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BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
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**PETITION TO AMEND THE
HIGH DESERT POWER PLANT**

Docket No. 97-AFC-1 C

**Energy Commission Staff Response to the Committee Recommended Decision
Granting Interim Relief to Drought-Proof the Facility**

Staff would like to thank the committee for issuing the revised Committee Recommended Decision Granting Interim Relief for the High Desert Power Project (HDPP). The relief in the condition of certification **SOIL&WATER-1** proposes a loading sequence of project water sources for the rest of this water year and for the 2016/17 water year, and includes extending access to adjudicated Mojave River Basin (MRB) ground water. The loading sequence will encourage maximum use of recycled water and limit use of groundwater from the adjudicated MRB to the minimum needed in emergency situations when State Water Project (SWP) water and banked SWP are not available.

There is no need to limit combined water use to 3,090 acre feet per year (AFY). It is true that project average annual water use is about 3,090 AF, but if drought conditions, hydroelectric availability, or the loss of Aliso Canyon natural gas storage pushes HDPP operation above past average, the proposed limit of 3,090 AFY will be prohibitively restrictive. Therefore, staff respectfully recommends removing the 3,090 AFY limit. Further, staff recommends adding language to the verification requiring the project owner to report on the basis for changes in water supplies. Additional information on the water quality and quantity conditions that compel the project owner to shift to a water supply source lower in the loading sequence could provide the Committee additional information necessary to crafting effective, well-informed conditions for long-term relief.

Also, staff continues to recommend banking of SWP water via percolation by the Mojave Water Agency (MWA) to provide interim relief to HDPP. The parties agree that the concept is particularly valuable because it would allow the possibility of storing excess water deliveries this year. Percolation banking would: 1) allow the project owner to bank SWP water whenever it is available, without the need for HDPP to be operating; 2) remove the limitation that SWP water has to be of certain quality to be banked; and, 3) save the project owner the costs incurred from treating the SWP water before injection as required in the current conditions of certification. Staff recommends that the committee consider including the staff's proposed revised conditions of certification **SOIL&WATER-4, 5, 6, 12, and 13** in the interim relief. Staff has provided the revised HDPP conditions of certification below to assist the committee in preparing a decision that provides the interim relief sought by HDPP, and the project reliability sought by all parties:

SOIL&WATER-1 The only water used for project operation (except for domestic purposes) shall be State Water Project (SWP) water obtained by the project owner consistent with the provisions of the Mojave Water Agency's (MWA) Ordinance 9 and/or appropriately treated recycled waste water, and/or an alternative water supply obtained from the Mojave River Basin (MRB) consistent with the "Judgment After Trial" dated January 1996 in City of Barstow, et al., v. City of Adelanto, et al. (Riverside County Superior Court Case No. 208568) (collectively, "MRB Water Rights") as administered by the Watermaster (the "Judgment").

- a. Whenever recycled waste water of quality sufficient for project operations is available to be purchased from the City of Victorville, the project owner shall use direct delivery of maximum quantities of such water for project operations. Whenever the quantity or quality of recycled waste water is not sufficient to support project operations, the project may supplement recycled water supplies with SWP water, banked SWP water from the four HDPP wells as long as the amount of water used does not exceed the amount of water determined to be available to the project pursuant to SOIL&WATER-5, and/or MRB Water Rights. The Project Owner shall consume no more than 2,000 AF **of MRB Water Rights** in water years ~~2014/2015 (October 1, 2014 – September 30, 2015)~~ 2015/2016 (October 1, 2015 – September 30, 2016) and 2016/2017 (October 1, 2016 – September 30, 2017). The acquisition, use and transfer of MRB Water Rights shall comply with the Judgment and Rules and Regulations of the Watermaster.

The project owner shall use no more than 3090 AFY per year, regardless of the source of water, for plant cooling operations.

