

**Section A: U.S. Department of the Interior Modified 4(e) Conditions –
BLM Reservation**

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Section A: Modified Conditions for the Protection and Utilization of the Bureau of Land Management Reservations Pursuant to Section 4(e) of the Federal Power Act

INTRODUCTION

This submission constitutes the Department of the Interior's (Department) through the Bureau of Land Management (BLM)'s Modified Conditions submitted pursuant to section 4(e) of the Federal Power Act (Modified Conditions) and supporting analysis for the Klamath Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC or Commission) No. 2082. This submission supplements the *Department of the Interior's Filing of Comments, Preliminary Terms, Conditions, Prescriptions, and Recommendations*, dated March 27, 2006 (USDI 2006). The March 27, 2006 submission is part of the administrative record in support of the Modified Conditions.

The Department through the BLM has developed these Modified Conditions pursuant to the *Federal Power Act* (FPA), as amended by the *Energy Policy Act of 2005* (EPAct). The EP Act provides parties to this licensing proceeding the opportunity to request trial-type hearings regarding issues of material fact that support the preliminary conditions developed pursuant to FPA Section 4(e). Procedures for trial-type hearings are set forth at 43 C.F.R. Part 45 of the Department's regulations. A trial-type hearing was held that included disputed material facts related to BLM's preliminary condition No. 4 – River Corridor Management. The administrative law judge (ALJ) decision (ALJ 2006) issued September 27, 2006 by the Hon. Parlen L. McKenna, made findings of fact regarding the Project's effects to the BLM reservation and the effects of the BLM's preliminary condition, resolving those material facts that were disputed by PacifiCorp. (hereafter "ALJ Decision"). The ALJ Decision is referenced as follows: ALJ Decision at [page number] [Finding of Fact (FOF) number]; ALJ Decision at [page number] [Ultimate Findings of Fact and Conclusions of Law (UFOF) number]. Testimony and exhibits submitted in the hearing are cited [Agency] [Witness Name], and [page number], where applicable. The EP Act also provides parties the opportunity to propose alternatives to the BLM's preliminary conditions. Procedures for proposing alternative conditions and analyzing such alternatives are set forth at 43 C.F.R. Part 45 of the Department's regulations. Proposed alternative conditions were submitted for all nine of the BLM's preliminary conditions. The conditions and rationale have been modified to reflect new information, evidence and supporting material, the ALJ's Decision, proposed alternative conditions, FERC's Draft Environmental Impact Statement (DEIS) and other information related to the BLM's preliminary conditions.

Structure of this Submission

Section 1 contains the overall BLM resource management plan goals and objectives and statutory authorities.

Section 2 contains BLM’s discussion and a description of change between the BLM preliminary and modified conditions.

Section 3 contains the Alternative Condition Analyses as required by 43 C.F.R. Part 45 § 45.73(b), and includes the equal consideration of effects demonstration as required by 43 C.F.R Part 45 § 45.73(d).

Section 4 contains the literature cited and references used in the submission.

Attachment A1 contains the Modified Conditions.

Appendix A1 contains the supplemental administrative record.

Section 1. RESOURCE MANAGEMENT PLAN GOALS AND OBJECTIVES AND STATUTORY AUTHORITY

RESOURCE MANAGEMENT PLAN GOALS AND OBJECTIVES

The continued protection and utilization of the BLM reservation requires management on the basis of multiple use and sustained yield pursuant to the *Federal Land Policy and Management Act of 1976* (FLPMA). The FLPMA establishes the policy of the United States to retain public lands in federal ownership, unless as a result of the land use planning process provided for FLPMA it is determined that disposal of a particular parcel is in the national interest. The FLPMA further directs the BLM to develop and maintain land management plans to guide management:

“...in a manner that will protect the quality of scientific, scenic, historical, ecological, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use...”

Section 102(8) of FLPMA.

According to FLPMA multiple use refers to the:

“...management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource use that takes into account the long-term needs of future generations for renewable and non-renewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, and historical values; and harmonious and coordinated management

of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.”

Section 103(c) of FLPMA

The Klamath Falls Resource Area Resource Management Plan (RMP), Rangeland Program Summary, and Record of Decision (ROD) (USDI BLM 1995a); the Medford District RMP and ROD (USDI BLM 1995b); and the Redding Field Office RMP and ROD (USDI BLM 1993) were developed in accordance with FLPMA. The Klamath Falls Resource Area and Medford District RODs and RMPs are consistent with and incorporate provisions of the 1994 *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (Northwest Forest Plan).

The Klamath Falls Resource Area RMP responds to the need for healthy forest ecosystems and habitat to support native species, including protection of riparian areas and waters as well as the need for a sustainable supply of timber and other forest products necessary to maintain local and regional economies (USDI BLM 1995a). The Klamath Falls Resource Area encompasses 212,000 acres including 19,450 acres of “Riparian Reserves” in Klamath County, Oregon. The Klamath River occurs in the Northwest Forest Plan area and is administered as a riparian reserve.¹ According to the Klamath Falls Resource Area RMP the riparian reserve for the Klamath River includes “the stream and the area on each side of the stream extending from the edges of the active stream channel to the outer edges of the 100 year floodplain or 320 feet on each side of the river, whichever is greater” (USDI BLM 1995a). As a general rule, management of riparian reserves prohibits or regulates activities that retard or prevent attainment of objectives of the Aquatic Conservation Strategy (ACS).

The ACS seeks to prevent degradation and restore habitat and ecosystem health by maintaining and restoring aquatic habitat, restoring habitat connectivity, and maintaining flows sufficient to sustain component elements of aquatic systems.² Among specific provisions of the ACS are provisions for managing roads, energy production, recreation, lands, riparian areas, fish and wildlife, and watershed and habitat restoration. Specific provisions for land management as it relates to hydroelectric projects under the jurisdiction of FERC are provisions requiring BLM input on the maintenance of instream flows and habitat conditions and maintenance/restoration of riparian resources and stream channel integrity necessary to ensure that ACS objectives are met (USDI BLM 1995a).

¹ Riparian reserves are designed to restore and maintain aquatic ecosystem functions and together with the Aquatic Conservation Strategy (ACS) provide substantial watershed protection benefits including attaining and maintaining water quality standards and moderating peak stream flows.

² The ACS Standards and Guidelines specific to hydropower relicensing require the BLM to “identify instream flows necessary to maintain and restore riparian resources, fish passage, and channel integrity” (USDA; USDI 1994). Lands allocated as Riparian Reserves require further evaluation to assess whether occupancy and use is acceptable and will not detract from or can be mitigated so that ACS objectives can continue to be met (USDA; USDI 1994).

The BLM reservation is occupied by portions of the Project and the Project affects the BLM reservation. As such, the Project is therefore subject to conditions that the Secretary of the Interior, acting through the BLM, deems "... necessary for the adequate protection and utilization of [these] reservation[s]" (FPA). As explained in greater detail below, the Project affects water resources, recreation, wild and scenic river values, travel and access management, cultural resources, terrestrial and riparian resources, special status species and fish and wildlife resources within these BLM-administered lands. The BLM has developed conditions for the license that are designed to provide for the adequate protection and utilization of the BLM reservation based on multiple use objectives.

The following conditions are necessary for the adequate protection and utilization of these reservations and the multiple use resource values for which the reservations are managed. These conditions are based on resources identified for management pursuant to FLPMA and approved RMPs for the Lakeview District, Klamath Falls Resource Area; Medford District and Redding Field Office. Therefore, the following Modified Conditions covering specific requirements for protection and utilization of the BLM-administered lands shall be included in any license issued for the Project.

STATUTORY AUTHORITY

The BLM Modified Conditions are deemed necessary for the protection and utilization of the BLM-administered reservation affected by the Klamath Hydroelectric Project. Section 4(e) of the FPA provides that "...licenses issued within any reservation...shall be subject to and 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." The definition of "reservations" includes "lands and interests in lands owned by the United States, and withdrawn, reserved, or withheld from private appropriation and disposal under the public land laws..." 16 U.S.C. § 796 (2).

The BLM manages federal lands (BLM lands) within and adjacent to the Project that are "reservations" as defined by the FPA. Specifically, the BLM lands are located adjacent to J.C. Boyle Reservoir and along the J.C. Boyle Bypass and Peaking reaches of the Klamath River. Portions of the J.C. Boyle Development occupy BLM lands, including the J.C. Boyle Powerhouse, J.C. Boyle Canal, J.C. Boyle Bypass and Peaking reaches and Project - related roads.

Currently, the BLM lands are withdrawn by either the *Revested Oregon and California Railroad Grant Lands Act* (O&C Act) or Power Site Reserve No. 258. The O&C Act (50 Stat 874) provided that these BLM lands were to be "conserved and perpetuated" rather than divested by the United States and be managed as timberlands and power site lands that shall be managed for purposes³ provided for in BLM resource management plans

³ In addition to providing for a permanent source of timber supply according to the principle of sustained yield, the O&C Act requires the Secretary to protect watersheds, regulate stream flow, provide recreation, and contribute to economic stability.

developed for these areas. The Power Site Reserve No. 258 was approved by Executive Order dated April 13, 1912 and reserved BLM lands withdrawing them from “settlement, location, sale, or entry, and reserved for water-power site.” These BLM lands were originally reserved under the *Pickett Act of 1910*⁴ but were subsequently withdrawn by Power Site Reserve No. 258.

In developing conditions under FPA Section 4(e) for the protection and utilization of the BLM reservation, it is appropriate for the BLM to consider the broad purposes – including environmental and fish and wildlife concerns – that Congress has identified in more recent laws such as FLPMA. *Southern California Edison v. FERC*, 116 F.3d 507, 518 (D.C. Cir. 1997). It is the reservation that exists now, not the reservation as it existed years ago, that is to be protected and utilized. *Keating v. FERC*, 114 F.3d 1265, 1279 (D.C. Cir. 1997).

Because Project facilities are located on BLM-administered lands that constitute the reservation, including the J.C. Boyle Powerhouse and parts of the J.C. Boyle canal road and tailrace, the BLM has the authority to submit conditions under the FPA § 4(e) for the adequate protection and utilization of the reservation (See *Escondido Mutual Water Co. v. LaJolla Band of Mission Indians*, 466 U.S. 765 (1984)). The D.C Circuit Court of Appeals recently clarified this authority in the decision, *City of Tacoma v. FERC*, 460 F.3d 53 (D.C. Cir. 2006). In that case, the court upheld the Department’s authority to impose the conditions stating “so long as some portion of the project is on the reservation, the Secretary is authorized to impose any conditions that will protect the reservation, including utilization of the reservation....” *Id.* at 66-67. See also *Public Utility District No. 1 of Pend Orielle County, Washington*, 117 FERC 61,205 (2006), p. 23, para. 59-60 (noting that Section 4(e) conditions are not limited to the geographic scope of the effects of project works located on the reservation nor are restricted to reservation lands within the project boundary.)

The BLM recognizes that the FERC has the sole jurisdiction to determine the Project boundary for the Project. Per 18 CFR § 4.41 (h)(2):

The boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of the environmental resources.

As such, the BLM expects that the Project boundary for a new license, if one is issued, will not be limited to lands proposed by PacifiCorp in its license application, but will

⁴ The Pickett Act of 1910 authorized the Executive Department to “temporarily withdraw from settlement, location, sale, or entry any public lands of the United States...and reserve the same for water-power sites, irrigation, classification of lands, or other public purposes to be specific in the orders of withdrawals: “[S]uch withdrawals or reservations shall remain in force until revoked...” “...and therefore in law and in practice Pickett Act withdrawals can continue indefinitely.” Opinion of the Solicitor, M-37005 (January 19, 2001).

include BLM-administered lands in order to fulfill Project purposes such as recreation and protection of environmental resources.

Section 2. DESCRIPTION AND RATIONALE FOR MODIFIED CONDITIONS

The full text of the Modified Conditions can be found in Attachment A1.

Additional rationale for the Modified Conditions is included in the *Department of the Interior's Filing of Comments, Preliminary Terms, Conditions, Prescriptions, and Recommendations* (USDI 2006). This previous submission is incorporated by reference as part of the rationale for the Modified Conditions.

BLM Modified Condition 1: Activities on or Affecting Bureau of Land Management-Administered Lands

Discussion

Based on review of the BLM preliminary condition No. 1 and PacifiCorp's proposed alternative condition and supporting information, as well as other information that includes, but is not limited to, PacifiCorp 2006a; PacifiCorp 2006b; PacifiCorp 2006c; FERC 2006; and HVT 2006, the BLM revised Condition No. 1 to clarify the requirements of the condition and to address issues raised by PacifiCorp. The underlying rationale for the Modified Condition is that BLM has the authority to review and approve Project-related activities to be undertaken by the Licensee that will occur on or affect BLM-administered lands and resources. These activities are related to the Licensee's implementation of license conditions contained in the new license, if one is issued.

If additional BLM-administered lands are included in the Project boundary, the licensee is required to obtain a BLM use authorization for the use and occupancy of those lands, pursuant to the FLPMA (43 U.S.C. § 1701 *et seq.*). To ensure consistency with BLM land management direction, the Licensee will prepare site-specific plans for activities authorized by the license that have the potential to impact BLM-administered lands or resources. These site-specific plans will enable the BLM to ensure that the proposed activity is consistent with BLM land management direction and policies as well as the various laws pertaining to BLM-administered lands. In the case of *National Environmental Policy Act* (NEPA) compliance, while many proposed activities may have been included in the Commission's environmental analysis, that analysis is focused on whether to issue a license and what the conditions of that license would be. In some cases, the Commission's environmental analysis may not contain sufficient site-specific information as to the location, timing and nature of the activity nor the site-specific effects of a particular proposed activity to meet BLM requirements for disclosure. In these cases, subsequent NEPA analysis may be required for the proposed activity.

PacifiCorp took exception to elements of BLM’s preliminary conditions, which it concluded to be potentially duplicative and/or conflicting. For example, the BLM preliminary condition required submission of Safety During Construction, Hazardous Substances, and Spoils Disposal plans that PacifiCorp viewed as duplicative of a FERC requirement. BLM’s Modified Condition does not require these plans. The BLM anticipates that where specific actions may necessitate such plans and measures, the measures would be included as part of the site-specific plan for that activity.

Other requirements are administrative and intended to ensure that administration of the Project according to the licensee does not result in damage to BLM lands and resources. If this is not the case the licensee shall be accountable for correcting the situation. The BLM has the authority to impose these conditions as the agency deems necessary for the adequate protection and utilization of the BLM reservation. The BLM has the authority to submit conditions under FPA § 4(e) for the adequate protection and utilization of the reservation (See *Escondido Mutual Water Co. v. LaJolla Band of Mission Indians*, 466 U.S. 765 (1984). Recently, this was clarified by a D.C. Circuit Court decision, *City of Tacoma v. FERC*, 460 F.3d 53 (D.C. Cir. 2006), wherein the court upheld the Department’s authority to impose the conditions stating “so long as some portion of the project is on the reservation, the Secretary is authorized to impose any conditions that will protect the reservation, including utilization of the reservation...” *Id.* at 66-67. See also *Public Utility District No. 1 of Pend Orielle County, Washington*, 117 FERC 61,205 (2006), p. 23, para. 59-60 (noting that Section 4(e) conditions are not limited to the geographic scope of the effects of project works located on the reservation nor are restricted to reservation lands within the project boundary). Narrowing the scope, as the alternative condition proposes, would result in less than adequate protection and utilization of the BLM reservation.

Rationale for the Modified Condition

The BLM administers approximately 197 acres within the current Project boundary (PacifiCorp 2003a, Exhibit A, page 2-17) for recreation use, fish and wildlife habitat, terrestrial and riparian resources, cultural resource protection, and road and facilities maintenance. Project operations and maintenance and other Project-related activities, including recreation, affects these and other BLM-administered lands and associated resources. The new license, if one is issued, will contain articles directing actions to be undertaken on these BLM-administered lands. Among these will be protections, mitigations and enhancements for the Project’s effects on BLM-administered lands and resources. To ensure these activities are in compliance with the laws, regulations, policies and land use plan decisions that guide activities on BLM-administered lands, the condition requires preparation of site-specific plans. The condition also contains other administrative components to ensure some degree of accountability in the event an action results in unanticipated consequences affecting BLM-administered lands and resources.

BLM has the authority to authorize the use and occupancy of BLM-administered lands and resources through FLPMA. FLPMA also establishes the general objectives for the management of BLM-administered lands, and directs that these lands be managed according to land use plans developed according to Sec. 202 of FLPMA. BLM Resource Management Plans (RMPs) provide direction for issuing, renewing, or granting authorizations to occupy, use or traverse BLM-administered lands for, among other uses, power generation, transmission, and distribution. If such actions have the potential to affect BLM-administered resources, they must be evaluated for consistency with the BLM RMPs developed pursuant to FLPMA and analyzed according to the NEPA.

BLM Modified Condition 2 – Consultation with the Bureau of Land Management

Discussion

Based on BLM’s preliminary condition No. 2, PacifiCorp’s proposed alternative condition with rationale and PacifiCorp’s comments on the BLM’s conditions (PacifiCorp 2006b, pages 13-14), the BLM has refined Condition No. 2 to clarify the requirements of the condition and to address some of the rationale PacifiCorp has provided. The objective of the Modified Condition is to ensure routine consultation with the BLM prior to initiating Project-related activities on or affecting BLM-administered lands. The Modified Condition also requires an annual meeting between the Licensee and the BLM, and establishes general reporting requirements of the Licensee. The Modified Condition also incorporates requirements of BLM’s preliminary condition No. 1 requiring consultation with the BLM and other authorized users in the Project area to avoid conflicting uses of Project lands and facilities.

The PacifiCorp proposed alternative condition narrows the scope of the BLM’s condition. The BLM has the authority to impose conditions as the agency determines are necessary for the adequate protection and utilization of the BLM reservation (*See* discussion for Condition No. 1 above). PacifiCorp’s proposed alternative condition would result in less than adequate protection and utilization of the BLM reservation.

PacifiCorp took exception to BLM’s reservation of the right “to require changes to Project operations through revision of 4(e) conditions” in the preliminary condition (PacifiCorp 2006, page 30). Without conceding to PacifiCorp’s legal arguments regarding the BLM’s authority under the FPA, the BLM has removed the language from this condition and addresses its reservation of authority in BLM Modified Condition No. 9.

Rationale for the Modified Condition

The FLPMA directs BLM management according to multiple-use principles that provide for the use and occupancy of BLM-administered lands by other entities. To ensure that Project operation and maintenance and other Project-related activities that take place on BLM-administered lands occurs in a manner consistent with BLM management direction, the agency has required routine consultation and reporting as elements of the condition. The BLM believes the consultation and reporting requirements are necessary for the

continued protection and utilization of BLM-administered lands and resources and will achieve consistency with BLM management direction and objectives for these lands.

While the licensee is authorized to use and occupy BLM-administered lands through a new license and/or a BLM use authorization, other authorized uses of BLM-administered lands in the Project area may be affected by Project activities. Conflicts between uses and/or users may necessitate consultation, planning, or dispute resolution in order to meet objectives among the BLM and other permitted users.

BLM Modified Condition 3 – Roads Inventory Analysis and Roads Management

Discussion

Based on review of BLM’s preliminary condition No. 3, PacifiCorp’s alternative condition with rationale, PacifiCorp’s comments on the BLM’s conditions (PacifiCorp 2006b, page 14), the BLM revised Condition No. 3 to clarify the requirements of the condition and to address issues raised by PacifiCorp. The Modified Condition requires the licensee to complete an Inventory Analysis (Analysis) of the roads in PacifiCorp’s *Study Area Roadway Inventory Analysis and Project Roadway Management Plan – Klamath Hydroelectric Project (FERC Project No. 2082)*(PacifiCorp 2006m) and estimate the percentage of use associated with Project operations and maintenance and other Project-related activities (e.g. recreation). Once complete, the licensee will develop a Road Management Plan (Roads Plan) to address management of roads that are used for Project-related purposes, including roads on or affecting BLM-administered lands (BLM Roads). The condition also requires consultation with the BLM prior to erecting signs on BLM-administered lands.

The BLM Modified Condition requires similar components to PacifiCorp’s proposed alternative condition. The BLM Modified Condition is broader scope in terms of the Inventory Analysis and the Road Management Plan. The Modified Condition’s requirement to estimate use of BLM Roads for Project-related activities in the Analysis and the lack of reference to the Project boundary in the Roads Plan are two examples. PacifiCorp itself identifies that “...the Alternative Condition ... would have the Licensee develop an Inventory Plan [actually an Inventory Analysis in the alternative condition] in the broader study area, as provided in BLM’s condition...” (PacifiCorp 2006 page 35). PacifiCorp also refers to the alternative condition having “the Licensee prepare a Road Plan for continued operation of those roads *within the Project boundary where the Licensee has authority.*” [emphasis in original] PacifiCorp 2006 page 36). This statement illustrates inconsistencies within the proposed alternative condition. Although part of the alternative condition appropriately refers to the need for the Roads Plan to address the Licensee’s responsibilities for road management, the alternative condition qualifies these responsibilities in various and inconsistent ways. These qualifications include:

- “...within the Project boundary for which the Licensee is solely or jointly responsible, as determined by the Commission...”

- "...within the Project boundary."
- "within the Project boundary where the Licensee has authority."
- "within the proposed Project boundary."

The BLM's expectation is that the Project boundary, which will be determined by FERC at the time a license is issued and will identify those lands needed for Project purposes. BLM expects further that the Licensee's responsibilities will be conveyed through the license articles and not based on "proposals" or the Licensee's estimation of scope of authority.

Rationale for the Modified Condition

Project Impacts - Road damage can occur as a function of the number and type of vehicles and/or frequency of trips. Use of BLM Roads for any Project-related purpose has the potential to impact the roads, facilities, and adjacent resources. PacifiCorp has not provided to the BLM data specific to the use of BLM Roads for Project purposes or for recreation access. It is well established that transportation management systems must be routinely maintained to ensure that Project operations and maintenance are uninterrupted. The same holds true for roads necessary for Project-related recreation activities, particularly where road maintenance is necessary to ensure public safety. While PacifiCorp's inventory (2004m) includes the majority of the BLM Roads affected by the Project, the report fails to describe the amount of Project-related use that each road receives. The report goes on to analyze only a subset of roads based on the premise that the Licensee is only responsible for roads within the Project boundary as proposed in PacifiCorp's final license application (FLA). FERC has sole jurisdiction over what constitutes the Project boundary, and PacifiCorp, by completing the analysis for a subset of roads in the Project area, failed to analyze the impacts from road use necessary for Project purposes, including recreation. For an analysis to be useful, it must be based on Project-related impacts to all BLM Roads and not narrowed in scope based on arbitrary criteria that are used to discriminate between roads within the current or proposed Project boundary. Narrowing the scope of the analysis limits the utility of conclusions regarding the effects of Project-related activities on BLM Roads.

Rationale - Section 302(b) of FLPMA requires BLM to address road maintenance and management, and specifically authorizes the Secretary of the Interior (Secretary) to "regulate, through easement, permits, leases, licenses, published rules, or other instruments as the Secretary deems appropriate, the use, occupancy, and development of the public lands, including, but not limited to, long-term leases to permit individuals to utilize public lands for habitation, ..." The BLM manages travel and access on roads through a road management plan (USDI BLM 1995a, page 71).

Since PacifiCorp submitted the *Study Area Roadway Inventory Analysis and Project Roadway Management Plan – Klamath Hydroelectric Project (FERC Project No. 2082)* (PacifiCorp 2004m) to FERC. Since that time, PacifiCorp has not proposed any management actions or consulted with BLM regarding road maintenance and use. While PacifiCorp has acknowledged that, "PacifiCorp is the primary entity responsible for the

continued management and maintenance of Project-related roads...,” (PacifiCorp 2004m page ES-1), the scope of that responsibility is limited to particular road classifications within the proposed Project boundary where PacifiCorp shares “management and maintenance responsibilities of jointly-maintained Project-related roads both within and directly adjacent to the proposed FERC Project boundary where there is a Project nexus.” (PacifiCorp 2004m page 31). An adequate travel management plan relies on a complete Analysis of roads necessary for Project-related purposes (See BLM Figure 3-1: Road Inventory Map in *Department of the Interior’s Filing of Comments, Preliminary Terms, Conditions, Prescriptions, and Recommendations*) (USDI 2006). A Roads Plan which can be developed based on a broader travel management plan could establish a Project nexus between roads within PacifiCorp’s proposed Project boundary and those outside of the Project but which are necessary for Project maintenance, operation, and recreation access. The Roads Plan should be based on Project-related roads where there is a Project nexus wherever they occur, not just within PacifiCorp’s proposed Project boundary.

Travel and access management through a roads management plan is directed by the KFRA RMP (USDI BLM 1995a, page 71) and Section 302(b) of FLPMA that requires road maintenance, management, and mitigation for impacts resultant from authorized activities that have the potential to impact BLM-administered lands. Thus, a BLM roads plan would include recommendations for management, maintenance, improvement or closure of roads as necessary. The objective of the condition is to bring this same information to bear from the standpoint of the Project and with the objective to develop a comprehensive plan and maintenance schedule for all roads affected by Project-related activities.

This BLM condition is intended to assure that PacifiCorp accurately identifies miles, level of use, and projected future use of roads necessary to operate and maintain the Project as well as to provide access to Project-related recreation facilities within and adjacent to the Klamath River canyon (See Area of Project Influence Map in USDI 2006). The Licensee will be required to, as part of the Roads Plan, to:

- Provide improvements necessary to bring existing roads up to BLM standards.
- Provide a percentage of the annual maintenance costs for roads that are used by the licensee and the public based on an estimation of user frequency.

The BLM agrees the roles and responsibilities as set forth in Section 3.1 of the *Study Area Roadway Inventory Analysis and Project Roadway Management Plan – Klamath Hydroelectric Project (FERC Project No. 2082)* (PacifiCorp 2004m) are appropriate but maintains that the scope of the proposed alternative condition is insufficient for addressing all Project-related roads that sustain Project-related uses in the area.

The Roads Plan should facilitate coordination of transportation maintenance and management to:

- continue to provide for public safety;
- minimize potential damage and disturbance to big game winter range;
- manage transportation access consistent with BLM management objectives;
- coordinate off-highway vehicle (OHV) management;

- minimize the potential for spread of noxious and invasive plants;
- restore hydrologic function in areas that have been impacted by use of BLM Roads for Project purposes; and
- continue to protect cultural resources.

Based on data compiled for the cooperative road inventory the BLM identified management needs for several roads within the Project area. At a minimum, approximately 14 miles adjacent to the J.C. Boyle Bypass and Peaking Reaches appear to remain necessary for the operation and maintenance of the Project. About 3.4 miles of these roads traverse PacifiCorp land and the remaining 10.6 miles are BLM Roads. This illustrates the necessity for a comprehensive and coordinated inventory and road management plan for the Project area. Additionally, many roads associated with the original Project construction, maintenance, and operation and those roads that are used for Project-related recreation within and adjacent to the Klamath River canyon were assessed. The Licensee will need to incorporate this analysis into the Inventory Analysis and the Road Management Plan in consultation with BLM.

BLM Modified Condition 4 – River Corridor Management

Introduction: Description of Modified Condition

Discussion

Four proposed alternative conditions were provided to BLM preliminary condition 4. Two alternatives were proposed by PacifiCorp for BLM preliminary condition 4 (See PacifiCorp 2006a, pages 41-47 [First Alternative Condition] and pages 62-64 [hereafter “Second Alternative Condition”]). A proposed alternative condition was also submitted by the Oregon Department of Fish and Wildlife (ODFW) (ODFW 2006) and another was submitted by the California Department of Fish and Game (CDFG) (CDFG). Both of the States’ proposed alternative conditions are similar in nature.

An additional proposed alternative condition was submitted by PacifiCorp on December 1, 2006 (PacifiCorp 2006d) as an “Addendum” to the Second Alternative Condition. PacifiCorp requested that the proposed “modifications” to the BLM’s preliminary condition No. 4 be at least considered by Interior when developing its modified conditions. See PacifiCorp 2006d at 1. The regulations implementing the EAct expressly require that any alternative must be filed within 30 days after the deadline for the BLM to file preliminary conditions with FERC. See 43 C.F.R. § 45.71 (a)(2) As this proposed alternative condition was submitted months after the time period designated in the regulations, it will not be considered as an alternative condition. However, the BLM reviewed the “Addendum” and considered “evidence and supporting material” that was relevant to consideration and evaluation of the Second Alternative Condition and the development of the Modified Condition. See 43 C.F.R. § 45.73(a). See also 16 U.S.C. § 823d(b)(4) (information “provided in a timely manner” must be

taken into account in preparation of the written statement explaining basis for ultimate decision to accept or reject and alternative).

With the review of the BLM preliminary condition No. 4, PacifiCorp's two timely submitted alternative conditions with rationale (PacifiCorp 2006), the Oregon Department of Fish and Wildlife (ODFW)'s alternative condition and rationale (ODFW 2006), California Department of Fish and Game's alternative condition and rationale (CDFG 2006), the substantial information and findings that came out of the trial type hearing, and other information, the BLM refined Condition No. 4 to clarify the requirements of the condition and to address the findings of fact contained in the ALJ Decision by the Hon. Parlen McKenna. The underlying objectives of the Modified Condition are similar to those contained in the BLM's preliminary condition, in that the Licensee is required to 1) provide minimum streamflows and a seasonal high flow in the J.C. Boyle Bypassed Reach; 2) limit "peaking" flows in the J.C. Boyle Peaking Reach; 3) implement ramp rate restrictions for both reaches; 4) conduct streamflow measuring and reporting; 5) develop a Sediment Management Plan that will result in the augmentation of sediment to the J.C. Boyle bypassed reach; and 6) develop an Adaptive Management Plan to adaptively manage the river corridor over a new license term. The Modified Condition also includes a provision for flow continuation measures in the event of powerhouse shutdowns, as proposed by ODFW's proposed alternative condition and by PacifiCorp in its license application.

Rationale for the Modified Condition

Additional rationale for BLM Modified Condition 4 – River Corridor Management (Modified Condition) is included in the Department of Interior's submission of the *Klamath Hydroelectric Project, No. 2082. Department of the Interior's Filing of Comments, Preliminary Terms, Conditions, Prescriptions, and Recommendations*, dated March 27, 2006 (USDI 2006).

Portions of the previous submission are also being supplemented with new information and findings of fact as developed through the trial-type hearing process which concluded in the ALJ Decision issued by the Hon. Parlen L. McKenna, dated September 27, 2006. The BLM, in the development of the Modified Condition, considered additional evidence/supporting material provided by other parties to the license proceeding and that was otherwise reasonably available to the agency. This includes, but is not limited to:

- FERC's DEIS (FERC 2006);
- PacifiCorp's Dec. 1, 2006 Comments on the DEIS (PacifiCorp 2006c);
- PacifiCorp's Dec. 1, 2006 submission titled: PacifiCorp's Addendum to PacifiCorp's Second Alternative Condition to the Bureau of Land Management Condition No. 4 (PacifiCorp 2006d);
- Hoopa Valley Tribe's Comments on PacifiCorp's Addendum and Modifications to PacifiCorp's Proposed Alternative Section 18 Prescriptions and Section 4(e) Conditions for the Klamath Hydroelectric Project (FERC Project No. 2082 December 12, 2006. (HVT 2006a);

- PacifiCorp's Dec. 29, 2006 submission titled: Klamath Hydroelectric Project, FERC Project No. 2082; PacifiCorp's Response to Comments and Documents submitted by Stakeholders on the FERC DEIS Related to Fish Passage, Water Quality, Instream Flows and Ramping Rates (PacifiCorp 2006e).

The BLM Modified Condition is intended to provide increased base flows and peak flows that more reflective of seasonal fluctuations typical of a natural hydrograph for the Klamath River. First, a proportional flow (40% of inflow) would be required when inflow to J.C. Boyle Reservoir exceeds 1,175 cubic feet per second (cfs). Second, a minimum of 470 cfs would be released at J.C. Boyle Dam when the average inflow of the previous three days is between 470 cfs and 1,175 cfs. Third, when the inflow is less than 470 cfs, then the flow released below the dam would equal inflow. Most of the time, the proposed base flows would provide a minimum flow of approximately 700 cfs in the J.C. Boyle peaking reach, about twice the current base flow. The BLM proposal would provide a seasonal high flow event, for seven full days, between February 1 and April 15, when inflows first exceed 3,300 cfs, during which time power generation would be suspended to allow all inflows down the J.C. Boyle bypass and peaking reaches during that one-week period. During the period between May 1 and October 31, the BLM Modified Condition provides for a single peaking event of 1,500 cfs to 3,000 cfs per week, with a priority set for peaking operations on Saturday, Sunday, and Friday in priority order to accommodate whitewater boating. The BLM Modified Condition results in higher base flows in the peaking reach comprised of spring accretions and minimum base flows to the bypass reach. The Modified Condition also requires a maximum ramp rate of two inches per hour.

The following section is organized by the components of the Modified Condition (e.g., J.C. Boyle Bypass Reach, J.C. Boyle Peaking Reach, etc.).

J.C. Boyle Bypassed Reach

Required minimum streamflows (proportional flow requirement, seasonal high flow, and minimum base flow requirement): The objective and the requirement in this portion of the BLM's Modified Condition are the same as in the Preliminary Condition, however some language was clarified in the Modified Condition.

Ramping: The objective and the requirements in this portion of the BLM's Modified Condition are the same as in the preliminary condition, however some language was clarified in the Modified Condition.

J.C. Boyle Peaking Reach

Streamflow Requirements: The objectives in this portion of the BLM's Modified Condition are the same as in the preliminary condition; however in the Modified Condition the language and some of the requirements were changed. The May 1 through October 31 allowance for a once weekly peaking event is changed to describe that such events will have a minimum peaking streamflow of 1,500 cfs and that this flow shall occur at the Spring Island Boat Launch between 0900 and

1400 hours. The Modified Condition includes these changes because these flows provide whitewater boating opportunities.

Ramping: The objectives and the requirement in this portion of the BLM's Modified Condition are the same as in the preliminary condition, however some language was clarified in the Modified Condition. High ramping rates associated with peaking operations can adversely impact fish survival by increasing downstream migration rates and predation pressure on stranded individuals, and by causing energy deficits in fish responding to rapid changes in flow. The existing daily flow patterns have a negative effect on the fishery resource because they affect food availability, available habitat area, and stranding losses. The fact that peaking, including associated ramp rates, is negatively impacting fish populations in the peaking reach was established during the hearing. The Project impacts are substantiated by the ALJ in the ALJ Decision.

Streamflow measurement and reporting:

The objectives and the requirement in this portion of the BLM's Modified Condition are the same as in the preliminary condition, however in the Modified Condition the language was changed to clarify the requirements.

FERC validated that implementation of the BLM preliminary 4(e) condition would require a stream gage on Spencer Creek. This requirement is also part of the BLM Modified Condition. FERC notes that the gage would be needed because flows would be calculated as a percentage of inflow to the J.C. Boyle Reservoir:

“The need for this [Spencer Creek] gage depends on the flow regime requirement downstream of J.C. Boyle dam (See discussion in section 3.3.3.2.1, *Instream Flows*). Reactivation and likely upgrades to allow for the continuous and real time reading of this gage only would be required if the flow regime for the J.C. Boyle bypassed or peaking reaches is calculated as a percentage of inflow to J.C. Boyle reservoir” (FERC 2006, page 3-126:2-6).

In the DEIS, FERC substantiated that implementation of the BLM preliminary condition (and retained in the Modified Condition) would require gages for streamflow measurements. These measurements would be needed above the dam and below the dam to establish minimum flows and document compliance.

“The flow regimes...entail the use of proportional flows, where the minimum flow would be either a specified value or a proportion of inflow to the reservoir or diversion dam of each development, whichever is the larger flow. Therefore, both establishing the minimum flow at any particular time, and documentation of compliance with that minimum flow would require gages that accurately measure inflow to each development on a real-time basis and outflow below each project dam or powerhouse where a minimum flow specification has been established” (FERC 2006, page 5-23:42-48).

FERC adopted the BLM measure to “provide instantaneous real time data that is readily available and accessible to the public, and design a database for reporting on surface water” in the DEIS (FERC 2006, page 5-79).

River “Gravel” Management Plan: The objectives and the requirement in this portion of the BLM’s Modified Condition have been changed to be less prescriptive and reflect the stipulation from the hearing. In addition the plan should address the need for an initial introduction of sediment.

Although the Klamath River corridor downstream from J.C. Boyle Dam is narrow and coarse, the small alluvial features that exist can temporarily store gravel and finer sediment to benefit fisheries and riparian habitat, provided sediment continuity and seasonal high flows are implemented to mobilize and distribute the sediment. Project induced physical processes have significantly altered the geomorphic function and biological productivity of the J.C. Boyle Bypassed Reach. First, the largest magnitude floods continued to bypass the Project’s diversion but contain no sediment load, which is trapped in the reservoir. This has progressively stripped sediment from the relatively small but important pockets, pools, bar tops, and channel margins over the past fifty years (the “hungry water” concept). Second, the frequent annual floods have been reduced in magnitude and frequency by Project diversions, and a persistently very low summer base flow results from Project operations. Third, the design and operation of the J.C. Boyle emergency bypass spillway has resulted in massive hillslope erosion and delivery of unsorted hillslope debris to the river channel. Infrequent floods combined with repeated debris delivery have resulted in the accumulation of unsorted sediment in the channel at the outlet of the emergency bypass spillway. This body of sediment attracts fish for spawning but it is embedded with fines and inherently unstable.

The BLM preliminary condition intended the term “gravel” to include a range of sediment sizes. However, the term “gravel” was interpreted literally by PacifiCorp and FERC as only gravel-sized sediment, such as spawning-sized gravel for salmonids. Thus, the term “gravel” in the BLM preliminary condition is replaced with the term “sediment” in the Modified Condition when a range of sediment sizes is the intending meaning. Specific size classes are used in the Modified Condition where necessary. To reflect this clarification, the “River Gravel Management Plan” in the BLM’s preliminary condition is changed to the “Sediment Management Plan” (SMP) in the Modified Condition.

