EXECUTIVE SUMMARY

SOUTHEAST REGIONAL WASTEWATER TREATMENT PLANT FACILITIES IMPROVEMENTS PROJECT AND GEYSERS EFFLUENT PIPELINE PROJECT

Administrative Draft EIR / EIS

SCH EIR/EIS No. 86-021101

May 3, 1994

Prepared for:
Lake County Sanitation District and
U.S. Bureau of Land Management

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Environmental Science Associates, Inc.

301 Brannan St.
Suite 200
San Francisco, California
94107-1811
(415) 896-5900

Also offices in

Los Angeles

Sacramento

920586

ESA

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1 INTRODUCTION AND NOTICING

The Southeast Regional Wastewater Treatment Plant (SERWTP) Facilities Improvement Plan and Geysers Effluent Pipeline and Effluent Injection Project is proposed as a plan to provide expanded wastewater treatment capabilities and to dispose of the effluent by injection in the Geysers geothermal field for purposes of power production. The project is located predominantly in the County of Lake, California, and also in part of Sonoma County. The plan includes various conventional facilities improvements in wastewater treatment to a secondary level of treatment at the SERWTP. The plan includes facilities to convey the treated effluent in a 26-mile, 24~~0~~-inch inside diameter pipeline to the Southeast Geysers. The wastewater from the SERWTP would be supplemented by raw lake water diverted from nearby Clear Lake. At the Geysers, the effluent would be directed into a system of distribution lines to wells located on a federal leasehold managed by the U.S. Bureau of Land Management (BLM) and private lands leased to geothermal developers within County of Lake and Sonoma County jurisdictions. Deep injection into the geothermal reservoir would occur year-round for all the wastewater/lake water delivered for these purposes, totaling ~~5,400 to 3,600~~ gallons per minute. In the geothermal reservoir, the water would be converted to steam and collected in production wells that would direct the steam to four existing power plants. Construction of the project would begin in December 1994 and require about 1 to 1.5 years to complete. Operation of the project would begin in late 1995 or early 1996. The plan has an operating ~~design~~ life of at least ~~approximately~~ 25 years.

The plan is proposed at this time because of the need to remove a Cease and Desist Order issued by the Central Valley California Regional Water Quality Control Board to the Lake County Sanitation District (LACOSAN). The Cease and Desist Order has placed a moratorium on additional connections to the sewer system, resulting in curtailed development in the SERWTP service area, which includes the City of Clearlake, community of Lower Lake and surrounding lands in the county. The plan also provides for a dependable supply of water in the Southeast Geysers to be injected into the geothermal reservoir in order to produce steam that is collected and directed to power plants. At present there is a continuing trend toward a decline in power production in the Southeast Geysers because of the decline in steam pressure.

This document is a summary of a combined full Environmental Impact Report (EIR) and Environmental Impact Statement (EIS), prepared pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), respectively. The CEQA lead agency is LACOSAN. The NEPA lead agency is the BLM. The EIR/EIS describes the environmental impacts of the various components of the project. Mitigation measures are suggested for reducing impacts to a less than significant level.

2 OPPORTUNITIES TO COMMENT ON THE DRAFT EIR/EIS

The EIR/EIS is a public disclosure document. It is intended to provide information to the decision-makers, cooperating agencies, responsible and trustee agencies, and to the public about the project and its environmental effects. A 45-day review period is provided for review of this document. As required by CEQA and NEPA, all agencies and the public may provide comments on the content of this Draft EIR/EIS. Comments may be provided in writing and should be addressed to:

Mr. Mark Dellinger		Mr. Rich Estabrook
Lake County Sanitation District	OR	U.S. Bureau of Land Management
255 North Forbes Street		2550 North State Street
Lakeport, CA 95453		Ukiah, CA 95482

The deadline for receiving all written comments is May 12, 1994. Written comments postmarked by that date will be incorporated into the Final EIR/EIS.

Agencies and the public also may provide comments on the Draft EIR/EIS at a joint public hearing of the BLM and Lake County Planning Commission to be held in the Board of Supervisors Chambers at the Lake County Courthouse, 255 N. Forbes Street, Lakeport, CA. The public hearing to receive comments on the Draft EIR/EIS will be held on Thursday, May 12, 1994.

All comments made on the Draft EIR/EIS will be provided a response in the Final EIR/EIS. The Lake County Planning Commission and BLM will review the Final EIR/EIS and certify at a public hearing that the document meets all requirements of CEQA and NEPA. Upon certification of the EIR/EIS, the Planning Commission will make its recommendations to the LACOSAN Board of Directors regarding environmental effects and required mitigation measures to be included in a mitigation monitoring plan; functional equivalent of a use permit.

Following the CEQA/NEPA review by the Planning Commission, the LACOSAN Board of Directors will review and consider the EIR/EIS and hold a public hearing on the project. After considering agency and public comments, the LACOSAN Board of Directors will make its decision on whether to issue a permit. If the project is approved, the Board will determine which mitigation measures to incorporate into the project. Some of the mitigations incorporated into the project will be the mitigation measures recommended in this EIR/EIS and by the Planning Commission, and approved by the LACOSAN Board of Directors.

3 PROPOSED PROJECT

3.1 PURPOSE AND NEED

The proposed project is a plan to:

(1) expand the plant capacity and wastewater treatment facilities at the Southeast Regional Wastewater Treatment Plant located near the City of Clearlake, California, as mandated by a Cease and Desist Order issued by the Central Valley Regional Water Quality Control Board,

(2) transport the effluent mixed with diverted lake water in a 26-mile pipeline to The Geysers, adding in effluent from the Middletown Wastewater Treatment Plant, and

(3) inject the effluent into The Geysers steam field to produce steam used in power generation.

The primary reason for proposing the project is the need to provide additional wastewater treatment capacity for the Clearlake and Lower Lake areas. Growth in the service area of the SERWTP since the facilities were installed has increased wastewater generation to a point that the demand is at or over the available capacity of the treatment plant and effluent discharge facilities. The second reason for proposing the project is the need for a dependable source of water in the Southeast Geysers that can be used for injection into the geothermal reservoir to produce steam. Since 1987, steam production has declined significantly because of the loss of steam pressure in the reservoir rock. These situations are discussed below.

The existing Southeast Regional Wastewater Treatment Plant (SERWTP), located north of Clearlake, began operation in 1975. The plant is owned and operated by LACOSAN. The installed plant capacity is 1.49 million gallons per day (mgd) and can handle peak flows up to 2.75 mgd. Secondary treatment of wastewater is performed at the plant and the effluent is directed into a 540~~469~~ acre-foot reservoir adjacent to the plant. The effluent is drawn from the

reservoir and sprinkle-irrigated on 244 acres of range land during the hot dry summer and dry periods in winter. There is an emergency overflow spillway to a tributary creek to Burns Valley Creek, which flows through the City of Clearlake and discharges into the lake. Such overflows have occurred in the past. These overflows have resulted in a violation of the Central Valley Regional Water Quality Control Board (CVRWQCB) permit for the plant which mandates that effluent be confined to the existing land disposal areas. At present the sprinkle irrigation system is not adequate to dispose of all of the effluent (when combined with precipitation run-off into the storage reservoir). Overflows from this condition also lead to discharge into Clear Lake. The discharge of wastewater into Clear Lake is prohibited by the CVRWQCB's Basin Plan for the lake and by County of Lake ordinance.

In fulfilling its delegated responsibility for wastewater treatment plant permitting under the federal Clean Water Act, the CVRWQCB issued a Cease and Desist Order in 1991 to LACOSAN, citing treatment and disposal deficiencies. That order forbids hook-ups which would put wastewater received at the plant over installed treatment plant capacity and approved effluent discharge capacity. The CVRWQCB ordered LACOSAN to provide additional capacity for the SERWTP service area and placed a moratorium on building and new hook-ups in the service area until an approved plan is in place and facilities for both treatment and disposal of wastewater are constructed.

The City of Clearlake and the County of Lake project that growth in the SERWTP service area will far exceed currently installed SERWTP capacity. Current estimates of growth indicate that there will be a need for a treatment capacity exceeding 3.0 mgd average within the next 30 years. In order to achieve this volume of wastewater treatment, new facilities for the SERWTP would have to be constructed.

The expansion of the SERWTP would provide new facilities to treat wastewater using standard engineering design to achieve acceptable levels of treatment at the plant. The more difficult problem is management and ultimate disposal of the treated wastewater effluent. Existing spray fields near the SERWTP cannot accommodate significant expansion or added volumes of effluent. Various alternatives to effluent disposal have been investigated. The project proposed and evaluated in this EIR/EIS is the preferred alternative. It would transport treated effluent through a constructed pipeline to The Geysers.

The secondary cause for proposing the project at this time is the opportunity to enhance steam production at The Geysers which has been in decline since 1987. The apparent cause of the

decline is the reduction in steam reservoir pressure as a result of the unavailability of sufficient injection water to adequately replace the amount of steam being produced. The proposed wastewater effluent would be a new source of water to compensate for this decline. The project would allow continued geothermal energy production in the southeast Geysers at higher production levels than would occur otherwise.

3.1.1 KEY ACTIONS LEADING TO THE PROPOSED PROJECT AND IDENTIFICATION OF ALTERNATIVES

The project has been proposed at this time because of a series of events and circumstances that have developed in both the LACOSAN service area of the SERWTP and in The Geysers. The key considerations related to these events and circumstances are summarized here to provide a general background to the proposed project.

While the construction of proposed wastewater treatment facilities at the SERWTP was conventional and relatively uncontroversial, the issue of ultimate disposal of the effluent proved more difficult to resolve and it produced considerable controversy.

LACOSAN in its 1991 facilities plan and an EIR investigated approximately twelve options for ultimate disposal of the effluent. Among these options was the transport of effluent to the southeast Geysers area for disposal which is included in this analysis. These options are detailed in the Southeast Regional Wastewater System Improvement Facilities Plan EIR which is included in this analysis. The alternative which was chosen for further investigation was the discharge of treated effluent to Cache Creek at Peachtree Crossing. The proposed discharge of treated effluent into Cache Creek produced a very large response from the downstream water users in Yolo County. Numerous comments on the proposed plan and its environmental impacts were received during public review of the Draft EIR, and the additional environmental studies which would have been required would have caused a significant delay. The delay would have made compliance with the Regional Water Quality Control Board's mandated Cease and Desist Order unachievable for two to three years or longer, and would have been extremely costly. As a result, further investigations into the engineering and economic feasibility of disposing the SERWTP effluent in The Geysers were initiated. A comparison of possible costs and environmental problems potentially associated with the Cache Creek disposal plan and the conceptual Geysers disposal plan indicated that the latter alternative would prove possible and perhaps preferable to the originally proposed plan. Moreover, there was an active interest on the

part of the geothermal industry to obtain the effluent provided that costs for construction of the 26-mile pipeline and related facilities would be shared.

The industry has had a 25-year history of injecting cooling tower condensate that was prohibited from being discharged into surface waters. The injection wells are several thousand to over 10,000 feet deep. Initial investigations of enhanced injection in the late 1980's indicated an excellent potential for positive response in the steamfield. As a result, broader programs for enhanced injection occurred throughout The Geysers with substantial success. The principal limitation was, and remains, the lack of an available, dependable sustained supply of water for use in injection.

Because LACOSAN has a potentially available and continuous supply of wastewater, the geothermal industry has a potential source of water to meet its injection needs. Significantly, the wastewater supply would be dependable and sustainable, as it would increase as growth occurs in LACOSAN's service area. For these reasons, in 1994~~2~~, LACOSAN and three industry partners (Calpine, NCPA, Unocal and PG&E) entered into ~~an~~ Agreements-in-Principle regarding construction and operation of a pipeline for delivery and use of treated effluent to the Southeast Geysers. The Agreement indicated that costs would be shared for design, construction and operation of a pipeline system delivering 5,400~~3,500~~ gpm of effluent to The Geysers.

In 1992, LACOSAN developed a plan for constructing The Geysers Effluent Pipeline. In conjunction with that plan, an EIR/EIS is required to be prepared as noted in the Initial Study prepared for the project. The requirement for the EIR stems from LACOSAN's requirement to comply with CEQA for major public improvement projects. The EIS requirement stems from the plan to construct facilities and to inject fluids in federal lands in the Southeast Geysers managed by the U.S. Bureau of Land Management and funding provided by the U.S. Department of Energy. In July 1993, the LACOSAN Board of Directors tentatively adopted the Geysers Disposal alternative for detailed environmental analysis and as the preferred disposal plan for effluent from the SERWTP.

This EIR/EIS Summary describes these various project components as part of a program of actions and includes an evaluation of their environmental impacts.

3.2 LOCATION

Most of the proposed facilities, including the SERWTP facilities, Clear Lake diversion pipeline and pumps, main effluent pipeline and pumps, are located in Lake County, California, between Clear Lake and the southeast Geysers (Figure 1). The effluent injection part of the project is located in the southwestern portion of Lake County. A ~~small~~ portion of the effluent pipeline and the secondary distribution pipelines to the injection wells in the steam field are located in Sonoma County. ~~A majority~~Part of the project located in The Geysers is within federal lands managed by the BLM and a part~~smaller portion~~ is located on lands administered by Lake County and Sonoma County. Figure 1 provides an overview map of the project facilities locations.

3.3 PROPOSED PROJECT AND RELATED LAND USE GOALS

For purposes of analyzing the environmental effects of the project in this EIR/EIS, the project is divided into the following three primary components: (1) the Southeast Regional Wastewater Treatment Facilities Plan Component; (2) the Geysers Effluent Pipeline Project Component; and (3) the Southeast Geysers Effluent Injection Program Plan Component.

3.3.1 SOUTHEAST GEYSERS EFFLUENT PIPELINE PROJECT COMPONENT

This component of the project is the proposed pipeline to carry effluent from the SERWTP to The Geysers.

Previous studies conducted by and for the County of Lake, Calpine Corporation (Calpine), ~~and~~ the Northern California Power Agency (NCPA) and Unocal Corporation (Unocal) established that a combined lake water and wastewater effluent flow of about 7.8~~5~~ mgd could be cost effectively conveyed to the southeast Geysers steam field from the SERWTP. 7.8~~Five~~ mgd would provide a flow of 5,400~~3,500~~ gallons per minute (gpm). The sources of this volume of flow would vary over time. As proposed for this project, the volume of flow in the pipeline would come from three sources: (1) effluent from the SERWTP; (2) a small amount effluent from the Middletown Wastewater Treatment Plant (MWTP); and (3) supplemental water diverted from Clear Lake.

LACOSAN has entered into ~~an~~ Agreements-in-Principle with Calpine, NCPA, Unocal and Pacific Gas & Electric Company (PG&E) to provide a flow of 5,400~~3,500~~ gpm in the proposed effluent pipeline. The proposed effluent pipeline system would be designed to supply an average

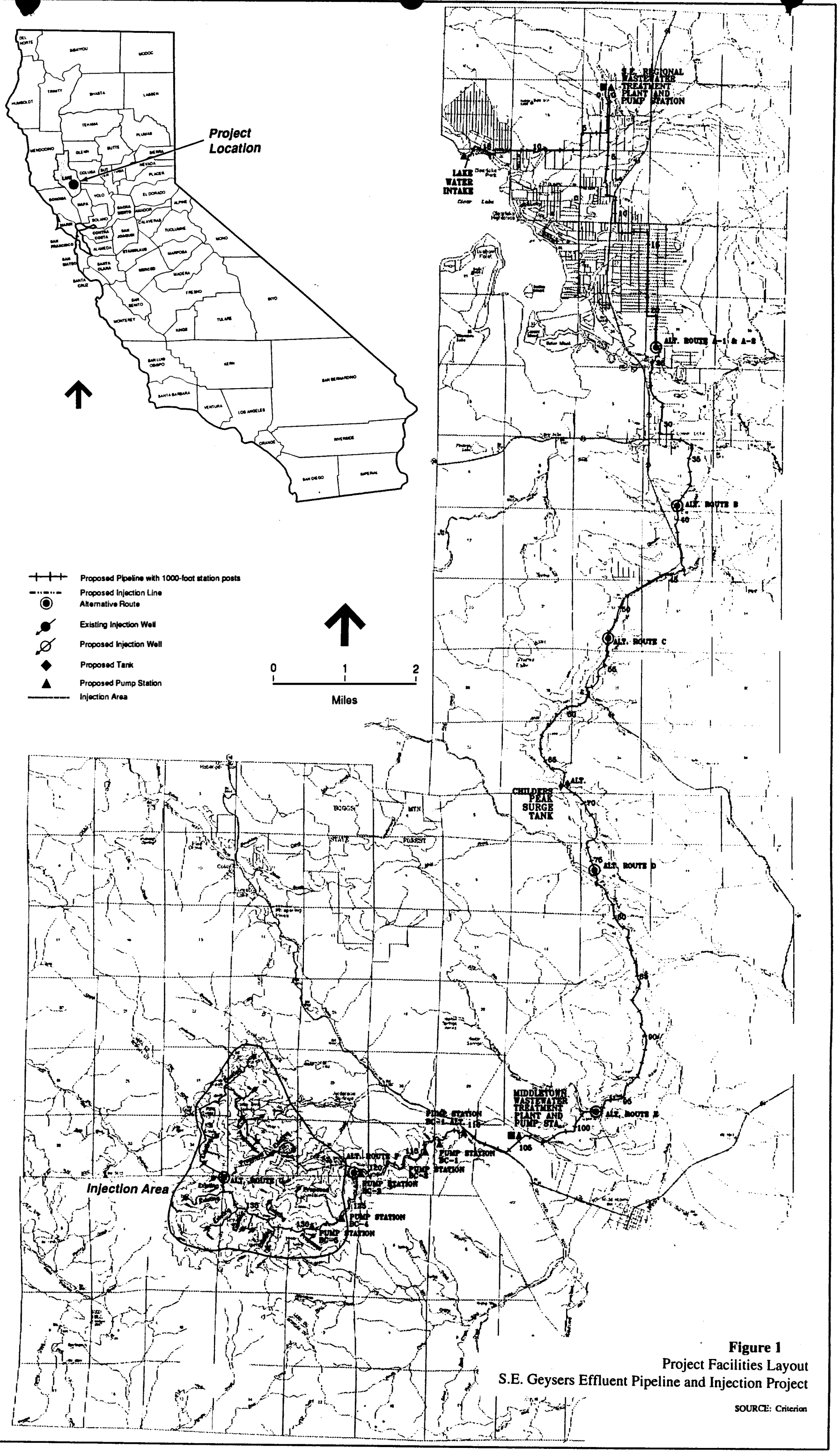

Figure 1
Project Facilities Layout
S.E. Geysers Effluent Pipeline and Injection Project

SOURCE: Criterion

annual a flow of 5,4003,600 gpm to The Geysers. It includes 5,3003,500 gpm from the SERWTP plus an additional 100 gpm from the MWTP. ~~However, it will require about 15 years before the majority of the 3,500-3,600 gpm flow will be derived from the combined two effluent sources.~~

In order to maintain the volume needed to operate the pipeline in the interim years, supplemental water, termed "make up water", will be drawn from Clear Lake and added to the effluent stored in the SERWTP reservoir. As SERWTP and MWTP effluent flows rise, the need for Clear Lake make up water would decline.

