

WR-1 WATER QUALITY STUDY PLAN

**KERN RIVER NO. 3 HYDROELECTRIC PROJECT
*FERC PROJECT No. 2290***

PREPARED FOR:



July 2022

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1.0 POTENTIAL RESOURCE ISSUE

- Kern River No. 3 Hydroelectric Project (Project) operations have the potential to alter water temperatures and dissolved oxygen (DO) concentrations, which may affect suitable habitat for fish and other aquatic species.

2.0 PROJECT NEXUS AND HOW THE RESULTS WILL BE USED

- Project diversions affect streamflows, which may affect water temperatures and DO concentrations in the North Fork Kern River (NFKR) below Fairview Dam, Salmon Creek below the Project diversion, Corral Creek below the Project diversion, and the NFKR downstream of the Kern River No. 3 (KR3) Powerhouse.
- The Project provides water-related recreation opportunities, which may contribute to elevated bacteria concentrations in the Project Area.
- Additional data are needed to characterize water temperature, DO, and bacterial levels in the Project Area.
- Results will be used to assess Project-related effects on aquatic habitat and determine when the Regional Water Quality Control Board (RWQCB) water quality objectives related to stream temperatures, DO concentrations, and bacteria levels are met.

3.0 STUDY GOALS AND OBJECTIVES

- Collect current stream water temperature data to characterize current water temperatures during summer months.
- Collect current DO monitoring data to characterize current DO concentrations during summer months.
- Collect current fecal coliform data to characterize bacterial concentrations.

4.0 STUDY AREA AND STUDY SITES

4.1. TEMPERATURE AND DISSOLVED OXYGEN MONITORING SITES

Temperature monitoring and DO measurements will occur at ten sites: seven locations within Project-affected reaches and three comparison sites along stream reaches upstream of Project operations (Figure 4-1):

Site 1: WQ-NFKR-19.0: NFKR upstream of Fairview Diversion impoundment pool

Site 2: WQ-NFKR-18.5: NFKR immediately downstream of Fairview Dam

Site 3: WQ-NFKR-10.9: NFKR at Gold Ledge Campground

Site 4: WQ-NFKR-3.2: NFKR immediately upstream of the KR3 Powerhouse

Site 5: WQ-NFKR-3.0: NFKR downstream of the KR3 Powerhouse

Site 6: WQ-NFKR-1.2: NFKR at the existing Kernville U.S. Army Corps of Engineers gage

Site 7: WQ-CC-1.4: Corral Creek upstream of the Project diversion

Site 8: WQ-CC-0.4: Corral Creek upstream of its confluence with the NFKR

Site 9: WQ-SC-0.55: Salmon Creek upstream of the Project diversion

Site 10: WQ-SC-0.05: Salmon Creek upstream of its confluence with the NFKR

4.2. FECAL COLIFORM SAMPLING SITES

Fecal coliform samples will be collected at a subset of the temperature and DO monitoring sites listed below:

