California Regional Water Quality Control Board
North Coast Region

ORDER NO. R1-2002-0014
ID NO. 1B86002RSON

WASTE DISCHARGE REQUIREMENTS

FOR

GEYSERS POWER COMPANY, LLC

(GEYSERS DISTRIBUTION PIPELINE SYSTEM AND INJECTION PROJECT)

THE GEYSERS

Sonoma County

The California Regional Water Quality Control Board, North Coast Region, (hereinafter Regional Water Board), finds that:

1. Geysers Power Company, LLC, (hereinafter Discharger), an indirect, wholly owned subsidiary of the Calpine Corporation, is engaged in geothermal well drilling and exploration; transportation of geothermal steam to power plants; disposal of geothermal steam condensate from the power plants; and the injection of Clear Lake water and disinfected secondary - 23 treated effluent from Lake County Special Districts, Southeast Regional Wastewater System (LCSDSRWS) located in Lake County at The Geysers Known Geothermal Resources Area (The Geysers) in Sonoma County. The Discharger proposes to inject advanced treated wastewater from The City of Santa Rosa, LCSDSRWS treated effluent, surface water from Clear Lake and local streams and power plant gray water into the geothermal reservoir at The Geysers. The Discharger submitted a Report of Waste Discharge dated July 11, 2000, for the construction and operation of the Geysers Distribution Pipeline System at The Geysers, and injection of treated wastewater from The City of Santa Rosa, LCSDSRWS, surface water from Clear Lake and local streams and power plant gray water into the geothermal reservoir at The Geysers. Supplemental information to complete filing of the application was submitted on January 16, 2001, January 19, 2001, March 2, 2001, April 8, 2001, May 11, 2001, June 14, 2001, July 3, 2001, July 5, 2001, July 16, 2001, and July 19, 2001. The Report of Waste Discharge was considered complete on August 6, 2001.

2. The Geysers is located in northeastern Sonoma County, approximately 12 miles northeast of Healdsburg, in an unincorporated area of Sonoma County zoned Resources and Rural Development. The existing and expanded operations are or will be conducted on lands located in T11N, R8W and T11N, R9W MDB&M.

This area is located within the Big Sulphur Creek drainage basin and is tributary to the Russian River (Attachment 1).

3. Wastes produced during site preparation and during geothermal well drilling operations consist of silt, soil, rock cuttings, drilling muds with additives, oil, and associated wastewater. All hazardous wastes generated from geothermal operations are disposed of off-site in an appropriate Class I Solid Waste Management Unit. All non-hazardous drilling mud and cuttings associated with geothermal well drilling operations are disposed of in a Class II Waste Management Unit operated by the Discharger on property owned by the U.S. Department of the Interior, Bureau of Land Management, 55 Leslie Street, Ukiah, CA 95482 and in the Geothermal Drilling Mud and Cuttings Disposal Area Class II Waste Management Unit located on property owned by Lakoma Fame Land Management, c/o Don Emerson, P.O. Box 69, Cobb, CA 95426, and Gordon D. Horner, 4025 Sears Road, Columbus, GE 31907.

Geothermal Steam Condensate

4. Dry-steam is produced by geothermal wells located throughout The Geysers steamfield. The steam is transported from the geothermal wells in large diameter insulated piping to 19 power plants operated by the Discharger where it is directed through turbines to generate approximately 800 mega watts of electricity and condensed to form geothermal steam condensate.

   Existing on-site support facilities include administration offices, warehouses, steam field repair and maintenance shops, drilling equipment storage yards, a geothermal steam and injection fluid pipeline system, and a road transportation system.

5. Geothermal steam condensate produced during geothermal power generation is known to contain ammonia, which can be toxic to aquatic life present in streams in the development area. The geothermal steam condensate is also known to contain boron that can be deleterious to irrigated agriculture located downstream of the development area. Other compounds and metals are known to exist in the steam condensate, which have the potential to negatively impact surface water quality.

6. The geothermal steam condensate is metered, transported, and injected into the subsurface steam producing geothermal reservoir. Geothermal steam condensate can also be used as a water source for drilling mud and other drilling related activities, earthwork compaction at the geothermal construction sites, and for fire protection.

