

**Black Canyon Hydroelectric Project  
FERC Project No. P-14110  
Revised Aesthetic Resource Assessment Study Plan  
January 2013**

Prepared for  
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## 1 INTRODUCTION

Black Canyon Hydro, LLC, (BCH) ultimately plans to file an application for an original license for the Black Canyon Hydroelectric Project (Project), FERC Project Number P-14110, and associated facilities on the North Fork Snoqualmie River (North Fork), approximately 4 miles northeast of North Bend in King County, Washington. The Project has a proposed generation capacity of 25 megawatts (MW) and would be located entirely on private lands.

### Intake Alternative A

Alternative A would consist of the following new facilities: (1) an 8-foot-high, 162.4-foot-long inflatable rubber diversion with an associated water intake structure; (2) a natural or roughened fish passage channel; (3) a variable pooling area behind the diversion with a normal water surface elevation of 971 feet above mean sea level and a maximum pooling of 2.83 acres; (4) a power conduit tunnel consisting of an approximately 450-foot-deep vertical tunnel into an approximately 8,350-foot-long, 9-foot-diameter horizontal tunnel and penstock; and (5) for access, Alternative A would utilize an existing logging road to minimize disturbance, and require only 825-feet of additional road.

### Intake Alternative B

Alternative B would consist of the following new facilities: (1) a control sill to maintain a consistent river bottom elevation, which would allow water, fish, sediment, large woody debris, and whitewater recreationists to pass unimpeded, with an associated water intake structure; (2) a power conduit tunnel consisting of an approximately 450-foot-deep vertical tunnel into an approximately 9,175-foot-long, 9-foot-diameter horizontal tunnel and penstock; and (3) for access, Alternative B would utilize an existing logging road to minimize disturbance, and require only 500-feet of additional road.

### Powerhouse

The power conduit tunnel and penstock from either Alternative A or B would terminate at the powerhouse proposed upstream of Ernie's Grove. Initially, the PAD described the powerhouse as being a metal building approximately 60-feet-wide by 100-feet-long. However, as a result of construction from the power conduit tunnel, an underground powerhouse of similar dimensions may be feasible. Tailrace dimensions have also been revised from a 60-foot-wide by 100-foot-long tailrace, to a 24-foot-wide by 200-foot-long tailrace. Whether above or below ground, the powerhouse would include two Francis turbine generator units, one rated at 16 MW and the other rated at 9 MW, as well as appurtenant facilities (switchyard, maintenance building, etc.). Additionally, a

temporary, 2,600-foot-long construction access road would extend from the powerhouse to the North Fork Road (while avoiding Ernie's Grove).

### Transmission

As presented in the PAD, transmission would consist of a 4.2-mile-long, 115-kilovolt overhead transmission line that transmits project power to the regional grid (transmission line would be an over-build of an existing transmission line with only approximately 0.65 miles of new transmission). However, an additional option, depending on minimum instream flow requirements, land use designations, and cost, may be to have the Project connect to the existing 34 kV transmission line running from the existing Black Creek Hydroelectric Project to Snoqualmie Falls. A transmission line could be run from the powerhouse back through the power conduit to the intake structure. From the intake structure a buried or overhead transmission line would only have to travel approximately 6,745-feet along an existing logging road through clear cuts.

The project would operate in run-of-river mode. The combined maximum hydraulic capacity of the two project turbines would be 900 cubic feet per second (cfs). The project would divert water from a 2.6-mile-section of the North Fork Snoqualmie River.

BCH filed a Notice of Intent (NOI) and the associated Pre-Application Document (PAD) to commence the FERC Integrated Licensing Process on March 27, 2012. In response to the subsequent study requests filed by FERC staff and other stakeholders and as detailed in 18 CFR 5.11, BCH is required to submit relevant resource study plans. This includes a study of aesthetics near the Project Reach which follows the requirements of 18 CFR 5.11(b)-(e).

## **2 STUDY DESCRIPTION AND OBJECTIVES**

In accordance with 18 CFR §5.11(d)(1), this section describes the goals and objectives of the study and the information to be obtained. The goal of this study is to identify effects of the proposed project on aesthetic (i.e., visual) resources in the project area. The specific objectives of the study are to:

- Summarize aesthetic resources in the vicinity of the project;
- Identify key observation points (KOPs) and informal recreation sites that are within view of each major element of the project (e.g., diversion, intake, powerhouse, transmission line, access roads, etc.);
- Conduct a detailed analysis of likely effects of the project on aesthetic resources as viewed from the KOPs; and

- Propose measures, as needed, to avoid or mitigate effects on aesthetic resources.

The Aesthetic Resource Assessment Study Plan was primarily based on the comments submitted by FERC staff on July 24, 2012 (FERC, 2012). While other stakeholders mentioned evaluating aesthetics within the context of other studies, FERC staff specifically requested a study of aesthetic resources, which also met the criteria found in Appendix A of Scoping Document 1 for study requests. Also, the FERC staff's study request appears to encompass the aesthetic related comments from other stakeholders.