Proposed facilities for this component include the following.

Main Geysers Pipeline

- Geysers Effluent Pipeline: The 26-mile main effluent pipeline would be a 13~~8~~7,500 feet long, 24~~0~~-inch inside diameter for most of its length, steel force main, placed both above-ground and underground in various segments to convey effluent from the SERWTP to the terminus in The Geysers; isolation valves on the main pipeline would be spaced at approximately two-mile intervals.

- Twenty-four inch diameter pipeline extension from the SERWTP reservoir to the six~~four~~ operating pumps and surge tank: Approximately 730 feet long, located entirely within the SERWTP yard; this would be a suction pipeline drawing effluent from the reservoir.

- SERWTP pumps: Up to six~~Four~~ turbine pumps, each would be 200 horsepower and have a 900 gpm output capacity; they would pump the effluent through the pipeline from the SERWTP to the Childers Peak Regulating Tank; an hydropneumatic surge tank would be ancillary to the pump station. A seventh pump may be installed as a backup.

- Childers Peak Regulating Tank: The steel tank would have a capacity of approximately ~~40~~620,000 gallons; it would be ~~5~~60 to ~~6~~70 feet in diameter and 24~~0~~ to 32~~25~~ feet high; it would be constructed above ground on a site below Childers Peak at about 1,800 feet mean sea level (msl); it would serve to provide the activating control water level for the SERWTP pumps and to provide surge suppressing storage of effluent.

- Middletown Wastewater Treatment Plant (MWTP) facilities: Includes two pumps, suction and discharge pipeline, surge control tank, connection valve into the main Geysers Effluent Pipeline, and power supply facilities; all facilities would be located in the MWTP yard.

- Bear Canyon Pump Stations: Five pump stations to lift the effluent from approximately elevation 1,470 feet above msl to the high point of 3,330 feet msl in The Geysers: each station would have three~~two~~ operating centrifugal pumps with 200-horsepower motors and, combined, have a 5,4003,600 gpm output capacity; the pumps would be located on 30- by-80-foot pads in an industrial-type building; a surge tank would be constructed for the first pump station. A fourth back-up also may be installed at each pump station.

- Y-Pad Injection Fluid Tank: This would be a 100,000-gallon steel tank constructed above ground on a concrete pad partially cut into the hillside on the south side of the NCPA Y-Pad in The Geysers at about 3,365 feet msl; it would control the flow of injectate to some of the secondary distribution pipelines and serve for storage of effluent and condensate. The tank would be located near the terminus of the Geysers Effluent Pipeline.

Geysers Secondary Pipeline System

- Secondary distribution pipelines in The Geysers to carry the effluent as injection fluid from the main pipeline to 20~~16~~ existing well heads where injection into the steam field would occur; the main pipeline to near the Calpine/NCPA boundary would be steel or polyethylene pipe buried and above ground along the road; several new polyethylene or steel pipelines buried in existing roads or above ground and above ground would be used to convey the effluent to the well-heads, as well as use of existing injection lines; the secondary pipelines vary in diameter from 8 inches to 16 inches. (No new wells are proposed to be constructed as part of this project.)

Lake Diversion: Make up Water Supply Facilities

- Lake Intake Structure: This would be a wire-wound screened intake feature to draw in water and an air purge system for purging debris from the intake; it would be located on the bottom of Clear Lake (elevation 1,295 msl) at a depth of approximately 30 to 35 feet below mean lake level (elevation 1,330); the underwater pipeline would be placed on the lake bottom anchored to concrete collars and would extend approximately 300 feet to the diversion pump station on the lake shore. Within 50 to 100 feet of the shoreline, the intake pipeline would be buried for the remaining distance to the pump station. The exposed underwater pipeline and intake screen would be protected by rock riprap along side and over it.

- Lake Diversion Pump Station: Three~~Two~~ vertical turbine pumps, each 125 horsepower, with a capacity of 2,060~~1,600~~ gpm at a total developed head of 160~~100~~ feet; the pumps would be installed over the suction chamber; the pumps and ancillary air compressor and surge arrestor would be housed in a sound-proof building located at the lake shore.

- Lake Diversion Pipeline: This would be a 16,600-foot PVC pipeline, 24~~18~~ inches in diameter; isolation valves would be placed at approximately two-mile intervals; it would be placed underground for its entire length from the lake shore to the SERWTP reservoir; the pipeline capacity will be up to 8.9~~4.8~~ mgd.

- Pipeline outlet structure: This would be placed at the bottom of the SERWTP reservoir with concrete or rip-rap rock for erosion protection.

Main Pipeline Ancillary Facilities

- Bear Canyon - M-Pad Road: new road and pump station pad located between the Calpine Bear Canyon Access Road and the NCPA M-Pad; the road would be approximately 20 feet wide, 2,400 feet long, with a widened area for the pump station (Station No. BC-3); the road would include 1.5:1 (horizontal to vertical) cut slopes, 2:1 fill slopes, and a 180-feet

wide and 60-feet high fill placed for the crossing of an unnamed creek with a crib wall; the creek would be placed in a culvert.

- Power supply line in The Geysers: This would be a 21 kilo-volt (kv) 26,000 feet long power line located in a right of way between an existing line near PG&E Unit 16 and the Bear Canyon Access Road; the power line would be constructed on wooden poles immediately adjacent to an existing 230 kv line between PG&E Unit 16 and the Bear Canyon Power Plant; upon reaching the Bear Canyon Access Road, it would split, running along the roadside to the five pump stations for the pipeline; provides power to the five Bear Canyon Pump Stations.

- Power supply line at the SERWTP: A small 12 kv line, less than 200 feet long, would be constructed on poles within the SERWTP yard to supply power to the four pumps for the pipeline.

- Flow control, monitoring and telemetry system: A distributed control system (DCS) would consist of remote telemetry units (RTUs) located at the SERWTP pump station and a master RTU in The Geysers; the computerized control station would be located at the NCPA control center; the DCS would control flows on a 24-hour basis by controlling the pumps at the SERWTP pump station and the Bear Canyon pump stations; these are regulated in response to pipeline flow pressure requirements and system demand from The Geysers steam field; water levels in the Childers Peak Regulating Tank would determine the activation or shut down of the pumps; a fiberoptic line would be run from the Childers Peak Regulating Tank to the NCPA control center to transmit information on the water level in the tank.

General Operation of the Pipeline System

The overall system would deliver up to 5,400~~3,600~~ gpm in the pipeline to The Geysers. This is the equivalent of approximately 7.8~~5.22~~ mgd. The proposed operations involve: (1) the diversion of make up water from Clear Lake to the SERWTP; (2) the collection of effluent from the SERWTP reservoir combined with the addition of make up water from Clear Lake; (3) the collection of effluent from the MWTP; (4) conveyance of the effluent in the main pipeline to the terminus in The Geysers; and (5) flow of effluent in the secondary distribution lines to the well-heads for injection. These are presented in summary fashion below.

(1) Clear Lake Diversion. To maintain the design flow of 5,320~~3,500~~ gpm from the SERWTP to the Geysers, water would be drawn from Clear Lake for a period of ~~approximately 20~~25 years. ~~Initially, t~~The volume of water taken from Clear Lake ~~(3.47 mgd)~~ would exceed that volume of effluent generated by the SERWTP ~~(1.57 mgd). This relationship is expected to be reversed in about the year 2010, when SERWTP effluent volumes probably would exceed the volume of required make up water.~~ As the Clearlake, Lower Lake and Middletown areas grow and effluent volumes continue to increase, eventually the need for make up water would decrease. However,

lake water diversions would be expected to occur throughout the 25-year design life of the project.

The average withdrawal from Clear Lake would be 6,243.47 mgd in 19965, or approximately 1.925 inches off the lake elevation, eventually dropping to 5,091.7 mgd in 20253. This equates to an annual withdrawal of 6,9943,888 acre-feet (af) per year in 19964, and 5,7051,920 af per year in 20213. These rates would vary under different rainfall conditions.

Pumping would occur each day ~~for dry months~~ of the year, except possibly for an approximate 30-day period during the August/September period of algae bloom in Clear Lake. To offset the period when pumps were turned off during the algae bloom, the pumps would operate at higher through-put volumes during the months preceding and following the algae bloom.

A single suction line extending into the lake would draw water into the pipe and then into a suction chamber. From there, the water would be pumped in the 2418-inch pipeline to the SERWTP reservoir. No facilities are planned for treating the make up water.

(2) Effluent Collection and Pumping at the SERWTP. The existing reservoir would receive both the effluent from the SERWTP and the make up water diverted from Clear Lake. The volume of SERWTP effluent varies substantially monthly, seasonally and annually. Sustained SERWTP influent flows of 3 mgd to 4 mgd already occur over many days in succession during unusually wet weather periods. Average anticipated flows in 1994 would be 1,401.57 mgd, rising to 1,602.10 mgd by the year 2000 and to 2,523.29 by the year 20213. As system effluent flows vary, daily adjustments in diversions from Clear Lake will be made to maintain consistent flows of 5,4003,500 gpm into the Geysers Effluent Pipeline at all times (24 hour per day, 365 days per year). Occasional shut down periods would occur for maintenance.

The combined SERWTP effluent and make up water in the reservoir would be drawn off through ~~an existing~~ proposed 2418-inch outlet, and pumped through 68,000 feet (12.9 miles) of the Geysers Effluent Pipeline to the Childers Peak Regulating Tank. Gravity flow would occur south of Childers Peak to the first Bear Canyon pump station (Pump Station BC-1) located along the Bear Canyon Access Road. This flow would be about 5,300 gpm.

(3) MWTP Effluent Intake. The main effluent pipeline passes through the MWTP, located west of Middletown at elevation 1,140 feet msl. At this location, effluent generated by the MWTP would be added to the flow in the main pipeline. In 1994, it is anticipated that 0.14 mgd average

wet weather flow would be added to the system; this would rise to 0.17 mgd by the year 2023. The addition of the MWTP flow would raise the total flow in the Geysers Effluent Pipeline to 5,400~~3,600~~ gpm.

The storage ponds at the MWTP also would be used to accommodate large fluctuations in effluent from the Middletown system, as well as flows that may occur at the SERWTP. There is sufficient storage capacity at the MWTP to handle peak system flows.

(4) Conveyance to the Terminus. The combined lake water and effluent flow from the SERWTP and MWTP in the Geysers Effluent Pipeline would flow (under hydraulic head from Childers Peak together with pumped flow from the MWTP) to an elevation of approximately 1,470 feet msl, at which would be located the Bear Canyon Pump Station No. 1 (BC-1).

The segment of the pipeline above BC-1 presents the greatest rise in elevation to reach the terminus. The highest elevation of the Geysers Effluent Pipeline is 3,300 feet msl, with the nearby Y-Pad Injection Fluid Tank located at the high point of the entire system at 3,336 feet msl. Five pump stations, placed at approximately equal vertical intervals would lift the 5,400~~3,500 3,600~~ gpm flow of diluted effluent into The Geysers, conveying it to the pipeline terminus located at ~~an existing sedimentation basin adjacent to~~ the NCPA C-Pad~~Plant No. 1~~. A subsidiary pipeline would draw water from the pipeline and direct it into the Y-Pad Tank. The Y-Pad Injection Fluid Tank would have a 100,000 gallon storage capacity and would receive flows of both effluent from the Geysers Effluent Pipeline and condensate from NCPA's existing operating system. The tank would be used to regulate flow of effluent to some of the distribution lines for injection.

(5) Effluent Distribution to Injection Well Heads. The overall operating system for the entire pipeline is driven by the demand for injection fluids in The Geysers and requirements for maintaining pressure in the pipeline. Demand would be based on steamfield operations determined by and controlled through the existing monitoring and flow control systems of NCPA, ~~and~~ Calpine, and Unocal. At present, overall demand for injection water would be able to absorb all the effluent produced by the SERWTP and MWTP. On a daily basis of injection, the demand may fluctuate, and these fluctuations would be reflected in the overall operation of the system for storage in the SERWTP reservoir, the Childers Peak Regulating Tank and the Y-Pad Injection Fluid Tank. Adjustments in make up water withdrawals from Clear Lake would be made to ensure even flows and efficient operating conditions of the pipeline. This would be accomplished by a computerized monitoring system, termed the distributed control system

(DCS), that would convey information by telemetry to the central control station at the NCPA control center related to the water levels in the tanks, line pressure, valve positions and flows at discharge points. Overall control of the system is handled by control of the pumps at each of the key locations for effluent input to the system (the Clear Lake diversion pumps, the SERWTP main pumps for the Geysers Effluent Pipeline, and the MWTP pumps). The Bear Canyon pumps would be regulated by water levels in the Childers Peak Regulating Tank. Remote control of all the pumps would occur from the central control station at the NCPA control station. The entire system would be computerized, with a back-up system at the SERWTP to ensure continued operations if the primary monitoring and control system were to fail.

The monitoring system also would identify abnormal operating conditions, such as a sudden increase of pressure in the pipeline or high or low water level in the Childers Peak Surge Tank. A low water level might indicate a loss of pressure in the pipeline because of failure. The system would provide an alarm to the central control station.

3.3.2 SOUTHEAST GEYSERS EFFLUENT INJECTION PROGRAM PLAN COMPONENT

This component of the project entails the ultimate disposal method of the effluent by deep injection into The Geysers steam field.

Proposed Facilities

The only new facilities for this component are the piping and valves that would be installed at existing well-heads that are not currently being used for injection.

General Operation of the Effluent Injection Program

Under the Project Agreement, ownership of the effluent would be equally divided between NCPA, Unocal and Calpine. A flow of ~~1,750~~ 1,800 gpm would be distributed by NCPA to seven of its existing wells used for injection and two existing wells that are not currently being used for injection. Delivery of effluent to Calpine would occur at the terminus of the main pipeline. Calpine would distribute its flow of ~~1,750~~ 1,800 gpm to three existing wells used for injection and four existing wells not currently used for injection. Unocal would distribute its 1,800 gpm flow of effluent to four existing injection wells.

This EIR/EIS evaluates the initial effluent injection strategy proposed by Calpine, Unocal and NCPA. It is anticipated that monitoring of the effects of the injection program on steam production over time will lead to modifications of the program, including both the selection of the wells to be used for injection and the rates of injection to those wells.

The injection area includes the steam fields operated by Calpine which supplies PG&E Unit 13 and Unit 16. There are no plans at present to use project effluent to supply steam to the Bear Canyon Power Plant although injection into the Bear Canyon area may occur after 1998. The NCPA injection area includes steam fields for Plant Nos. 1 and 2. The Unocal injection area includes steam fields supplying PG&E Units 18 and 20. The proposed 5,400~~3,500~~ ~~3,600~~ gpm of injection would approximately double the current rate of injection in this part of The Geysers by Calpine, Unocal and NCPA.

The injection method is the same as that used in current injection operations using power plant cooling tower condensate and collected storm water runoff from well pads and power plant sites. In basic concept, the effluent would be injected into deep wells, where it would migrate through fractures and pores in the hot reservoir rock, heating and flashing into steam. The steam flow derived from the injection fluid would increase steam pressure in the geothermal reservoir, thereby increasing the output of existing production wells. Existing pipelines gather the steam and direct it to the power plants.

