IDAHO DEPARTMENT OF FISH AND GAME
SOUTHWEST REGION
3101 South Powerline Road
Nampa, Idaho 83686

Brad Little / Governor
Ed Schriever / Director

May 17, 2019

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: Pre-Application Document for the Barber Dam Hydroelectric Project; Project No. 4881

Dear Ms. Bose,

The Idaho Department of Fish and Game ("Department") has reviewed the Pre-Application Document ("PAD") for the Barber Dam Hydroelectric Project (Project No. 4881; "Project"). Fulcrum, LLC and Ada County are co-licensees of the Project and are applying to the Federal Energy Regulatory Commission ("FERC") to renew the existing license. The Project is located on the Boise River at river mile 58.9 in the City of Boise, approximately 4 miles downstream of Lucky Peak Dam and approximately 2 miles downstream of the Boise River Diversion Dam, which diverts water to the New York Canal. The Project facility includes a 1100-ft. long, ca. 35-ft. high embankment dam; a 400-ft. long, 25-ft. high concrete-capped timber crib spillway section; a powerhouse containing two 1.85 megawatt turbine/generator units; and 60 ft. of underground transmission.

The purpose of these comments is to assist FERC by providing technical information addressing potential effects on fisheries, wildlife, and habitat and how any adverse effects might be mitigated. It is not the purpose of Idaho Department of Fish and Game to support or oppose this proposal. Resident species of fish and wildlife are property of all Idaho citizens, and IDFG and the Idaho Fish and Game Commission are expressly charged with statutory responsibility to preserve, protect, perpetuate and manage all fish and wildlife in Idaho (Idaho Code § 36-103(a)). In fulfillment of our statutory charge and direction as provided by the Idaho Legislature, we offer the following comments and suggestions.

General Comments

The Project has potential to directly affect fisheries in the Boise River by impeding fish passage, reducing water quality, and altering flow regime. The applicants assume run-of-river operations have minimal effects on the river's biota. For example, they propose the Project will have "minimal effects on the fishery resources in the lower Boise River" (*4.4.3 Effects of Project on Temporal and Spatial Distribution and Any Associated Trends*). Additionally, in *Section 5.1*

Issues Pertaining to the Identified Resources, the PAD identifies a run-of-river operational framework to be a key element of protections of natural resources and ecological functions, including fish, wildlife, and wetlands. More to the point, the applicant's intention to manage for run-of-river conditions is cited as a reason why they are not proposing additional "protection, mitigation, or enhancement measures."

The Project may affect Boise River fisheries in several ways. The Project's dam impedes movement of fish because the structure does not provide upstream passage. The headpond, turbine works, and spillway may affect water quality, including sediment, temperature, and gas levels, which may affect fish and other aquatic organisms. Water management through the Project causes flow fluctuations which may adversely affect habitat and demographics of fish and macroinvertebrate populations (e.g., Gibeau et al. 2017). The Project may also affect bedload transport and large woody debris dynamics, which influence stream bed characteristics and instream habitat characteristics, as well as riparian vegetation and bank stability.

The lower Boise River is an economically important fishery to the region and the state. The Department spends a substantial amount of time and effort monitoring and evaluating the fish populations within the lower Boise River and working to improve the river's habitat. Recent fisheries surveys have included long-term trend monitoring of wild trout populations as well as assessments of harvest, use, and reproduction. These surveys indicate the river's trout populations, especially wild rainbow trout, increased substantially from the 1990s through 2010, coinciding with the institution of stable winter flow maintenance. Since then, abundances have plateaued. Department monitoring indicates that wild trout populations, while overall healthy, likely reached carrying capacity based on the river's habitat limitations. Because the lower Boise River is habitat limited, the Department is continually looking for opportunities to improve existing habitat.