7. Expanded geothermal development in The Geysers area has led to a steady rate of decline of geothermal reservoir steam pressures. This has resulted in a reduction of power plant operation and electrical generation. Approximately 22 to 23 percent of the steam mass produced is recovered as geothermal steam condensate

for injection back into the underlying geothermal reservoir. Steam producers have found managed injection of condensate and water from other sources have improved steam reservoir pressures, steam production, and electricity production. The Discharger estimates approximately 186,000 kilowatt-hours (kWh) of electricity can be generated per million gallons of injected water. Using this relationship, The Geysers will generate 744,000,000 kWh of electricity per year, assuming wastewater injection 24 hours per day. Comparing the 79,000,000 kWh energy consumption for the geysers pump stations with the energy production results in a net gain of 665,000,000 kWh per year.

8. This project includes features within the jurisdiction of Region 5 and Region 1. Attachment 1 shows the Regional Water Board jurisdictional boundaries, the pipeline routing, and the well injection sites in Region 1.

Injection of LCSDSRWS Treated Wastewater

9. The California Regional Water Quality Control Board, Central Valley Region, adopted Waste Discharge Requirement Order No. 96-166, which regulates the treated effluent from LCSDSRWS.

10. The Discharger, in partnership with LCSDSRWS and the Northern California Power Agency (NCPA), has constructed and successfully operated a pipeline to deliver a current makeup of 20 percent treated wastewater and 80 percent supplemental Clear Lake water for injection into the underlying geothermal reservoir in The Geysers (Attachment 2, points A to C). NCPA is responsible for the operation of the pipeline from the intake side of the pump station located at the intersection of Bear Canyon Road and Highway 175 (Point-of-Delivery) located in Region 5 to the pipeline manifold at NCPA's sedimentation basin located in Region 1 (Attachment 2, points B to C). The Discharger, under this Order, is responsible for the operation of the pipeline from NCPA's sedimentation basin to the northwest in the geothermal field (Attachment 2, points C to D and Attachment 1) and branches thereto. The pipeline has a design capacity of 8.1 million gallons per day, with approximately 1/3 of the recycled water injected into the geothermal reservoir by the Discharger in Region 5, approximately 1/3 of the flow is injected by NCPA in Region 1, and approximately 1/3 of the flow is injected by the Discharger in Region 1 which is covered by this permit. NCPA currently injects recycled wastewater in compliance with Waste Discharge Requirements Order No. 97-44.

The Discharger is currently injecting up to approximately 2,800,000 gallons per day of imported water into existing injection wells BEF 42B-33, D&V 11, and D&V 73-33 located in the Unit 18 area and existing injection wells GDC 21 and GDCF 65-29 located in the Unit 20 area in Region 1. This permit will not increase the quantity of effluent flow but rather increase the area of application and number of injection wells.

**Injection of the City of Santa Rosa,
Laguna Subregional Wastewater Treatment Plant's
Treated Wastewater**

11. Waste Discharge Requirements Order No. R1-2000-02 is in effect for the City of Santa Rosa, Laguna Subregional Wastewater Treatment, Reuse, and Disposal facilities and operation of the pipeline including the Termination Reservoir. The wastewater treatment plant is designed to treat up to 21.3 mgd of wastewater to disinfected tertiary treatment standards and serves a population of 202,500 persons in the communities of Cotati, Rohnert Park, Santa Rosa, Sebastopol, and the unincorporated South Park County Sanitation District. Order No. R1-2000-2 also regulates existing irrigation of approximately 6,236 acres of urban and agricultural land and the discharge to surface waters during the allowable discharge period (October 1 through May 14).

12. The Discharger, in partnership with the City of Santa Rosa, is currently constructing a 41-mile pipeline and Termination Reservoir to convey advanced treated water to The Geysers for steamfield injection, known as the Geysers Recharge Project. The City of Santa Rosa has entered into a contractual agreement with Geysers Power Company, LLC, which obligates the City to provide 4,015 million gallons of treated wastewater each year to Geysers Power Company, LLC. This translates to an average daily delivery of 11 million gallons per day (mgd), with a range of between 9 and 12.1 mgd. The pipeline has a design capacity of 12.1 mgd, and an ultimate capacity of up to 16 mgd. The Discharger is responsible for the operation and injection of the treated wastewater into the geothermal reservoir once the water exits the Termination Reservoir discharge flange (Point-of-Delivery) (Attachments 1 and 2, point E). Santa Rosa's treated water will be injected within the confines of points C, D, and E as shown on Attachments 1 and 2.