In the Modified Condition, the SMP is less prescriptive than the River Gravel Management Plan in the BLM preliminary condition. The SMP will be developed, such that objectives outlined in the Modified Condition are met. One example of a change in from the BLM preliminary condition is that sediment augmentation quantities are not specified in the Modified Condition. The BLM preliminary condition discussed a range of sediment augmentation from 20% to 100% of the annual quantity trapped in J.C. Boyle Reservoir (6,134 tons per year). This quantity is composed of gravel and coarser sediment and does not include finer sediment sizes. PacifiCorp responded to the BLM preliminary condition with a proposal designed to, “. . .be an adaptive mitigation measure

with an initial augmentation followed by recurring augmentation based on detailed monitoring of the added material over the life of the new license” (PacifiCorp Appendix E, page 4-169). PacifiCorp reasoned that, “Given the long-term reduction in gravel supply below Project dams, gravel augmentation could begin with a larger volume to fill in-channel storage sites” (PacifiCorp Appendix E, page 4-169). The large initial augmentation concept, to mitigate for long-term reduction below the Project dams, followed by recurring smaller augmentation amounts, is adopted in the strategy of the BLM Modified Condition. The Modified Condition also refers to “sediment storage” and “sediment storage potential” of the reach in several places. This responds to PacifiCorp’s statement above in that a large initial augmentation could be focused on filling the in-channel storage sites that have sustained the long term reduction of sediment due to the Project. If this strategy is employed, then the sediment augmentation program could be adaptively managed more effectively in future years, with annual sediment augmentation amounts being responsive to the flows that the reach receives in any given year. While estimates of the bed-stored sediment potential exist, estimates for bar top and channel margin trapping of sediment remain to be developed. In the Modified Condition, the annual sediment augmentation amount will be determined in the SMP as stipulated between BLM and PacifiCorp and will be based upon meeting the overall objectives of the SMP. In addition, the monitoring program needed to determine if the objectives are met will also be developed in the SMP. This will facilitate adaptive management and modifications to the SMP as needed.

Adaptive Management Plan (AMP): The objectives and the requirements in this component of the BLM’s preliminary condition are the same as in the Modified Condition, however some language was expanded upon and clarified in the Modified Condition. In the Modified Condition, the connection between the AMP and all of the requirements of the condition are made clear.

In the rationale for requiring an adaptive management plan in the preliminary condition, it is stated that monitoring is needed to determine the effects of Project operations and implementation of the FPA Section 4(e) conditions on the resident, migratory and anadromous fish populations. FERC, in describing its rationale for Aquatic Resource Monitoring measures in its Staff Alternative notes that, “Monitoring the effects of environmental measures that are included in a new license helps to ensure that the measures are effective, and it affords the opportunity for measures to be modified, if needed, to meet resource management goals (FERC 2006, Page 5-46:32-37). This rationale is identical to the purposes and needs for the BLM’s AMP.

The modified Adaptive Management Plan (AMP) requirement reflects the changes in the Modified Condition and is intended to clarify the connections between the AMP and implementation of the requirements in the River Corridor Management Condition 4 (e.g., sediment management plan, required minimum streamflows, recreation flows, ramping rates, and streamflow measurement and reporting). The revised AMP portion of the Modified Condition more accurately reflects the specific aquatic resource objectives of the Modified Condition that are to be included in the AMP. FERC acknowledged that the habitat-related measures that the BLM specifies “...would constitute a substantial change

from current operations, and would warrant monitoring to determine their effects and evaluating whether additional alteration of project operations may be warranted.” (FERC 2006, Page 5-46:47-49). As such, BLM has substantiated the need for an AMP to monitor how implementation of the Modified Condition is effective in meeting the goals and objectives of the Modified Condition. Implementation of the AMP will provide the information needed to develop proposed modifications if resource goals are not being met or additional information warrants changes.

Flow Continuation Valve: The Modified Condition adds a provision for flow continuation measures in the event of powerhouse shutdowns. This provision was included to allow the flow regime in the J.C. Boyle Bypassed and Peaking reaches to remain essentially unchanged during intermittent shutdown. Currently the J.C. Boyle Powerhouse cannot maintain downstream river flow levels or ramp rates if there is an unscheduled outage (one or both of the generating units trip off line.) During an unscheduled outage the Klamath River water level, downstream of the J.C. Boyle Powerhouse, drops rapidly. Flow capacity through each unit is roughly 1,425 cfs. When one unit trips off line the river drops 1.3 feet and if both units trip off line the river will drop approximately 3 feet. When either event occurs the water is released at the canal spillway, or water is released at the dam (PacifiCorp 2004a, Exhibit E, 2004).

The impacts of unscheduled outages are a rapid drop in the Klamath River water level and erosion due to the use of the canal emergency spillway. A rapid change in water levels could cause fish to become stranded during these events. If the flow is not restored quickly enough, stranded fish could die (PacifiCorp 2004a, Exhibit E, 2004). Past use of the spillway has resulted in erosion of the hillside leading down to the J.C. Boyle Bypassed Reach and subsequent increases in sediment and turbidity in the river. It also has caused a large erosional feature, and if left un-restored, could undermine the road and canal.

The installation of the synchronous bypass valves would eliminate rapid water level fluctuations. This would reduce the negative effects on the fishery resource, including the lack of food availability and habitat area, and stranding losses. In addition, it would reduce the use of the canal emergency spillway, minimizing further erosion.

BLM Modified Condition 5 – Cultural Resources and Management

Discussion

Based on review of the BLM preliminary condition No. 5, PacifiCorp’s proposed alternative condition with rationale, PacifiCorp’s comments on the BLM’s conditions (PacifiCorp 2006b, page 27) and other information, BLM has refined Condition No. 5 to clarify the requirements and incorporate a stipulation between PacifiCorp and the BLM that was recorded during the hearing. The objectives of the Modified Condition are that the Licensee shall complete the cultural resources inventory for BLM-administered lands within the Area of Potential Effect (APE), amend the Historic Properties Management Plan (HPMP) to address the management of all sites within the APE and to meet certain

other requirements, and to conduct site specific studies of specific sites as identified in the stipulation and, if necessary, incorporate appropriate mitigation measures for these sites into the HPMP.

The BLM's Modified Condition contains similar general requirements to PacifiCorp's alternative condition.. Wording changes relate to PacifiCorp's attempting to narrow the scope of the BLM's authority. The BLM has the authority to impose these conditions as they are related to the adequate protection and utilization of the BLM reservation (*See* Statutory Authority above). PacifiCorp's narrowing of the condition in their alternative condition results in less than adequate protection and utilization of the BLM reservation.

PacifiCorp's attempt to narrow the condition is counter to proceedings where once an APE is established, cultural resource surveys are completed according to specific protocols within the entire APE, not a portion thereof. By definition, it is the area of *potential* effect, and is not determined or limited to the existing Project boundary or the known or anticipated effects to cultural resources.

Rationale for the Modified Condition

The BLM cultural resource condition is intended to ensure that protection of cultural properties on BLM-administered lands from effects of Project-related activities is accomplished.

Cultural resources on BLM-administered lands are managed pursuant to the *Antiquities Act* of 1906, the *Archaeological Resources Protection Act* (ARPA) of 1979, the *Historic Sites Act* of 1935, the *Historic and Archaeological Data Preservation Act* of 1974, the *National Historic Preservation Act* (NHPA) of 1966 (as amended), the *National Environmental Policy Act* (NEPA) of 1969, the *American Indian Religious Freedom Act* (AIRFA) of 1992, the *Native American Graves Protection Act* (NAGPRA) of 1990, the *Federal Land Policy and Management Act* (FLPMA) of 1976, Executive Order 11593 issued in 1972, and 36 CFR part 800. In addition, the Klamath Falls Resource Management Plan (RMP) (USDI BLM, 1995a) directs the BLM to identify, manage and protect cultural resources as well as to consult and coordinate with affected Native American tribes. All federal actions that have a potential to affect cultural resources are subject to these laws and regulations, including the Commission's current proceeding to determine whether to issue a new license for the Klamath Hydroelectric Project, and if so, under what conditions would a license be issued.

The Project affects cultural resources as a function of roads, facilities operation, and recreation use. Eighteen NRHP-eligible cultural sites on BLM-administered land exist within the currently defined Area of Potential Effect (APE). The Licensee has acknowledged impacts to cultural sites within the Project boundary resultant of public access and recreation (e.g., "*Some of these sites appear to be affected by Project operations and/or Project-related activities such as public access and recreation*" PacifiCorp 2004e, pg 3-1). Additional impacts identified by the Licensee include looting, vandalism, erosion, road and utilities development, livestock grazing, and camping

(PacifiCorp 2004e, Tables 3.6-1 and 3.6-2). In addition, Project flow management may be affecting five sites (35KL21/786, 35KL22, 35KL24, 35KL558, and 35KL577) within the APE (See below).

In a letter to the ALJ dated August 11, 2006 and as ordered by the ALJ on August 14, 2006, BLM and PacifiCorp jointly submitted a stipulation stating that:

PacifiCorp and the BLM agree that PacifiCorp's flow operations do not cause erosion impacts at the following 13 BLM cultural sites: 35KL18, 35KL550, 35KL567, 35KL576, 35KL629, 35KL630, 35KL632, 35KL633, 35KL635, 35KL785, 35KL791, 35KL1083, and JC03-29. The parties further agree that more detailed, site-specific studies are required to determine the erosion impacts, if any, from PacifiCorp's flow operations at the following 5 BLM cultural sites which are within, or partially within, the T1 terrace: 35KL21/786, 35KL22, 35KL24, 35KL558, and 35KL577. PacifiCorp agrees that it will coordinate and consult with the BLM when it carries out any of the aforementioned site-specific studies.

Recreation in the Project area is expected to increase over the period of the next license (PacifiCorp 2004k, pg 3-54). The Licensee notes that visitors to the Project area mainly are concerned with resting/relaxing, fishing, camping and boating opportunities (PacifiCorp 2004k, pg 3-59 – 3-60). Within the APE on BLM land, these opportunities tend to occur on the river terraces and immediately adjacent to the river. These terraces contain the remains of numerous historical and prehistoric sites which are at risk of continued disturbance. Increased recreation use results in increased disturbance associated with casual collection of artifacts and inadvertent disturbance. This will continue over the period of the new license and over time will contribute to the loss of cultural resources or at a minimum, reduce site integrity.

Of particular concern is the use of all-terrain vehicles (ATVs), including motorcycles, within the canyon. Disturbance to archaeological sites on BLM lands by ATV use has been documented (Canaday 2003) and is expected to continue. At several sites within the canyon, especially at Frain Ranch, ATVs are using prehistoric house pit depressions as jumps/ramps and obstacle courses (Canaday 2003). This severely disturbs the artifacts as well as the integrity of the structures. Disturbance of archaeological sites from ATV use is expected to continue as long as access to these areas is unrestricted, and should be considered in the HPMP.

Complete Cultural Resources Inventory – BLM lands within the APE have not been fully inspected for cultural resources. Therefore, the full extent of Project effects on the BLM reservation is unclear. All BLM lands within the APE require cultural resources surveys to fulfill the intent of the NHPA as well as to meet Tribal trust responsibilities. The BLM routinely conducts cultural resource surveys for its' own ground disturbing activities and requires outside entities wishing to conduct undertakings on BLM-administered lands (such as the relicensing of the Klamath Hydroelectric Project) to comply with laws and regulations related to cultural resources.

The Licensee did not identify a cultural resources APE prior to the initiation of cultural resources surveys for the relicensing effort. Instead, the Licensee proposed a Field Inventory Corridor (FIC) that would encompass the APE when one was designated. Cultural resource surveys were conducted within portions of the FIC during the 2002/2003 field seasons. A proposed APE was submitted to the California and Oregon State Historic Preservation Officers (SHPO) and the Yurok Tribal Heritage Preservation Officer on February 2, 2004. A copy of the proposed APE was also provided to the relicensing Cultural Resources Work Group (CRWG) at this time. The surveys conducted within the FIC do not adequately cover the entire APE. The Licensee stated in a letter to the Oregon SHPO dated August 2, 2004 (PacifiCorp 2004g), that all land within the APE was adequately inspected for cultural resources. The Licensee maintains that areas within the APE located on BLM land should be surveyed by the BLM. The BLM has noted (USDI 2004, Raby 2004a, 2004b) that under Section 106 of the NHPA, the Licensee is obligated to ensure that surveys within the APE are conducted. Further, the BLM notes that portions of the APE on BLM lands have been inspected or cleared by BLM in association with management actions unrelated to the Project relicensing proceeding. However, when one compares past surveys with those conducted by the Licensee within the currently defined APE, it is clear that several hundred acres have yet to be inspected. Included in this total are approximately 77.2 acres of BLM land that have not been surveyed. Additional BLM-administered lands within the APE have also not been inspected, but it is too steep or marshy for effective survey. The 77.2 acres identified here are areas of relatively gentle topography. FERC has also indicated that survey of BLM land within the APE should be conducted by PacifiCorp (FERC 2006 page 5-53) and the Oregon State Historic Preservation Office (SHPO), by letter dated November 15, 2006 to FERC on the DEIS, concurs with this condition (OPRD 2006).

Amend Historic Properties Management Plan – Cultural resources on BLM lands have and will continue to be affected by the Project. The Licensee did not adequately address the survey, protection, monitoring, and mitigation of cultural resources located on BLM lands. The HPMP does not include NRHP eligible sites located on BLM-administered land within the J.C. Boyle Peaking Reach. These sites are within the APE included in the FLA, may be impacted by Project-related activities, and must be included in the HPMP. The Licensee notes, “*The FERC has regulations that require that a Historic Properties Management Plan be prepared to mitigate and manage Project effects on cultural resources that are eligible for the National Register of Historic Places (NRHP).*” (PacifiCorp 2004j, pg 1-1). In the Final Technical Report, the Licensee evaluates NRHP eligibility for 20 sites on BLM land within the APE (PacifiCorp 2004e, Table 3.6-1 and 3.6-2). Two sites (35KL634 and 35KL1419) are not eligible for inclusion on the NRHP. One site (35KL785) was not evaluated because it was not within the FIC inspected by the Licensee. The Licensee’s proposed APE now encompasses this site that the BLM considers eligible for the NRHP. The 17 remaining sites were evaluated by the Licensee as being eligible for inclusion on the NRHP. At the time, the Licensee noted the effect of Project operations on these sites (PacifiCorp 2004e, Table 3.6-1 and Table 3.6-2). However, none of the sites are included in the HPMP. This condition requires the Licensee to include these sites in the HPMP. FERC staff also

concludes that the HPMP should be amended to encompass the entire APE (FERC 2006, page 5-53).

The BLM monitors at least 20% of its' cultural resources as directed in the RMP (USDI BLM 1995a). The intent of the condition is to incorporate required monitoring of cultural resources on BLM-administered lands within the APE to be consistent with BLM's current management direction.

Cultural resource surveys conducted on federal land are considered adequate for compliance purposes for approximately 15 years (Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation). Changes in vegetation cover, surface visibility, erosion, and survey techniques can affect the reliability of past surveys. BLM routinely re-surveys areas prior to undertakings if the original survey is older than approximately 15 years and often sooner if a proposed undertaking is planned within areas considered to be high probability for containing cultural resources (river terraces, gentle slopes, adjacent to water, etc.). The condition requires the Licensee to re-inspect past surveyed areas on BLM-administered lands if ground disturbing projects are proposed for areas that have past survey clearance older than 15 years.

Detailed Site Specific Studies – The five sites (35KL21/786, 35KL22, 35KL24, 35KL558, and 35KL577) on BLM administered land within the APE immediately adjacent to the Klamath River in the J.C. Boyle Peaking Reach may be impacted by Project flow fluctuations eroding the river bank. The stipulation described above recognized that PacifiCorp flow operations may be causing adverse impacts to these sites. The Modified Condition directs PacifiCorp to conduct (in consultation and coordination with the BLM) site specific studies to determine whether Project flow management is causing impacts from erosion at these sites. At least one prehistoric site (35KL22) containing human remains is included in the list of sites to be investigated. Emergency stabilization efforts currently protect a portion of this site. Cultural deposits at these sites may be at risk from erosion through periodic wetting and drying of the fragile archaeological deposits. Continued ramping, changes in discharge during summer months, and the short duration of peaking, need to be evaluated as potential forces of erosion during the detailed site specific studies at these five sites.

BLM Modified Condition 6 – Recreation and Aesthetic Resources Management

Discussion

Based on review of the BLM preliminary condition No. 6, PacifiCorp's alternative condition with rationale, and PacifiCorp's comments on the BLM's conditions (PacifiCorp 2006b, pages 27-28), the BLM has refined Condition No. 6 to clarify the requirements of the condition. The objective of the Modified Condition requires the Licensee to complete a Recreation Resource Management Plan (RRMP) that describes the management of all Project-related recreation activities and Project-related recreation facilities, including those on or affecting BLM-administered lands. The RRMP will also

include a Visual Resource Management Plan that identifies provisions and guidelines for managing visual resources in and around Project facilities on BLM-administered lands.

In general, the BLM's Modified Condition is similar to BLM's preliminary condition, and has similar general requirements to PacifiCorp's alternative condition. The condition differs significantly in terms of identified recreation facilities, which is a consequence of a dispute over what constitutes Project-related recreation. PacifiCorp has narrowed the scope of its responsibilities for Project-related recreation and further through its alternative has attempted to narrow the scope of BLM's authority under Section 4(e) of the FPA. The BLM has the authority to impose these conditions as they are related to the adequate protection and utilization of the BLM reservation (*See* Statutory Authority above). PacifiCorp's narrowing of the condition in its alternative condition would result in less than adequate protection and utilization of the BLM reservation.

PacifiCorp took exception to the BLM's reserving the right "to require changes to the plan..." wording in the preliminary condition. While its arguments are related to a lack of BLM authority to require changes to Project operations through revision of FPA §4(e) conditions (not applicable in BLM preliminary condition No. 6), the BLM has removed the language from this condition and will rely on the consultation requirements contained in this and other conditions. The BLM Modified Condition does modify the timing for monitoring and assessment of visitor use to determine the need for new facilities or management to coincide with Form 80 Report requirements of the Licensee.

Rationale for the Modified Condition

Recreation Resource Management Plan

Recreation Opportunities and Demand

Summer whitewater rafting, fishing (including fly fishing) reservoir-based boating, and camping are all Project-related recreation activities. Peaking operations for power generation accommodate high quality whitewater boating that otherwise would be absent during summer months. Predictable flows that accommodate whitewater boating have developed a commercial whitewater boating industry on the upper Klamath River in this area. In the absence of the Project, the upper Klamath River would likely afford only "technical" whitewater or low-flow boating (e.g. kayaking) opportunities during the summer months. The Project has also created and led for an increased demand for reservoir based recreation. In response to demand for Project-related recreation and the need for access to accommodate this demand, BLM developed and has maintained recreation infrastructure to partially supply this demand. BLM has incurred the cost associated with construction and maintenance of this infrastructure as well as for the costs associated with staffing, planning, maintenance, and monitoring use and condition of these facilities. The Licensee needs to take a larger role in providing for Project-related recreation in a new license, and needs to develop a Recreation Resource Management Plan (RRMP) that coordinates the management of Project-related recreation resources in the area with other stakeholders and agencies, including the BLM.

Recreation use and demand for developed, staffed and maintained facilities will continue to grow as the population of the Klamath Basin expands over the next 30 to 50 years (PacifiCorp 2004k, pages 5-46-49). Increased recreation use of the Project and Project-created recreation opportunities presents a challenge to BLM-administered lands management that requires balancing resource protection with increased demand for diverse recreation opportunities. Increased recreation use of public lands, including Project-related recreation, without a corresponding increase in capital improvements necessary to maintain the infrastructure will ultimately result in negative impacts to other resource values; the quality of the recreation experience; and to human health and safety. To date, the cost associated with developing or maintaining recreation infrastructure, including some areas where Project-related recreation dominates, has mainly been borne by the BLM.

The Commission acknowledges recreation demand resultant of Project operations and requires the details of recreation management be developed through a comprehensive recreation management plan (See 18 CFR Ch. 1, 4-1-96 Ed.). The Commission requires that the comprehensive recreation management plan be prepared in consultation with federal agencies with managerial responsibilities for lands utilized by the Project and including agency recommendations for creating, preserving or enhancing recreation opportunities at the Project and in the Project vicinity.

The Licensee developed a Draft Technical Report for Recreation Resources (PacifiCorp 2003c) and the Recreation Needs Summary (PacifiCorp 2003d) that identified existing and proposed recreation facilities and opportunities for BLM-administered lands including: Topsy Campground, Spring Island Boaters Access, Klamath River Campground, Stateline Takeout, and dispersed day-use sites. These needs were omitted from subsequent filings to the Commission regarding recreation needs and opportunities in the Final License Application (PacifiCorp 2004a), however, the recreation needs remain and must be addressed. In the absence of provisions to improve, develop, or maintain these facilities the Licensee would fail to meet existing or projected demand for recreation resources (PacifiCorp 2004k, pages 5-46 through 5-49). The BLM condition is intended to ensure that the licensee accommodates the recreation demand that the Project has induced. While the BLM has supported a significant percentage of the Project-related recreation in the past, it is time that the licensee takes a larger role in supporting the Project-related recreation in a new license.

Topsy Campground

The Topsy Campground receives recreation use that is a direct result of the Project reservoir and would not have been constructed if the Project had not created a demand for this type of recreation facility. Existing recreation demand for developed camping at the J. C. Boyle Reservoir is met entirely by the Topsy Campground. The Topsy Campground is the only developed and staffed camping facility on J.C. Boyle Reservoir. Demand for camping at Topsy Campground is high on most weekends during summer months and the number of campsites (16), group sites, and improved day-use sites are

limited. In fact, the BLM has had to close the entrance to Topsy Campground on numerous weekends when site capacity is filled.

FERC recognized the nexus of Topsy Campground to the Project and recommended as part of the Staff Alternative in the DEIS to “[r]etain Topsy Campground in the Project boundary, develop a potable water system for this facility, address this facility in the Operations and Maintenance Program of PacifiCorp’s Recreation Resources Management Plan, and develop a Memorandum of Agreement with the Bureau of Land Management that defines PacifiCorp’s and the Bureau’s responsibilities at this site.” (FERC 2006 Page 5-20).

Availability of a potable water supply at Topsy Campground has become problematic. Two wells at the site have failed due to poor water quality and currently BLM transports potable water to the site. A reliable potable water supply is a necessity for public safety and health. The Licensee recognized the need for water system improvements, stating, “BLM’s water system needs refurbishment and/or a new potable well source created.” (PacifiCorp 2004k, page 5-20).

The Topsy Campground access road is potholed, washboarded, and as a result is difficult to maintain. The BLM receives frequent complaints from the public regarding the condition of the road and associated dust. This situation, and other similar situations, should be evaluated in the RRMP to address and implement appropriate measures to reduce these road hazards and dust from vehicles. FERC concluded, as part of the Staff Alternative in the DEIS, that the portion of Topsy Grade from Highway 66 to the intersection of the road that provides access to J.C. Boyle dam, including access to Topsy Campground, should be included as part of the Project since it is needed for Project operations and maintenance, as well as for Project-related recreation. The BLM agrees.

The BLM agreed with the Licensee, that, in the Draft Technical Report for Recreation Resources (PacifiCorp 2003c) and the Recreation Needs Summary (PacifiCorp 2003d), the identified the need for a group site on J.C. Boyle Reservoir to handle large weekend gatherings, and additional day-use picnic and camping sites for Topsy Campground was needed. Day-use and camping sites at the Topsy campground are not designed to accommodate the increased number of day-users, campers, or groups that access the area. Off-site developments at the Boyle Bluffs area are preferred as additional space for expansion at Topsy Campground is not available. The Licensee has recognized this need in the Final License Application: “Approximately 10 new RV/tent campsites will likely be needed as the BLM’s Topsy Campground reaches capacity. Infill or expansion is not feasible at this location. A new day use and campground facility at Boyle Bluffs may be considered.” (PacifiCorp 2004a, Exhibit E, page 7-99). The DEIS Staff Alternative incorporates PacifiCorp’s proposed measure # 28P, which included modification of “the schedule for construction of a potable water supply and restroom facilities at the proposed J.C. Boyle bluffs campground and day-use area to correspond with the initial construction phase at this site...” (FERC 2006 pages 5-4) The DEIS also indicates that these measures should be completed earlier than the 20 years after license issuance, as proposed by PacifiCorp.

J.C. Boyle Bypass Reach

The BLM administers lands along the J.C. Boyle Bypassed Reach for fishing, hiking, sightseeing, and other dispersed recreation. The J.C. Boyle Bypassed Reach boating and fishing access sites have not been improved with signage, barriers, or designated parking spaces. Historically, the Licensee allowed angler and boater access to the reach. Additional graveled and delineated boating and fishing access sites on BLM-administered lands are needed to meet existing demand, provide safe parking and trail access to the Bypassed Reach. These sites were identified by the Licensee for potential development: “*J.C. Boyle Bypass Reach/Powerhouse Area Fishing Access Trails.*” There are a number of opportunities to formalize user-defined trails and/or create new hardened fishing access trails in the J.C. Boyle Bypassed Reach and powerhouse area. Formalized fishing access trails could be developed below J.C. Boyle dam and near the J.C. Boyle powerhouse. One or more pull-offs along the Canal Access Road could be used for parking. A second location for a formalized trail would start at the gravel parking area adjacent to the J.C. Boyle Powerhouse ‘shed’ and follow the river upstream. This short fishing access trail probably would require some new trail construction. (PacifiCorp 2004k, pages 5-100 and 5-101) The BLM concurs with FERC staff conclusions for the J.C. Boyle Bypassed Reach recreation developments in the DEIS, and the management of these developments should be incorporated into the RRMP.

Spring Island Boater Access

The Spring Island site was constructed by the BLM in the early 1980s, principally in response to commercial whitewater boating interests. The facility was constructed after PacifiCorp prohibited launching from just above the J.C. Boyle powerhouse. Because summer white-water boating is dependant on flow releases from the Project, the BLM concludes that the Spring Island boater access is Project-related, serves the Project purpose of recreation and has a direct nexus to the Project.

The Spring Island boater access is accessed by the Project-related road located within the existing Project boundary. The Powerhouse road leading to the Spring Island Boater’s access is often washboarded, dusty, and difficult to maintain. Additional maintenance and re-surfacing is necessary to reduce hazards and for dust control. FERC recognized in the DEIS that the Powerhouse Road to the Spring Island turn-around serves Project purposes (FERC 2006, page 3-467, lines 6-16), but as the Spring Island boater access is also Project-related, this facility and the rest of the road accessing this site must be included in the RRMP. As no other facility exists or is proposed by the Licensee to meet the demand for improved day-use launching facilities below the J.C. Boyle Powerhouse, the Spring Island boater access is a critical part of the recreation infrastructure for Project-related recreation. The BLM recognizes that the opportunities for whitewater boating during the summer months will be reduced with the implementation of BLM Modified Condition No. 4 and will occur primarily on the weekends during this time. This will necessitate that the Spring Island boaters access be evaluated to accommodate this more focused use in the RRMP.

PacifiCorp has proposed a small boat and kayak launch facility below J.C. Boyle Dam (DEIS page 3-418, lines 4-6). While this new facility will likely see most use during spring/early summer spill events when flows are higher, Spring Island will continue to see use primarily during summer hydropower peaking events. Under all of the alternatives considered in detail in the DEIS, flow releases at J.C. Boyle Dam would be insufficient for white-water boating during summer months in the Bypassed Reach. The vast majority of use at Spring Island boat launch is for launching of commercial float trips during the summer months.

The Spring Island boater access (for put in) is needed for Project purposes as are the Stateline Takeout and Fishing Access 1 (for take-out.) FERC identified in the DEIS that the existing road from the Ager-Beswick road to the Stateline Takeout is needed for the Project purpose of recreation (with which BLM agrees), and likewise, the access road below the turn-around to and including the Spring Island boater access is also needed for the Project purpose of recreation.

For the reasons stated above, Spring Island boater access meets a needed Project purpose by providing an improved recreation access for whitewater boating, including during times of hydropower peaking. As such, this facility and the road accessing it should be included in the RRMP which results in the Licensee assuming at least a percentage of the operation and maintenance and improvements needed at the site.

Klamath River Campground

The BLM's Klamath River Campground is accessed by an extremely rough road that requires maintenance including grading, rock fall protection, and rock removal. The campground would not be accessible if this road had not been constructed for the Project. The Licensee recognized the need for road improvements in its Recreation Resources Draft Technical Report (PacifiCorp 2003c, page 5-144): "Consider some improvement to the primitive access road to this site, while not attracting large crowds to this site."

BLM estimates that annual use of the site accounted for approximately 1,000 visits (USDI BLM 2004a). Approximately 70 percent of annual recreation use at this site occurs during the summer peak season (PacifiCorp 2004k, page 5-72) and the majority of visitors in the Upper Klamath River participated in whitewater boating (PacifiCorp 2004k, page 3-16). The campground and rutted access road needs improvement. The Licensee recognized the need for site improvements in its Recreation Resources Draft Technical Report: "In general, these may include site improvements and/or site relocation." (PacifiCorp 2003c, page 5-144).

Overall, use of this site is considered to be approaching its recreation capacity (PacifiCorp 2004k, pages 5-72 and 5-73). Additional sites are needed to meet demand for improved camping facilities below the J.C. Boyle Powerhouse. There are no other existing or proposed developed facilities for camping on this segment of the Klamath River. As this facility has been shown to receive recreation use that is a direct result of the Project roads and Project peaking operations and would not have been constructed in

the absence of the Project, the BLM concludes that the facility and access road should be included in the RRMP and that the Licensee has some responsibility for maintaining and operating this facility.

Stateline Takeout

The Stateline Takeout Recreation Site and access road, which the BLM and PacifiCorp currently share responsibility for managing, receives heavy use during peak summer months. Primary recreation users include commercial whitewater rafting companies and the general public. The BLM portion of the Stateline site is impacted as a function of recreation demand and lack of developed camping and day use facilities. The Stateline Takeout Recreation Site would not exist in the absence of the peaking flows from Project operations. Currently, Fishing Access 1 and the Stateline Takeout provide the only public boater takeouts.

BLM has provided permanent vault and rented portable toilets at both the BLM and the PacifiCorp portions of the Stateline Takeout. While PacifiCorp proposed in the FLA to exclude the BLM portion of the Stateline Takeout site, the PacifiCorp portion of the Stateline Takeout can only be accessed through BLM-administered lands. The DEIS Staff Alternative proposes that the access road from Ager-Beswick Road to the existing site on PacifiCorp land is needed for Project purposes, and it would be illogical to identify that only the PacifiCorp portion of the Stateline Takeout site is needed for Project purposes. The management of the access road and the entire Stateline Takeout Recreation Site needs to be addressed in the RRMP.

The Licensee has identified several resource protection measures and recreation enhancements for the BLM-administered portion of Stateline Recreation site in the draft technical reports and needs summaries. Overall, use of this site is considered to be approaching its recreation capacity (PacifiCorp 2004k, page 5-145). Road improvements are needed to reduce erosion, rutting and impacts from uncontrolled recreation use. Designated camping areas are needed to reduce loss of vegetation and conflicts with cultural sites. These items are necessary to meet an existing recreation demand and reduce conflicts with other resources.

As the BLM portion of the Stateline site has been shown to receive whitewater boating use that is a direct result of the Project (PacifiCorp 2004k, pages 5-145 and 5-146); is only accessible by the same access road needed for the PacifiCorp portion of the site, and would not have been constructed in the absence of the peaking flows from the Project, the BLM concludes that the Licensee has some fiscal obligation for maintenance and operation of these facilities.

Dispersed Day-use Sites

Several dispersed and undeveloped campsites and day-use areas on BLM-administered lands receive camping, fishing and boating use. Recreationists gain access to these sites via Project roads or while floating the Klamath River during times of hydropower

peaking. Several sites have fire grates and picnic tables and serve as “designated” dispersed camps when summer fire restrictions are in effect. These day-use sites are needed to meet an existing recreation demand as identified by the Licensee (PacifiCorp 2004k, pages 5-148 through 5-150). As these day-use sites have been shown to receive Project-related recreation use, the BLM concludes that these sites should be addressed in the RRMP and that the Licensee has some fiscal obligation for maintenance and operation of these facilities.

While FERC concludes in the DEIS that Frain Ranch and other dispersed sites, and associated whitewater scouting trails along the peaking reach do not provide access to Project lands or waters or accommodate Project recreation, the BLM considers that some level of Project-related recreation use occurs at these sites. As stated in the DEIS and in PacifiCorp’s Recreation Final Technical Report (PacifiCorp 2004k), there is a clear nexus between whitewater boating and PacifiCorp’s peaking operations. Whitewater boaters use all of these sites and scouting trails during summer hydropower peaking. Therefore, these sites do accommodate Project-related recreation and should be included in the RRMP and that there is some level of Licensee responsibility for the operation and maintenance and potential improvements at these sites.

Monitoring and Coordination

The BLM Modified Condition requires monitoring and coordination components to be included in the RRMP. Monitoring of recreation use is an integral part of the implementation of any RRMP, and should include provisions for monitoring and assessment of visitor use on BLM-administered lands that are affected by Project-related recreation at an interval no greater than six years. The BLM changed the assessment requirements from the preliminary condition to comport with Form 80 Report requirements of FERC. The BLM’s expectation is that the assessment will identify when new facilities or changed management of recreation uses are needed and that the RRMP will consult appropriately with the BLM for Project-related recreation use occurring on BLM-administered lands on an annual basis. The BLM also expects that the RRMP will also include thresholds or trigger points for actions to be taken in situations where adaptive management is needed.

Other Considerations

Additional educational and interpretation materials are needed to better inform the public about whitewater hazards and other safety concerns. These items have been identified as a recreation need in the Recreation Resources Final Technical Report (PacifiCorp 2004k, page 5-143). PacifiCorp’s proposed protection and enhancement measure #32P has identified the need for including a multi-resource interpretation and education program with new signs, kiosks, brochures and/or services in the RRMP should address this concern.

The BLM and National Park Service have identified the need for enhanced and up-to-date flow information for the boating public. The BLM agrees with FERC staff where

they include in the DEIS Staff Alternative the additional measure #32P modified to include: expanding “the flow-related information available to the public on PacifiCorp’s website and addressed in the Whitewater Boating and River-based Fishing Program component of PacifiCorp’s Recreation Resources Management Plan to include real-time-flow information at all telemetry-gaged project-reaches.” (FERC 2006, page 2-46, lines 19-22).

Visual Resource Management (VRM) Plan

The Commission requires discussion of scenic values and protection of this resource in consultation with Federal or state agencies with land management responsibility (18 CFR Ch. 1, 4-1-96 Ed.). The consultation must indicate the nature, extent, and results of the consultation. The report must include a description of the measures proposed by the applicant to ensure that any proposed Project works, rights-of-way, access roads and other topographic alterations blend, to the extent possible with the surrounding environment. Metal powerline structures, concrete structures, canals, roads and other Project facilities detract from the scenic quality of the BLM-administered lands along the lower portion of J.C. Boyle Reservoir and the Upper Klamath River to Iron Gate Reservoir. To date, PacifiCorp has not proposed measures to improve aesthetic resources for the J.C. Boyle Bypass Canal and other facilities, which has resulted in FERC Staff not being able to identify specific measures to improve aesthetic resources at this Project facility (the bypass canal) in the DEIS (FERC 2006 page 3-468-469).

Strong visual contrasts are apparent in the Bypass Reach where large continuous concrete structures dominate much of the view of visitors as they descend into the canyon. These Project facilities continue to impact aesthetic resources and do not meet BLM Visual Resource Management class III objectives for the area (USDI BLM 1995a, Map 2-5). VRM Class III objectives allow for moderate levels of change to the characteristic landscape and management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form, line, color, texture and scale found in the predominant natural features of the characteristic landscape.

The Licensee has indicated that BLM’s VRM guidelines and standards would be used to improve some of the existing facilities which are visible from public viewing points on BLM-administered lands (PacifiCorp 2004L, pages 64-66). The BLM has determined that additional facilities need to be included in the VRM Plan as they do not meet the VRM objectives for the area. The Project facilities on BLM-administered lands impacting scenic resources include the J.C. Boyle Bypass Canal and other concrete structures; switch yards, power houses, buildings, penstocks, metal powerline structures; and Project recreation facilities including campgrounds and day-use sites. Project structures likely require screening or concealment using methods as described in this condition in order to meet BLM VRM objectives. The VRM Plan will provide for managing landscape character in such a way as to accommodate existing and new Project-related facilities. Revegetation and site rehabilitation are likely necessary to help meet VRM Plan guidelines for the Topsy campground. While the Licensee has identified

in its Draft RRMP that mitigation measures such as recoating or repainting facilities to reduce contrasts can be accomplished during regular Project maintenance, the BLM stresses that these items should be accomplished within a specific implementation schedule that is described in the VRM Plan.

In 1994, the Upper Klamath River was designated by the Secretary of the Interior as a Scenic River and is included in the National Wild and Scenic Rivers system pursuant to the Wild and Scenic Rivers Act. The BLM requires protections for the designated reach that provide for VRM Class A management in the river corridor that should be addressed in the VRM Plan.

BLM Modified Condition 7 – Vegetation Resources Management Plan

Discussion

Based on review of the BLM preliminary condition No. 7, PacifiCorp's alternative condition with rationale, and PacifiCorp's comments on the BLM's conditions (PacifiCorp 2006b, pages 28-30), the BLM has refined Condition No. 7 to clarify the requirements of the condition and to address some of the rationale PacifiCorp has provided. The objective of the Modified Condition requires the Licensee to complete a Vegetation Resources Management Plan (VRMP) that describes the management of vegetation resources for those areas affected by Project-related activities, including Project-related recreation. The VRMP will include, at a minimum, activities and management related to noxious weeds and threatened, endangered and BLM Sensitive species on BLM-administered lands affected by Project-related activities, and contain rehabilitation measures for the area below the J.C. Boyle emergency spillway.

The BLM's Modified Condition contains similar general requirements to BLM's preliminary condition, although is structured differently and has different specific wording in some areas. The BLM's Modified Condition also contains similar general requirements to PacifiCorp's alternative condition, but differs significantly in terms of PacifiCorp's attempting to narrow the scope of the BLM's authority under Section 4(e) of the FPA. The BLM has the authority to impose these conditions as they are related to the adequate protection and utilization of the BLM reservation (see Statutory Authority above). PacifiCorp's narrowing of the applicability of the condition in their alternative condition would result in less than adequate protection and utilization of the BLM reservation.