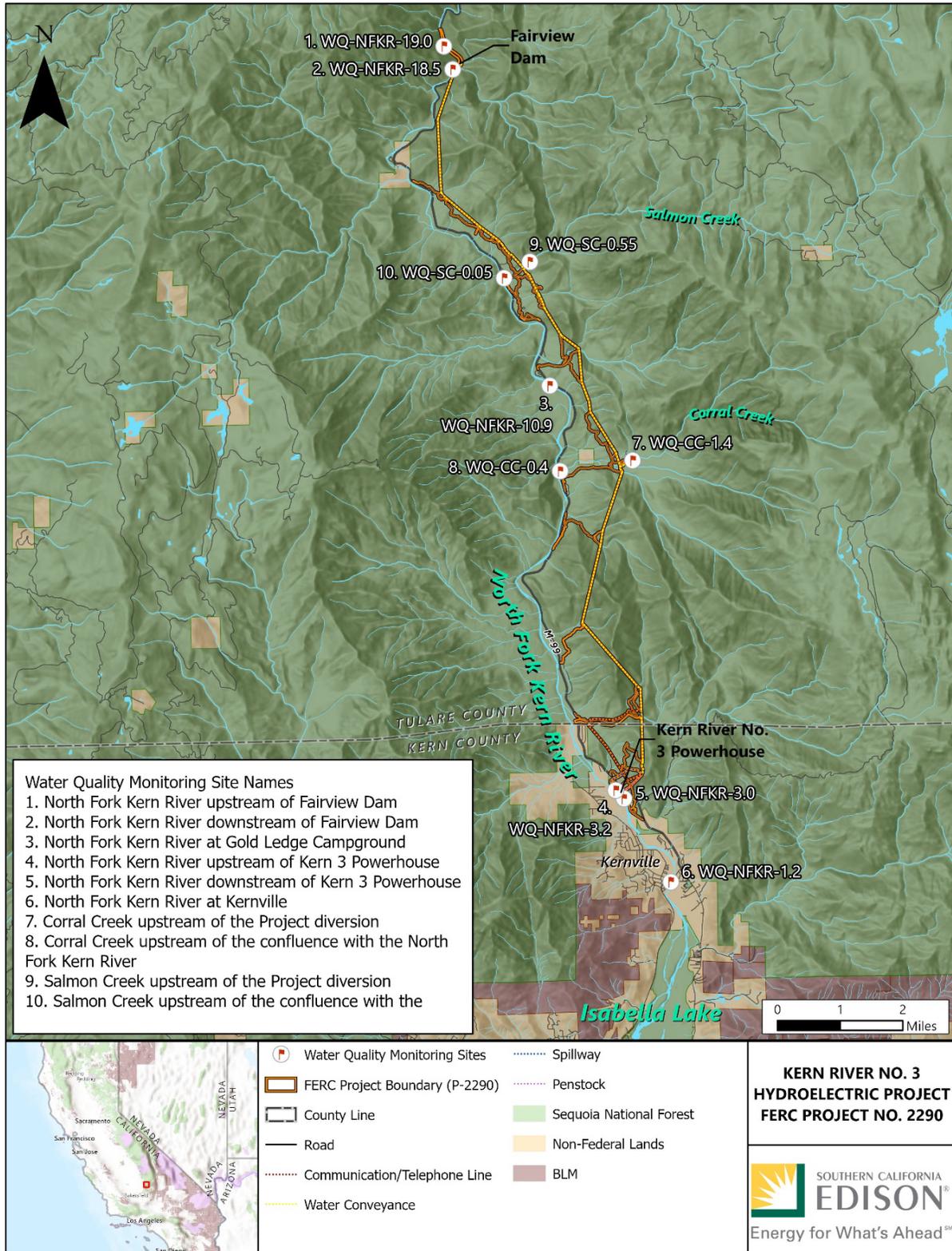
Site 1: WQ-NFKR-19.0: NFKR upstream of Fairview Diversion impoundment pool

Site 3: WQ-NFKR-10.9: NFKR at Gold Ledge Campground

Site 4: WQ-NFKR-3.2: NFKR immediately upstream of the KR3 Powerhouse

Site 8: WQ-CC-0.4: Corral Creek upstream of the confluence with the NFKR (if flow is present)

Site 10: WQ-SC-0.05: Salmon Creek upstream of the confluence with the NRKR (if flow is present)



BLM = Bureau of Land Management

Figure 4-1. Water Quality Study Monitoring Sites.

5.0 EXISTING INFORMATION

The KR3 Project Pre-Application Document (September 2021) reviewed the existing, relevant, and reasonably available information associated with water quality in the three Project bypass reaches. Water quality in the NFKR within the Project Vicinity is typical of west slope Sierra Nevada mid-elevation rivers, with low concentrations of minerals, metals, and nutrients; low turbidity; and DO near 100 percent saturation. Water temperature in the NFKR supports a variety of aquatic resources including both coldwater and transitional zone fish assemblages, as temperatures vary seasonally from lows during peak snowmelt period to highs at or above 20 degrees Celsius (°C) in late summer, including upstream of the Fairview Dam Bypass Reach.¹

The following sources were also used and reviewed when developing this study plan:

- Central Valley RWQCB—beneficial use designations and DO objectives
- U.S. Forest Service—Sportfish and Forest Service Sensitive species
- California Department of Fish and Wildlife—Fish (sportfish and California special-status species)

To capture additional years of summer water temperature and DO information, SCE initiated early data collection between June and September 2021 at the same locations described below in this study plan. The results of the 2021 monitoring event will be included as part of the Technical Memo prepared for either the ISR or USR filing.