13. Union Oil Company of California, NEC Acquisition Company, and Thermal Power Company and the City of Santa Rosa have entered into a contractual agreement detailed in the *Construction and Operating Agreement Santa Rosa Geysers Recharge Project*, dated April 14, 1998 for activities that could affect water quality and distribution system performance in The Geysers in the event of a release. The Discharger is a successor to Union Oil Company of California, NEC Acquisition Company, and Thermal Power Company under Amendment No. 2 to Asset Purchase Agreement dated March 19, 1999. The *Construction and Operating Agreement Santa Rosa Geysers Recharge Project*, is the responsibility of the Discharger for the activities that could affect water quality and distribution system performance in The Geysers in the event of a release:

    a. Geysers Power Company, LLC has agreed to construct the pipeline and related facilities from the Point-of-Delivery to The Geysers steamfield and The Geysers injection system.

b. Each party shall apply for and secure, all necessary permits and licenses necessary for completion of its portion of the project.

c. Each party shall operate, maintain, and replace as necessary that portion of the project which it constructs.

d. The City has agreed to deliver the Annual Amount to at the Point-of-Delivery, unless authorized by the Joint Oversight Committee.

e. Geysers Power Company, LLC has agreed to accept the Annual Amount of water at the point-of-delivery.

f. The water shall be treated to the requirements of the California Department of Health Services: Title 22 of the California Code of Regulations for tertiary wastewater treatment, or its substitute regulation.

g. If the water delivered by the City does not meet the requirements set forth in *Water Quality Standards for* Geysers Power Company, LLC *Acceptance and CITY Delivery*, Geysers Power Company, LLC may:

i) accept the water delivered;
ii) require the City to supply water exclusively from the Laguna Wastewater Treatment Plant which meets the requirement set forth in *Water Quality Standards for* Geysers Power Company, LLC *Acceptance and CITY Delivery* until the water quality problem is corrected; or
iii) reject the water reserving all remedies provided by this Agreement and by law.

h. The Joint Oversight Committee shall be responsible for the periodic review and/or modification of the of the water quality parameters in *Water Quality Standards for* Geysers Power Company, LLC *Acceptance and CITY Delivery*. The Joint Oversight Committee shall establish sampling protocol.

i. Both parties shall comply with all applicable federal, state, and local laws and the rules and regulations of any federal, state, local or other government agency having jurisdiction over the activities and operations conducted pursuant to this Agreement.

LCSDSRWS and City of Santa Rosa,
Laguna Subregional Wastewater Treatment Plant Treated Effluent and Handling Procedures

14. LCSDSRWS produces disinfected secondary–23 treated effluent as defined by Title 22, Division 4, Chapter 3, Section 60301.225 found in the California Code of Regulations and in compliance with Waste Discharge Requirements Order No. 96-166 issued by the California Regional Water Quality Control Board, Central Valley Region. The City of Santa Rosa**,** Laguna Subregional Wastewater

Treatment Plant produces disinfected tertiary treated effluent as defined by Title 22, Division 4, Chapter 3, Section 60301.230 found in the California Code of Regulations and in compliance with Waste Discharge Requirements Order No. R1-2000-02 issued by the California Regional Water Quality Control Board, North Coast Region. In compliance with Title 22, Division 4, Articles 3 and 4 in the California Code of Regulations, all recycled water will be used for injection into the geothermal reservoir will not come in contact with workers, and the general public is excluded from The Geysers steamfield.

Injection Well Regulation by the California Division of Oil, Gas, and Geothermal Resources

15. The California Division of Oil, Gas, and Geothermal Resources (DOGGR), District No. G3, Santa Rosa Office, under the authority of Title 14, Chapter 4, Subchapter 4 for State-Wide Geothermal Regulations, regulates geothermal and geothermal injection wells. Section 1724.6, Article 3, Subchapter 1, Chapter 4, Title 14 requires all proponents of underground injection and disposal projects to submit project information to DOGGR for evaluation and subsequent approval. Specifically, DOGGR regulates the installation, conversion of geothermal wells, well use, injection reporting, and integrity testing and liquid monitoring of geothermal injection wells. This agency's primary responsibility for injection wells is to ensure the protection of all aquifers containing useable water and surface water from contamination. This Order allows discharge to injection wells that have received approval from DOGGR.