PacifiCorp took exception to inclusion of "invasive species" in the preliminary condition in addition to noxious weeds. While the BLM assumes that the VRMP will also include discussion regarding management of invasive species and noxious weeds, BLM has removed the reference in the Modified Condition.

PacifiCorp also takes exception to the BLM's reserving the right "to require changes to the plan..." wording in the preliminary condition. While its arguments are related to the lack of BLM's authority to require changes to Project operations through revision of FPA

§4(e) conditions (not applicable in BLM preliminary condition No. 7), the BLM has removed the language from this condition and will rely on the consultation requirements contained in this and other conditions.

Rationale for the Modified Condition

Maintenance of the J.C. Boyle powerhouse, canal, and Project road and transmission line ROWs as well as use of BLM roads used for Project-related recreation all impact vegetation resources administered by the BLM. The Licensee proposes to develop a Vegetation Resources Management Plan (PacifiCorp 2004a, Exhibit E 5-122) to guide vegetation and weed management and monitoring near Project facilities and roads, recreation sites, and transmission lines. This condition is intended to ensure that the Vegetation Resources Management Plan (VRMP) is completed in consultation with the BLM and that BLM-administered lands affected by Project-related activities are included in the VRMP. Specific areas needing attention in the VRMP include limiting the introduction and potential spread of noxious weed species, management of threatened, endangered and sensitive species, and the rehabilitation of the severe erosion downslope of the emergency spillway.

Noxious Weeds

Powerhouse maintenance, transmission line and road ROW maintenance, and use of Project roads contribute to the spread of noxious weeds and invasive non-native plant species, placing other native plant communities at risk. Noxious and invasive weed species are effective at colonizing disturbed areas such as those associated with Project facilities. Once established these species have the capacity to invade undisturbed, adjacent sites as well.

Vegetation maps for the Project include 165 acres adjacent to the Klamath River, Jenny Creek, and Spencer Creek and approximately 75 acres adjacent to the J.C. Boyle and Keno reservoirs that were surveyed for botanical resources. Surveys from 2002 revealed 60 infestations and the presence of 17 target weed species. Infestations include populations of St. Johns' wort, hoary cress, Canada thistle, Dyer's woad, and Mediterranean sage (PacifiCorp 2004b, page 8-5). BLM previously mapped 52 of the 60 infestations. Previous surveys also recorded the presence of common toadflax, Himalayan blackberry, poison hemlock, and salt cedar. The botanical survey is inadequate for determining the geographic scope of Project impacts on vegetation resources. Current information for noxious weeds and invasive non-native plants does not reflect the widespread distribution of some species. For example, six "widespread species" (cheatgrass, Dalmatian toadflax, medusahead, yellow starthistle, and bull thistle) were not mapped, and only their general distribution was described based on plot data. The distribution and relative abundance of yellow starthistle, a species targeted for prevention and control by the Oregon State Weed Board, should be surveyed and mapped so appropriate treatments to control the species can be developed and implemented in the Project area.

An integrated vegetation management strategy necessitates understanding the distribution of noxious and invasive as well as other species across the broader landscape. The limited spatial scope of the existing vegetation survey limits the ability to analyze or mitigate for effects to vegetation from Project-related activities. Since listed noxious weed species have been targeted for control by the Oregon State Weed Board, the distributions of these species should have been mapped. This is also true for other noxious weed species and targeted non-native invasive species in order to develop an effective, integrated weed management plan for the Project area, including BLM-administered lands affected by Project-related activities.

BLM management direction for the management of noxious weeds requires an integrated program to reduce or control infestations. The program must be coordinated with other agencies, including the Oregon Department of Agriculture, and incorporated into all authorizations for the use and occupancy of BLM-administered lands. The BLM maintains a cooperative agreement with the Oregon State Weed Board. Through the Oregon State Weed Board, the BLM participates in established Weed Management Areas, which include all stakeholders, in order to coordinate across multiple land ownerships. As the Project occupies BLM-administered lands and the Licensee also has lands in the Project area, the Licensee needs to address noxious weed and invasive species management in a coordinated manner in the VRMP.

Threatened, Endangered, and Sensitive Plant Species

Project impacts to threatened, endangered and sensitive (TES) plant species are discussed in the FLA only as they relate to flow and water level manipulations. However, other Project-related activities also have the potential to affect TES species. Project facilities and operations directly and indirectly affect TES species and their habitat. This includes disturbance from Project operations, Project roads, and Project-related recreation.

Information regarding the abundance and distribution of TES plant species is based on field surveys, review of BLM, Oregon Natural Heritage Information Center (ORNHIC), California Natural Diversity Database, and California Native Plant Society records. While PacifiCorp claims that the “intuitive controlled” survey method (Whiteaker et al. 1998) (PacifiCorp 2004b, page 5-3) was used, they failed to confirm information about known TES plant locations within the survey area “because of their remote location within the study area” (PacifiCorp 2004b, page 5-20). The survey focused on sites “most likely to be directly affected by Project activities,” as opposed to areas supporting potential habitat for suspected species. Neither skipping over remote areas nor focusing only on areas that might be directly affected are indicative of an “intuitive controlled” survey. Thus, the location of several known populations of TES plant species that have been recorded from other sources could not be corroborated based on PacifiCorp’s results. Confirmation of species presence/absence and distribution is necessary to determine the magnitude of impacts of Project operations on TES species, as well as ascertaining the proper management for these species in the VRMP. It is unlikely that all TES plant populations within the Project area have been located. For example, bristly sedge, a BLM sensitive species formerly believed to be extinct in Oregon, was identified

along the J.C. Boyle Reservoir and the Topsy Campground subsequent to the 2002 survey. Several TES species were found in the seasonally wet, alkaline flood plains adjacent to Keno reservoir, and may be impacted by changes in reservoir management. These species are Applegate's milkvetch (federally listed as endangered), short-podded thelypodium, pendulus bulrush, Columbia yellow cress, and salt heliotrope. Several other TES plant species are found in seasonally wet meadows not influenced directly by flow manipulations. However, Project roads and roads created off Project roads often cross these meadows and disrupt the natural hydrology to which these species are adapted. These species include red root yampah, Howell's yampah, and Bellinger's meadow foam.

PacifiCorp's propensity to focus only on their proposed Project boundary during their study reports has resulted in an inadequate information base to determine Project effects or how TES plant species should be managed in the Project area. Impacts have been described as "uncertain" and related solely to Project maintenance or flow regulation. Like the evaluation of the affect of Project operations on individual species, assessing changes in habitat as a function of Project operations is described as "difficult." Because impacts to TES plant species are inadequately described, discussion of potential future impacts is likewise inadequate. As a consequence the proposed Vegetation Resources Management Plan lacks detail describing "protections" for plant species and habitats (PacifiCorp 2004a, Exhibit E, page 5-126). Based on this inadequacy, a failure to adequately survey the Project area for TES species, and inappropriate application of the survey methodology, it is unlikely that all TES plant populations within the Project area have been located or that impacts of Project operations have been adequately described. Thus, the provisions of the proposed Vegetation Resources Management Plan, including provisions for TES plant protection are inadequate, and should be revised in consultation with the BLM and other stakeholders.

Emergency Spillway Erosion Rehabilitation

PacifiCorp proposes to install a synchronized bypass valve near the J.C. Boyle powerhouse to at least reduce the use of the emergency spillway. The BLM agrees that this measure is needed, as does FERC staff in the DEIS. While it is uncertain whether this measure would only reduce or would eliminate the use of the emergency spillway (USDI 2006a at 11), there is no question that the restoration of the eroded area downslope of the spillway is necessary. In fact, FERC staff considered the restoration of the slope "...to be imperative." (FERC 2006, page 5-22). The BLM agrees. Remediation measures for this area will, by necessity, include the reestablishment of vegetation on the site, commensurate with the expected use of the spillway, once that is determined. Concerns over the Project's access road also need to be addressed, as well as measures to prevent further damage to the bypassed river channel and aquatic habitat. Considering the extent of damage that has occurred at the site, it is likely that continued monitoring and additional measures will be needed throughout the license term, especially if there is any possibility that the emergency spillway were to be used in the future. For these reasons, the BLM's Modified Condition includes a provision that the rehabilitation of the eroded slope below the emergency spillway be addressed in the VRMP.

BLM Modified Condition 8 – Wildlife Habitat Management Plan

Discussion

Based on review of the BLM preliminary condition No. 8, PacifiCorp's alternative condition with rationale, and PacifiCorp's comments on the BLM's conditions (PacifiCorp 2006b, pages 30-34), the BLM has refined Condition No. 8 to clarify the requirements of the condition and to address some of the rationale PacifiCorp has provided. The objective of the Modified Condition requires the Licensee to complete a Wildlife Habitat Management Plan (WHMP) that describes the management of wildlife habitat for BLM-administered lands affected by Project-related activities, including Project-related recreation.

The BLM's Modified Condition contains similar general requirements to BLM's preliminary condition. The BLM's Modified Condition also has similar general requirements to PacifiCorp's proposed alternative condition, but differs significantly as PacifiCorp attempts to narrow the scope of the condition. The BLM has the authority to impose these conditions as they are deemed necessary for the adequate protection and utilization of the BLM reservation (See Statutory Authority above). PacifiCorp's narrowing of the applicability of the condition in their alternative condition would result in less than adequate protection and utilization of the BLM reservation.

PacifiCorp took exception to BLM's use of the term "effectiveness" monitoring and proposes "use" monitoring instead. The BLM considers effectiveness monitoring as necessary for determining the effectiveness of management actions. In the case of where the term was applied in the preliminary condition, as in to determine the effectiveness of the wildlife crossings, escape ramps and measures for the western pond turtle, monitoring of the use would determine whether the structures are effective or not. Therefore, the BLM Modified Condition uses the term "use" monitoring. Regarding PacifiCorp's addition of "existing" to the escape ramps reference in the preliminary condition based on the rationale that there is no information indicating that additional ramps are necessary; any monitoring of use of these structures will provide valuable information as to the effect of the mitigating activity.

PacifiCorp took exception to the BLM's reserving the right "to require changes to the plan..." wording in the preliminary condition. While its arguments are related to the lack of BLM's authority to require changes to Project operations through revision of FPA §4(e) conditions (not applicable in BLM preliminary condition No. 8), the BLM has removed the language from this condition and will rely on the consultation requirements contained in this and other conditions.

Rationale for the Modified Condition

The Klamath Falls Resource Area RMP requires that the BLM shall "Cooperate with federal, tribal, and state wildlife management agencies to identify and mitigate impacts

associated with habitat manipulation....and other management activities that threaten the continued existence and distribution of native wildlife inhabiting federal lands” (USDI BLM 1995a, page 31). The Klamath Falls Resource Area RMP requires that as a main objective, the BLM shall manage wildlife habitat and “enhance and maintain biological diversity and ecosystem health in order to contribute to healthy wildlife populations” (USDI BLM 1995a, page 31).

Wildlife Crossings and Escape Ramps for the J.C. Boyle Canal

The J.C. Boyle Canal blocks movement by individual terrestrial mammals and reptiles. Inside the canal, the height of the freeboard (vertical distance between water and top of inside canal wall) varies depending on the amount of water in the canal, but generally exceeds several feet, so that once animals are in the water they cannot exit except at the two existing escape points. There is no way to cross the J.C. Boyle Canal (PacifiCorp 2004c). The PacifiCorp study concluded that Project waterways may alter movement patterns or corridors, which, in turn, may make animals more susceptible to predation or hunting mortality (PacifiCorp 2004c, page 6-23). The study also suggested several management options for terrestrial habitat connectivity focusing on Project waterways. Among these recommendations was the installation of wildlife crossings.

The Klamath River is the only waterway that crosses the southern part of the Cascade Mountain range and is thus one of the most important big game migration and movement corridors in Oregon. The mixture of vegetation types and landforms also supports a high diversity of habitats for other wildlife species. Small and medium-size mammals and reptiles use the rocky habitat in the middle portions of the J.C. Boyle Bypass Reach. Under current operations there is no opportunity for these species to safely cross the Canal to access riparian habitat along the Klamath River. This habitat may provide important summer habitat for reptiles. In addition, juveniles of many species disperse greater distances and may be affected by the canal (PacifiCorp 2004c). There would be benefits to local populations of these species by enhancing crossing opportunities along the canal.

While it may be impossible to prevent all wildlife fatalities associated with water developments, the BLM will make a reasonable effort to ensure that these projects are as wildlife safe as reasonably possible (USDI BLM 2004b). This includes all existing and future water developments on public lands regardless of who constructed them, when they were constructed, or how construction was authorized (USDI BLM 2004b).

Effectiveness Monitoring of Wildlife Crossings and Escape Ramps

The Klamath Falls Resource Area RMP requires monitoring as part of the BLM’s land management strategy. The direction and guidance set forth in the RMP states that “Monitoring is an essential component of natural resource management because it provides information on the relative success of management. Monitoring results will provide managers with the information to determine whether an objective has been met and whether to continue or modify the management direction.” (USDI BLM 1995a, page

85). Monitoring of the use of the wildlife crossings and escape ramps can be used to inform the effectiveness of the facilities and may lead to adaptive management of the facilities to meet the desired objectives.

Installation of Western Pond Turtle Basking Structure

The western pond turtle is a BLM Sensitive species in Oregon. Western pond turtles occur throughout the Project area, although use appears to be concentrated around basking structures (exposed rocks and occasionally logs) and near areas of slower moving water. They require basking sites, such as logs, rocks, etc. (Csuti et al 1997). Basking sites for thermoregulation are an important component of western pond turtle's habitat (St. John 2002). Pond turtles are ectothermic (cold-blooded), which means that their body temperatures are largely determined by sources of heat outside of their body (Brown et al 1995). During atmospheric basking, turtles elevate and maintain body temperatures near 32 degrees Celsius through a number of thermoregulatory behaviors including: exposing shell to direct sun (heating), dunking the head, feet or body in water (cooling), changing exposure to heating and cooling sources, rotating the body axis, and extending or retracting the limbs and head (Bury and Holland 1993). Changes in water level can affect the availability of suitable basking sites along reservoir and river shorelines. Logs that are partially submerged and available for turtles at one flow or pool level could become entirely exposed at lower flows.

Peaking operations for power production has likely affected habitat suitability for the species. Peaking operations may dislodge basking logs and move logs which are not anchored to the bank or stream bottom. Daily water level fluctuations also increase the rate of decomposition and may make the logs unsuitable (e.g., either inaccessible due to flooding or exposure) for basking. This would occur most often in the J.C. Boyle Peaking Reach where daily peaking results in stage changes of several feet in some locations. Bury (1995) reported that basking logs are limited in this reach (PacifiCorp 2004c). In the J.C. Boyle Peaking Reach, turtles seem to be restricted to relatively few areas that still have suitable basking habitat especially under varying water levels due to peaking operations (Roninger, personal communication, 2005). Peaking operations may also affect pond turtles by periodically widening the distance between the water's edge and shoreline habitat, thus reducing availability of basking sites.

The Topsy/Pokegama Landscape Analysis was prepared by the Klamath Falls Resource Area and the USFWS to meet requirements set forth by the Northwest Forest Plan's Aquatic Conservation Strategy. This plan recommended to "Place large logs in slow water areas known to be important western pond turtle aquatic habitat." (Bury 1995). Logs could be anchored to shore where they would be partially submerged to provide basking and escape cover...Because of the upstream dams and past harvest activity; these areas may have less instream logs than were present historically."(USDI BLM 1996)

Currently, there are few basking structures downstream of the Project facilities. The existing structures receive a high degree of use and should be protected from further degradation. Additional structures located in suitable areas of the J.C. Boyle Peaking

Reach should accommodate more turtle basking at different surface water elevations (PacifiCorp 2004a). The number and distribution of these structures would be determined based on known turtle concentrations, location of recreational activity, and suitability of adjacent uplands for nesting and over wintering.

Effectiveness Monitoring of Installed Western Pond Turtle Basking Structure

The Klamath Falls Resource Area RMP requires monitoring as part of the BLM's land management strategy. Monitoring of the turtle basking structures for use by turtles can be used to inform the effectiveness of the structures and assist in adaptively managing of the structures to meet the desired objectives.

Threatened, Endangered, Sensitive, Special Status Species

Survey, Habitat Protection and Improvement for SS Species on BLM-Administered Lands

The largest number of threatened, endangered and BLM Sensitive (TES) and Special Status (SS) plant and animal species were documented in the J.C. Boyle Peaking Reach; with most of the TES/SS avian species were found in association with riparian, wetland or open water habitats. All TES/SS herptile species (including western pond turtles) and TES/SS mammals (including bats) rely on wetland and riparian habitat during some stage of their life cycle. The extent and suitability of riparian habitat has been affected by Project operations (PacifiCorp 2004c, 5-83 through 5-85).

Preservation of Klamath River aquatic systems and associated peripheral wetland and riparian habitat will be critical to the maintenance of wildlife populations currently existing in and around the study area. The BLM SS species management direction requires that authorized activities taking place on BLM-administered lands, including Project-related activities, provide for the conservation of SS species, and ensure all actions are evaluated to determine if SS species objectives are being met (USDI BLM 2001a, pages 5-6). It will be necessary to conduct protocol surveys for TES/SS species through the life of the new license for habitat disturbing activities on BLM-administered lands in order to evaluate the continuing impacts and maintain current inventories. Surveying initially would supplement the baseline data and subsequent surveys would allow PacifiCorp and the BLM to evaluate the impacts from Project-related activities to TES and SS species over time. Surveys would also be used to identify SS species habitat that would need protection and restoration or mitigation from Project impacts. This is consistent with current RMP direction that states that the BLM should "study, maintain or restore community structure, species composition and ecological processes of special status plant and animal habitat." and consistent with the BLM Special Status Species Policy (USDI BLM 2001a) to monitor and evaluate ongoing management activities to ensure conservation objectives for listed species are being met. The Klamath Falls RMP objectives for Special Status species are to "...manage for the conservation of Federal Candidates and Bureaus Sensitive Species and their habitats so as far as not to contribute the need to list and to recover the species." (USDI BLM 1995a, page 36).

In order to fully evaluate the impacts from the Project an appropriate survey effort of Special Status species and their habitat is needed over the long-term to address those impacts that are on-going as a result of the Project. The surveys conducted, in preparation of the License application, in some cases did not meet BLM protocols, RMP direction, Northwest Forest Plan requirements or the policies in the BLM Special Status Species Manual. Survey protocols for most species are conducted over multiple years to increase the chances of detection. Surveys for Survey and Manage (S&M) Aquatic and Terrestrial Mollusks are required for habitat disturbing actions under the Northwest Forest Plan (USDA USDI 1994) and subsequent 2001 Record of Decision (USDA USDI 2001). The Project has and will continue to impact suitable habitat for terrestrial and aquatic mollusks listed under the S&M species list for the Klamath Falls Resource Area. These surveys should be conducted for those species and according the S&M survey protocol. The current S&M mollusk surveys (PacifiCorp 2004c) were not conducted to Northwest Forest Plan standards (USDA USDI 2001) as stated in the FLA (PacifiCorp 2004a, Exhibit E, page 5-117).

Seasonal Restrictions for TES and SS Species - The Klamath Falls Resource Area RMP/ROD (USDI BLM 1995a, pages 34 and 38-39) provides seasonal restrictions (time of year and/or distance from sensitive area) for management activities on or adjacent to BLM-administered lands that may disturb species during critical periods of their reproduction. Those species include bald and golden eagles, peregrine falcons, Townsend's big-eared bat, northern goshawk, northern spotted owl, and osprey. The BLM condition is proposed to ensure that sensitive avian species continue to be managed consistent with BLM management objectives as well as for State and Federal laws and/or regulations that include provisions for such protections.

Avian Protection Plan for the Upper Klamath River

The bald eagle, golden eagle, osprey, prairie falcon and peregrine falcon have all been documented (Isaacs and Anthony 2005, PacifiCorp 2004a, FTR pp 5-55-60) within the Project and all are susceptible to collision or electrocution from existing transmission facilities. The Final License Application acknowledged that several poles along the transmission line south of the Copco II bypass are not raptor safe (PacifiCorp 2004a Executive Summary 5-5) and it is likely that other poles also impact raptor populations.

An Avian Protection Plan (APP) for Project facilities in the Upper Klamath River should be included in the WHMP, developed in consultation with the BLM and other stakeholders. This plan will address avian interactions (e.g. electrocution, collision, nesting, perching) and the guidelines to be followed with all transmission facilities. The guidelines should follow guidelines in the Avian Protection Plan Guidelines (APLIC and USFWS, 2005), "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996" (APLIC 1996) and/or the most current publication for avian protection at the time. The APP should also include provisions for routine monitoring of Project facilities to discover if additional measures are needed to protect avian species.

BLM Modified Condition 9 – Reservation of Authority

Discussion

Based on review of the BLM preliminary condition No. 9 and PacifiCorp's alternative condition (which is to strike the BLM condition in its entirety) and rationale, the BLM has refined the title and content of Condition No. 9 slightly to provide more clarity as to the requirements of the condition. The objective of the Modified Condition is to ensure that any license issued reserves the authority to require the Licensee to implement such conditions for the protection and utilization of Department of Interior reservations as may be provided by the Secretary of the Interior, pursuant to Section 4(e) of the Federal Power Act, 16 U.S.C. § 797(e).⁵

Rationale for the Modified Condition

PacifiCorp asserts that the Department's reservation of authority condition "would vitiate the due process rights conferred by Congress and contravene the plain language of the..." 2005 amendments to Federal Power Act (FPA) by the Energy Policy Act of 2005 (Pub. L. 109-58, title II, § 241 (2005); 16 U.S.C. §§ 797(e), 811, 823d) (PacifiCorp 2006, page 9).

It is the Department's view that submitting mandatory conditions pursuant to Section 4(e) of the FPA would trigger the Commission's amending the license. The Commission has found that:

"A reservation of authority is a well-recognized means of obtaining the licensee's consent to modifications that may be necessary during the term of the license...."

Public Utility District No. 1 of Pend Orielle County, Washington 117 FERC 61,205 (2006), p. 32, para. 88. A reservation of authority has also been judicially affirmed. *Wisconsin Public Service Corporation v. FERC*, 32 F.3d 1165 (7th Cir. 1994). Both the Court of Appeals and FERC recognize that future exercise of the reserved authority would require notice and an opportunity for hearing. *Id.*, *Wisconsin Public Service*, 32 F.3d at 1170. Moreover, the joint regulations implementing the EP Act further recognize that the hearing and alternatives process will be available if and when the BLM exercises this reserved authority. 43 C.F.R. § 45.1(c).

Section 3. ALTERNATIVES ANALYSIS

⁵ The preamble to the Joint Regulations implementing the EP Act states, however, that license parties cannot request a hearing regarding the reservation of authority itself, or submit alternative to such reservation." 70 Fed. Reg. 69804, 69808 (November 17, 2005). Moreover, the effects of a reservation of authority, by its nature, are indeterminate. The BLM has not considered PacifiCorp's proposed alternative to Condition No. 9 as a formal alternative, but does address PacifiCorp's contentions in the Rationale section.

In accordance with 43 CFR, Part 45 any party to a license proceeding may propose an alternative Federal Power Act (FPA) section 4(e) condition or section 18 fishway prescription to an agency's preliminary condition or prescription. With respect to the Bureau of Land Management (BLM), the BLM must adopt the proposed alternative section 4(e) condition if the BLM determines, based on evidence and supporting material provided by any party to the license proceeding or otherwise available to the agency, that the alternative condition, as compared to the BLM preliminary §4(e) condition:

1. Costs significantly less to implement or results in improved operation of the project works for electricity production; and
2. Provides for the adequate protection and utilization of the reservation.

[*See* Pub. L. NO. 109.58, §241(c), 119 Stat. 674, 675-76 (2005) (adding new FPA Section 33(a) and (b)) (codified at 16 U.S.C § 823d(a) and (b)).]

The statute and implementing regulations require that agencies must consider the evidence/supporting material provided by any party to the license proceeding or otherwise available to the agency, including any Administrative Law Judge (ALJ) decision on disputed issues of material fact issued under 7 CFR §1.660 (Agriculture), 43 CFR § 45.60 (Interior), or 50 CFR §221.60 (Commerce) with respect to the preliminary FPA §4(e) condition. In this case, this includes the ALJ decision issued by the Hon. Parlen L. McKenna, dated September 28, 2006.

The analysis of the above criteria is included below for each BLM preliminary condition.

When the agency files its modified condition, it must also file with FERC:

1. Any study, data, or other factual information relied on that is not already part of the licensing proceeding record.
2. A written statement explaining:
 - a. The basis for the modified condition; and
 - b. If the agency is not adopting any alternative, its reasons for not doing so.

This written statement must also demonstrate that the agency gave equal consideration to the effects of the condition adopted and any alternative not adopted on:

1. Energy supply, distribution, cost, and use;
2. Flood control;
3. Navigation;
4. Water supply;
5. Air quality; and
6. Preservation of other aspects of environmental quality.

The entirety of this document constitutes the Secretary's written statement.

BLM Condition 1

One alternative condition was provided by PacifiCorp for BLM Preliminary Condition 1 (See PacifiCorp 2006, pages 10-15):

Criteria 1 – Will the alternative condition, as compared to the BLM's preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production?

Answer – The alternative condition would likely cost less to implement, but not significantly less. The alternative condition would not result in improved operation of the project works for electricity production.

Justification – PacifiCorp's alternative condition would likely cost less to implement since it provides for reduced requirements when the Licensee undertakes activities on a limited subset of BLM-administered lands. Both the preliminary condition and PacifiCorp's proposed alternative condition are focused on the processes to be taken by the Licensee concerning activities on BLM-administered lands, and neither specifically identifies measures that might take place. Based on estimates provided by PacifiCorp, coordination on any particular issue would cost \$1,000 to \$2,000, and NEPA analysis for 100 foot right-of ways could potentially cost \$1,000 per mile (PacifiCorp 2006, page 25). The costs between the BLM preliminary condition and PacifiCorp's alternative condition would be similar. However, PacifiCorp's alternative condition would reduce the applicability of the condition to a subset of BLM-administered lands which could result in less need for plan development for specific activities and possible NEPA analysis, and correspondingly less cost. The costs provided by PacifiCorp as "...potential additional costs from \$500 to \$3,000 for additional avian protection on each distribution pole and \$5,000 for each transmission-line pole that are otherwise outside the Project boundary; and potential costs of \$75,000 per mile of burying small powerlines outside the Project boundary" (PacifiCorp 2006, page 25) are irrelevant to the BLM preliminary condition and PacifiCorp's alternative condition, as neither condition requires or contemplates these actions. Similarly, PacifiCorp's comparison between the number of acres "...that could potentially come within BLM Condition No. 1" and the number of acres in PacifiCorp's proposed Project boundary is not applicable to the cost of the condition, as the conditions are focused on requirements for licensee-conducted activities on those lands, which is not comparable to the number of the acres themselves.

PacifiCorp's alternative condition would not result in improved operation of the project works for electricity production over BLM's preliminary condition. PacifiCorp's "diversion of resources" argument, as well as the potential for duplicative NEPA-related analysis and potentially conflicting requirements

regarding safety and hazardous substances, are not related to improving operation of the project works for electricity production, but are related to PacifiCorp's interpretation that the preliminary condition exceeds BLM's authority. Similarly, PacifiCorp's assertion that other aspects of the condition exceeds BLM's authority, such as those related to surrender, indemnification and reconstruction due to Licensee damage to BLM lands, would not lead to improved operation of the project works for electricity production if PacifiCorp's alternative condition were chosen.

Criteria 2 – Will the alternative condition, as compared to the BLM's preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – PacifiCorp's alternative condition will not provide for the adequate protection and utilization of the reservation.

Justification – In general, the alternative condition unnecessarily limits the scope of the condition to BLM-administered lands in the Project area that meet PacifiCorp's interpretation of what constitutes a "reservation" under the Federal Power Act, and similarly limits BLM's authority to only some BLM-administered lands within the Project boundary for the Project. Thus, significant impacts from the Project to BLM-administered lands and resources (of which there are many) would not be addressed in terms of required consultation with the BLM and the development of site-specific plans for required mitigation measures through the new license term.

PacifiCorp's arguments that the BLM does not have authority to impose FPA § 4(e) conditions on certain BLM-administered lands or its assertion that BLM authority is limited to only some BLM-administered lands within the Project boundary are without merit. PacifiCorp presents its interpretation of the Supreme Court's holding in *Escondido Mutual Water Co. v. LaJolla Band of Mission Indians*, 466 U.S. 765 (1984). However, because Project facilities are located on BLM-administered lands that constitute the reservation, including the J.C. Boyle Powerhouse and parts of the J.C. Boyle canal, road and tailrace, the BLM has the authority to submit conditions under FPA § 4(e) for the adequate protection and utilization of the reservation. The D.C. Circuit Court of Appeals rejected an argument virtually identical to PacifiCorp's in the recent decision, *City of Tacoma v. FERC*. No. 05-1054 (D.C. Cir. Aug. 22, 2006). In that case, the court upheld the Department's authority to impose the conditions stating "...so long as some portion of the project is on the reservation, the Secretary is authorized to impose any conditions that will protect the reservation, including utilization of the reservation..." *Id.* at 66-67. *See also Public Utility District No. 1 of Pend Orielle County, Washington*, 117 FERC 61,205 (2006), p. 23, para. 59-60 (noting that Section 4(e) conditions are not limited to the geographic scope of the effects of project works located on the reservation nor are restricted to reservation lands within the project boundary).

The BLM recognizes that the Commission has the sole jurisdiction to determine the Project boundary for the Project. Per 18 CFR § 4.41 (h)(2):

The boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of the environmental resources.

As such, the BLM expects that the Project boundary for the new license, if one is issued, will not be limited to lands proposed by PacifiCorp in its license application, but will include BLM-administered lands in order to fulfill Project purposes such as recreation and the protection of environmental resources. The BLM preliminary condition provides for, among other things, the Licensee to prepare site-specific plans for BLM's approval for activities that would take place on those BLM-administered lands to ensure that those activities meet BLM land management direction.

PacifiCorp's attempt to limit the application of the condition would result in less protection for BLM administered lands, including, as even PacifiCorp indicates, the emergency spillway facility, that has significantly impacted BLM-administered lands and resources through its operation according to the existing license. Through not including this facility in its application for a new Project license and its proposal to not include this facility within the new Project boundary, it is apparent that PacifiCorp is attempting to reduce its obligations to mitigate for the impacts of this facility. Similarly, PacifiCorp's proposal to exclude the BLM Topsy Campground from the new Project boundary ignores the fact that this campground is present solely due to the presence of J.C. Boyle Reservoir, and supports a significant amount of the Project-related recreation use on the reservoir. It is well established that the Licensee is responsible for Project-related recreation, and PacifiCorp's proposed exclusion of this campground from the new Project boundary, combined with its arguments as to the limitation of BLM's authority, would result in less than adequate protection and utilization of the BLM reservation in this area.

Conclusion

To satisfy FPA Section 33's standards for when an alternative proposal must be accepted, a proposed alternative must *both* be adequately protective of the reservation *and* either significantly less costly to implement or resulting in improved operations for electricity production. PacifiCorp's alternative condition would unnecessarily limit the requirements. Although PacifiCorp's alternative would cost less to implement, it would not provide for the adequate protection and utilization of the BLM reservation

Equal Consideration of Effects Demonstration

The BLM has conducted the appropriate analysis in accordance with 43 C.F.R §45.73 and has determined the following for BLM Modified Condition 1 and PacifiCorp's proposed alternative condition 1:

1. Energy supply, distribution, cost, and use

PacifiCorp indicates that its alternative condition would not have a negative effect on energy supply, distribution, cost or use (PacifiCorp 2006, Page 27). PacifiCorp asserts that the BLM's condition will have "...a relatively greater impact..." on energy supply, distribution, cost or use due to the potential "...diversion of resources to activities and requirements..." required by the BLM condition. The BLM does not accept this conclusion, as any diversion of resources required by the BLM condition would have no effect on energy supply, distribution, cost or use, nor would it adversely affect the operation of the Project in general for electricity production. It is the BLM's conclusion that neither PacifiCorp's alternative condition nor BLM's Modified Condition will have an effect on energy supply, distribution, cost or use.

2. Flood control

PacifiCorp identified that their proposed alternative would not affect flood control (PacifiCorp 2006, Page 27). The BLM's Modified Condition would not affect flood control.

3. Navigation

PacifiCorp identified that their alternative would have no affect on navigation (PacifiCorp 2006, Page 27). The BLM's Modified Condition would not affect navigation.

4. Water Supply

PacifiCorp identified that their alternative would have no effect on water supply (PacifiCorp 2006, Page 27). The BLM's Modified Condition would not affect water supply.

5. Air Quality

PacifiCorp identified that their proposed alternative would have no effect on air quality (PacifiCorp 2006, Page 27). The BLM's Modified Condition would not affect air quality.

6. Preservation of Other Aspects of Environmental Quality

PacifiCorp identified that their alternative will have no effect on environmental quality (PacifiCorp 2006, Page 27). The BLM's Modified Condition would not affect other aspects of environmental quality.

BLM Condition 2

One alternative condition was provided by PacifiCorp for BLM Preliminary Condition 2 (See PacifiCorp 2006, pages 28-29).

Criteria 1 – Will the alternative condition, as compared to the BLM’s preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production.

Answer – The alternative condition would likely cost less to implement, but not significantly less. The alternative condition would not result in improved operation of the project works for electricity production.

Justification – PacifiCorp’s alternative condition would likely cost less to implement since it provides for reduced requirements for when the Licensee would be required to consult with the BLM concerning Project-related activities on some BLM-administered lands. Both the BLM preliminary condition and PacifiCorp’s proposed alternative condition are focused on the consultation and reporting processes to be taken by the Licensee concerning activities on BLM-administered lands, and do not specifically identify any activities beyond the consultation and reporting requirements. PacifiCorp’s alternative condition does not change these requirements, but limits the scope of applicability of the requirements. As such, this narrowing would likely only result in insignificant cost savings, because the same requirements are inherent to both conditions. For example, both conditions have a requirement to consult with the BLM each year. Similarly, a requirement for a report on the “status of implementing conditions of the license” is in both conditions, whether these respective activities include those that “could affect BLM-administered resources” or, as PacifiCorp’s alternative condition provides, those that “take place on BLM reservation lands within the Project boundary” (PacifiCorp 2006, page 28). Therefore, the difference in cost to implement is not significant. PacifiCorp’s comparison between “...BLM reservation lands within the Project boundary and to all other lands that could potentially come within BLM Condition No. 2” (PacifiCorp 2006, pages 30-31) is not applicable to the cost of the condition, as both conditions are focused on the same requirements for consultation and reporting, which is not related whatsoever to the quantity of lands involved in the consultation.

PacifiCorp’s alternative condition would not result in improved operation of the project works for electricity production over BLM’s preliminary condition. PacifiCorp’s “diversion of resources” argument is not related to improving operation of the project works for electricity production, but is only related to PacifiCorp’s position that the preliminary condition exceeds BLM’s authority. Both conditions’ requirements to consult with the BLM and provide reports on the status of implementing conditions of the license could, theoretically, lead to some improved operation of the project works for electricity production. However these potential improvements would be of the same magnitude, as the requirements are the same for both conditions.

Criteria 2 – Will the alternative condition, as compared to the BLM’s preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – PacifiCorp’s alternative condition will not provide for the adequate protection and utilization of the reservation.

Justification – In general, the alternative condition unnecessarily limits the scope of the condition to BLM-administered lands in the Project area that meet PacifiCorp’s interpretation of what constitutes a “reservation” under the Federal Power Act, and similarly limits BLM’s authority to only some BLM-administered lands within the Project boundary for the Project. As presented, PacifiCorp’s alternative condition could limit the requirement to consult with the BLM, including consultation for some license conditions that directly involve BLM-administered lands. Thus, a likely result is that some requirements of the license, including activities to take place on BLM-administered lands, would not be implemented in consultation with BLM, but only as the Licensee sees fit to implement them. This result, as envisioned by PacifiCorp’s alternative condition, does not provide for adequate protection and utilization of the BLM-administered lands that constitute the reservation.

PacifiCorp’s arguments that the BLM does not have authority to impose FPA § 4(e) conditions on certain BLM-administered lands or their assertion that BLM authority is limited to only some BLM-administered lands within the Project boundary are without merit. Because Project facilities are located on BLM-administered lands, including the J.C. Boyle Powerhouse and parts of the J.C. Boyle canal, road and tailrace, the BLM has the authority to submit conditions under FPA § 4(e) for the adequate protection and utilization of the reservation (*See* Criteria 2 for Condition 1).

Another PacifiCorp argument is that the BLM lacks authority to require changes to Project operations through revision of 4(e) conditions. This is addressed in the rationale for BLM Modified Condition No. 9 in Section 2 of this submission.

Conclusion

To satisfy FPA Section 33’s standards for when an alternative proposal must be accepted, a proposed alternative must *both* be adequately protective of the reservation *and* either significantly less costly to implement or resulting in improved operations for electricity production. PacifiCorp’s alternative condition would unnecessarily limit the requirements for consultation. Although PacifiCorp’s alternative would cost less to implement, it would not provide for the adequate protection and utilization of the BLM reservation. Conversely, the BLM Modified Condition No. 2 would provide adequate protection and utilization of the resources through consultation of the Condition for all BLM-administered lands.

Equal Consideration of Effects Demonstration

The Department has conducted the appropriate analysis in accordance with 43 C.F.R §45.73 and has determined the following for the BLM Modified Condition 2 and PacifiCorp's Alternative Condition 2:

1. Energy supply, distribution, cost, and use

PacifiCorp indicates that its alternative condition would not have a negative effect on energy supply, distribution, cost or use (PacifiCorp 2006, Page 31). PacifiCorp asserts that the BLM's condition will have "...a relatively greater impact..." on energy supply, distribution, cost or use due to the potential "...diversion of resources to activities and requirements..." required by the BLM condition. *Id.* The BLM does not accept this conclusion, as any diversion of resources required by the BLM condition would have no effect on energy supply, distribution, cost or use, nor would it adversely affect the operation of the Project in general for electricity production. It is the BLM's conclusion that neither PacifiCorp's alternative condition nor BLM's Modified Condition will have an effect on energy supply, distribution, cost or use.