The project owner shall implement an interim "Loading Sequence" in the following order:

1. **The project owner will use recycled waste water as the primary water supply, to the extent it is available and its quality is sufficient to maintain cooling tower functions and reliable operation of the facility.**
2. **If there is insufficient recycled waste water of quality or quantity sufficient to maintain cooling tower functions and reliable operation of the facility, recycled waste water may be blended with either directly available or banked SWP Water.**
3. **If there is insufficient directly available or banked SWP Water, the project owner may blend recycled waste water with MRB Water Rights to achieve the required cooling tower blowdown rate or cooling tower functionality, subject to the limitations contained above.**

At the project owner's discretion, dry cooling may be used instead, if an amendment to the Commission's decision allowing dry cooling is approved.

- b. The project owner shall report, on or before the 15th of each month, the use of water from all sources for the prior month to the Energy Commission CPM in acre-feet. The monthly report shall include acre-feet usage by source, as well as total.
- c. The project owner shall submit a Petition to Amend (PTA) no later than November

1, 2015 that will implement reliable primary and backup HDPP water supplies that are consistent with state water policies or an alternate cooling system like dry cooling.

- d. (Item Deleted)
- e. The project's water supply facilities shall be appropriately sized and utilized to meet project needs. The project shall make maximum use of recycled waste water for power plant cooling given current equipment capabilities and permit conditions.
- f. The project owner shall continue with the feasibility study evaluating the use of 100 percent recycled water for evaporative cooling purposes and other industrial uses. The feasibility study shall be completed by the project owner and submitted to the CPM.

VERIFICATION: The project owner shall provide final design drawings of the project's water supply facilities to the CPM, for review and approval, thirty (30) days before commencing project construction. The project owner shall submit to the CPM documentation showing the agreements entered into between the project owner, MWA Watermaster, and water right owners in MRB regarding the acquisition, use and transfer of MRB Adjudicated Water Rights. The project owner shall report all use of water from MRB to the Energy Commission CPM on a monthly basis.

The project owner shall submit a monthly report on the 15th day of every month to the CPM that describes why there was a change in the loading sequence from recycled water as the primary supply, including the times when the owner decided to switch to using groundwater from the adjudicated MRB for blending and the reason why the decision to use the adjudicated groundwater was made, and the amount of adjudicated groundwater used.

The project owner shall provide a biannual report on the progress being made on the project design for use of 100 percent recycled water for power plant cooling. The report shall include information related to project modifications that may be needed for using up to 100 percent recycled water. The first report shall be due six months after adoption of this condition of certification, and the final feasibility report shall be submitted to the CPM no later than November 1, 2014. Verifying compliance with other elements of Condition SOIL&WATER-1 shall be accomplished in accordance with the provisions of the Verifications for Conditions 2, 3, 6, 20, and 21 as appropriate.

The project owner shall submit a PTA no later than November 1, 2015 that will implement reliable primary and backup HDPP water supplies that are consistent with state water policies or an alternate cooling system like dry cooling.

The final feasibility study should contain, but not be limited to, the following information:

I- Water Supply

- A. Potential sources of recycled water, its current and projected use, and alternative pipeline routes.
- B. Adequacy of recycled water supplies to meet plant operation demand (provide future projections of supply and demand considering annual volumes, monthly patterns of

plant water use vs. availability of water supply, and peak day supply and demand)

- C. Quality of existing and recycled water supplies
- D. Water treatment requirements for existing and recycled water supplies
- E. Cooling cycles of concentration for existing and potential recycled water supplies

II-. Cooling & Process Needs

- A. Consumptive water uses e.g.: cooling tower make-up, evaporative cooling of CTG inlet air, CTG compressor intercooling, and STG condensation; CTG NOx control; CTG power augmentation; boiler water makeup
- B. Space requirements for additional treatment of recycled water supplies vs. space available on the plant site
- C. Water balance diagrams for recycled water use and wastewater discharge for average and peak conditions to include distinctions in using existing vs. recycled water

III-. Wastewater Treatment Disposal

- A. Method (existing discharge via sewer system to WWTP, dedicated brine return line, deep well injection, or zero liquid discharge (ZLD) recovery)
- B. Available capacity & operating limitations

