

FACT SHEET
U.S. Environmental Protection Agency, Region 9
Draft Underground Injection Control Class I Non-Hazardous Permit
Permit Number R9UIC-CA1-FY17-2
Live Oak Limited

Location:

Well Live Oak WD-1 covered by this Draft Permit is located approximately 6 miles north of Bakersfield, California - Section 18, Township 28 South, Range 28 East in Kern County, California

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I. Purpose of the Fact Sheet

The U.S. Environmental Protection Agency, Region 9 (EPA) has prepared this fact sheet for the draft Underground Injection Control (UIC) Class I Non-hazardous Industrial Waste Disposal Well Permit (Draft Permit), proposed to be issued to Live Oak Limited (Live Oak or Permittee). Pursuant to the UIC regulations in Title 40 of the Code of Federal Regulations (CFR) §124.8, the purpose of this fact sheet is to briefly describe the principal facts and the considerations that went into preparing the Draft Permit. To meet these objectives, this fact sheet contains a description of the facility, a brief discussion of the permit conditions, the basis for these permit conditions, background information on the permit process, and a description of EPA's final decision-making process.

II. Description of the Facility

Live Oak owns a cogeneration power plant that is located approximately 6 miles north of Bakersfield, California. The approximately 5-acre site consists of a 48-megawatt natural gas-

fired power plant and an existing Class II-permitted water disposal well (Well Live Oak WD-1). Well Live Oak WD-1 has been operating under authority of a California Division of Oil, Gas, and Geothermal Resources (DOGGR) Class II permit since 1991. The current daily injection volume of Well Live Oak WD-1 is approximately 1,000 barrels of water per day (BWPD), and past daily injection volumes have ranged as high as 3,100 BWPD.

Previously, the Live Oak cogeneration facility provided a byproduct of steam to assist nearby oil producers in the recovery of heavy oil. This activity resulted in DOGGR's permitting of Well Live Oak WD-1 as a Class II injection well. However, Live Oak lost its contract to provide steam to nearby oil production operations in 2015. Given the change of steam sharing status, EPA and DOGGR agreed that Well Live Oak WD-1 should no longer be regulated as a UIC Class II injection well. In order for Live Oak to maintain the ability to dispose of waste water at its cogeneration facility, EPA required Live Oak to seek authorization to reclassify its existing Class II injection well, Live Oak WD-1, as a Class I non-hazardous injection well. DOGGR has indicated that once EPA makes a final determination to issue or deny the UIC Class I permit, DOGGR will revoke Live Oak's existing Class II permit.

The injectate of Well Live Oak WD-1 will be non-hazardous waste waters consisting of boiler blow down, cooling tower blow down, boiler feed water conditioning waste waters, and raw water filter backwash that are generated from the Live Oak power plant and from any of seven (7) additional power plants, all owned by Western Generation Partners – Redwood Holdings, LLC (WGP) in the Central Valley of California. Injection by Well Live Oak WD-1 will be into the Famoso Sand within the Kern River Oil Field, at the perforated interval of 5,379 feet to 5,604 feet below ground surface. The Famoso Sand at Well Live Oak WD-1 has greater than 10,000 mg/L total dissolved solids (TDS) and is confined above by the approximately 150-foot thick Upper Walker Shale and below by the approximately 100-foot thick Lower Walker Shale.

III. Brief Summary of Specific Permit Conditions

To ensure that the proposed project/injection activity complies with all relevant Safe Drinking Water Act (SDWA) regulations and to protect public health and Underground Sources of Drinking Water (USDWs), EPA is proposing the following conditions for construction, testing, corrective action, operation, monitoring and reporting, plugging and abandonment, and financial assurance in the Draft Permit. The sections below summarize the proposed conditions, requirements, as well as other permit considerations.

Requirements Prior to Drilling, Testing, Constructing, or Operating (Part II, Section A of the Draft Permit)

Live Oak provided evidence of financial assurance for the plugging and abandonment of Well Live Oak WD-1 to EPA, and the Draft Permit would require that Live Oak maintain the financial assurance. In addition, the Draft Permit calls for adequate notification of activities to test the well and the injection formation, and timely reporting of those activities.