2. Flood control

PacifiCorp identified that their proposed alternative would not affect flood control (PacifiCorp 2006, Page 31). BLM's Modified Condition would not result in any effect to flood control.

3. Navigation

PacifiCorp identified that their alternative would have no affect on navigation (PacifiCorp 2006, Page 31). BLM's Modified Condition would not result in any effect to navigation.

4. Water Supply

PacifiCorp identified that their alternative would have no affect on water supply (PacifiCorp 2006, Page 31). BLM's Modified Condition would not result in any effect to water supply.

5. Air Quality

PacifiCorp identified that their proposed alternative would have no effect on air quality (PacifiCorp 2006, Page 31). BLM's Modified Condition would not result in any effect on air quality.

6. Preservation of Other Aspects of Environmental Quality

PacifiCorp identified that their alternative will have no effect on environmental quality (PacifiCorp 2006, Page 31). BLM's Modified Condition would not result in any change to other aspects of environmental quality.

BLM Condition 3

One alternative condition was provided by PacifiCorp for BLM Preliminary Condition 3 (See PacifiCorp 2006, pages 33-34).

Criteria 1 – Will the alternative condition, as compared to the BLM’s preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production.

Answer – The alternative condition would likely cost less to implement, and may be significantly less. The alternative condition would not result in improved operation of the project works for electricity production.

Justification – PacifiCorp’s alternative condition would likely cost less to implement since it limits the Licensee’s responsibilities for road management within the Project boundary. While the majority of the alternative condition appears to be centered around the Project boundary as determined by the Commission, it limits actual “operation and maintenance (O&M) activities required for the continued operation of the Project that occur [to only] within the [Licensee’s] proposed Project boundary” (PacifiCorp 2006, page 33). In the BLM’s view, the Project boundary proposed by PacifiCorp does not contain all of the lands required for Project purposes or all BLM-administered lands affected by the Project. This limitation, as incorporated into the alternative condition, may result in the condition costing significantly less to implement.

The BLM recognizes that the Commission has the sole jurisdiction to determine the Project boundary for the Project. Per 18 CFR § 4.41 (h)(2):

The boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of the environmental resources.

As such, the BLM expects that the Project boundary for the new license, if one is issued, will not be limited to lands proposed by PacifiCorp in its license application, but will include BLM-administered in order to fulfill project purposes such as recreation and the protection of environmental resources.

Beyond this, the alternative condition is not significantly different in cost effect as compared to the BLM’s preliminary condition.

PacifiCorp’s arguments that the alternative condition would cost significantly less to implement due to the “diminishment” in area to which they assert BLM has conditioning authority is not justified. BLM conditioning authority is not limited as PacifiCorp suggests. PacifiCorp uses a comparison of the BLM “Potential Area of Influence” to what it proposed as a Project boundary in its application (or what is within the existing Project boundary) in an attempt to corroborate its assertion of a significant cost difference between the alternative condition and the BLM’s preliminary condition. Both cases, where it identifies the significant difference in acreage and miles of road, are immaterial since the BLM never

asserted or envisioned that the Roads Management Plan would include all the acres or miles of road in the “Potential Area of Influence.” The “Potential Area of Influence” is to be used in the development of the Inventory Analysis (similar to PacifiCorp’s alternative condition), and even the name does not imply that the Licensee was responsible for all of the roads contained therein.

PacifiCorp’s alternative condition would not result in improved operation of the Project works for electricity production over BLM’s preliminary condition. PacifiCorp’s “diversion of resources” argument is not related to improving operation of the project works for electricity production, but is related to PacifiCorp’s interpretation that the preliminary condition exceeds BLM’s authority. The licensee is responsible for management of roads that are needed for Project purposes, including Project-related recreation. PacifiCorp’s alternative condition, to the extent it would divert resources from meeting that responsibility, would likely adversely affect the operation of the Project works for electricity production.

Criteria 2 – Will the alternative condition, as compared to the BLM’s preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – PacifiCorp’s alternative condition will not provide for the adequate protection and utilization of the reservation.

Justification – In general, the alternative condition unnecessarily limits the scope of the condition to BLM-administered lands in the Project area that meet PacifiCorp’s interpretation of what constitutes a “reservation” under the Federal Power Act, and similarly limits BLM’s authority to only some BLM-administered lands within the Project boundary for the Project.

PacifiCorp’s arguments that the BLM does not have authority to impose FPA § 4(e) conditions except on “reservations” or their assertion that BLM authority is limited to only some BLM-administered lands or roads within the Project boundary lack merit (*See* Criteria 2 for Condition 1).

The BLM recognizes that the Commission has the sole jurisdiction to determine the Project boundary for the Project. The Project boundary will include lands and roads that are necessary for operation and maintenance of the Project and for other Project purposes, including Project-related recreation, shoreline control, or protection of environmental resources. As such, the BLM expects that the Project boundary for the new license, if one is issued, will include additional BLM-administered lands from those proposed by PacifiCorp in their license application. The BLM preliminary condition requires the Licensee to take their share of the responsibility for Project-related roads on BLM-administered lands and to ensure that those activities meet BLM land management direction. PacifiCorp’s alternative condition would unnecessarily limit these requirements, and therefore

would not provide for the adequate protection and utilization of the BLM reservation.

Another PacifiCorp argument is that the BLM lacks authority to require changes to Project operations through revision of 4(e) conditions. While in this instance PacifiCorp's assertions are related to BLM's reserving the right to require changes to the Roads Plan, the overriding issue is addressed in the rationale for BLM Modified Condition No. 9 in this submission.

Conclusion

To satisfy FPA Section 33's standards for when an alternative proposal must be accepted, a proposed alternative must *both* be adequately protective of the reservation *and* either significantly less costly to implement or resulting in improved operations for electricity production. Although PacifiCorp's alternative would cost less to implement, it would not provide for the adequate protection and utilization of the BLM reservation.

Equal Consideration of Effects Demonstration

The Department has conducted the appropriate analysis in accordance with 43 C.F.R §45.73 and has determined the following for the BLM Modified Condition 3 and PacifiCorp's proposed alternative condition 3:

1. Energy supply, distribution, cost, and use

PacifiCorp indicates that their alternative condition would not have a negative effect on energy supply, distribution, cost or use (PacifiCorp 2006, Page 39), asserting that the BLM's condition will have "...a relatively greater impact on energy supply, distribution, cost and use..." due to the potential "...diversion of resources to activities and requirements..." required by the BLM condition. The BLM does not accept this conclusion, as any diversion of resources required by the BLM condition would have no effect on energy supply, distribution, cost or use, nor would it even greatly affect the operation of the Project in general for electricity production. It is the BLM's conclusion that neither PacifiCorp's alternative condition nor BLM's Modified Condition will have an effect on energy supply, distribution, cost or use.

2. Flood control

PacifiCorp identified that their proposed alternative would not affect flood control (PacifiCorp 2006, Page 39-40). BLM's Modified Condition would not result in any effect to flood control.

3. Navigation

PacifiCorp identified that their alternative would have no affect on navigation (PacifiCorp 2006, Page 40). BLM's Modified Condition would not result in any effect to navigation.

4. Water Supply

PacifiCorp identified that their alternative would have no effect on water supply (PacifiCorp 2006, Page 40). BLM's Modified Condition would not result in any effect to water supply.

5. Air Quality

PacifiCorp identified that their proposed alternative would have no effect on air quality (PacifiCorp 2006, Page 40). BLM's Modified Condition would not result in any effect on air quality.

6. Preservation of Other Aspects of Environmental Quality

PacifiCorp identified that their alternative will have no effect on environmental quality (PacifiCorp 2006, Page 40). BLM's Modified Condition would not change other aspects of environmental quality.

BLM Condition 4

The BLM condition is intended to provide increased base flows and peak flows that are more reflective of seasonal fluctuations typical of a natural hydrograph for the Klamath River. First, a proportional flow (40% of inflow) would be required when inflow to J.C. Boyle Reservoir exceeds 1,175 cfs. Second, a minimum of 470 would be released at J.C. Boyle Dam when the average inflow of the previous three days is between 470 and 1,175 cfs. Third, when the inflow is less than 470 cfs, then dam released flow would equal inflow. Most of the time, the proposed base flows would provide a minimum flow of approximately 700 cfs in the peaking reach, about twice the current base flow. The BLM proposal would provide a seasonal high flow event, for seven full days, between February 1 and April 15, when inflows first exceed 3,300 cfs. During this one week period power generation would be suspended to allow all inflows down the bypass and peaking reaches. During the period between May 1 and October 31, the BLM proposal involves a single peaking event of 1,500 cfs to 3,000 cfs per week, with a priority set for peaking operations on Saturday, Sunday, and Friday in priority order to accommodate whitewater boating. The BLM proposal also includes a maximum ramp rate of two in/hr.

Four proposed alternative conditions were provided to BLM Preliminary Condition 4. Two alternatives were proposed by PacifiCorp for BLM Preliminary Condition 4 (See PacifiCorp 2006a, pages 41-47 [First Alternative Condition] and pages 62-64 [Second Alternative Condition]). An alternative condition was also submitted by the Oregon Department of Fish and Wildlife (ODFW) and another was submitted by the California Department of Fish and Game (CDFG). Both of the States' proposed alternative conditions are very similar.

An additional proposed alternative condition was submitted by PacifiCorp on December 1, 2006 (PacifiCorp 2006d) as an "Addendum" to the Second Alternative Condition. PacifiCorp requested that the proposed "modifications" to the BLM's Preliminary Condition No. 4 be at least considered by Interior when developing its modified conditions. PacifiCorp expressly stated that the filing should not be considered to be a replacement of the Second Alternative Condition

or a withdrawal of its existing proposed alternative (*See* PacifiCorp 2006d at 1). Additional information regarding this proposed alternative condition was submitted on December 29, 2006 (PacifiCorp 2006e). The regulations implementing the EAct expressly require that any alternative must be filed within 30 days after the deadline for the BLM to file preliminary conditions with FERC (*See* 43 C.F.R. § 45.71 (a)(2)). Since this proposed alternative condition was submitted months after the time period designated in the regulations, it will not be considered as an alternative condition.

However, consistent with its statutory and regulatory obligation to consider relevant evidence and supporting material that is reasonably available to the agency, the BLM reviewed the “Addendum” to determine whether it set forth “evidence and supporting material” that was relevant to consideration of the Second Alternative Condition and the development of the Modified Condition. *See* 43 C.F.R. § 45.73(a). To the extent relevant and feasible in the time available, such evidence and supporting material was considered by the BLM in evaluating the Second Alternative Condition and developing the modified condition [*See also* 16 U.S.C. § 823d(b)(4) (information “provided in a timely manner” must be taken into account in preparation of the written statement explaining basis for ultimate decision to accept or reject and alternative)].

PacifiCorp’s First Alternative Condition

PacifiCorp’s First Alternative Condition proposes to strike/delete the BLM Preliminary Condition in its entirety.

Criteria 1 – Will the alternative condition, as compared to the BLM’s preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production?

Answer – The alternative condition would cost significantly less to implement, and would result in improved operation of the project works for electricity production.

Justification – PacifiCorp’s alternative condition would cost significantly less to implement since there would be no condition that requires substantial changes to Project operations and other mitigation measures. For example, increased instream flows, ramping rate restrictions, a seasonal high flow and gravel augmentation would not be required. PacifiCorp’s alternative condition would also result in “improved” operation of the Project works for energy production as BLM’s preliminary condition will have an effect on the generation ability of the J.C. Boyle Development.

Criteria 2 – Will the alternative condition, as compared to the BLM’s preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – PacifiCorp’s alternative condition will not provide for the adequate protection and utilization of the reservation.

Justification – PacifiCorp bases the majority of its arguments on legal premises that either have no merit or are not relevant to protection and utilization of the BLM reservation. The alternative condition also fails to recognize that the Project has significant effects on BLM-administered lands and resources in the river corridor area below J. C. Boyle Dam, and therefore fails to provide for the adequate protection and utilization of the BLM reservation by not proposing measures to reduce these effects.

PacifiCorp’s legal arguments have been addressed above under Criteria 2 for Condition 1 and the Statutory Authorities section above.

PacifiCorp’s Second Alternative Condition

PacifiCorp’s Second Alternative Condition, in general, modifies BLM’s preliminary condition to reflect specific actions proposed in its license application. These actions include minimum instream flows, ramping rates, and gravel augmentation, but lacks a seasonal high flow. Other aspects of the BLM’s preliminary condition are included in the Second Alternative Condition, such as gaging locations and instream flow monitoring.

This alternative condition requires significantly less than the Modified Condition in terms of the magnitude of measures to implement in the river corridor. PacifiCorp’s Second Alternative Condition (PacifiCorp 2006, Pages 62-64) is as follows:

A. Minimum Stream Flow and Ramping for the J.C. Boyle Development

1. Required Minimum Stream Flow – The Licensee shall, within one year after license issuance, maintain minimum stream flows as specified:

- a. A minimum flow of 100 cfs shall be released from J.C. Boyle Dam at all times.
- b. A minimum flow of 100 cfs shall be released at J.C. Boyle powerhouse or an additional 100 cfs shall be released at J.C. Boyle dam.

2. Ramping During Controlled Events – The Licensee shall, within one year after license issuances:

- a. In the J.C. Boyle Bypassed River Reach, not exceed a flow down-ramp rate of 150 cfs per hour, except for flow conditions beyond the Project’s control. This ramp rate is primarily applicable to spill and planned maintenance events. To the extent possible, flow changes in the J.C. Boyle Bypassed River Reach shall occur during night-time hours.
- b. In the J.C. Boyle Peaking Reach, not exceed a flow up-ramp rate of 9 inches (in water level) per hour, not exceed a flow down ramp rate of 9 inches per hour for flows exceeding 1,000 cfs, and not exceed 4 inches per hour for flows less than 1,000 cfs (as measured at USGS gage station No. 11510700 downstream of the J.C. Boyle powerhouse). Further, while peaking operation will continue at the J.C. Boyle powerhouse, the Licensee shall ensure that the daily peaking

operation will not exceed 1,400 cfs (as measured at USGS gage station No. 11510700 downstream of the J.C. Boyle powerhouse).

B. Stream Flow Measurement and Reporting: J.C. Boyle Bypassed River and Peaking Reaches

1. Instream Flow Measurement - The Licensee shall, within one year after license issuance:

- a. Continuously measure the stage of water at a minimum of four gaging sites. Three sites are currently gaged. The Licensee shall establish one additional site, using the most current USGS protocol for gage stations installation, maintenance and data collection (USGS 1982 – Measurement and Computation of Streamflow: Volumes 1 and 2, Geologic Survey Water –Supply Paper 2175).
- b. Existing gage station shall include the Klamath River below Keno Dam (#11509500), Spencer Creek above the confluence with the J.C. Boyle Reservoir (#11510000), and Klamath River below the H.C. Boyle Powerhouse (#11510700). The Licensee shall operate and maintain the gages at these sites if the gages are no longer served by the current operator.
- c. The Licensee shall install a new gage on the Klamath River J.C. Boyle Bypassed River Reach below all outlets from the J.C. Boyle Dam and above the springs at RM 225. The location of the gage shall be approved by the BLM in its reasonable discretion prior to installation.

2. Instream Flow Reporting – The Licensee shall, within one year after license issuance:

- a. Provide instantaneous 30-minute real time stream flow data in cfs via remote access that is readily available and accessible to the public.
- b. Design and maintain a database similar to the most current version of the USGS National Water Information System (NWIS) for reporting on surface water. The database shall store gage network data and streamflow tracking procedures. BLM shall review and approve in its discretion the database.
- c. The Licensee shall, within two years after License issuance, submit a report for each water year (i.e. October 1st through September 30th) of stream flow data reported in cfs to the BLM. The report shall be filed with the BLM within six months of the end of each water year.

C. River Gravel Placement

1. The Licensee shall, within one year after License issuance, place approximately 100 to 200 cubic yards of spawnable gravel in the upper end of the J.C. Boyle Bypassed River Reach.
2. The Licensee shall monitor the initial placement of gravel and shall augment the gravel placement as necessary in the upper end of the J.C. Boyle Bypassed River Reach in order to maintain the effect of the initial placement.

Criteria 1 – Will the alternative condition, as compared to the BLM’s preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production?

Answer – The alternative condition would cost significantly less to implement, and would result in improved operation of the project works for electricity production.

Justification – PacifiCorp’s alternative condition would cost significantly less to implement since the condition requires substantially less change to Project operations in, for example, minimum instream flows, ramping restrictions and gravel augmentation requirements. PacifiCorp’s alternative condition would also result in “improved” operation of the Project works for energy production as the alternative would have less impact on the generation ability of the J.C. Boyle Development than the BLM preliminary condition. The BLM acknowledges that

the section 4(e) condition is expected to reduce the amount of power that can be generated compared to existing conditions. Hydrologic modeling conducted by the U.S. Bureau of Reclamation calculates that average annual energy production would be 23 percent less under BLM conditions compared to the status quo. Nevertheless, according to the modeling, PacifiCorp would still be able to generate an annual average of 562,790 MWh (California Energy Commission 2006 page 29, Table 2-4).

Criteria 2 – Will the alternative condition, as compared to the BLM’s preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – As described more fully below, PacifiCorp’s alternative condition will not provide for the adequate protection and utilization of the reservation, and BLM’s Condition will provide for the adequate protection and utilization of the reservation.

Justification – PacifiCorp’s proposed alternative would perpetuate Project impacts to the river channel, riparian habitat, and fish habitat. The BLM’s condition would protect those resources by restoring hydrologic and geomorphic processes that would lead to the improvement of the above resources. PacifiCorp’s alternative would provide for more power production and whitewater boating opportunities. However, the BLM’s condition would continue to provide for those resources by continuing to allow for an average annual production of 562,790 MWh of electricity from the Project, and by continuing to provide whitewater boating opportunities, particularly on weekends. The following section addresses these issues in more detail:

1. PacifiCorp’s alternative minimum instream flows would not result in restoring and improving aquatic habitats, including salmonid spawning habitat; BLM’s Condition would restore and improve these resources.
2. PacifiCorp’s alternative ramping rate restrictions would not result in reducing the Project’s effects to aquatic species; BLM’s Condition would reduce those effects.
3. PacifiCorp’s alternative does not include a seasonal high flow and would result in continuing adverse effects to aquatic habitats, stream channel complexity and riparian habitat quality; BLM’s Condition would improve conditions for these resources.
4. PacifiCorp’s limited gravel augmentation program would not improve spawning habitat and other aquatic habitats, increase stream channel complexity or improve the quality of riparian habitat; BLM’s Condition would protect these resources.

5. Although some recreational uses would be reduced, the BLM Condition would provide recreational opportunities for boating, fishing, and other recreational uses.
6. Although power production would be reduced, the BLM Condition would allow an average of 562,790 MWh of electricity generation per year.

1) Minimum Instream Flows: PacifiCorp's alternative minimum instream flows would not result in restoring and improving aquatic habitats, including salmonid spawning habitat; BLM's Condition would restore and improve these resources.

a). J.C. Boyle Bypassed Reach Fish Habitat

PacifiCorp asserts that the existing release of 100 cfs will enhance usable fish habitat. The proposed release of 100 cfs does not provide adequate redband trout habitat in the Bypassed Reach. Based on results of PHABSIM modeling provided by PacifiCorp (2006d), data shows that redband trout habitat would be maximized at about 600 cfs release for adults and 800 cfs release for juveniles and fry.

The results of PacifiCorp's WUA curves suggest that there would be meaningful improvements for some important life stages in the Bypassed and Peaking reaches with BLM minimum flows. This is apparent in the table provided by PacifiCorp in the Addendum to the Second Alternative Condition (2006d), which shows that the percentage of maximum trout fry WUA increases from 66% to 83% when flow release is increased from 100 cfs to 470 cfs.

Because juvenile and fry habitat appears to be extremely limited in the Bypassed Reach it may be a significant limiting factor on trout population recruitment. Low numbers of fry and juveniles recruited into the J.C. Boyle peaking reach (hereafter "Peaking Reach") may be indicative of this limitation also being present in the Bypassed Reach. Flow vs. habitat relationships were not presented for spawning habitat for redband trout despite indications that the Bypassed Reach has a high potential for spawning habitat if Project effects on substrate and flow are mitigated (Robison 2006).

Existing flows (same as PacifiCorp's alternative of minimum flow of 100 cfs in the Bypassed Reach) do not provide adequate protection for spawning habitat and in fact adversely affect spawning habitat. The ALJ discussion regarding BLM Issue 14 (ALJ Decision at 75) states:

"PacifiCorp believes the presence of spawning trout, in the bypass reach, show that current flows provide favorable spawning conditions. (PC PFF 48). However, the only area where trout spawning is observed is directly downstream of the emergency canal spillway. (FOF 14-21). This very limited spawning, in a very unnatural environment, does not demonstrate that the current flow regime provides favorable conditions."

The ALJ also concluded that:

“The Project’s artificial low flow regime contributes to the lack of available spawning gravel in the J.C. Boyle peaking and bypass reaches” (ALJ Decision at 78).

Although no PHABSIM was completed for trout or anadromous fish spawning habitat in the bypass reach, the evidence suggests that spawning habitat for salmonids would increase with flow increases. Maximum spawning habitat availability for suckers in the bypass reach occurs at 650 cfs (PacifiCorp 2005a, page 73). This is an indication that incrementally higher flows are needed to inundate suitable spawning substrate in the peaking reach, as suggested by FERC (1990). A similar pattern of increasing habitat availability with increasing flows would be expected for trout and anadromous species, because higher flows inundate areas in the channel where smaller sized substrate suitable for spawning is located.

However, under the current flow regime, spawning habitat is largely unavailable due to low minimum flows in the peaking reach (FERC 1990; ALJ Findings of Fact 16-1 through 16-6). In addition to indications that higher, more stable flows would improve salmonid spawning habitat, maximum sucker spawning habitat occurs at 700 cfs for the peaking reach (PacifiCorp 2005a) which is similar to the minimum instream flow of 690 cfs required by the BLM Modified Condition.

In addition to the ALJ’s findings, which generally focused on spawning habitat and migration, there are several studies which collectively support the conclusion that low base flows lower growth and productivity of the redband trout population in the J.C. Boyle Bypassed Reach.

(a) Addley et al. (2005) documented that macroinvertebrates have been reduced by dewatering the channel. Macroinvertebrate drift data showed much lower drift density in the dewatered reach compared to the Keno reach above J.C. Boyle Dam.

(b) PacifiCorp (2004b) documented that older larger fish, which need higher intake rates and larger prey to maintain growth, grow more slowly and exhibit reduced fish survival in the J.C. Boyle bypassed reach compared to the Keno reach. The fact that few larger and older fish persist in the Bypassed Reach indicates that low flow conditions in the Bypassed Reach are energetically unfavorable due to lack of food resources and habitat availability.

(c) The City of Klamath Falls (1986) documented that Project operations in the J.C. Boyle bypassed reach negatively impact the redband trout fishery and habitat, including food availability, fish production, and overall fish size.

(d) Oregon Department of Fish and Wildlife (2003) documented that the minimum flows of 100 cfs in the J.C. Boyle Bypassed Reach did not adequately

provide for a healthy productive fish community, with reduced growth, low relative weights, and low persistence of fish over age 4.

Finally, BLM considers this reach to have high potential for anadromous fish adult holding and spawning habitat due to the presence of deep pools and runs in combination with high volume cold water springs that can offer refugia areas during summer and winter water conditions. There is no evidence that the ALJ's findings for trout habitat in the Bypassed Reach would not also be applicable to anadromous fish habitat. In fact, for FWS/NMFS Issue 7, the ALJ examined the suitability of the Project reaches for providing habitat for anadromous fish including spawning habitat. His final rulings included the following findings which support Robison's conclusions:

“The record, however, shows that there are approximately 28 miles of suitable habitat for anadromous fish to spawn in the main stem provided gravel is placed in those areas. Such habitat includes areas cooled by springs (thermal refugia) in the J.C. Boyle bypass (Finding of Fact 6-1).

This discussion highlights the impacts of Project operations on aquatic habitats, and points out that 100 cfs flow below the J.C. Boyle Dam will not improve aquatic habitat in the Bypassed Reach, but maintain the poor conditions that currently exist.

b). J.C. Boyle Peaking Reach Fish Habitat

PacifiCorp proposes in its Second Alternative Condition to add 100 cfs either at the J.C. Boyle Dam or at the J.C. Boyle Powerhouse. Based on PacifiCorp's recommendation in its comments on the DEIS (PacifiCorp 2006c, page 2-3), the BLM analysis considers that the additional 100 cfs would be added at the J.C. Boyle Powerhouse. PacifiCorp asserts that because streambed wetted area is increased and PHABSIM weighted usable area (WUA) is nearly maximized, that adding 100 cfs to the existing baseflow of 320 cfs "...would nearly maximize the instream habitat for adult trout" (PacifiCorp 2006 page 65).

PacifiCorp's rationale is based solely on the results of the PHABSIM modeling. Several other studies to supplement the PHABSIM results show that higher flows are needed to protect aquatic resources. Other studies that inform instream flow alternatives analysis are the wetted perimeter analysis contained in PacifiCorp's Instream Flow Addendum Report (PacifiCorp 2005a), a side channel incipient flow analysis (PacifiCorp 2005), a bioenergetics model (Addley et al 2005) and a 2-dimensional PHABSIM model which examined a Peaking Reach channel section with a significant side channel (Addley and Allen 2005). In addition to these studies, BLM examined hydrologic methods including an IHA (Indicators of Hydrologic Alteration) analysis (Huntington 2005), and strict applications the Tennant (1976) and Tessman (1980) formulas. This additional information is outlined in the rationale for the BLM preliminary condition (USDI 2006). The results of these analyses indicate that 420 cfs in the Peaking Reach falls short of adequate protection of aquatic resources.

BLM notes that PacifiCorp did not analyze spawning in either the Bypassed or Peaking reaches because the suitable spawning areas identified were insufficient to develop a

model (PacifiCorp 2005a). Since the maintenance and enhancement of spawning habitat for multiple salmonid species is needed, BLM sought other sources of information to make inferences regarding the availability of spawning habitat and the flows required to provide adequate quantities of that habitat. This included a reworking of the transect data from the PHABSIM study (Robison, 2006). These results show that maximum spawning habitat occurs at Dam release flows of approximately 600 cfs in the J.C. Boyle Bypassed Reach for steelhead, with similar results for Chinook (900 cfs) and coho salmon (450 cfs). Under the current flow regime in the Peaking Reach, trout do not presently spawn (ALJ Decision at 44 FOF 16-1) and spawning habitat is essentially unavailable due to low flows (FERC 1990; ALJ Decision at 44 FOF 16-3).

Minimum flows in the J.C. Boyle peaking reach occur as a function of flow releases at J.C. Boyle Dam, combined with J.C. Boyle bypass reach spring accretions, when water is not flowing through the J.C. Boyle Powerhouse. The record of evidence has established that peaking operations, including associated minimum flows, negatively impact the fish populations including redband trout and the forage fish population. The ALJ substantiated this evidence in his Ultimate Finding of Fact for BLM Issue 16, in Findings of Fact 16-1 through 16-6, and in his discussion of these findings (ALJ Decision, page 77-78).

The ALJ also made findings on the effects of low flows on rearing habitat (FOF 16-6). His ruling supports BLM's rationale that higher flows are needed to sustain quality rearing habitat. The ALJ stated "The Project reduces the frequency and extent of inundation of depositional features in the bypass and peaking reach. This hydrologic impact reduces the availability of suitable rearing habitat for juveniles." (ALJ Decision, page 45, FOF 16-6).

PacifiCorp also suggests that "...the addition of 100 cfs would... increase the area of the streambed that is continually wetted, and correspondingly reduce the amount of the streambed that would be subjected to watering and dewatering events...during periods of flow fluctuations." While the first part of this statement is accurate (increased wetted area) there is no evidence that there would be a reduction in the amount of streambed that would be dewatered since there is no proposal to limit the amount of water to be added through the turbines. The wetted perimeter analysis suggests that the channel is not filled at 420 cfs but instead requires approximately 700 cfs to reach a break in channel slope for riffle and runs (PacifiCorp 2005a). It is only after flows exceed the break in slope that there would be a decrease in the amount of streambed area dewatered for a given flow change.

The ALJ substantiated BLM's conclusion that low flows due to Project operations affect the availability of habitat in the Peaking Reach. In his summary the ALJ found:

"The evidence in the record establishes that current operations have adversely affected the redband trout fishery resource. First, the J.C. Boyle Dam traps sediment necessary for spawning habitat. **Second, the existing flow regime has increased the embedment of fine sediment in spawning gravel, impairs spawning migrations, and causes low flows, which contribute to the lack of**

successful spawning. Third, the peaking operations cause stranding of aquatic organisms, results in downstream displacement of juvenile fish, increases the energetic demands placed upon adult trout, and lowers the production of macroinvertebrate prey. The proposed River Corridor Management Condition would address these negative impacts.” [emphasis added]
ALJ Decision at 77-78.

“The Project’s artificial low flow regime contributes to the lack of available spawning gravel in the J.C. Boyle peaking and bypass reaches. (FOF 16-3 to 16-6). Prior to the J.C. Boyle Dam, trout were observed spawning in the peaking reach. (FOF 16-2). Currently, trout do not spawn in the peaking reach and only limited spawning has been observed in the bypass reach. (FOF 14-21; 16-1). While sediment blockage at the J.C. Boyle Dam has contributed to lack of suitable spawning gravel in both reaches, **low flows reduce access to spawning gravel that remains.** Spawning gravel has been observed along channel margins and on depositional features in the peaking and bypass reach. (FOF 16-3 to 16-6). However, **when low flows occur, portions of this margin-habitat are no longer inundated with water, making the spawning gravel unusable.** (Id.). The proposed conditions would substantially alter the current flows by providing an overall increase in base flows. (FOF 19-8 to 19-10). **Higher base flows allow for greater inundation of habitat suitable for spawning.**” [emphasis added]
ALJ Decision at 78

This discussion highlights the impacts of Project operations on aquatic habitats, and points out that an additional 100 cfs flow below the J.C. Boyle Powerhouse, in the absence of other measures such as ramp-rate restrictions, a seasonal high flow and sufficient sediment augmentation, is not likely to improve aquatic habitat in the Peaking Reach.

c). Instream Flow Methodology

BLM and other stakeholders recognized that the 1-dimensional PHABSIM could not be the only study relied upon for making instream flow decisions. This led to several other studies being completed to supplement the PHABSIM study. While the BLM considered the PacifiCorp PHABSIM study, BLM and other fisheries scientists noted several inadequacies in the model that were never fully addressed by PacifiCorp. Detailed explanations of these deficiencies were provided to FERC in DOI’s comments on the DEIS (DOI 2006a) and other supporting documents (Li 2006; Robison 2006). These inadequacies result in the PHABSIM study not being reliable for use in isolation from the other studies. BLM used all of the information and studies available to inform its decisions.

The Tennant method is a commonly used, scientifically based method for developing instream flow recommendations. It is a hydrology based method rather than an incremental physical habitat model (Annear et al 2004) and has been accepted for this use by Alaska courts (Estes 1998). According to Tharme (2003) hydrological methods constitute the most used methodology for environmental flow assessment. It is also

common practice to employ multiple methodologies for comparative purposes and to test for applicability and agreement between methodologies (Whiting, 2002).

PacifiCorp asserts that the modified Tennant method has significant limitations and is a much less accurate predictor of the habitat effects of flows than the PHABSIM model as applied to the Project reaches. BLM does not dispute the fact that the modified Tennant method is not an incremental methodology that produces flow versus habitat relationships. BLM does argue that that under the circumstances, the method was properly applied and represents a reasonable and scientifically defensible method that actually lines up with several of the habitat vs. flow relationships determined using PHABSIM methodology (See examples from Robison, 2006 and Li, 2006).

Tennant recommends 30% of unimpaired average annual flow for “for sustaining good survival conditions for most aquatic resources and general recreation.” BLM recognized several factors that needed consideration in evaluation of a Tennant based flow recommendation and applicability to the Klamath River. First, upstream uses deplete average annual water yield by approximately 10-15%. Therefore, 30% of “unimpaired” hydrology would be approximately 640 cfs. Secondly, BLM recognized that hydrologic and geomorphic conditions in the Klamath River were not entirely analogous to the intermountain streams upon which Tennant based his recommendation. Therefore, adjustments were made based on review of the available information. With regard to the Bypassed and Peaking reaches, the BLM conducted field visits to visually compare various flow levels, including release flows of about 500 cfs. With respect to the Peaking Reach, the BLM examined PacifiCorp wetted perimeter analysis results for riffle and run habitats and the incipient flow side channel analysis. Finally, BLM examined the results of relevant PHABSIM studies, including the PacifiCorp PHABSIM study, the BLM flow study (Henricksen, et al. 2002), the bioenergetics study (Addley et al 2005), and the 2-PHABSIM side channel results (Addley and Allen 2005), and the reworking of PacifiCorp (2004) habitat transect data for anadromous fish spawning (Robison 2006). Using all of this information and in consideration of recreation and power generation interests, BLM selected 470 cfs or 30% of the current hydrologic conditions. When this amount of flow was checked against relevant geomorphic conditions as Tennant and others suggest, BLM found that there was general agreement among the site specific studies. That is, 470 cfs dam release strikes a reasonable balance in providing side channel habitat, improvements in WUA for several life stages of trout, reasonable responsiveness to wetted perimeter analysis, and general agreement with the bioenergetics model and 2-d side channel PHABSIM results.

PacifiCorp asserts that “In most cases, the modeling showed that riparian and fish habitat would not be materially improved in the reaches if flows were increased” (PacifiCorp 2006, page 78). BLM does not dispute the fact that many of the WUA curves are flat (unresponsive to changes in flow). Therefore, it is not surprising that in some cases the modeling shows only modest increases in available habitat.

In responding to criticism of the hydrological based Tennant/Tessman methods, it is equally important to consider the limitations of PHABSIM results. Numerous authors

have pointed out the high statistical uncertainty, lack of ecological relevance, and user biases of PHABSIM results (Annear et al. 2004, Bovee et al 1998). Importantly, PHABSIM is unable to predict channel responses to changes in flow and sediments (Bovee et al 1998). BLM has established, and the ALJ substantiated, that geomorphic changes resulting from Project dams and operations have altered the channel bed and sediment transport processes. PHABSIM results are predictions based on the present condition of a stream (Bovee et al. 1998). BLM has established that the channel and habitat conditions in the Bypassed and Peaking reaches have the capacity to improve with implementation of an appropriate flow regime and restoration of a sediment supply (ALJ Decision at 87 UFOF 13, 14 and 15). The stream morphology and substrate conditions will change when flow and sediment changes are implemented, which in turn will affect the quantity and quality of habitat in the Bypassed and Peaking reaches. Ultimately, this means that the PHABSIM results that PacifiCorp relied on to make its minimum flow proposal cannot be relied upon to accurately predict the quality and quantity of habitat that would result under a different flow and sediment regime. FERC in the DEIS and the ALJ Decision at 41 FOF 14-4 both recognized that implementation of a coordinated gravel augmentation plan with a seasonal “flushing” flow would likely improve habitat and channel complexity.

Since PHABSIM is not capable of predicting how changes in flow can affect channel form and substrate conditions, a hydrology based approach is a reasonable alternative since a hydrology based approach is not affected by channel impacts. This was a substantial consideration in the decision to not exclusively rely on the PHABSIM results to select between different flow alternatives.

Finally, PacifiCorp asserts that “the Tennant method or the modifications have never been calibrated or tested for the hydrology, topography, geology or ecology of the Klamath River.” This argument is without merit since the BLM based its decisions on several site specific studies and modified the flow regime based on the seasonal hydrologic patterns of the Project inflow. With regard to calibration to the ecology of the Klamath River, the same argument could be applied to a PHABSIM study insofar as flow values determined from habitat vs. flow relationships are not correlated in any way to fish abundance or fish biomass.

In summary, the BLM concludes that the Tennant/Tessman methods as applied by BLM in concert with other instream flow study data, is an appropriate methodology to use in informing decisions regarding minimum flows necessary for the adequate protection and utilization of the reservation.

d) Water Quality and Temperature

PacifiCorp asserts that the BLM preliminary condition “will likely only diminish existing water quality...” by having the “...unintended adverse consequence of raising bypassed reach temperatures by impairing or eliminating the cooling effect of natural springs.” PacifiCorp asserts that the condition is not necessary, or appropriate and is inadequate for protecting any BLM resource due to the

likelihood that water temperatures would increase. The BLM considered the increased temperature on fish habitat and determined that the effects would not be detrimental due to the cool water from the spring accretions in the Bypassed Reach. The minimum flows will improve riparian and fish habitat in the Bypassed Reach by providing flows more similar to those in which the riparian and aquatic species are adapted. The BLM stipulated that the Bypassed Reach minimum flows required by the condition will raise the water temperatures downstream of the springs located in the Bypassed Reach. *See* Order Granting, in part, the Federal Agencies' Motion to Dismiss Certain PacifiCorp Issues dated July 13, 2006. However, BLM will not make any determination as to whether this fact would result in the impairment of water quality in this reach. As addressed in the State of Oregon Notice of Intervention and Response, (May 9, 2006), the Project's impacts to water quality in the J.C. Boyle reaches will be "subject to evaluation and findings by the Oregon Department of Environmental Quality pursuant to Section 401 of the Clean Water Act, 33 U.S.C. § 1341."

BLM has concluded based on the substantial evidence in the record that 1) food availability would be greater with the minimum flow requirement; 2) beneficial temperature conditions for resident redband trout may occur with a higher flow release; and 3) lack of immediate, complete mixing of water with different temperatures (dam release flow and spring accretions) would provide for persistence of large areas of cold water (thermal refugia) for fish. The FERC DEIS, comments to the DEIS provided by the Department of Interior, and the findings of fact from the ALJ substantiated several of these lines of evidence.

