



United States Department of the Interior

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July 31, 2020

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

Subject: Comments on the Notice of Application for Preliminary Permit for the Big Canyon Pumped Storage Project, Federal Energy Regulatory Commission (FERC) No. 15024-000, Coconino County, AZ (**ER 20/0239**)

Dear Ms. Bose:

The U.S. Department of the Interior (Department) has reviewed the June 2, 2020, Notice of Application for Preliminary Permit for the Big Canyon Pumped Storage Project, which would be located about 23 miles west of Tuba City, in Coconino County, Arizona. On March 12, 2020, Pumped Hydro Storage LLC filed an application for a preliminary permit, pursuant to section 4(f) of the Federal Power Act (FPA), proposing to study the feasibility of a pumped storage project in Big Canyon, a tributary to the Little Colorado River (LCR). The Department offers the following comments on the application, which include contributions from the Department's U.S. Fish and Wildlife Service (Service), National Park Service (NPS) and Bureau of Indian Affairs (BIA). We organized our comments by resource area.

Per the preliminary permit application, the proposed pumped storage project (Project) would be located entirely on Navajo Nation tribal trust lands. The estimated annual power generation at the Project would be 7,900 Gigawatt-hours. The Project does not propose to dam the LCR as the other two proposals from the applicant in this same area (P-14992 and P-14994). In this proposal, Pumped Hydro Storage is proposing to extract groundwater, bring it to the surface where it would fill three different surface reservoirs, and build a fourth, lower reservoir to generate power (discharge) as water moves down through a turbine and draws power as it pumps water (recharge) to the upper reservoirs.

Fish and Wildlife Resources

Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, requires Federal agencies to consult with the Service to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Since the proposed Project area would affect listed species and designated critical habitat, section 7(a)(2) consultation with the Service would be required if FERC approved the proposed application.

Humpback chub

The humpback chub (*Gila cypha*, chub) is a fish endemic to the warm-water portions of the Colorado River system of the southwestern United States. The humpback chub is listed as endangered under the ESA throughout its historical range in the states of Arizona, Colorado, Utah, and Wyoming (50 CFR 17.11 & 17.12). The historical range of the species includes portions of the Colorado, Green, and Yampa rivers, but the construction of mainstream dams reduced the range in canyon areas. The construction of Flaming Gorge (Hideout Canyon) and Hoover dams (Black Canyon) caused the extirpation of two of eight documented humpback chub populations (USFWS 2017). The Service and partners manage humpback chub as two units, the 'Upper Basin' and 'Lower Basin,' separated by Glen Canyon Dam. There are currently only five extant chub populations, including four upstream of Lake Powell (Black Rocks, Westwater Canyon, Desolation/Gray canyons, and Cataract Canyon) and one downstream of Lake Powell (Grand Canyon, which includes the LCR). All extant chub populations have historically experienced periods of decline. The Grand Canyon/LCR chub population increased from minimum levels observed in the early to mid-2000s; has been stable since 2008 and represents the largest remaining population in existence (USFWS 2017).

In the Lower Basin, humpback chub reproduction in the LCR sustains the entire Grand Canyon Humpback Chub population (Yackulic *et al.* 2014). Therefore, the LCR is a significantly important stream for the endangered humpback chub across the range of the species. The lower 12.9 km (8 miles) of the LCR is designated critical habitat (as is the mainstem Colorado River in Grand Canyon), and is the principal spawning area for the species in the Lower Basin of the Colorado River. In addition, the LCR provides habitat and food for the core population of humpback chub in the Grand Canyon. Big Canyon, the site of the proposed Lower Dam, is a major tributary to the LCR. Although, the proposed action is not physically located within the LCR, the drilling of wells into the aquifers that supply water to the LCR, as well as the modification of seasonal flow from Big Canyon into the LCR is likely to have adverse hydrological effects on the LCR that may also negatively affect the future condition of the humpback chub.

The proposed surface location of the groundwater wells is over alluvium of the LCR, with adjacent/underlying bedrock in the Redwall and Muav limestone (regional R-aquifer). Groundwater wells in this location would likely withdraw water from one or both aquifers. The Redwall Limestone has low porosity except where solution-enhanced fractures and voids are present and would not be a reliable water source, especially as the proposed location is near the bottom of this geologic section, with underlying geology (Bright Angel Shale) considered to be non-water bearing (Bills *et al.* 2007). The shallow alluvium of the LCR is therefore the most feasible target for the source of water for this Project, which would result in reduced surface flows in the LCR.

