all the results of the performance test.

- 1-6. SMUD shall, if requested by the NSCAPCD, operate and maintain an on-site meteorological station capable of determining wind direction, wind speed, and temperature.

Verification: SMUD shall furnish such data in a form acceptable to the NSCAPCD. SMUD shall note the submittals in periodic compliance reports filed with the CEC.

- 1-7. SMUD can participate in the Geysers Air Monitoring Program (GAMP) if it is implemented, to meet the monitoring requirements specified in DCC Condition 13A.

Verification: If SMUD participates in GAMP, SMUD shall request the GAMP committee chairman to forward to the CEC a copy of the MOU when fully executed by the parties. If SMUD does not participate in GAMP SMUD shall submit to the NSCAPCD, LCAPCD, ARB, and CEC, for their

review, a detailed H₂S ambient monitoring plan at least 60 days before the monitoring begins.

- 1-2. SMUD shall maintain a log of all power plant outages and abatement equipment malfunctions. The log, at a minimum, shall contain (1) the periods of abatement equipment malfunction, reason for malfunctions, and the corrective action taken, (2) the periods of scheduled and unscheduled outages and the cause of the outages, if known, (3) a summary of any irregularities that occurred with the continuous monitors, if used, and (4) the dates and hours in which SMUDCEO #1 was in excess of the appropriate H₂S emission limitation as specified in the DCC.

Verification: The NSCAPCD shall notify the CEC and APE if the log is not properly maintained or access to the log is not provided. The NSCAPCD shall also recommend any action which the district has or will take to correct the problem.

Section 2. PUBLIC HEALTH

A. Applicable Laws, Ordinances, Standards, and Practices

- o California Administrative Code, Title 17, Section 20355.
- o California Health and Safety Code, Section 25607.
- o Public Resources Code, Section 25532.

B. Requirements

2-1. SMUD shall conduct quarterly sampling and analysis for radon-222 concentrations in noncondensable gases in the cooling tower exhaust. An outline of the current California Department of Health Services Radiologic Health Section (CDHS/RHS) minimal requirements for monitoring and reporting on radon-222 follows:

- o The facility must be sampled at least quarterly.
- o The sampling and analysis methods must be shown to be accurate by comparison to known standards supplied by an acceptable source (e.g., EPA). This "standard comparison" or "calibration" shall be run with each set of samples counted unless it is shown that the counting system is sufficiently stable. If calibration is unnecessary for each run, then calibration shall be required at least once per year.
- o Each power production unit must be sampled such that the instantaneous radon-222 emission rate (Ci/sec) to the environment is accurately determined.

This radon-222 monitoring program will be conducted for at least the first two years of commercial operation. If monitoring results indicate that the radon-222 release for the SMUDGECO facility is well within applicable standards, the program may be modified, reduced in scope, or eliminated provided the approval of CDHS/RHS is obtained by SMUD. As new information and techniques become available, with concurrence of SMUD and CDHS/RHS, changes may be made to the program or the methods employed in monitoring radon-222.

Verification: Approximately 10 percent of samples will be taken in duplicate with the duplicate sample sent to the CDHS Sanitation and Radiation Laboratory in Berkeley for cross-check analysis as a quality control on the SMUD's laboratory analyses.

SMUD will provide annual reports to CDHS/RHS discussing each point above. All results shall include the standard deviation associated with the counting error. The error in the sampling procedure and emission calculation shall be discussed.

The report shall also indicate the maximum dose due to emissions calculated at the site boundary, and to the resident nearest the location of maximum radon-222 concentration, and the resultant expected population dose. (These dose calculations may follow a simplified methodology established by CDHS/RHS.)

Annual reports shall be maintained by CDHS/RHS and be available to the NSCS, CEC staff, and the public on request. CDHS/RHS shall report annually the results of the radon-222 monitoring program to the NSCS and the CEC. This report shall include at a minimum data

concerning average and high values of radon-222 emissions and incidences of the 3.0 picocuries per liter (pCi/l) and 6.0 pCi/l level exceedances (see 2-2. and 2-3. below).

If the program is modified, reduced in scope, or eliminated, SMUD shall send a copy of CDHS/RHS approval to the USGS and CEC.

- 2-2. If the radon-222 concentration exceeds 3.0 pCi/l in the cooling tower exhaust, SMUD must inform the CDHS/RHS with a special report.

Verification: SMUD shall provide a written report to CDHS/RHS of sample results within 30 days of confirming an exceedance of 3.0 pCi/l radon-222 in the cooling tower exhaust. Confirmation includes the reanalysis of the sample by SMUD or another qualified laboratory. Confirmation of sample results must be accomplished in the most expedient manner possible. The procedures used shall be the same as the normal analysis but may include sending samples to CDHS/RHS and/or outside qualified laboratories for analysis. The confirmation of a sample should take less than five calendar days. SMUD shall notify the USGS of corrective actions taken.

- 2-3. If the radon-222 concentrations exceed 6.0 pCi/l in the cooling tower exhaust, SMUD shall notify the CDHS/RHS and the CEC by telegram or telephone upon confirmation of the sample result.

Verification: SMUD shall notify CDHS/RHS and the CEC within 24 hours of confirming the sample results (see 2-2. above for confirmation requirements). SMUD shall notify the USGS of corrective actions taken.

2-4. SMUD shall obtain ambient air measurements for benzene, silica, mercury, arsenic, ammonia, vanadium, and radon-222 and its daughters in accordance with the following requirements (see also corresponding requirement for regulated air pollutants). These requirements may be accommodated as a part of any established regional data-gathering program acceptable to NSCAPCD, USGS, CARB, and CEC staff.

- o Measurements shall be made in the populated areas in Cobb Valley downwind of the power plant, to be determined by NSCAPCD, USGS, CEC staff, CARB, and SMUD.
- o Sampling will be performed for at least one year prior to commercial operation. The duration of sampling during operation shall be agreed upon by SMUD, NSCAPCD, CARB, USGS, and CEC prior to start up of this sampling.
- o Mercury will be measured in the particulate and vapor state.
- o Benzene will be measured in the vapor state.
- o Particulate measurements for silica, arsenic, mercury, and vanadium will be made using a sampler for inhalable particulates. Elemental analyses may be performed using particle induced X-ray emission (PIXE) techniques, atomic absorption, or neutron activation techniques. Particulate samples will be collected every sixth day on the same schedule as the California Air Resources Board (CARB) statewide hi-vol particulate monitoring.

- o Mercury vapor measurements will be made by trapping the vapor and subsequent laboratory analysis. The schedule for mercury vapor sampling may differ from the particulate sampling depending on the exact method used.
- o Ammonia will be measured in the gaseous state concurrently with H₂S. If a uniform ratio exists between ammonia and H₂S, ambient H₂S data can be used to estimate ammonia concentrations.
- o Ammonia measurements will be performed using a continuous NO-NO₂ analyzer retrofitted with a high temperature converter designed for ammonia determination.
- o Measurement for radon-222 and its daughters will be made using approved methods.
- o Measurement methods other than those specified above may be proposed and used by SUD as approved by USGS in consultation with the CEC staff.
- o A quality assurance program will be included to maintain the integrity of the collected data.

Verification: A sampling plan consistent with the above sampling requirements will be prepared by SUD for approval by the USGS, in consultation with the CEC, ARB, NSCAECC, and CEHS, 120 days before monitoring begins. SUD shall provide the USGS, NSCAECC, ARB, and the CEC with quarterly reports summarizing the monitoring results.

2-5. SMUD, USGS, and CEC staff, in consultation with CARB and CDHS, will agree upon significant levels of regulated and nonregulated pollutants applicable in the operational monitoring program. (Significant levels for regulated pollutants will be revised only if there is a change in federal or state air quality standards.)

Verification: CEC staff shall prepare a report on the agreed upon levels for pollutants. This report will be filed with the USGS and the CEC.

2-6. For the first two years of operation, SMUD shall analyze the incoming steam to the power plant for mercury, vanadium, arsenic, silica, boron, benzene, and ammonia. These components shall be monitored every quarter.

Verification: Methods for sampling, analysis, quality control/quality assurance, and reporting results will be prepared by SMUD for approval by the USGS, in consultation with CEC, NSCAPCD, CARB, and CDHS, 120 days before the program begins.

Test results shall be submitted to the NSCAPCD, the USGS, and the CEC on a quarterly basis. After two years the NSCAPCD shall determine if annual testing for the above-mentioned steam constituents is sufficient. SMUD may join with the steam supplier in performing such tests. Continuation of the initial steam-sampling program will depend upon:

- o The variation of the concentration of each pollutant in the steam,

- o The rate of emission of each pollutant, and
- o The development or status of ambient air quality standards or emission regulations for each pollutant.

If pollutant concentrations do not vary more than 20 percent or if rates of emissions are low (as compared to agreed upon significant levels), monitoring will be terminated for specific pollutants upon approval of the USGS in consultation with the CEC staff.

2-7. In the second year of commercial operation, SMUD shall perform two mass balance measurements for mercury and arsenic. Samples will be collected twice during the year from incoming steam, condensate, noncondensable gas to the Stretford, noncondensable gas to the cooling tower, Stretford solution, cooling tower emissions, cooling tower blowdown, and cooling tower sludge.

SMUD shall perform mass balance calculations to quantify the emission rate of all incoming arsenic and mercury leaving the power plant.

Verification: Methods for sampling, analysis, quality control/quality assurance, and reporting results will be prepared by SMUD for approval by the USGS, in consultation with CEC, NSCAPCD, CARB, and CDHS, 120 days before the program begins.

SMUD will prepare a report on the mass balance measurements and calculations. SMUD shall send 8 copies of the report to the USGS within 30 days after completing the measurements. The program

results will be evaluated by CEC and CDMS to determine requirements, if any, for continuation of a mass balance measurement program.