1) Klamath River redband trout have demonstrated their capacity to grow at very high temperatures given an adequate food supply (Addley 2005). As indicated by bioenergetic studies (Addley 2005), trout growth in all Project reaches is more influenced by the food supply than by temperature. With a flow release of 470 cfs, average temperatures would be suitable, if not near "optimal" for salmonid growth, and do not exceed acute levels (PacifiCorp Dec 29, 2006, page 30). In the laboratory studies used to determine optimal temperatures for growth, fish are fed maximum food rations. Higher nutrient levels are expected to increase forage food production which would compensate for less than optimal temperature conditions for growth. Food availability in the J.C. Boyle bypass reach would be greater with higher flow releases, because the water released from J.C. Boyle Dam is higher in nutrients. This would support greater growth of periphyton and, in turn, higher concentrations of macroinvertebrate prey for fish (Gard 2006).

2) When using general rainbow trout growth and feeding temperature optimums (13°C to 16°C, Behnke 1992), Gard (2006) found that despite slightly less than optimal temperature conditions for growth, increased drift would compensate for higher temperature and may result in greater growth rates with the BLM required minimum streamflow of 470 cfs.

Bartholow and Heasley (2005) show that increased flow releases from J.C. Boyle Dam will decrease water temperatures in the bypassed reach above the springs

and increase water temperatures in the bypassed reach below the springs. This is illustrated in Figure 2 (PacifiCorp, page 30, Dec 29, 2006). Under the current flow regime, temperatures approach acute levels **above** the springs. Higher flows can ameliorate temperature concerns in this section of the Klamath River. According to Bartholow and Heasley (2005), upstream of the springs, the maximum stream temperature would be 26.9 °C under a worst-case climatic scenario for July when flows are 100 cfs. This is in the range of acute mortality for normal rainbow trout, 24 to 27 °C (Moyle 2002), and close to acute mortality for redband trout (28 to 29 °C, Behnke 1992). At 450 cfs, which is near the BLM prescribed flow, maximum stream temperatures would be 25.1 °C, which is below the acute mortality threshold for rainbow trout (Bartholow and Heasley 2005).

According to PacifiCorp, mean water temperatures in the three miles below the springs are only slightly above optimal for trout growth and survival (PacifiCorp 2006, Figure 2, page 30). Maximum water temperatures remain well below acute levels and are always lower than temperatures in the peaking reach, the Keno reach, and the bypass reach above the springs. Thus, in the three miles below the springs, negative impacts to fish due to water temperature are not a concern.

3) In addition to the lack of water temperature concerns for the fully thermally mixed portions of the bypass reach, spring areas will remain available as cold water refugial areas. The ALJ partially addressed this issue when considering PacifiCorp's proposed findings of fact for FWS/NMFS Issue 6. The ALJ rejected all of PacifiCorp's proposed findings with respect to effects of increased flows and temperature, but acknowledged that, "The Federal Agencies concede that increased flow in the J.C. Boyle bypass reach will increase water temperatures in the summer. However, the record evidence is inconclusive as to the degree of temperature change." (ALJ at D-66, Ruling 2-52).

The ALJ's decision rejected PacifiCorp's argument that the BLM flows would degrade the beneficial cooling effect of the springs in the bypassed reach and validated that the BLM minimum streamflow requirement would provide thermal refugia. He stated, "The record evidence demonstrates that the BLM flow conditions would leave approximately a 200-yard thermal refugia area for use of anadromous fish. Further, in the J.C. Boyle bypass reach, springs would continue to offer a thermal refugia area for fish." (ALJ at D-67, Ruling 2-55).

2) Ramp Rates: PacifiCorp's alternative ramping rate restrictions would not result in reducing the Project's effects to aquatic species; BLM's Condition would reduce those effects.

a). J.C. Boyle Bypassed Reach Ramp-Rate Restrictions

PacifiCorp proposes to limit the downramp for releases at J.C. Boyle Dam to 150 cfs per hour, suggesting that this is five-fold less than the current license rate and that this will reduce the potential for stranding associated with spill events. BLM estimates that 150

cfs per hour is equivalent to approximately 2 inches per hour and is therefore similar to the BLM preliminary condition for the downramp rate in the Bypassed Reach. The BLM considers this downramp rate adequate to protect resident trout and other aquatic organisms currently residing in the Bypassed Reach.

Much of the Project impact information on ramp rates in the peaking reach in the record is applicable to the bypass reach. This is particularly true with respect to downramping events following periods of high flow or downramping during the spawning and incubation period (March-June.) The massive stranding event following downramping after a period of high flows in the peaking reach (observed by Dusmoor 2006) indicated that ramping rates can also be a serious concern in the bypass reach. Since the bypass reach also has high flow events during spill (flows greater than 3,300 cfs), followed by downramping to the minimum base flow (100 cfs), stranding events similar to the one observed in the peaking reach could occur in the bypass reach. Further, evidence that stranding has occurred due to Project operations in the bypass reach is apparent from ODFW file reports. These reports provide accounts of numerous fish strandings and die-off events below Link River, Keno, and J.C. Boyle Dams (ODFW 2006). For example, in the bypassed reach a fish mortality and stranding event was reported by ODFW on April 11, 1989 when inflows were reduced to the base flow of 100 cfs after an extended duration of spill.

Although no trout were observed by Dunsmoor in the peaking reach, it has been established that there are extremely low densities of trout fry and juveniles in the peaking reach compared to the bypass reach. Therefore, in addition to the types of impacts observed by Dusmoor in the peaking reach, trout and potentially incubating eggs could be stranded if a similar event occurred in the bypass reach.

FERC recognized the potential for fish stranding, but was unaware of the ODFW finding which documented stranding occurrences in the bypass reach. In the DEIS, FERC stated: “When release flows drop from about 1,000 cfs to the 100 cfs minimum flow, dewatering of streambed areas and a few side channels can pose a risk of stranding to small fish”(FERC 2006, 3-238:34-27).

As substantiated by BLM’s record of evidence and the ALJ findings of fact for BLM Issue 17 (See ALJ findings below), existing upramp rates in the Bypassed Reach that PacifiCorp does not propose to limit are also impacting fish populations and food resources and are potentially affecting fish populations and growth. Therefore, BLM finds that an equally restrictive upramp rate would be needed to protect aquatic resources in the Bypassed Reach.

PacifiCorp disputes the BLM’s rationale for the up-ramping restriction component of the BLM preliminary condition. PacifiCorp asserts that “...there is no evidence demonstrating that current upramp rates are adversely affecting native fish populations...” and that “[a]vailable data shows that peaking operations are not adversely affecting fish populations and that fish do not migrate in response to peaking” (PacifiCorp 2006 page 77).

The BLM has established and the ALJ has substantiated that: “The BLM’s proposed upramp rate will improve conditions for fish resources and other aquatic organisms by reducing adverse effects caused by the existing nine inch/hour upramp rate.”

ALJ Decision at 87 UFOF 17

The ALJ validated the BLM Condition in the summary of his findings of fact concerning upramping as follows:

“PacifiCorp’s peaking operations cause extreme daily flow fluctuations and create upramp rates as high as nine inches/hour in the J.C. Boyle peaking reach (*FOF 17-1*). BLM conditions propose an upramp rate of no more than two inches/hour (*FOF 17-2*). Upramp rates of two inches/hour are similar to naturally occurring rates and will be protective of fish resources. (*FOF 17-2 to 17-4*). The current peaking operations and their unnatural upramp rates create several conditions that are harmful to the trout fishery.”

ALJ Decision at 79.

PacifiCorp itself indicates that an up-ramp or down-ramp rate of two inches per hour would “...protect fall spawning Chinook salmon in the peaking reach...” and would “...provide relatively stable flows to prevent the stranding of emerging Chinook and steelhead fry and migrating juveniles” (PacifiCorp 2006d, page 10 and 11). From this BLM concludes that an equally protective ramp rate would be needed in the Bypassed Reach, particularly since this reach has large volume springs that would benefit spawning, provide temperature refugia, and has a more stable flow regime.

PacifiCorp’s Second Alternative Condition does not provide sufficient upramp restrictions for protection of aquatic species in the Bypassed Reach.

b). J.C. Boyle Peaking Reach Ramp-Rate Restrictions

PacifiCorp’s Second Alternative Condition would preclude full two-unit peaking. BLM acknowledges that the 1,400 cfs per day limit is an improvement over existing Project operations because it reduces the magnitude of daily flow changes to the extent that two-unit peaking currently occurs. However, the frequency of large magnitude flow changes (a nearly six fold change in flow magnitude) would still occur under this measure. No evidence is provided that would indicate that this measure would significantly alter the existing impacts which include fish and macroinvertebrate stranding, dewatering of spawning and rearing habitat, lowered macroinvertebrate production, lower growth and reduced fish size, and potential downstream displacement of juvenile salmonids. BLM has established in the record that current peaking operations are harmful to the J.C. Boyle

redband trout population (USDI 2006). These impacts were substantiated by the ALJ's findings for BLM Issues 16 and 17 which affirm the harmful impacts of current peaking operations. Current peaking operations are dominated by single unit peaking and the data collected support these findings and was largely collected during and influenced by single unit peaking regimes. Therefore, BLM does not consider this measure to be a substantial increase in protection from existing peaking effects and does not find it adequately protects aquatic resources in the Peaking Reach.

Limiting the upramp rate to 9 inches per hour, and the downramp rate to 4 inches per hour for flows less than 1000 cfs, does not adequately protect aquatic resources in the Peaking Reach. Although the downramp rate change from 9 inches to four inches represents an improvement, downramp rates of greater than 2 inches are known to cause stranding of fish and macroinvertebrates (Hunter 1992). The fact that a downramp rate of approximately 4 inches per hour can cause massive stranding in the Peaking Reach was substantiated by Larry Dunsmoor of the Klamath Tribes (Dunsmoor 2006). In a single downramp event, he observed thousands of fish stranded and an order of magnitude more invertebrates stranded following a period of steady high flow. The ramp rate at the location of the stranding event was approximately 4 inches per hour (Dunsmoor 2006).

The ALJ acknowledged the BLM condition in his decision, stating "Reduced ramp rates can resolve the problem of fish stranding. (*FOF 16-13, 16-14*). The BLM proposed conditions calls for a two inch/hour maximum downramp rate, a drop from the four inch/hour ramp rate used at the sites where severe mortality of aquatic organism occurred. (*FOF 16-13, 16-14*). Ramp rates of two inch/hour have been shown to be effective at stopping the occurrence of stranding (*Id.*)" (ALJ Decision, page 79).

The record of evidence upon which the ALJ made his decisions regarding ramp rates and peaking impacts relied on extensive amounts of research demonstrating that high ramp rates cause harm to aquatic life (Finding of Fact 16-7) but also on site specific studies completed in support of the Salt Caves License Application (FERC 1990) and more recent studies specific to the Klamath River. The recent studies substantiate that more moderate ramp rates would reduce stranding mortality (Finding of Fact 16-10), reduce flushing of fry and juveniles (16-15 to 16-20), reduce energetic demands affecting fish growth and survival (16-21 to 16-23), increase macroinvertebrate production (16-24 to 16-25, 17-4 to 17-7), and increase forage fish availability (17-8 to 17-9).

Additionally, anadromous fish reintroduction would result in multiple salmonid species spawning and rearing in the Project reaches. PacifiCorp itself has indicated that an up-ramp or down-ramp rate of 2 inches per hour would be protective of spawning Chinook salmon in the Peaking Reach and would "...provide relatively stable flows to prevent the stranding of emerging Chinook and steelhead fry and migrating juveniles." (PacifiCorp 2006d, page 10 and 11).

PacifiCorp provides a rationale for adequately protective (2 inches per hour) ramp rates which is similar to the rationale in BLM's preliminary conditions.

“To ensure spawning success, it will be important to maintain water levels that will not dewater redds. It is equally important to avoid fluctuating water levels during fry emergence since this is the weakest swimming life stage for salmonids. In the Northwest, a common reference used to support ramp rate proposals is Hunter, Hydropower Flow Fluctuations and Salmonids: A review of the Biological Effects, Mechanical Causes and Options for Migration [Mitigation] (1992). This report is a review of studies that were conducted on low-gradient, gravel dominated, alluvial streams predominately for anadromous fish. Hunter (1992) concluded that ramp rate of two inches per hour would provide protection for aquatic organism to adjust to changing water levels without excessive mortality due to poor swimming success, entrapment, or stranding. Therefore the 2 inch per hour ramp rate proposed by PacifiCorp will provide adequate protection during these life stages”

With respect to peaking and ramping effects, the ALJ made numerous findings of fact which substantiate the BLM’s rationale for the preliminary condition that existing up and down ramp rates of 9 inches per hour cause harm to aquatic resources (See ALJ Decision at 45-46 (FOF’s 16-12 to 16-15)). In summary, these findings substantiate that peaking is a widely documented source of stranding resulting in cumulative impacts to fish populations, and that PacifiCorp’s peaking operations cause high mortality to fish and macroinvertebrates (the primary food source for trout) in the Peaking Reach. PacifiCorp’s modest improvements in ramp rates do not offer significant protection of aquatic resources. The record of evidence which the ALJ considered in making his findings substantiates the need for significantly more protective ramp rates than proposed by in PacifiCorp’s Second Alternative Condition.

In addition to finding that existing ramp rates are not protective, the ALJ substantiated evidence in the record that a ramp rate similar to BLM’s required 2 inch/hour ramp rate would be protective of aquatic resources. Based on review of information regarding the large stranding event in 2006, the ALJ found that “Reduced ramp rates can resolve the problem of fish stranding” (ALJ Decision at 45 FOF 16-13) and “At a site further downstream where no mortalities of fish were observed, the ramp rate was 2.4 inches/hour, similar to BLM’s proposed condition of a 2 inch/hour maximum downramp rate” (ALJ Decision at 46 FOF 16-14).

Evidence that Project flow operations are affecting the health and status of the trout population substantiate that peaking, flow and ramping measures proposed by PacifiCorp are not adequately protective. The ALJ acknowledged that “Flushing of juvenile salmonids downstream is likely in the peaking reach” (ALJ Decision at 46 FOF 16-16) and “Few fry have been captured in the Oregon section of the peaking reach; the section of the peaking reach with the highest ramp rates” (ALJ Decision at 46 FOF 16-17).

Conversely, he also found that “PacifiCorp did not meet its burden to show that peaking flows, in the Oregon portions of the peaking reach, do not result in downstream displacement of juvenile salmonids.” ALJ Decision at 80.

High ramping rates associated with peaking operations can adversely impact fish survival by increasing down migration rates and predation pressure on stranded individuals, and by causing energy deficits in fish responding to rapid changes in flow. The existing daily flow patterns have a negative effect on the fishery resource because they affect food availability, available habitat area, and stranding losses. The fact that peaking, including associated ramp rates, is negatively impacting fish populations in the peaking reach was established during the hearing.

Evidence that Project operations are causing fish to incur energetic costs resulting in fewer and smaller sized trout in the Peaking Reach was also substantiated by the ALJ's findings. The ALJ found that flow fluctuations cause trout movement, induce macroinvertebrate drift, produce a varial zone devoid of benthic food productivity and reduced forage fish abundance. See ALJ Decision at 47 FOF's 16-21 to 16-25; ALJ Decision at 48-49 FOF's 17-3 to 17-9.

The ALJ validated that the upramp rate can also cause chronic macroinvertebrate losses, incur energetic costs for fish, and impact the success and abundance of forage fish species such as suckers and dace. The discussion and findings of fact from the ALJ include:

“Peaking operations also affect the energetic demands placed on trout and decrease macroinvertebrates prey. Peaking operations force trout to increase movement, which in turn decreases energy available for overall health, growth, and reproduction.⁶ (FOF 16-21). Peaking operations reduce the production of macroinvertebrates by ten to twenty-five percent. (FOF 16-24). Macroinvertebrate drift rates, a measure of food availability for trout, is five to six times greater in the non-peaking Keno reach than in the peaking reach. (FOF 16-25). Peaking operations contribute to the lower macroinvertebrate drift rates, which in turn decrease the macroinvertebrate prey available for trout (*Id.*)” (ALJ Decision, page 80 to 81).

“Comparing growth of trout in the non-peaking Keno reach to the trout in the J.C. Boyle peaking reach provides insight into the effects peaking has on trout growth. Growth rates are greater in the peaking reach through age two. (FOF 16-26). Growth rates are similar in both reaches between ages two and three. (*Id.*). Growth rates are greater in the non-peaking Keno reach after age three, and the Keno reach trout are older. (FOF 16-26, 16-30). Since larger fish operate closer to the energetic margins than smaller fish, it makes sense that lower energetic demands in the non-peaking reach would result in larger adult trout. (FOF 16-23). Mature fish grow larger when they prey on forage fish, a higher energy

⁶ PacifiCorp's radio-telemetry study indicated that peaking operations did not induce any significant trout movement. (PAC PFF 75). However, PacifiCorp's radio-telemetry study only detects upstream-downstream fish movement, so it would not detect all fish movement that would increase energetic costs. (PAC-Ols-D-20 at Sec. 5, 5-8, 5-9). High water flows force trout to swim faster to stay in place. (BLM-Simons-Ex. 0 at 5:8-6:7). Fish also move laterally with changes in flow; fish move from the center of the channel at low flows to the edges of the channel at high flows. (KTR-LKD-DT-BLM 16 at 7:13-17; KTR-LKD-Ex. 10 at 26).

source than invertebrate drift. (*FOF 16-31*). The Project-caused impacts to forage fish (via stranding and displacement) help explain the lower growth rates and absence of larger trout in the peaking reach.⁷ (*FOF 16-32*). High growth rates of younger trout in the peaking reach indicate that peaking effects on macroinvertebrate prey are not substantial. Since younger fish prey mainly on macroinvertebrate, if peaking operations were having a substantial effect on macroinvertebrate prey, a lower growth rate in younger fish would be expected. By comparing the growth of trout in the non-peaking Keno reach to the growth of trout in the J.C. Boyle peaking reach, it has been established the peaking operations decrease growth rates for mature trout...” (ALJ Decision, page 81 to 82).

PacifiCorp also asserts that its proposed ramping rates also provide whitewater boating and angling opportunities because one unit can provide raftable flows and anglers will have larger time windows for angling opportunities. While it is reasonable to suggest that the general peaking pattern would continue to provide for whitewater boating, it is not clear how one unit peaking would extend the “window” for angling over a two unit peaking scenario. Since angling generally occurs during off-peak periods, two-unit peaking would provide a longer angling window because it would use up available peaking storage in less time than single unit peaking.

In summary, the evidence clearly shows that a substantial reduction in ramping and peaking is needed to reduce aquatic resource impacts.

3) Seasonal High Flow and Sediment Augmentation Program: PacifiCorp’s alternative does not include a seasonal high flow and would result in continuing adverse effects to aquatic habitats, stream channel complexity and riparian habitat quality; BLM’s Condition would improve conditions for these resources.

PacifiCorp’s Second Alternative Condition does not provide for a seasonal high flow (or “flushing flow” as PacifiCorp terms it.) The BLM provided substantial justification in its rationale for the preliminary condition in support of the measure (USDI 2006) to which PacifiCorp disputed several material facts used by the BLM. In PacifiCorp’s rationale for its Second Alternative Condition, several assertions are made regarding the seasonal high flow, and in some cases, in combination with the sediment augmentation measure.

a). Feasibility

PacifiCorp first asserts that the “flushing flows” required by the BLM’s preliminary condition are not feasible, but does not provide rationale as to why, other than to assert that the J.C. Boyle Project “does not have the storage capacity to significantly alter the frequency and impact of larger floods.” This assertion is irrelevant to the feasibility of

⁷ PacifiCorp cites a study it sponsored which asserts that Keno trout are larger because they have access to a minnow forage base and reservoirs. (*PAC Reply Brief Appendix at 28*). Such conditions may contribute to the increased size of Keno reach trout, however PacifiCorp has failed to adequately discount the effects that stranding and downstream displacement will have on forage fish supply.

providing a “seasonal high flow” into the Bypassed Reach at J.C. Boyle Dam when inflows to the reservoir exceed 3,300 cfs, as required in the BLM preliminary condition. The seasonal high flow is feasible, as it can be accomplished entirely through spill at the dam.

b). Channel Geomorphology

PacifiCorp asserts that the “flushing flows” required by the BLM’s preliminary condition are not necessary since it disputes that “channel geomorphic changes in the J.C. Boyle Bypassed Reach caused by Project conditions have resulted in detrimental effects on aquatic and riparian habitats, including channel narrowing, increased bank erosion, and reduced channel migration” (PacifiCorp 2006 page 66).

Project induced physical processes have significantly altered the geomorphic function and biological productivity of the J.C. Boyle Bypassed Reach. First, the largest magnitude floods have continued by Project diversion but without sediment load, which is trapped in the reservoir. This has progressively stripped sediment from the relatively small but important pockets, pools, bar tops, and channel margins over the past 50 years. Second, the frequent annual floods have been reduced in magnitude and frequency by Project diversions, and a persistently very low summer base flow results from Project operations. Third, the design and operation of the J.C. Boyle emergency spillway has resulted in massive hillslope erosion and delivery of unsorted hillslope debris to the channel. Infrequent floods combined with repeated debris delivery have resulted in the accumulation of unsorted sediment in the channel at the outlet of the emergency bypass spillway. This body of sediment attracts fish for spawning, but it is embedded with fines and inherently unstable.

Coarsening of the Streambed

According to PacifiCorp (PacifiCorp 2004d) and the written testimony from Brian Cluer during the EP Act hearing, Project dams have caused coarsening of the bed:

“The WR FTR (PacifiCorp 2004d, page 6-111, BLM Cluer Ex. 5) states: “Project dams have trapped significant quantities of bed load sediment over the course of Project operations. This has resulted in some coarsening of the bed downstream of Project dams. As a result, the channel classifications presented in this report may indicate that in certain reaches (e.g., the J.C. Boyle peaking reach at the USGS gauge, and downstream of Iron Gate dam at the fish hatchery), the channel is in the process of adjusting to a reduced sediment supply from upstream reaches” (Direct Testimony of Brian L. Cluer, BLM Cluer Exhibit 0, page 6:14-20).

“...the authors of the WR FTR concluded that a finer bed material existed before the project. They used this conclusion, supported with multiple lines of evidence, in developing the sediment budget and the incipient motion calculations. Not explicitly stated by PacifiCorp is the corollary conclusion that the Project has diminished fine grained deposits that would have supported increased size, number, and qualities of invertebrate habitat, fish habitat, and potentially riparian

habitat” (Direct Testimony of Brian L. Cluer, BLM Cluer Exhibit 0, page 7:24 to page 8:4).

FERC concluded in the Draft Environmental Impact Statement (DEIS) for the Project that Project dams have multiple effects on physical processes and riparian and fish habitat. According to FERC, these include:

“In the Oregon portion of the reach [J.C. Boyle peaking reach], habitat includes cascades, deep and shallow rapids, runs, riffles, and occasional deep pools. Substrate is heavily armored and consists primarily of boulders and large cobbles, with a few small pockets of gravel behind boulders” (FERC 2006, page 3-172: 4-6).

The ALJ Decision concerning the Project’s effects on the Bypassed Reach substantiates the BLM’s rationale for the seasonal high flow measure in the BLM preliminary condition. Several findings by the ALJ established that the Project has caused geomorphic changes in the Bypassed Reach that does indeed result in impacts to aquatic and riparian habitats. Project dams, in particular J.C. Boyle Dam, have trapped significant amounts of sediment, causing a reduction of sediment deposits in the Bypassed Reach. This has diminished the quantity and quality of fish habitat and resulted in smaller alluvial features. The findings of the ALJ conclude that sediment trapping by J.C. Boyle Dam is the primary cause of low sediment availability in the Bypassed Reach (ALJ Decision at 41 FOF 14-2) and that J.C. Boyle Dam has captured an average of 6,124 tons/year of channel bedload and thus has blocked its transport into the Bypass and Peaking reaches (ALJ Decision at 40 FOF 11-1). Overall, the bed material in the J.C. Boyle Bypassed and Peaking reaches has coarsened due to the J.C. Boyle Dam limiting the sediment supply. In addition, the sediment that is delivered to the channel or was in the channel at the time of Project construction is transported downstream during Project spill events in the Bypassed Reach and during peaking flows in the Peaking Reach (ALJ Decision at 40 FOF 11-3). In the Bypassed Reach, the channel bed is dominated by 64 percent boulders and 28 percent cobble. A reduction in fine grain deposits diminishes the quantity and quality of fish habitat (ALJ Decision at 41 FOF 14-1).

The ALJ validated the BLM’s conclusions regarding Project effects when he acknowledged that additional changes to channel geomorphology, including that if Project-related “...coarsening of the bed had not occurred, it is likely that active features (e.g., point bars, islands) would have been characterized by finer sediment...” (ALJ Decision at 41 FOF 11-9) and that low base flows combined with sediment being blocked by J.C. Boyle Dam result in smaller alluvial features (ALJ Decision at 40 FOF 11-5). The ALJ found, as BLM had identified in its rationale for the preliminary condition, that there is a relationship between the physical changes in the channel and the resulting effect to aquatic and riparian habitat. As the Project reduces the frequency and extent of inundation of depositional features in the Bypassed and Peaking reaches, this hydrologic impact reduces the availability of suitable rearing habitat for juveniles (ALJ Decision at 45 FOF 16-6) and that implementation of coordinated sediment delivery with seasonal high flows (as provided in the BLM condition) can result in deposition of gravel in

velocity pockets on the bed and fine sands on the banks. These deposits have ecological benefits including creating spawning pockets around boulders and in pools (ALJ Decision at 41 FOF 14-4).

In addition to findings from the ALJ, FERC stated in the DEIS that, “[m]ore-frequent flushing flows would refresh spawning gravels and disperse sediment across the channel (and potentially onto the floodplain, depending on the magnitude of the flow), benefiting aquatic and riparian habitats” (FERC 2006, page 3-35: 17-31).

According to testimony from Cluer for the hearing, seasonal high flows in the Bypassed Reach would be beneficial to flush accumulations from the bed and redistribute them to higher elevations, useful to riparian plants. He stated, “In the bypassed reach, because of the prolonged duration of low base flows consisting of high concentrations of suspended solids during summer months, accumulations of fines and organic matter can build up in the bed. Seasonal high flows in the bypassed reach would be beneficial by annually flushing accumulations from the bed. Rather than accumulating and moving along the bed, fines can be redistributed to higher elevations by a seasonal high flow, where riparian plants can benefit from those nutrients” (Direct Testimony of Brian L. Cluer, BLM Cluer Exhibit 0, page 15:8 to page 16:4). The ALJ substantiated this benefit in his findings, “Seasonal high flows, in combination with the BLM’s proposed gravel augmentation program, will likely create a more dynamic channel with a wider range of sediment deposits which will be deposited higher on the channel margin, serving an ecological benefit” (Finding of Fact 10-5).

Hillslope Erosion and Debris Delivery to the Channel

In contrast to the overall coarsening and reduction in channel-stored sediment downstream from J.C. Boyle Reservoir, focused hillslope erosion at the emergency overflow spillway, aggravated by decreased flood flow frequency, magnitude and duration, has resulted in a localized accumulation of hillslope debris in the channel.

In written testimony for the hearing, Cluer cited the PacifiCorp Water Resources Final Technical Report (PacifiCorp 2004d):

“...Perhaps the most visible geomorphic change is downstream of the emergency overflow spillway near RM 222. Erosion at the spillway has significantly increased the rate of fine and coarse sediment delivery in this area, and bedforms have developed and changed through time as a result of this change in sediment supply. Project facilities and operations in this reach may have significantly affected underlying geomorphic processes in the reach” (Direct Testimony of Brian L. Cluer, BLM Cluer Exhibit 0, page 8:13-25).

Cluer also stated:

“Sediment input at the emergency spillway erosion site provides relevant empirical evidence about the retention and value of sediment in the bypass reach. Since dam operations began in 1958, approximately 69,000 cubic yards of hillslope sediment has been delivered to the stream from the washout with an additional 10,000 cubic yards from associated erosion of the opposite bank (WR

FTR pg 6-117, BLM Cluer Ex. 5). This gives an average annual sediment input from the emergency spillway and associated bank erosion of 2345 tons/year (from Master Sediment Budget spreadsheet, BLM Cluer Ex. 8). It is visibly obvious that a large quantity of this introduced sediment has accumulated in the Klamath River channel (See BLM Cluer Ex. 9)” (Direct Testimony of Brian L. Cluer, BLM Cluer Exhibit 0, page 8:13-25).

Erosion from the spillway, coupled with low base flows in the reach, cause sediment inputs to be greater than the river’s ability to transport it at these flows. In the environmental consequences section of the DEIS, FERC describes impacts due to the J.C. Boyle canal emergency spillway as follows:

“...project operations have increased sediment supply from point sources of erosion and fill encroachment on the river channel” (FERC 2006, page 3-29: 12-13).

This Project impact was further discussed by FERC:

“With nearly 70,000 cubic yards of sediment eroded below it, the J.C. Boyle canal emergency spillway is the single largest point source of sediment in the project area. Currently, if the J.C. Boyle powerhouse trips offline, there is no bypass through the powerhouse to accommodate the water in the canal. Instead, it is spilled through the relatively low gradient concrete emergency spillway. Once water reaches the end of the concrete, it freefalls onto the canyon slope below, and flows to the river, eroding the hillslope in the process. The headward erosion of this hillslope may ultimately threaten the adjacent roadway, or even the canal itself. Given the nature of bypassed flows in the reach, sediment input from the spillway to the channel far outpaces the river’s ability to transport it” (FERC 2006, page 3-29: 26-33).

Distribution of Accumulated Sediment

The threshold for sediment mobilization in the J.C. Boyle bypass reach is not as clearly understood as is necessary for describing the hydrologic effects of the Project, or the effectiveness of the proposed seasonal high flows on the debris deposit at the J.C. Boyle emergency spillway. PacifiCorp’s study contained several biases. The tracer particles used in the study at the bypass reach were placed in the steepest section of the river and were limited to the center of the channel. Both of these actions bias the study toward a finding that a given flow can greatly mobilize particles (ALJ Decision at 71). The ALJ acknowledged that coarse sediment could be mobilized in the bypass reach with flows of 1,700 cfs and greater (Finding of Fact 10-2).

The FERC DEIS discussed some of the current limitations to understanding the flows required for mobilization of coarse sediment:

“All of PacifiCorp’s tracer gravel work was completed within the J.C. Boyle bypassed reach (one site) or the J.C. Boyle peaking reach (two sites.) During the study, the site in the bypassed reach downstream of the emergency spillway experienced a peak flow of 1,700 cfs and had 4 tracers out of 16 total tracers undergo some movement. All tracers at the site ranged from 32 to 128 mm, and 2 tracers each from both the 32 to 64

mm class and the 64 to 128 mm class moved. Because 2 tracers in the 64 to 128 mm class moved at flows below 3,800 cfs, the calculated threshold estimate of roughly 3,800 cfs needed to move a 128 mm particle is probably an overestimate, and lower flows are likely capable of mobilizing spawning-sized sediment in this reach. Overall, these tracer gravel results and the results from the other sites, suggest that the reliability of PacifiCorp's hydraulic threshold of mobility calculations is variable when compared to empirical data.

The estimates of discharge at the threshold of bed mobility have substantial uncertainty. Sources of uncertainty include the Shield's numbers (a dimensionless value of critical shear stress) used in the calculations for each study reach cross section, which PacifiCorp based on a limited set of tracer gravel movement observations.... For the without-project estimates, PacifiCorp used an experimentally derived Shield's number obtained from studies on gravel-bed systems. Aside from arbitrary judgment, we have no further basis or available information upon which to quantitatively modify these parameters. Further, the Manning's roughness coefficient that PacifiCorp used to estimate the discharge associated with the depth of flow at the threshold of bed mobility was also calibrated at a limited number of study reach cross sections and then applied to the remaining study sites" (FERC 2006, page 3-38:1 to 3-39:10).

However, this mobilization threshold, as determined by PacifiCorp in the FLA and analyzed in the FERC DEIS, is valid only very locally on a steep portion of the debris deposit, because of sampling location biases. The mobilization threshold flow required for significant mobilization and downstream distribution of sediment to occur is substantially greater than 1,700 cfs. The emergency spillway deposit would not have accumulated to its present extent if this were not true, and recent prolonged high flows in the bypass reach would have been more geomorphically effective at eroding the deposit.

BLM has taken a conservative approach in the Modified Condition. This approach requires that the Licensee reexamine the flows necessary for mobilization and distribution of the augmented sediment as the effects of the Project on channel form, riparian vegetation, and aquatic habitats (notably salmonid spawning beds) are a function largely of the flows needed to mobilize the bed, the effects that Project operations have on these flows, and the frequency and duration of bed mobility and sediment transport given the lack of sediment recruitment from above the dams (FERC 2006, page 3-34: 15 to 3-35: 2).

c). Impoundment Impacts

PacifiCorp points to the Department's summary of impoundment impacts as "...another basis for flushing flows..." citing that "...DOI also asserts that Project effects such as the maintenance of high nutrient levels and lack of peak flushing flows may be contributing to increased densities of anadromous fish parasites" (PacifiCorp 2006 page 67). While PacifiCorp disputed this assertion, and proclaimed that the Project "actually decreases nutrient loads below Iron Gate Dam..."; that "[f]lushing flows are not controlled by the Project but are controlled by BOR..."; and that, "...as demonstrated by the presence of C. Shasta in the

Cowlitz River-which experiences flash, high flows-it is premature to draw the connection between a lack of flushing flows and the presence of parasites in the river...”, (PacifiCorp 2006 page 67) the simple answer is that the BLM did not use any of the above as a basis for the “seasonal high flow” required by the preliminary condition. While some of these disputed facts resulted in findings by the ALJ with respect to FPA Section 18 prescriptions, they were not part of the rationale BLM used in the development of the BLM condition.

d). Riparian Habitat and Wildlife Species

Riparian Habitat

PacifiCorp asserts that in “the bypassed reach, spill flows during peak spring runoff are sufficiently large to promote and maintain riparian vegetation throughout the reach...” and that PacifiCorp’s proposed flow regime for the new license “will maintain sufficient riparian vegetation to support existing wildlife” (PacifiCorp 2006 page 67).

In the rationale for the BLM’s preliminary condition, the BLM described that Project operations, including the reduced frequency, magnitude, and duration of a riparian maintenance flow; fluctuating flows from peaking operations; low base flows in the J.C. Boyle bypassed reach; and the lack of fine sediment, all contributed to detrimental impacts to riparian habitat. In the preliminary condition, the BLM indicated that these impacts resulted in increases in reed canary grass (an undesirable riparian plant species), decreases in desirable riparian woody species such as coyote willow, and effects on the movement and migration of wildlife species, including riparian focal species. PacifiCorp disputed these effects, and the facts associated with them, and they were determined through the hearing process.

The findings of the ALJ substantiate the Project impacts to riparian habitat described by BLM in the preliminary condition. The ALJ cites to evidence that Project operations have caused reed canary grass to encroach in the J.C. Bypassed Reach channel where low flows expose the channel and that grasslands dominated by riparian vegetation now comprise approximately two-thirds of the riparian plant community (ALJ Decision at 38 FOF 10-6; ALJ Decision at 39 FOF 10-8). He concluded from this that channel encroachment “may be adversely affecting the abundance and quality of fish and terrestrial habitat.” (ALJ Decision at 38 FOF 10-7). Further he found that the problem is exacerbated by lack of seasonal high flows stating “By decreasing the frequency of larger flows, the Project operations have reduced the number of flow events that can scour established reed canary grass.” (ALJ Decision at 41 FOF 11-8).

The ALJ, in general, validates the rationale for the BLM Modified Condition as contained in the rationale for the BLM preliminary condition, with the exception that there is not the expectation that woody riparian vegetation would increase which in turn would benefit riparian focal bird species. The ALJ’s findings of fact related to riparian habitat include that about eighty (“80”) percent of the J.C.

Boyle bypass reach (an area of 4.3 miles in length) is confined by steep canyon walls. Thus, only twenty (“20”) percent of the bypass reach (less than one mile in length) has potential for “riparian restoration” (Finding of Fact 10-1); Willow is a desirable riparian plant that germinates and establishes itself on freshly deposited alluvium (material transported and deposited by river flows) (Finding of Fact 11-10); Reed canary grass is adapted to survive in frequently inundated coarse substrate and is capable of out-competing woody riparian vegetation (Finding of Fact 11-12); and High flows can scour (uproot and dislodge) reed canary grass. Moderate flows are likely to scour plants with less well-established root mats. Larger flow events are likely to scour older plants with more well-established root mats (Finding of Fact 11-6).

The ALJ’s ultimate finding of fact and conclusion of law for BLM Issue No. 11 summarizes these findings:

Project operations have adversely affected riparian resources in both the bypass and peaking reaches by supporting the perpetuation of reed canary grass and by affecting the structure, size, and nature of depositional features. However, the extent of any loss to riparian-focal bird species is indeterminate, based upon evidence that woody riparian vegetation has not decreased noticeably (ALJ Decision, page 87).

In the DEIS, FERC, while not acknowledging the ALJ findings, notes similar conclusions that Project dams prevent sediment movement downstream, which may adversely affect establishment of riparian vegetation. More specifically, FERC explains that most of the J.C. Boyle bypassed reach is comprised of coarse sediment which does not support establishment of desirable riparian vegetation:

“Project dams interrupt the natural movement of sediment on the Klamath River, resulting in the potential for adverse effects on aquatic habitat (decreased spawning substrate and increased algal growth) and riparian vegetation....” (FERC 2006, Page 3-33: 34-36).

“Project dams prevent the downstream transport of sediment, which may result in a diminished supply of spawning gravel and other altered geomorphological processes (including sand and silt starvation) that may influence aquatic habitat and adversely influence the establishment of riparian vegetation” (FERC 2006, Page 3-39: 34-37).

“Conditions for riparian vegetation in the J.C. Boyle bypassed reach are naturally limited by the narrow width of the valley bottom and the amount of that bottom width occupied by the channel. Despite this fact, scattered areas of fine sediment deposition along the channel margin do support a relatively narrow fringe of riparian vegetation. Through the reach below the canal and emergency spillway, substantial portions of the right bank are comprised of coarse material from the road upslope. The material has constricted the channel and has altered the riparian vegetation along much of the reach. Riparian vegetation (such as willows, alder, cottonwood, sycamore) does not become established in the coarse (cobble, boulder, and larger) material coming from upslope; frequently it is displaced by reed canary grass, an ecologically undesirable species that provides little habitat for native fauna. Further, sediment supply to the reach is largely eliminated by J.C. Boyle Dam, and few sources of sediment (aside from the coarse fill

encroachment) occur upstream of the emergency spillway blowout” (FERC 2006, page 3-51: 21-31).

