

135 FERC ¶ 62,136
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

PacifiCorp

Project No. 2342-022

ORDER MODIFYING AND APPROVING SEDIMENT
ASSESSMENT, STABILIZATION AND MANAGEMENT PLAN

(Issued May 12, 2011)

1. On March 16, 2011, as supplemented on May 5, 2011, and May 11, 2011, PacifiCorp (licensee) filed a Sediment Assessment, Stabilization and Management Plan (Plan) pursuant to ordering paragraph (M) of the Order Accepting Surrender of License, Authorizing Removal of Project Facilities, and Dismissing Application for New License (Surrender Order) for the Condit Hydroelectric Project No. 2342.¹ The project is located on the White Salmon River in Klickitat and Skamania counties, Washington.

Background

2. Ordering paragraph (M) of the Commission's Surrender Order, requires the licensee to file, for Commission approval, at least 90 days before starting removal activities, a plan to assess the quantity and condition of remaining reservoir sediments, including those exposed immediately following the initial dewatering of Northwestern Lake, and to stabilize the dewatered reservoir bed and provide fish passage through the former reservoir area. The Commission Order on Rehearing, Denying Stay, and Dismissing Extension of Time Request (Rehearing Order) deleted ordering paragraph (M)(2) and modified ordering paragraphs (M)(3) and (M)(6).² Ordering paragraph (M) was modified to state that the plan shall include, at a minimum:

- (1) an analysis to determine the impact of lowering the reservoir to stream level over a six-hour period on the stability of the banks of Northwestern Lake;
- (2) a plan to conduct aerial mapping using LiDAR and pedestrian surveys to prepare maps showing the location, thickness, and characteristics of

¹ *PacifiCorp*, 133 FERC ¶ 61,232 (2010).

² *PacifiCorp*, 135 FERC ¶ 61,064 (2011).

remaining sediments in the reservoir, including at the reservoir tributary mouths;

- (3) description of the methods of managing residual sediments and restoring the White Salmon River valley in the former reservoir area to a stable, free-flowing condition;
- (4) a provision to assess whether accumulated reservoir sediments affect anadromous fish passage into Northwestern Lake tributaries, including Mill and Buck creeks, and, if so, a description of measures to mitigate these effects;
- (5) a schedule for consultation with the entities identified below concerning the results of mapping and analysis of the remaining sediments;
- (6) a provision for filing with the Commission, within 90 days of the commencement of reservoir dewatering: (a) the results of the analysis, (b) comments of consulted entities, (c) licensee's response to entities' comments, and (d) any measures proposed by the licensee to manage residual sediments and restore the White Salmon River valley in the reservoir area to a stable, free-flowing condition. If these measures include blasting of the remaining exposed reservoir sediments, then the filing shall include a blasting plan that includes a description of the type of blasting to be performed, expected explosive strength, proposed blast locations and timing, and mitigation measures to protect the valley from environmental damage related to blasting;
- (7) a three-year monitoring program, including performance standards and success criteria;
- (8) procedures to be implemented if monitoring demonstrates that sediment stabilization measures are not successful or areas of unstable sediment are identified, including the need for additional monitoring; and
- (9) a reporting and implementation schedule.

3. The licensee shall prepare the plan after consultation with the National Marine Fisheries Service (NMFS) , U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (Forest Service), Washington Department of Fish and Wildlife (WDFW), Washington Department of Ecology (Ecology), Yakama Nation, and U.S. Army Corps of Engineers (Corps). The licensee shall include with the plan documentation of consultation, copies of consulted entities' comments and recommendations on the completed plan, and specific descriptions of how the entities' comments are

accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information. The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

4. If the results of the mapping and analysis indicate that management, removal, or stabilization (vegetative or structural) of the residual sediments would be necessary in order to protect fish and wildlife resources or maintain public safety, the Commission may direct the licensee to implement such measures.