The lower 13-mile stretch of the LCR is perennial because of spring flow from the Redwall and Muav Limestones (Hart *et al.* 2002). The proposed groundwater well location is near several significant locations of groundwater discharge to the LCR where reductions in flow would translate into reductions to baseflow in the LCR. These groundwater discharge areas include: Blue Springs (located 4.4 miles south of the proposed wells); the Sipapu (a flowing travertine mound located 2 miles downstream of the proposed wells); and the Salt Mines, a groundwater discharge site (located 5.5 miles west of the proposed wells, near the confluence of the LCR and

Colorado River). We do not fully understand the nature and extent of groundwater-surface water interactions in this area, so it is unclear how alluvial groundwater withdrawal might affect bedrock groundwater discharge. However, unquantified groundwater gain and/or loss is occurring along the axis of the LCR, especially along the section of the river which crosses exposure of the Regional R-aquifer (Blue Spring complex), roughly from just upstream of Blue Spring to approximately the lower confining unit (the Bright Angel Shale) of the R-aquifer, about 1 mile downstream of the proposed wells. Several mapped north-south trending faults cross the LCR through this section, which may act as conduits for groundwater flow. There are also additional unmapped springs downstream of Blue Springs that discharge from the Muav limestone (Hart *et al.* 2002), which may be affected by groundwater withdrawals within the proposed Project area.

The proposed reservoirs will exchange water and biota; including nonnative aquatic species that will reproduce rapidly within the reservoirs. Large runoff events will occur in the Big Canyon reservoir and spill water and nonnative fish into the LCR and Colorado River. The likely addition of new and more frequent additions of nonnative fish will have significant effects on aquatic resources including humpback chub.

In summary, the proposed groundwater pumping, particularly combined with ongoing drought conditions, will reduce the LCR's baseflow in humpback chub critical habitat. The reduction in baseflow from the proposed Project, would negatively affect the ability of the chub to sustain its population in the LCR by altering water temperature and chemistry, reducing habitat, and affecting travertine dam development. Further, the Project will likely provide a new source of nonnative species that will negatively affect humpback chub. If constructed as proposed this Project could change the Service's assessment of projected future condition for the humpback chub (USFWS 2017).

Flannelmouth and bluehead suckers

The LCR also provides high quality habitat for the native flannelmouth (*Catostomus latipinnis*) and bluehead (*Catostomus discobolus*) suckers. The Service, NPS, Reclamation, tribes, multiple states, and many other partners are signatories to a three species, range-wide candidate conservation agreement (UDNR 2006) committed to active conservation of these two suckers, as well as the roundtail chub (*Gila robusta*). In part, the signatories aimed the agreement and concomitant actions at reducing the likelihood of listing additional species as threatened or endangered under the Endangered Species Act. The LCR is important adult, spawning, and nursery habitat for these species, and the proposed action would negatively affect the status of these species in the LCR, and in the Colorado River in Grand Canyon National Park.

Migratory Birds and Raptors

The preliminary permit application includes two new double circuit 500 kV electric transmission lines from the Project switchyard near the proposed powerhouse to the existing 500 kV and 345 kV transmission lines located 14 miles east of the Project. Electrocution on power lines is a major threat to birds, in particular birds of prey such as the golden eagle (*Aquila chrysaetos*) and other raptors that occur within the Project area. In addition, collisions with electric utility lines kill between 8 million and 57 million birds in the United States annually. Combined with electrocutions, bird fatalities resulting from electric utility lines have been a long-standing bird

conservation issue. Even though we need more research in this area, experts recommend a number of options for reducing bird collisions with transmission lines (*see* APLIC 2012).

Water Resources

Periodic high flows serve to scour the LCR of accumulated sediment and to break up some of the travertine that builds up over time because of the calcium carbonate precipitate characteristic of the stream. Researchers related strong year classes of humpback chub to high spring flow in the LCR, indicating that high flows cleanse marl (unconsolidated sedimentary rock consisting of clay and lime), sediment, and precipitate from the system, stimulate food production, and enhance survival of eggs and larvae (Gorman and Stone 1999, Van Haverbeke *et al.* 2013). Both the base flow provided by Blue Spring, and the periodic high spring flows provided by snow-melt runoff are important in maintaining suitable spawning conditions for the aquatic species (including humpback chub) in the LCR. The proposed Project would significantly affect the baseflow in the LCR, which would affect the magnitude, frequency, duration, timing, and rate of change of the LCR flow regime and demonstrably affect both aquatic and terrestrial resources.