- 2-8. New well steam analysis will be performed by SMUD when new steam supply wells are added to guarantee that combined power plant emission (the sum of base line, power plant contributions, and new well contributions) do not change significantly (+20 percent). Methodology for this analysis will be the same as in 2-6. above.

Verification: SMUD shall send the new well steam analysis to USGS within 30 days after the sampling.

Section 3. SOCIOECONOMICS/AESTHETICS

A. Applicable Laws, Ordinances, Standards, and Practices

- o Warren-Alquist Act (Public Resources Code Section 25001).
- o Title 14, California Administrative Code, Division 6, Sections 15142 and 21083, and Appendix G.
- o Scenic Highway Element of the Sonoma County General Plan.

B. Requirements

- 3-1. SMUD shall provide adequate compensation for incurred **county** costs specified in the Commission decision. These items include (a) road construction and maintenance fees, (b) indemnification of Sonoma **County** from third party damage claims attributable to construction traffic related to the SMUDGEO facilities, and (c) reimbursement for emergency medical costs incurred by Sonoma County attributable to the construction of the facility.

Verification: SMUD shall verify compliance in its annual compliance report to the CEC.

- 3-2. SMUD, in consultation with the Geysers labor coordinator, shall design a vanpool program to transport workers across the KGRA to and from Sonoma **County**. The program shall begin when required construction work force reaches 10 workers and shall continue until the close of construction.

Verification: 30 days prior to construction, SMUD shall provide the USGS with interim plans for a vanpool program. Within 10 days after the formalization of any agreements between SMUD and (a) firms which will provide service as a part of the vanpool program, or (b) the Geysers labor coordinator and/or individual craft unions concerning the transportation program, SMUD shall submit eight copies of relevant passages from the agreements to the USGS. In the event that a new Geysers labor agreement requires changes in the vanpool transportation program, SMUD shall provide the USGS with a letter, countersigned by the Geysers labor coordinator, which describes and documents reasons for the modifications. Compliance with this requirement shall be noted in SMUD's annual compliance report to the CEC.

- 3-3. SMUD shall paint the facilities in colors which reduce the contrast between the facilities and the natural background as seen by distant viewers. SMUD shall prepare color photographs of the facilities as viewed from the south, southwest, and northwest directions. Photographs shall clearly represent the facility but also include elements of the background against which it is silhouetted.

Verification: Subsequent to completion of construction and prior to unit start-up, SMUD shall submit eight copies of the photographs to the USGS. BLM and Sonoma County Planning Department, as requested by the USGS, will review the photographs to advise the USGS regarding the acceptability of the visual impacts mitigation measures. SMUD shall inform the CEC of the submittal of the photographs in a periodic compliance report.

3-4. SMUD shall participate in any proceeding conducted by the CEC or GRIPS to evaluate cumulative socioeconomics at the Geysers.

Verification: SMUD shall provide a brief summary of its participation in the annual compliance report filed with the CEC.



Section 4. CULTURAL RESOURCES

(No compliance requirements were specified in the decision.)

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Section 5. BIOLOGICAL RESOURCES

A. Applicable Laws, Ordinances, Standards, and Practices

- o California Public Resources Code Section 25503 (requires that "...in planning for future electrical generation...environmental protection...should be considered").
- o Fish and Wildlife and Protection and Conservation, Fish and Game Code Section 1600 et seq.
- o California Public Resources Code Section 21000 et seq. (California Environmental Quality Act). State EIR Guidelines, 14 California Administrative Code, Section 15000 et seq. (cumulative impacts).
- o Fish and Game Code Sections 2050 - 2055 (California Endangered Species Act of 1970) and implementing regulations.
- o Fish and Game Code Sections 1580 - 1584 (California Ecological Reserve Act of 1968) and implementing regulations.
- o Fish and Game Code Sections 3511, 4700, 5000, 5050, and 5515 (Fully Protected Species).
- o National Environmental Policy Act, 42 U.S.C., Section 4321 et seq. (cumulative impacts).
- o Federal Regulations Implementing the Geothermal Steam Act of 1970 [30 USC 1001 - 1025 and CFR 270.34(k)].

- o Guidelines for Acquiring Environmental Baseline Data on Federal Geothermal Leases (Geothermal Environmental Advisory Panel 1977, Section 5.0, Biological Data).
- o Federal Geothermal Resources Operational Order (GRC Order 4). General Environmental Protection Requirements.

B. Requirements

- 5-1. Prior to construction SMUD has undertaken studies to provide information on sensitive biological resources for the power plant site. No additional studies are required (Findings 2, 3, 4, 5, 6, 7, and 8).

To determine impacts to legally protected species and other biological resources within the steam field portion of the project, the steam field developer will file with the USGS Deputy Conservation Manager for Geothermal a Plan of Baseline Data Collection (Response No. 1, May 3, 1980). Based on federal law, these studies must be conducted at least one year prior to operation.

Verification: During the AFC applicants' submittals were reviewed for potential impacts on sensitive biological resources.

- 5-2. During construction SMUD will implement the mitigation measures identified in the Final Decision. The measures include the following specific items:

- o SMUD will not conduct earth moving activities during the months of December, January, and February (AFC, p. 5-46; Finding 11). However, if weather conditions are favorable and SMUD desires

to carry out earth moving operations during the wet season (November, December, January, February, and March), they will notify the USGS and BLM and receive their concurrence. Extra effort to control erosion and sedimentation will be initiated during this time period, and these measures will be specified in the notification to the USGS and BLM. The USGS will notify the CEC and CDFG of such construction activities and the erosion control measures to be implemented.

- o SMUD will utilize other erosion control measures (AFC, p. 5-46).
- o SMUD will control erosion of the cut and fill slopes and sedimentation into the creeks by the check dam drainage system (Mitigation and Monitoring Plan, December 1, 1980, Finding 9a).
- o SMUD will implement mitigation measures to reduce impacts to Birdsong Meadow (Finding 9b):
 - The road through the meadow will not exceed 30 feet in width, and the maximum paved surface will be 24 feet wide (Workshop, September 30, 1980).
 - The portion of the road through the meadow will be upgraded and the road surface paved immediately following roadbed preparation (prior to October 1, 1981) (Workshop, September 30, 1980, Finding 9b).

- Improved drainage across the road and additional culvert drainages will be provided. Gully erosion of the meadow will be controlled by use of energy dissipators at the outflow from the culverts (Workshop, September 30, 1980, Finding 9b).
- SMUD will correct and monitor gully erosion in the meadow (Mitigation and Monitoring Plan, December 1, 1980, Finding 16e).
- SMUD will construct and maintain a fence along the road to control access onto the meadow (Mitigation and Monitoring Plan, December 1, 1980, Finding 9b). The fence will be in place prior to road construction (Workshop, September 30, 1980, Finding 9b).
- SMUD will revegetate the cut and fill areas of the road through the meadow as soon as possible following construction. Shrub species will be planted along the road (Workshop, September 30, 1980, Mitigation and Monitoring Plan, December 1, 1980, Finding 9b).
- SMUD will utilize a few trees from the road clearing to create snags in the meadow (Mitigation and Monitoring Plan, December 1, 1980) and at other locations designated by CDFG (CDFG letter, April 18, 1980; Workshop, September 30, 1980; CDFG letter, November 11, 1980, Finding 9f).

- SMUD will implement a program to monitor the effectiveness of the erosion control measures, revegetation, and use of the snags (Mitigation and Monitoring Plan, December 1, 1980, Finding 16e).
- o SMUD will implement a monitoring program for water quality and flow rate on Calm Creek above the road to PCandE Units 9 and 10 (Mitigation and Monitoring Plan, December 1, 1980, Finding 16e). If adverse impacts occur, the USGS will consult with CEC, CDFG, BLM, and SMUD to determine appropriate mitigation (Workshop, September 30, 1980, AFC, p. 5-87B, Finding 14c).
- o SMUD will carry out a water quality monitoring program on Cobb Creek (Mitigation and Monitoring Plan, December 1, 1980, Finding 16b).
- o Vehicle access to trails in the vicinity of the power plant and those diverging from the emergency access road will be blocked (Workshop, September 30, 1980, Mitigation and Monitoring Plan, December 1, 1980, Finding 9c).
- o Controlled burns will be conducted in areas of mixed chaparral and chamise to improve forage and compensate for loss of wild-life habits (Mitigation and Monitoring Plan, December 1, 1980, Finding 9e).
- SMUD will contribute funds to BLM so that this federal agency can select and conduct the prescribed burning (Mitigation and Monitoring Plan, December 1, 1980).

- Burning will cover approximately 12 acres in each 10-year period during the life of the power plant (Mitigation and Monitoring Plan, December 1, 1980).
- SMUD will implement a monitoring program to assess the controlled burn program (Mitigation and Monitoring Plan, December 1, 1980, Finding 16f).
- o SMUD will implement a drift monitoring program which will include (Finding 16a):
 - Spring and fall monitoring of vegetation during the first three years of power plant operation (AFC response, June 3, 1980; Mitigation and Monitoring, December 1, 1980).
 - Annual infrared color photography (AFC response, June 3, 1980).
 - Monitoring of the mixed evergreen forest northeast of the power plant site (Mitigation and Monitoring Plan, December 1, 1980).
- o SMUD will revegetate the cut and fill slopes at the power plant site and along the main access road (Workshop, September 30, 1980, Mitigation and Monitoring Plan, December 1, 1980; AFC response, June 3, 1980). Revegetation efforts will be completed on disturbed areas before November of those years in which revegetation is performed (Finding 9d).