Storm Water Permit

16. The Discharger has obtained a National Pollution Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity for the construction of the Geysers Power Company, LLC (Calpine) – Santa Rosa Geysers Pipeline Project, Geysers Distribution Pipeline System, dated May 5, 2000. The Discharger has developed and is implementing a Storm Water Pollution Prevention Plan for the project that details Best Management Practices for preventing the discharge of contaminated storm water to surface waters. The General Storm Water Permit for construction activities will be terminated after all construction activities have ceased and the Discharger has filed a Notice of Termination.

17. The steamfield receives approximately 60 inches of annual precipitation with some years exceeding 114 inches of precipitation. The area experiences several snowstorms each year. The area has received up to 18 inches of precipitation in a 24-hour period. Approximately 85 percent of the storm events occur between the months of November and April.

Steamfield Injectate Distribution System

18. The Discharger is responsible for construction of an injectate (effluent) distribution system from the Termination Reservoir at the top of Pine Flat Road to the injection wells. Recycled water distribution system will consist of 18-miles of 12 to 36-inch diameter pipeline, a pump station to elevate the water to higher elevations in The Geysers, a one million gallon storage/surge protection tank, approximately 21 existing injection wells, and LCSDSRWS connection to maximize flexibility for recharge.

19. Geothermal reservoir conditions constantly change and the use of geothermal wells for injection is dependent on many variables. Depending on maintenance schedules, power generation demands, well function, geothermal reservoir response, and many other variables, The Geysers distribution pipeline and injection system may distribute up to 16 MGD of treated effluent from the City of Santa Rosa, and 2.8 MGD from LCSDSRWS. Existing and proposed injection wells include but are not limited to:

Existing Injection Wells and Unit No.		Proposed Injection Wells and Unit No.	
---	---	CA 1862-6	Sonoma
GDC 26	5&6	---	---
GDC 53-13	5&6	---	---
GDC 53A-13	5&6	---	---
GDC 88-12	5&6	---	---
SB 15	5&6	---	---
DX 10	7&8	DX 5	7&8
OS 3	7&8	OF 51B12	7&8
OS 21	7&8	OS 11	7&8
---	---	OS 87A-2	7&8
LF 02	9&10	LF 15	9&10
LF 23	9&10	LF 16	9&10
DX 61	11	DX 14	11
OS 12	11	DX 19	11
---	---	OS 13	11
---	---	OS 16	11
---	---	CMHC 06	12
---	---	DX 26	12
---	---	LF 03	12
GDC 05	14	GDC 19	14
GDC 08	14	---	---

Existing Injection Wells and Unit No.		Proposed Injection Wells and Unit No.	
GDC 18	14	---	---
GDCF 117A-19	14	---	---
DX 72	17	DX 45	17
---	---	DX 47	17
---	---	DX 48	17
D&V 11	18	BEF 85A-28	18
D&V 73-33	18	D&V 4	18
---	---	GDCF 36-28	18
BEF 42B-33	20	GDC 17-28	20
GDC 21	20	GDCF 36-2	20
GDC 36-28	20	---	---
GDCF 65-29	20	---	---

20. The steamfield recycled effluent distribution system will be constructed in two phases. Phase I construction of the pipeline began in April 2000 and consists of a substantial portion of the distribution piping system from the interface point at Unit #13 with the LCSDSRWS connection and running primarily to the northwest to the Unit #17 area. Phase II of the construction project covers the remaining piping system from the Santa Rosa Termination Reservoir to a point immediately above the pumping station where it ties into the Phase I pipeline.

Project Summation and Purpose

21. The Discharger proposes to inject geothermal steam condensate and storm water, LCSDSRWS reclaimed disinfected secondary-23 treated wastewater, supplemental surface water from Clear Lake and local streams, an insignificant amount of power plant grey water, and City of Santa Rosa reclaimed disinfected tertiary treated wastewater into the geothermal reservoir for the beneficial purpose of improved steam reservoir pressures, steam production, and electricity production.

Site Description

22. The steamfield site and surrounding areas are rural and are primarily used for geothermal steam and energy production and hunting. Vegetation consists of chaparral, oak woodlands, grassy, and coniferous forest areas. The area consists of steep northwest to southeast trending mountainous terrain ranging in elevation from 1,000 to 3,800 feet above sea level.