Conditions for Existing Well and Future Well Construction (Part II, Section B of the Draft Permit)

The Draft Permit identifies the precise location of the existing Well Live Oak WD-1 and includes a schematic for the well. Live Oak's permit application described the logs and other tests conducted during drilling and construction of Well Live Oak WD-1, including deviation checks, casing logs, and injection formation tests. Live Oak also conducted formation evaluation wireline logging operations and used those results to estimate and report values for hydrocarbon saturation, porosity, lithology, formation water resistivity, TDS concentrations, and rock mechanical properties for both the injection and confining zones identified within the permitted geological sequence and for selected intervals for identification of any USDWs above the injection zone.

The Draft Permit requires Live Oak to conduct a Step-Rate Test (SRT) on Well Live Oak WD-1 to establish the maximum allowable injection pressure, as well as a pressure fall-off test (FOT) to determine and monitor formation characteristics.

The Draft Permit also requires Live Oak to install and maintain the monitoring devices necessary to obtain samples of the injection fluids, and to continuously measure and record, at Well Live Oak WD-1, the injection pressure, annulus pressure, flow rate, and injection volumes. Live Oak must give advance notice to EPA of any planned physical alterations or additions to Well Live Oak WD-1.

The Draft Permit only authorizes Well Live Oak WD-1. If Live Oak is interested in drilling any additional injection wells in the future, the Draft Permit requires Live Oak to submit an application for a major permit modification to EPA for review and approval.

Corrective Action (Part II, Section C of Draft Permit)

Live Oak completed preliminary calculations of the Zone of Endangering Influence (ZEI), and EPA has confirmed that the ZEI is within the Area of Review (AOR) that extends ¼-mile beyond Well Live Oak WD-1. Live Oak will recalculate the ZEI annually, based on any new data obtained from the FOT and static reservoir pressure observations required under the Draft Permit. If the recalculated ZEI extends beyond the AOR, Live Oak must identify wells requiring corrective action that are within the recalculated ZEI and submit to EPA a list of the wells, along with their locations and construction data. Corrective action may include, but is not limited to reentering, plugging, and abandoning any production or exploratory wells which penetrate the injection zone and are located within the recalculated ZEI. Live Oak may not commence corrective action activities prior to submitting a plan for approval by EPA.

Well Operation (Part II, Section D of the Draft Permit)

Live Oak must demonstrate that Well Live Oak WD-1 has mechanical integrity and that the proposed injection fluid is not hazardous. The Draft Permit requires periodic mechanical integrity tests (MITs) via a casing/tubing annular pressure test at least once every five (5) years, continuous pressure monitoring in Well Live Oak WD-1, and a radioactive tracer and a temperature log (or other approved diagnostic tool or procedure) annually to ensure protection of USDWs. The tubing/casing annulus pressure of Well Live Oak WD-1 will be continuously monitored and recorded to verify that internal mechanical integrity of the wellbore is maintained

during operations. Radioactive tracer and temperature surveys will be conducted to verify the absence of significant fluid movement through vertical channels adjacent to the wellbore. Loss of mechanical integrity of Well Live Oak WD-1 requires Live Oak to send notification to EPA and take action to restore and confirm mechanical integrity of the well.

The injection pressure and injection volume limitations in the Draft Permit will be based on the results of the SRT conducted on Well Live Oak WD-1, and both limitations must be approved by EPA. The Draft Permit also requires that Live Oak operate Well Live Oak WD-1 in a manner that does not initiate or propagate fractures in the injection formation or the confining zone, cause migration of injection or formation fluids into or between USDWs, or allow migration of injected fluids to oilfield production wells. Authorized injection fluids include the fluids generated from the Live Oak power plant operations, and the same category of fluids from the listed power plants in the Draft Permit. Live Oak must document any particulate filters used upstream of Well Live Oak WD-1.