- o SMUD will monitor the use of the purple martin nesting area near the power plant to determine if there are effects from cooling tower drift (Mitigation and Monitoring Plan, December 1, 1980, Finding 16a). If adverse impacts occur, the USGS will consult with CEC, CDFG, BLM, and SMUD to develop and implement mitigation (memo, October 24, 1980; SMUD, December 1, 1980, Finding 14).

- o Usage of surface water for a construction water source will be monitored by a qualified biologist employed by SMUD to avoid adverse biological impacts. Sources of surface water being used for construction purposes and the name of the qualified biologist will be submitted to the USGS prior to withdrawal of water. The qualified biologist will have the authority to suspend usage of the water source if adverse biological resource impacts are imminent and will notify the USGS of the decision (Finding 12).

- o Construction activities shall be monitored by a qualified biologist(s) employed by SMUD. The qualified biologist will be given authority to temporarily suspend construction activities if adverse biological resource impacts are imminent, until corrective actions can be taken. The biologist will notify the USGS of action taken and the corrective measures that were implemented (Finding 13).

Verification: The USGS, in consultation with CEC biology staff, CDFG staff, and BLM, will review the statement of compliance and/or monitoring program reports submitted by SMUD and

reports by the qualified biologist* on actions taken during construction and corrective measures that were implemented. If deemed necessary, or in response to a registered complaint, the USGS, in consultation with CEC, CDFG, and BLM, will inspect mitigation related activities and, if appropriate, will require SMUD to take recommended corrective actions. CEC biology staff, CDFG staff, BLM, and USGS will, upon reasonable notice, be allowed field access to inspect mitigation related activities and to inspect SMUD's mitigation and monitoring program files.

Field enforcement of measures to protect biological resources will be the responsibility of both the project site supervising construction engineer and the qualified biologist. The qualified biologist will advise the supervising construction engineer of details concerning required mitigation prior to need for its implementation and shall supervise, as necessary, construction activities to ensure proper implementation of all compensation/mitigation measures. The supervising construction engineer will act on the advice of the qualified biologist to correct and/or temporarily halt construction or construction practices which are not in conformance with the compensation/mitigation plan, terms, and conditions of AFC approval, or to

*A qualified biologist is defined as having a bachelor's degree in biological science, zoology, botany, ecology, or a closely related field, plus three years of working experience in field biology. Formal advanced education in the above subject areas may be substituted for experience on a year-for-year basis up to a maximum of two years.

protect biological resources until corrective action can be taken. With respect to overall implementation, if any specific mitigation measure or monitoring program is not implemented, is done incorrectly, or is determined to be ineffective, SMUD, in consultation with the USGS, will take action to correct the problem. If deemed necessary or in response to a registered complaint, staff of CEC, CDFG, BLM, and USGS will be allowed to conduct field inspections and review SMUD's mitigation and monitoring program files. Staff of SMUD, CEC biology staff, CDFG, BLM, and USGS will endeavor to arrive at a mutually acceptable resolution to the problem. If the parties cannot reach a resolution, the matter will be referred to the Deputy Conservation Manager for Geothermal, Western Region, USGS.

The qualified biologist shall inform (by telephone) the USGS as soon as possible of difficulties which are pursuant to Section 5-2 above, and follow with a written report within 10 days to describe the problem and corrective actions taken.

SMUD will submit to the USGS a statement of compliance upon completion of each group of related measures that are designed to meet similar needs. Measures used to mitigate or avoid biological resource losses must be completed to the satisfaction of the USGS and the BLM under the direction of an appropriately qualified biologist who is employed by SMUD. The qualified biologist will prepare the statement of compliance for SMUD.

Eight copies of an annual progress report covering all aspects of ongoing or unfulfilled project mitigation/compensation measures will be sent no later than April 1 of each year to the USGS. The USGS will provide one copy of the report to the CDFG and one copy to the CEC.

- 5-3. Prior to operation SMUD will conduct baseline data collection which will be adequate to assess the success of mitigation measures and monitoring programs. These will include baseline studies of vegetation and the purple martin in order to monitor cooling tower drift effects (Mitigation and Monitoring Plan, December 1, 1980, Finding 16a).

Verification: The USGS, in consultation with the CEC biology staff, CDFG staff, and BLM, will review and, if necessary, recommend modifications in locations of baseline monitoring programs.

If any specific mitigation measure or monitoring program is not implemented, is done incorrectly, or is determined to be ineffective, SMUD will take action to correct the problem. Staff of SMUD, CEC, CDFG, BLM, and USGS will endeavor to resolve any conflicts or problems. If differences cannot be resolved the USGS will take action necessary to resolve the problem.

SMUD will submit to the USGS eight copies of a report, including a map (scale 1:50 or more detailed) showing the locations and types of monitoring stations that have been implemented, and the USGS will provide one copy of the report and map to the CDFG and one copy to the CEC.

5-4. During operation SMUD will continue implementation of applicable measures of the project mitigation and monitoring program (see Requirements 5-1, 5-2, and 5-3 above).

More refined and specific information regarding cumulative impacts to biology may become available at a later date. If so, mitigation measures of a regional nature requiring interagency/interutility cooperation may be deemed appropriate. Should participation in such cooperative efforts be mandated by the USGS in consultation with the CEC, the implementation of these mitigation efforts will be audited by the USGS.

SMUD will continue the following biological resource related monitoring programs until the effectiveness of the mitigation measures has been established or it has been demonstrated mitigation will not be required.

- o Visual and infrared photographic assessment of potential cooling tower drift effects on vegetation near the power plant and assessment of potential effects on the purple martin nesting area (Mitigation and Monitoring Plan, December 1, 1980, Finding 16a).
- o Water quality and sedimentation sampling of Cobb Creek (Finding 16b).
- o Water quality, sedimentation, and stream flow sampling of Calm Creek (Finding 16c).

- o Effectiveness of revegetation and erosion control methods (Finding 16d).
- o Effectiveness of measures implemented at Birdsong Meadow and the snag creation plan (Finding 16e).
- o Effectiveness of wildlife habitat improvements by controlled burns and information on appropriate time for reburning of selected sites (Finding 16f).
- o The need to continue the monitoring programs will be reviewed in 1985 (Finding 16).

Verification: The USGS, in consultation with the CEC biology staff, CDFG, and BLM, will review the project monitoring progress reports and, if necessary, provide recommendations for changes in the program.

If the requirements are not implemented SMUD will take appropriate action to correct any deficiencies. Staff of SMUD, CEC, CDFG, BLM, and USGS will endeavor to resolve any conflicts or problems. If differences cannot be resolved, the USGS will take action necessary to resolve the problem.

SMUD will submit to the USGS eight copies of the monitoring progress reports that are due by April 1 of each year. The USGS will provide one copy of the report to the CDFG and one copy to the CEC. SMUD will provide immediate notification, including a written statement of impacts and corrective actions

taken, if monitoring studies or field observations indicate adverse impacts to biological resources.

- 5-5. SMUD will prepare a decommissioning plan which includes a biological resource element for the power plant a year in advance of decommissioning. SMUD will implement the approved decommissioning plan.

Verification: A year before the power plant is due to be deactivated, SMUD shall submit eight copies of a decommissioning plan to the USGS for review and approval. USGS will provide one copy of the plan to the CEC and one copy to the CDFG. The USGS, in consultation with the CEC biology staff, CDFG, and BLM, will review the decommissioning plan and, if necessary, provide recommendations for changes in the program.

SMUD will submit a statement of compliance to the USGS indicating the required decommissioning actions have been completed. CEC, CDFG, BLM, and USGS will be allowed access to the leasehold to make observations as appropriate or necessary.

If requirements are not complied with, SMUD will take appropriate action to correct any deficiencies. Staff of SMUD, CEC, CDFG, BLM, and USGS will attempt to resolve any problems or conflicts. If the parties cannot reach a resolution the USGS will take appropriate action to arbitrate the dispute.

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Section 6. WATER QUALITY, HYDROLOGY, WATER RESOURCES

A. Applicable Laws, Ordinances, Standards, and Practices

- o California Administrative Code, Title 23, Subchapter 15.
- o California Health and Safety Code, Division 20, Chapter 6.5.
- o California Administrative Code, Title 22, Division 4.
- o Porter-Cologne Water Quality Control Act.
- o California Administrative Code, Title 23, Sections 13260 and 13269.
- o North Coast Regional Water Quality Control Board Order No. 74-151.
- o Porter-Cologne Water Quality Control Act.
- o Water Quality Control Plan, North Coast Basin (1B).
- o Water Quality Control Plan, Central Valley Basin (5A).
- o California Administrative Code, Title 23.
- o California Water Code, Part 2.

B. Requirements:

- 6-1. To document and minimize off-pad discharges of condensate or other chemicals/solutions utilized in the operation of their SMUDGE0 #1 geothermal power plant, SMUD shall construct the power plant pad of

an impermeable substance (1×10^{-6} cm/sec.). SMUD shall also provide individual unit containment systems as described throughout the AFC process.

Verification: Prior to commencing commercial operation, SMUD shall file with the CEC and the NCRWQCB, a copy of the "as-built" drawings of the spill containment system; and an affidavit, signed by a registered civil engineer, attesting to the impermeability of the pad layer.

- 6-2. To ensure the integrity of the spill containment and storm water drainage systems, SMUD shall maintain those systems and repair them as needed.

Verification: Annually (July 1) SMUD shall file with the CEC, NCRWQCB, and USGS a summary of repair or alterations made to the spill containment or storm water drainage systems.

- 6-3. As a conditional exemption to filing for waste discharge requirements, SMUD shall file a Spill Contingency Plan with the NCRWQCB as identified in Board Order No. 74-151.