23. Geologic units within the steamfield area include Quaternary alluvium, colluvium, and landslide deposits; and Late Jurassic to Late Cretaceous Franciscan Complex. The Franciscan Complex is comprised of slightly metamorphosed, folded, faulted, and sheared greywacke, shale, conglomerates, chert, and metavolcanic rocks, as well as metamorphosed ultra-basic rocks consisting of serpentinite. The Franciscan Complex can be divided into the

nonreservoir and reservoir rocks. The nonreservoir rocks have low porosity and permeability and are essentially nonwaterbearing. The reservoir rocks, with high temperature and high fracture permeability, are saturated with water and steam. A zone of nearly impermeable rock marks the transition zone between the nonreservoir and reservoir rocks. This zone has been postulated to cap the reservoir and serve as a barrier to reservoir recharge. Several areas within The Geysers have undergone hydrothermal alteration and minor mineralization.

24. Franciscan Complex rocks at The Geysers geothermal field have been intruded by a silicic batholith approximately two million years old, which trends northwest to southeast through the heart of the geothermal field. The depth to the batholith ranges from 3,000 feet to over 7,000 feet and slopes down to the northwest.

25. Several inactive northwest to southeast trending faults cut the area. Active regional faults outside the steamfield include the San Andreas, Rodgers Creek-Healdsburg, Maacama, and Big Valley and Calloymi Fault Zones approximately 30 miles, 11 miles, 6 miles, and 5 miles away, respectively. The Rogers Creek-Healdsburg and Maacama Faults could generate a magnitude 7 earthquake. The Big Valley and Calloymi Fault is smaller. The area is seismically active with numerous relatively small earthquakes (magnitude of less than 1 to 3) occurring on a daily basis related to the withdrawal of geothermal fluids and injection of fluids.

Surface Water

26. The area is within the Big Sulphur Creek and Squaw Creek watersheds of the Russian River Hydrologic Unit.

27. The beneficial uses of Squaw Creek and Big Sulphur Creek include:

a. domestic supply
b. agricultural supply
c. industrial supply
d. groundwater recharge
e. freshwater replenishment
f. water contact recreation
g. noncontact water recreation
h. sport fishing
i. warm freshwater habitat
j. cold freshwater habitat
k. preservation of areas of special biological significance
l. wildlife habitat
m. preservation of rare and endangered species
n. fish migration
o. fish spawning

28. The beneficial uses of the Russian River include:

    a. municipal and domestic supply
    b. agricultural supply
    c. industrial supply
    d. groundwater recharge
    e. freshwater replenishment
    f. navigation
    g. hydropower generation
    h. water contact recreation
    i. noncontact water recreation
    j. sport fishing
    k. warm freshwater habitat
    l. cold freshwater habitat
    m. preservation of areas of special biological significance
    n. wildlife habitat
    o. preservation of rare and endangered species
    p. fish migration
    q. fish spawning

29. The Russian River has been included on the Clean Water Act Section 303(d) list as an impaired water body. A Total Maximum Daily Load (TMDL) and Attainment Strategy has been scheduled for completion by the Regional Water Board in the Year 2011. The TMDL lists impairments of the beneficial uses for the Russian River and its tributaries and sets objectives and targets for the reduction of those impairments to the maximum extent possible. The intent of the TMDL is to restore, enhance, and protect the beneficial uses that are being impaired.

Groundwater

30. Beneficial uses of areal groundwaters include:

    a. domestic water supply
    b. industrial supply

31. State Water Resources Control Board Resolution No. 88-63, a Policy Entitled "Sources of Drinking Water," adopted May 19, 1988, provides that all surface and groundwaters of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Water Boards, with certain exceptions. Among other exceptions, State Water Resources Control Board Resolution No. 88-63 provides for exceptions where the aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations (CFR), Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

32. Primary shallow groundwater resources in The Geysers area occur as small, localized, perched aquifers in Franciscan Complex nonreservoir rocks and along slide planes in Quaternary landslide deposits. These waters express themselves as predominately low yielding springs and seeps of non-potable and potable water. The geothermal reservoir exists from approximately 1,500 to over 12,000 feet in depth and contains hot, pressurized, highly mineralized, non-potable water, and steam.

33. The proposed Calpine design will have no impacts to groundwater from construction and operation of the distribution pipelines or the injection wells. No regional groundwater aquifers of significant yield have been reported in the Mayacamas Mountains near The Geysers. Available evidence indicates that groundwater in the volcanic rocks at Cobb Mountain does not mix with the groundwater from the steamfield. The contact between the Cobb Mountain volcanics and the Franciscan Complex is a planar surface sloping about 7 degrees to the northeast. Groundwaters flow along this contact surface over the nearly impermeable Franciscan Complex. A reservoir cap effectively seals the steamfield from the overlying groundwater. No further mixing is likely.