Seven exisiting and two new NCPA injection wells would receive between 200 gpm to 1,800 gpm as an average annual rate of flow (NCPA also would add other sources of water for injection, such as rainwater, raising the upper rate of injection to 2,000 gpm). The injection intervals are typically on the order of 3,000 feet to over 10,000 feet deep. The amount of effluent injection at each well would vary.

Three existing and four new Calpine injection wells would receive between 200 and 1,800 gpm as an average annual rate of flow. The injection intervals are typically on the order of 2,400 feet to over 8,000 feet deep. The amount of injection effluent in each well would vary and effluent will likely be mixed with power plant condensate prior to injection into some wells.

Four existing Unocal injection wells would receive between 200 and 400 gpm (adding to other sources) as an average annual flow rate. The injection intervals are typically on the order of 2,800 to over 9,000 feet deep.

The annual energy production related to this 5,4003,600 gpm of effluent injection is anticipated to be between approximately 197,000131,400 and 657,000438,000 Mega-Watt hours (MWh).

3.3.3 SOUTHEAST REGIONAL WASTEWATER TREATMENT PLANT FACILITIES PLAN COMPONENT

The proposed project consists of capacity improvements to the SERWTP treatment facilities. Effluent would be secondarily treated.

Proposed filtration facilities consist of a chemical coagulant aid/feed mix system and single or multi-media filters. The effluent would be filtered by passing it through a filter system after the addition of a chemical to increase the removal of solids (coagulant aid). Coagulant aid chemicals would be either polymer or aluminum sulfate (alum), both commonly used for this purpose in domestic water supply treatment systems. Filters would be conservatively sized and have backup units for dependability.

Under normal conditions, the oxidation ditch process would be operated on a continuous year-round basis to produce a high quality secondary effluent. This effluent would be conveyed into the existing reservoir for storage. Prior to actual disposal, stored effluent would be disinfected.

The improved chlorine disinfection system would have the capability of processing effluent from either the clarifier, the reservoir, or filtration facilities.

Proposed treatment facilities improvements include:

1. a separate septage/grease receiving structure
2. grit chamber improvements
3. replacement of the existing comminutor with a mechanically cleaned bar screen
4. ditch distribution box
5. oxidation ditch improvements
6. clarifier splitter box
7. a new secondary clarifier
8. a new return/waste sludge pump station
9. effluent flow metering additions
10. chlorine contact pipeline additions
11. sludge drying beds or
12. belt filter press facility
13. oxidation ditch

3.4 MAJOR ISSUES AND RELEVANT DATA CATEGORIES

The following is a brief summary of major relevant environmental issues which were raised in the scoping process.

Biological Resources. The EIR/EIS should describe impacts to native vegetation, including listed plant species; wildlife, including barriers to migration; and impacts to fish. Information was also requested regarding the methods of trenching and stream crossings, width of the corridor and disturbed area restoration.

Clear Lake. The EIR/EIS should describe the impacts on Clear Lake from withdrawals of water.

Cultural resources. The EIR/EIS should describe the impacts on cultural resources. Consultation with Native American groups should be conducted.

Effects on environmentally sensitive areas. The EIR/EIS should discuss impacts on any wetlands, wild and scenic rivers, floodplains, vernal pools, streams, critical habitats and other environmentally sensitive areas.

Effects on geothermal reservoir. Question was raised regarding the impacts of injection on the geothermal reservoir rock and long-term operations in the southeast Geysers.

Induced Seismicity. Question was raised whether the project would induce increased earthquake hazards.

Water Quality. Question was raised regarding chemistry of the effluent in relation to groundwater, including potential for impacts to bottling companies using spring water at Cobb Mountain.

4 ALTERNATIVES TO THE PROJECT

LACOSAN and the BLM can take one of three basic actions with regard to the application for the proposed project. (1) The proposed project can be approved with mitigation measures including those presented in this EIR/EIS. (2) The proposed project could be abandoned or postponed indefinitely. That decision, in effect, would establish the No Action/No Project Alternative as the selected course of action with respect to the objectives of the project. (3) The proposed project can be amended to include approved design alternatives to those proposed as part of the project.

4.1 NO ACTION/NO PROJECT ALTERNATIVE

The No Action/No Project Alternative is the condition which would apply if the project or the design alternative were not constructed. The Alternative does not include any new facilities, operations or activities that are related to the objectives of the proposed project. Instead, the No Action/No Project Alternative presents a scenario of conditions which would exist if the project or the design alternatives were not constructed. There would be no environmental impacts related to facilities construction, operation or abandonment.

None of the project objectives would be realized under the No Action Alternative. Under the No Action Alternative, the conditions which led to proposing the project at this time would continue to exist. These are:

- The requirements of the regulatory agencies to correct wastewater problems at the SERWTP would not be met.

- The existing Cease and Desist Order from the California Regional Water Quality Control Board (CVRWQCB) would be violated.

- Raw wastewater could overflow manholes in local streets because of surcharging of the sewer pipes during wet weather. During maximum flow conditions, some sewers could back up temporarily, causing stopped or slow flow of toilets and drains.

- Wet weather conditions would result in untreated wastewater overflows to Burns Valley Creek and eventually into Clear Lake and Cache Creek.

- The moratorium on new connections to the sewer system would be continued indefinitely. Further growth would be prohibited in LACOSAN's SERWTP service area, including the City of Clearlake, the Lower Lake area and all other areas in the district.

- LACOSAN would incur financial penalties (with fines possibly as high as $10,000 per day) and possible prosecution for criminal negligence. Assuming the fees to cover the cost of fines alone, the rates charged to existing users would be increased by as much as $0.53 per day per person for violations which were fined the maximum allowable amount. Assuming 60 days of violation per year in 1994, this could total up to $40 per month per household.

- Continued declines in steam pressure in the southeast Geysers would be anticipated. This, in turn, would result in continued decline in power production at The Geysers.

4.2 PROJECT DESIGN ALTERNATIVES

The Project Design Alternatives include an assortment of engineering design and pipeline route variations from those included in the proposed project. As these are all sub-components of the overall Geysers Effluent Pipeline, they do not individually or collectively represent a complete alternative to the proposed project. If approved, individually or collectively, the Project Design Alternatives would be an amendment to the proposed project design.

The Project Design Alternatives include two types: alternative facilities designs and alternative routes for some pipeline segments. Each is described below.

4.2.1 ALTERNATIVE FACILITY DESIGNS

Lake Diversion Pumps and Pipeline on Pier

Under this alternative facility design, the pumps and pipeline to the lake shore would be located on a pier constructed approximately 300 feet horizontally into Clear Lake. The location would be the same as that for the proposed project (for which the pipeline would be under water and the pumps located in a building on the shore. The pumps, motor control center, air compressor, ~~surge arrestor~~ and air receiver would be housed in a small, sound-proof garage-like structure on the pier. The surge arrestor would be situated on the shoreline as in the proposed plan. Water pumped from depth in the lake would be directed into a 16-inch pipeline that would be located on the pier to the lake shore, at which point it would pass underground as with the proposed design.

Bear Canyon Single Pump Station and One-Way Surge Tank in the Geysers

A single pump station is an alternative design concept to the proposed use of five separated pump stations to lift the effluent up to The Geysers after leaving the MWTP (see Section 2.3.3.5). The single pump station would be located at the Bear Canyon Access Road/Highway 175 intersection in an area currently used for vehicle parking and open space. A total dynamic head of about 1,800 feet is needed to convey the effluent to the Geysers. Up to six~~Four~~ vertical turbine pumps, each with an output capacity of 900~~950~~ gpm and with 600 horsepower motors would operate 24-hours per day. A seventh pump possibly could be installed to serve as a back-up pump to the operating pumps. Ancillary electrical facilities at the pump station would be housed in a single building. The pumps would be located outdoors. The entire site would occupy approximately 0.4 acres and would be entirely fenced (chain link-type).

Associated with the single Bear Canyon Pump Station described above is the need for a surge tank on the Geysers Effluent Pipeline at the high point of the pipeline in The Geysers. This would be a one-way surge tank to prevent the potential for destructive down-surge conditions caused by an instantaneous pump shutoff. The volume of the tank would be determined during detail design; at this time, it is estimated to be no greater than 50,000 gallons. The steel tank would be exposed to the atmosphere at the top. Upon excessive down-surge in the Geysers Effluent Pipeline, the tank contents would drain through a check valve to fill the line and prevent a separation of the water column that could be highly destructive to the pumps. The tank would be located on an existing pad near the NCPA Plant 2 occupied partly by a fire control water storage tank. The proposed tank would be constructed immediately adjacent to that fire control tank. It would be constructed entirely above-ground. The tank would be up to 20 feet high and 25 feet in diameter.

Under the proposed project design, the one-way surge tank would not be needed.

Lake Diversion By-Pass Pipeline at the SERWTP

As an alternative to discharging diverted lake water into the SERWTP reservoir, a pipeline would be constructed between the point where the lake diversion pipeline enters the SERWTP and the pumps for the Geysers Effluent Pipeline. This would be a 24-inch pipeline constructed entirely within the SERWTP. This alternative would directly convey the diverted lake water to the Geysers Effluent Pipeline instead of conveying it to the reservoir. Mixing of the lake water and the SERWTP effluent would occur at a junction point at the suction side of the pumps at the SERWTP instead of mixing in the reservoir. Under this alternative, the existing 18-inch reservoir outlet pipe drawing water from the reservoir would not need to be modified.

4.2.2 ALTERNATIVE ROUTES FOR PIPELINE SEGMENTS

This section describes alternative routes that were evaluated in this EIR/EIS for specific segments of the Geysers Effluent Pipeline and the Childers Peak Regulating Tank. These alternatives were proposed because of engineering design considerations and flexibility in final site selection. Each route segment is identified below including the station post (referenced to the proposed route).

These alternatives do not include overall route alternatives for the Geysers Effluent Pipeline which were evaluated early in the planning process and rejected.

- Alternate Route A-1 (station post 23.3 - 24.5). This alternative located north of the Clear Lake Outlet Channel is proposed in order to avoid placement of the pipeline in an existing private driveway. This alternative would be about 1,000 feet long. It would add about 400 feet to the proposed route.

- Alternate Route A-2 (station post 23.3 - 24.5). This alternative (near A-1) is proposed in order to avoid placement of the pipeline in a private driveway. It is a variation similar to Alternate A-1. This alternative would be about 1,050 feet long. It would add about 450 feet to the proposed route.

- Alternate Route B, Crossing of Clayton Creek (station post 38.8 - 39.1). This alternative route is proposed because of the possible limitations of construction on the bridge (that is future bridge widening would be limited by the pipeline). As an alternative to crossing Clayton Creek on the bridge, just upstream of the bridge the route would span the deeply incised channel. This alternative would be about 250 feet long. It would reduce the proposed route by approximately 100 feet.

- Alternate Route C, Crossing of Highway 29 (station post 53.0 - 53.3). This route would be taken to avoid damage to some large trees on the east side of the highway. The alternate is neither shorter nor longer than the proposed route.

- Alternate Route D, (station post 74.5 - 75.5). This alternative is proposed in order to reduce the length of the pipeline. This alternative would be about 500 feet long and would reduce the length of the pipeline by about 250 feet by avoiding the longer turn that the existing road takes. In this remotely-located portion of the pipeline route, the proposed alignment would be in an existing dirt road leading down from Childers Peak saddle.

- Alternate Route E, (station post 97.0 - 98.5). This route is proposed in order to reduce the need for easement acquisition. It would avoid crossing the northern edge of a pasture between Big Canyon Road and Harbin Springs Road. This alternative would be about 2,000 feet long. It would about 900 feet longer than the proposed route, but would be entirely located within or in the shoulder of public roads.

- Alternate Route F, (station post 121.0 - 124.0). This route was the alignment originally proposed by the project engineers to connect the Bear Canyon Access Road and the M-Pad. It was believed to be less costly to construct and less disruptive of the environment than the proposed alignment. The overall length of this alternative route would be approximately 5,000 feet; of this about 2,000 feet would be the overland segment. This alternative would be about 2,700 feet longer than the proposed route, but it would require substantially less grading. Under this alternative, a pump station would be constructed on the M-Pad instead of Pump Station BC-3.

- Alternate Distribution Pipeline Route G (138.5 - 139.5). This alternate route was proposed in order to avoid construction disturbance in the road at the busy NCPA gate. At approximately 400 feet south of the NCPA gate, the 16-inch diameter pipeline would leave the road and follow along the southern edge of the pad to its western side, then head northerly in a cleared area used for access that ends in the main road on the Calpine leasehold.

- Alternate Site for Childers Peak Regulating Tank. The engineering advantage of this location would be its more direct tie-in to the pipeline where it ascends Sweet Springs Canyon. The Childers Peak Regulating Tank would be located at the high point of the Geysers Effluent Pipeline between the SERWTP and the MWTP. The proposed tank site would be located in an open area along the west side of the saddle in the Big Canyon Creek watershed. The alternate site would place the tank more to the east of the saddle. To accommodate the tank at the alternate site, a fairly substantial cut would be made into the hillside.

5 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impacts of the project are summarized in Tables 1 through 3. Impacts related to the Geysers Effluent Pipeline Component are summarized in Table 1. Impacts related to the Southeast Geysers Effluent Injection Program Plan Component are summarized in Table 2. Impacts related to the SERWTP Facilities Plan Component are summarized in Table 3. Impacts related to the alternatives to the project are summarized either where they are significant or potentially significant, or where they differ significantly from the impacts of the proposed project (see Table 4). The impact summary tables begin on page 23. Impact and mitigation numbering corresponds to that in the full EIR/EIS.

TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
GEOLOGY, SEISMICITY, AND SOILS		
5.2.1.1. Construction of the proposed pipelines, pump stations and tanks would result in accelerated erosion. (S; ST)	*Residual Impact: Following implementation of Mitigations 5.2.1.1.A through 5.2.1.1.J, erosion impacts would be reduced to insignificant with the exception of intervals along Sweet Springs Creek, the unnamed tributary to Putah Creek, and the unnamed tributary to Bear Creek. 5.2.1.1.A. Detailed design plans and specifications for construction of the project shall conform to the Lake County Grading Ordinance. Detailed design plans and specifications for construction of the re-graded Unocal access road shall conform to the Sonoma County Grading Ordinance. 5.2.1.1.B. All construction and grading activities shall expose as little new ground surface as possible. In all areas requiring removal of vegetation but no grading, root crowns shall be left intact so as to retard soil erosion. (See also Mitigations 5.2.3.10.B and C.) 5.2.1.1.C. Site grading shall be minimized to reduce the possible risk of future slope and/or foundation instability. In areas to be graded, the ground surface shall be cleared and stripped of vegetation and surface soils containing organic materials. The strippings shall be saved for reuse in landscaping, unless disposed off-site in a location approved by the Lake County Planning Department or Sonoma County Planning Department, as appropriate. 5.2.1.1.D. Revegetation of graded areas shall take place as quickly as possible as weather permits, but generally no later than October 15th.	S; ST*

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.1.1. (continued)	5.2.1.1.E. Upon completion of final design and route surveys, an erosion control plan should be developed and implemented. Emphasis should be on site-specific methods to prevent or minimize erosion at each stream crossing identified in Table 4.4.2-1 and areas identified in Table 5.2.1-1 as having high potential for accelerated erosion. Specific plans and drawings should be submitted prior to initiating any ground clearing or surface disturbing activities and should be incorporated into Stream Alteration Agreements with the California Department of Fish and Game. 5.2.1.1.F. Construction monitoring should be performed on an on-going basis during all site preparation and grading activities. 5.2.1.1.G. Reports and certification should be routinely prepared and submitted by the project sponsors to the Lake County Planning Department, BLM and Sonoma County Planning Department (as appropriate) documenting that construction of the project components has conformed to the design plans/specifications, best construction practices, and mitigation measures. 5.2.1.1.H. Construction activity involving ground disturbance (including clearing, grading, and placement fill or spoils) shall be limited to the dry season between April 1 and November 1. 5.2.1.1.I. Following completion of construction of the various project components, and prior to the first rains of the wet season, all accumulations of loose soil and other debris associated with project construction should be removed and properly disposed. The environmental inspector should make observations of the project components when completed (or at the end of each construction season) and certify that clean-up/grooming has been properly completed.	