Verification: Prior to CEC certification, SMUD shall file such a Spill Contingency Plan with the NCRWQCB. A copy of the approved Spill Plan shall be submitted to the CEC.

- 6-4. SMUD proposes to inject their domestic wastewater disposal system effluent into the geothermal aquifer at the steam suppliers reinjection well.

Verification: Prior to commercial operation SMUD shall file with the CEC, NCRWQCB, and the USGS "as-built" drawings of the waste disposal system and signed verification that the above system does connect to the steam suppliers reinjection line downstream of the spent condensate collection sump.

6-5. To protect the quality of waters within the immediate vicinity of the SMUDGE0 #1 site, SMUD has proposed numerous mitigation measures as listed in the Joint Water Resource Findings identified below:

- o SMUD agrees to design and construct the paved pad surface to drain a 100 year storm.
- o SMUD proposes to utilize condensed steam for cooling water consistent with current practices of like geothermal power plants.
- o Condensed steam will be utilized for cooling water make-up. The excess cooling water will evaporate as it passes through the cooling tower or will be reinjected into the steam resource reservoir.
- o Initial start-up cooling water supplied by the steam developer will be steam condensate.
- o SMUD Agrees to "truck-in" the domestic-potable annual water as needed. This water will be acquired from an outside source.

- o SMUD agrees to minimize work in the area where a spring has been identified.

Verification: Prior to commencing commercial operation SMUD shall file statements signed by a registered civil engineer, as appropriate, and the project manager, identifying compliance-noncompliance and/or deviations to the above listed mitigation measures.

- 6-6. To document water quality impacts associated with geothermal development, SMUD shall monitor the water quality of streams potentially affected by the SMUDGE0 #1 geothermal power plant. SMUD shall be responsible for such monitoring for the life of the project.

Cooperation amongst the various agencies and companies involved in the development of the Geysers KGRA developed a regional Aquatic Resources Monitoring Program for the KCRA (KCRA-ARM program).

Verification: Since SMUD is a voluntary participant in the KCRA-ARM program, no verification is needed at this time.

If the KCRA-ARM program ceases to exist prior to next August, SMUD must file a proposed aquatic resources monitoring program to be implemented the following water year. Results will be tabulated and submitted to the CEC annually.

- 6-7. SMUD or its contractor shall utilize no surface waters for power plant or associated appendages construction without first notifying the appropriate agencies.

Verification: At least 30 days prior to commencing construction, SMUD shall contact the CEC, the Division of Water Rights, the counties of Sonoma and Lake, the appropriate RWQCB and the USGS, identifying the potential source(s) of construction water, projected monthly volumes, the method (purchase, diversion, etc.) of obtaining the water, and the latest construction schedule. SMUD shall also obtain any required permits or waivers.

- 6-8. The stormwater drainage and collection system throughout the power plant pad area is to be designed to accommodate a 100-year frequency storm.

Verification: Within 90 days following turbine roll, SMUD shall have filed an attachment with the CEC, signed by a registered civil engineer and the project anager, identifying compliance and/or deviations to the above requirement.

- 6-9. Initial start-up water (cooling tower, etc.) is to be condensed steam supplied by the steam developer or purchased from other KGRA sources. The exact means and volumes were undetermined at the time of certification, therefore SMUD shall file that information with the CEC.

Verification: Within 90 days following turbine roll, SMUD shall have filed an attachment with the CEC, signed by a registered civil engineer and the project manager, identifying compliance and/or deviations to the above requirements.

6-10. SMUD has proposed to annually need approximately 1 acre-foot of "potable" water for various domestic, irrigation, and operational needs. The exact source(s) and volume of this water were undetermined at the time of certification; therefore, SMUD shall file that information (projected for the life of the project) with the CEC.

Verification: In an annual compliance report to the CEC, SMUD shall identify the source and volume of "potable" water used.

Section 7. GEOTECHNICAL/SEISMIC HAZARDS

A. Applicable Laws, Ordinances, Standards, and Practices

- o Uniform Building Code (1979) especially Chapters 29 and 70.
- o California Business and Professions Code, Section 7835.
- o Good engineering practice.

B. Requirements

7-1. SMUD will assign one or more qualified geotechnical engineers to the project to monitor compliance with design intent in geotechnical matters, to provide consultation during design and construction of the project, to make professional geotechnical judgments concerning actual site conditions, and to recommend field changes to the responsible civil engineer. The responsibilities of the geotechnical engineer will include:

- o Review of earthwork quality control tests (including compaction test);
- o Reporting to the responsible civil engineer any geologic conditions which differ from those predicted on the basis of the engineering and geology and soils engineering reports any site earthwork which does not comply with the approved grading plans and change orders;
- o Preparation, in accordance with UBC 7015, of a soils grading report with his approval that the site is adequate for the intended use; and

- o Other duties (such as monitoring on-site or near-site ground-water levels) as appropriate.

Verification: The geotechnical engineer shall submit copies of the soils grading report to the USGS and Sonoma County CEO.

7-2. SMUD will assign a qualified certified engineering geologist* who will be present as needed during all phases of site excavation and grading to evaluate site geologic conditions and geologic safety. He/she shall report to the responsible civil or geotechnical engineer any geologic conditions which differ from those predicted in the Engineering Geology Report. Responsibilities of the engineering geologist will include:

- o Collection during site excavation and grading of information relative to site geology and geologic safety, including inspection and monitoring of drill logs and drill cores;
- o Preparation of a detailed permanent geologic map or log of all final excavated surfaces (including wall and floors of the foundations of the turbine generator building; cooling tower, and other permanent structures);
- o Reporting to the responsible civil or geotechnical engineer any geologic conditions which differ from those predicted in the Engineering Geology Report; and

*On March 17, 1982, the USGS waived the requirement for using an "certified engineering geologist" and allowed use of a "registered geologist."

o Preparation, in accordance with requirements of UEC Section 7015, of a geologic grading report, with approval that the site is adequate for the intended use as affected by geologic conditions.

Verification: The engineering geologist shall submit copies of the geologic grading report to the USGS and Sonoma County CEO.

7-3. If adverse site conditions should be discovered during site excavation and grading which will require substantial changes* in facility design (or implementation of mitigation measures which would be classified as substantial changes) SMUD's evaluation of these conditions shall be signed and stamped by a certified engineering geologist. Any plan setting forth the substantial changes (change orders) shall be signed and/or stamped by a certified engineering geologist. Any plans setting forth the substantial changes (change orders) shall be signed and/or stamped by the responsible registered civil engineer who shall also verify that the change orders conform with the terms and conditions of the certificate.

SMUD will submit eight copies of the proposed change orders and the geotechnical information on which they are based to the USGS for review.

Verification: Unless the USGS is notified otherwise within 30 days of receipt by the CEC of any change order, SMUD's proposed change orders will be deemed acceptable to the CEC staff.

*"Substantial changes" are those changes requiring an alteration in design concept and preparation of new design calculations.

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Section 8. SOILS

A. Applicable Laws, Ordinances, Standards, and Practices

- o Uniform Building Code, Chapter 7C.
- o USGS Geothermal Resource Operational Order No. 4.
- o Sonoma County Grading Ordinance.
- o Water Quality Control Plan, North Coast Basin (1B).

B. Requirements

- 8-1. SMUD shall comply with the objectives of the Water Quality Basin Plan relating to turbidity and sedimentation loadings of surface waters. The Basin Plan states that such loadings shall not increase so as to cause nuisance conditions.

Verification: Prior to the start of commercial operation, SMUD shall submit a statement to the North Coast Regional Water Quality Control Board (NCRWQCB) and the CEC verifying with the above objectives. The NCRWQCB may conduct on-site inspections to verify compliance.

- 8-2. SMUD shall periodically clean and adequately maintain the sediment collection--check dam ditch system. Annually SMUD shall quantify the amount of sediment removed from that system. All removed materials will be disposed of at a site approved by the USGS.

Verification: Annually SMUD shall file a statement with the NCRWQCB and the CEC identifying the integrity of the sediment containment

system, and the maintenance required to that system, and included shall be the quantification report of materials removed from the system and their place of disposal. This reporting shall continue for three complete rainy seasons after commercial operations begin.

If such monitoring/quantification indicates SMUD's proposed erosion mitigation measures are inadequate, the CEC and/or USGS may require additional mitigation or monitoring.

Section 9. CIVIL ENGINEERING

A. Applicable Laws, Ordinances, Standards, and Practices

- o Uniform Building Code (1979 edition):
- o Federal Standards:
 - Title 30 CFR Part 270.
 - GRO Order No. 4.
 - GRO Order No. 5.

B. Requirements

9-1. At least 30 days prior to submittal of proposed grading plans, SMUD shall notify the USGS of the expected date the plans will be filed. At least 60 days prior to the start of excavation and grading, SMUD shall submit to the USGS eight copies of proposed grading for review by the USGS, CEC, and the Sonoma County chief building official (CBO). SMUD's responsible registered civil engineer(s) and certified engineering geologist(s) shall verify and sign that the proposed grading plans (including any accompanying reports) comply with the requirements set forth in the applicable laws, ordinances, and standards. SMUD shall make in-lieu payments to Sonoma County equivalent to the fees listed in Chapter 70 of the UBC for review of the grading plans and the issuance of the grading permit. SMUD shall not begin any excavation, grading, or other earthwork (other than that required for site exploration) until the proposed grading plans are accepted by the USGS.

Verification: Within 30 days of receipt of the grading plans, the CBO and the CEC shall each file with the USGS a compliance letter containing their review comments. If either the CBO or the CEC fails to file the compliance letter, the USGS may deem the proposed grading plans acceptable to the agency which did not file a compliance letter. The USGS shall notify SMUD as soon as the grading plans are accepted by the USGS.