Licensee's Plan

5. On March 16, 2011, and supplemented on May 5, 2011, and May 11, 2011, the licensee filed its Sediment Assessment, Stabilization and Management Plan. The objective of the Plan is to provide guidance to stabilize slopes and banks within the former reservoir bed in preparation for revegetation activities, to enhance protection of the public, and to provide for fish passage through the former reservoir. The Plan states that approximately 2.3-million cubic yards of sediment has collected in Northwestern Lake since the reservoir was formed, based on comparing bathymetric data collected in 2006 with pre-dam topographic information from 1912. Sediment deposit in the reservoir ranges in size from clay to cobbles, although the vast majority of sediment is comprised of small particles that can readily erode and be transported downstream by the White Salmon River. It is estimated that river erosion will remove between 1.6 million to 2.2 million cubic yards of sediment from the reservoir.

Initial Impact of Lowering the Reservoir

6. The removal of the Condit dam will initially involve lowering the lake level and excavating a tunnel through the base of the dam to rapidly drain the reservoir. The Plan states that when the drain tunnel is opened through the dam, the reservoir will rapidly dewater in about six hours. Fine-grained sediments in the lower reservoir will rapidly erode and expose the pre-dam riverbed through the narrow bedrock canyon upstream of the dam. During the initial six hours, fine-grained sediment deposits will produce side slopes that are tall, nearly vertical, and saturated with water. Extensive slope and bank failures are anticipated to occur in the lower reservoir as turbulence erodes the sediment in the bedrock gorge. Additionally, landslides in the lake sediment will likely be very common when the reservoir is drained, but a blockage of the reservoir is not likely.

Sediment Mapping

7. The Plan outlines a proposal to perform sediment mapping after the reservoir has been drained in order to estimate the amount of sediment remaining in the reservoir and to develop information on slopes that may require stabilization. The Plan proposes that 75 days after the breach, ground survey control will be set and a Light Detection and Ranging (LiDAR) survey will be conducted of the reservoir bed extending from the Condit dam to approximately 1,400-feet upstream of Northwestern Lake Road in order to map the topography of the lake bed. The data obtained from the LiDAR survey will be referenced against the 2006 bathymetric data as well as the original 1912 topography to estimate the quantity of sediment that has been removed, determine whether observed slopes represent pre-project conditions, and determine whether observed sediment is overlaying stable natural slopes. The width of the river channel and various river segments will also be compared to the 1912 topography.

Monitoring

8. Monitoring the reservoir after the reservoir has been drained will include the following: routine field inspections to identify unstable embankments and provide active management recommendations to ensure public safety and achieve stable conditions within the former reservoir reach; and a study that will compare sediment transport and geomorphic response observed following reservoir draining to the assumptions and modeling described in the 2004 Sediment Behavior Analysis Report. Routine field inspections will be conducted of the reservoir area and the downstream portion of White Salmon River to identify unstable slopes, debris jams, fish passage problems, and develop strategies to address observed conditions. The inspections will also note the progress of sediment erosion. Video monitoring and photographs will be used following the breach to document and characterize immediate geomorphic response of the reservoir bed to the breaching of the dam. In addition, aerial photography of the reservoir bed and downstream reaches of the river will be taken one and two years post breach and will be used to document the progress of sediment stabilization efforts and revegetation measures.

9. A series of LiDAR surveys will document and characterize geomorphic response of the White Salmon River and accumulated reservoir sediments over two to three years. The first LiDAR survey will be conducted 75 days post breach. The second survey will be conducted at the end of the first rainy season following dam breaching. The topography will be reviewed and compared to the previous survey, and evaluated. A third LiDAR survey will be conducted at the end of the second rainy season after the breaching of the dam. The results of the surveys will be provided to the Commission and Ecology in annual progress and monitoring reports.