6.0 STUDY APPROACH

- Water Temperature Monitoring
 - Continuous water-temperature data loggers (e.g., Onset HOBO) will be installed at the sites identified above. Both prior to and after deployment, quality control calibrations will be performed on each unit. Data loggers will be placed inside protective housing and then installed in each stream segment at a location representative of the main channel.
 - Data loggers will be deployed starting June 1, 2022, and will collect data for 12 months (through May 31, 2023) to capture summer shoulder (fall and spring) and winter seasons.
 - Coordinates of each logger after installation will be recorded using a Global Positioning System (GPS) unit.

¹ The Fairview Dam Bypass Reach is defined as the 16-mile bypass reach of the NFKR between Fairview Dam and the KR3 Powerhouse trailrace.

- Water temperature will be recorded at 15-minute intervals and summarized as daily means, maxima, and minima.
- All loggers will be checked approximately monthly during the summer deployment, during which time data will be downloaded from each unit. Loggers deployed over winter and early spring will be checked approximately monthly, or as flow and weather conditions allow; there is an increased potential for logger and or data loss over the winter and into early spring due to high-flows conditions. Data loggers will be placed in locations with sufficient circulation, yet also protected from high scouring flows.
- Two thermographs will be installed at each site to provide redundancy in the case of tampering or vandalism.
- DO Monitoring
 - Continuous DO data loggers (e.g., Precision Measurement Engineering, Inc. [PME] miniDOT) will be installed at the sites identified in Section 4.1 above.
 - Data loggers will be deployed between June 1 and September 30, assuming safe access to the stream channel. Both prior to and after deployment, quality control calibrations will be performed on each unit. Data loggers will be placed inside protective housing and then installed in each stream segment at a location representative of the main channel.
 - Coordinates of each logger after installation will be recorded using a GPS unit.
 - DO concentrations will be recorded at 15-minute intervals and summarized as daily means, maxima, and minima. Loggers will be checked approximately monthly during deployment, during which time data will be downloaded from each unit.
 - Data loggers will be placed in locations with sufficient circulation, yet also protected from high scouring flows.
- Bacterial Sampling
 - Sampling for fecal coliform will occur at sites listed in Section 4.2 above. Samples will be collected from just below the water surface as a composite sampling from a well-mixed area at each stream site. Samples will be collected on, at minimum, five separate dates during the summer within a 30-day period and will include the Labor Day holiday weekend (i.e., August through September 2022). Samples will be collected in sterilized bottles supplied by a certified Environmental Laboratory Accreditation Program analytical laboratory. Field sampling personnel will fill each sample bottle by direct immersion in the river. Immediately after collection, samples will be placed on ice for transport to the analytical laboratory within the required field hold time (Table 6-1).

Table 6-1. Bacterial Sampling Methods

| Parameter | Method | Target Reporting Limit | Hold Time |
|----------------|----------|------------------------|-----------------|
| Fecal Coliform | SM 9221E | 1.8 MPN / 100 mL | 8 hours at 4 °C |

°C = degrees Celsius; MPN = most probable number; mL = milliliter

7.0 REPORTING

SCE will file an Initial Study Report (ISR) within 1 year following FERC’s Study Plan Determination (estimated August 3, 2023) and an Updated Study Report (USR) no later than 2 years after FERC’s Study Plan Determination. The ISR and USR will provide an update on SCE’s overall progress in implementing the Study Plan and schedule and the data collected, including an explanation of any variance from the Study Plan and schedule. A Technical Memo will be appended to either the ISR or USR filing, as applicable. Associated data files, which will include tabularized results, graphics, and other data and material specifically identified above, will be included with the Technical Memo, and relevant data will be included as appendices to the Technical Memo, as well as in electronic format upon request. The information provided in the Technical Memo will be summarized in, and appended to, the Application for New License.

In addition, SCE may prepare interim reports during the study year to apprise Stakeholders on study implementation progress and to support consultation with Stakeholders.

8.0 SCHEDULE

| Date | Activity |
|-------------------------|--|
| Spring 2022–Spring 2023 | Deploy temperature and DO loggers; Collect bacterial samples |
| Spring 2023 | Analyze data and prepare Technical Memo |
| August 2023 | Provide Technical Memo with ISR |

DO = dissolved oxygen; ISR = Initial Study Report

9.0 LEVEL OF EFFORT AND COST

The estimated cost (2022 dollars) for the study is \$65,000, which includes study-specific consultation, field work, data compilation and analysis, and reporting.

10.0 REFERENCES

None.