According to FERC in the DEIS, there are sediment size and flow regime requirements for establishment and survival of riparian vegetation. The timing, magnitude, and duration of flows are important for recruitment, growth, and seed viability. FERC describes the conditions needed for riparian vegetation as follows:

“Fluvial processes can play a major role in generating floodplains of different heights suitable for establishing woody riparian species (Stromberg et al., 1991; Johnson, 1992; Scott et al., 1993; Rood and 31 Mahoney, 2000). Flow regimes also are a potentially more important aspect governing the recruitment of riparian vegetation, regardless of geomorphic setting (Mahoney and Rood, 1998; Friedman and Auble, 1999).... Fluvial geomorphic conditions affecting riparian vegetation recruitment and sustained growth include proper substrate and flow regime requirements, including (a) the timing, shape, and duration of descending limb of hydrograph, and (b) the timing, magnitude, and duration of peak flows. Riparian trees, as pioneer species, are poor competitors that require bare, open sites with moist, fine-grained mineral soil with no organic duff for establishment. Recently scoured point bars or isolated patches of alluvial soil deposition along a river provide such conditions. Riparian seed viability is generally short, lasting about 2 to 4 weeks. Hence, these substrate conditions must coincide with both seed dispersal and a favorable rate of decline in soil moisture (water table elevation), discussed further in this section” (FERC 2006, page 3-23: 29-43).

“In terms of recruitment, spring peak flows and the descending limb of the annual hydrograph relative to seed dispersal are the most important aspects of riparian establishment. Riparian seedlings are intolerant of drought. The timing and rate of drop of the descending limb with respect to the elevation of the seed is important. If river water levels decline too rapidly, tree seedlings will not be able to grow roots fast enough to follow the coincident decline in soil moisture (caused by the drop in the water table), and the seedling will die of desiccation. PacifiCorp assumed that coyote willow seed disperses in May and June and collected data accordingly. However, because only incidental observations of coyote willow seed dispersal were made in late May or early June 2002, these observations may not reflect the time period where the majority of willow seed dispersal occurs. Although riparian seedlings are drought intolerant, they do tolerate flooding. This adaptation allows seedlings to handle short-duration flooding during the year of their establishment, or in the spring of subsequent years. However, despite this adaptation to inundation, seedlings can still be eliminated by physical scour or sediment deposition. Hence, establishment must occur at an elevation range high enough to escape peak flows that could scour or bury seedlings, but still low enough to maintain contact with a declining water table” (FERC 2006, page 3-26: 1-15).

FERC notes that in the J.C. Boyle peaking reach, riparian vegetation is absent from the channel margins inundated by peaking operations. Further, flows in the Project reaches have mobilized and winnowed away the fine sediment needed for establishment of riparian vegetation. FERC describes these impacts in the DEIS as follows:

“However, riparian vegetation on bars and channel margins of this reach [J.C. Boyle peaking reach] appears to be affected by peaking operations. For instance, the sediment composition of most alluvial bars appears amenable to riparian vegetation recruitment and growth, but the bars are unvegetated to the margin of inundation during peaking. Similarly, vegetation is generally absent from channel margins within the same area of peaking inundation” (FERC 2006, page 3-26: 34-38).

“Relatively fine substrate is necessary for the recruitment of riparian vegetation (Mahoney and Rood, 1992)...Although flows in many reaches may not be able to mobilize the D50 sediment size, flows have likely been more than sufficient to mobilize and winnow away the finer (sand, silt, and clay) particle sizes—the particle sizes that are important for colonization by many species of riparian vegetation” (page 3-51: 14-15, 17-20).

Wildlife Species

PacifiCorp states that “[m]any riparian-associated populations, including several threatened and endangered species, are present in relatively high abundance in the bypassed and peaking reaches as compared with abundance in other habitats in the area” (PacifiCorp 2006 page 68). There are only two threatened or endangered wildlife species known to occur in the Project area (FERC 2006, pages 3-370 through 3-376) and only one of them (northern bald eagle) can normally be considered “riparian associated.” It is logical to assume that riparian-associated populations would be present in relatively high abundance as compared with abundance in other non-riparian habitats in the area.

In its rationale for the preliminary condition, the BLM stated that “Project-related impacts on the distribution and type of riparian vegetation present in the riparian area affect the movement and migration of **wildlife** species that utilize that habitat”[emphasis in original] (DOI 2006 page A-31). This was based on PacifiCorp’s statement that the “patchy distribution of riparian habitats and unnatural distribution of riparian plant species may decrease the linear movement of several avian, reptile, amphibian, and mammalian species” (PacifiCorp 2004c, page 6-54). Concerning wildlife species, the ALJ found that “[a] relative increase in early woody riparian vegetation and a relative decrease in reed canary grass will likely increase abundance of riparian-focal bird species in the J.C. Boyle bypass reach” (ALJ Decision at 39 FOF 10-15). However, he also found that the BLM proposed flows would not increase woody riparian habitat. (ALJ Decision at 40 FOF 10-16). Therefore, it is unlikely the BLM preliminary condition would result in an increase in abundance of riparian-focal bird species since it would not increase woody riparian habitat. To the limited degree that BLM relied on potential Project effects to riparian-focal bird species as rationale for the condition, the facts do not support this rationale. It is therefore not established that either the BLM preliminary condition or PacifiCorp’s Second Alternative Condition will have any significant effects to riparian-focal bird species.

e). Redband trout spawning habitat

PacifiCorp disputes the rationale provided by the BLM for the preliminary condition requiring the need for “flushing flows” and gravel augmentation to restore spawning gravel to portions of the river channel and to “provide spawning substrate for both resident and anadromous fish and other aquatic life, and that seasonal high flows are needed to maintain stream channel and riparian processes that provide fish habitat.” (PacifiCorp 2006 page 69-70). The ALJ Decision contains numerous findings relating to these issues that substantiates not only that the Project had the effects on spawning habitat as described in the BLM’s rationale, but that the BLM’s preliminary condition would result in an increase in usable spawning habitat. These findings are based on evidence concerning the hydrologic and geomorphic effects of existing Project operations and the beneficial effects of the BLM seasonal high flow measure in combination with the sediment augmentation measure.

The ALJ supported BLM’s conclusion that existing flows and sediment blockage do not provide for quality spawning conditions in the Bypassed Reach. The ALJ ruled “The J.C. Boyle bypass reach channel bed consists mainly of coarse material not suitable for trout spawning. (FOF 14-1). On average, 6,124 tons of channel bedload is blocked a year at the J.C. Boyle Dam. (FOF 11-1). This blockage is the primary factor in the coarsening of the channel. (FOF 14-2)...” (ALJ Decision, page 75).

The ALJ acknowledged that Project impacts have resulted in the only observed trout spawning activities, including the presence of redds, occurring in the Bypassed Reach just downstream of the emergency spillway (ALJ Decision at 43 FOF14-21) and that the redds at this location are inherently unstable since the spillway could be used at any time and the very steep slope of the channel increases the effects of flood flows (ALJ Decision at 44 FOF 14-23). “If the gravel at the emergency spillway were transported downstream by seasonal high flows, they would be more valuable fish habitat because the gravel would be transported to more stable locations and better sorted into spawning sizes...” (ALJ Decision at 44 FOF 14-25). The ALJ also substantiated that an annual “flushing flow” can clean and redeposit gravel to provide quality spawning habitat (ALJ Decision at 42 FOF 14-8) and that BLM high flows, as compared to current conditions, will mobilize and transport sediment more frequently (ALJ Decision at 38 FOF 10-4). The ALJ found that:

“Implementation of coordinated sediment delivery with seasonal high flows can result in deposition of gravel in velocity pockets on the bed and fine sands on the banks. These deposits have ecological benefits including creating spawning pockets around boulders and in pools...”

ALJ Decision at 41 FOF 14-4.

The value of sediment input to the J.C. Boyle bypassed reach is described by Cluer in his testimony from the hearing.

“The ecological importance of sediment introduced to the bypassed reach is illuminated in a response to comments from the U.S. Fish and Wildlife Service on

March 27, 2006 (See BLM Cluer Ex. 10). PacifiCorp stated “Sediment delivered to the channel from operation of the J.C. Boyle overflow emergency spillway may actually provide needed sediment. The J.C. Boyle bypass reach is sediment-limited. Gravel delivered to the reach immediately downstream of the emergency overflow spillway increases channel complexity and aquatic habitat. Redband trout spawners have been observed using these gravels” (BLM Cluer Ex. 9 at 19).

One of the benefits of the seasonal high flow in the BLM Modified Condition is more efficient mobilization of the mixed sediment debris accumulated in the channel at the emergency overflow spillway. Although there is evidence of fish utilization of this deposit, it is highly embedded with fines and inherently unstable, so its ecological value is depressed from its potential.

The ALJ affirms that the location of the trout redds near the J.C. Boyle emergency spillway is unstable, and that if gravel from the spillway was transported downstream, it would provide more stable and better sorted spawning habitat. The findings that support these conclusions include FOF 14-21, 14-23, and 14-25.

FERC noted that the J.C. Boyle bypassed reach has substantial capacity to transport sediment, the sediment input from erosion at the spillway is greater than the sediment transport capacity of the river, except during the high flows associated with spill events.

“...Although erosion caused by operation of the emergency overflow spillway contributed a large volume of sediment to the lower third of the reach...this section of the river also has substantial capacity to transport sediments due to its high stream gradient (2.3 percent) in the vicinity of the emergency overflow spillway” (FERC 2006, Page 3-171:6-10).

PacifiCorp’s Fish Resources FTR, Appendix 4F (BLM Cluer Ex. 10) (Allen et al. 2004, pg 19) summarizes fish redds observed in the bypassed reach (BLM Cluer Ex. 11). They found 66 redds total, 43 in and around the emergency spillway deposit, 19 within 3,500 feet downstream, and only 4 redds scattered upstream to the J.C. Boyle dam. The observed 66 redds were found in 44 separate gravel patches, 36 of which were defined as pockets. Only 5 were found along the banks, and 1 in a classic pool tail / riffle crest location. Approximately 82% of the gravel patches with redds were 10 by 10 feet or less, and 2/3 of the observed spawning fish used patches less than 35 ft².

Above and below the emergency spillway, channel slopes and widths are not substantially different (ODFW 1998) (BLM Cluer Ex. 11); the differences tend to cancel out in their effect on sediment transport (BLM Cluer Ex. 12). The greatest difference is the input of significant quantities of sediment from the erosion of the hillslopes. Fisheries and geomorphic observations at and around the sediment deposit at the Project’s emergency spillway in the J.C. Boyle bypass channel establish some important points. (1) Coarse sediment delivered to the bypass reach has accumulated in the channel during Project operations. (2) Once mobilized and sorted by flow, fish utilize that

sediment, and therefore it has demonstrated ecological value. (3) Gravel pockets, although small, are currently utilized spawning habitat.

The large proportion of redds found in the proximity of the emergency spillway deposit is indicative of the natural proclivities of fish to find and use sediment in a setting where a limited amount of spawning gravel is available. From a geomorphic perspective this location is relatively unstable for two reasons. First, the spillway can be used at any time and its use probably destroys or buries redds and spawning gravel patches. Second, the slope in the bypass reach channel attains the highest value on the downstream face of the spillway deposit (WR FTR pg 6-54, Figure 6.7-19, BLM Cluer Ex. 5 at 54).

Because sediment mobilization is related to slope by a power function (for a given increase in slope there is a much higher increase in sediment mobilization potential) this locale is inherently unstable during flood flows in the bypass channel or discharge from the emergency spillway” (Direct Testimony of Brian L. Cluer, BLM Cluer Exhibit 0, page 9:1 to page 10:8).

According to testimony from Mark Gard, deposition of fine sediments occurs in the specific microhabitats where rainbow trout spawn. Thus, seasonal high flows could increase the quality of trout spawning habitat in the bypass reach.

“Hampton (1988, BLM Gard Ex. R1) found that embeddedness greater than 10% results in a substantial reduction in the suitability of steelhead spawning habitat. As noted in my direct testimony, the two spawning gravel patches I observed in the bypass reach were 50% embedded. In addition, data in Thomas R. Payne and Associates (2003, BLM Gard Ex. R2) as summarized in a frequency graph (BLM Gard Ex. R3), indicates that 30% of the redds had percent fines greater than 10%, with the percentage of fines being as high as 40%. Thomas R. Payne and Associates (2003, BLM Gard Ex. R2), does not state where these measurements were taken, although they are typically taken in the tailspill. In constructing their redds, salmon will reduce the percent fines in the substrate. As a result, the percent fines in the tailspill will typically be much less than was present before the redd was constructed. Accordingly, the data in Thomas R. Payne and Associates (2003, BLM Gard Ex. R2) likely underestimates the degree of embeddedness in trout spawning habitat in the bypass reach. In conclusion, while the bypass reach as a whole is not a depositional zone, deposition of fine sediments does occur in the specific microhabitats where rainbow trout spawn and thus seasonal high flows could provide a benefit for increasing the quality of trout spawning habitat in the bypass reach” (Direct Testimony of Mark Gard BLM Gard Exhibit 0, page 1:20 to page 2:9).

The ALJ supported this conclusion in his findings stating that a seasonal high flow of adequate duration and frequency can improve quality spawning habitat by mobilizing and redistributing fine sediment, especially in areas that are currently embedded. The Findings of Fact that validate this include 14-7 and 14-8.

PacifiCorp disputes BLM's rationale for the time period of February 1 to April 15 each year when the seasonal high flow, as required in BLM's preliminary condition, would occur. PacifiCorp asserts that this timing "...would adversely effect redband trout spawning and delay spawner migration to Spencer Creek, thereby defeating BLM's objective of enhancing spawning habitat and benefiting redband trout. PacifiCorp goes on to pose the argument that "[i]f BLM's flushing flow condition would have the unintended effect of adversely impacting spawning beds and delaying redband trout migration, the condition is not protective of redband trout, a population that BLM asserts it flushing flow is designed to protect..." (PacifiCorp 2006 page 72). Besides the findings made above by the ALJ, several other findings again validate the BLM's rationale for the seasonal high flow concerning this issue. The ALJ substantiated that salmonids will hold during high flows and resume spawning once the flows have dropped and that the one week seasonal high flow will still leave 21 weeks for rainbow trout to spawn (ALJ Decision at 42 FOF 14-13). While BLM's proposed flushing flow would always occur during spawning season (ALJ Decision at 42 FOF 14-14), and flushing flows scheduled during or immediately after fish spawning could dislodge eggs and result in reduced recruitment, flushing flows released just prior to spawning would produce more beneficial effects. (ALJ Decision at 43 FOF 14-15).

The timing of the BLM seasonal high flow condition reflects the natural hydrologic flow regime under which redband trout evolved and would be implemented during the normal peak flow period (ALJ Decision at 43 FOF 14-17). Concerning migration, historically, redband trout rearing in the Oregon portion of the Klamath River downstream of the J.C. Boyle Dam migrated upstream to spawn in Spencer Creek. Redband trout rearing below J.C. Boyle Dam moved upstream in two peak spawning migrations, one in the spring and one in the fall, both of which were associated with increases in the river flow (ALJ Decision at 43 FOF 14-18). Spring and fall freshets attract spawning rainbow trout upstream past J.C. Boyle Dam and juvenile trout migrate downstream to rearing areas below J.C. Boyle Dam (ALJ Decision at 43 FOF 14-19). However, soon after the installation of J.C. Boyle Dam, upstream spawning migrations of redband trout were reduced and recent data shows little successful migratory movement occurs from downstream to upstream of J.C. Boyle Dam (ALJ Decision at 43 FOF 14-21).

The ALJ's UFOF for BLM Issue 14 concludes that:

"[t]he BLM seasonal high flows will assist in the creation of redband trout spawning habitat, decrease fine sediment embedment in spawning gravel, and improve redband trout migration. These benefits provide for a net positive effect to redband trout spawning; overcoming the possible scouring effects high flows will have on spawning trout"

ALJ Decision at 87 UFOF 13.

PacifiCorp asserts that its Second Alternative Condition "...would support existing conditions and adequately protect the trout fishery resources." It appears that PacifiCorp believes that if redband trout are in existence in the Project reaches, no further mitigation is necessary. The redband trout fishery has been affected by the Project, resulting in

reduced growth rates of older age classes, lower proportions of older age classes, reduced fish size in the migratory population, and reduced migration to suitable spawning areas. The ALJ made several findings of fact that substantiates the Project's effects on redband trout as presented in BLM's rationale for the preliminary condition. These are best summarized in the ALJ's discussion for BLM Issue 16 and by the ALJ's UFOF for BLM Issue 16:

“The evidence in the record establishes that current operations have adversely affected the redband trout fishery resource. First, the J.C. Boyle Dam traps sediment necessary for spawning habitat. Second, the existing flow regime has increased the embedment of fine sediment in spawning gravel, impairs spawning migrations, and causes low flows, which contribute to the lack of successful spawning. Third, the peaking operations cause stranding of aquatic organisms, results in downstream displacement of juvenile fish, increases the energetic demands placed upon adult trout, and lowers the production of macroinvertebrate prey. The proposed River Corridor Management Condition would address these negative effects.” [footnote omitted]

ALJ Decision at 77-78

Overall, the ALJ summarizes the benefits of BLM's seasonal high flow requirement as follows:

“BLM Condition 4.A.1(c) [the BLM seasonal high flow] will provide a net positive effect on redband trout spawning. Specifically, the proposed flows will assist in the distribution of gravel used for spawning, will clean established spawning beds, and will assist in migratory movement of trout. (FOF 14-1 to 14-8, 14-17 to 14-21). Negative effects include a loss of spawning habitat below the emergency spillway and the possible scouring of trout eggs. (FOF 14-14, 14-15, 14-24, 14-25). PacifiCorp has not met its burden to show that the negative effects outweigh positive effects.”

ALJ Decision at 73-74.

“BLM ISSUE 16: Current Project operations, particularly sediment blockage at the J.C. Boyle Dam, the flow regime, and peaking operations, negatively affect the redband trout fishery. The proposed River Corridor Management Conditions would improve fishery resources.”

ALJ Decision at 87 UFOF 14.

The positive ecological benefits resulting from the seasonal high flow significantly outweigh spawning effects--resulting in a net positive benefit to redband trout habitat, as well as habitat for other aquatic species. The objectives of the seasonal high flow are not to maintain the existing unsustainable and marginally suited spawning areas resulting from the emergency spillway, but rather are to support multiple riparian, ecological, and geomorphic processes that would lead to greater benefits to redband trout than the current flow regime or PacifiCorp's Second Alternative Condition provides.

The BLM concludes that the seasonal high flow, delineated in the BLM condition is necessary to improve the quality and quantity of spawning habitat in the J.C. Boyle Bypassed Reach. This will improve spawner migration to Spencer Creek. PacifiCorp's Second Alternative Condition does not contain a seasonal high flow, and therefore does not provide the spawning habitat benefits of the BLM Condition.

f). ESA Biological Opinions

PacifiCorp asserts that the seasonal high flow contained in the BLM preliminary condition could result in violation "...of the terms and conditions of the Biological Opinions issued by FWS with respect to elevations in Upper Klamath Lake for ESA-listed sucker fish and by NMFS with respect to Klamath River flows below Iron Gate Dam for coho salmon..." Notwithstanding the ESA §7 formal consultation for the Project that has yet to be completed, there is no information establishing that requiring that all inflow to J.C. Boyle Reservoir being routed into the Bypassed Reach for a minimum of seven days once inflow reaches 3,300 cfs would affect Upper Klamath Lake or flows below Iron Gate Dam. Similarly, PacifiCorp fails to explain how the condition could cause a failure "to meet BOR refill objectives for Upper Klamath Lake" (PacifiCorp 2006, page 71) and there is no information to support this conclusion. The upstream federal actions addressed by the biological opinions help to determine when and how much water flows into PacifiCorp's Project, but do not set any preconditions or otherwise dictate how PacifiCorp manages water through the Project. PacifiCorp can only manage water within the limits of its license and its water rights. The seasonal high flow element of the BLM preliminary condition addresses only whether PacifiCorp runs water through the J.C. Boyle power canal or through the Bypassed Reach--it does not in any way require PacifiCorp provide flood water that would not otherwise be flowing into the Project.

The seasonal high flow is solely based on inflow to J.C. Boyle Reservoir, and is not dependent on requirements or agreements that may be in place for Upper Klamath Lake or below Iron Gate Dam. Annually, the first time inflow reaches the 3,300 cfs threshold from February 1st through the April 15th time period (if it occurs in a given year), all flow will be provided to the Bypassed Reach – instead of being at least partially routed through the J.C. Boyle power canal and powerhouse to reenter the Klamath River at the head of the Peaking Reach. PacifiCorp goes on to assert that "Endangered Species Act and Upper Klamath Lake refill objectives could be at risk in dry years under BLM's seasonal flow condition" (PacifiCorp 2006, page 71). This assertion is also in error, because, if during a dry year flows to J.C. Boyle Reservoir do not reach 3,300 cfs during the time period required in the condition; there would be no seasonal high flow.

4) Sediment Augmentation: PacifiCorp's limited gravel augmentation program would not improve spawning habitat and other aquatic habitats, increase stream channel complexity or improve the quality of riparian habitat; BLM's Condition would protect these resources.

The limited amount of proposed gravel placement (100-200 cubic yards of spawnable gravel) in the upper end of the Bypassed Reach may provide a slight increase in potentially usable spawning areas for trout. However, the lack of a seasonal high flow in PacifiCorp's Second Alternative Condition would likely result in this habitat becoming embedded with fine sediment, as is the case with the spawning gravel presently in the reach. This is substantiated by the ALJ's findings that trout spawning gravel in the Bypassed Reach is embedded with fine silt (ALJ Decision at 42 FOF 14-7) and that an annual flushing flow can clean and redeposit gravel to provide quality spawning habitat. (ALJ Decision at 42 FOF 14-8).

The limited amount of only spawning-sized gravel, as proposed by PacifiCorp's Second Alternative Condition, also does not address the other objective for the sediment augmentation program, i.e. the need to improve channel complexity. This objective is also part of the stipulation by PacifiCorp and BLM contained in the ALJ's order of August 2, 2006. The stipulation clarifies, in pertinent part, that the "1,226 tons/year minimum and 6,134 tons/year maximum quantities specified in the River Corridor Management Condition were not intended to be limited to spawnable gravels but also include a range of sediment particle sizes and intended to address channel complexity." PacifiCorp's Second Alternative Condition would only provide a limited amount of spawnable sized gravel and would not accomplish the objective to improve channel complexity.

In the BLM Modified Condition, the Sediment Management Plan is clarified, such that a range of sediment sizes would be provided to meet the additional objective to provide smaller sized sediment to improve stream channel complexity. The Modified Condition also recognizes the likely need for an initial large placement of gravel to replenish five decades of sediment blocked by the Project since the dam has been in place. After the first augmentation, monitoring and adaptive management will occur to determine subsequent augmentation needs. The Modified Condition recognizes the finding of the ALJ regarding the BLM's preliminary condition that "...proposed a gravel management plan in which 1,226 to 6,134 tons of sediment per year would be added to the Klamath River below J.C. Boyle Dam" (Finding of Fact 14-3) and the stipulation that there are multiple objectives for the sediment augmentation program. By establishing the objectives of the program, the specific sediment augmentation amounts to meet the objectives can be determined through the adaptive management aspects of the program.

Determining the area of the bed that could trap coarse sediment can be used to estimate the volume of sediment that could be stored in deposition zones. This quantity is useful because it provides a measure of the initial sediment augmentation necessary to return a system to geomorphic and biologic function. The area of the bed that could trap coarse sediment was estimated by Cluer for the hearing.

He (a) examined the detailed cross sections and maps presented in Appendix 6A of the WR-FTR, (b) examined the fisheries habitat field studies of ODFW (1998)

and FR-FTR Appendix 4 (b), (c) personally examined the entire reach on May 5 and July 13-14, 2006, (d) took several photographs from different vantage points overlooking long sections of channel, and (e) conducted spatial analysis on selected photos. The results combining both the pool and steeper areas together gives an estimate of the total channel area with potential to trap coarse sediment is approximately 36%. This estimate agrees favorably with the habitat information presented by PacifiCorp and ODFW (1998) field measurements. It is clear that about 1/3 of the channel area in the bypass reach has potential to trap coarse sediment. The bypass reach is 4.7 miles long (24,800 feet) and the average low-flow channel width is 88 feet (derived from the average wetted width of the cross sections in ODFW (1998) at minimum base flow of about 100 cfs). Although coarse sediment would be mobile only during flood flows, when the wetted channel width is greater than 88 feet, using the channel width at minimum base flow is reasonable because coarse sediment deposits would be concentrated in the bottom of the channel. Therefore, assuming 88 feet average width, the low-flow channel area is 2,182,400 square feet, and the potential trapping area is approximately 80,000 square yards.

By assuming an average thickness of coarse sediment accumulation in potential deposition zones it is possible to estimate the storage volume for bed sediment by assuming one foot average depth of coarse sediment. One foot is the minimum height of boulders above the bed (0.3 meters, illustrated in WR FTR Appendix 6A). Given that spawning is a common goal, one foot gravel depth is also the minimum necessary for successful salmonid redds; supported by literature compiled and summarized in Groot and Margolis (1991). This depth of coarse sediment over 80,000 square yards equals approximately 26,600 cubic yards, or 39,000 tons assuming a bulk density of 1.485 tons/yard (density value from PacifiCorp's Master Sediment Budget). This result is approximately six times the average annual load of bed material trapped by J.C. Boyle dam. This method and the results were recognized by PacifiCorp's expert witness in fluvial geomorphology, Dr. Mark Tompkins, as reasonable (Tompkins Rebuttal Testimony, page 3: 11-13). [For further detail on this method, See Direct Testimony of Brian L. Cluer, BLM Cluer Exhibit 0, page 10:14 to page 13:14].

In the DEIS, FERC confirmed that functioning river systems transport sediment at rates equivalent to sediment inputs over time, therefore maintaining channel morphology and habitat.

“Natural river reaches export fine and coarse sediment at rates approximately equal to sediment inputs. Although the amount of and mechanism for sediment storage within any particular river reach fluctuates from one year to the next, it sustains channel morphology and habitat attributes in a dynamic quasi-equilibrium when averaged over the course of longer time periods such as a series of wet and dry years (on the order of 5 to 10 years or more)” (FERC 2006, page 3-29: 2-13).

The BLM Modified Condition applies this scientific principle, as described below, in the Sediment Management Plan. Based on conclusions in the DEIS, FERC supports the same framework for a Sediment Augmentation Plan as the BLM in the Modified Condition. The Sediment Management Plan would include mapping areas suitable for sediment deposits before and after placement to determine sediment amounts, locations, and sizes needed to meet plan objectives. Subsequently, reporting of these results to FERC and stakeholders would allow for consultation during the adaptive management process of the plan. FERC outlines this process as follows:

“We also conclude that mapping of gravel before and after gravel placement would be useful to help quantify the measure’s benefits and to guide further gravel augmentation efforts. Accordingly, we include in the Staff Alternative the approach to gravel augmentation...which would begin with developing a gravel augmentation plan, mapping existing spawning gravel deposits and alluvial surfaces suitable for riparian recruitment and, based on the results of that mapping, developing sediment augmentation volumes, locations, and sizes that meet plan goals. We expect that during some years it may not be necessary to provide any augmentation if previous gravel has remained at locations that would provide appropriate spawning habitat (e.g., during relatively dry years). During wet years, larger quantities of gravel may be needed to augment gravel washed downstream from suitable spawning areas. The reporting aspects specified by the resource and land management agencies and the Hoopa Valley Tribe for gravel augmentation would provide for coordination and review of the program by the Commission and stakeholders, and allow for consultation regarding any proposed changes to implementation and monitoring. This approach would facilitate any future augmentation necessary to meet habitat objectives in these reaches” (FERC 2006, page 5-20: 42 to page 5-21: 8).

Many of the findings of fact by the ALJ validate the evidence contained in BLM’s rationale for the condition regarding the benefits of the seasonal high flow and gravel augmentation program components of the BLM’s preliminary condition. These are summarized by pertinent parts of the ALJ’s UFOF’s for BLM Issues 10, 11, and 14:

“BLM ISSUE 10: The seasonal high flows will contribute to improving the quality of riparian habitat in the J.C. Boyle bypass reach by increasing the sediment deposit within the channel and decreasing reed canary grass...”

ALJ Decision at 86 UFOF 11.

“BLM ISSUE 11: Project operations have adversely affected riparian resources in both the bypass and peaking reaches by supporting the perpetuation of reed canary grass and by affecting the structure, size, and nature of depositional features...”

ALJ Decision at 87 UFOF 12

“BLM ISSUE 14: The BLM seasonal high flows will assist in the creation of redband trout spawning habitat, decrease fine sediment embedment in spawning gravel, and improve redband trout migration. These benefits provide for a net positive effect to redband trout spawning; overcoming the possible scouring effects high flows will have on spawning trout.”

ALJ Decision at 87 UFOF 13.

FERC made similar conclusions in the DEIS stating that Project dams have multiple effects on physical processes and riparian and fish habitat. According to FERC staff, these include:

“The sediment that makes up the bed and banks of the Klamath River ranges in size from silt and sand to gravel, cobbles, and boulders with outcrops of bedrock. Since their construction, project dams have trapped most sediment that was previously delivered to downstream reaches and altered the flows necessary to transport sediment in reaches of the river. Together, these changes have altered natural sediment transport processes, reduced gravel bar and pocket gravel deposits, and reduced salmonid and lamprey spawning and rearing habitat. Additionally, project operations have increased sediment supply from point sources of erosion and fill encroachment on the river channel.” (FERC 2006, page 3-29: 7-13).

“...Gravel is scarce, in part because recruitment from upstream areas is blocked by the presence of J.C. Boyle dam...” (FERC 2006, Page 3-171:5-6).

“Project dams prevent the downstream transport of sediment, which may result in a diminished supply of spawning gravel and other altered geomorphologic processes (including sand and silt starvation) that may influence aquatic habitat and adversely influence the establishment of riparian vegetation” (FERC 2006, Page 3-39: 34-37).

“Project dams interrupt the natural movement of sediment on the Klamath River, resulting in the potential for adverse effects on aquatic habitat (decreased spawning substrate and increased algal growth) and riparian vegetation...” (FERC 2006, Page 3-33: 34-36).

“...the project consistently increases the estimated discharge required to mobilize the bed. Project operations reduce the frequency of bed-mobilizing events from roughly an annual or semi-annual basis to about two times less frequent. This indicates that, without project operations, spawning gravels would be more-frequently mobilized, flushed, and replenished from upstream....More-frequent flushing flows would refresh spawning gravels and disperse sediment across the channel (and potentially onto the floodplain, depending on the magnitude of the flow), benefiting aquatic and riparian habitats” (FERC 2006, page 3-35: 17-31).

The BLM concludes that the seasonal high flow, in combination with a more robust sediment augmentation program, is necessary for the restoration of geomorphic processes, improvement in riparian habitat quality and aquatic habitats including trout spawning habitat.

5) Recreation: Although some recreational uses would be reduced, the BLM Condition would provide recreational opportunities for boating, fishing, and other recreational uses.

Based on recreation use estimates and surveys conducted during relicensing (PacifiCorp 2004k, Section 3.7.2 pages. 3-36 to 3-49), boating and fishing are common recreation activities in these two reaches, and total recreation use in these areas probably exceeds 12,000 “recreation days” (one person visiting for any portion of a day) per year. Of that total, about 4,000 to 5,000 recreation days are specifically associated with commercial rafting (which BLM tracks via special use permits with outfitters.) Other users to the area reported activities such as camping, relaxing, fishing, hiking, sightseeing, and wildlife viewing (*Id.* at page 3-17, Table 3-7.11).

a). Whitewater Boating

Under the status quo and the PacifiCorp Second Alternative Condition, flows are optimized for power production. Whitewater boating takes place on the river between the J.C. Boyle powerhouse and the California-Oregon border, or in the Peaking Reach. This reach has been commercially rafted since 1979, and rafting use has adapted to the available flow regime. The BLM Condition was designed to provide flows that are more reflective of seasonal fluctuations, typical of a natural hydrograph for the Klamath River, for the protection of natural resources while also providing for whitewater opportunities.

The BLM Condition was designed to meet multiple objectives and balance resource protection with use. The BLM Condition will reduce the frequency and timing of high flows preferred by whitewater recreationists and result in fewer and differently-timed whitewater boating opportunities. However the Modified Condition was developed to minimize these reductions. Since approximately 65% of the visits occur on the weekend (ALJ Decision at 52 FOF 19-22), the BLM Condition emphasizes providing weekend boating opportunities.

The BLM produced a model to evaluate and minimize the impacts of the change to an increased base flow and flows more reflective of seasonal events, including high and low flows, on boating opportunities. As part of the effort to understand how manipulation of river flows affects various flow-dependent resources, the BLM evaluated how specific aspects of the flow regime (the magnitude, duration, frequency, timing, and rate of change of streamflows) affect flow-dependent resources, including recreation (primarily angling and commercial and private boating), fish and wildlife habitat, water quality, power generation, cultural resources, and aesthetics. The ALJ relied on the BLM model as the basis for his findings, including the ultimate finding that “The BLM’s proposed flows will substantially reduce the frequency and quality of whitewater boating in the J.C. Boyle peaking reach.” ALJ Decision at 87 UFOF 16.

The ALJ employed the BLM model to find that “Under the flows proposed by BLM, in an average year (such as 2000), the approximate decreases in raftable days would be as follows: total number of days would decrease forty-four (“44”) percent (from 183 days to 102 days); the total number of weekend days would decrease eighteen (“18”) percent

(from 78 to 64); the total number of days in the July-August period would decrease seventy-one (“71”) percent (from sixty-two (“62”) to eighteen (“18”); and the total number of weekend days in July-August would decrease thirty-five (“35”) (from twenty-six (“26”) to eighteen (“18”))...” ALJ Decision at 52 FOF 19-27.⁸

Therefore, while whitewater boating would be reduced, it is not the case, as PacifiCorp asserts, that the BLM preliminary condition “obliterates” whitewater rafting (PacifiCorp 2006, page 53). To the contrary, in an average year, under the BLM Condition, there would still be 102 days of opportunity, with 18 days occurring on weekends in July through August. There would be fewer opportunities in a dry year and more in a wet year. ALJ Decision at 53 FOF 19-32.

The effects quantified by the BLM model for commercial whitewater boating do not extend to other boating opportunities. Under the BLM Condition base flow during the summer would be about 700 cfs (ALJ Decision at 51 FOF 19-11). Kayaking can occur at lower flows (e.g. 400 to 500 cfs) with “technical” trips begin about 700 cfs (ALJ Decision at 52 FOF 19-17).

b). Fishing

The ALJ concluded that the “ability to fly-fish in the J.C. Boyle peaking reach will be reduced; the extent of this reduction has not been established” ALJ Decision at 87 UFOF 16. Under the BLM Modified Conditions there will be a diminishment in the ability to wade because of higher base flows, however the amount and related effect is unknown (19-51). Wading becomes more difficult as the depth and velocity through this section of river increases, thus implementation of the BLM Modified Condition will make wading more difficult (19-49). However it is expected that anglers will adjust their tackle and techniques (19-51) because the redband trout population will increase (19-54). Greater base flow may reduce ability of fishermen to successfully cast and maintain their flies leading to other variations of fishing and adaptations by fishermen to increase angler success (example: fishing while boating or other inflatable devices) (19-14).

The number of days with preferred flows for wading are not expected to increase with increased base flows, as preferred fishing time is during morning and evening when base flows occur. During the summer months, base flows are available every day except in very wet years. However, under BLM Modified Condition higher (peaking) flows could be present during many summer weekends, possibly beginning on Friday morning/afternoon, and continuing through Sunday mornings. In an average year during the summer the amount of peaking on weekends would decrease by 18% (19-27). Thus there would be increased low flow conditions, but the flow would be sub-optimal for fly-fishing. While the predicted base flow of 700 cfs is termed sub-optimal, it is well within the acceptable range (400 to 1,200 cfs) as displayed in Table 2.7-29: Flow evaluation

⁸ Although these numbers are based on modeled opportunities and approximate what might occur, the model might overestimate the number of days and hours whitewater boating opportunities will be available (ALJ Decision at 54 FOF 19-34, 35, 36, and 37).

curves for fishing opportunities on the Hell's Corner reach based on Phase II closeout survey information (PacifiCorp 2004k, p.2-94).

Wading access, as set out in the fishability study conducted by PacifiCorp, is only one component of assessing flow needs for fishing opportunities. Other components include fishing success or effects on the fishery (ALJ Decision at 55 FOF 19-52). The proposed flows will increase the population of the redband trout fishery (ALJ Decision at 55 FOF 19-54). Further, if anadromous fish are reintroduced in the Upper Klamath River and recover to harvestable levels, there will likely be anglers who will fish for these stocks, which would be an improved opportunity for recreational fishing.

c). Other Recreation

Other recreational uses such as camping, relaxing, hiking, sightseeing, and wildlife viewing are not likely to be significantly affected by changes to the flow regime. Tent camping ranked as the second most popular recreational activity in the Upper Klamath WSR (PacifiCorp 2004k, page 3-18). Opportunities for camping and hiking would be improved though additional or improved hiking trails, improved recreation sites and road maintenance in the Upper Klamath WSR.

In summary, under the BLM Condition whitewater boating opportunities will be substantially reduced, although whitewater boating opportunities will persist. With regard to the impacts to fly fishing, the BLM expects that the condition will negatively affect wading access, but will improve conditions for fish habitat during a new license term and will result in an improved fishery, although with different windows for fishing access and different flow conditions.

6) Power: Although power production would be reduced, the BLM Condition would allow an average of 562,790 MWh of electricity generation per year.

The BLM manages under the principles of multiple use, and in accordance with land use plans developed for an area. To accomplish this, there is often a requirement for balancing the uses (including hydropower generation) of the resources present in an area.