The Geysers injection wells take water under a vacuum at the wellhead. Water is piped to the injection well, and when entering the well typically falls thousands of feet down a steel cased well. Geothermal injection wells are cased to prevent well bridging due to formation sloughing. Additionally, the liquid water is heavier than the steam and will not rise to the surface until it flashes to steam. In addition, the California Division of Oil, Gas and Geothermal Resources regulations require that measurements be made in the injection wells to insure integrity of the casing and to measure the depth of the standing water level. This is to ensure that water cannot flow from the injection well at depths shallow enough to affect groundwater resources.

California Environmental Quality Act Compliance

34. A joint Environmental Impact Statement and Environmental Impact Report (Lake County EIR) was prepared and certified by Lake County and the United States Bureau of Land Management on September 20, 1994 for modifications to be made to the LCSDSRWS, construction of the pipeline, and delivery of treated wastewater to the underlying geothermal reservoir at The Geysers to satisfy the requirements of the CEQA and NEPA. The Regional Water Board has considered the environmental effects of the quantity and distribution of Lake County wastewater at The Geysers as set forth in the EIR/EIS, including the following significant and/or potentially significant impacts on water quality:

a. Construction of the project includes stream crossings and trenching which may lead to siltation in creeks and waterways, or raise turbidity in the areas of the construction site.

b. Failure of the Geysers Effluent Pipeline could result in a spill of injection water and related wash-out at the discharge point.

c. The Geysers Effluent Pipeline could experience slow leaks that could contaminate local ground water.

35. The following mitigation measures, which have either been required by Lake County or US Bureau of Land Management, addressed in the Central Valley Regional Water Quality Control Board's Waste Discharge Requirements Order No. 96-165, or required in this Order, will minimize the above-mentioned significant environmental impacts:

a. Construction of the project will be done under applicable storm water construction permits, stream bed alteration agreements, and water quality certifications.

b. Impacts caused by failure of The Geysers Effluent Pipeline will be minimized through the use of isolation valves at approximately two mile intervals and at stream crossings, and automatic equipment to shut down pump stations in the event of pipeline failure. Impacts from failures will also be mitigated through compliance with effluent limits for the Southeast Regional Wastewater Treatment Plant effluent established in Waste Discharge Requirements Order No. 96-166, adopted by the California Regional Water Quality Control Board, Central Valley Region.

c. Groundwater contamination caused by slow leaks from the pipeline will be mitigated through compliance with effluent limitations contained in Waste Discharge Requirements Order No. 96-166, adopted by the California Regional Water Quality Control Board, Central Valley Region, and by prohibiting releases of injection water from the pipeline. Additionally, as part of the project, the Discharger proposes to encase the pipeline where its alignment passes within 100 feet of domestic wells.

36. For the injection of Santa Rosa wastewater and the expansion of LCSDSRWS treated effluent discharge area, the City of Santa Rosa prepared, certified and adopted between July 31, 1996 through February 31, 2001, an Environmental Impact Report (Santa Rosa EIR) with 53 addenda. The addendum entitled *Santa Rosa Geysers Recharge Project, Calpine Addendum* (the Addendum) pertains to the Geysers Recharge Project in The Geysers and details the delivery of treated wastewater to the underlying geothermal reservoir to satisfy the requirements of the CEQA. The City of Santa Rosa adopted the Addendum on July 6, 2000. As stated in the Santa Rosa EIR, the project may have the following significant or potentially significant impacts on water quality:

a. Construction of the project in The Geysers could affect sensitive biological resources in the steamfield.

b. The project will disturb soils and scar construction areas in The Geysers.

c. In The Geysers steamfield, the project will be constructed on unstable slopes.

d. An endangered, threatened, or rare plant or wildlife species program needs to be developed for the project.

e. Withdrawal and injection of fluids into the geothermal reservoir may lead to increased seismic activity in The Geysers steamfield.

f. The Geysers steamfield component may cause flooding due to rupture.

g. The Geysers steamfield component may destroy wetlands or other waters of the United States.

h. The Geysers Steamfield component could experience slow leaks that could contaminate local ground water.