Land Resources

Grand Canyon National Park was established to preserve and protect the natural and cultural resources, and ecological and physical processes of the Grand Canyon along with its scenic, aesthetic, and scientific values for the benefit and enjoyment of the public. Although the proposed Project is located on Navajo Nation lands adjacent to the Grand Canyon National Park boundary, it could significantly affect park resources by creating major changes in the Little Colorado River. The application for a preliminary permit identifies Grand Canyon National Park as an entity likely interested in, or affected by, the application. As the NPS has a responsibility to protect the resources and values of Grand Canyon National Park, the NPS would like to discuss these concerns in more detail if this Project proceeds further.

The preliminary permit application states that the applicant will conduct geotechnical studies at the proposed dams, reservoirs, and tunnel locations by borehole drilling samples and test pits. The application also states that they will take measures to avoid or minimize disturbance at the drilling locations, test pits will be backfilled to return the site as much as possible to natural conditions, and that the methods to mitigate disturbances will be coordinated with the Navajo Nation Council. We recommend the applicants also coordinate with the Service, NPS, and all affected tribes prior to conducting these studies to ensure there are no effects to endangered species, cultural resources, or NPS resources.

Long-term Experimental and Management Plan (LTEMP)

The Department, through the Bureau of Reclamation (Reclamation) and NPS are implementing the LTEMP for operations of Glen Canyon Dam, the largest unit of the Colorado River Storage Project. The LTEMP provides a framework for adaptively managing Glen Canyon Dam operations over 20 years consistent with the Grand Canyon Protection Act of 1992 (GCPA) and other provisions of applicable federal law. LTEMP determines specific dam operations and actions to implement to improve conditions and continue to meet the GCPA requirements and to minimize adverse effects on the downstream natural, recreational, and cultural resources in both Grand Canyon National Park and Glen Canyon National Recreation Area, including resources of importance to American Indian Tribes.

The proposed Project is a concern because of its potential effects to implementation of the LTEMP, which was approved in 2016. Reclamation and NPS jointly prepared this plan based on modeling that assumed a healthy population of humpback chub in the LCR. Major changes to the status of this humpback chub population could require re-consultation under section 7 of the ESA. The goal of the LTEMP is to protect downstream resources by adaptively managing the Glen Canyon Dam. The proposed Project could affect the formation and maintenance of sandbars and beaches in the Grand Canyon. Sandbars and beaches are important for camping recreation, fish habitat, and for the preservation of cultural resources in the Grand Canyon. The relationship between sediment and these resources has been documented through many years of research and monitoring, and we encourage the FERC and applicant to consider these findings (East *et al.* 2016, East *et al.* 2017, Sankey *et al.* 2018). In addition, this plan supports and assumes a healthy population of humpback chub remaining in this tributary. Major changes to the status of this population could require re-consultation under section 7 of the ESA and could require additional compliance under NEPA. We recommend that FERC and the applicant work with Service and NPS to understand the potential effects of the proposed dams if they are going to proceed further.

Tribal Interests

In addition to the shared natural resource interests the Department has with Indian tribes, below we discuss a number of tribal-specific interests tied specifically to the action area, including cultural resources.

The application, under Information Required, section (2)(v), instructs the applicant to identify all Indian tribes that may be affected by the Project. However, the preliminary permit application lists only one tribe, the Navajo Nation. There are at least ten other tribes that may be affected by this proposal. In addition to the Navajo Nation, these include, but are not limited to the Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab Band of Paiute Indians, Las Vegas Tribe of Paiute Indians, Moapa Band of Paiute Indians, Paiute Indian Tribe of Utah, San Juan Southern Paiute Tribe, Yavapai-Apache Nation, and the Pueblo of Zuni. All of these tribes have aboriginal and current connections to the Project area. The LCR, which includes its tributaries such as Big Canyon, is an important and sacred place to all of the aforementioned tribes and has been since time immemorial. The proposed Project area is on land that the Federal government holds in trust for the Navajo Nation; however, all the listed tribes used the area aboriginally. Through their traditions, these tribes maintain cultural and spiritual connections to the area today. In particular, most of these tribes consider the LCR watershed, as part of the Grand Canyon, a National Register eligible Traditional Cultural Property (TCP) for the purpose of section 106 compliance under the National Historic Preservation Act. At least two tribes have formally nominated the Grand Canyon and its tributaries as a TCP, and as such, requiring preservation in perpetuity.