The BLM acknowledges that the section 4(e) condition is expected to reduce the amount of power that can be generated compared to existing conditions. Hydrologic modeling conducted by the U.S. Bureau of Reclamation calculates that average annual energy production of the Project would be 23 percent less under BLM conditions compared to the status quo. Nevertheless, according to the modeling, PacifiCorp would still be able to generate an annual average of 562,790 MWh (California Energy Commission 2006 page 29, Table 2-4).

Beyond the reduction in generation, PacifiCorp also asserts a loss in peaking value. No such loss would be incurred however, for two reasons. First, there is limited peaking value at the facility today. Changes in river management over the last two decades have reduced PacifiCorp's generation flexibility. At least 60 percent of Klamath's output

appears to be base load run-of-river generation whose amount and availability is not subject to control by PacifiCorp. Second, the BLM alternative would have a minimal impact on the ability to generate during peak load hours according to the Reclamation model runs. The 23 percent reduction in total generation is evenly spread across all time periods (California Energy Commission 2006, Page 30). Based on historic conditions, about 70 percent of total generation occurs in the 58 percent of the hours defined as “peak load.” The remainder is generated in off peak hours due to high flows, particularly during the winter, that cannot be stored overnight or across seasons to be released during peak hours, or regulatory requirements to meet downstream flow objectives.

In summary, under the BLM condition total power production would be maintained at an annual average of 562,790 MWh and peak power production would be minimally affected.

Oregon Department of Fish and Wildlife’s Alternative Condition

The Oregon Department of Fish and Wildlife (ODFW)’s alternative condition only modifies BLM’s preliminary condition with respect to the minimum instream flows to be required below J.C. Boyle, ramp-rate restrictions, and that the J.C. Boyle development be operated as a run-of-river facility with no peaking operations. The alternative condition also adds the requirement for a flow continuation measure at the J.C. Boyle canal and powerhouse to provide continuous flow under powerhouse shutdown conditions. Other aspects of the BLM’s preliminary condition would remain the same, such as seasonal high flow, streamflow measurement and reporting, a river gravel management plan, and an adaptive management plan.

Criteria 1 – Will the alternative condition, as compared to the BLM’s preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production?

Answer – The alternative condition would not cost significantly less to implement, and would not result in improved operation of the project works for electricity production.

Justification – ODFW’s alternative condition would cost more to implement than BLM’s preliminary condition since the condition requires more minimum instream flows, a more restrictive ramp rate and the J.C. Boyle development to be operated as a run-of-river development with no peaking operations. The ODFW’s alternative condition would not improve operation of the Project works for energy production as the alternative has a substantially greater effect on the generation ability of the J.C. Boyle Project facility than the BLM preliminary condition.

Criteria 2 – Will the alternative condition, as compared to the BLM’s preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – ODFW’s alternative condition would provide for the adequate protection and utilization of the reservation.

Justification – In general, the alternative condition would provide for, as ODFW asserts, further improved aquatic habitat conditions than the BLM’s preliminary condition. However, even ODFW acknowledges that “these [BLM’s] preliminary conditions...would mark a significant improvement over the ...flows, and ramping restrictions existing at the J.C. Boyle component of the Project and proposed by PacifiCorp for relicensing.” (*Id.* page 2). The ODFW also acknowledges that the “BLM condition of a base flow of 470 cfs (or 40% of inflow) and a weekly rather than daily peaking strategy will provide an increased level of protection to anadromous and resident fish and wildlife that are currently adversely affected by Project operations of extreme low flows and high ramp rates.” (*Id.* page 12). However, the State then goes on to assert that the BLM’s preliminary conditions do not provide for the adequate protection of aquatic resources through requiring “lower minimum flows in the bypass reach than necessary to adequately support aquatic habitat, and allow higher ramping rates in both reaches thereby posing greater adverse impacts to aquatic habitat and fish.”

While aquatic resources are a primary resource of interest to the BLM, it is not the only resource that the BLM needs to consider. The BLM manages lands under the principles of multiple use, and in accordance with land use plans developed for an area. To accomplish this, there is often a requirement for balancing the uses of the resources present in an area. The BLM has concluded that the BLM’s preliminary condition, in combination with other BLM preliminary conditions, sufficiently balances the use of these resources in the river corridor in order to meet the land management direction for the area.

The State’s alternative condition’s requirement for a flow continuation measure at the J.C. Boyle canal and powerhouse to provide continuous flow under powerhouse shutdown conditions has merit. As identified by the State, a flow continuation measure or a synchronous bypass valve that would reduce or “...eliminate rapid water level fluctuations caused by load rejection at the Project...” and that would “protect fish and wildlife and their spawning grounds and habitat...” below the J.C. Boyle Powerhouse. This measure was added to the BLM Modified Condition.

California Department of Fish and Game’s Alternative Condition

California Department of Fish and Game (CDFG)’s alternative condition only modifies the BLM’s preliminary condition with respect to the minimum instream flows to be required below J.C. Boyle Dam, ramp-rate restrictions, and that the J.C. Boyle development be operated as a run-of-river facility with no peaking operations. Other aspects of the BLM’s preliminary condition would remain the

same, such as seasonal high flow, streamflow measurement and reporting, a river gravel management plan, and an adaptive management plan.

Criteria 1 – Will the alternative condition, as compared to the BLM’s preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production?

Answer – The alternative condition would not cost significantly less to implement, and would not result in improved operation of the project works for electricity production.

Justification – The CDFG’s alternative condition would cost more to implement than BLM’s preliminary condition since the condition requires more minimum instream flows, a more restrictive ramp rate and the J.C. Boyle development to be operated as a run-of-river development with no peaking operations. CDFG’s alternative condition would not improve operation of the Project works for energy production as the alternative has a substantially greater effect on the generation ability of the J.C. Boyle Project facility than the BLM preliminary condition.

Criteria 2 – Will the alternative condition, as compared to the BLM’s preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – CDFG’s alternative condition would provide for the adequate protection and utilization of the reservation.

Justification – In general, the alternative condition would provide for, as CDFG asserts, further improved aquatic habitat conditions than the BLM’s preliminary condition. However, even the State acknowledges that “these [BLM’s] preliminary conditions...would mark a significant improvement over the ...flows, and ramping restrictions existing at the J.C. Boyle component of the Project and proposed by PacifiCorp for relicensing.” (*Id.* page 2). The State also acknowledges that the “BLM condition of a base flow of 470 cfs (or 40% of inflow) and a weekly rather than daily peaking strategy will provide an increased level of protection to anadromous and resident fish and wildlife that are currently adversely affected by Project operations of extreme low flows and high ramp rates.” (*Id.* page 12). However, the State then goes on to assert that the BLM’s preliminary conditions do not provide for the adequate protection of aquatic resources through requiring “lower minimum flows in the bypass reach than necessary to adequately support aquatic habitat, and allow higher ramping rates in both reaches thereby posing greater adverse impacts to aquatic habitat and fish.”

While aquatic resources are a primary resource of interest to the BLM, it is not the only resource that the BLM needs to consider. The BLM manages lands under the principles of multiple use, and in accordance with land use plans developed for an area. To accomplish this, there is often a requirement for balancing the

uses of the resources present in an area. The BLM has concluded that the BLM's preliminary condition, in combination with other BLM preliminary conditions, sufficiently balances the use of these resources in the river corridor in order to meet the land management direction for the area.

Conclusion

As noted above, to satisfy FPA Section 33's standards for when an alternative proposal must be accepted, a proposed alternative must *both* be adequately protective of the reservation *and* either significantly less costly to implement or resulting in improved operations for electricity production. Here, as discussed above, the BLM concludes that the components contained in PacifiCorp's Second Alternative Condition are inadequate for the protection and utilization of the reservation. The lack of sufficient minimum instream flows and ramping rates, the lack of a seasonal high flow, and the lack of a sufficient sediment augmentation program all leave the condition less than adequate for the protection and utilization of the BLM reservation. Therefore, the BLM concludes that the proposed Alternatives fail to satisfy the standards of Section 33 and should not be accepted, even though the BLM assumes for purposes of the analysis that the PacifiCorp alternatives would be significantly less costly to implement. While the states of Oregon and California's alternatives would provide adequate protection of BLM-administered resources, they too fail to satisfy the standards of Section 33 and should not be accepted because they are not significantly less costly to implement than the BLM condition.

Equal Consideration of Effects Demonstration

The Department has conducted the appropriate analysis in accordance with 43 C.F.R §45.73 and has determined the following for the BLM Modified Condition No. 4 – River Corridor Management and PacifiCorp's First Alternative Condition, Second Alternative Condition, the ODFW's alternative condition and California Department of Fish and Game's alternative condition.

1. Energy supply, distribution, cost, and use

Neither the BLM Condition nor the proposed alternative conditions have a significant impact on energy supply, distribution, cost or use.

Supply: Although the BLM Condition will reduce the generating capability of the Project, the impact is insignificant when compared to the total customer requirements, and is *de minimis* in the context of regional energy supply. The Project is a system resource, and has no function other than the provision of electric energy to the applicant's system as a whole. Hydrologic modeling by the Bureau of Reclamation estimates that the BLM condition would reduce total generation by 23 percent of the modeled 727,926 megawatt hours (MWh) average annual power generation from Klamath, or approximately 165,000 MWh annually. This amount is 0.25 percent of the total MWh supplied by PacifiCorp in 2004, the latest year for which data were available. As a

comparison, PacifiCorp's transformer and line losses in 2004 were 3,741,391 MWh, which were considered acceptable, predictable and consistent with PacifiCorp's system planning criteria. Thus the mandatory conditions would reduce total generation by only 4 percent of current, planned energy losses.

Since PacifiCorp is only one of a number of energy suppliers in the Northwest, the impact on total regional energy supply must be considered *de minimis*. Although PacifiCorp provided no information regarding the impact of its proposed alternative on energy supply, we note that Klamath generation, in total, represents less than 1 percent of total system generation, and a little over one-sixth of transformer and line losses. Accordingly, Klamath, itself, makes an insignificant contribution to PacifiCorp's energy supply, and makes a *de minimis* contribution to regional energy supply. Thus, neither the prescriptions nor the alternative regarding Klamath would have a significant impact on energy supply, either in the region or on the applicant's system.

Distribution: The BLM Condition does not address energy distribution facilities, and therefore does not have any direct impact on the distribution of energy. Moreover, as regional energy supply impacts are *de minimis*, there are no indirect impacts on energy distribution. PacifiCorp provided no information regarding the impact of its proposed alternative on the distribution of energy. The BLM has no other information indicating any impact of PacifiCorp's alternative on energy distribution.

Cost: The impact of the BLM Conditions on energy cost is judged not to be significant. PacifiCorp's filings in its recent rate case in California explains that Klamath is an unreliable source of power and that its energy, when available, is used to displace other, more expensive sources; accordingly, PacifiCorp views the replacement value of Klamath energy as PacifiCorp's decremental generation cost, which is unaffected by any changes in Klamath Project operations.⁹

In 2004, PacifiCorp purchased 15,594,000 MWh at a cost of \$368 million dollars¹⁰, or about \$23.60 / mWh. The loss of the 165,000 MWh due to the BLM's conditions has a cost impact of \$3.5 million annually. In 2004, PacifiCorp's total revenues from sales of electricity, (including unbilled revenues) were approximately \$3 billion, including \$328 million in sales for resale. Thus the potential impact on electric costs would be no more than 0.12 percent; or no more than \$0.00006 per kWh, based on a total of 62,693,000 MWh sold or used in 2004.

⁹ "Decremental Generation Cost" is a term used by PacifiCorp in its Opening Brief in U-901-E before the Public Utilities Commission of the State of California, filed August 28, 2006. It refers to the cost that would otherwise occurred but for the availability of the Klamath power. Since the most readily available alternative to Klamath would be for PacifiCorp to purchase additional power under its existing supply arrangements, the average cost of purchased power reflects this decremental generation cost. See especially pages 30 – 35.

¹⁰ FERC Form 1 for 2004, page 401a, line 27 and quoted in "Klamath Annual Net Benefits 10(j) Presentation December 2006", Robert Berman, U.S. Department of the Interior, Office of Policy Analysis, slide 16.

Even this cost may be overestimated. Efficiency improvements to PacifiCorp's transmission and distribution systems, to reduce energy losses, may be available at a cost of only \$1.20 / MWh. Specifically, transmission and distribution losses average 2-3 percent for line losses and 5-6 percent for transformer losses. Thus transformer losses account for two-thirds of total losses. These transformer losses are equally divided between no-load losses (which occur 24x7x365 hours per year) and load losses which occur only when supplying load. Thus the no-load losses are 2-3 percent of generation or one-third of total losses. No-load losses can be reduced by approximately 70 percent through the use of energy-efficient transformers such as those with amorphous metal cores. Accordingly, of the 3,741,000 MWh energy losses, 1,247 gWh were no-load losses, of which 873 gWh were avoidable through the use of modern, energy-efficient transformers. These transformers average about \$1.20 MWh more than the less efficient, steel core transformers PacifiCorp uses. Since avoidable losses are significantly greater than the losses associated with the Modified Condition, the value of the lost power may be no more than \$1.20 MWh.

Use: Neither the BLM Condition nor the proposed alternative conditions would have any impact on energy use.

2. Flood control

Because the Project's reservoirs are relatively small compared with the Klamath River's annual runoff (e.g., Iron Gate reservoir impounds only 4 percent of annual runoff, and Copco No. 1 reservoir only 5 percent), the Project reservoirs are generally *not* operated for flood control (PacifiCorp 2004, Ex E, Page 3-181). While Project reservoirs are drawn down to some extent prior to spring runoff, this can provide only very limited flood control during high flow events. (PacifiCorp 2004, Ex B Page 2-7).

PacifiCorp identified that their proposed alternatives would not affect flood control (PacifiCorp 2006, Pages 58 and 83). Similarly, the ODFW and California Department of Fish and Game identified no impacts on flood control (ODFW 2006 at 30 and CDFG 2006 at 20). None of the conditions analyzed in this section would result in any change to the currently very limited flood control.

3. Navigation

There is no large-scale commercial navigation on the Klamath River, and the dams are not equipped with locks for barges.

There is downstream navigation by rafts and kayaks, these are considered recreational effects, and are analyzed in more detail above.

PacifiCorp stated that its alternatives would not negatively affect navigation (PacifiCorp 2006, Pages 58 and 83). Similarly, the ODFW and California Department of Fish and Game identified no impacts on navigation (ODFW 2006 at 30 and CDFG 2006 at 20). None of the conditions analyzed in this section would result in any change to navigation.

4. Water Supply

PacifiCorp's Final License Application did not identify any Project-induced effects on municipal or irrigation water supply (PacifiCorp 2004, Exhibit E, Page 9-54). PacifiCorp stated that its alternatives would not negatively affect water supply (PacifiCorp 2006, Pages 58 and 83). Similarly, ODFW and California Department of Fish and Game identified no impacts on water supply (ODFW 2006 at 30 and CDFG 2006 at 20). None of the conditions analyzed in this section would result in any change to the water supply.

5. Air Quality

PacifiCorp did not identify any effect of its proposed alternatives (PacifiCorp 2006, Pages 58 and 83) on air quality. ODFW and California Department of Fish and Game did not address air quality. None of the conditions analyzed in this section would result in any change to air quality.

6. Preservation of Other Aspects of Environmental Quality

PacifiCorp stated that its alternatives will not affect other aspects of environmental quality (PacifiCorp 2006, Pages 58 and 83). The ODFW and California Department of Fish and Game indicated that their alternatives would be complimentary of prescriptions and recommendations submitted by other agencies and the implementation of water quality improvements on the Klamath River and tributaries, but identified no effects on other aspects of environmental quality (ODFW 2006 at 30 and CDFG 2006 at 20). Analysis of the environmental effects of altering flow, ramping rate requirements and sediment augmentation are analyzed in more detail above. None of the conditions analyzed in this section would result in any change to other aspects of environmental quality.

BLM Condition 5

One alternative condition was provided by PacifiCorp for BLM Preliminary Condition 5 (See PacifiCorp 2006, pages 84-86).

Criteria 1 – Will the alternative condition, as compared to the BLM's preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production.

Answer – The alternative condition would likely cost less to implement, and may be significantly less. The alternative condition would not result in improved operation of the project works for electricity production.

Justification – PacifiCorp's alternative condition would likely cost less to implement since it limits the Licensee's responsibilities for cultural resources to those found within the Project boundary, and only those cultural resources found on what PacifiCorp considers to be BLM "reservations" within the Project boundary. PacifiCorp estimated that the additional surveys required by the BLM preliminary condition (excluded in the alternative condition) would cost

approximately \$10,000 to \$15,000 and amending the current Historic Properties Management Plan (HPMP) would cost approximately \$45,000. In addition, PacifiCorp inappropriately uses a proportion of the costs for managing the 59 sites in the current HPMP to the 18 additional sites identified in the BLM preliminary condition, using an assumption that management of these sites would be of similar costs. The costs of managing the additional sites identified in the BLM preliminary condition are directly related to the Project-related effects on these sites. As such, it is inappropriate to extrapolate the expected costs for managing the sites until they are incorporated into the amended HPMP and appropriate measures are identified. The BLM preliminary condition does not establish any specific measures to be implemented by the Licensee, only that known damages will be addressed in terms of measures for the sites in the amended HPMP. PacifiCorp estimates the costs for their alternative condition to be \$8 million (2004 dollars) in capital costs and \$7.8 million in operations and maintenance (O&M) costs (2004 dollars) over a 30-year license term. A total estimated cost of surveying the remaining BLM-administered lands within the Area of Potential Effect and amending the HPMP of \$60,000 is not significantly more than the total costs of implementing PacifiCorp's alternative condition. However, if, as PacifiCorp argues, the Project-related effects to the additional sites identified in the BLM preliminary condition and necessary measures are proportional to the sites already contained in the HPMP, then the overall cost of implementing the amended HPMP could approach their estimated \$10.5 million for capital costs and \$7.8 million in O&M costs (both 2004 dollars), and therefore could be considered significantly more than PacifiCorp's alternative condition.

PacifiCorp's alternative condition would not result in improved operation of the project works for electricity production over BLM's preliminary condition. PacifiCorp's "diversion of resources" argument is not related to improving operation of the project works for electricity production, but is related to PacifiCorp's interpretation that the preliminary condition exceeds BLM's authority. The Licensee is responsible for protection of cultural resources that are affected by the Project, including by Project-related recreation. PacifiCorp's alternative condition, to the extent it would divert resources from meeting that responsibility, still would not likely improve the operation of the project works for electricity production.

Criteria 2 – Will the alternative condition, as compared to the BLM's preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – PacifiCorp's alternative condition will not provide for the adequate protection and utilization of the reservation.

Justification – PacifiCorp bases the majority of its arguments on legal premises that either have no merit or are not relevant to protection and utilization of the BLM reservation. These legal arguments are addressed elsewhere in this analysis

or are addressed in the rationale for the BLM's Modified Condition. PacifiCorp's departure from the accepted process of analyzing cultural resources that may be affected by the Project through the identification and subsequent survey of an Area of Potential Effect (APE) has resulted in the inadequacy of the current HPMP, as the current HPMP does not include analysis and appropriate measures for all sites within the APE, including sites on BLM-administered lands. Therefore, PacifiCorp's alternative condition does not provide for adequate protection and utilization on the BLM reservation.

Conclusion

To satisfy FPA Section 33's standards for when an alternative proposal must be accepted, a proposed alternative must *both* be adequately protective of the reservation *and* either significantly less costly to implement or resulting in improved operations for electricity production. Although PacifiCorp's alternative may cost less to implement, it would not provide for the adequate protection and utilization of the BLM reservation

Equal Consideration of Effects Demonstration

The BLM has conducted the appropriate analysis in accordance with 43 C.F.R §45.73 and has determined the following for the BLM Modified Condition 5 and PacifiCorp's Alternative Condition 5:

1. Energy supply, distribution, cost, and use

PacifiCorp indicates that their alternative condition would not have a negative effect on energy supply, distribution, cost or use (PacifiCorp 2006, Page 89). PacifiCorp asserts that the BLM's condition will have "...a relatively greater impact..." on energy supply, distribution, cost or use due to the potential "...diversion of resources to activities and requirements..." required by the BLM condition. *Id.* The Department does not accept this notion, as any diversion of resources required by the BLM condition would not affect energy supply, distribution, cost or use, nor would it greatly affect the operation of the Project in general for electricity production. It is the Department's conclusion that neither PacifiCorp's alternative condition nor BLM's Modified Condition will have an effect on energy supply, distribution, cost or use.

2. Flood control

PacifiCorp identified that their proposed alternative would not affect flood control (PacifiCorp 2006, Page 89). The BLM's Modified Condition would not affect flood control.

3. Navigation

PacifiCorp identified that their alternative would have no affect on navigation (PacifiCorp 2006, Page 89). The BLM's Modified Condition would not affect navigation.

4. Water Supply

PacifiCorp identified that their alternative would have no effect on water supply (PacifiCorp 2006, Page 89). The BLM's Modified Condition would not affect water supply.

5. Air Quality

PacifiCorp identified that their proposed alternative would have no effect on air quality (PacifiCorp 2006, Page 89). The BLM's Modified Condition would not affect air quality.

6. Preservation of Other Aspects of Environmental Quality

PacifiCorp identified that their alternative will have no effect on environmental quality (PacifiCorp 2006, Page 90). The BLM's Modified Condition would not change other aspects of environmental quality.

BLM Condition 6

One alternative condition was provided by PacifiCorp for BLM Preliminary Condition 6 (See PacifiCorp 2006a, pages 90-93).

Criteria 1 – Will the alternative condition, as compared to the BLM's preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production.

Answer – The alternative condition would likely cost significantly less to implement. The alternative condition would not result in improved operation of the project works for electricity production.

Justification – PacifiCorp's alternative condition would cost less to implement since it limits the Licensee's responsibilities for Project-related recreation to those found within the Project boundary, and only those Project-related recreation resources found on what PacifiCorp considers to be BLM "reservations" within the Project boundary. Without arguing the veracity of PacifiCorp's cost estimates of the BLM's preliminary condition and PacifiCorp's alternative condition, it is reasonable that the BLM's preliminary condition will cost significantly more than PacifiCorp's alternative condition. The BLM's preliminary condition requires additional facilities on BLM-administered lands that receive Project-related recreation use to be included in the Recreation Resource Management Plan (RRMP) to identify additional Licensee responsibilities, while the PacifiCorp alternative excludes these facilities.

PacifiCorp's alternative condition would not result in improved operation of the project works for electricity production over BLM's preliminary condition. PacifiCorp's "diversion of resources" argument is not related to improving operation of the project works for electricity production, but is related to PacifiCorp's interpretation that the preliminary condition exceeds BLM's authority. The Licensee is responsible for Project-related recreation, including

that which occurs on BLM-administered lands. PacifiCorp's alternative condition, to the extent it would divert resources from meeting that responsibility, still would not likely improve the operation of the project works for electricity production.

Criteria 2 – Will the alternative condition, as compared to the BLM's preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – PacifiCorp's alternative condition will not provide for the adequate protection and utilization of the reservation.

Justification – PacifiCorp bases the majority of its arguments on legal premises that either have no merit or are not relevant to protection and utilization of the BLM reservation. These legal arguments are addressed elsewhere in this analysis or are addressed in the rationale for the BLM's Modified Conditions.

PacifiCorp's argument regarding the Topsy Campground is nonsensical, as even though PacifiCorp proposes to exclude the site from the Project boundary, there is no dispute that the campground is 100% Project-related, and would logically be included in the new Project boundary (as it is in the existing Project boundary) since the site is needed for the Project purpose of recreation. PacifiCorp's uses background information purporting the argument that since PacifiCorp did not have any responsibility for several BLM recreation sites in the existing license, they shouldn't have any responsibility in a new license. They also use this argument to support the proposed exclusion of these sites from the Project boundary.

The BLM recognizes that the Commission has the sole jurisdiction to determine the Project boundary for the Project. The Project boundary will include lands and roads that are necessary for operation and maintenance of the Project and for other Project purposes, including Project-related recreation, shoreline control, or protection of environmental resources. As such, the BLM expects that the Project boundary for the new license, if one is issued, will include additional BLM-administered lands from those proposed by PacifiCorp in their license application. The BLM preliminary condition provides for the Licensee to take their share of the responsibility for Project-related recreation on BLM-administered lands and to ensure that those activities meet BLM land management direction. PacifiCorp's alternative condition would unnecessarily limit these requirements, and therefore would not provide for the adequate protection and utilization of the BLM reservation.

PacifiCorp provides another argument that the BLM lacks authority to require changes to Project operations through revision of 4(e) conditions. While in this instance PacifiCorp's assertions are related to BLM's reserving the right to

require changes to the RRMP, the overriding issue is addressed in the rationale for BLM Modified Condition No. 9 in this submission.

Conclusion

To satisfy FPA Section 33's standards for when an alternative proposal must be accepted, a proposed alternative must *both* be adequately protective of the reservation *and* either significantly less costly to implement or resulting in improved operations for electricity production. Although PacifiCorp's alternative may cost less to implement, it would not provide for the adequate protection and utilization of the BLM reservation

Equal Consideration of Effects Demonstration

The BLM has conducted the appropriate analysis in accordance with 43 C.F.R §45.73 and has determined the following for the BLM Modified Condition 6 and PacifiCorp's Alternative Condition 6:

1. Energy supply, distribution, cost, and use

PacifiCorp indicates that their alternative condition would not have a negative effect on energy supply, distribution, cost or use (PacifiCorp 2006, Page 97). PacifiCorp asserts that the BLM's condition will have "...a relatively greater impact..." on energy supply, distribution, cost or use due to the potential "...diversion of resources to activities and requirements..." required by the BLM condition. *Id.* The Department does not accept this conclusion, as any diversion of resources required by the BLM condition would have no effect on energy supply, distribution, cost or use, nor would it even greatly affect the operation of the Project in general for electricity production. It is the Department's conclusion that neither PacifiCorp's alternative condition nor BLM's Modified Condition will have an effect on energy supply, distribution, cost or use.

2. Flood control

PacifiCorp identified that their proposed alternative would not affect flood control (PacifiCorp 2006, Page 97). The BLM's Modified Condition would not affect flood control.

3. Navigation

PacifiCorp identified that their alternative would have no affect on navigation (PacifiCorp 2006, Page 98). The BLM's Modified Condition would not affect navigation.

4. Water Supply

PacifiCorp identified that their alternative would have no affect on water supply (PacifiCorp 2006, Page 98). The BLM's Modified Condition would not affect water supply.

5. Air Quality

PacifiCorp identified that their proposed alternative would have no effect on air quality (PacifiCorp 2006, Page 98). The BLM's Modified Condition would not affect air quality.

6. Preservation of Other Aspects of Environmental Quality

PacifiCorp identified that their alternative will have no effect on environmental quality (PacifiCorp 2006, Page 98). The BLM's Modified Condition would not change other aspects of environmental quality.

BLM Condition 7

One alternative condition was provided by PacifiCorp for BLM Preliminary Condition 7 (See PacifiCorp 2006a, pages 99-100).

Criteria 1 – Will the alternative condition, as compared to the BLM's preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production?

Answer – The alternative condition would likely cost less to implement, but not significantly less. The alternative condition would not result in improved operation of the project works for electricity production.

Justification – PacifiCorp's alternative condition would cost less to implement since it limits the Licensee's responsibilities for vegetation management activities to those that would occur within the Project boundary, and only those Project-related recreation resources found on what PacifiCorp considers to be BLM "reservations" within the Project boundary. PacifiCorp's "reservations" argument has no merit (see analyses for Condition No. 1); and the differences between "BLM-administered lands affected by the Project" in the BLM preliminary condition and "within the Project boundary" as proposed in the alternative condition are difficult to ascertain. While PacifiCorp insinuates that the BLM preliminary condition could be applied to "...7,599 acres of BLM-owned lands within the Klamath River canyon area between J.C. Boyle Dam and Copco Reservoir..." the condition is intended to be applicable, as stated, to BLM-administered lands affected by the Project. If the Licensee intends to conduct vegetation management activities on lands affected by the Project, activities both on and off BLM-administered lands should be addressed in the Vegetation Resources Management Plan (VRMP).

However, notwithstanding the legal arguments, the requirements of the BLM preliminary condition and PacifiCorp's alternative condition are substantially similar. The VRMP in both conditions is intended to guide the Licensee's vegetation management activities through a new license term. The BLM does not anticipate that the practices employed would differ to any great extent between the conditions, and therefore the costs would not be significantly different.

PacifiCorp's alternative condition would not result in improved operation of the project works for electricity production over BLM's preliminary condition. PacifiCorp's "diversion of resources" argument is not related to improving operation of the project works for electricity production, but is related to PacifiCorp's interpretation that the preliminary condition exceeds BLM's authority. The Licensee is responsible for and proposes to conduct vegetation management activities, including on BLM-administered lands. PacifiCorp's alternative condition, to the extent it would divert resources from meeting that responsibility, still would not likely improve the operation of the project works for electricity production.

Criteria 2 – Will the alternative condition, as compared to the BLM's preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – PacifiCorp's alternative condition will not provide for the adequate protection and utilization of the reservation.

Justification – In general, the alternative condition unnecessarily limits the scope of the condition to BLM-administered lands in the Project area that meet PacifiCorp's interpretation of what constitutes a "reservation" under the Federal Power Act, and similarly limits BLM's authority to only some BLM-administered lands within the Project boundary for the Project. PacifiCorp bases the majority of its arguments on legal premises that either are without merit or are not relevant to protection and utilization of the BLM reservation. These legal arguments are addressed elsewhere in this analysis and/or are addressed in the rationale for the BLM's Modified Conditions. The limitations contained in the alternative condition would result in the BLM's inability to ensure the adequate protection and utilization of the BLM reservation.

The BLM recognizes that the Commission has the sole jurisdiction to determine the Project boundary for the Project. The Project boundary will include lands and roads that are necessary for operation and maintenance of the Project and for other Project purposes, including Project-related recreation, shoreline control, or protection of environmental resources. As such, the BLM expects that the Project boundary for the new license, if one is issued, will include additional BLM-administered lands from those proposed by PacifiCorp in their license application. The BLM preliminary condition provides for the Licensee to take their share of the responsibility for Project-related recreation on BLM-administered lands and to ensure that those activities meet BLM land management direction. PacifiCorp's alternative condition would unnecessarily limit these requirements, and therefore would not provide for the adequate protection and utilization of the BLM reservation.

PacifiCorp provides another argument that the BLM lacks authority to require changes to Project operations through revision of 4(e) conditions. While in this

instance PacifiCorp's assertions are related to BLM's reserving the right to require changes to the VRMP, the overriding issue is addressed in the rationale for BLM Modified Condition No. 9 in this submission.

Conclusion

To satisfy FPA Section 33's standards for when an alternative proposal must be accepted, a proposed alternative must *both* be adequately protective of the reservation *and* either significantly less costly to implement or resulting in improved operations for electricity production. Although PacifiCorp's alternative may cost less to implement, it would not provide for the adequate protection and utilization of the BLM reservation

Equal Consideration of Effects Demonstration

The BLM has conducted the appropriate analysis in accordance with 43 C.F.R §45.73 and has determined the following for the BLM Modified Condition 7 and PacifiCorp's alternative condition 7:

1. Energy supply, distribution, cost, and use

PacifiCorp concludes that their alternative condition would not have a negative effect on energy supply, distribution, cost or use (PacifiCorp 2006, Page 104). PacifiCorp asserts that the BLM's condition will have "...a relatively greater impact..." on energy supply, distribution, cost or use due to the potential "...diversion of resources to activities and requirements..." required by the BLM condition. *Id.* The Department does not accept this conclusion, as any diversion of resources required by the BLM condition would have no effect on energy supply, distribution, cost or use, nor would it even greatly affect the operation of the Project in general for electricity production. It is the Department's conclusion that neither PacifiCorp's alternative condition nor BLM's Modified Condition will have an effect on energy supply, distribution, cost or use.

2. Flood control

PacifiCorp identified that their proposed alternative would not affect flood control (PacifiCorp 2006, Page 104-105). The BLM's Modified Condition would not affect flood control.

3. Navigation

PacifiCorp identified that their alternative would have no affect on navigation (PacifiCorp 2006, Page 105). The BLM's Modified Condition would not affect navigation.

4. Water Supply

PacifiCorp identified that their alternative would have no affect on water supply (PacifiCorp 2006, Page 105). The BLM's Modified Condition would not affect water supply.

5. Air Quality

PacifiCorp identified that their proposed alternative would have no effect on air quality (PacifiCorp 2006, Page 105). The BLM's Modified Condition would not affect air quality.

6. Preservation of Other Aspects of Environmental Quality

PacifiCorp identified that their alternative will have no effect on environmental quality (PacifiCorp 2006, Page 105). The BLM's Modified Condition would not change other aspects of environmental quality.

BLM Condition 8

One alternative condition was provided by PacifiCorp for BLM Preliminary Condition 8 (See PacifiCorp 2006a, pages 106-107).

Criteria 1 – Will the alternative condition, as compared to the BLM's preliminary condition, cost significantly less to implement, or result in improved operation of the project works for electricity production?

Answer – The alternative condition would likely cost less to implement, but not significantly less. The alternative condition would not result in improved operation of the project works for electricity production.

Justification – PacifiCorp's alternative condition would cost less to implement since it limits the Licensee's responsibilities for wildlife management activities to those that would occur within the Project boundary, and only those Project-related wildlife resources found on what PacifiCorp considers to be BLM "reservations" within the Project boundary. PacifiCorp's "reservations" argument has no merit (See analyses for Condition No. 1); and the differences between "BLM-administered lands affected by Project operations and maintenance" in the BLM preliminary condition and "within the Project boundary" as proposed in the alternative condition are difficult to ascertain. While PacifiCorp insinuates that the BLM preliminary condition could be applied to "...7,599 acres of BLM-owned lands within the Klamath River canyon area between J.C. Boyle Dam and Copco Reservoir...", the condition was intended to be applicable, as stated, to BLM-administered lands affected by Project operations and maintenance. If the Project affects wildlife species or habitat, including on BLM-administered lands, and if the Licensee proposes to implement related measures on those lands, both should be addressed in the Wildlife Habitat Management Plan (WHMP).

However, notwithstanding the legal arguments, the requirements of the BLM preliminary condition and PacifiCorp's alternative condition are substantially similar, with one exception. The WHMP in both conditions is intended to guide the Licensee's wildlife habitat management activities through a new license term. The BLM preliminary condition requires that measures include escape ramps on the J.C. Boyle Canal, whereas the alternative condition only requires use monitoring of the existing escape ramps. This results in the alternative condition

potentially costing somewhat less, but it is unclear as to the significance of this cost difference. PacifiCorp did not provide any cost information regarding these measures in their rationale for the alternative condition, so the BLM must assume that the cost difference is not significant. As the two conditions do not significantly differ in terms of elements of the WHMP, the BLM does not consider the costs to be significantly different.

PacifiCorp's alternative condition would not result in improved operation of the project works for electricity production over BLM's preliminary condition. PacifiCorp's "diversion of resources" argument is not related to improving operation of the project works for electricity production, but is related to PacifiCorp's interpretation that the preliminary condition exceeds BLM's authority. The Licensee is responsible for and proposes to develop and implement a WHMP, including BLM-administered lands. PacifiCorp's alternative condition, to the extent it would divert resources from meeting that responsibility, still would not likely improve the operation of the project works for electricity production.

Criteria 2 – Will the alternative condition, as compared to the BLM's preliminary condition, provide for the adequate protection and utilization of the reservation?

Answer – PacifiCorp's alternative condition will not provide for the adequate protection and utilization of the reservation.

Justification – In general, the alternative condition unnecessarily limits the scope of the condition to BLM-administered lands in the Project area that meet PacifiCorp's interpretation of what constitutes a "reservation" under the Federal Power Act, and similarly limits BLM's authority to only some BLM-administered lands within the Project boundary for the Project. PacifiCorp bases the majority of its arguments on legal premises that are without merit or are not relevant to protection and utilization of the BLM reservation. These legal arguments are addressed elsewhere in this analysis and/or are addressed in the rationale for the BLM's Modified Conditions. The limitations contained in the alternative condition would result in the BLM's inability to ensure the adequate protection and utilization of the BLM reservation.

The BLM recognizes that the Commission has the sole jurisdiction to determine the Project boundary for the Project. The Project boundary will include lands and roads that are necessary for operation and maintenance of the Project and for other Project purposes, including Project-related recreation, shoreline control, or protection of environmental resources. As such, the BLM expects that the Project boundary for the new license, if one is issued, will include additional BLM-administered lands from those proposed by PacifiCorp in their license application. The BLM preliminary condition provides for the Licensee to take their share of the responsibility for Project-related recreation on BLM-administered lands and to

ensure that those activities meet BLM land management direction. PacifiCorp's alternative condition would unnecessarily limit these requirements, and therefore would not provide for the adequate protection and utilization of the BLM reservation.

PacifiCorp provides another argument that the BLM lacks authority to require changes to Project operations through revision of 4(e) conditions. While in this instance PacifiCorp's assertions are related to BLM's reserving the right to require changes to the WHMP, the overriding issue is addressed in the rationale for BLM Modified Condition No. 9 in this submission.

Conclusion

To satisfy FPA Section 33's standards for when an alternative proposal must be accepted, a proposed alternative must *both* be adequately protective of the reservation *and* either significantly less costly to implement or resulting in improved operations for electricity production. Although PacifiCorp's alternative may cost less to implement, it would not provide for the adequate protection and utilization of the BLM reservation

Equal Consideration of Effects Demonstration

The BLM has conducted the appropriate analysis in accordance with 43 C.F.R §45.73 and has determined the following for the BLM Modified Condition 8 and PacifiCorp's proposed alternative condition 8:

1. Energy supply, distribution, cost, and use

PacifiCorp indicated that their alternative condition would not have a negative effect on energy supply, distribution, cost and use (PacifiCorp 2006, Page 110), asserting that the BLM's condition will have "...a relatively greater impact..." on energy supply, distribution, cost or use due to the potential "...diversion of resources to activities and requirements..." required by the BLM condition. *Id.* The Department does not accept this conclusion, as any diversion of resources required by the BLM condition would have no effect on energy supply, distribution, cost or use, nor would it even greatly affect the operation of the Project in general for electricity production. It is the Department's conclusion that neither PacifiCorp's alternative condition nor BLM's Modified Condition will have an effect on energy supply, distribution, cost or use.