37. The Regional Water Board has reviewed the Santa Rosa EIR and addenda, including the Addendum, and finds that the above-identified significant impacts will be mitigated to less than significant levels by the following mitigation measures, some of which have been incorporated into the project as a change or alteration or required by this Order.

a. Calpine will avoid impacts to sensitive biological resources by constructing and installing the pipeline within existing roads and above ground in selected areas.

b. All construction sites will be returned to pre-existing topographic conditions and a Revegetation Plan will be submitted to the City of Santa Rosa for approval. Implementation will involve broadcasting indigenous seed, straw distribution, and applying a tackifier.

c. The distribution pipeline within The Geysers steamfield shall be adjusted to avoid areas with slope stability problems where feasible. In areas where the pipeline cannot be relocated, the pipeline will be installed above ground on a sliding support or underground using a modified trench with low density backfill and welded steel pipe.

d. Where pipeline corridors, maintenance roads, or construction access roads will unavoidably affect a sensitive plant or animal resource, plants of concern will be transplanted, construction will be limited to a 50-foot wide corridor, perimeter of the construction corridor shall be clearly defined, and/or the project will be scheduled to avoid nesting activities.

e. Prior to injection of reclaimed wastewater, the local seismic network will be maintained by Calpine and upgraded around wells proposed for injection.

Additional seismic detection equipment with improved seismic software will be installed in Cobb and Anderson Springs. Injection will be adjusted to lessen seismic events and biennial reports will be produced containing planned operational responses.

f. Flooding impacts caused by failure of The Geysers effluent pipeline will be minimized through the use of isolation valves. Impacts from failures will also be mitigated through compliance with effluent limits for the City of Santa Rosa, Laguna Subregional Wastewater Treatment, Reuse, and Disposal Facilities established in Waste Discharge Requirements Order No. R1-2000-2, adopted by the California Regional Water Quality Control Board, North Coast Region.

g. The proposed 0.8 mile Calpine cross-country pipeline section will be buried, and will not encounter any wetlands, as identified by field surveys. Approximately 17 miles of the 18-mile distribution pipeline will be buried beneath existing roads. The pipeline will cross approximately 47 culverts along roadways, some of which carry waters of the United States. The pipeline will be placed over the culvert or will bore under it to avoid impacts to waters of the United States.

h. Groundwater contamination caused by slow leaks from the pipeline will be mitigated by compliance with effluent limitations contained in Waste Discharge Requirements Order No. R1-2000-2, adopted by the California Regional Water Quality Control Board, North Coast Region, and by prohibiting releases of injection water from the pipeline.

Notification

38. The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations.

39. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.

THEREFORE, IT IS HEREBY ORDERED the Discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS (INJECTION FLUIDS)

1. The discharge of any waste not specifically regulated by this Order is prohibited.

2. Creation of a pollution, contamination, or nuisance, as defined by Section 13050 of the California Water Code (CWC), is prohibited.

3. The discharge of domestic waste, treated or untreated, to surface waters is prohibited.

4. The discharge of injection fluids (domestic waste, condensate, treated effluent) to soils, surface waters, or surface water drainage courses is prohibited. Injection fluids can be used for fire fighting and soil compaction.

5. The use of geothermal fluids for purposes other than specified herein in this Order is prohibited. Specifically, the use of geothermal fluids on access roads, well pads, or other developed project locations for dust control is prohibited.

6. Effluent from the Lake County Special Districts, Southeast Regional Wastewater System shall be treated to the requirements of the California Department of Health Services: Title 22, California Code of Regulations for disinfected secondary-23 treated wastewater, or its substitute regulation.

7. Effluent from the City of Santa Rosa shall be treated to the requirements of the California Department of Health Services: Title 22, California Code of Regulations for disinfected tertiary wastewater treatment, or its substitute regulation.

8. The discharge shall be limited to injection into the geothermal reservoir except where the Executive Officer has approved other uses of recycled wastewater in compliance with Title 22, California Code of Regulations.

9. The Discharger may use alternate injection wells as it sees fit providing DOGGR and/or BLM have approved the use of these wells and notification has been provided to the Executive Officer.

B. DISCHARGE SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF THE GEYSERS DISTRIBUTION PIPELINE SYSTEM

1. All construction shall comply with the following:

   a. All trench spoils shall be disposed of in stable areas as determined by a qualified engineer.

   b. All trench spoils shall be limited to inert materials that have not contacted geothermal solid or liquid wastes.

   c. All trench spoils shall be placed at slopes not to exceed 3:1.

   d. All construction spoils shall be adequately protected from erosion using applicable Best Management techniques no later than October 15th and be maintained throughout the wet weather season.

e. Appropriate Best Management techniques run-on controls shall be implemented on all construction spoils no later than October 15th and be maintained throughout the wet weather season.

f. Total volume of disposed spoils shall be reported for each spoils disposal area.

g. All disposal areas shall be located on a map.

