

Condit Hydroelectric Project Decommissioning

FERC Project No. 2342

ANNUAL SEDIMENT ASSESSMENT REPORT - 2014



September 26, 2014

Project Description

The Condit Hydroelectric Project was completed in 1913 on the White Salmon River in Skamania County and Klickitat County, Washington. The Condit Hydroelectric Project has been removed as outlined in the Project Removal Design Report dated March 15, 2011; 12 supporting management plans; the Washington Department of Ecology (Ecology) 401 certification; the US Army Corps of Engineers 404 permit, and the Federal Energy Regulatory Commission (FERC) Surrender Order. Dam removal was completed in September of 2012. Significant revegetation work was completed in March 2013. Supplemental tree planting was performed in March 2014. The establishment of vegetation is being monitored.

A specific Sediment Assessment, Stabilization, and Management Plan, (PacifiCorp Energy, 2011) was developed to address sediment stability and management issues that were expected to occur in the decommissioning process. This plan identified general goals and procedures for 1) performing a post-dewatering assessment, 2) mapping the sediment which remains in the reservoir area, 3) estimating the quantity of sediment remaining in the reservoir area, 4) evaluating the stability of sediment slopes and banks in the reservoir area, 5) determining corrective actions as needed, and 6) evaluating fish passage through the former reservoir.

Regulatory Requirements

A Clean Water Act Section 404 permit was issued for this project (US Army Corps of Engineers, Regulatory Division, May 13, 2011). The 404 permit requires that the applicant (PacifiCorp Energy) implement the Management Plan (Sediment Assessment, Stabilization, and Management Plan, PacifiCorp Energy, 2011) as approved by the FERC.

A Clean Water Act Section 401 certificate was issued for this project (Washington Department of Ecology (Ecology), Water Quality Certification Order No. 8049, of October 12, 2010). The 401 certification also requires that the applicant (PacifiCorp Energy) implement the management plan (Sediment Assessment, Stabilization, and Management Plan, PacifiCorp Energy, 2011).

The FERC April 2011 Surrender Order required PacifiCorp Energy to submit a Sediment Assessment, Stabilization, and Management Plan in accordance with the Ecology 401 certification. The FERC Order Modifying and Approving Sediment Assessment, Stabilization, and Management Plan (FERC, May 12, 2011) incorporated elements of the Sediment Assessment, Stabilization, and Management Plan into their requirements.

PacifiCorp Energy has submitted several reports to FERC and Ecology addressing sediment behavior: a Draft Sediment Behavior Report (December 2011), Post-Reservoir-Dewatering Assessment Report (February 2012), the 2012 Annual Sediment Assessment Report (September 2012), and the 2013 Annual Sediment Assessment Report (September 2013).

Stability of Reservoir Sediment since 2013

Periodic site inspections conducted over the last year have confirmed sediment deposits in the former reservoir area have remained very stable during this reporting period. The factors

contributing to the geotechnical stability of slopes in the former reservoir area can be attributed to the ongoing effectiveness of factors including low slope angles, good herbaceous cover, and the collection of water from the hillsides into natural or graded channels. There have been no observed mass failures of reservoir sediments. Herbaceous cover has continued to develop and has been effective in limiting surface erosion. A rockfall occurred in January 2014 on an existing vertical rock face along the White Salmon River opposite Location 4. Freeze-thaw effects on the rock slope are believed to have caused the rockfall.

During the winter of 2013-14 one flow event during March exceeded the ten-year flood recurrence interval of 3,716 cubic feet per second for March. As expected for a flow of this magnitude, this event scoured away some riverbank sediments at or below the high water line, but no major riverbank retreat was observed. Bank erosion and sloughing were observed along river right in Location 6 between Northwestern Lake Bridge and Buck Creek. Corrective action will be implemented in the fall of 2014 in this area after consultation with Ecology.

The potential for additional riverbank scour during high-flow events will remain, but as the vegetation matures, any scour will be more a function of the natural river system than a result of the decommissioning project. The river channel has remained in essentially the same horizontal alignment since the dam was breached and especially since the grading of the reservoir sediments was completed in August 2012. The attached photographs taken from the same vantage point as in previous years illustrate that the reservoir sediments have remained stable for the past year.

