

**Black Canyon Hydroelectric Project
FERC Project No. P-14110
Erosion Potential Study Plan
November 2012**

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 and would be located entirely on private lands.

The Project design being proposed has been updated in response to stakeholder input. BCH has developed potential alternatives for the intake structure, powerhouse, and transmission route.

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 overbuild 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 erosion potential, 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 address potential impacts related to erosion potential.

More specifically, the objectives of the Erosion Potential Study Plan are to:

- Recommend best management practices for construction activities to prevent soil erosion and sedimentation.

- Recommend Project design features such as drainage and shoreline stabilization to prevent soil erosion and sedimentation.

3 STUDY AREA

The study area of the Erosion Potential Study Plan is the area of physical disturbance related to Project construction and operation. Specifically, the study will evaluate erosion potential at the site of the diversion and fish passage structures, road extensions, new transmission lines, powerhouse, tailrace, and appurtenant facilities.

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 erosion potential in the area of physical 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 environmental measures associated with possible soil erosion 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 erosion potential at the Project, and the need for additional information.

Section 5.1.1 of the Pre-Application Document (PAD) includes a discussion of soil types in the vicinity of the Project as provided by the U.S. Department of Agriculture's Natural Resources Conservation Service (BCH 2012). Additionally, Appendix G of the PAD includes a map, key, and soil summary as provided by the Web Soil Survey Tool provided online by the National Resources Conservation Service.

6 NEXUS TO PROJECT

In accordance with 18 CFR §5.11(d)(4), this section describes any nexus between Project operations and erosion potential.

Construction and operation of the Project would alter a maximum of approximately 12.5-acres of primarily forested land. The clearing of trees and addition of the Project has the potential to increase soil erosion. An erosion potential study will help to identify appropriate best management practices and design to control soil erosion during construction and operation of the Project.

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).

The Erosion Potential Study Plan will comprise the following objectives:

7.1 Objective 1: Describe Actual Site Conditions

- A description of actual site conditions, including bedrock, soils, slopes, vegetation, and drainage.
- The data used for this description will be produced through the completion of other study plans. For example, completion of the “Wildlife, Vegetation, and Sensitive Habitats Study Plan” will provide the information necessary to characterize vegetation at the site of project features.

7.2 Objective 2: Describe Nature and Extent of Land-Disturbing Activities

- Once siting of project features has been finalized, or multiple alternative locations have been identified, the nature and extent of land disturbing activities will be described at those location(s).
- A “clearing limit” showing the extent of forest clearing during construction will be identified.
- An additional “wound zone” will be identified showing an additional 25-foot beyond the clearing limit where there may be impacts to surrounding forest.

7.3 Objective 3: Identify and Review Best Management Practices (BMP's)

- A range of BMP's will be identified from local, State and other authorities in consultation with stakeholders.
 - For example, the King County Surface Water Design Manual includes an appendix providing "Erosion and Sediment (ESC) Standards."

7.4 Objective 4: Synthesize Study Results

- Using the results of other related studies, and after determining final project location, BCH will create an Erosion and Sediment Control Plan to be submitted to the FERC along with the Project's License Application.

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.

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. Resource Study Schedule

Component	Completion Date*
Proposed Study Plan Comments Due	December 6, 2012
File Revised Study Plan	January 7, 2013
Revised Study Plan Comments Due	January 22, 2013

Field Studies	2013
Consult with Agencies regarding BMP's	2013
Initial Study Report Meeting	February 21, 2014
Erosion and Sediment Control Plan	Filed with License Application

*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 \$10,000.

Table 2. Level of Effort and Cost

Task	Labor and Expenses
Describe Site Conditions	\$1,000
Describe Extent of Land Disturbance	\$1,500
Identify BMP's	\$2,500
Draft Erosion and Sediment Control Plan	\$5,000
Total	\$10,000

11 REFERENCES

BCH (Black Canyon Hydro, LLC). 2012. Pre-application document for Black Canyon Hydroelectric Project FERC Project No. 14110. March 27.

King County. 2009. Surface Water Design manual – Appendix D Erosion and Sediment (ESC) Standards. Department of Natural Resources and Parks. January 9.

12 APPENDIX A: Erosion Potential Study Area