2. All maintenance activities shall comply with following Discharge Specifications:

a. All excavated spoils shall be disposed of in stable areas as determined by a qualified engineer.

b. All excavated spoils shall be limited to inert materials that have not contacted geothermal solid or liquid wastes.

c. All excavated spoils shall be placed at slopes not to exceed 3:1.

d. All excavated spoils and disturbed areas shall be adequately protected from erosion using applicable best management techniques no later than October 15th and be maintained throughout the wet weather season.

e. Appropriate Best Management techniques run-on controls shall be implemented on all excavated spoils and disturbed areas no later than October 15th and be maintained throughout the wet weather season.

f. Total volume of disposed spoils shall be reported for each spoils disposal area.

g. All disposal areas shall be located on a map.

C. GENERAL PROVISIONS

1. A copy of this Order shall be kept at the discharge facility for reference by operating personnel at all times. Key operating personnel shall be familiar with its contents.

2. Within six months of adoption of this permit, the Discharger shall submit in writing to the Executive Officer of the Regional Water Board (Executive Officer), a Spill Response, Monitoring, and Cleanup Plan addressing spills from The Geysers distribution pipeline.

3. The Discharger shall implement the mitigations as described in finding 37 and report to the Regional Water Board on September 1 each year following the adoption of this permit on the application of each mitigation measure.

4. In the event of overlap or conflict between Waste Discharge Requirements Orders Nos. R1-2002-0014, 99-35, 95-5, and 95-6, this permit will regulate construction activities associated with road construction, drill site preparation, well drilling, well re-working, well abandonment, and modification to the wastewater injection distribution system; of any circulation loss during the construction of a well at depths less than 300 feet; monitoring of injection fluids and spills; and notification and reporting.

5. Severability

   Provisions of these waste discharge requirements are severable. If any provision of these requirements is found invalid, the remainder of these requirements shall not be affected.

6. Operation and Maintenance

   The Discharger shall maintain in good working order and operate as efficiently as possible any facility or control system installed by the Discharger to achieve compliance with the waste discharge requirements.

7. Change in Discharge

   The Discharger shall promptly report to the Regional Water Board any material change in the character, location, or volume of the discharge.

8. Change in Ownership

   In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to the Regional Water Board:

   a. existence of this Order, and

   b. the status of the Discharger's annual fee account.

9. Vested Rights

   This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, nor protect the Discharger from his liability under federal, state, or local laws, nor create a vested right for the Discharger to continue the waste discharge.

10. Monitoring

The Discharger shall comply with the Contingency Planning and Notification Requirements Order No. 74-151 and the Monitoring and Reporting Program No. R1-2002-0014 and any modifications to these documents as specified by the Executive Officer. Such documents are attached to this Order and incorporated herein. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services.

a. Order No. 74-151 requires immediate incident reporting of unintentional or accidental spills (including Emergency Response actions) and diligent action to abate the effects of the discharge. Written confirmation of the incident is required within two weeks of notification.

b. General Monitoring and Reporting Provisions require sampling and analysis performance criteria in addition to compliance reporting criteria and timeframes.

11. Inspections

The Discharger shall permit authorized staff of the Regional Water Board:

a. entry upon premises in which an effluent source is located or in which any required records are kept;

b. access to copy any records required to be kept under terms and conditions of this Order;

c. inspection of monitoring equipment or records; and

d. sampling of any discharge.

12. Noncompliance

In the event the Discharger is unable to comply with any of the conditions of this Order due to:

a. breakdown of waste treatment equipment;

b. accidents caused by human error or negligence; or

c. other causes such as acts of nature.

The Discharger shall notify the Executive Officer by telephone as soon as he/she or his/her agents have knowledge of the incident and confirm this notification in writing within two weeks of the telephone notification. The written notification shall include pertinent information explaining reasons for the noncompliance and shall indicate the steps taken to correct the problem and the dates thereof, and the steps being taken to prevent the problem from recurring.

13. Revision of Requirements

The Regional Water Board will review this Order periodically and may revise requirements when necessary.

Certification

I, Susan A. Warner, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on January 24, 2002.

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Susan A. Warner
Executive Officer

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