- 9-2. Upon submittal by SMUD to the USGS of adequate quality assurance/quality control procedures for review and checking of grading plans the USGS may delegate to SMUD the responsibility for determination that the proposed grading plans conform with the UBC 79 or other requirements of the certificate. The USGS will consult with the CEC prior to its decision on a determination of quality assurance/quality control adequacy.

Verification: The USGS will notify SMUD when the quality assurance/quality control procedures have been determined to be adequate.

- 9-3. SMUD will submit to the USGS eight copies of a monthly summary of construction progress. Upon completion of site earthwork SMUD will prepare and maintain, as a public record for the life of the project, the "as-graded" plans with approval of the responsible civil engineer that the work was done in accordance with the final approved grading plans. CEC staff and its agents shall have access to these filed documents.

SMUD will notify the USGS when site earthwork is ready for final inspection and, upon completion of the rough grading work and at the final completion of the work, will file with the USGS eight copies of the signed/sealed "as-graded" plan, soils engineering report, and geologic grading report.

SMUD will not begin construction of any structure or foundation until notified by the USGS that site earthwork is acceptable to the USGS. The USGS will consult with the CEC prior to any USGS decision concerning such notification.

Verification: If the CEC does not notify the USGS otherwise within 10 days of receipt of the final "as-graded" plan and supplementary reports, the USGS may deem these documents and site earthwork acceptable to CEC staff. The USGS will notify SMUD when it finds the documents and site earthwork acceptable.

9-4. SMUD will prepare and submit for acceptance a reclamation plan to the USGS to restore the site to the original condition as nearly as practicable at least six months prior to decommissioning of the facility.

Verification: Within 60 days after receipt the USGS shall notify SMUD on the acceptability of the reclamation plan.

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Section 10. STRUCTURAL ENGINEERING

A. Applicable Laws, Ordinances, Standards, and Other Criteria

Laws:

- o Title 8, California Administrative Code, adopting American Society of Mechanical Engineers' Boiler and Pressure Vessel Code (ASME BPV Code).
- o Title 24, California Administrative Code, adopting current edition of Uniform Building Code (UBC) as minimum legal building standards.
- o Chapter 7, Division 3, Business and Professions Code, requiring state registration to practice as a civil engineer or structural engineer in California.

Ordinances:

- o Sonoma County Ordinance 2395 adopting (with appropriate additions or deletions) UBC 76 or equivalent building standard.

Standards:

- o Uniform Building Code, 1979 Edition (UBC 79).
- o American Society of Mechanical Engineers' Boiler and Pressure Vessel Code.
- o American National Standards Institute (ANSI), "B 31.1 Power Piping Code."

- o ANSI, "Building Code Requirements for Minimum Design Loads in Buildings and Other Structures" (ANSI A 58.1-1972).
- o American Concrete Institute (ACI), "Building Code Requirements for Reinforced Concrete" (ACI 318-77).
- o ACI, "Building Code Requirements for Structural Plain Concrete" (ACI 322-72).
- o ACI, "Commentary on Building Code Requirements for Reinforced Concrete" (ACI 318C-77).
- o American Institute of Steel Construction (AISC), "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings" (AISC SDFESS 78).
- o AISC, "Commentary on the Specifications of the Design, Fabrication, and Erection of Structural Steel for Buildings" (AISC CSDFESS 79).
- o AISC, "Specification for Structural Joints Using ASTM, A325 or A490 Bolts," April 1978 (AISC SST 78).
- o AISC, "Code of Standard Practice for Steel Buildings and Bridges," September 1976 (AISC CSPSEB 76).
- o American Welding Society, "Structural Welding Code, AWS D1.1-79," (AWS D1.1-79).
- o AWS, "Reinforcing Steel Welding Code AWS D12.1-75" (AWS D12.1-75).
- o "National Design Specification for Stress-Grade Lumber and Fastenings, 1977" (NDS 77).

- o American Institute of Timber Construction, 1972, "Timber Construction Standards," AITC-100.
- o American Iron and Steel Institute (AISI), "Specification for the Design of Light Gauge Cold-Formed Steel Structural Members" (AISI SDLCFSS).
- o Steel Joist Institute, "Standard Specifications and Load Tables" (SJI SSLT).
- o American Association of State Highway and Transportation Officials, "Standard Specifications for Highway Bridges," 1977 Edition (AASHTO BRIDGE 77).

Other Criteria:

- o SMUDGE #1 AFC, Section 11311 (entitled "Civil and Structural Design"), Appendix B (entitled "Seismicity Study"), and Appendix C (entitled "Structural Design Criteria").
- o SMUD's responses (dated June 23, November 12, December 11, 1980, and January 1981) to staff interrogatories and review comments.
- o SMUD will use the following references as guides in the final design of the power plant and related facilities.
 - Applied Technology Councils, "Tentative Provisions for the Development of Seismic Regulations for Buildings," (NBS-SF-510; ATC-5-06).
 - Structural Engineers Association of California, "Recommended Lateral Force Requirements," 1975, Recommendations and Commentary.

- o Applicable findings and conclusions regarding structural engineering contained in the decision.
- o Applicable terms and conditions of the certificate.
- o In the event that UBC 79 is not adopted by the state (under Title 24, CAC) prior to construction, SMUD will demonstrate that facility design conforms with the requirements of UBC 1976.

B. Requirements

10-1. SMUD shall design and construct SMUDCEO #1 and its related facilities to be in conformance with the applicable laws, ordinances, standards, and practices set forth above, and with the information, criteria, and methods set forth in the following documents:

- o SMUDCEO #1 AFC, Section 1.3.1 (entitled "Civil and Structural Design"), Appendix B (entitled "Seismicity Study"), and Appendix C (entitled "Structural Design Criteria").
- o SMUD's responses (dated June 23, November 12, December 11, 1980, and January 1981) to staff interrogatories and review comments.

Criteria set forth which govern the design of specific structures and facilities will be used in the final design and construction of each such structure and facility. However, in the case of discrepancies between various criteria the most stringent criteria will be used unless SMUD can justify use of a less restrictive criteria to the USGS.

SMUD shall prepare and submit to the USGS eight copies of proposed design criteria, structural analyses, and final plans* and specifications (final design documents) for review by the USGS, CEC, and the Sonoma County CBO.

Verification: The USGS, in consultation with the CEC staff or its agent, shall review SMUD's proposed design criteria and analysis methods to determine that the proposed design or design approach conforms with terms and conditions of the certificate (other than county requirements) or, if not, that any nonconformance is justified. In addition, the USGS and CEC may, upon request, review proposed procurement specifications.

The Sonoma County CBO or his agent may review and comment on compliance of proposed final plans and specifications with requirements (primarily URC 76) of County Ordinance 2395.

If SMUD's proposed design criteria or methods, final plans and specifications, and procurement specifications are not acceptable, CEC will notify USGS within the review time frame established by the USGS. The USGS and CEC will then meet to resolve unacceptable items.

10-2. SMUD shall not begin construction of any structure or foundation for which final plans and specifications have not been approved by the USGS.

*Final plans are defined as the plans approved by the registered structural engineer upon which construction will be based.

SMUD will simultaneously submit eight complete sets of final structural designs, plans, and specifications for each structure and structure foundation to the USGS at least 60 days prior to the intended construction start date.

The final plans and specifications will clearly reflect the inclusion of approved criteria methods used to develop the design for category 1 and category 0 structures and components, and shall include design calculations.

Verification: The responsible design engineer(s) shall sign and/or stamp all proposed final plans and specifications, and shall certify in writing that to his knowledge:

- o The proposed final plans and specifications are consistent with the applicable referenced criteria and with any other applicable terms and conditions of the certificate, and were developed using design criteria and analysis methods accepted by the USGS in consultation with the CEC staff.
- o SMUD's procurement specifications for components purchased from a vendor comply with the referenced criteria and with any other applicable terms and conditions of the certificate.

The CBO may, within 30 days of receipt of final plans and specifications from the USGS, file with the USGS a compliance letter containing the county's review comments. If no compliance letter is received by the USGS, the USGS may assume the proposed design is acceptable to the CBO.

The CAM will, within 30 days of receipt by CEC of SMUD's proposed final plans and specification, file a compliance letter to notify the USGS of the proposed plans and specifications are acceptable to CEC staff or, if not, what changes are recommended by CEC staff. Should the CAM fail to file a compliance letter within 30 days, the USGS may deem SMUD's proposed final plans and specifications acceptable to CEC staff.

- 10-3. For the turbine generator building and turbine generator pedestal, SMUD will clearly demonstrate through submittal of design calculations and drawings that the proposed final plans and specifications are based on and conform with the design criteria and analysis methods required by the certificate and analysis methods required by the certificate or that any nonconformance is justified.

Verification: At least 60 days prior to start of any construction of the turbine generator building and turbine generator pedestal, SMUD will submit to the USGS the final results of a dynamic analysis based on accepted response spectra to demonstrate the adequacy of proposed seismic design.

- 10-4. If SMUD proposes substantial changes (as defined in the Structural Engineering Findings and Conclusions) in facility design, eight copies of the proposed substantially changed plans and specifications (change orders) shall be submitted to USGS, signed, and/or stamped by the responsible design engineer who shall also certify that the proposed change orders conform with the requirements set forth or referenced herein and with any other terms and conditions

of the certificate. Any nonconformance shall be justified by the utility.

Verification: The USGS, in consultation with the CEC staff or its agent, will review the proposed change orders to determine that they conform with the requirements or, if not, that any nonconformance is justified.

10-6. Inspections shall be performed in accordance with Chapters 3 and 70 of the Uniform Building Code (1979 edition). SMUD will provide a staff of field inspectors to monitor conformance with the accepted final plans, specifications, and change orders. These field engineers and/or inspectors will be present on site at all times to monitor construction activities.