Proposed Reporting

10. The licensee will prepare a preliminary post-reservoir-dewatering assessment progress report as required by Ecology, and will submit this document to Ecology within 60 days after the breach, and will file it with the Commission 90 days post breach. The report will be based on the weekly field inspections of the reservoir sediment evolution post breach. The licensee will file a post-reservoir-dewatering assessment progress report 120 days post breach to Ecology and the Commission. The report will document progress achieved toward stabilizing the reservoir bed and removing sediment that may impede fish passage and will present a plan for additional measures that may be necessary to stabilize remaining sediments in the reservoir.

Performance Standards and Grading

11. A grading plan for the reservoir area will be submitted for review concurrently with the post-reservoir-dewatering assessment progress report. The grading plan will utilize the LiDAR topography to show the remaining sediments within the reservoir area and how the topography will be altered to achieve a long-term stable landform. The grading plan will also include proposed slopes and contouring to facilitate revegetation of upland areas, stabilization of side drainages, and identification of locations of possible new wetlands.

Sediment Management

12. Natural sediment erosion will perform the majority of the sediment removal and restore the reservoir area to natural, stable contours that existed prior to the construction of the dam. Natural sediment erosion will mobilize a large portion of the sediment in a short amount of time following reservoir dewatering. However, some slopes may not achieve a stable condition and may need to be actively managed. Sediment will be actively managed where necessary to assure public safety and to develop stable conditions as quickly as possible allowing for fish passage, and revegetation of the reservoir.

13. Active sediment management measures will be implemented to actively collapse unstable reservoir sediments into the White Salmon River to achieve safe and stable slopes and river banks, as well as promote long-term sediment stabilization. Slopes that are steeper than 30 degrees will be assessed to determine whether they are stable or whether additional stabilization measures are necessary. Where riverbanks are determined to be unstable or pose a public safety risk, they will be collapsed to achieve a stable angle of repose at an expected slope of 30 degrees. When accessible, heavy equipment may be used to remove sediment or collapse riverbanks. Hydraulic excavation may be performed to erode sediments into the river and collapse unstable slopes when access is limited, particularly in the first 75 days post breach. In addition, blasting may be used to collapse unstable slopes or to remove or dislodge debris from the reservoir.

14. The Plan states that passive stabilization measures may also be used including natural revegetation, vegetative treatments, seeding, and planting in order to resist surface erosion resulting from heavy rains, and to promote long-term stability of slopes and riverbanks.

Sediment and Fish Passage

15. The Plan states that as part of routine field inspections an assessment of whether accumulated reservoir sediments affect anadromous fish passage into Northwestern Lake tributaries, including Mill and Buck creeks, will be performed. Strategies to correct fish passage problems should they arise are outlined in the Aquatics Resources Plan and will be coordinated with the sediment removal activities presented in the Sediment Assessment, Stabilization and Management Plan.

Pre-Filing Consultation

16. A draft copy of the Sediment Assessment, Stabilization and Management Plan was provided to NMFS, USFWS, Forest Service, the Corps, WDFW, and Yakama Nation, and Ecology on February 18, 2011. The Yakama Nation, USFWS, WDFW, Forest Service, NMFS, and Ecology stated the agencies did not have comments on the draft plan in emails dated February 23, 2011, March 4, 2011, March 7, 2011, March 9, 2011, March 10, 2011, and March 11, 2011, respectively. No other comments were received.

Review

17. We reviewed the licensee's Sediment Assessment, Stabilization and Management Plan filed on March 16, 2011, as supplemented on May 5, 2011, and May 11, 2011, and it satisfies the requirements of ordering paragraph (M) of the Rehearing Order. The Plan adequately provides an assessment of the quantity and condition of the remaining reservoir sediments and includes appropriate reporting and implementation schedules. The Plan provides an analysis of the impact of lowering the reservoir to stream level on the stability of the banks of Northwestern Lake for the six hours immediately following dam breach. In addition, the Plan contains procedures for mapping and monitoring the remaining sediments, including the use of LiDAR surveys, routine field inspections, and a study to compare sediment transport and geomorphic response observed following reservoir draining. An assessment of whether accumulated reservoir sediments affect anadromous fish passage into Northwestern Lake tributaries is included in the Plan. The Plan also outlines sediment management techniques should it become necessary for public safety or fish passage, and to restore the White Salmon River to a stable, free-flowing condition. The Sediment Assessment, Stabilization and Management Plan should therefore be approved.