IV-. Economic Costs of Existing Source and Recycled Sources (where applicable)

A. Capital costs

1. water supply pipeline
2. water supply pumping station(s)
3. well(s)
4. water treatment system
5. wastewater pipeline & facility capacity charge
6. permitting (PM 10, Legionella, discharge quality and quantities)
7. Right of Way and Easement acquisitions
8. engineering, procurement, construction inspection and testing
9. biologic surveys/environmental assessment reports

B. Annual (operating and maintenance) Costs

1. existing and recycled water purchase cost
2. chemicals (cooling tower & water treatment)
3. labor
4. energy (water supply pumping, water .treatment)
5. wastewater discharge fee
6. solids disposal (class of waste, transportation & landfill fees)

- C. Project Life - Identify project life
- D. Total Project Cost (base case)
- E. Installed cost per watt
- F. Total Annualized Cost - expressed as the uniform end-of-year payment (A/P) of Capital Costs + Annual Costs
- G. Cost of Capital
- H. Debt to equity ratio
- I. Average debt service coverage ratio

V-. Expected Effects on Electric Customers

- A. Description of existing electricity rate structure and current rates to customers using existing water source
- B. Description of expected electricity rates to customers using recycled water over remaining life of the plant

VI- Environmental Considerations for the use of Recycled Water

- A. Describe the potential effects of recycled water use on the generation of hazardous waste and on the quality of its wastewater discharge
- B. Describe the potential impacts to public health through the use and discharge of recycled water
- C. Describe the potential effects of recycled water use and discharge on the degradation of water quality and its potential to be injurious to plant life, fish, and wildlife
- D. Describe potential effects on existing water rights or entitlements

VII- Discussion of applicable California Water Code provisions

SOIL&WATER-4-InjectionBanking Schedule

- a. The project owner shall inject one thousand (1000) acre-feet of SWP water within twelve (12) months of the commencement of the projects commercial operation.
- b. By the end of the four years and two months from the start of commercial operation, the project owner shall install and begin operation of a pre-injection ultraviolet (UV) disinfection system.
- c. By the end of the fifth year of commercial operation, the project shall submit a report to the CPM demonstrating that HDPP has maintained an average THM concentration level consistent with the WDR permit requirements.
- d. After the end of the fifth year of commercial operation, the project owner shall inject SWP water when it is available in excess of volumes needed to operate the project, up to a cumulative quantity of 13,000 acre-feet, subject to equipment capabilities and permit requirements. The amount of **injected SWP** water available to HDPP for extraction is equal to Injection minus Extraction minus Dissipation minus 1000 acre-

feet, as defined in **SOIL&WATER-6**.

- e. As a replacement of the project's injection groundwater bank, the project owner shall work with the MWA to seek a feasible agreement or modify existing agreements to allow the project to bank SWP water, for exclusive use in HDPP, in the Mojave River Basin through percolation using existing MWA facilities.**
- f. The project owner may continue to bank water by direct injection until the amount of water in the MWA bank for HDPP reaches 3,000 acre-feet (AF). Once the MWA water bank for HDPP reaches 3,000 AF, the project owner shall cease banking SWP water via direct injection.**
- g. The project owner shall achieve and maintain a combined bank (MWA bank and injection bank) of 9,000 AF, plus or minus 3,000 AF for use in any one year, by September 30, 2024. Prior to plant closure, the project owner may reduce the combined bank:**
- To 6,000 AF plus or minus 3,000 AF three years prior to plant closure;**
 - To 3,000 AF plus or minus 3,000 AF two years prior to plant closure;**
 - To 0 (zero) AF one year prior to plant closure.**