2. Flood control

PacifiCorp identified that their proposed alternative would not affect flood control (PacifiCorp 2006, Page 110). The BLM's Modified Condition would not affect flood control.

3. Navigation

PacifiCorp identified that their alternative would have no affect on navigation (PacifiCorp 2006, Page 110). The BLM's Modified Condition would not affect navigation.

4. Water Supply

PacifiCorp identified that their alternative would have no effect on water supply (PacifiCorp 2006, Page 110). The BLM's Modified Condition would not affect water supply.

5. Air Quality

PacifiCorp identified that their proposed alternative would have no effect on air quality (PacifiCorp 2006, Page 111). The BLM's Modified Condition would not affect air quality.

6. Preservation of Other Aspects of Environmental Quality

PacifiCorp identified that their alternative will have no effect on environmental quality (PacifiCorp 2006, Page 111). The BLM's Modified Condition would not change other aspects of environmental quality.

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Attachment A1: U.S. Department of the Interior Modified 4(e) Conditions – BLM Reservation

BLM Modified Condition 1: Activities on or Affecting Bureau of Land Management-Administered Lands

- (a) For any proposed activity to be implemented by the Licensee on or affecting BLM administered lands that are added to the Project boundary, the Licensee shall request and obtain a BLM use authorization prior to conducting the activity. The Licensee shall fund any required environmental analysis related to the issuance of the use authorization, as determined by the BLM. As part of the request for the use authorization, the Licensee may provide environmental analysis of the proposed action that meets BLM requirements for implementing the National Environmental Policy Act (NEPA) in existence at the time the request is made, including changes in statutes or regulations governing BLM NEPA procedures. The Licensee may also refer to or rely on any previous NEPA analysis for the proposed measure to the extent the analysis is currently applicable, as determined by BLM. The use authorization may contain stipulations for fire protection, spoils disposal, hazardous materials, safety or other standard use authorization measures consistent with the requirements in effect at the time for implementation of similar actions on BLM-administered land.
- (b) The Licensee shall prepare site-specific plans for the approval of the BLM for activities required by the license that have the potential to impact BLM administered lands or resources. The site-specific plans shall include, at a minimum:
 - (i) a map depicting the location of the proposed activity;
 - (ii) the land use allocation and management designation including standards and guidelines for the area of the proposed activity;
 - (iii) site-specific designs for the proposed activity;
 - (iv) proposals for Project-specific mitigation measures, including, but not limited to, applicable measures addressing safety, inspections, spoils disposal, hazardous substances, and restoration needs;
 - (v) proposals for implementation and effectiveness monitoring necessary to meet standards and guidelines; and
 - (vi) data from surveys, biological evaluations, or consultation required by regulation and as applicable to activities on BLM-administered lands.
- (c) Upon BLM approval of the site-specific plans, the Licensee shall conduct any additional environmental analysis deemed necessary by the BLM to ensure consistency with statutes, regulations and policies, including the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Native American Grave Protection Act (NAGPRA), the Clean

Air Act, the Clean Water Act, and the Endangered Species Act (ESA) and the BLM direction in the National Environmental Policy Act Handbook 1790-1 (USDI BLM 1988), or as amended. As part of the site-specific plan, the Licensee may provide environmental analysis of the proposed activity that meets BLM requirements for implementing the National Environmental Policy Act (NEPA) in existence at the time the request is made. The Licensee may also refer to or rely on any previous site-specific NEPA analysis for the proposed activity to the extent the analysis is currently applicable, as determined by BLM. The Licensee shall obtain written authorization of the BLM prior to the implementation of the activity.

- (d) The Licensee shall avoid disturbance to all public land survey monuments, private property corners, and BLM boundary markers. In the event that any markers or monuments are destroyed by an act or omission of the Licensee, in connection with the use and/or occupancy authorized by the license or a BLM use authorization, depending on the type of monument destroyed, the Licensee shall reestablish or reference same in accordance with (1) the procedures outlined in the "Manual of Instructions for the Survey of the Public Land of the United States," (2) the specifications of the County Surveyor, or (3) the specifications of the BLM. The Licensee shall ensure that any such official survey records affected are amended as provided for by law.
- (e) The Licensee shall maintain Project-related improvements and facilities located on BLM-administered lands to accepted standards of repair, orderliness, neatness, sanitation, and safety. The Licensee shall comply with all applicable Federal, State, and local laws, regulations, including but not limited to, the Federal Water Pollution Control Act, 33 U.S.C. § 1251 et seq., the Resources Conservation and Recovery Act (RCRA), 42 U.S.C. § 6901 et seq., the Comprehensive Environmental Response, Control, and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq., and other relevant environmental laws, as well as public health and safety laws and other laws relating to the siting, construction, operation, and maintenance of any facility, improvement, or equipment.
- (f) The Licensee shall restore BLM-administered lands affected by the Project to a condition satisfactory to BLM prior to any surrender of the Project license. At least one year in advance of license surrender, the Licensee shall file with the Commission a restoration plan approved by the BLM. The plan shall identify Project-related improvements to be removed, restoration measures, and time frames for implementation and estimated restoration costs.
- (g) Prior to the abandonment of any Project-related facilities on or affecting BLM-administered lands, including impacts due to changes in the Project boundary from that in the original license, the Licensee shall restore such lands and improvements to a condition acceptable to BLM. At least one year in advance of the abandonment of these Project-related facilities, the Licensee shall file with the Commission a restoration and maintenance plan approved by the BLM. The plan shall identify, at a minimum, improvements that will be removed,

improvements abandoned but not removed, restoration and maintenance measures, time frames and costs.

- (h) The Licensee shall, within one year of license issuance, develop a standard operating procedures plan that the Licensee shall implement in the event of Project-related emergencies. At a minimum, the plan shall address BLM-administered lands potentially affected by the Project, and address procedures, environmental permits, and subsequent mitigation measures for any Project-related impacts to BLM administered lands including, but not limited to, the J.C. Boyle emergency spillway and canal and slope failures. This plan shall be developed with consultation and approval by BLM. The plan shall include implementation strategies for agency coordination, restoration actions, monitoring and evaluation, and potential mitigation measures.
- (i) The Licensee shall exercise diligence in protecting from damage the land and property of the BLM covered by and used in connection with this license, including any buildings, bridges, roads, trails, lands or other property of the BLM; and shall restore, reconstruct or compensate the BLM for any damage resulting from negligence and from the violation of the terms of this license or any law or regulation applicable to the BLM by the Licensee, or by any agents or employees of the Licensee acting within the scope of their agency or employment. Arrangements to restore, reconstruct, or compensate for damages shall be made with the BLM.
- (j) The Licensee shall indemnify, defend, and hold the United States harmless for any costs, damages, claims, liabilities, and judgments arising from past, present, and future acts or omissions of the Licensee in connection with the use and/or occupancy of BLM-administered lands or resources authorized by the license. This indemnification and hold harmless provision applies to any acts and omissions of the Licensee or the Licensee's heirs, assigns, agents, employees, affiliates, subsidiaries, fiduciaries, contractors, or lessees in connection with the use and/or occupancy authorized by this license which result in: (1) violations of any laws and regulations which are now or which may in the future become applicable, and including but not limited to environmental laws such as the CERCLA, RCRA, Oil Pollution Act, Clean Water Act, Clean Air Act; (2) judgments, claims, demands, penalties, or fees assessed against the United States; (3) costs, expenses, and damages incurred by the United States; or (4) the release or threatened release of any solid waste, hazardous substances, pollutant, contaminant, or oil in any form in the environment.

BLM Modified Condition 2: Consultation with the Bureau of Land Management

- A. The Licensee shall consult with the Bureau of Land Management (BLM) at least annually and prepare a report on the status of implementing conditions of the license, including, at a minimum, those that may affect BLM-administered lands and resources. The report shall include, but is not limited to, the:

1. Results of any monitoring performed over the previous year for reporting effectiveness of license requirements;
 2. Review of any non-routine maintenance;
 3. Discussion of any foreseeable changes to Project facilities or operations;
 4. Discussion of any necessary revisions or modification to plans approved as part of this license; and
 5. Discussion of elements of current year maintenance plans, e.g. road maintenance.
- B.** A copy of the records, plan reports, monitoring reports, and other pertinent records shall be provided to the BLM at least 10 days prior to the annual meeting, unless otherwise agreed.
- C.** Within 60-days of issuance of the report to BLM, the Licensee shall file the record of consultation and any BLM comments and recommendations with the Commission.
- D.** The Licensee shall consult with the BLM on a as-needed basis to identify and resolve potential conflicts with BLM policy and direction prior to initiating activities on BLM-administered lands,
- E.** The Licensee shall consult with the BLM at least annually to determine if any Project-related activity may affect other authorized activities on BLM-administered lands in the Project area. If a Project-related activity may affect other authorized uses, then the Licensee shall resolve potential conflicts with representatives of those permitted uses.

The Licensee shall submit copies of other reports related to Project safety, including Spill Prevention Control and Countermeasure Plans and annual emergency and hazardous chemical inventories, and non-compliance to the BLM concurrently with submittal to the Commission. These include, but are not limited to, any non-compliance report filed by the Licensee for facilities or operations on or affecting BLM-administered lands.

BLM Modified Condition 3: Roads Inventory Analysis and Roads Management

- A.** Within six months of license issuance, the Licensee shall complete, in consultation with the Bureau of Land Management (BLM), a Project Roads Inventory Analysis (Analysis) and file the Analysis with the Commission for approval. The Licensee shall prepare a draft Analysis after consultation with the BLM. The Licensee shall allow a minimum of 60 days for the BLM to comment and make recommendations on the draft Analysis before finalizing the Analysis and filing it with the Commission. The Licensee shall include with the Analysis documentation of consultation, copies of comments and recommendations and a description of how the comments and recommendations are accommodated by the Analysis. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on Project-specific information. At the time it files the Analysis with the Commission, the Licensee shall serve a copy of the filed documents upon the BLM. At a minimum, the Analysis shall address all roads that cross BLM-administered lands included within

the geographical scope of the *Study Area Roadway Inventory Analysis and Project Roadway Management Plan – Klamath Hydroelectric Project (FERC Project No. 2082)* (PacifiCorp 2004m), including in the analysis the estimated percentage of use that is associated with Project operations and maintenance and other Project-related activities such as Project-related recreation. The Analysis, at a minimum, shall identify and map the roads, bridges, culverts and other transportation-related structures within the broader overall study area, as described above, as well as identifying the estimated percentage of Project-related use these transportation-related facilities sustain.

- B.** Within one year of license issuance, the Licensee shall develop, in consultation with the BLM, a Road Management Plan (Plan) and file the Plan with the Commission for approval. The Licensee shall prepare a draft Plan after consultation with the BLM. The Licensee shall allow a minimum of 60 days for the BLM to comment and make recommendations on the draft Plan before finalizing the plan and filing it with the Commission. The Licensee shall include with the Plan documentation of consultation, copies of comments and recommendations and a description of how the comments and recommendations are accommodated by the Plan. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on Project-specific information. At the time it files the Plan with the Commission, the Licensee shall serve a copy of the filed documents upon the BLM. The Plan shall include all roads that cross BLM-administered lands (BLM Roads) that are identified in the Project Roads Inventory Analysis that sustain Project-related uses, including Project-related recreation.
1. At a minimum, the Plan shall include the items specified in the Final License Application (PacifiCorp 2004a, Executive Summary, page 8-5; Land Use, Visual, and Aesthetic Resources Final Technical Report, page 3-7; and Appendix 3C) and shall:
 - (a) Identify roads, bridges, culverts and other transportation-related structures necessary for Project-related activities, including Project-related recreation;
 - (b) Identify transportation-related operations and maintenance (O&M) activities required for the continued operation of the Project;
 - (c) Identify transportation-related activities required to address Project-related recreation uses;
 - (d) Include provisions for use and cost-sharing agreements for Project and Project-related transportation related structures;
 - (e) Identify the Licensee share for management and maintenance of BLM Roads affected by the Project;
 - (f) Identify BLM roads previously used but which are no longer necessary to operate and maintain the Project or used for Project-related recreation, and include plans for decommissioning these roads as appropriate;
 - (g) Provide for continued protection of natural and cultural resources along Project-related roadway corridors;
 - (h) Identify appropriate standards for the maintenance of Project-related roads and other transportation-related structures;

- (i) Identify and implement Best Management Practices for maintaining and protecting cultural resources, vegetation resources (including management for noxious weeds), aquatic resources, and minimizing soil erosion; and
 - (j) Identify relevant BLM policies for transportation management of BLM Roads affected by Project-related activities.
2. The Roads Plan shall accommodate unrestricted access by the BLM necessary to manage and administer BLM lands and resources that are affected by Project operations. The plan shall include provisions for the maintenance of crossings and rights-of-way (ROW) required by and consistent with permit requirements for powerlines, penstocks, ditches, and pipelines.
- C. The Licensee shall consult with the BLM prior to erecting any signs on BLM-administered lands that are necessary for operation or maintenance of Project operations or facilities. The Licensee must obtain approval from the BLM specific to the location, design, size, color, and content of signs. The Licensee shall be responsible for maintaining all Licensee-erected signs to neat and presentable standards.

BLM Modified Condition 4: River Corridor Management

A. J.C. Boyle Bypassed River Reach

1. Required Minimum Streamflows – The Licensee shall, within one year after license issuance, operate J.C. Boyle Development to accomplish the following:
 - (a) Proportional flow requirement: Provide no less than 40% of the inflow to J.C. Boyle Reservoir to the J.C. Boyle Bypassed River Reach, to be measured at a new gage below the J.C. Boyle Dam near RM 225. Inflow to J.C. Boyle Reservoir shall be calculated by averaging the previous three days of the combined daily flows as measured at the Keno gage #11509500 and Spencer Creek gage #11510000 (Calculated Inflow).
 - (b) Minimum base flow requirement: When Calculated Inflow is less than 1,175 cubic feet per second (cfs), no less than 470 cfs shall be provided to the J.C. Boyle Bypassed River Reach, except that when the Calculated Inflow is less than 470 cubic feet per second (cfs), then flow shall be provided to the J.C. Boyle Bypassed River Reach in an amount equal to the Calculated Inflow.
 - (c) Seasonal high flow requirement: When Calculated Inflow to J.C. Boyle Reservoir exceeds 3,300 cfs during the period between February 1st and April 15th, diversion to the J.C. Boyle Power Canal shall be suspended at least once and continued for a minimum of seven days.
2. Ramping During Controlled Events – The Licensee shall, within one year after license issuance, operate J.C. Boyle Development to not exceed an up-ramp rate or down-ramp rate of two inches per hour as measured at the new gage below J.C. Boyle Dam when conducting controlled flow events (e.g., scheduled maintenance and changes in minimum flow requirements), except when implementing the seasonal high flow or when turbine capacity is exceeded. The Licensee, in

consultation with the BLM, shall develop and implement an appropriate ramp rate to follow after the seasonal high flow to prevent stranding fish in the J.C. Boyle Bypassed Reach.

B. J.C. Boyle Peaking Reach

1. Streamflow Requirements – The Licensee shall, within one year after license issuance, operate the J.C. Boyle Development from May 1st to October 31st to provide a minimum streamflow of 1,500 cfs a maximum of once a week, such that these flows occur at the Spring Island Boat Launch between 0900 and 1400 hours from Friday through Sunday, in the priority of Saturday, Sunday, and then Friday.
2. Ramping During Controlled Events – The Licensee shall, within one year after license issuance, operate the J.C. Boyle development to not exceed an up-ramp rate or down-ramp rate of two inches per hour when conducting controlled flow events (e.g. scheduled maintenance, power generation, changes in streamflow requirements), except during implementation of the seasonal high flow, as measured at the J.C. Boyle Powerhouse gage USGS #11510700.
3. Flow Continuation Measure – The Licensee shall, within one year of license issuance, implement a flow continuation measure at the J.C. Boyle canal and powerhouse to provide a minimum of 48 hours of continuous flow under powerhouse shutdown conditions.

C. Streamflow Measurement and Reporting: J.C. Boyle Bypassed River and Peaking Reaches

1. Instream Flow Measurement – The Licensee shall, within one year after license issuance:
 - (a) Continuously measure the stage of water at three existing gage sites. Existing gage stations shall include the Klamath River below Keno Dam (#11509500), Spencer Creek above the confluence with the J.C. Boyle Reservoir (#11510000), and Klamath River below the J.C. Boyle Powerhouse (#11510700). The Licensee shall operate and maintain the gages at these sites if the gages are no longer operated or maintained by the current operators.
 - (b) The Licensee shall establish and operate one additional gage on the Klamath River J.C. Boyle Bypassed River Reach below all outlets from the J.C. Boyle Dam and above the springs near RM 225, using the most current USGS protocol for gage station installation, maintenance, and data collection.
2. Instream Flow Reporting - The Licensee shall, within one year after license issuance:
 - (a) Provide instantaneous 30-minute real time streamflow data in cfs via remote access that is readily available and accessible to the public.
 - (b) Design and maintain a database, similar to the most current version of the USGS National Water Information System (NWIS) for reporting on surface water. The database shall store gage network data and streamflow tracking procedures. BLM shall review and approve the database.
3. The Licensee shall, within two years after license issuance, submit a report for each water year (i.e. October 1st through September 30th) of streamflow data

reported in cfs to the BLM. The report shall be filed with the BLM within six months of the end of each water year.

D. Sediment Management Plan (SMP)

Within one year of license issuance, the Licensee shall develop, in consultation with and approval of the Bureau of Land Management (BLM), a Sediment Management Plan (SMP) and file the SMP with the Commission for approval. The Licensee shall prepare a draft SMP after consultation with the BLM and other stakeholders that are willing to participate, including, but not limited to USFWS, BOR, NOAA Fisheries, USGS, ODEQ/EPA, ODFW, CDFG, NCRWQCB, ODSL and affected Tribes. The Licensee shall allow a minimum of 60 days for the BLM and other stakeholders to comment and make recommendations on the draft SMP before finalizing the plan and filing it with the Commission. The Licensee shall include with the SMP documentation of consultation, copies of comments and recommendations, and a description of how the comments and recommendations are accommodated by the SMP. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on Project-specific information. At the time it files the SMP with the Commission, the Licensee shall serve a copy of the filed documents upon the BLM. The SMP shall be designed to meet the following objectives:

- increase channel complexity;
- increase spawning habitat for resident and anadromous fish; and

The SMP, at a minimum, shall adhere to the following 1) overall strategy; 2) goals; 3), elements, 4) performance measures, and 5) reporting requirements:

1) Overall Strategy - increase sediment storage in the J.C. Boyle Bypassed River reach (gravel/cobble sized material in boulder/bedrock pockets, gravel/cobble sized material on bars and in pools, and sand/gravel sized material on bar tops and along channel margins); improve coarse sediment transport (distribute introduced and existing accumulations downstream); and restore a balance between sediment supply and transport using high flows and sediment introduction.

2) Goals – improvement of physical habitat attributes corresponding to sediment storage in the reach. Broadly, the goals to be achieved include (a) increasing fish spawning habitat; (b) increasing stream channel complexity; and (c) improving riparian habitat quality.

3) Elements – The above goals may be achieved by meeting all of the following:

- a. In one large introduction effort establish bed-stored sediment to its potential in the J.C. Boyle Bypassed River Reach. Determine capacity for gravel and cobble sediment to be trapped in boulder pockets and pools and capacity for sand and gravel trapped on bar surfaces and along the channel margins. An estimate of the large introduction quantity for gravel/cobble in spawning pockets and pools is 1 foot of gravel depth in pockets likely to trap coarse sediment, which cover approximately 1/3 of the low flow channel. Similar estimates for bar top and

channel margin trapping of sands and gravels to meet riparian goals need to be developed. If restoring seasonal high flows mobilizes and distributes the sediment accumulated at the J.C. Boyle emergency spillway deposit sufficiently to meet the capacity of the bypassed river reach downstream from that deposit, then the sediment introduction criteria can be reduced by a corresponding quantity to attain the potential for the bypassed river reach upstream from the emergency spillway.

- b. Establish a sediment transport model to initially estimate sediment exports, per grain size, from the reach in order to estimate and plan for implementation of subsequent sediment infusion quantities and qualities. Annually refine the model with annual flood season bed material and suspended sediment transport measurements.
 - c. Establish a sediment monitoring program, using standardized techniques, that adaptively manages the program over time and evaluates whether the sediment augmentation program is effective. Effectiveness shall be determined based on the Performance Measures (See part 4 below). The monitoring results shall be reported to sufficiently inform annual adaptive management decisions for sediment infusion quantities and qualities after the initial large sediment input. Monitoring results may also be used to adapt additional aspects of the augmentation, including, but not limited to, timing, location, augmentation methods, and particle size composition.
 - d. Maintain sediment continuity per grain size in the J.C. Boyle bypassed river reach through adaptive infusions of sediment quantities sized to replace sediment exported from the reach.
 - e. Develop spawning habitat suitability criteria for the JC Boyle bypassed river reach for steelhead, coho, Chinook, and resident trout by modeling the quantity and quality of salmonid spawning habitat for a flow of 470 cfs plus accretion flows. Establish a periodic monitoring program to validate model estimates of spawning habitat quantity and quality.
 - f. Annually monitor and identify locations of salmonid spawning activity in the bypass reach for each salmonid species or stock.
- 4) Performance Measures – The following shall be considered for inclusion in the SMP:
- a. Achieve the determined capacity for gravel and cobble sediment to be trapped in boulder pockets and pools within three years of SMP approval.
 - b. Achieve the determined capacity for sand and gravel trapped on bar surfaces and along the channel margins within three years of SMP approval.

c. Maintain sediment continuity and a balanced sediment budget, such that gravel/cobble spawning patches and sand/gravel riparian bar surfaces remain within an average of +/- 10% of the estimated sediment trap capacity.

5) Reporting -

- a) The Licensee shall submit to the BLM and the Commission an annual report on the activities of the SMP implementation during the previous year. The report shall include a description of the quantities, sizes, composition, timing, method(s), and location of sediment added and any monitoring data. The report shall integrate data from year to year, such that an analysis of trends is included.
- b) At least every five years, the Licensee shall consult with the BLM to review and update or revise the SMP as appropriate. Upon Commission approval, the Licensee shall implement the revised SMP.

E. Adaptive Management Plan (AMP)

Within one year of license issuance, the Licensee shall develop, in consultation with the Bureau of Land Management (BLM), an Adaptive Management Plan (Plan) and file the Plan with the Commission for approval. The Licensee shall prepare a draft Plan after consultation with the BLM. The Licensee shall allow a minimum of 60 days for the BLM to comment and make recommendations on the draft Plan before finalizing the plan and filing it with the Commission. The Licensee shall include with the Plan documentation of consultation, copies of comments and recommendations and a description of how the comments and recommendations are accommodated by the Plan. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on Project-specific information. At the time it files the Plan with the Commission, the Licensee shall serve a copy of the filed documents upon the BLM. At a minimum, the Plan shall address all BLM-administered lands that are affected by the Project in the J.C. Boyle Bypassed River and Peaking Reaches. After Commission approval, the Licensee shall implement the Plan.

The Plan, at a minimum, shall:

1. Be designed to monitor how implementation of the River Corridor Management Condition is effective in improving fish habitat quantity and quality for resident, migratory, and anadromous fish, with emphasis on spawning habitat.
2. Be designed to monitor how implementation of the River Corridor Management Condition is effective in increasing channel complexity and riparian habitat quality.
3. Be designed to monitor how implementation of the River Corridor Management Condition affects flows for recreational boating.
4. Be designed to monitor how implementation of the River Corridor Management Condition is affecting fish migration, spawning, and rearing conditions for salmonids.

5. Contain annual reporting requirements of the Licensee for monitoring results, data collection, and an evaluation of these results for all monitoring efforts in the river corridor.

BLM Modified Condition 5 – Cultural Resources Inventory and Management

1. Cultural Resources Inventory – Within one year of license issuance, if not previously completed, the Licensee shall complete cultural resources inventory of Bureau of Land Management (BLM)-administered lands within the Area of Potential Effect (APE) to the following specifications:

- (A) In consultation with the BLM and affected tribes, the Licensee shall complete a cultural resources inventory of approximately 77.2 acres of BLM-administered land within the APE that were not inventoried in the Licensee’s 2002-2003 inventory efforts.
- (B) The Licensee shall employ survey standards consistent with BLM Class III survey protocols (BLM 1998).
- (C) In consultation with the BLM, affected tribes, and State Historic Preservation Officer (SHPO), the Licensee shall document newly identified sites according to BLM and SHPO standards and assess the sites for eligibility on the National Register of Historic Places (NRHP). Newly discovered sites shall be incorporated in an amended HPMP (see below).
- (D) The Licensee shall submit a draft report to the BLM documenting the results of the inventory within 60 days of completion. The report shall follow SHPO report guidelines. The Licensee shall allow a minimum of 60 days for the BLM to review and make recommendations on the draft before finalizing the report and filing it with the Commission. A copy of the final report shall be submitted to the BLM, affected tribes, and the SHPO.

2. Amend Historic Properties Management Plan

Within one year of license issuance, the Licensee shall amend, in consultation with the BLM, the Historic Properties Management Plan (HPMP) to address the management of all sites within the APE and file the HPMP with the Commission for approval. The Licensee shall prepare a draft amended HPMP after consultation with the BLM, affected tribes and SHPO. The Licensee shall allow a minimum of 60 days for the BLM to comment and make recommendations on the draft amended HPMP before finalizing the plan and filing it with the Commission. The Licensee shall include with the HPMP documentation of consultation, copies of comments and recommendations and a description of how the comments and recommendations are accommodated by the HPMP. If the Licensee does not adopt a recommendation, the filing shall include the Licensee’s reasons, based on Project-specific information. At the time it files the HPMP with the Commission, the Licensee shall serve a copy of the filed documents upon the

BLM. At a minimum, the HPMP shall address all BLM-administered lands within the APE.

The HPMP, at a minimum, shall include:

- (A) Measures to monitor, stabilize, protect, restore, and/or mitigate for Project-related effects to known sites within the APE on BLM-administered land. Sites discovered during the completion of surveys on BLM land within the APE shall also be included in the amended HPMP.
- (B) Monitoring of BLM cultural sites within the APE that shall be completed by a qualified professional archaeologist, and shall involve, at a minimum, visiting 20% of the eligible sites each year to ascertain impacts, the effects of mitigations in preventing continued degradation of the resource, whether eligible properties are being affected by Project-related activities, and whether non-eligible historic properties should be re-evaluated for consideration of eligibility.
- (C) Protocols for conducting cultural resources surveys on BLM-administered lands prior to future Project-related activities proposed within the APE. If a Project-related activity is proposed within an area where cultural resource surveys are older than 15 years, the Licensee shall conduct a new survey.
- (D) Procedures for handling, cataloging, interring, or repatriating cultural resources on BLM land exposed by unanticipated Project related effects.
- (E) Provisions for annual reports to be submitted to the Commission, the BLM, and affected tribes documenting mitigations, new findings and assessment of the effectiveness of mitigations in preventing degradation of cultural properties on BLM-administered lands.
- (F) A schedule for implementing the amended HPMP, incorporating a priority for those sites which are at greatest risk of continued degradation from Project-related activities.
- (G) Provisions for the review and periodic revision of the HPMP to incorporate new information regarding the condition or effects to historic properties on BLM-administered lands or changes in site eligibility as a function of policy, law, regulation, or advances in scientific technology.
- (H) Implementation of the HPMP upon Commission approval.

3. Detailed Site Specific Studies – Within one year of the license issuance, the Licensee shall, in consultation with the BLM, conduct detailed, site specific studies to determine the erosion impacts, if any, from flows resulting from Project operations at five BLM sites (35KL21/786, 35KL22, 35KL24, 35KL558, and 35KL577) which are within, or partially within, the T1 terrace.

- (A) The Licensee shall submit a draft report documenting the results of the detailed studies within 60 days of the completion of the fieldwork to the BLM for review. The Licensee shall allow a minimum of 60 days for the BLM to review and make recommendations on the draft before finalizing the report and filing it

with the Commission. A copy of the report shall be submitted to the BLM, affected tribes, and the SHPO.

- (B) If the detailed studies show that Project related flows impact any of the five sites, mitigation measures developed in consultation with the BLM and affected tribes shall be incorporated within the amended HPMP.

BLM Modified Condition No. 6 – Recreation and Aesthetic Resources Management

Within one year of license issuance, the Licensee shall develop, in consultation with the Bureau of Land Management (BLM), a Recreation Resource Management Plan (RRMP) and file the RRMP with the Commission for approval. The Licensee shall prepare a draft RRMP after consultation with the BLM. The Licensee shall allow a minimum of 60 days for the BLM to comment and make recommendations on the draft RRMP before finalizing the plan and filing it with the Commission. The Licensee shall include with the RRMP documentation of consultation, copies of comments and recommendations and a description of how the comments and recommendations are accommodated by the RRMP. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on Project-specific information. At the time it files the RRMP with the Commission, the Licensee shall serve a copy of the filed documents upon the BLM. At a minimum, the RRMP shall address all BLM-administered lands that are affected by Project-related recreation. After Commission approval, the Licensee shall implement the Plan.

A. The RRMP, at a minimum, shall include:

1. Descriptions of Project related existing and potential recreation sites and trails and all those that are on or affecting Bureau of Land Management (BLM) administered lands. These include such sites as Topsy Campground, Spring Island Boaters Access, Klamath River Campground, dispersed day-use sites, Stateline Takeout and Bypass Reach fishing access and trails.
2. A schedule for implementation, maintenance, capital improvements, and monitoring for those BLM recreation facilities that are affected Project-related recreation.
3. Estimates of the costs to operate, maintain and monitor BLM facilities that receive Project-related recreation. The RRMP shall identify responsibility for the costs of operating, maintaining and monitoring, at a minimum, Topsy Campground, Spring Island Boaters access, the Stateline Takeout, the Klamath River Campground and dispersed day-use sites. The RRMP shall identify the appropriate instruments for shared administration of these sites.
4. Maintenance and needed development measures for recreation sites, day-use areas, and non-motorized and motorized trails located on BLM-administered lands affected by Project-related recreation. At a minimum, these sites will include: Topsy Campground; J.C. Boyle Bypass Reach boating and fishing access sites and associated access trails; Spring Island Boaters Access; Klamath River Campground; and

dispersed day-use sites used by whitewater boaters along the Klamath River; scouting trails at major rapids; and the Stateline Takeout.

5. Standards for facilities operation and maintenance; facility replacement, modification, or upgrade; and monitoring for those BLM recreation facilities affected by Project-related recreation.
6. Provisions to bring facilities up to accepted standards for handicap accessibility, public health and cleanliness, safety, and security.
7. Provisions for monitoring and assessment of visitor use on BLM-administered lands that are affected by Project-related recreation at an interval no greater than six years. The assessment shall identify when new facilities or management are needed and shall incorporate a feedback loop and necessary trigger points for action for adaptive management.
8. Provisions for an annual visitor-use report that will be provided to the BLM.
9. Provision for annual review and periodic modifications or revisions of the RRMP.

B. The Licensee shall include a Visual Resource Management (VRM) Plan in the RRMP that includes provisions and guidelines for managing visual (e.g., aesthetic) resources on BLM-administered lands that contain Project facilities from the headwaters of J.C. Boyle Reservoir to Iron Gate Reservoir. The VRM Plan should describe how the design, maintenance, and construction of Project facilities will maintain or preserve visual resource values. The VRM plan shall be consistent with BLM VRM objectives and guidelines (USDI BLM 1995a, pages 43-44 and Map 2-5; USDI BLM 1993, page 33). The VRM Plan shall include provisions for aesthetics at the bypass canal and other concrete structures, switch yards, power houses, buildings, penstocks, metal powerline structures; and Project recreation facilities including campgrounds and day-use sites. The following are examples of the types of mitigation measures that may be used to meet VRM objectives for the Project:

- (a) For bypass canal and other concrete structures: mitigate color and form contrasts by application of acid/stain agent (e.g., Permeon) to reduce contrasts in existing structures; by addition of earthtone coloring agents in concrete mix for new structures; and in concert with vegetative screening or landscaping. Vegetative screening or landscaping may require systematic watering, fertilizing or other measures to ensure its survivability and effectiveness over the term of the license.
- (b) For switch yards, power houses, buildings, penstocks, metal powerline structures: mitigate color and form contrasts by application of paint/stain earthtone colors selected from the surrounding natural appearing landscape colors to reduce contrasts; and in concert with vegetative screening or landscaping. Replace conductors with non-reflective materials at such time as reflectors would otherwise be replaced.
- (c) For Project recreation facilities including campgrounds and day-use sites: mitigate color and form contrasts by vegetative or structural screening for all existing and newly constructed recreation facilities. Mitigate impacted areas with vegetation plantings to reduce erosion, improve aesthetics and screening.
- (d) For J.C. Boyle Powerhouse and Canal access roads, Project roads, and other landform alterations: mitigate color and form contrasts by establishing

vegetation. Application of soil tackifiers and bio-stimulants may be necessary to facilitate revegetation. Talus slopes and cutbanks; mitigate color and form contrasts by establishing vegetation. Application of soil tackifiers and bio-stimulants may be necessary to facilitate revegetation.

BLM Modified Condition 7 - Vegetation Resources Management Plan

Within one years of license issuance, the Licensee shall develop, in consultation with the Bureau of Land Management (BLM), a Vegetation Resources Management Plan (Plan) and file the Plan with the Commission for approval. The Licensee shall prepare a draft Plan after consultation with the BLM. The Licensee shall allow a minimum of 60 days for the BLM to comment and make recommendations on the draft Plan before finalizing the plan and filing it with the Commission. The Licensee shall include with the Plan documentation of consultation, copies of comments and recommendations and a description of how the comments and recommendations are accommodated by the Plan. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on Project-specific information. At the time it files the Plan with the Commission, the Licensee shall serve a copy of the filed documents upon the BLM. At a minimum, the Plan shall address all BLM-administered lands that are affected by the Project, including those affected by Project-related recreation. After Commission approval, the Licensee shall implement the Plan.

The Plan, at a minimum, shall include:

1. Provisions to re-survey lands affected by the Project, including, at a minimum, BLM-administered lands affected by Project-related activities, according to accepted protocols to determine or verify the distribution of TES species.
2. Provisions for establishing a weed management area (WMA) that includes the Project area and interested stakeholders.
3. Provisions for surveying, documenting, managing and monitoring noxious weed and invasive plant species, including periodic review of federal, state and local noxious weed lists in the Project area.
4. Provisions for surveying, documenting, monitoring and protecting threatened, endangered, and sensitive (TES) plants, including periodic review of BLM sensitive species, Oregon Natural Heritage Information Center (ORNHIC), California Natural Diversity Database, and California Native Plant Society records.
5. Proposed vegetation management activities for, at a minimum, the J.C. Boyle Powerhouse and canal, maintenance of transmission line and road rights-of-way (ROW), and use of Project-related roads on or affecting BLM-administered lands.
6. Proposed remediation measures and subsequent monitoring program for the eroded area below the J.C. Boyle emergency spillway.
7. A geospatial map (e.g., GIS map) and digital database to store information on species occurrence; distribution; status according to the ODA system of ranking species for control; and timing of last survey.
8. Proposed treatments, mitigations, and best management practices for managing weeds on BLM-administered lands that are impacted by Project-related activities.

9. Descriptions as to how the Plan is consistent with BLM guidance for integrated pest management.
10. Principles of integrated pest management that include prevention and detection, application of integrated control methods, education, coordination, native plant community restoration, monitoring, and evaluation. Integrated control methods may include cultural, physical, biological, and chemical control techniques.
11. Provisions for annual review and periodic modifications or revisions of the Plan.

BLM Modified Condition 8: Wildlife Habitat Management Plan

Within two years of license issuance, the Licensee shall develop, in consultation with the Bureau of Land Management (BLM), a Wildlife Habitat Management Plan (Plan) and file the Plan with the Commission for approval. The Licensee shall prepare a draft Plan after consultation with the BLM. The Licensee shall allow a minimum of 60 days for the BLM to comment and make recommendations on the draft Plan before finalizing the plan and filing it with the Commission. The Licensee shall include with the Plan documentation of consultation, copies of comments and recommendations and a description of how the comments and recommendations are accommodated by the Plan. If the Licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on Project-specific information. At the time it files the Plan with the Commission, the Licensee shall serve a copy of the filed documents upon the BLM. At a minimum, the Plan shall address all BLM-administered lands that are affected by the Project, including those affected by Project-related recreation. After Commission approval, the Licensee shall implement the Plan.

The Plan, at a minimum, shall include:

1. Measures with use monitoring for wildlife crossings and escape ramps for the J.C. Boyle Canal.
2. Measures with use monitoring for western pond turtle habitat improvement.
3. Threatened, endangered, sensitive (TES) species and Special Status (SS) species survey and monitoring including survey protocols for long-term survey and monitoring of TES and SS species and their habitat for BLM-administered lands affected by Project-related activities to assess impacts and develop necessary mitigations. This information shall supplement the previous study completed by PacifiCorp (PacifiCorp 2004c - Threatened, Endangered, Sensitive and Special Status Species Assessment).
4. Restoration, protection, and/or enhancement measures for wildlife and/or wildlife habitat affected by Project-related activities.
5. Seasonal restrictions for active nest sites on BLM-administered lands for bald eagles, golden eagles, ospreys, peregrine falcons and other raptors affected by Project-related activities.
6. An Avian Protection Plan (APP) for the Upper Klamath River. This plan shall address avian interaction (electrocution, collision, nesting, perching) with all transmission facilities and follow guidelines in the Avian

Protection Plan Guidelines (APLIC and USFWS, 2005), “Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996” (APLIC 1996) and/or the most current publication for avian protection at the time.

7. Provisions for annual review and periodic modifications or revisions of the Plan.

BLM Modified Condition 9: BLM Reservation of Authority

Authority is reserved to require the Licensee to implement such conditions for the protection and utilization of Department of Interior reservations as may be provided by the Secretary of the Interior, pursuant to Section 4(e) of the Federal Power Act, 16 U.S.C. § 797(e).