### **3 STUDY AREA**

The Study Area will consist of lands, Project facilities and waters within and adjacent to the Project boundary including the project reach.

### **4 RESOURCE MANAGEMENT GOALS**

In accordance with 18 CFR §5.11(d)(2), this section describes resources management goals of agencies or Indian tribes with jurisdiction over the resources to be studied.

Section 4(e) and 10(a) of the FPA require that the Commission give equal consideration to all uses of the waterway on which a project is located. When reviewing a proposed action, the Commission must consider the environmental, recreational, fish and wildlife, and other non-developmental values of the Project, as well as power and developmental values.

Describing the project effects on aesthetics in the area of disturbance related to Project construction and operation is necessary to fulfill the Commission's responsibilities under the National Environmental Policy Act (NEPA). Ensuring that potential aesthetic impacts related to the Project are analyzed is relevant to the Commission's public interest determination.

### **5 EXISTING INFORMATION**

In accordance with 18 CFR §5.11(d)(3), this section describes existing information on aesthetic and scenic conditions at the Project, and the need for additional information.

The North Fork drains an overall watershed of 104 square miles, dropping from an elevation of 5,894 feet at its headwaters on Lennox Mountain to 410 feet at the Three Forks confluence. As it moves downstream from the diversion location, the river enters a canyon known as Black or Ernie's Canyon, with McLeod Ridge to the west and quickly

rising foothills to the east. The proposed intake diversion structure is located at river mile (RM) 5.1 at an elevation of 958 feet. The proposed powerhouse is located at the downstream boundary of the project area at RM 2.5, reentering the North Fork at an elevation of approximately 520 feet.

The project area is zoned as forestry and has historically, and currently is, managed as a commercial tree farm. The project reach between the intake diversion structure and the powerhouse is approximately 2.6 miles long. This segment of river generally flows south and west through an area dominated by western hemlock. A riparian zone of variable size follows the river on either side with size determined predominately by steep slopes which are often present along this segment of river. Habitat types on both sides of the river are primarily determined by sustained commercial forestry activities which have created a mixture of forest types depending on the time and location of logging activities.

The Project is located in the area of the Mount Si Natural Resources Conservation Area (NRCA) with the project reach adjacent to the NRCA boundary. Mount Si, a popular tourist attraction, is visible from points within the project area. Other mountain peaks in view include Mount Teneriffe, Green Mountain, and Little Si.

Recreational users are common, particularly hunters, river kayakers and holders of Hancock permits which allow for the collection of firewood. Ernie's Grove, an unincorporated community, is located immediately downstream of the proposed project area. Residential homes are located on both sides of the North Fork below the proposed powerhouse location.

Additional information needs for aesthetic resources include the following:

- ArcGIS "Observer Points" Tool: a spatial analyst extension which identifies all areas that can be seen by a person of average stature standing at a specific location.
- Photo documentation and rendering
- Analysis of potential aesthetic effects of construction, operation and maintenance of associated structures including:
  - Powerhouse
  - Diversion and intake structure
  - Access road extensions
  - Tailrace

- Variation in flow regime within project reach (assuming it is safe to access the location at a range of flows)

## **6 NEXUS TO PROJECT**

In accordance with 18 CFR §5.11(d)(4), this section describes any nexus between Project operations and effects on aesthetic resources.

Project construction and operation has potential direct and indirect effects on aesthetic resources in the vicinity of the project and during construction. These effects include visibility of project facilities in the landscape, temporary construction activities, and variation in the project reach's flow regime. The information collected by this study will allow an evaluation of Project operations effects on aesthetic resource in the study area.

## **7 METHODS**

In accordance with 18 CFR §5.11(d)(1) and §5.11(d)(5), this section provides a detailed description of the proposed study methodology, including data collection and analysis techniques, or objectively quantified information, sampling strategy, and a schedule including data collection and analysis techniques, or objectively quantified information, sampling strategy, and a schedule including appropriate field season(s) and the duration (see "Schedule" heading below for schedule).

Aesthetic resources in the study area will be identified, inventoried, and evaluated through desktop analysis based on GIS-based and hard-copy resource maps, manual inventorying, photo-rendering, and other appropriate data sources.

The visual resource study methods involve the four subtasks described below and will be addressed in the final report:

- Summarize aesthetic resources in the vicinity of the Project
- Identify key observation points (KOPs) and informal recreation sites within view of each major element of the project (Appendix A for Proposed KOPs).
- Review potential conflicts with existing aesthetic resources
- Propose prevention, mitigation and enhancement measures as needed to mitigate effects on aesthetic resources

## 7.1 Summarize Aesthetic Resources

- Summarize aesthetic resources in the vicinity of the Project, including views of the Project from private properties, natural areas accessible to the public (existing parks, trails, campground, key scenic attractions, etc.), and other informal recreation sites.<sup>NPS 1</sup>

## 7.2 Key Observation Points

- KOPs within the surrounding landscape, including formal and informal recreation sites that may be within view of the Project were identified in the Proposed Study Plan. The KOPs will include views from the top of the Mt. Si and Little Mt. Si Trails, campsites within Hancock Forest Management property to the northeast of the Project area, a parking area near the Three Forks Natural Area where kayakers often park, and from the North Fork Snoqualmie River at both the proposed intake and powerhouse/tailrace locations (to help evaluate aesthetic impacts on kayakers and private homeowners in Ernie's Grove). These two KOPs will allow for an evaluation of any effects on the natural character of the North Fork (e.g., color and appearance of flowing flatwater and falls) and riparian areas. The KOPs have been mapped on the Appendix A.