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.1.1. (continued)	5.2.1.1.J. The project sponsors should prepare and implement for the project a long-term inspection and maintenance plan for the right of way and all ancillary facility sites. 5.2.1.1.K. Unocal should cover the regraded Jeep trail with a layer of crushed rock, or other material acceptable to Sonoma County, in order to minimize further rutting and rilling of the road bed. If Unocal's alternative route (at the north end of the Jeep trail) is used, the existing one-lane dirt road should be revegetated and water bars should be installed on it.	
5.2.1.2. Construction of the project would result in streambank erosion and silt deposition in stream channels. (S)	5.2.1.2. To reduce impacts of silt deposition, implement Mitigation Measures 5.2.1.1.A through J for areas of potentially significant streambank erosion and silt deposition. Mitigation Measures contained in Sections 5.2.2 and 5.2.3 should also be implemented. *Residual Impact: Significant along Sweet Springs Creek, parts of the tributary to Big Canyon Creek, and parts of the tributary to Bear Creek but short-term if proper stablization techniques are used. Insignificant elsewhere.	S*
5.2.1.3. Slope failures and/or soil settlements could damage project components. (PS)	5.2.1.3.A. To minimize hazards of slope failure at the Childers Peak Regulating Tank site and pipeline alignments listed in Table 5.2.1-3, geotechnical investigation should be undertaken in potentially unstable areas which could be destabilized by erosion. Recommendations for adequate foundation design will be followed.	I
	5.2.1.3.B. The Geysers Effluent Pipeline should span the serpentine soil and deeply gullied area between Stations 66.4 to 66.8. The support piers shall be located a few tens of feet to either side of the serpentine deposit.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.1.4. Construction activity for the Geysers Effluent Pipeline could reactivate an old landslide between Stations 57.3 and 57.4. (PS)	5.2.1.4. Project design should include a determination of the level of construction-related vibration the project components can withstand without reactivation of the landslide. A geotechnical engineer should be present on site during construction to determine whether grading and construction activities or related vibration may be undermining the stability of the slope.	I
5.2.1.5. Blasting may be required in some areas for constructing the Geysers Effluent Pipeline. Potentially significant impacts of blasting include potential damage to nearby structures from vibration and fall-out of particulates at the blast site. (PS)	5.2.1.5. A blasting plan that reduces the impact to non-hazardous levels in developed areas should be developed. The plan shall comply with all county, state and federal safety regulations pertaining to blasting. If such a plan cannot be successfully developed and implemented, the pipe segments should be built above ground or relocated to an area not requiring blasting or which is inherently more safe for blasting.	I
5.2.1.6. Improper or unauthorized spoils disposal could result in unstable slopes and accelerated erosion. (PS)	5.2.1.6.A. All spoil disposal sites should be located, graded, compacted, seeded and left in such a manner that they are well-drained and protected from erosion. Spoil disposal sites should not be located within or in the immediate vicinity of streams. Under no circumstances shall spoil be sidecast into or in close proximity to canyons, sidewalls, streams, gullies, drainage ditches or wetlands.	I
	5.2.1.6.B. Spoils disposed at the MWTP should be compacted and seeded and spray-irrigated to establish an erosion resistant surface. Additionally, a straw bale check dam to trap sediment should be constructed on any drainage way between the fill site and Putah Creek to prevent sediment discharge into the creek.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
	5.2.1.6.C. At the Childers Peak site, in addition to Mitigation 5.2.1.6.A, carry out land imprinting, hydroseeding of all exposed fills and irrigate it to allow vegetation to establish. Construct silt fences and straw bale check dams to trap sediment from the fill site before it can enter the unnamed tributary to Big Canyon Creek.	I
5.2.1.6. (continued)	5.2.1.6.D. In areas along the pipeline corridor where spoils would be spread, carry out Mitigation 5.2.1.6.A and sprinkle irrigate the surface until the vegetation is established and the onset of the rainy season begins (until mid-October at the earliest). In no cases, should spoil be left in piles or unprotected from erosion and sites with over three percent gradient should be avoided.	I
	5.2.1.6.E. In areas along the pipeline corridor where spoils would be spread, the construction contractor should be held responsible for all spoils stabilization and erosion control to the satisfaction of the County. Each contractor should be required to post a bond to ensure that proper methods have been implemented for spoils disposal in all areas within his construction segment.	I
	5.2.1.6.F. Spoils disposal in unspecified offsite areas should be evaluated by the County Planning Department at the time such sites are proposed to receive the soil.	I
5.2.1.7. Seismic groundshaking could damage project components. (PS)	5.2.1.7. The project final design should include development of a "maximum credible design earthquake" which the project components can withstand without failure or major damage.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.1.8. The Collayomi Fault crosses the alignment of the Geysers Effluent Pipeline. (PS)	5.2.1.8. As a precautionary mitigation measure, the installation of isolation valves on either side of the projected fault trace is recommended. This would include the pipeline segment between about Station 102.5 and 105.0, roughly from the northeast edge of Collayomi Valley, northwesterly to the Middletown WWTP.	I
5.2.1.9. Soils that are subject to some severe limitations could damage the pipeline. The impact is of undetermined significance because of limited data, but should be regarded as potentially significant. (PS)	5.2.1.9.A. Conduct soil testing to identify shrink/swell properties between Stations 86.3 to 93.3. If the soil is subject to severe shrink/swell, the material should not be used as backfill unless amended with other materials to achieve an acceptable level for engineering.	I
	5.2.1.9.B. Dewatering may be required during construction for Stations 97.6 to 98.0. Special drainage may be needed for the backfill and/or greater support needed for the pipeline if the soils are soft.	I
HYDROLOGY AND WATER QUALITY		
5.2.2.1. Construction of the Geysers Effluent Pipeline Project component would have a significant short-term impact on water quality of Sweet Springs Creek, the unnamed tributary of Big Sulphur Creek, and the unnamed tributary of Bear Creek. (S; ST)	5.2.2.1. The construction contractor shall employ best construction practices in compliance with CVRWQCB and NCRWQCB requirements and the Manual for Construction Stormwater Management and County grading ordinances. Application of Mitigation Measures 5.2.1.1.A through J, 5.2.3.1.G, 5.2.3.10.A, B and C, and 5.2.3.12.A and B, should also be required. *Residual Impact: The impact in Sweet Springs Creek and the unnamed tributary to Bear Valley Creek is partially mitigable through use of best construction practices.	S*

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.2.2. The crossing of Copsey Creek, Big Canyon Creek and Putah Creek could result in direct degradation of water quality from sediment and dead vegetation. (PS; ST)	5.2.2.2.A. The construction contractor should limit construction in the channels of Copsey Creek, Big Canyon Creek and Putah Creek to the period of low flow (generally between August 1 and September 30).	I
	5.2.2.2.B. The construction contractor should use "in-the dry" construction methods in the channels of Copsey Creek, Big Canyon Creek and Putah Creek and should remove all cleared dead vegetative debris upon completion of construction.	I
	5.2.2.2.C. The construction contractor should not dispose of any soil or vegetative debris in any part of the stream channel of Copsey Creek, Big Canyon Creek and Putah Creek.	I
5.2.2.3. The placement of fill in the channel of the unnamed tributary to Bear Creek and the unnamed tributary to Big Sulphur Creek could result in significant degradation of water quality. (S)	5.2.2.3.A. To avoid impacts of fill placement in the creek, construct a span crossing of the pipeline in the canyon and install an isolation valve on the uphill side of the pipeline. *Implementation of Mitigation 5.2.2.3.A would reduce the impact to insignificant. OR as an alternative to 5.2.2.3.A 5.2.2.3.B. If fill is placed in the creek, as proposed, carry out a detailed program of silt control including avoiding construction where there is water in the creek. Additionally, place straw bales and rock check dams to collect silt and dissipate stream flow energy. These should be cleaned manually for the first three years after construction.	PS, ST*

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
	5.2.2.3.C. If fill is placed in the creek as proposed, the fill slopes should be terraced and roughened to reduce direct runoff and covered with jute or other types of netting. The fill slopes should be seeded according to BLM specifications and sprinkled to promote seed germination and growth. 5.2.2.3.D. The fill slopes should be inspected yearly for the life of the project. Any gullying or mass wasting of the fill should be corrected immediately. 5.2.2.3.E. Rock rip rap should be placed along the creek bottom at the outlet of the culvert to dissipate erosive energy of water flowing through the culvert. *With implementation of Mitigatons 5.2.2.3.B-E, the impact would remain potentially significant.	
5.2.2.4. Construction of the Lake Diversion water intake and pipeline would substantially increase local turbidity in Clear Lake at the construction site. (S; ST).	5.2.2.4.A. LACOSAN and the BLM shall consult with the COE to determine if any permits are required, and conditions which may apply to the permits, for disturbance of lake bottom sediments. *Residual Impact: The effects are unavoidable and cannot be mitigated to result in a substantial reduction in effect. The impacts would be short-term and subside relatively rapidly as soon as construction ceases.	S, ST*
	5.2.2.4.B. LACOSAN shall consult with the CDFG to determine the requirements for a Lake Alteration Agreement.	I
5.2.2.5. Construction of the Geysers Effluent Pipeline would require the closure of a well to prevent aquifer contamination. Improper well closure could introduce surface contaminants into the groundwater. (PS)	5.2.2.5. The project sponsors shall comply with all requirements of the California Division of Mines and Geology (CDMG) for well closure. A CDMG inspector shall certify that the well has been properly sealed and capped.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.2.6. Failure of the Geysers Effluent Pipeline could result in a spill of wastewater and related wash-out at the discharge point. (PS)	5.2.2.6.A. Prior to start-up, prepare an Operations Manual that details procedures for remote and manual system operation of the system. The manual should specify training requirements and responsibilities of district personnel.	I
	5.2.2.6.B. Prior to start-up, prepare an Emergency Response Plan.	I
	5.2.2.6.C. Establish a valve exercising program for the isolation valves.	I
	5.2.2.6.D. Spare parts and repair equipment should be stocked by the project sponsors.	I
	5.2.2.6.E. Install locking covers on all valves and switches to prevent unauthorized use.	I
	5.2.2.6.F. Evaluate the effectiveness of a cathodic protection system to prevent pipeline corrosion.	I
	5.2.2.6.G. Project sponsors should provide full-time inspection during all phases of project construction. The completed system should be fully tested prior to regular operation.	I
	5.2.2.6.H. Final design of the pipeline, Childers Peak Regulating Tank and other facilities should incorporate groundshaking intensity associated with a maximum credible earthquake.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.2.6. (Continued)	5.2.2.6.I. Install isolation valves at a minimum of 2-mile intervals, as proposed, as well as (or spaced to include a location at) at the following stream crossings: Burns Valley Creek; the Clear Lake Outlet Channel; Clayton Creek; Copsey Creek (upper crossing at El Roble Grande Ranch); Sweet Springs Creek at Station 60, Big Canyon Creek; Station 100; Putah Creek; and at the crossing of the unnamed tributary of Bear Creek.	I
5.2.2.7. The Geysers Effluent Pipeline could experience slow leaks that could contaminate local groundwater. (PS)	5.2.2.7.A. Conduct a detailed survey of wells located within 100 feet of the final pipeline alignment. Identify any wells that are used for domestic water supply, their depths and capacities.	I
	5.2.2.7.B. As part of the final design, install impermeable liners in the pipeline trench where the alignment comes within 100 feet of an existing domestic water well.	I
	OR, as alternative mitigation to 5.2.2.7.A and B,	
	5.2.2.7.C. Conduct annual sampling of well water for any domestic water well within 100 feet of the pipeline alignment, and provide contractual assurances to the well-owner of a guaranteed supply of potable water at the expense of the Project Sponsors in the event a leak in the pipeline is identified as the source of groundwater contamination.	I
5.2.2.8. The Geysers Effluent Pipeline would have an insignificant impact on surface water resources, flood hazard and ground water. The project would transfer approximately 6,994~~5,616~~ acre-feet per year out of the Clear Lake Basin. (I)	No mitigation is required.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
BIOLOGICAL RESOURCES		
5.2.3.1. Construction of the Geysers Effluent Pipeline and Lake Diversion Pipeline could result in loss of habitat and direct loss of individuals of California red-legged frog. (S)	5.2.3.1.A. A survey for all life-cycle stages of California red-legged frog should be conducted immediately prior to initiating construction to determine whether California red-legged frogs are present in all perennial and intermittent streams and wet meadows potentially crossed by or in close proximity to the pipelines, access roads and construction areas.	I
	5.2.3.1.B. All construction work in streams and wetlands should be conducted during the dry season, between July 1st and October 30. If there is any streamflow, a check dam above and below the trench must be installed to prevent adult red-legged frogs from entering the trench. The trench should be inspected daily and the frogs should be removed carefully out of the construction areas.	I
	5.2.3.1 C. In accordance with USFWS and CDFG requirements, the project sponsors should prepare and implement a mitigation program prior to the initiation of any ground clearing, grading, construction or any other activities which would disrupt this species.	I
	5.2.3.1.D. In disturbed habitat of the red legged frog, surface soil in the trench ROW and stream sediments should be carefully excavated and stockpiled to be returned to the top of the finished trench at the same elevation as the original ground level.	I
	5.2.3.1.E. Spoils should not be disposed within habitat of the red-legged frog. Spoils should be placed no closer than 50 feet from streams and wetlands and should be spread so as not to create mounds or other barriers. All spoils should be replanted with plant species common to the area.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.3.1. (continued)	5.2.3.1.F. As required by County ordinance, all work should be completed within the dry season to minimize the amount of sediment that is suspended in the water of the swale or stream course.	I
	5.2.3.1.G. Application of chemicals harmful to wildlife in the ROW during construction and operational phases of the project should be prohibited.	I
	5.2.3.1.H. The pipeline construction corridor should be as narrow as is possible, and no wider than 15 feet in stream crossings or wetlands in which red legged frogs are found.	I
	5.2.3.1.I. If vegetated at the time of project construction, the banks of the stream should be replanted with the same native species present on the undisturbed banks upstream and downstream from the disturbance.	I
	5.2.3.1.J. A qualified representative of the County should monitor construction to ensure contractor compliance with these requirements.	I
	5.2.3.1.K. The construction contractor should be required to provide all workers with information about identification and impact avoidance for red-legged frogs.	I
	5.2.3.1.L. Standard provisions to control construction activities, protect water quality, and provide for dust and erosion control as well as the designation of Environmentally Sensitive Areas (ESAs) to protect this habitat should be implemented to substantially reduce or eliminate potential indirect impacts to red-legged frog.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.3.2. Construction of the main Geysers Effluent Pipeline could result in loss of habitat, as well as direct loss of individuals, of northwestern pond turtle. (PS, CUM)	5.2.3.2.A. Immediately prior to construction, a specific survey should be conducted to determine the presence of this species within Clayton and Copsey Creeks for an area 100 yards upstream and downstream of each crossing site.	I
	5.2.3.2.B. Standard provisions to control construction activities, protect water quality, and provide for dust and erosion control as well as the designation of Environmentally Sensitive Areas (ESAs) to protect this habitat should be implemented to substantially reduce or eliminate potential indirect impacts to turtles.	I
	5.2.3.2.C. Prior to and during construction, the streams supporting northwestern pond turtles should be temporarily dammed both up- and down-stream of construction areas and turtles should be carefully relocated upstream of construction activities by a qualified biologist.	I
5.2.3.3. Construction of the Geysers Effluent Pipeline could result in loss of habitat and direct loss of individuals of foothill yellow-legged frog. (PS; CUM)	5.2.3.3. Apply Mitigation 5.2.3.1. A and B but with reference to the foothill yellow-legged frog.	I
5.2.3.4. Construction of the project pipeline could result in loss of habitat, as well as direct loss of individuals, of California horned lark. (PS; CUM)	5.2.3.4. Conduct California horned lark nest surveys prior to construction and, if identified, avoid construction during the nesting period.	I
5.2.3.5. Construction of the project pipeline could result in loss of habitat, as well as direct loss of individuals of loggerhead shrike. (PS; CUM)	5.2.3.5. Apply Mitigation Measure 5.2.3.4, but with reference to the loggerhead shrike.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.3.6. Construction of the project pipeline could result in loss of habitat, as well as direct loss of individuals, of black-shouldered kite. (PS; CUM)	5.2.3.6.A. Conduct black-shouldered kite nest surveys in the early nesting season and avoid construction near nesting sites during the nesting period.	I
	5.2.3.6.B. Between Morgan Valley Road and Clayton Creek Road, place new access roads without loss of trees and restore grassland areas to their original condition.	I
5.2.3.7. Construction of the project pipeline could result in loss of habitat, as well as direct loss, of Cooper's hawk and sharp-shinned hawk . (PS; CUM)	5.2.3.7.A Immediately prior to construction conduct a nesting survey of Cooper's hawk and sharp-shinned hawk.	I
	5.2.3.7.B. Spoils disposal should not occur around the base of coast live oaks, black oaks and cottonwoods.	
5.2.3.8. Construction of the pipeline in the area of Clear lake could remove roosting snags required for wintering bald eagles. (I)	No mitigation required.	I
5.2.3.9. Laying of the underwater intake structure and pipe from the lake shore could increase the turbidity of the water, which would be a significant impact for listed species of fish. (S)	5.2.3.9. Laying of the pipe should be conducted so as to avoid adult spawning and fry feeding areas of listed species.	I
5.2.3.10. Construction of the Geysers Effluent Pipeline and one secondary distribution line could result in loss of habitat and direct loss of the seed bank of populations of six plant species that are federal candidates for listing as endangered. (PS)	5.2.3.10.A Conduct pre-construction surveys in May-June and salvage all perennial special status plants within the pipeline corridor.	I
	5.2.3.10.B. If spoils disposal occurs at the Childers Peak Regulating Tank site, salvage all serpentine soils and create a 6-inch to 1-foot thick cover of the salvaged soil over the spoils.	