The significance of the Grand Canyon and its major tributaries transcends cultures as people travel from all over the world to visit a place where many ancestors of contemporary native people first came to know this world. To some of the peoples, like the Hopi and the Zuni, the Grand Canyon was home to their ancestors as they journeyed to their present homelands, miles from the canyon rim. Other tribes, like the Apache, Havasupai, Hualapai, Navajo, Southern Paiute, and Yavapai, stayed connected to the Canyon by living near, or within its depths. Both

the Zuni and Hopi people have identified some of their most sacred places within the LCR. The proposed action would directly affect these locations.

The Department has a trust responsibility to each of the aforementioned tribes to ensure their resources are respected and protected. Because the proposed Project may affect these tribes, the federal action agency or agencies, including the Federal Energy Regulatory Commission (FERC), need to consult with each tribe on a government-to-government basis to determine how each may be affected and how to address these effects.

Because the proposed Project area is on the Navajo Nation, there are additional effects to consider. The Department recognizes the Navajo Nation as a governmental sovereign with inherent powers and authority to manage and control their natural resources, in addition to the cultural resources mentioned above. The Navajo Nation has authority over many natural resources, only two of which we will briefly mention here. The Navajo Nation maintains an endangered species list, which includes a number of listed species that occur in the LCR including, but not limited to, the humpback chub. The Navajo Nation has also established the LCR as a Biological Preserve, pursuant to their Biological Resource Land Use Clearance Policies and Procedures (RCP). The Navajo Nation's RCP does not allow development in a Biological Preserve unless it is compatible with the purpose of the area.

In furtherance of the Department's trust responsibility, its Bureaus and agencies participate in preliminary permit and licensing proceedings to ensure that tribal interests and resources are sufficiently considered, and addressed, before FERC makes any final decisions. BIA, in particular, exercises the Department's authorities under the FPA to ensure the protection and utilization of Indian reservations and to assist affected tribes in receiving reasonable annual charges for the use of tribal lands. If FERC grants this application and Pumped Hydro Storage, LLC develops a license application, the Department's Bureaus and agencies will actively participate in the proceeding and will work to ensure that potential effects to tribal lands and natural and cultural resources are sufficiently studied, addressed, and mitigated.

Cultural Resources/Historic Properties

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties, consult with various federal, state and tribal offices, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. Federal agencies must complete this process prior to moving forward with or issuing a permit, license, or assistance for an undertaking. While completion of the Section 106 process is not an "authorization" per se, a federal agency must be able to show evidence that it has properly concluded its review in accordance with the regulations. Since the proposed Project area contains known historic properties, following the section 106 process would be required if FERC approved the proposed application.

Federal Reserved Indian Water Rights

Based on the United States Supreme Court's decision in *Winters v. United States* and its progeny, the Navajo Nation has reserved water rights, held in trust by the United States, necessary for the purposes of the Navajo Reservation. See *Winters v. United States*, 207 U.S. 564 (1908). These vested rights have a priority date no later than the establishment of the Reservation, and the Navajo Nation and United States have filed claims in the pending Little

Colorado River adjudication to define and quantify those rights. *See In re Navajo Nation HSR*, CV 6417-300 (Apache County Superior Court, Ariz.). The Navajo Nation relies primarily on groundwater to satisfy its historic, present, and future needs, and it is very likely that Pumped Hydro Storage LLC's proposal to extract groundwater and bring it to the surface for purposes of power generation would detrimentally impact the water resources on which the Navajo Nation relies. Moreover, Pumped Hydro Storage LLC's proposal would require the applicant to obtain sufficient groundwater for its Project, and given the vested, senior water rights of the Navajo Nation, it is questionable whether available water exists. Pumped Hydro Storage LLC's future use of groundwater could be curtailed or prohibited if the use interferes with the Navajo Nation's water rights once decreed.