## 7.3 Review Potential Conflicts

- Use the ArcGIS "Observer Points" Tool spatial analyst extension to identify all areas that can be seen by a person of average stature standing at a specific KOP.
- Compile photographic renderings that illustrate the current view from each KOP and how that view would change with the Project's development. Photographs will be taken at the two river KOPs during high, average, and low flow periods based on a review of available hydrologic information. However, BCH safety concerns may alter the timing and location of photography.
  - Photographic renderings at the project intake and powerhouse site will be created from three perspectives (above, even, and below).
- KOPs outside of the waterway will be photographed during the highest use season (expected to be summer).
- Conduct a detailed analysis of likely effects of the project on aesthetic resources as viewed from the KOPs.
  - How will the landscape change with the addition of project features?
  - Will there be a change in the natural lightscape?<sup>NPS 2</sup>
- Include a review of potential conflicts during the construction phase of the project.



## 7.4 Propose Prevention, Mitigation, and Enhancement Measures (PM&E)

- If the Project's operation or construction is found to have impacts on aesthetic resources, PM&E measures will be identified to reduce Project impacts.<sup>NPS 2, 3</sup> These strategies might include: avoidance, detour, scale and timing minimization, protection, mitigation, and enhancement measures (such creating or enhancing existing viewpoints) to offset potential impacts on aesthetic resources.<sup>NPS 1</sup>

## 8 PROGRESS REPORTING

In accordance with 18 CFR §5.11(b)(3), this section describes provisions for periodic progress reports, including the manner and extent to which information will be shared; and the time allotted for technical review of the analysis and results.

Study reports will be submitted as required by the FERC Integrated Licensing Process (ILP). The most recent schedule, issued by FERC in Appendix B of Scoping Document 1, includes a number of opportunities for progress reports, exchange of analysis and results between stakeholders, and information sharing. After proposed study plans are filed with FERC there will be a study plan meeting and comment period before a revised study plan is filled and a comment period passes. Once studies begin, the ILP also has deadlines for an Initial Study Report to be submitted, an Initial Study Report Meeting, and an Initial Study Report Meeting Summary. However, this schedule is subject to change by FERC staff and should not necessarily be relied upon. It is BCH's understanding that any changes to the ILP plan and schedule will be noticed by FERC staff.

Prior to the completion of the Initial Study Report, BCH will provide an opportunity for technical review of the draft study results and analysis. When the draft version of the Initial Study Report has been completed, it will be posted to the project website ([www.blackcanyonhydro.com](http://www.blackcanyonhydro.com)) and BCH will send notice of its availability by e-mail to contacts included on the mailing list identified in the "Revised Communication and Information Protocol" (filed electronically with the FERC on November 27, 2012). Stakeholders will have 15-days from the issuance of this notice to provide written comments to BCH through the project website's "Contact" tab.

## 9 SCHEDULE

In accordance with 18 CFR §5.11(b)(2), the schedule for conducting the study is provided in Table 1 below.

**Table 1. Aesthetic Resource Assessment Study Schedule**

<b>Component</b>	<b>Completion Date*</b>
Summarize Aesthetic Resources	Winter - Spring 2013
Review Potential Conflicts/Propose PM&E	Summer - Fall 2013
Evaluate Potential PM&E Measures	Fall 2013
Draft Initial Study Report Notice & Informal Comment Period	Winter 2013
Initial Study Report Due	February 6, 2014

\*Dates based on schedule created and presented by FERC in Scoping Document 1 and subject to change.

## 10 LEVEL OF EFFORT AND COST

In accordance with 18 CFR §5.11(d)(6), the anticipated level of effort and cost are provided in Table 2 below.

The estimated cost of this work is approximately \$12,500, depending upon the number of KOPs studied. One senior planner and one or two technicians would be expected to visit and photograph those sites, prepare digital renditions of the view of the project from each KOP, evaluate the potential effects of the project on views from each KOP, evaluate view impacts from water and air, and draft and finalize maps and reports.

**Table 2. Level of Effort and Cost**

<b>Task</b>	<b>Labor and Expenses</b>
Identify KOPs	\$3,000
Site Visits and Reporting	\$2,000
Digital Renditions	\$4,500
Review Potential Conflicts/Propose PM&E	\$3,000
Total	\$12,500

## 11 REFERENCES

Federal Energy Regulatory Commission, 2012. Letter to Chris Spens with request for studies, additional information, and study requests in response to the Notice of Intent to File, Pre-Application Document (PAD) and Scoping Document. July 24, 2012. Federal Energy Regulatory Commission. Washington, D.C.

## 12 APPENDIX A: Key Observation Points