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.3.11. Construction of the Geysers Effluent Pipeline would displace grassland along the entire route, and would displace woodland, serpentine chaparral, serpentine grassland, serpentine seep, serpentine barrens habitat, and an old road bed that has been recolonized by native annual species, including two federal candidates, along identified portions of the route. (PS)	5.2.3.11. Salvage the topsoil and seed bank to ensure the re-establishment of these special status species and other native species.	I
5.2.3.12. Construction of the Geysers Effluent Pipeline and a permanent access road in the roadless area of Sweet Springs Creek would result in loss of riparian vegetation and temporary degradation of stream habitat. It would add to the cumulative loss of riparian habitat in the region. Approximately 1.4 acres of new road (0.8 miles) would be constructed in this area. (PS; LT; CUM)	5.2.3.12.A. Eliminate the creation of a new access road in Sweet Springs Creek Canyon. *Residual Impact: Mitigation measure 5.2.3.12.A would reduce the impact to a less than significant level.	I*
	5.2.3.12.B. Reduce construction corridor impact to a minimum (estimated 15 feet in width) using special construction methods in areas where no previous road exists in Sweet Springs Creek Canyon. *Residual Impact: Mitigation 5.2.3.12.B would probably reduce the impact to a less than significant level. However, no road will remain paralleling the pipeline.	I*

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
	5.2.3.12.C. (Alternate Mitigation) Reduce impact resulting from creation of a new permanent access road (estimated 10 feet width) using special construction techniques in areas where no previous road exists in Sweet Springs Creek Canyon. *Residual Impact: If Mitigation 5.2.3.12.C is completed, the impact would be reduced substantially but possibly not to below the level of significance.	PS*
5.2.3.13. Construction of the project pipeline could result in cumulative loss of montane hardwood woodland, montane hardwood-conifer woodland and mixed chaparral that provide habitat for special status species. (PS; CUM)	5.2.3.13. Please refer to Mitigation Measures 5.2.3.1.A, 5.2.3.5 and 5.2.3.7. *Residual Impact: Implementation of mitigations would reduce but not entirely eliminate the impact.	PS*
5.2.3.14. Construction of the Geysers Effluent Pipeline connector road from the Bear Canyon Access Road to NCPA's M-Pad (Stations 121 to 124) would fill and culvert a tributary watercourse. (S)	5.2.3.14.A. The road fill would require a Stream Alteration Agreement to be signed with the California Department of Fish and Game (pusuant to CDFG Code 1603), and one of the conditions of this agreement would likely be mitigation for the loss of stream values and bank disturbance.	I
	5.2.3.14.B. Avoidance of impacts by minor redesign of the stream crossing should include the following actions: • Conduct a pre-construction survey of the stream for red-legged frog adults, tadpoles, and eggs, depending on the season and if any are found construct check dams both upstream and downstream to prevent the frogs from being crushed by the fill. • Design and construct a headwall on both the upstream and downstream sides of the road crossing.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.3.14. (Continued)	• Design road construction on both sides of the stream to eliminate fill on the slope above the stream. • By careful design, remove as few trees for the road construction as is possible.	
	5.2.3.14.C. In consultation with the County and California Department of Fish and Game develop a mitigation plan to compensate for unavoidable impacts.	I
	5.2.3.14.D. Best Engineering Practices should be followed to minimize the erosion from the newly constructed fill of the stream crossing.	I
5.2.3.15. Construction of the Geysers Effluent Pipeline and Lake Diversion Pipeline would result in the removal of some large mature oaks and conifers. (I)	5.2.3.15.A. Vegetation disturbance shall be minimized and limited to the removal of vegetation necessary for the construction of the approved facilities.	I
	5.2.3.15.B. The project sponsor shall not remove trees four inches in diameter or greater (measured at thirty-six inches above natural grade) unless specifically approved by the Planning Department and shown in the project plan.	I
	5.2.3.15.C. Prior to the issuance of development permits, the project sponsor should submit a tree preservation plan for review and approval of the Planning Department. This plan should include the locations of all mature trees within the construction or activity areas of the proposed use.	I
	5.2.3.15.D. Unless specifically approved, no excavation, placement of fill, compaction, or irrigation should take place within the dripline of mature trees.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.3.15. (Continued)	5.2.3.15.E. Vegetation beyond the construction perimeter should not be disturbed. Clearing limits for development shall be specified in the development plans, and specifications shall be submitted for approval to the Planning Department.	I
	5.2.3.15.F. Critical environmental features, such as County designated riparian Environmentally Sensitive Areas along Putah, Harbin and Big Canyon Creeks, shall remain in open space. No grading, building or removal of trees over 4 inches in diameter at 3 feet in height shall occur without written authorization of the Planning Director in consultation with the California Department of Fish and Game. No side casting of dirt shall occur outside of approved areas.	I
5.2.3.16. Construction of Lake Diversion Pipeline would result in the loss of approximately one-quarter acre of wet meadow. (I; CUM)	No mitigation is required.	I
5.2.3.17. Construction of the Geysers Effluent Pipeline could result in a degradation of habitat for rainbow trout (Salmo Gairdneri) in Big Sulphur Creek. (S; ST)	5.2.3.17.A. Prior to and during construction, temporary damming of the tributary to Upper Big Sulphur Creek downstream of the construction area would reduce the temporary impact of sedimentation flowing downstream into Upper Big Sulphur Creek. 5.2.3.17.B. Mitigation 5.2.3.14.A, B and D should also be employed for the crossing of the unnamed tributary of Big Sulphur Creek.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
AIR QUALITY		
5.2.4.1. Construction of the proposed pipelines and related facilities would generate criteria air pollutant emissions, particularly PM_{10} and NO_x, over the construction period. (PS; ST)	5.2.4.1.A. The project sponsors shall obtain an Authority to Construct (A/C), and Permit to Operate (P/O) from the LCAQMD and NSCAPCD prior to construction. The project sponsors shall follow the conditions of these permits. The recommended dust control program should be followed if one is not specified in the A/C:	I
	5.2.4.1.B. The construction contracts should specify that temporary construction yards or staging areas shall not be in proximity to residential dwellings and schools.	I
	5.2.4.1.C. The construction contracts should specify that the contractor shall offer wood from trees felled for construction purposes for use as firewood. With other vegetative material, the contractor shall acknowledge and follow the burn requirements set forth in the LCAQMD *Rules and Regulations*.	I
5.2.4.2. Construction of the pipelines could generate asbestos dust emissions. (PS)	5.2.4.2. See discussion of this impact and related mitigation measures under Impact 5.2.10.1.	I
5.2.4.3. Operation of the effluent pipeline could result in odorous emissions if anaerobic conditions are allowed to develop in the pipeline itself. (I; LT)	5.2.4.3. If acceptable to LCAQMD, LACOSAN should add sufficient chlorine to the effluent to reduce the potential for odor impacts from operation of the pipeline.	I
5.2.4.4. Long-term operation of the project would have an insignificant impact on air quality. (I; LT)	No mitigation is required.	I

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ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.4.5. Growth-inducing impacts of the project in the LACOSAN service area would not have a significant adverse cumulative effect on air quality, with the possible exception of PM_{10} impacts in the City of Clearlake. (I; CUM)	No mitigation is required.	I
NOISE		
5.2.5.1. Construction of the proposed pipelines and related facilities would result in a substantial increase in ambient noise levels along the proposed routes. The impact would be relatively brief at any one location along the routes. (S; ST)	5.2.5.1.A. The construction contracts should specify that noisy construction activities are to be limited to 8:00 a.m. to 6:00 p.m., Monday through Saturday.	I
	5.2.5.1.B. The construction contracts should specify that construction equipment powered by internal combustion engines must be equipped with best available mufflers.	I
	5.2.5.1.C. The construction contracts should specify that blasting should be avoided unless there is no feasible alternative. If blasting is necessary, the construction contractor should employ blasting techniques utilizing the most current technology so as to limit noise levels and vibration and shall notify all property owners within a 2,000-foot radius of the blasting site of the blasting schedule as soon as practicable.	I
	5.2.5.1.D. The construction contractor should coordinate with Pomo School and Lower Lake Elementary and High Schools for scheduling purposes to minimize the temporary noise impacts at those locations.	I

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ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.5.1. (continued)	5.2.5.1.E. The construction plan should identify all construction yards and staging areas. The construction yards/staging areas should be located as far as practicable away from existing residences and schools.	I
	5.2.5.1.F. All vehicles and heavy equipment used on-site shall be adequately muffled to comply with Motor Vehicle Code requirements.	I
	5.2.5.1.G. Adjustable backup beepers (when required by law) shall be set to the lowest allowable levels.	I
	5.2.5.1.H. In the event substantive noise complaints are received, the project sponsors shall submit a noise control plan for review and approval by the Lake County Noise Control officer. This noise control plan may require reduced hours of construction or other noise mitigation measures.	I
5.2.5.2. Operation of the proposed pumps at SERWTP would increase noise levels in the vicinity. The noise from the pumps could exceed 50 dBA, Ldn at the nearest residence if left running 24-hours per day. (PS)	5.2.5.2. The project design should be revised to specify that the pumps at SERWTP would be enclosed.	I
5.2.5.3. Other pump stations would have less-than-significant noise impacts. (I)	No mitigation required.	I

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ENVIRONMENTAL IMPACT	MITIGATION	LSAM
CULTURAL RESOURCES		
5.2.6.1. The Geysers Effluent Pipeline Project component could destroy or damage important historic and prehistoric cultural resources. If the project were implemented as proposed, the impact is unavoidable but partially mitigable through resource recovery. (PS)	5.2.6.1A. The project sponsors should seek to avoid archaeological sites to the extent feasible. To establish the site boundary, the areal extent of resource deposits shall be identified in field studies by a qualified professional archaeologist.	I
	5.2.6.1.B. The project sponsors should retain a qualified professional archaeologist to conduct subsurface studies to determine the Cultural Resource Significance (CRS) of the sites.	I
	5.2.6.1.C. If potentially significant archaeological materials are found, a program of resource recovery shall be developed and implemented at the site. Additionally, sites with significant cultural resources may be eligible for inclusion in the National Register of Historic Places.	I
	5.2.6.1.D. In the event that burials are encountered, the archaeologist should contact the County Coroner, and if the burial is a Native American, consult with Native American groups of the region to determine their preference for final internment of the remains.	I
	5.2.6.1.E. In all cases of identified archaeological or historic sites, a qualified observer should be present on site at all times during site clearing and excavation. The observor should have authority to halt construction in the event that cultural resources are encountered in order to evaluate the resource and carry out appropriate recovery.	I

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ENVIRONMENTAL IMPACT	MITIGATION	LSAM
VISUAL AND AESTHETIC RESOURCES		I
5.2.7.1. The Geysers Effluent Pipeline Project component would have a less than significant impact on the visual/aesthetic environment. (I)	No mitigation is required	I
5.2.7.2. Station 101.5 to 102.5 of the main Geysers Effluent Pipeline would create a permanent strong visual contrast of relatively high visibility although primarily in the background of the viewers' landscape. (I; LT)	5.2.7.2. (Recommended) The project sponsors should revegetate the ROW to minimize textural contrasts with the surrounding hill slopes.	I
5.2.7.3. Station 121 to 122 of the main Geysers Effluent Pipeline would create a permanent strong visual contrast of relatively high visibility although primarily in the background of the viewers' landscape. (I; LT)	5.2.7.3. (Recommended) The cut and fill slopes should be revegetated using grasses and planted shrubs and trees typical of the surrounding hills. The project sponsors shall submit a landscaping plan for approval by the County Planning Department. Monitoring of revegetation success shall occur for a period of no less than five years.	I
5.2.7.4. The proposed cut and fill and Y-Pad Injection Fluid Storage Tank would create a permanent strong visual contrast of relatively high visibility although entirely in the background of the viewers' landscape. (I; LT)	5.2.7.4. (Recommended) Mitigation would be the same as Mitigation 5.2.7.3, with reference to the Y-Pad Injection Fluid Storage Tank and pad.	I
5.2.7.5. The pump house for the Lake Diversion Pipeline on the lakeshore would be visible in the foreground to nearby residences. A tree may be removed for the pipeline. (I)	5.2.7.5. (Recommended) The pump house and surrounding landscaping should be designed to provide aesthetically compatible features with the lake shore environment. The final plan shall be approved by the Lake County Planning Department in consultation with the City of Clearlake Planning Department.	I

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ENVIRONMENTAL IMPACT	MITIGATION	LSAM
LAND USE		
5.2.8.1. The Geysers Effluent Pipeline Project component would occupy a total of approximately 11 acres. (I)	No mitigation required.	I
SOCIOECONOMICS AND PUBLIC FACILITIES		
5.2.9.1. The project would create a small amount of employment opportunity in the short term for construction and in the long term. (B; ST)	5.2.9.1 (Recommended). The project sponsors should prepare a local hiring and training program for approval by the Planning Department. It shall be the goal of this program to maximize employment of Lake County residents, thereby reducing socio-economic impacts on housing and transportation, while increasing benefits to the local community. The program shall be prepared in consultation with the Job Training Partnership Agency (JTPA) and Employment Development Department (EDD), and be approved prior to issuance of grading permits.	B
5.2.9.2. The project would have an insignificant impact on public services for short-term construction. (I; ST)	No mitigation required.	I
ENVIRONMENTAL CONTAMINATION HAZARDS		
5.2.10.1. Pipeline construction would require excavation of asbestos-containing serpentine rock that would result in the release of asbestos fibers, and possibly would expose workers to mercury or other heavy metals associated with the serpentine. (PS)	5.2.10.1.A. The construction contractors shall comply with LCAQMD regulations for the excavation of serpentine rock in Lake County and meet the LCAQMD performance goals while excavating in Sonoma County. 5.2.10.1.B. The construction contractors shall comply with OSHA and Cal/OSHA asbestos removal worker requirements whenever serpentine rock containing over one percent asbestos is being excavated.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.10.1. (continued)	5.2.10.1.C. Any serpentine material encountered in disturbance areas prior to or during construction shall be analyzed for heavy metals. If the levels of the metals exceed the state CCR Title 22, Section 66261 limits, the construction contractor shall comply with the hazardous waste worker safety requirements.	I
5.2.10.2. Construction of pipelines could expose workers to agricultural chemicals in the Burns Valley Area. (PS)	5.2.10.2.A. The construction contractors should consult the Lake County Agricultural Commissioner to determine when the permitted application of restricted use pesticides to field or orchards is occurring, and the construction contractor shall amend the construction schedule to avoid exposures as necessary.	I
	5.2.10.2.B. The construction contractor shall use dust control practices as required by the LCAQMD (See Mitigation 5.2.4.1.A).	I
5.2.10.3. If hydrocarbon contaminated soil is encountered, project construction could expose workers to hydrocarbon vapors, generate hazardous wastes, and would limit future site clean-up options. (PS)	5.2.10.3.A. If petroleum vapors are detected or petroleum stained soil is encountered along the route, the soil to be excavated should be tested for the presence of hydrocarbons. If the levels of hydrocarbons are greater than the regulatory threshold for hazardous waste, the pipeline should either be rerouted around the contaminated site or the contaminated soil should be excavated and disposed as a hazardous waste. Contaminated soil should not be used as backfill.	I
	5.2.10.3.B. When excavating hazardous (i.e., contaminated) soil, the construction contractor must comply with all federal, state, and local hazardous waste regulations.	I
	5.2.10.3.C. Prior to initiating earth work, the construction contractor should conduct an information meeting to discuss hazard recognition and other issues related to worker safety.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.10.4. Improper use, storage, or disposal of hazardous substances used in project construction and long-term operation, such as fuel, oil, solvents, and hydraulic fluids, could expose workers to hazardous substances and cause environmental contamination. (PS)	5.2.10.4.A. The construction contractors, LACOSAN and the geothermal operators must comply with all federal, state, and local hazardous substance regulations.	I
	5.2.10.4.B. The construction contractors, LACOSAN and geothermal operators should service construction equipment only on impermeable surfaces with spill containment features.	
	5.2.10.4.C. Any fuel wagon or temporary fuel storage structure used by the construction contractor in the field should not leak and should not release large amounts of fuel in case of a fuel hose rupture.	I
	5.2.10.4.D. The construction contractor, LACOSAN, and the geothermal operators should instruct workers on the proper and safe procedures for disposal of hazardous wastes generated during project construction and long-term operation.	I
5.2.10.5. The improper use of hydrocarbon wastes and some herbicides for ROW maintenance can cause environmental contamination. (S)	5.2.10.5.A. No used motor oil or other mostly petroleum hydrocarbon material, such as diesel, should be used for ROW dust or weed control.	I
	5.2.10.5.B. Only herbicides recommended by the Lake County Agricultural Commissioner, the Lake County and Sonoma County Departments of Environmental Health, and the California Department of Fish and Game shall be used for ROW maintenance.	
5.2.10.6. Excavation of former drilling sumps could expose worker to the waste and break the clay liner of the sump.	5.2.10.6. The pipeline and distribution pipelines shall be routed around any existing or former drilling waste sumps.	