Upon submittal by SMUD to the USGS of adequate quality assurance and quality control procedures for inspection of construction work, USGS may delegate to SMUD responsibility for determining that construction work conforms with UBC 79 or other requirements of the certificate.

Should responsibility for inspections be delegated to SMUD,* SMUD shall certify that the designated inspectors have the authority to:

- o Stop construction work which does not conform with approved plans, specifications, and change orders;
- o Require changes or remedial work to reestablish conformance;
- and

*On May 19, 1981, the USGS delegated inspection responsibility to SMUD.

- o Report substantial nonconformance to the USGS as soon as discovered.

The USGS, CEC staff, CBO, or their agents may, upon reasonable notice, inspect the construction at any time to ensure that construction conforms to the accepted final plans, specifications, and substantial change orders.

Verification: SMUD shall notify the CEC and CBO if they are delegated inspection responsibility by the USGS.

The responsible civil engineer shall certify in writing to the USGS that the finished work for each major structure or component is accurately depicted in the "as-built" plan and that it conforms with accepted final plans, specifications, and change orders.

Upon notification by SMUD of completed construction for each major structure or component, the USGS, in consultation with the CEC staff or its agent, may perform final site inspection to determine that the finished work is accurately represented by the "as-built" plans and specifications and change orders.

- 10-7. At least 15 days prior to intended start of construction based on a proposed change order or corrective measure, SMUD will submit eight copies of such change order or corrective measure to the USGS for distribution and review.

Verification: Unless the CBO and CAM notify the USGS otherwise within 10 days of receipt of a change order, the proposed change order will be deemed acceptable to the CBO and to the CEC.

10-8. SMUD shall establish and maintain public records on file at SMUD the following documents:

- o Summary of concrete strength tests;
- o Copies of concrete pour sign-off sheets;
- o Bolt torque inspection reports;
- o Field weld inspection sheets; and
- o "As-built" drawings for the construction of civil and architectural work (changes approved by the USGS shall be identified on the "as-built" drawings.

Verification: SMUD shall notify the CEC and the USGS of the availability and location of these documents.

10-9. SMUD shall keep the Sonoma County CBO, the CEC, and the USGS informed regarding the status of construction.

Verification: SMUD shall submit eight copies of the monthly progress report to the USGS for distribution.

10-10. Modifications to the facility after operation has commenced which would violate the laws and standards in Section A above is considered a major change and requires USGS approval before the change is made. USGS will consult with the CEC prior to its decision of approval or nonapproval.

At least 30 days prior to the intended start of construction of a major change, SMUD will submit 8 copies of the proposed major change to the USGS for distribution and review.

Verification: Unless the CBO and CAM notify the USGS otherwise within 20 days of receipt of the proposed major change, the major change will be deemed acceptable to the CBO and to the CEC.

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Section 11. SOLID WASTE MANAGEMENT

A. Applicable Laws, Ordinances, Standards, and Practices

- o California Water Code, Section 13260.
- o Title 22, California Administrative Code, Division 4, Chapter 30.
- o Title 23, California Administrative Code, Chapter 3.
- o California Health and Safety Code, Division 20, Chapter 6.5.
- o Federal Resources Conservation and Recovery Act.

B. Requirements

11-1. SMUD shall ensure that the construction wastes are taken to a waste disposal facility licensed to accept those wastes.

Verification: SMUD shall notify the CEC and the Solid Waste Management Board of the disposal option selected for the construction wastes.

11-2. The only Stratford process waste is sulfur cake with some entrained process chemicals. SMUD shall ensure that the sulfur cake is properly stored in an appropriate container and removed periodically to be sold or disposed at a site approved for such wastes.

If a secondary treatment system is used to abate H_2S emissions, the plant may produce additional hazardous wastes. Any sludge which accumulates in the cooling tower will be removed as needed and hauled by a registered hazardous waste hauler to an approved disposal site.

Verification: SMUD shall submit final design plans and "as-built" drawings to the Sonoma County CBO incorporating these design features. In addition SMUD shall each month, if waste shipments are made, submit completed hazardous waste manifests to CDHS in compliance with Section 66475 of Title 22, CAC.

If a separate solids removal system is added to the condensate or circulating water system, SMUD shall submit design plans to CEC and Sonoma County CBO 60 days before start of construction and "as-built" drawings 30 days after completion of construction. Solids removed are subject to the same hazardous waste provisions as Stretford waste and cooling tower sludge.

- 11-3. SMUD shall ensure that any hazardous waste hauler employed has a certificate of registration from the California Department of Health Services (CDHS), Hazardous Waste Management Branch. SMUD shall require that hazardous wastes are taken to a facility permitted by CDHS to accept such wastes.

Verification: SMUD shall keep a letter on file verifying that hazardous waste haulers have CDHS certificates of registration. In addition SMUD shall each month, if waste shipments are made, submit completed hazardous waste manifests to CDHS in compliance with section 66475 and Title 22, CAC.

- 11-4. If hazardous wastes, including Stretford sulfur effluent, are stored on site for more than 60 days, SMUD shall obtain a determination from the CDHS that the requirements of a Hazardous Waste Facility Permit have been satisfied.

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Verification: SMUD shall notify the CEC if it files an in-lieu application with CDHS for the operation of a hazardous waste facility.



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Section 12. SAFETY

A. Applicable Laws, Ordinances, Standards, and Practices

- o Title 8, California Administrative Code (CAC), Industrial Relations, Chapter 4, Division of Industrial Safety.
- o Title 8, CAC, Chapter 4.4, Section 1509--Construction Safety Orders, Accident Prevention Program.
- o Title 8, CAC, Chapter 4.7, Section 3203--General Industry Safety Orders, Accident Prevention Program.
- o Title 8, CAC, Chapter 4.7, Section 5155--Airborne Contaminants.
- o Title 8, CAC, Chapter 4.7, Groups 20 and 27.
- o Uniform Building Code (1976 edition), 5, 20, 22, 33.
- o National Fire Protection Association (NFPA) Standards: 10, 12, 12A, 13, 14--Class II Service, 16, 19B, 20, 194 (1974 edition), 30, 70, 214, 26, 27, 198 (1972 edition), 231A.
- o Public Resources Code, Section 4291.

B. Requirements

- 12-1. SMUD shall implement an accident prevention program in accordance with the provisions of Sections 3203, et seq. of Title 8, CAC. (These sections include chemical handling and storage and provisions for hazardous materials and airborne contaminants based on Section 5155, Title 8, CAC.) SMUD shall request CAL/OSHA Consultation Service to review SMUD's accident prevention program.

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Verification: SMUD shall request a letter from the CAL/OSHA Consultation Service certifying compliance with the requirements of Section 3203 and 5155, Title 8, CAC. Prior to commercial operation SMUD shall submit to the USGS eight copies of a letter from the CAL/OSHA Consultation Service certifying compliance with the requirements of Sections 3203 and 5155, Title 8, CAC.

- 12-2. On-site worker safety inspections shall be conducted by the California Division of Occupational Safety and Health (CAL/DOSH) during construction and operation of the facility or when an employee complaint has been received.

Verification: DOSH will forward to the USGS and the CAM a copy of any citations or corrective orders.

- 12-3. SMUD shall finalize agreements with the Bureau of Land Management (BLM), California Department of Forestry (CDF), and local entities for mutual assistance in fire fighting.

Verification: SMUD shall submit to the USGS eight copies of mutual assistance agreements prior to the start of construction.

- 12-4. SMUD shall certify that design and construction are in reasonable conformance with applicable fire safety and standards and underwriters' requirements as set forth above.

Verification: Prior to start of commercial operation SMUD shall submit to the USGS eight copies of a Certificate of Compliance signed by SMUD's fire insurance company.

12-5. SMUD will arrange for a review and a certificate of compliance stamped by a registered civil, mechanical, or industrial engineer certifying that the Stretford system pressure vessels have been fabricated in accordance with ASME Code, Section VIII, Division 1, which is adopted in Chapter 4.1, Title 8, CAC.

Verification: Prior to commercial operation SMUD shall submit to the USGS eight copies of the Certificate of Compliance, copies of Certified Code Papers, and field inspection reports (if used) for pressure vessels.

12-6. SMUD will arrange for a review and a Certificate of Compliance stamped by a registered civil, mechanical, or industrial engineer certifying that the Stretford tanks and permanent H₂O₂ storage tanks, if used, are fabricated in accordance with API 620 and API 650 and that H₂O₂ storage tanks are fabricated in accordance with Manufacturers Data Sheet SD-53.

Verification: Prior to commercial operation SMUD shall submit to the USGS eight copies of the Certificate of Compliance and copies of Certified Code Papers.

12-7. SMUD will arrange for a review and a Certificate of Compliance stamped by a registered civil, mechanical, or industrial engineer certifying that the lube oil storage tanks are designed and constructed according to Article 145, Title 8, CAC, and anchored and designed to 0.4 W.

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Verification: Prior to commercial operation SMUD shall submit to the USCS eight copies of the Certificate of Compliance and Certified Code Papers.

- 12-8. SMUD will arrange for a review and a Certificate of Compliance stamped by a registered civil, mechanical, or industrial engineer certifying that bolted and/or welded anchorages on H_2O_2 , acid, caustic, and chelating agent tanks are designed and constructed to withstand a force of 0.87 W at working stress design using UBC formula 12.8. All other bolted and/or welded anchorages for Category I equipment will be designed and constructed to 0.4 W. In any event, the anchorage criteria shall be consistent with other design and performance criteria.

Verification: Prior to commercial operation SMUD shall submit to the USCS eight copies of the Certificate of Compliance.