VERIFICATION: The project owner shall submit an installation and operation report describing the pre-injection ultraviolet disinfection system (UV) by the end of the fourth year of commercial operation. Forecasted estimates of SWP water to be injected shall be included in the quarterly Aquifer and Storage Recovery Well Report. The project owner shall submit a UV performance report by the fifth year of commercial operation. For other related items, see the verification to **Condition 5**. See also the verification to **Condition 12**. **If the project owner and MWA are able to reach an agreement or modify existing agreements regarding use of existing MWA facilities for the percolation and banking of SWP water for the exclusive use in HDPP, the project owner shall provide a copy of such agreement or modified agreements to the CPM within 30 days of their being finalized.**

SOIL&WATER-5 Calculation of Balance

- a. The amount of banked groundwater **as injected SWP water** available to the project shall be calculated by the CEC staff using the HDPP model, FEMFLOW3D. **The amount of MWA banked groundwater available for the exclusive use of HDPP, from SWP water percolated by MWA, shall be calculated by MWA or the Mojave Basin Area Watermaster.** The amount of banked groundwater available shall be updated on a calendar year basis by the CEC staff, taking into account the amount of groundwater pumped for the project during the ~~preceding~~ year and the amount of water banked by the project during the preceding year.

SOIL&WATER-6 Banked Water Available for Project Use

- a. The amount of banked groundwater available to the project during the first twelve (12) months of commercial operation is the amount of SWP water injected by the project owner into the High Desert Power Project (project) wells, minus the amount of groundwater pumped by the project owner, minus the amount of dissipated groundwater, and minus any amount described in SOIL&WATER-5(b).
- b. The amount of banked groundwater available to the project after the first twelve (12)

months of commercial operation is: **(1) the amount of SWP water percolated by MWA and (2) the amount of SWP water injected by the project owner into the project wells, minus the amount of groundwater pumped for the project owner, minus the amount of dissipated groundwater, minus one thousand (1,000) AF, and minus any amount described in SOIL&WATER-5(a)**

SOIL&WATER-12 The project owner shall prepare and submit to the CEC CPM and, if applicable, to the Lahontan RWQCB for review and approval, a water treatment and monitoring plan that specifies the type and characteristics of the treatment processes and identify any waste streams and their disposal methods. The plan shall provide water quality values for all constituents monitored under requirements specified under California Code of Regulations, Title 22 Drinking Water Requirements, from all production wells within two (2) miles of the injection wellfield for the last five (5) years.

The plan shall also provide SWP water quality sampling results from Rock Springs, Silverwood Lake, or other portions of the East Branch of the California Aqueduct in this area for the last five (5) years. Also identified in the plan will be the proposed treatment level for each constituent based upon a statistical analysis of the collected water information. The statistical approach used for water quality analysis shall be approved prior to report submittal by the CEC CPM and, if applicable, the RWQCB. Treatment of SWP water prior to injection shall be to levels approaching background water quality levels of the receiving aquifer or shall meet drinking water standards, whichever is more protective. The plan will also identify contingency measures to be implemented in case of treatment plant upset.

The plan submitted for approval shall include the proposed monitoring and reporting requirements identified in the Report of Waste Discharge (Bookman-Edmonston 1998d) with any modifications required by the RWQCB.

VERIFICATION: Ninety (90) days prior to **banking-injection** of SWP water within the Regional Aquifer, the project owner shall submit to the Lahontan RWQCB and the CEC CPM a proposed statistical approach to analyzing water quality monitoring data and determining water treatment levels. The project owner shall submit the SWP water treatment and monitoring plan to the CEC CPM and, if appropriate, to the Lahontan RWQCB for review and approval. The CEC CPM s review shall be conducted in consultation with the MWA, the VVWD, and the City of Victorville. The plan submitted for review and approval shall reflect any requirements imposed by the RWQCB through a Waste Discharge Requirement.

SOIL&WATER-13 The project owner shall implement the approved water treatment and monitoring plan. All **banked-injected** SWP water shall be treated to meet local groundwater conditions as identified in Condition **SOIL&WATER-12**. Treatment levels may be revised by the CEC and, if applicable, by the RWQCB, based upon changes in local groundwater quality identified in the monitoring program not attributable to the groundwater banking program. Monitoring results shall be submitted annually to the CEC CPM and, if applicable, to the RWQCB.