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
TRAFFIC AND CIRCULATION		
5.2.11.1. Pipeline construction could delay emergency vehicle access on roadways along the pipeline route. (PS; ST)	5.2.11.1.A. The contractor should be obligated to provide for emergency vehicle access in a timely manner, i.e., as quickly as possible. To minimize disruption and delays for emergency vehicle access, LACOSAN would identify detours and require the contractor(s) to maintain steel trench plates at the construction sites to restore access across open trenches. The amount of open trench at one time would be limited to 500 feet.	I
	5.2.11.1.B. Police, fire, and emergency services should be notified weekly of the timing, location, and duration of construction activities throughout the project for that week and a schedule of construction activities by area and date. Additionally, the construction contractor should monitor emergency service provider radio channels during all periods of road closure on Big Canyon Road and Riata Road so as to provide a quick response for the passage of emergency vehicles.	I
5.2.11.2. An increase in roadway wear in the project vicinity would occur as a result of heavy truck and construction equipment movements. (PS; ST)	5.2.11.2.A. Conduct a preconstruction survey of the road condition on key access routes to the project sites. Monitor the pavement and/or road surface condition of local streets and designate roads judged to be in good condition for use by heavy truck traffic.	I
	5.2.11.2.B. Roads damaged by construction traffic should be repaired to a condition equal to or better than that which existed prior to construction activity.	I
	5.2.11.2.C. Detour roads should be selected to use paved roads to the extent feasible to reduce damage to unpaved roads and to minimize dust.	I

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TABLE 1: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE GEYSERS EFFLUENT PIPELINE COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.2.11.3. Pipeline installation within and across streets would result in the temporary closure of local roadways, and would reduce the number of, or the available width of, travel lanes on major roads. This would result in temporary disruption of traffic flows and brief increases in traffic congestion. (I; ST)	5.2.11.3. (Recommended) Special traffic control measures should be incorporated into the construction contract specification documents.	I
5.2.11.4. Construction activities would restrict access to adjacent land uses. (I; ST)	5.2.11.4. (Recommended) Require adequate public notification of construction activity, including any applicable detour routing to alternate access and/or parking for affected land uses.	I
5.2.11.5. An increase in vehicles trips in the project vicinity would occur as a result of construction activities. (I; ST)	5.2.11.5. (Recommended) Measures to plan construction travel routes should be incorporated by the Project Sponsors into contract specification documents to ensure implementation by the construction contractor(s).	I
5.2.11.6. Construction of the Bear Canyon to M-Pad Connector Road could result in a re-distribution of traffic on Bear Canyon Access Road, Socrates Mine Road and State Route 175. (B)	No mitigation is required.	B
ENERGY AND MATERIALS		
5.2.12.1. Construction of the proposed pipelines and related facilities and long-term operation of the pumps would consume substantial amounts of energy, but would be more than offset by the energy derived from injection of the effluent. (B)	No mitigation is required	B

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TABLE 2: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SOUTHEAST GEYSERS EFFLUENT INJECTION PROGRAM PLAN COMPONENT

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
GEOTHERMAL RESERVOIR EFFECTS		
5.3.1.1. The proposed injection of effluent could double the recovery rate of injection derived steam (IDS) within several years in Calpine and NCPA leaseholds. (B)	No mitigation is required.	B
5.3.1.2. The proposed injection of effluent would slow the rate of decline in the Low Pressure Area (LPA) but would not change its spatial extent. (B)	No mitigation is required.	B
5.3.1.3. The proposed injection of effluent would be compatible with the chemistry of reservoir geothermal fluids and, therefore, would not have significant adverse impacts on geothermal field and power plant operations. (I)	No mitigation is required.	NI
INDUCED SEISMICITY		
5.3.2.1 The project would result in increased microseismicity in the project area and vicinity, but probably would not induce larger earthquakes that pose a substantial threat to public safety and substantial damage to structures. (I)	No mitigation is required.	I
5.3.2.2 The project probably would not result in significantly increased hazards of major earthquakes, but project-related induced seismicity potentially could contribute to minor local property damage. (I)	No mitigation is required.	I

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TABLE 2: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SOUTHEAST GEYSERS EFFLUENT INJECTION PROGRAM PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
HYDROLOGY AND WATER QUALITY		
5.3.3.1. Effluent injection with the proposed project would not contaminate groundwater aquifers and/or public water supply sources. (I)	No mitigation is required.	I
5.3.3.2. Leakage of effluent through damaged injection well casings could migrate to the surface and contaminate surface water. While highly unlikely, this would be a significant impact if it occurred. The impact is mitigable. (PS)	5.3.3.2. Effluent injection pressures should be monitored in accordance with CDOG&GR and BLM requirements.	I
5.3.3.3 An accidental spill of injection fluid could result in potentially significant temporary degradation of streams in the Southeast Geysers. The impact is mitigable. (PS)	5.3.3.3-A Employ measures contained in the existing spill prevention control and counter measure plans required by the Hazardous Materials Business Plan and Lake County Ordinance.	I
	5.3.3.3-B. The operator of the leasehold in which an uncontained spill occurs should undertake clean-up of all damages to the watershed and undertake repair and restoration of the affected stream channels.	I
ENERGY RESOURCE ISSUES		
5.3.4.1. The project is expected to result in (at least) a net increase in electricity generation of approximately 184~~123~~ million kWh. (B)	No mitigation is required	B

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TABLE 2: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SOUTHEAST GEYSERS EFFLUENT INJECTION PROGRAM PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
AIR QUALITY		
5.3.5.1. Construction of secondary distribution lines in the Geysers would generate criteria pollutant emissions from combustion of fuel by construction equipment and from vehicle movement over unpaved roads. Emissions of PM_{10} could violate the state PM_{10} standard in the immediate vicinity of construction areas. (PS)	5.3.5.1 The project sponsors should follow the same mitigation measures as those discussed under Mitigation 5.2.4.1.A and 5.2.4.1.C (which are related to construction of the Lake Diversion and main effluent pipelines).	I
5.3.5.2. Construction of the distribution pipelines in the Geysers could generate asbestos dust emissions. (PS)	The mitigation measures listed under Impact 5.2.10.1 also apply to this impact.	I
5.3.5.3. Over the long-term, the increase in steam production due to the project would not substantially affect emissions (and downwind concentrations) from geothermal development in the Southeast Geysers since injection-derived steam has low concentrations of non-condensible gases (NCG), including H_2S. (I)	No mitigation is required	I
5.3.5.4. The project could result in the release to the atmosphere of toxic emissions contained in the proposed injection fluid, which would be a combination of water from Clear Lake and effluent from SERWTP and MWTP. (I)	5.3.5.4 (Recommended) Viral and bacterial contamination of IDS and/or effluent should be evaluated to assure absence or destruction of pathogens prior to atmospheric release.	I
5.3.5.5. The project could result in short-term emissions increases during the process of converting production wells to injection wells. (I; ST)	5.3.5.5. (Recommended) In consultation with LCAQMD, the steam field operators shall employ best available emissions control technology and techniques.	I

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TABLE 2: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SOUTHEAST GEYSERS EFFLUENT INJECTION PROGRAM PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
NOISE		
5.3.6.1. Conversion of production wells to effluent injection wells could result in a temporary noise impacts for the closest residents in the Southeast Geysers and in Anderson Springs. (I;ST)	5.3.6.1. (Recommended) Employ best available (noise) control measures in consultation with LCAQMD.	I
5.3.6.2. With the project, steam production in the Southeast Geysers would decline more slowly than it would without the project and the occasional noise events and complaints that accompany geothermal development activity would decline more slowly as well. (S)	5.3.6.2. The steamfield operators and power plant operators need to continue to work with LCAQMD to minimize the impacts of their activities on nearby residents. This means continuing to use best available (noise) control measures, to notify residents of scheduled noise events (where noise control is infeasible or ineffective), to take into account seasonal and meteorological factors in scheduling noisy activities, among others. *Residual Impact: Since the current, cumulative noise impact of geothermal development activity in the Southeast Geysers is significant, the project's effect of continuing this activity would also have a significant noise impact on the nearest residents.	S*
SOCIOECONOMICS AND PUBLIC SERVICES		
5.3.7.1. The project would continue to provide work opportunity for approximately 85 existing positions in the geothermal industry. (B)	No mitigation is required	B
5.3.7.2. An economic benefit of the project would result from royalties paid to the federal, state, and county governments and from tax revenues. (B)	No mitigation is required	B

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
GEOLOGY		
5.4.1.1. There are no known geologic hazards or soil limitations which would prevent construction of the proposed treatment and disposal facilities. (NI)	5.4.1.1. Geologic studies should be conducted as part of the detailed design prepared for the construction of the facilities and may include test pits or borings.	I
5.4.1.2. Excavations will be as deep as 12 to 15 feet for the construction of the treatment facilities. Construction of treatment plant facilities will involve excavation of 19,000 cubic yards of earth. Excavated material will be used for backfilling, spread on-site, or hauled to the Eastlake Landfill and used as daily cover material. (I)	5.4.1.2.A. Detailed design plans and specifications should be prepared for the project. They should conform to the Lake County Grading Ordinance and be based on adequate geotechnical design investigation of the project components. For open excavations which are 5 feet or deeper, the contractor should obtain a permit from the applicable agency as required by California Labor Code 6424. 5.4.1.2.B. The project geotechnical investigation should include soils-related design criteria for use in preparation of and/or reviewing the plan. Soil testing and profiling should be done prior to excavation. Compaction should be obtained by mechanical means, hand tamping, or a combination of these methods. 5.4.1.2.C. Design plans and construction specifications for all project facilities and grading shall be prepared by a registered civil engineer subject to approval by the Lake County Public Works and Building Departments. 5.4.1.2.D. The project sponsors shall obtain a grading permit from the Lake County Public Works Department prior to commencement of grading activities. All grading shall be in accordance with the Lake County Grading Ordinance implementation of which is the responsibility of the Lake County Building Department.	I

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.4.1.2. (continued)	5.4.1.2.E. No grading shall be conducted during the rainy season or during wet weather. Grading shall be limited to between April 10th through October 10th, unless an extension has been approved by the Public Works and Planning Departments based on dry weather, suitable soil conditions and installed erosion control measures. 5.4.1.2.F. All construction and grading activities shall expose as little new ground surface as possible. In all areas requiring removal of vegetation but no grading, root crowns shall be left intact so as to retard soil erosion. 5.4.1.2.G. Site grading shall be minimized to reduce the possible risk of future slope and/or foundation instability. In required areas to be graded, the ground surface shall be cleared and stripped of vegetation and surface soils containing organic materials. The strippings shall not be used in compacted fills, but shall be saved for reuse in landscaping, unless disposed of off-site in a location approved by the Planning Department. 5.4.1.2.H. Revegetation of graded areas shall take place as quickly as possible as weather permits, but in no case later than October 15th. At a minimum, revegetation shall consist of reseeding with grass all graded areas. Straw and/or mulch shall also be used to control erosion on all graded banks and slopes over 10%. For projects with slopes of 20% or greater, or located within 100 ft. of a blue line water feature (as identified on a USGS map), the project sponsors shall also install a silt fence or straw bales with rebar around downhill perimeters or lakeward of the fill areas prior to grading activities.	

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.4.1.2. (continued)	5.4.1.2.I. Excavated materials shall not be sidecast or pushed over the edges of slopes during construction and final grading. Cut and fill operations shall be carried out so that earthen materials (rocks, dirt strippings, etc.) shall be disposed of in manner and location approved by the Planning and Public Works Departments. 5.4.1.2.J. Replanting of all exposed surfaces consistent with approved revegetation and slope stabilization plans shall be accomplished within the first growing season following disturbance, unless other scheduling is approved by the Planning Department. 5.4.1.2.K. Loose soil mounds or surfaces shall be protected from wind and/or water erosion by being appropriately covered when construction is not in active progress or when required by the Planning Department. 5.4.1.2.L. The project sponsors shall retain a landscape architect, registered forester, plant ecologist or other qualified professional acceptable to the Planning Director to reevaluate the entire revegetation program during the spring following initial planting. If deemed by the Planning department to be unsuccessful, additional revegetation will be required not later than the immediately succeeding fall season. The revegetation program shall include periodic inspection and upgrading as necessary. All plantings shall be maintained or replanted for the life of the project. 5.4.1.2.M. Culverts, ditches, trash racks, etc. shall be regularly cleaned and maintained in order to keep these facilities operational and reduce the possibility of overflow and resultant erosion siltation impacts.	

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.4.1.2. (continued)	5.4.1.2.N. Where road alignment traverses hillsides, the road surface shall be sloped toward the hillside to prevent rilling and erosion of downslope areas and fills. 5.4.1.2.O. Road surfaces shall be compacted to at least 95% relative compaction, and all road fills shall be compacted to at least 90% relative compaction. Roads shall be constructed to result in minimal disturbance of soils and vegetation within the project area. Use of out-sloping and water bars shall be incorporated in the design to reduce erosion.	
WATER RESOURCES		
5.4.2.1. Construction at the treatment plant would require extensive modifications of the site in the vicinity of the existing facilities. Care would have to be exercised to ensure that on-going operational performance is not impaired. (I)	No mitigation is required	I
5.4.2.2. Interference with sludge disposal or utilization and reuse of wastewaters consists primarily of incompatible pollutants which can be concentrated in sludge or by reuse techniques such as land disposal of treated wastewater. Disposal of amounts of priority pollutants in effluent or sludge in excess of RWQCB requirements would be a significant impact. (S)	5.4.2.2.A. Monitoring of the effluent should be continued and the program expanded to include the sampling of priority pollutants annually and monthly for metals and other inorganic constituents. 5.4.2.2.B. The project sponsors would comply with all requirements of the CVRWQCB and the State DWR Division of Water Rights. No discharge of hazardous materials shall be allowed in ground or surface waters.	I
5.4.2.3. Based on the one sample of sludge analyzed, which showed that the sludge has low concentrations of chemical constituents when compared with national sludge quality data, no adverse impact on groundwater from solubilization of trace metals is expected. (I)	5.4.2.3. (Recommended.) Implement measures for controlling sludge disposal including DOHS recommended practices for land spreading.	I

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.4.2.4. Treated wastewater effluent stored in the reservoir may indirectly recharge the groundwater basin and result in changes in local water quality. (PS)	5.4.2.4. LACOSAN shall continue existing well water monitoring program.	I
5.4.2.5. Effluent runoff from the land disposal areas, if not properly managed, could cause surface contamination of local drainage ways. (I)	No mitigation is required	I
5.4.2.6. Flooding potential in the project area is minimal except in the unlikely event that the existing reservoir dam were to fail. Should such an event ever occur, water would flow down the creek through Burns Valley to Clear Lake causing minor flooding. Failure of the dam would be a significant impact. (PS)	5.4.2.6. LACOSAN shall continue to perform periodic dam inspections and shall maintain freeboard limits.	I
5.4.2.7. Nutrients contained in treated wastewater could create algal growths which could change water quality in the reservoir and create odors during reservoir drawdown. (I)	5.4.2.7. See Impact 5.4.4.2 for mitigation measures.	I
5.4.2.8. Stormwater runoff from the SERWTP could potentially cause contamination of surrounding surface waters in local drainage ways and Clear Lake. If provisions of the NPDES Permit are adhered to, any impacts from stormwater runoff would be less than significant. (I)	5.4.2.8.A. The general stormwater discharge permit requires industrial dischargers, which includes sewage treatment plants, to: (1) eliminate illicit discharges of stormwater to stormwater systems; (2) develop and implement a stormwater pollution prevention plan; and (3) perform monitoring of discharges to stormwater systems.	I

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.4.2.8. (continued)	5.4.2.8.B. Drainage plans shall be prepared by a registered civil engineer and submitted to the Lake County Flood Control District and Department of Public Works for approval. All drainage improvements shown on the approved plans shall be implemented into the project. 5.4.2.8.C. Prior to the issuance of grading permits, the LACOSAN shall submit an on-site and downstream off-site drainage plan for the approval of the Lake County Flood Control District. This plan shall include hydraulic calculations on and off-site, and shall address the existing capacity of watercourses and impacts of development using 10 year criteria. Drainage structures shall be designed with adequate capacity for full development of the project site. 5.4.2.8.D. Drainage plans shall distribute storm runoff and channel it to existing natural waterways only to the extent that it will not increase water head to the point of unnatural channel abrasion, nor carry excessive siltation which might adversely impact water quality. Energy dissipators and collection devices to reduce the erosion force of unnatural runoff shall be installed if required by county or state agency representatives.	
BIOLOGY		
5.4.3.1. Construction of the proposed SERWTP facilities is not expected to significantly impact any wildlife species or its habitat within the SERWTP treatment plant boundaries. (I)	No mitigation is required	I
5.4.3.2. Operation of the proposed SERWTP facilities could have an adverse effect on the biotic resources in the project area if a spill occurs. The spilled effluent water would drain to Burns Valley Creek and to Clear Lake. (PS)	5.4.3.2 Nutrient loads of effluent disposed to surface waters should be minimized and the project should comply with CRWQCB and California Department of Fish and Game requirements and recommendations regarding water quality.	I