The Department's Fisheries Management Plan 2019 –2024 ("FMP") provides direction for Boise River fisheries management. Objective 2 for the Boise River fishery (FMP pg. 263) directs Department staff to "Seek improved land and water management practices that significantly protect and enhance fish habitat." A strategy for achieving this goal is to "[c]ollaborate with other agencies and private entities for opportunities to protect or improve fish habitat, enhance flows, and remove migration barriers." Objective 4 for the Boise River fishery (FMP pg. 264) directs Department staff to "[s]eek changes to reservoir management and stream flows that benefit fish." The accompanying strategy is to "[c]ontinue to seek moderation of rapid increases or decreases of flow in the Lower Boise River for flood control or due to Barber Dam operations.

Relationship of Barber Dam operations to flow management

The PAD describes operations (*Section 3.4 Current Project Operations*) as follows:

> The Project is operated in a run-of-river mode using automatic pond level control of the turbine-generator units. The headpond level is maintained at the spillway crest so that all inflow is spilled upon unit trip or shut-down. Generally, the control system's pond level setpoint (i.e., the water level that the system is programmed to maintain) is seasonally adjusted. During the irrigation season (April–October), the pond level setpoint is normally set just above the crest of the

> spillway, resulting in a small amount of flow passing over the full width of the spillway at all times and ensuring that water will immediately begin flowing over the spillway following an outage. During the winter (November–March), the pond level setpoint is normally lowered to 0.04 foot (~ 0.5 inch) below the spillway crest to prevent ice buildup on the surface of the spillway, which could damage the concrete.

In this description, the PAD describes the dam operator's practice of maintaining the headpond level at the spillway crest "so that all inflow is spilled upon unit trip or shutdown." In other words, run-of-river operations would be maintained when any interruption of flow through the turbine units is immediately compensated by simultaneous increased volume over the spillway. However, this section also describes the practice of holding headpond level below the spillway crest during winter to prevent ice buildup on the spillway. Under this operational scenario, a complete or partial interruption of flow through the turbines would not result in immediate flow over the spillway. Instead, no flow would pass over the spillway until the pool level raises 0.04 ft. to reach the spillway crest. Typical winter flows are currently 240 cfs. If flow through the turbines is completely interrupted, no water would discharge below the dam for at least 9 minutes, assuming a 75-acre surface area of the impoundment behind the dam as stated in *Section 3.2.3 Impoundment*. The resulting flow fluctuation would dewater portions of the river bed and propagate downstream.

The PAD addresses previous license compliance in *Section 3.5.4 Compliance History* and characterizes a February 2015 interruption of downstream flow as the one time the Project has not complied with its license. In February 2015, the river was dewatered when the turbines shut down while the headpond height was 3 ft. below the spillway for a dam maintenance project (February 24, 2015 letter from Fulcrum to FERC). This event interrupted river flow for approximately 7 hours before flow over the spillway resumed.

The PAD described IDFG conclusions regarding effects on fisheries as follows: "Idaho Department of Fish and Game (IDFG) surveyed the river downstream of the dam for incidences of fish kill or other wildlife impacts and concluded that the flow variation event did not substantially affect adult or most juvenile fish." However, that description does not completely characterize the Department's conclusions. In a February 24, 2015 letter from the Department to FERC, the Department described its staff activities and findings following the event. In this letter, the Department identified concerns about "negative impacts to aquatic macro-invertebrates and young-of-the-year fish of certain species (fall-spawning species), especially wild brown trout eggs or recent hatchlings."

Following the February 2015 event, the applicants improved the system for notifying dam operators and partnering agencies in the event of any interruption of operations (*Section 3.5.4 Compliance History*). However, the notification system does not solve the flow interruption problem. The current configuration of the facility and operation of the pool height creates the potential for flow interruptions anytime water is not passing over the spillway. Flow can be maintained only with immediate discharge to the downstream river channel when flow through the turbines is interrupted. Shortened operator response time may reduce the duration of the flow

interruption but does not solve the structural and operational constraints that lead to flow interruptions.

The Department is aware of other flow fluctuations affecting downstream flow rates and river stage. The July 31, 2018 letter from Sawtooth Law Offices to Ada County included in the PAD (unnumbered page; 144th page of the document) describes such events. Department staff have communicated with Fulcrum, LLC staff about other events. However, the PAD does not discuss or summarize events other than the February 2015 event. As stated previously, flow fluctuations may adversely affect fish populations or other aquatic organisms, particularly when such fluctuations dewater portions of the stream channel. For that reason, the Department recommends the applicants include a description of these events in their Draft License Application.