- 12-9. SMUD will arrange for a review and preparation of a Certificate of Compliance by a registered civil, mechanical, or industrial engineer certifying that the design and construction of tanks containing H_2O_2 , acid, caustic, and chelating agents or the containment surrounding these tanks will withstand a force of 0.87 W at working stress design.

Verification: Prior to commercial operation SMUD shall submit to the USCS eight copies of the Certificate of Compliance.

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12-10. SMUD will arrange for a review and a Certificate of Compliance stamped by a registered civil, mechanical, or industrial engineer certifying that hydrogen systems are installed in accordance to Article 138 of Title 8, CAC.

Verification: Prior to commercial operation SMUD shall submit to the USGS eight copies of the Certificate of Compliance.

12-11. SMUD will arrange for a review by a registered civil, mechanical, or industrial engineer certifying that caustic soda systems are installed and handled in accordance with Section 5162 of Title 8, CAC.

Verification: Prior to commercial operation SMUD shall submit to the USGS eight copies of the Certificate of Compliance.

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Section 13. TRANSMISSION LINE SAFETY AND NUISANCE

A. Applicable Laws, Standards, and Criteria

- o Noise: (Construction) CAL/DOSH, 8 California Administrative Code, Sections 5095 - 5099.
- o Safety/Reliability: CPUC GO-95.
- o Safety: CAL/DOSH, 8 California Administrative Code, Article 85, Section 2940 et seq., Article 87, Section 2950 et seq., and General Construction Safety Orders, Title 8, Chapter 4, Subchapters 4 and 7.
- o Safety: (Interference with Navigable Airspace) FAA, 49 USCA 1348, 14 CFR, Part 77.
- o Nuisance: (Radio Interference) Federal Communications Commission rules and regulations, 47 CFR Part 15.25 (Incidental Radiation Devices).
- o Electrical Clearances: Title 14, California Administrative Code, Sections 1254 - 1256; Public Resources Code, Sections 4292 - 4296, State and Private Land Fire Protection.
- o Staff grounding criteria.
- o Staff RI/TVI criteria.

B. Requirements

- 13-1. At least 30 days prior to the date the proposed construction is to begin, SMUD shall file a "Notice of Construction or Alteration" form

with the Federal Aviation Administration if it anticipates that a transmission line tower or any appurtenance would be more than 200 feet above the ground level, per 14 CFR, Part 77.

Verification: SMUD shall forward a copy of any such filing to the CEC and the USGS.

- 13-2. SMUD shall construct, operate, and maintain the transmission lines in accordance with Title 14, California Administrative Code, Sections 1254 - 1256, and Public Resources Code Sections 4292 - 4296.

Verification: Within 30 days after completion of construction, SMUD shall submit a statement from a responsible civil engineer to the California Department of Forestry (CDF), the USGS, and the CEC indicating that the transmission line has been constructed in accordance with applicable requirements. SMUD shall also inspect the transmission line annually to ensure that the line maintains required clearances, especially during the fire season. In the event that noncompliance is determined by the CDF, the CDF shall require SMUD to take measures necessary to correct the noncompliance. If SMUD's corrective measures are unsatisfactory in the opinion of the CDF, the CDF shall inform the CEC and shall recommend a course of action.

- 13-3. SMUD shall ensure that, regardless of location or ownership, all metallic ungrounded fences longer than 150 feet within the right-of-way shall be grounded following the procedures outlined in the AFC.

Verification: Within 30 days after completion of transmission line construction, SMUD shall file a statement verifying compliance.

13-4. In the event of complaints regarding induced currents from vehicles, portable objects, large metallic roofs, fences, gutters, or other objects, SMUD shall investigate and take all reasonable measures at its own expense to correct the problem for valid complaints provided that the nuisance is being caused by SMUD's transmission facility and that (a) the object is located outside the right-of-way, or (b) the object is within the right-of-way and existed prior to right-of-way acquisition.

For objects constructed, installed, or otherwise placed within the right-of-way after right-of-way acquisition, SMUD shall notify the owner of the object that it should be grounded. In this case, grounding is the responsibility of the property owner. SMUD shall advise the property owner of this responsibility in writing prior to signing the right-of-way agreement.

Verification: SMUD shall maintain a record of activities related to this paragraph. These records shall be made available to authorized CEC staff upon request.

13-5. SMUD shall ensure that the design and construction of the transmission line satisfies or exceeds both the requirements of PUC General Order 95 and the terms and conditions of CEC certification. SMUD shall receive CEC approval for a waiver of any General Order 95 requirements. SMUD shall also receive CEC approval for any of the following significant changes in transmission line design:

- o Number, type, and configuration of towers;
- o Voltage (phase to phase);
- o Number of circuits;
- o Size, number, and type of conductors (including static wires);
- o Normal and emergency rating of conductors (MVA and MW);
- o Route, route length, and right-of-way width;
- o Actual installed construction cost (provide within 90 days after construction); and
- o SMUD grounding standard.

Verification: Within 30 days following completion of the transmission line, SMUD shall submit to the CEC and the USGS a statement signed by a California registered electrical engineer which verifies compliance with the requirements of PUC General Order 95 and with the terms and conditions of CEC certification. The statement shall note any waivers granted by the CEC for General Order 95 requirements.

13-6. On-site worker safety inspections may be conducted by the California Division of Occupational Safety and Health (CAL/DOSH) during construction and operation of the transmission line or when an employee complaint has been received. SMUD shall notify the CEC and the USGS in writing in the event of a violation and shall indicate if such violation may delay the transmission line construction schedule.

Verification: SMUD shall maintain records of CAL/DOSH inspections and shall make them available to authorized CEC staff upon request.

13-7. SMUD shall make every reasonable effort to locate and correct, on a case-by-case basis, all causes of radio and television interference attributed to the transmission line facilities including, if necessary, modifying receivers and furnishing and installing antennas. In addition, SMUD shall take reasonable care to prevent the conductors from being scratched or abraded.

Verification: SMUD shall maintain records of complaints and corrective action and shall make these records available to authorized CEC staff upon request.

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Section 14: TRANSMISSION LINE ENGINEERING

(Transmission line engineering requirements are included in Section 13.)

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Section 15. TRANSMISSION LINE BIOLOGICAL RESOURCES

(Transmission line biological resource requirements are included in Section 5.)

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SECTION 16. NOISE

A. APPLICABLE LAWS, ORDINANCES, STANDARDS, AND PRACTICES

- 0 OCCUPATIONAL HEALTH AND SAFETY ACT OF 1970 (29 CFR 1910 ET SEQ.).
- 0 USMMS GEOTHERMAL RESOURCE OPERATION ORDER #4.
- 0 TITLE 8, CALIFORNIA ADMINISTRATIVE CODE, ARTICLE 105.
- 0 NOISE ELEMENT OF THE SONOMA COUNTY GENERAL PLAN.
- 0 DRAFT SONOMA COUNTY ZONING ORDINANCE.

B. REQUIREMENTS

16-1. SMUD SHALL COMPLY WITH STANDARDS SET FORTH IN THE MOST RECENT SONOMA COUNTY USE PERMITS WHICH ARE 65 DBA FOR DAYTIME HOURS (7 A.M. TO 10 P.M.) AND 45 DBA FOR NIGHTTIME HOURS (10 P.M. TO 7 A.M.) FOR RESIDENCES, OR THE PROVISIONS OF THE SONOMA COUNTY ZONING ORDINANCE AS THEY RELATE TO NOISE, IF THEY ARE ADOPTED. IN THE EVENT THE SONOMA COUNTY PLANNING DEPARTMENT, USGS, OR SMUD RECEIVES PUBLIC COMPLAINTS OF THE NOISE DUE TO CONSTRUCTION OR OPERATION, SONOMA COUNTY AND SMUD AGREE TO PROMPTLY CONDUCT AN INVESTIGATION TO DETERMINE THE EXTENT OF THE PROBLEM. SMUD SHALL TAKE REASONABLE MEASURES TO RESOLVE THE COMPLAINTS.

WITHIN 10 DAYS OF A REQUEST BY THE SONOMA COUNTY PLANNING DEPARTMENT, SMUD SHALL CONDUCT NOISE SURVEYS AT THE SENSITIVE RECEPTORS WHICH REGISTER COMPLAINTS AND AT THE FACILITY PROPERTY LINE NEAREST THE COMPLAINING RECEPTORS. SMUD SHALL CONDUCT SURVEYS



FOR THE PERIOD OF THE CONSTRUCTION WORKING DAY AND, IF POSSIBLE, UNDER CIRCUMSTANCES SIMILAR TO THOSE WHEN THE NOISE WAS PERCEIVED. THE SURVEY SHOULD BE REPORTED IN TERMS OF THE LX AND LEQ LEVELS (X = 10, 50, AND 90). SMUD SHALL IDENTIFY AND IMPLEMENT FEASIBLE MITIGATION MEASURES NECESSARY TO ASSURE COMPLIANCE WITH THE COUNTY STANDARDS.

VERIFICATION: SMUD SHALL PROMPTLY FORWARD TO SONOMA COUNTY THE SURVEY RESULTS, THE MITIGATION MEASURES APPLIED TO RESOLVE THE PROBLEM, AND THE RESULTS OF THESE EFFORTS. SONOMA COUNTY SHALL ADVISE THE CEC OF ANY CONTINUING NONCOMPLIANCE CONDITIONS.