Monitoring, Recordkeeping, and Reporting of Results (Part II, Section E of Draft Permit)

The Draft Permit requires continuous monitoring of injection fluid temperature, injection rate, daily injection volume, total cumulative volume, well head injection pressure, and annular pressure in Well Live Oak WD-1. The injectate must be sampled quarterly to determine the quantities/values of the following constituents using EPA-approved methods: inorganics (major anions and cations, and trace metals); solids (TDS and total suspended solids); general and physical parameters (temperature, turbidity, pH, conductivity, hardness, specific gravity, alkalinity, biological oxygen demand, density, and viscosity); volatile organic compounds; and semi-volatile organic compounds. Live Oak is also required to manifest each disposal load of waste fluids received from other WGP facilities as provided in the Manifest System for Disposal Water in Appendix I of the Draft Permit. Pursuant to the Draft Permit, Live Oak is required to maintain all operational and monitoring records, and to submit four (4) quarterly reports to EPA each year that include the results of the required monitoring, among other things.

Plugging and Abandonment (Part II, Section F of the Draft Permit)

Live Oak will be required to plug and abandon Well Live Oak WD-1 as provided in the Plugging and Abandonment Plan in Appendix G of the Draft Permit. After a cessation of injection operations for two (2) years for Well Live Oak WD-1, Live Oak must plug and abandon the inactive well in accordance with the Plugging and Abandonment Plan unless Live Oak notifies EPA of its intent to reactivate the well, has demonstrated that the well will be used in the future, and describes actions or procedures to ensure that the well will not endanger USDWs during the period of temporary abandonment. The inactive well must pass an initial internal MIT before EPA authorizes temporary abandonment status. EPA may change the manner in which Well Live Oak WD-1 will be plugged if the well is modified during its permitted life or if the proposed Plugging and Abandonment Plan for the well is not consistent with EPA requirements for construction or mechanical integrity.

Financial Assurance (Part II, Section G of the Draft Permit)

Live Oak established financial assurance for the plugging and abandonment of Well Live Oak WD-1 in the amount of \$66,400 by demonstrating that it passed the financial test as specified in 40 CFR § 144.63(f)(1)(i). The financial assurance mechanism and amount will be reviewed annually and updated as needed. EPA may also require Live Oak to change to an alternate method for demonstrating financial assurance and to periodically estimate and update the Plugging and Abandonment Plan and/or the cost associated with it.

Duration of Permit (Part II, Section H of the Draft Permit)

EPA proposes to issue the Permit and the authorization to inject for a period of ten (10) years unless terminated under the conditions set forth in Part III, Section B.1 of the Draft Permit.

IV. Permit Process

Application and Review Period

The EPA Water Director has authority to issue permits for underground injection activities under 40 CFR §144.31. Live Oak is applying for UIC Permit Number R9UIC-CA1-FY17-2 to convert an existing Class II injection well to a Class I injection well to dispose of non-hazardous waste waters generated from the Live Oak power plant and from any of seven (7) additional WGP natural gas-fired turbine power plants, as listed in the Draft Permit.

On March 27, 2017, EPA received a permit application from Live Oak for the reclassification and operation of Well Live Oak WD-1. Over the following two years, Live Oak provided substantial clarifications and supplemental information to modify and update the permit application to address technical questions from EPA. After completing a thorough technical review of all submitted information, EPA has determined that the information provided by Live Oak is sufficient to prepare the Draft Permit. The Draft Permit, if finalized, would authorize injection of non-hazardous waste waters by Well Live Oak WD-1 for ten (10) years.

Based on our review of the operational standards, monitoring requirements, and existing geologic setting, EPA believes the activities allowed under the proposed Draft Permit are protective of USDWs defined at 40 CFR §144.3, as required under the SDWA.

Consultation

As part of the permit process, pursuant to 40 CFR §144.4, EPA is required to consider other federal laws, specifically Section 7 of the Endangered Species Act (ESA) and Section 106 of the National Historic Preservation Act (NHPA).

Endangered Species Act (ESA)

Under Section 7 of the ESA, EPA is required to ensure that any action authorized by EPA does not jeopardize the continued existence of any endangered or threatened species or adversely

affect its critical habitat. In November 2018, Live Oak submitted to EPA a Biological Evaluation (BE), prepared by McCormick Biological Inc. Included in the BE is a U.S. Fish and Wildlife Service (USFWS) IPaC Trust Resources report, generated on October 16, 2018, which identified eleven (11) threatened, endangered, and candidate species as potentially occurring in the action area (i.e., the project area plus an additional 250-foot buffer zone beyond the project area). EPA informally consulted with USFWS via letter dated August 15, 2019, requesting concurrence with EPA's determination that the proposed action may affect, but is not likely to adversely affect, the Tipton kangaroo rat, the San Joaquin kit fox, and the blunt-nosed leopard lizard. EPA provided the USFWS a summary of the biological evaluation provided by Live Oak with the permit application, which documented the screening for the potential occurrence of special-status species at the project area, the evaluation of the effects of the proposed action, and the avoidance and minimization measures provided by the Permittee that represent best management practices for reducing the potential for impacts on the identified species. By letter dated September 25, 2019, USFWS concurred with EPA's determination regarding those three species.