Boise River Streamflow Maintenance

The PAD states in *Section 4.3.1 Hydrology and Streamflow*:

> Low flow conditions, approximately 250 cfs, generally begin in mid-October when irrigation diversions end. The low flow period extends until flood control releases begin, sometime between the end of January and March. Flood flows generally extend through June, and releases for irrigation control flows from July through mid-October (IDEQ, 1999).

The United States Bureau of Reclamation (BOR) manages reservoir storage in Lucky Peak Reservoir within the terms of Water Right No. 63-3618. This water right includes storage of 152,300 acre-feet for the beneficial use of streamflow maintenance, and the license for this right includes a condition that "The Bureau of Reclamation and Idaho Department of Fish and Game shall provide joint written instructions to the Director [of Idaho Department of Water Resources], for conveyance to the watermaster, regarding release of the Lucky Peak streamflow maintenance storage water." Current reservoir discharge establishes a winter flow of 240 cfs using this storage account when flood releases or releases for irrigation are not in effect. Irrigation diversion is typically reduced in mid-October and resumes April 1. Reservoir discharge for the purpose of flood control often occurs during late February and March.

Recommendations

At this time the Department is primarily concerned with anthropogenic flow fluctuations caused by this project and the potential for adverse effects on economically important fisheries. To avoid, reduce, and mitigate these effects, the Department recommends that the applicants consider the following in their Draft License Application:

- Applicants develop operational or structural solutions addressing flow variations before licensure by FERC.

- The new license contain conditions to ensure run-of-river flows through the Project independent of turbine operation.

- Establish methods for monitoring change in discharge through the Project. Currently, effects on discharge through the project must be inferred from existing upstream and downstream gages, which are located outside the project area and subject to influences outside the project area (e.g., diversions or tributaries between the gages and the Project). Establishing accountability for effects on resources related to flow fluctuations requires a system for accurately monitoring the Projects effects on river flow.

- Establish a protocol for investigating and studying environmental effects of irregular Project operations, including interruptions of flow.

- Establish a fisheries mitigation plan. Such a plan may comprise mitigations for (1) downstream effects on fisheries resulting from facility malfunctions or other unanticipated events, (2) effects on downstream habitat, including water quality, caused by the dam structure or dam operations, and (3) the effects of interrupted fish passage.

The Department appreciates the opportunity to provide information pertinent to the proposed project. Please contact Bill Bosworth in the Southwest Region office at (208) 465-8465 if you have any additional questions concerning this letter.

Sincerely,

Bradley B. Compton
Southwest Regional Supervisor

BBC/WRB

cc: John Cassinelli, IDFG Fisheries, SW Region-Nampa
Joe Kozfkay, IDFG Fisheries, HQ
Gary Vecellio, IDFG HQ Director's Office

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Enclosure: February 24, 2015 letter from the Department to FERC

Literature Cited

Gibeau, P., B.M. Connors, and W.J. Palen. 2017. Run-of-River hydropower and salmonids: potential effects and perspective on future research. Can. J. Fish. Aquat. Sci. 74: 1135-1149.

IDAHO DEPARTMENT OF FISH AND GAME
SOUTHWEST REGION
3101 South Powerline Road
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C.L. "Butch" Otter / Governor
Virgil Moore / Director

February 24, 2015

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Biological impacts of Lower Boise River flow cessation at Barber Dam Hydroelectric Project (FERC No. 4881-026); Power Outage Incident of February 3 and 4, 2015.