Tributary Stream Channels

Tributary stream channels that flow into the White Salmon River within the former reservoir area are a mix of perennial and ephemeral streams. There are ten tributary streams that drain into the reservoir area, eight of which cross sediment deposits, and four of those are ephemeral. Conditions at the tributary streams are consistent with those reported in 2013 with no significant changes or erosion noted. The 2013 Sediment Assessment report identified the need for repairs to grade control elements in Location 5. The repairs remain to be done, but monitoring during 2014 showed minimal change in conditions in this ephemeral stream. Other than this area to be repaired, none of the tributary stream channels have migrated laterally, nor have the channels undercut adjacent slope areas.

Engineered Log Jams

The seven Engineered Log Jams (ELJ) that were placed to facilitate the development of riparian floodplains adjacent to the river remain intact and stable. An ELJ at Location 4 was directly across the river from, and affected by, the rockfall that occurred in January 2014. Inspection of the site indicated that the rockfall caused a wave that ran up the opposite riverbank at least 20 feet above the ELJ. After the initial wave, the rock debris at the base of the vertical wall

temporarily diverted the thalweg so the force of the river's flow was aimed directly at the ELJ. These conditions eroded some of the sediment that was covering the ELJ on the upland side and possibly caused some scour under the ELJ. With the shift in the thalweg, the ELJ was also evaluated as a hazard to boating and plans were initiated to shorten some logs overhanging the main channel. However, the ten-year event in March 2014 mobilized the talus from the rockfall and the thalweg shifted back to the previous alignment. Modification to the ELJ was subsequently determined not to be necessary and monitoring of conditions will continue.

Recreational Cabin Removal

In February 2012, two cabins built on sites leased from PacifiCorp Energy located on each side of Buck Creek at its confluence with the White Salmon River were identified as safety hazards due to the potential for riverbank erosion to undermine the cabins. Under the terms of the leases, these cabin sites were closed to further recreational use. One cabin was removed in 2012 and the second cabin is anticipated to be removed during fall 2014. The slope below this cabin exceeds the angle of repose and is subject to erosion. The site will be graded to a stable slope in conjunction with demolition.

Annual Qualitative Assessment

Periodic site inspections indicate that the remaining reservoir sediments have exhibited only minor erosion in the past year. There have been no observed areas of major sediment instability. Implementation of the approved grading plan has included grading to stable slope angles and management of surface drainage. In the FERC Order Modifying and Approving (the) Sediment Assessment, Stabilization and Management Plan (FERC, 5/12/2012) the licensee is required to submit a progress report by September 30 of each year. In addition, the 401 certification issued by Ecology states "a stable condition" will generally be attained when:

- a. Remaining slopes and banks are stable and do not present a public safety risk,
- b. The river within the former reservoir area has attained a stable course and channel width, and
- c. The amount of sediment released from the reservoir is no longer significant, as determined from the water quality (turbidity) measurements and from LiDAR sediment mapping and sediment quantity calculations.

Two of these criteria for a stable condition have been met. Inspections of the former reservoir have shown conditions consistent with the 2012 and 2013 LiDAR surveys and confirmed that the river within the former reservoir has attained a stable course and channel width since August of 2012. Based on monitoring results, water quality was considered acceptable by Ecology and monitoring was discontinued in December 2013.

The criterion for stable slopes has been met in most of the reservoir area, but additional grading at the mouth of Buck Creek is needed in conjunction with cabin demolition. Repair of the bank

erosion just downstream of Buck Creek that occurred during the ten-year event in March 2014 is also needed and is anticipated to be done in conjunction with the cabin demolition.

PacifiCorp Energy intends to continue monitoring of the reservoir area coincidental with the monitoring of the revegetation effort to confirm the stability of these specific locations as well as ongoing stability throughout the project area. This monitoring will include inspections following flow events exceeding the 5-year recurrence interval threshold. Per the 401 certification, post flood inspections will "identify unstable slopes, debris jams and fish passage problems."

PacifiCorp Energy will submit a sediment monitoring report to FERC and Ecology by September 30, 2015, summarizing the observed sediment stability conditions during the year.



Location 1 – May 27, 2014



Location 2 – July 11, 2014



Location 3 – May 27, 2014



Location 4 – July 11, 2014



Location 5 Upstream – May 25, 2014



Location 5 Downstream – May 25, 2014



Location 6 Riverbank–May 27, 2014



Cabin at mouth of Buck Creek - to be removed



Rockfall opposite Location 4—January 21, 2014



Rockfall Cliff – May 27, 2014