18. Ordering paragraph (B) requires the licensee to file annual LiDAR surveys and progress reports by September 30 of each year, as required by ordering paragraph (Q)(b) of the Rehearing Order, and section 4.3.3(7) of the WQC. Ordering paragraph (B) reserves the Commission's right to determine when sufficient LiDAR surveys and progress reports have been undertaken for Commission purposes and when it no longer needs to oversee LiDAR surveys or receive monitoring reports.

19. Although ordering paragraph (M)(6) requires the licensee to file a report on the analysis with the Commission within 90 days from the commencement of reservoir dewatering, the licensee proposes in the Plan to file an interim report with the Commission 90 days post dewatering and a final report 120 days post breach. As stated in the Plan, Ecology requires a 60 day progress report and a 120 final report; therefore the licensee proposes to file similar reports with the Commission. In addition, the first LiDAR survey will not occur until 75 days post breach, and therefore the licensee will not have sufficient time to analyze the LiDAR data. In order to provide the Commission with a more fruitful discussion of the remaining sediment, the licensee proposes in its plan to file a final report 120 days post breach, and an interim assessment based on the weekly field inspections of the reservoir sediment 90 days post breach. We concur that a 90 day interim report and a 120 day post breach final report is reasonable; therefore, ordering paragraph (C) requires the licensee to file the 60 day interim report submitted to Ecology, along with any comments Ecology has on the interim report within these timeframes. Ordering paragraph (D) grants the licensee an extension of time to within 120 days of the commencement of reservoir dewatering for the filing of the materials required by ordering paragraph (M)(6) of the Rehearing Order.

The Director orders:

(A) PacifiCorp's Sediment Assessment, Stabilization and Management Plan filed on March 16, 2011, as supplemented on May 5, 2011, and May 11, 2011, pursuant to ordering paragraph (M) of the Commission's Order on Rehearing, Denying Stay, and Dismissing Extension of Time for the Condit Hydroelectric Project, as modified by ordering paragraphs (B) through (D) below, is approved.

(B) The licensee shall submit annual LiDAR survey and progress reports by September 30 of each year, as required by ordering paragraph (Q)(b) of the Commission's Order on Rehearing, Denying Stay, and Dismissing Extension of Time Request for the Condit Hydroelectric Project, and section 4.3.3(7) of the water quality certification issued by the Washington Department of Ecology. The licensee shall submit to the Commission documentation of any consultation, and copies of any comments and recommendations made by any consulted entity in connection with each report. The Commission reserves the right to require changes to project removal measures based on the information contained in the report and any other available information. The Commission also reserves the right to determine when sufficient LiDAR surveys and

progress reports have been undertaken for Commission purposes and when it no longer needs to oversee LiDAR surveys or receive monitoring reports.

(C) The licensee shall file a Draft Sediment Behavior Report 90 days post breach. The report will be based on the weekly field inspections of the reservoir sediment evolution post breach. The licensee shall allow Washington Department of Ecology 30 days to comment on the report prior to filing with the Commission. The filing shall include with the report, documentation of consultation with Washington Department of Ecology, copies of Washington Department of Ecology's comments and recommendations, and specific descriptions of how Washington Department of Ecology's comments are included in the report.

(D) The licensee shall file, within 120 days of the commencement of reservoir dewatering, the results of the analysis of the effects of post-reservoir-dewatering on reservoir sediments.

(E) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the FPA, 16 U.S.C. § 8251 (2006), and the Commission's regulations at 18 C.F.R. § 385.713 (2010). The filing of a request for rehearing does not operate as a stay of the effective date of this order, or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

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and Compliance