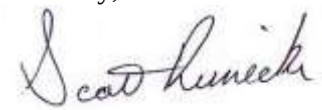
Dear Secretary Bose:

The cold-water section of the Lower Boise River from Lucky Peak Dam downstream to approximately Middleton is a popular and highly-valuable trout fishery. A recent use and economic survey indicated that anglers took 63,562 trips to the Boise River in Ada County during 2011 and expended $2,894,343 in trip-related expenses. This wouldn't have been possible two decades ago, simply because trout numbers and, therefore, angling interest were low. Since 1994, wild trout populations have increased substantially. Increases can be linked to higher, more stable, and more consistent winter flows as well as to improved water quality, and increased prevalence of selective harvest practices by many anglers. In addition to trout, the Lower Boise River provides habitat for several other native fish species including mountain whitefish, Umatilla dace, speckled dace, longnose dace, mottled sculpin, largescale sucker, bridgelip sucker, mountain sucker, northern pikeminnow, and chiselmouth.
On the morning of February 4th, 2015, IDFG regional staff was informed by our headquarters staff that Lower Boise River flows were much lower than normal. Apparently, flow decreased to zero cfs at Barber Dam in the middle of the night, decreasing water levels and flows in a portion of the river for about 8-10 hours. The length of river affected by these occurrences in not known, but flows were reduced up to 12 miles downstream, according to the Glenwood Bridge flow gauge. By morning, flows were beginning to increase, but had not yet reached the normal level for this time of year (240 cfs).Upon hearing the news, regional staff gathered float equipment and proceeded to Barber Dam to search for dead and or stranded fish. We launched at approximately 1300 h and floated from Barber Dam to West Parkcenter Bridge, a distance of about five miles. Along the way, we stopped at approximately 10 locations to visually scan near-shore cobbles for dead or stranded fish. By 1400 h, it became apparent that flow was higher than normal for this time of year (greater than 240 cfs). We found no dead fish during this effort. The following day, regional staff returned for further inspection. Staff backpack electro-fished two riffles just downstream of the Ridenbaugh diversion dam, about 0.6 miles downstream of Barber Dam. During these efforts, they sampled an "abundance" of sculpin of all sizes, a few live young, rainbow trout (age 1), and visually observed two dead young fish on the near-shore cobbles (a sculpin and a young brown trout). IDFG plans no additional surveys at this time, except for normal future monitoring efforts (triennial interval). Our ability to fully assess the impact or lack thereof from this event is compromised by several factors. A flow spike to about 500 cfs after de-watering and during our inspections may have prevented us from finding dead or stranded fish, if there were many, by flushing them downstream. Secondly, IDFG does not estimate the abundance of most small fish species, such as dace, sculpin, and sucker, only

species presence. Primarily, our surveys are designed to estimate the abundance of trout and whitefish longer than 4" in length. These sorts of surveys were completed most recently during 2013 and will be repeated during 2016. Despite these limitations to our cursory assessment, we believe that very few adult-sized fish were killed when the Lower Boise River was de-watered. It is likely that most adult-sized fish were able to move to stagnant pools of water until flow resumed. We have evidence that some juvenile fish were killed; however, estimating a total number for the affected area or as percent of the population is not possible. In contrast to our lack of suspected effect to juvenile and adult-sized fish, we suspect negative impacts to aquatic macro-invertebrates and young-of-the year fish of certain species (fall- spawning species), especially wild brown trout eggs or recent hatchlings. Wild brown trout are known to spawn in or near river bank margins or in other shallow water habitats in the affected reach. Similarly, very young mountain whitefish, another fall spawning game fish, were likely to have been negatively affected. The 2016 fish survey may provide information as to what extent this year class of wild brown trout and mountain whitefish were affected.

Lastly, many cold-water fish species rely on aquatic macro-invertebrates as food. There is abundant scientific literature that documents the effects of rapid drawdowns to aquatic macro-invertebrate communities. We believe abundance and diversity of macro-invertebrates in the affected area was reduced due to desiccation and catastrophic drift. Once again, we cannot calculate a numerical estimate of the impact to the aquatic macro-invertebrate community as little pre-event or baseline data exists. In summary, IDFG has evidence or has concluded using professional judgment that flow cessations at Barber Dam did not impact adult or most juvenile fish substantially. In contrast, we conclude that aquatic macro-invertebrates and young of the year brown trout and mountain whitefish were likely impacted negatively. If you have any questions, please contact Joe Kozfkay, our Southwest Regional Fish Manager.

Sincerely,



Scott Reinecker
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