EPA also determined that the proposed action will have no effect on other species listed in the IPaC report as potentially occurring in the area (California red-legged frog, yellow-billed cuckoo, southwestern willow flycatcher, delta smelt, vernal pool fairy shrimp, giant garter snake, San Joaquin woolly-threads, and Bakersfield cactus). Listed species with "no effect" determinations do not require review by the USFWS.

National Historic Preservation Act (NHPA)

The historic preservation review process mandated by Section 106 of NHPA is outlined in regulations issued by the federal Advisory Council on Historic Preservation (ACHP) titled, "Protection of Historic Properties" at 36 CFR Part 800. Considering these requirements, EPA determines whether the proposed federal permit is an undertaking and whether it has the potential to cause effects on historic properties. Issuance of a federal permit is considered a federal undertaking; therefore, EPA is required to meet the statutory responsibilities under Section 106.

In a letter dated October 16, 2018, EPA consulted with the California State Historic Preservation Office (SHPO) by describing the project, the area of potential effect, steps taken to identify historic properties, and the proposed finding of no historic properties affected by this undertaking. The SHPO, in a letter dated November 16, 2018, concurred with EPA's finding that no historic properties will be affected by this undertaking.

Public Participation

The public has thirty (30) days to review and comment on the Draft Permit (40 CFR §124.10). The Draft Permit, public notice, and this fact sheet are available at the following location:

Beale Memorial Library
701 Truxtun Avenue
Bakersfield, CA 93301
(661) 868-0701

The Draft Permit, public notice, this fact sheet, and the permit application are available at the following location:

U.S. Environmental Protection Agency Environmental Information Center/Library
75 Hawthorne Street
San Francisco, CA 94105
Telephone: (415) 947-4406
Library-reg9@epa.gov

These documents are also available at the following EPA Region 9 webpage:
<http://www.epa.gov/region09/water/groundwater/uic-permits.html>.

The public comment period begins on October 21, 2019 and ends on November 20, 2019. During this period, all written comments on the Draft Permit can be mailed, faxed, or e-mailed to Calvin Ho (see the contact information listed on the first page of this fact sheet), who is also available by phone to answer any questions about the Draft Permit.

All persons, including the applicant, who object to any condition of the Draft Permit or EPA's decision to prepare a Draft Permit must raise all reasonably ascertainable issues and submit all reasonable arguments supporting their position by the close of the comment period (40 CFR §124.13). EPA has not scheduled a public hearing but could do so if there is a significant degree of public interest in the Draft Permit (40 CFR §§124.11 and 124.12). In the event EPA schedules a hearing, we will provide thirty (30) days advance notice to the public. EPA is providing public notice of the comment period by publication in the Bakersfield Californian newspaper.

Final Decision-Making Process

After the close of the public comment period, EPA will review and consider all comments relevant to the Draft Permit and application. EPA will send a response to comments to the applicant and each person who has submitted written comments or requested notice of the final permit decision. EPA will also post the response to comments document on our website. The response to comments will contain: a response to all significant comments on the Draft Permit; EPA's final permitting decision; any permit conditions that are changed and the reasons for the changes; and procedures for appealing the decision. The final decision shall be to either issue or deny the Permit. The final decision shall become effective no sooner than thirty (30) days after the service of the notice of decision. Within thirty (30) days after the final permit decision has been issued, any person who filed comments on the Draft Permit, participated in any public hearing on this matter, or takes issue with any changes in the Draft Permit, may petition the Environmental Appeals Board to review any condition of the permit decision. Commenters are referred to 40 CFR §124.19 for procedural requirements of the appeal process. If no comments request a change in the Draft Permit, the Permit shall become effective immediately upon issuance (40 CFR §124.15).