16-2. WITHIN 90 DAYS AFTER THE PLANT REACHES ITS RATED POWER GENERATION CAPACITY AND CONSTRUCTION IS COMPLETE, SMUD SHALL CONDUCT A NOISE SURVEY AT 500 FEET FROM THE GENERATING STATION OR AT A POINT ACCEPTABLE TO SMUD, CEC, AND SONOMA COUNTY PLANNING DEPARTMENT AND AT THE NEAREST SENSITIVE RECEPTOR. THE SURVEYS WILL COVER A 24-HOUR PERIOD AT EACH SURVEY POINT WITH RESULTS REPORTED IN TERMS OF LX (X = 10, 50, AND 90), LEQ, AND LDN LEVELS.

SMUD SHALL PREPARE A REPORT OF THE SURVEY THAT WILL BE USED TO DETERMINE THE PLANT'S CONFORMANCE WITH COUNTY STANDARDS. IN THE EVENT THAT COUNTY STANDARDS ARE BEING EXCEEDED, THE REPORT SHALL ALSO CONTAIN A MITIGATION PLAN AND A SCHEDULE TO CORRECT THE NONCOMPLIANCE.

NO ADDITIONAL NOISE SURVEYS OF OFF-SITE OPERATIONAL NOISE ARE REQUIRED UNLESS THE PUBLIC REGISTERS COMPLAINTS OR THE NOISE FROM



THE PROJECT IS SUSPECTED OF INCREASING DUE TO A CHANGE IN THE OPERATION OF THE FACILITY.

VERIFICATION: WITHIN 30 DAYS OF THE NOISE SURVEY, SMUD SHALL SUBMIT ITS REPORT TO THE SONOMA COUNTY PLANNING DEPARTMENT AND USGS.

16-3. WITHIN 180 DAYS AFTER THE START OF COMMERCIAL OPERATION, SMUD SHALL PREPARE A NOISE SURVEY REPORT FOR THE NOISE-HAZARDOUS AREAS IN THE FACILITY. THE SURVEY SHALL BE CONDUCTED BY A QUALIFIED PERSON IN ACCORDANCE WITH THE PROVISIONS OF TITLE 8, CAC, ARTICLE 105. THE SURVEY RESULTS WILL BE USED TO DETERMINE THE MAGNITUDE OF EMPLOYEE NOISE EXPOSURE. IF EMPLOYEE COMPLAINTS OF EXCESSIVE NOISE ARISE DURING THE LIFE OF THE PROJECT, CAL/DOSH, DEPARTMENT OF INDUSTRIAL RELATIONS, SHALL MAKE A COMPLIANCE DETERMINATION.

VERIFICATION: SMUD SHALL NOTIFY CAL/DOSH, USGS, AND THE DEC OF THE AVAILABILITY OF THE REPORT.



the project is suspected of increasing due to a change in the operation of the facility.

Verification: Within 30 days of the noise survey, SMUD shall submit its report to the Sonoma County Planning Department and USGS.

16-3. Within 180 days after the start of commercial operation, SMUD shall prepare a noise survey report for the noise-hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 2, CAC, Article 105. The survey results will be used to determine the magnitude of employee noise exposure. If employee complaints of excessive noise arise during the life of the project, CAL/DOSH, Department of Industrial Relations, shall make a compliance determination.

Verification: SMUD shall notify CAL/DOSH, USGS, and the CEC of the availability of the report.

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Section 17. POWER PLANT EFFICIENCY

(No power plant efficiency requirements were included in the decision.)

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APPENDIX A

LETTER OF UNDERSTANDING BETWEEN CEC AND USGS WITH
RESPECT TO POSTLICENSING DUTIES
AND RESPONSIBILITIES FOR THE SMUDGE #1 GEOTHERMAL PROJECT

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LETTER OF UNDERSTANDING BETWEEN CEC AND USCS
WITH RESPECT TO POSTLICENSING DUTIES
AND RESPONSIBILITIES FOR THE SMUDCEO #1 GEOTHERMAL PROJECT

I. INTRODUCTION

Pursuant to the Memorandum of Understanding dated February 27, 1980, the California Energy Commission (CEC), United States Geological Survey (USGS), and Bureau of Land Management (BLM) undertook a cooperative effort to compile the environmental documentation necessary to comply with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) and to issue necessary permits and licenses for Sacramento Municipal Utility District's (SMUD) proposed Geothermal Project No. 1.

The purpose of this agreement is to set forth the duties and responsibilities of the CEC and the USCS following the issuance of licenses and approvals for the SMUDCEO #1 Geothermal Project. This agreement also includes provisions for postcertification supervision of the project to ensure that the project is constructed and operated pursuant to the terms and conditions of certification and licenses, and is in compliance with applicable laws, standards, and ordinances. These provisions are attached to this agreement as Appendix A (Compliance Monitoring Report).

II. GENERAL PROVISIONS

A. The CEC recognizes that the proposed project is located on federally owned lands and will utilize geothermal resources owned by the United States and managed by the USGS pursuant to the Geothermal Steam Act of 1970 (P.L. 91-581). Accordingly, the CEC acknowledges

that the ultimate decision-making authority for all issues pertaining to the design, construction, and operation of the proposed facility which may arise pursuant to the implementation and execution of this agreement resides with the BLM and the USGS.

- B. The USGS recognizes that the proposed project is located within the territorial confines of the State of California. Accordingly, USGS agrees to consider the interests of the state in making post-certification decisions pursuant to this agreement, and shall give great weight to the comments and recommendations of the CEC with respect to such decisions.
- C. The USGS and the CEC agree that the Northern Sonoma County Air Pollution Control District shall have all of the rights, duties, and responsibilities specified in the "Approved ARB-CEC Joint Policy Statement of Compliance with Air Quality Laws by New Power Plants" executed by the CEC and the California Air Resources Board on January 23, 1979, to the extent the statement is consistent with applicable federal laws. A copy of the agreement is attached hereto as Appendix B.
- D. The USGS shall ensure compliance with applicable local standards in conducting its postcertification duties and responsibilities in all technical areas in which the CEC is secondarily involved.
- E. The CEC may recommend the use of state or local agencies in performing one or more monitoring functions as outlined in Appendix A.

If the USGS does not utilize such an agency as recommended, it shall provide for such monitoring functions.

F. The USGS and the CEC agree that the terms of this agreement supersede any differing or inconsistent terms which may appear in Appendix A and that the provisions of Appendix A shall be implemented consistently with the terms of this agreement.

G. Decisions of the Deputy Conservation Manager (DCM) for Geothermal may be appealed under the provisions of 30 CFR Part 290.

H. The USGS agrees to maintain possession of all proprietary information which may be submitted by the Applicant pursuant to the provisions of Appendix A. The CEC may review such proprietary information at the offices of the USGS.

III. PRIMARY CEC INVOLVEMENT

Subsequent to CEC certification of the SMUDGE #1 Geothermal Project, the Commission shall have primary involvement in the review of final seismic design criteria, structural design criteria for critical structures and equipment, design criteria of air pollution control equipment, and in the evaluation and selection of mitigation measures for significant adverse geologic conditions encountered during site preparation.

Primary CEC involvement shall be carried out as follows:

A. All drawings, reports, analyses, and other design documents of structures or equipment for which the CEC is primarily involved shall be submitted by the Applicant to the USGS. Upon receipt of

such documents, the USGS shall immediately forward two copies of each such document to the CEC for review and preparation of suggestions and recommendations from the CEC to the USGS. Any responses from the CEC regarding these documents shall be made to the USGS no more than 30 days from their receipt by the CEC unless an extension of that time is agreed upon by the CEC and USGS. If no response is received by the USGS within this time, USGS will assume that the CEC is satisfied with the documents and has no recommendations or suggestions to offer. The USGS will have up to 15 additional days to review the recommendations and to resolve any areas of disagreement between the CEC and USGS.

- B. The USGS shall not approve the design criteria, designs, or mitigation measures for the power plant and related essential (Category 1) structures and equipment until it has expressly solicited the advice and recommendations of the CEC. If the decision of the USGS does not adopt the recommendations of the CEC, the USGS shall provide written explanation of its reasons for not adopting such recommendations.

As used in this agreement, critical structures include the turbine generator building and turbine generator pedestal. Essential equipment includes the turbine generator, surface condenser, gas removal equipment, overhead bridge crane, main transformers, H₂S abatement facility, circulating water pumps, switchyard equipment, and the cooling tower system.

- C. The USGS shall not approve mitigation measures for significant adverse geologic conditions until it has solicited the advice and recommendations of the CEC.

As used in this agreement, a significant adverse geologic condition is a condition which requires an alteration in structural design concept or the preparation of new design calculations.

IV. SECONDARY CEC INVOLVEMENT

- A. The CEC shall be secondarily involved in the execution and evaluation of all mitigation measures specified in the Final Joint Environmental Study. The Commission's secondary involvement shall be carried out as follows:

1. All required Plans of Operation, Applications for Permits, reports, designs, and similar documents shall be submitted by the Applicant to the USGS. The USGS shall immediately forward copies of such documents to the CEC so that the CEC can review the documents and make any recommendations within the time frame established by the DCM, Geothermal, and USGS.
2. The CEC may submit advice and recommendations for consideration by USGS.
3. With respect to the mitigation measures specified in the Final JES, and unless the subject matter is covered in Appendix A:
 1. The USGS in accordance with 30 CFR 270.34-1 shall require the Applicant to prepare for USGS approval a detailed Plan of

Utilization describing the manner in which each mitigation measure will be implemented;

2. The USGS shall require the Applicant to submit Annual Reports of Compliance under 30 CFR 270.76; and
3. The USGS Construction Permit shall include provisions for CEC inspection of the site and related facilities.

Dated:

Original signed by:

WILLIAM F. ISHERWOOD
Acting Deputy Conservation
Manager, Geothermal
United States Geological
Survey

Dated:

Original signed by:

RUSSELL L. SCHEWICKART
Chairman
California Energy Commission