Additionally, the Hopi Reservation lies within the boundaries of the Navajo Reservation, and the Hopi Tribe similarly has senior reserved water rights that are currently being adjudicated in the Lower Colorado River adjudication. *See In re Hopi Reservation HSR*, CV6417-203 (Apache County Superior Court, Ariz.). The Department therefore discourages Pumped Hydro Storage LLC from pursuing a proposed Project that could be jeopardized by the Navajo Nation's or Hopi Tribe's exercise of their senior water rights.

Lands of the United States

In its application, Pumped Hydro Storage LLC is required to identify any lands of the United States that are enclosed within the proposed Project boundary, including any Federal reservations within the Project boundary. The applicant states, "[n]o public lands will be used for this project" (Exhibit 1, question 5). Earlier in both applications, however, it acknowledges that "[t]he Project will be located entirely on Navajo Nation lands" (Exhibit 1, question 1). Project mapping clearly indicates where the Project is located.

We wish to clarify that Indian reservations are Federal lands. The Navajo Nation's reservation is held in trust by the United States, and the United States and its agencies have a unique trust responsibility to those lands. Accordingly, we recommend modifying this statement in any future descriptions of this proposed Project to clarify that the Project would be located on a Federal reservation held in trust by the United States for the Navajo Nation.

If FERC grants this preliminary permit application and Pumped Hydro Storage LLC eventually chooses to pursue a license for the construction and operation of the proposed Project, the company should be aware that the Department has statutory responsibilities to protect the lands and resources affected by the Project. Section 4(e) of the Federal Power Act (FPA) provides that the Commission shall issue licenses within a federal reservation only after a finding by FERC that the license will not interfere or be inconsistent with the purpose for which such reservation was created and acquired. This section also provides that licenses for hydropower projects on federal reservations shall contain such conditions as the secretary of the department under whose supervision such reservation falls shall deem necessary for the adequate protection and utilization of such reservation. Thus, section 4(e) gives the Secretary of the Interior (Secretary) authority to impose conditions on licenses issued by FERC for hydropower projects located on reservations under the Secretary's supervision. Section 18 of the FPA also authorizes the Secretary to require fishways, as appropriate. Sections 10(a) and 10(j) of the FPA allows Departmental agencies and bureaus to recommend certain terms and conditions, including recommendations for the protection, mitigation, and enhancement of fish and wildlife. Finally, section 10(e) authorizes the Department, through BIA, to assist tribes in obtaining a reasonable annual charge for the use of tribal lands.

Conclusion

The Department appreciates the opportunity to review and comment on the preliminary permit application for the proposed Project (FERC No. 15024-000). We have described substantial effects that could result from the actions identified in the preliminary permit application. The Department encourages the applicant and FERC to consult and coordinate with the Service, NPS, Reclamation, BIA, and all affected tribes if this Project proceeds further. For questions regarding the National Park Service resources, please contact Rob Billerbeck at rob_p_billerbeck@nps.gov or at (303) 987-6789. For questions regarding FWS resources, please contact Shaula Hedwall at shaula_hedwall@fws.gov or at (928) 556-2118. For questions regarding tribal resources, please contact Lyle Ben at lyle.ben@bia.gov or at (505) 863-8394. For all other questions, please contact me at janet_whitlock@ios.doi.gov or at (415) 420-0524.

Sincerely,

Janet Whitlock
Regional Environmental Officer

cc: Chairperson, Havasupai Tribe, Peach Springs, AZ
Chairman, Hopi Tribe, Kykotsmovi, AZ
Chairperson, Hualapai Tribe, Peach Springs, AZ
Chairperson, Kaibab Band of Paiute Indians, Fredonia, AZ
Chairman, Las Vegas Tribe of Paiute Indians, Las Vegas, NV
Chairman, Moapa Band of Paiutes, Moapa, NV
President, Navajo Nation, Window Rock, AZ
Chairwoman, Paiute Indian Tribe of Utah, Cedar City, UT
President, San Juan Southern Paiute Tribe, Tuba City, AZ
Chairman, Yavapai-Apache Nation, Camp Verde, AZ
Governor, Pueblo of Zuni, Zuni, NM
Executive Director, Intertribal Council of Arizona, Phoenix, AZ
Director, Southern Paiute Consortium, Fredonia, AZ
Director, Western Regional Office, Bureau of Indian Affairs, Phoenix, AZ
Director, Navajo Regional Office, Bureau of Indian Affairs, Gallup, NM
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