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
AIR QUALITY		
5.4.4.1. The estimated nitrogen dioxide emissions of 235 lb NO_x/day and the 158 lb TSP/day indicate that the construction of proposed SERWTP facilities will require a LCAQMD Authority to Construct since the New Source Review limits are surpassed by nitrogen dioxide and the Total Suspended Particulate emissions as outlined in LCAQMD Rule 602. (PS; ST)	5.4.4.1.A. The construction contractor shall comply with dust control procedures required by the LCAQMD. 5.4.4.1.B The LACOSAN shall obtain an Authority to Construct and maintain a Permit to Operate from the Lake County Air Quality Management District (LCAQMD). All conditions of the LCAQMD Authority to Construct and Permit to Operate are herein referenced and made part of this project description. 5.4.4.1.C. The LACOSAN shall comply with all applicable local, state and federal laws and regulations regarding air contaminants. This requirement includes, but is not limited to, emissions of suspended particulates, carbon monoxide, hydrocarbons, odors, and toxic or obnoxious gases and fumes. 5.4.4.1.D. The LACOSAN shall utilize best available air emissions control technology as necessary to minimize emissions subject to the approval of the Lake County Air Quality Management District. *Residual Impacts: The impacts of TSP would be insignificant. Impacts related to NO_x emissions would remain significant after mitigation.	S*
5.4.4.2. The proposed improvements to the facility will result in greater reliability in maintaining the sewage treatment operations within standards and will result in a reduced likelihood of odor generation. (B; LT)	No mitigation required.	B
5.4.4.3. There is a potential for odor generation from soils upon excavation during the civil construction of proposed improvements. (UI)	5.4.4.3. The soils engineer should evaluate the potential for odor generation upon excavation and mitigation measures should be developed and implemented if deemed necessary by the LCAQMD.	I

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.4.4.4. New pumps and operation support equipment will be electrically powered. The emissions associated with their use are considered to be minor and will not significantly impair achieving regional air quality goals. (I)	No mitigation is required	I
NOISE		
5.4.5.1. Construction at the treatment plant site for the excavation of the various facilities, demolition of some existing facilities and transportation to and from the site would increase existing noise levels. The incremental increase over background noise levels created by these activities is estimated at 86 dBA at 50 ft. (S; ST)	5.4.5.1. Construction noise can be reduced by ensuring that the equipment uses proper mufflers and that the construction activities occur only during acceptable hours as specified in the Lake County Zoning Ordinance section 41.11. See also Mitigation in Section 5.2.5. *Residual Impacts: Implementation of Mitigation 5.4.5.1 would reduce noise during periods of particular annoyance to residents, but noise levels would remain significant at other times.	S*
5.4.5.2. The proposed additional wastewater processing equipment at the SERWTP will generate operational noise which will add incrementally to the existing noise levels. Since the closest neighbors are 2,000 ft away, background noise levels caused by the additional equipment and activities at the site are estimated to be below 55 dBA, Ldn. (I)	5.4.5.2 (Recommended) Generating equipment which creates the least noise should be considered in the selection of aeration equipment. Equipment should be selected on the basis that it should not result in noise levels greater than 45 dBA at the SERWTP boundary if it is to operate at night.	I
CULTURAL RESOURCES		
5.4.6.1. Because of the extensive previous analysis at the SERWTP site, it is not anticipated that new cultural resources would be encountered during facilities construction. However, if resources are present, their disturbance would constitute a potentially significant impact. (PS)	5.4.6.1.A. Should archaeological materials be discovered during development, all activity should be temporarily halted in the vicinity of the finds and a qualified archaeologist shall be retained to evaluate the finds and to recommend mitigation procedures if necessary.	I

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.4.6.1 (continued)	5.4.6.1.B. The LACOSAN shall contact a designated member of the Native American community acceptable to the Lake County Planning Department prior to grading, trenching or excavation. 5.4.6.1.C. All grading, trenching or excavation shall be conducted in the presence of a qualified archaeologist. Should any cultural or archaeological resource be discovered, all work shall halt in the vicinity of the find(s) until the archaeologist determines the significance of the resource and recommends mitigations. Mitigation measures, if necessary, shall be implemented subject to the approval of the Planning Department. 5.4.6.2.D. Alterations to cultural site shall be subject to the review and approval of the Lake County Cultural Resource Commission unless waived by the Planning Director consistent with Article 21-38.4 of the Lake County Zoning Ordinance.	
VISUAL		
5.4.7.1. The proposed SERWTP facilities would be constructed immediately adjacent to the existing facilities in an area previously disturbed by construction activities. Therefore, significant visual impacts are not anticipated. (I)	5.4.7.1.A. (Recommended) Architectural features and landscaping of the new facilities should be submitted to Lake County and City of Clearlake Planning Departments for review. 5.4.7.1.B. (Recommended) Trees should be planted in the irrigation buffer area to help reduce drift of aerosols and improve plant area appearance, and should be protected effectively from grazing animals. There should be continued maintenance to ensure that the landscaping at the SERWTP is maintained, watered and pruned, and the attractiveness of the facilities is maintained by painting etc.	I

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.4.7.1. (continued)	5.4.7.1.C. The following mitigation conditions shall also be applied: The permittee shall submit a detailed landscape plan meeting zoning ordinance standards for review and approval by the Lake County Planning Director; and, irrigation and the placement of landscape plants within the dripline area of oaks shall be avoided. 5.4.7.1.D. Development of the site shall maximize the retention of existing vegetation and the protection of trees on the site. The landscape plan shall show all trees over 4 inches in diameter at 3 feet in height in the proposed development area, and indicate which will be retained and which are proposed for removal. No development or irrigation shall occur within the dripline of all remaining trees unless specifically approved in the landscape plan.	
LAND USE		
5.4.8.1. Construction at the SERWTP would convert 10 acres from other uses to facilities. (I)	No mitigation is required.	I
5.4.8.2. Implementation of the proposed project would result in compliance with CRWQCB Waste Discharge Requirements and lifting of the building moratorium now in effect. Development may then take place in accordance with County and City planned growth, with related changes in land use. (B)	No mitigation is required.	B
SOCIOECONOMICS AND PUBLIC FACILITIES		
5.4.9.1. Implementation of the proposed facilities improvements would allow lifting of the existing moratorium on new connections and permit planned growth consistent with the Lake County and City of Clearlake General Plans. (B)	No mitigation is required.	B

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
ENVIRONMENTAL CONTAMINATION HAZARDS		
5.4.10.1. The estimated risks on an annual basis for the existing use of chlorine at the SERWTP is considered insignificant. (I)	5.4.10.1.A. (Recommended) The most important precaution is the proper handling of the chemicals and the proper maintenance of equipment. Operator training in this regard is therefore very important. 5.4.10.1.B. (Recommended) The chlorination/sulfur dioxide facilities should be located as far from any residences as feasible. 5.4.10.1.C. (Recommended) Nearby residents should be educated regarding chlorine odors and what to do if chlorine odors or an alarm are noticed. 5.4.10.1.D. Prior to storage, a chlorine leak detector shall be installed which will be transmitted by a telephone dialer to the Fire Protection District office and the Lake County Sheriff's Department. An emergency airpack for entrance into the operations room in the event of a chlorine leak shall be available on-site. 5.4.10.1.E. All areas designated for liquid fuel storage shall include secondary containment features equal to at least 150% of the fuel storage tank volume in compliance with Uniform Fire Code Section 79.508. No liquid fuels shall be stored on the property until these containment features have been completed and approved by the Lake County Environmental Health Department and OSHA. At no time shall liquid fuel storage take place outside of a designated and contained fuel storage area. 5.4.10.1.F. The permit holder shall contractually obligate all associated contractors and their subcontractors to conduct a vehicle inspection of each truck hauling toxic or hazardous materials prior to leaving the project site.	I

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
TRAFFIC AND CIRCULATION		
5.4.11.1. There would be short-term increases in vehicular activity associated with the construction of the proposed facilities. There would be construction employees coming to the sites and the transport and use of heavy equipment in the form of a grader, a bulldozer, a scraper, a loader and necessary haul trucks. (S; ST)	5.4.11.1.A. (Recommended) The local residents should be notified in advance of the construction schedule of the possible inconveniences they may incur as a result of the construction activities. Proper road signs and signal personnel should be utilized to ensure that public and occupational safety is maintained during construction. 5.4.11.1.B. (Recommended) Movement of heavy equipment should be scheduled to avoid commute hours on Highway 53 and school bus hours. 5.4.11.1.C. (Recommended) Repair of any damage to roads from truck traffic or equipment should be done immediately. 5.4.11.1.D. All parking and access areas shall be continuously maintained in good repair throughout the life of the project. 5.4.11.1.E. LACOSAN shall obtain all required encroachment permits from DPW, Caltrans and the City of Clearlake. 5.4.11.1.F. The project sponsors shall be responsible for repair of any direct verifiable damage to public roadways resulting from construction or operation of this project. 5.4.11.1.G. The LACOSAN and all subcontractors operating under the authority of this project shall comply with speed limits and all other traffic laws on public roadways. Construction-related truck traffic shall avoid school busing hours.	I

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TABLE 3: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO THE SERWTP FACILITIES PLAN COMPONENT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
5.4.11.1. (continued)	5.4.11.1.H. All extra-wide and slow-moving vehicles shall be preceded by a flag car while on public roadways. The California Highway Patrol shall be notified of hazardous waste transport schedules by the permit holder. 5.4.11.1.I. The LACOSAN shall install necessary traffic signs and/or striping as recommended by the Department of Public Works and the City of Clearlake.	
ENERGY AND MATERIALS		
5.4.12.1. Due to the improvements to the SERWTP which will accommodate future growth, the electrical consumption is expected to increase by about 20% - 35%. This would be an insignificant increase.	No mitigation is required	

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TABLE 4: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO ALTERNATIVES TO THE PROPOSED PROJECT

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
Alternate Route A-1 and A-2		
Impacts for the project design alternative would be similar to those for the proposed project in the areas of Geology, Soils and Seismicity; Biological Resources, Air Quality, Noise, Cultural Resources, Visual Resources, Socioeconomics and Public Facilities, Traffic and Circulation, and Energy and Materials.		
Impact 5.2.1.1 also applies to this alternative. (S)	Mitigation Measures 5.2.1.1 A-K also apply.	I
6.3.2.2. Silt generated by construction would be conveyed down the corridor to Dam Road and from there into the Clear Lake Outlet Channel (CLOC). (PS)	Mitigation identified in Section 6.3.1 also applies to this impact.	I
Impacts 5.2.10.2 through 5.2.10.4 would also apply to this alternative route		
Alternate Route B		
Impacts for the project design alternative would be similar to those for the proposed project in the areas of Air Quality, Noise, Cultural Resources, Visual Resources, Land Use, Socioeconomics and Public Facilities, Traffic and Circulation, and Energy and Materials.		
6.3.1.1. Construction of the alternate crossing could result in significant erosion hazard and a hazard of stream erosion undermining the pipeline. (PS)	Mitigation measures 5.2.1.1.A through K would apply to this segment.	I

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TABLE 4: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO ALTERNATIVES TO THE PROPOSED PROJECT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
6.3.2.3. Construction of the pipeline at this alternate location could result in significant short term silt deposition in Clayton Creek. (S)	Mitigation measures identified for the proposed project, including Mitigation 5.2.2.1, should also be applied to this alternate crossing.	I
6.3.3.1. Construction of the proposed alternate route potentially could affect northwestern pond turtles and habitat of the black-shouldered kite. The impact is potentially significant but of short term. The impact on the habitat is less than significant unless northwestern pond turtles are present. If that species is present, Impact 5.2.3.2 would apply to this site. Similarly, this area may provide habitat for the black-shouldered kite, as discussed in Impact 5.2.3.6. The impact and mitigation measures already apply to the proposed crossing of Clayton Creek, and are assumed to be equally applicable to this alternative. (PS; ST)	Mitigation 5.2.3.2.A and B and Mitigations 5.2.3.6.A and B would apply to this site	I
Impacts 5.2.10.2 through 5.2.10.4 would also apply to this alternative route		
Alternate Route C		
There are no significant environmental impacts associated with this alternative.		
Impacts for the project design alternative would be similar to those for the proposed project in the areas of Hydrology and Water Quality, Air Quality, Noise, Cultural Resources, Visual Resources, Land Use, Socioeconomics and Public Facilities, Traffic and Circulation, and Energy and Materials.		

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TABLE 4: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO ALTERNATIVES TO THE PROPOSED PROJECT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
This alternative would have the beneficial effect on Visual Resources of preserving several large conifers and deciduous trees along the east side of the road. (B) Impacts 5.2.10.2 through 5.2.10.4 would also apply to this alternative route.		
Alternate Route D Impacts for the project design alternative would be similar to those for the proposed project in the areas of Biological Resources, Air Quality, Noise, Cultural Resources, Visual Resources, Land Use, Socioeconomics and Public Facilities, Traffic and Circulation, and Energy and Materials.		
6.3.1.2. Construction in this alignment would likely be subject to high erosion hazards similar to those described in Impact 5.2.1.1. (S)	Mitigation Measures 5.2.1.1.A through K also would apply to this segment.	I
6.3.2.4. Construction of the pipeline at this alternate location could result in potentially significant erosion, with silt deposition ultimately in Big Canyon Creek. (PS) Impacts 5.2.10.2 through 5.2.10.4 would also apply to this alternative route	Mitigation measures included under Section 6.3.1, and as part of the proposed project, including Mitigation 5.2.2.1, also would apply to this impact	I

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TABLE 4: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO ALTERNATIVES TO THE PROPOSED PROJECT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
Alternate Route E		
There are no significant environmental impacts associated with this alternative.		
Impacts for the project design alternative would be similar to those for the proposed project in the areas of Air Quality, Noise, Cultural Resources, Visual Resources, Land Use, Socioeconomics and Public Facilities, Traffic and Circulation, and Energy and Materials.		
Impacts 5.2.10.2 through 5.2.10.4 would also apply to this alternative route		
Alternate Route F		
Impacts for the project design alternative would be similar to those for the proposed project in the areas of Air Quality, Noise, Cultural Resources, Visual Resources, Land Use, Socioeconomic and Public Facilities, Traffic and Circulation, and Energy and Materials.		
6.3.1.3. Because this route ascends a steep slope with erodible soils, erosion hazards would be high, as described in Impact 5.2.1.1. (PS)	Mitigation Measures 5.2.1.1.A through K also would apply to this segment. Additionally, double debris fences should be installed on both sides of the ridgeline. Following construction, all debris entrapped in the fences should be collected and removed to a suitable spoil disposal site.	I

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TABLE 4: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO ALTERNATIVES TO THE PROPOSED PROJECT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
6.3.2.5. The impacts on runoff and water quality of this alternative would be less than significant for the portion in the Bear Canyon Access Road to the Bear Canyon Power Plant, but potentially significant for the portion between the power plant and the NCPA M-Pad. (PS)	Careful slope stabilization methods and revegetation should be required to ensure that the erosion and silt generation would be minimized (see Section 6.3.1).	I
6.3.3.2. The project alternative would contribute to permanent cumulative loss of mixed chaparral and montane hardwood habitat of the Cooper's hawk and sharp-shinned hawk. As with Impact 5.2.3.11, construction of this alternate would contribute to the potentially significant cumulative impacts on these habitats of the Cooper's hawk and sharp-shinned hawk. *Napa lomatium* also may be present and lost due to construction. (PS;CUM)	Mitigation Measures 5.2.3.5 and 5.2.3.7 also would apply to this alternate. Preservation of the plants is recommended, but not required.	I
Impacts 5.2.10.2 through 5.2.10.4 would also apply to this alternative route		
<u>Alternate Route G</u>		
There are no significant environmental impacts associated with this alternative.		
Impacts for the project design alternative would be similar to those for the proposed project in the areas of Air Quality, Noise, Cultural Resources, Visual Resources, Land Use, Socioeconomics and Public Facilities, Traffic and Circulation, and Energy and Materials.		

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TABLE 4: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO ALTERNATIVES TO THE PROPOSED PROJECT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
Impacts 5.2.10.2 through 5.2.10.4 would also apply to this alternative route		
This Alternate Distribution Pipeline Route would have the beneficial impact of avoiding lane closures at the busy NCPA gate. (B)	No mitigation is required.	
<u>All Alternate Pipeline Routes</u>		
6.3.10.1. If the alternative routes are near any of the sites listed in Table 4.11.2-2, project construction could expose workers to hydrocarbon vapors, and could interfere with ongoing clean-up activities. (PS)	6.3.10.1.A Prior to excavating near a site under remediation, the Lake County Division of Environmental Health shall be consulted. Department recommendation shall be followed or the pipeline rerouted around the contaminated area.	I
<u>Alternate Site For Childer's Peak Regulating Tank</u>		
Impacts for the project design alternative would be similar to those for the proposed project in the areas of Geology, Soils and Seismicity, Hydrology and Water Quality, Biological Resources, Air Quality, Noise, Cultural Resources, Visual Resources, Land Use, Socioeconomics and Public Facilities, Traffic and Circulation, and Energy and Materials.		
Construction of this site would require a greater amount of grading, including possibly blasting, as compared to the proposed site. The cut into the hillside to create a pad for the tank, would introduce some potential slope instability. (PS)	As with the proposed project, at least three exploratory borings should be drilled to assess the variability of subsurface conditions. The proposed 10-foot high 1.5:1 slopes probably would be stable and pose minimal hazard for the proposed tank. Additional mitigation is not necessary.	I

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TABLE 4: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO ALTERNATIVES TO THE PROPOSED PROJECT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
The impacts on hydrology and water quality would be similar to those of the proposed project, but possibly greater in intensity because of the greater amount of grading and related silt generation. Additionally, cuts in the hillside could encounter seeps of groundwater draining from the slopes of Childer's Peak. (PS)	Mitigation measures for the proposed project, including Mitigation 5.2.2.1, would also apply to this alternative. Additionally, if seeps are encountered during grading of the site, proper drainage features should be constructed to collect the flow of groundwater and channel it in a controlled manner to the drainage system.	I
6.3.3.3. The project would result in the potential loss of two special status plant species. (PS)	Mitigation 5.2.3.9 also would apply to this alternative.	I
<u>Lake Diversion Pumps and Pipeline on Pier</u> Impacts for the project design alternative would be similar to those for the proposed project in the areas of Geology, Soils and Seismicity; Biological Resources, Air Quality, Cultural Resources, Land Use, Socioeconomics and Public Facilities, Traffic and Circulation, and Energy and Materials.		
6.3.2.1. The driving of piles for the pier would substantially increase turbidity of water locally. The impact would be potentially significant but of short-term duration, probably on the order of about one month. (PS: ST)	No effective mitigation is possible. *Residual Impact: The impacts on water quality from construction of the pier probably would be approximately similar in kind but somewhat greater than those of the proposed project.	PS*
6.3.5.2. Construction of the proposed pier would result in significant short-term noise related to pile driving. (S: ST)	6.3.5.2. Limit pile driving activities to the hours of 8:00 a.m. to 5:00 p.m., Monday through Saturday. *Residual Impact: Implementation of Mitigation 6.3.5.2 would reduce the relative degree of annoyance of the noise but would not affect noise levels.	PS*

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TABLE 4: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO ALTERNATIVES TO THE PROPOSED PROJECT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
6.3.7.1. The alternative pier and pumphouse would result in a significant alteration of the visual environment. The impact is unavoidable. (S)	No effective mitigation is possible. Residual Impact: The pier would have to be constructed and lighted so as to visible to boats. The impact is unavoidable.	S*
<u>Bear Canyon Single Pump Station</u> Impacts for the project design alternative would be similar to those for the proposed project in the areas of Geology, Soils and Seismicity, Air Quality, Cultural Resources, Land Use, Socioeconomics and Public Facilities, Traffic and Circulation, and Energy and Materials.		
6.3.5.1. Operation of one large pump station at the foot of Bear Creek Road (rather than a series of five smaller pump stations up to the Y-Pad tank) could result in a significant noise impact since this larger pump station would not be enclosed (as proposed). The nearest residence would likely experience noise levels in excess of 50 dBA, Ldn from the pumps at this station. (S; LT)	6.3.5.1. If this alternative design component is chosen, re-design the pump station so that the pumps would be enclosed.	I
The primary impact would be the loss of several large trees and Valley Oak Woodland habitat similar to Impact 5.2.3.13. These trees may provide habitat for Cooper's hawk and sharp-shinned hawks, and impacts would be the same as those described for Impact 5.2.3.7. (PS)	Related Mitigation 5.2.3.13 and 5.2.3.7 would apply to the site.	I

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TABLE 4: SUMMARY OF IMPACTS AND MITIGATION MEASURES RELATED TO ALTERNATIVES TO THE PROPOSED PROJECT (Continued)

ENVIRONMENTAL IMPACT	MITIGATION	LSAM
The proposed facilities would be located immediately adjacent to a well-travelled highway. They would be visible in the foreground views of travellers in both directions on SR175. The proposed facilities would contrast strongly with the existing landscape. (I)	No mitigation is required.	I
One-way Surge Tank in the Geysers		
There are no significant environmental impacts associated with this alternative.		
The tank would be another industrial type feature in the landscape that already has substantial modification for facilities of the geothermal industry. The proposed site is located in a seldom-seen area for the public. (I)	No mitigation is required	I
By-pass Pipeline at the SERWTP		
There are no significant environmental impacts associated with this alternative.		

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5.1 SIGNIFICANT AND UNAVOIDABLE IMPACTS

Significant and unavoidable impacts of the project are adverse environmental effects which cannot be reduced to a level less than significant through mitigation. The following impacts of the project are both significant and unavoidable:

- Impacts 5.2.1.1 and 5.2.2.1 Constuction of the proposed pipelines, pumps stations and tanks would result in significant short-term accelerated erosion in some areas. Construction of the Geysers Effluent Pipeline Project component would also result in significant short-term impacts to water quality in Sweet Springs Creek, an unnamed tributary of Big Canyon Creek, and the unnamed tributary to Bear Creek.

- Impact 5.2.2.3 Underwater construction of the Lake Diversion water intake and pipeline would temporarily substantially increase local turbidity in Clear Lake at the construction site.

- Impact 5.2.3.11. Construction of the project pipeline could result in a permanent cumulative loss of montane hardwood woodland, montane hardwood-conifer woodland and mixed chaparral that provide habitat for special status species of birds.

- Impact 5.2.6.1. The Geysers Effluent Pipeline Project component could permanently destroy or damage important historic and prehistoric cultural resources.

- Impact 5.4.5.1. Construction at the SERWTP site for the excavation of the various facilities, demolition of some existing facilities and transportation to and from the site temporarily would increase existing noise levels to 86 dBA at 50 feet. This is estimated to impact the closest residence, during peak construction, at 54 dBA.

- Impact 5.3.6.2. With the project, steam production in the Southeast Geysers would decline more slowly than it would without the project and the occasional noise events and complaints that accompany geothermal development activity would decline more slowly as well. Since the current, cumulative noise impact of geothermal development activity in the Southeast Geysers is significant, the project's effect of continuing this activity would also have a significant long-term indirect noise impact on the nearest residents.

5.2 GROWTH INDUCEMENT

Growth inducement may constitute an adverse impact if the growth is not consistent with the land use plans and growth management plans and policies of the area affected. The proposed expansion of wastewater treatment facilities and the disposal of treated effluent are actions that remove a primary growth obstacle in the SERWTP service area, therefore this project would be growth inducing. However, implementation of the proposed project would allow lifting of the existing moratorium on new connections and permit planned growth, consistent with the Lake County and City of Clearlake General Plans. Therefore, growth inducement in the City of Clearlake and Lower Lake areas would be a beneficial, as opposed to an adverse impact. The

proposed disposal of sewage from the Middletown WTP would not be growth inducing. There would be no effect on growth in Sonoma County.

5.3 CUMULATIVE IMPACTS

A cumulative impact assessment can be based on a list of reasonably foreseeable future projects in the project area or on a general projection of future growth.

Construction of the listed approved and pending projects and the proposed project would result in the following potentially significant short-term cumulative impacts:

- Erosion hazards and silt generation, particularly in the Clearlake area. As a major construction project in Clearlake, it would be one of the major sources of short-term erosion combined with that of the other projects. Mitigation measures for erosion control would be applied to these projects and would substantially reduce erosion problems to an acceptable level.

- The exposure of residents to the earthquake hazards of the region due to the anticipated increase in population in the region;

- Potentially significant cumulative silt generation;

- Substantially increased use of water resources for domestic, commercial and industrial uses;

- Substantial generation of wastewater;

- The disturbance of a significant area of open space in ~~the~~ Lake County and their associated habitats;

- The loss of natural vegetation and wildlife habitat in both the SERWTP service area and in the county as a whole, specifically, the permanent reduction of habitat of the northwestern pond turtle, red-legged frog, foothill yellow-legged frog, California horned lark, loggerhead shrike, black-shouldered kite, Cooper's hawk and sharp-shinned hawk.

- The cumulative loss of individual plants including listed and candidate plant species, and other special status plant species;

- Air quality degradation related to construction of approved and pending projects in the service area. The timing of these projects are uncertain, and thus the impacts may not occur concurrently.

6 ENVIRONMENTALLY PREFERRED ALTERNATIVE

Section 1505.2(b) of NEPA requires that the Record of Decision must identify all alternatives that were considered . . . "specifying the alternative or alternatives which were considered to be environmentally preferable." The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA, Section 101. This may be interpreted to mean the alternative that causes the least damage to the biological and physical environment and/or which best protects, preserves and enhances historic, cultural and natural resources. The lead agency is not required to select the environmentally preferred alternative as the preferred project under Council on Environmental Quality regulations, as other factors such as schedule, cost, technology and policy considerations may be considered. However, such considerations should be entered into the BLM's Record of Decision when the preferred alternative is not also the environmentally preferred alternative.

For the proposed project, the environmentally preferred alternative is the project as proposed with inclusion of Alternative Route F. Alternative Route F (stations 121.0-124.0) would replace the proposed segment of the route requiring construction of a new road between the Bear Canyon Access Road and the M-Pad with a route that trends up the hill behind the Bear Canyon Power Plant to the M-Pad. Use of Alternative F would substantially reduce the amount of grading and reduce the amount of vegetation disturbance which provides habitat for some sensitive species of wildlife. It would eliminate the need for placing a substantial fill in an intermittent creek canyon, with consequent losses of riparian values and short-term impacts on water quality. Alternative F would present some constraints for access for purposes of inspection of the alignment. It would not provide as good access to the pipeline for the response to a potential leak or spill resulting from a break as that provided by the proposed project. It would have some visual impact, regarded as insignificant.

7 RESPONSIBLE PARTIES AND AGENCIES EXPECTED TO USE THIS EIR/EIS

7.1 PROJECT SPONSORS

The project sponsors, which include companies and/or agencies participating in the project, are the Lake County Sanitation District (LACOSAN), Calpine Corporation, ~~and~~ Northern California Power Agency and Unocal Corporation. Pacific Gas and Electric Company (PG&E) is participating to the extent that it would purchase effluent-derived steam from Calpine and Unocal.

7.2 PROJECT OPERATORS

The project operators include the Lake County Sanitation District (LACOSAN) with responsibility for operating the SERWTP, Lake Diversion Facilities, Middletown Wastewater Treatment Plant Pump Station, and secondary response for systems operation regarding the flow of treated effluent from the SERWTP into the Geysers Effluent Pipeline.

Calpine Corporation, Unocal and Northern California Power Agency (NCPA) share responsibility for operation of the project with regard to injection of the effluent into the geothermal reservoir. NCPA has been delegated primary responsibility for monitoring and control of the effluent systems operation in the Geysers Effluent Pipeline. NCPA, Unocal and Calpine Corporation each have responsibility for operation of their separate injection programs in the Southeast Geysers.

PG&E has responsibility for supplying power to operate all components of the system.

All construction costs will be shared by LACOSAN, Calpine, NCPA, Unocal and PG&E as well as other federal and state funding sources.

7.3 CEQA AND NEPA CO-LEAD AGENCIES AND COOPERATING AGENCIES

The CEQA lead agency is LACOSAN.

The NEPA lead agency is the BLM, Ukiah District.

The U.S. Department of Energy is a cooperating federal agency. The State of California Energy Commission is a cooperating state agency. The U.S. Department of Commerce/Economic Development Administration, the U.S. Department of Agriculture/Rural Development Administration and the U.S. Environmental Protection Agency are also possible cooperating agencies as they will use this EIR/EIS to support a decision on whether to fund the project. The State of California Regional Water Quality Control Board is also a potential cooperating agency.

7.4 PERMITTING AGENCIES AND AGENCIES EXPECTED TO USE THE EIR/EIS

Agencies expected to use the EIR/EIS include all agencies with permitting or authorization approval. These include federal, state and local governments. Additional agencies expected to

use the EIR/EIS include trustee agencies, which have an advisory responsibility, and funding agencies. Table 5 lists each of the agencies and their respective roles.

7.5 PROJECT PLANNERS AND ENGINEERS

Project planning has been provided by Criterion, Engineers and Planners, Inc., Portland, OR.

Preliminary engineering and design has been provided by Dewante and Stowell Engineering, Sacramento, CA; Eco:Logic Consulting Engineers, Roseville, CA; and Veizades & Associates Consulting Engineers, San Francisco, CA.

Environmental analysis and planning has been provided by Environmental Science Associates, Inc., San Francisco, CA, and by Goddard and Goddard Engineering, Lucerne, CA., with the assistance of the following consultants: Sonoma State University Academic Foundation, Cultural Resources Facility; GeothermEx. Inc.; Michael J. Dwyer Consulting Engineering Geologist; Jan Newton Ph.D.; and Golder Associates, Inc.

TABLE 5: RESPONSIBLE PARTIES AND AGENCIES EXPECTED TO USE THE EIR/EIS

Action Requiring Permit/Consultation	Agency	Permit or Approval	Statutory Authority
Federal			
Use of Public Land for a project not completely related to development of a federal geothermal lease	BLM	Right-of-Way Grant	Federal Land Policy and Management Act
Drilling of new injection wells	BLM	Geothermal Drilling Permit	Steam Act 43 CFR 3260
Conversion of Existing Wells to Injection	BLM	Geothermal Sundry Notice	Steam Act 43 CFR 3260
Grant of ROW/Lease Fluid Injection	BLM	Land Use permit Injection permit	Federal Land Policy and Management Act; Title 43, Subchapter C Part 3000, Geothermal Steam Act
Fill Material Placement or Dredging	Army Corps of Engineers	*Informal* Consultation Nationwide permit foreseen	Sec. 404 Clean Water Act, 33 U.S.C. Sec. 1344; Executive Order 11990 (Protection of Wetlands) & Order 11988 (Flood Plain Management)
Disturbance of Special Status Plants and Animals	U.S. Fish and Wildlife Service	*Informal* Consultation No permit foreseen	Fish and Game Code Sec. 2080-2085
Disturbance of Cultural Resources	Advisory Council on Historic Preservation	Consultation	National Historic Preservation Act Section 106
"	Native American Heritage Commission	Consultation	
Construction of Pipeline and Pump Stations - Worker Safety	Occupational Safety & Health Administration	Compliance with OSHA Regulations	29 CFR 1910 29 CFR 1926
Funding	U.S. Department of Energy	No permit; DOE is a cooperating agency	

(Continued)

TABLE 5: RESPONSIBLE PARTIES AND AGENCIES EXPECTED TO USE THE EIR/EIS (Continued)

Action Requiring Permit/Consultation	Agency	Permit or Approval	Statutory Authority
Funding	U.S. Department of Commerce/Economic Development Administration	No Permit: EDA is a potential cooperating agency	-
Funding	U.S. Department of Agriculture, Rural Development Administration	No Permit: RDA is a potential cooperating agency	-
Funding	U.S. Environmental Protection Agency	No Permit: EPA is a potential cooperating agency	-
State			
Crossing of State Highway ROW	CA DOT (Caltrans)	Encroachment Permit	Streets and Highways Code Secs. 660-734
Disturbance of Streamcourse and Lake Bottom	State Lands Commission	County Lakebed Management permit required for pier	
Disturbance of Streamcourse and Lake Bottom	CA Dept. of Fish and Game	Stream /Lake Alteration Agreement	Fish and Game Code Secs. 1600-1607
Disturbance of Special Status plants and animals	CA Dept. of Fish and Game	*Informal* Consultation No permit foreseen	CA Endangered Species Act: Fish and Game Code Sec. 2080-2085
Discharges into Waters of the State - Hydrostatic Test Water	Central Valley Regional Water Quality Control Board	Permit to Discharge	Porter Cologne Act
" - Construction -related Pollutants	"	National Pollutant Discharge Elimination System Stormwater Permit for Construction	Clean Water Act
Discharges into Waters of the State - Hydrostatic Test Water	North Coast Regional Water Quality Control Board	Permit to Discharge	Porter Cologne Act

(Continued)

TABLE 5: RESPONSIBLE PARTIES AND AGENCIES EXPECTED TO USE THE EIR/EIS (Continued)

Action Requiring Permit/Consultation	Agency	Permit or Approval	Statutory Authority
Fluid Injection	California Division of Oil and Gas & Geothermal Resources	Notice of Intent Responses to Written Orders	CA Code Title 14, Division 2
Air Pollutant Emissions for Construction and at Pump Stations	Lake Co. AQMD	Authority to Construct Permit to Operate	Clean Air Act; CA Health and Safety Code, Sec. 39000-43834
Air Pollutant Emissions for Construction and at Pump Stations	North Coast AQMD	Authority to Construct Permit to Operate	Clean Air Act; CA Health and Safety Code, Sec. 39000-43834
Funding	California Energy Commission	No Permit: CEC is a cooperating agency	-
Funding	State Water Resources Control Board	No Permit: SWRCB is a potential cooperating agency	
Local			
Construction and Operation	Lake County	Building Permits Grading Permits Access Easements Encroachment Permits	Lake County Ordinances
Construction and Operation	Sonoma County	Building Permits Grading Permits Access Easements Encroachment Permits	Lake County Ordinances
Construction and Operation	City of Clearlake	Building Permits Access Easements Use Permits in Streets	City Ordinances
Sale of Lake Diversion Water	Yolo County Flood Control and Water Conservation District	Sale Agreement	

SOURCE: Environmental Science Associates, Inc., 1994