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UNITED STATES DISTRICT COURT
DISTRICT OF OREGON
PORTLAND DIVISION

DESCHUTES RIVER ALLIANCE, an
Oregon nonprofit corporation,

Plaintiff,

v.

PORTLAND GENERAL ELECTRIC
COMPANY, an Oregon corporation,

Defendant.

Case No.: 16-cv-01644-SI

DECLARATION OF LORI CAMPBELL

1. My name is Lori Campbell. I am competent to testify to the matters stated herein, which are true and correct to the best of my knowledge, information, and belief. Except as otherwise indicated, this declaration is based on my personal knowledge.

2. I have a Bachelor of Science in Biology and Master of Science in Biology with an emphasis in freshwater studies from Eastern Washington University. My graduate work involved a water quality study related to managing nuisance aquatic macrophytes in a freshwater lake. Since November 2005, I have been employed by the Portland General Electric Company (PGE) at the Pelton Round Butte Hydroelectric Project (Project) as a water quality specialist. My duties as a water quality specialist include implementing the water quality monitoring and reporting outlined in the Clean Water Act section 401 certifications for the Project from the Oregon Department of Environmental Quality (DEQ) and the Water Control Board (WCB) of the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO), including the Water Quality Monitoring and Management Plan (WQMMP) referenced in the certifications. I am involved in making recommendations to adjust operations of the Selective Water Withdrawal Facility (SWW) as it relates to blending surface and deep water withdrawal for temperature management, and also in making recommendations to initiate or adjust spilling at the Reregulating Dam as it relates to dissolved oxygen management. My duties include coordination with DEQ and the WCB as operational adjustments are made to affect temperature and dissolved oxygen in the Deschutes River immediately downstream of the Project. I report monitoring results to DEQ and the WCB on a yearly (annual water quality reports), monthly (monthly water quality reports), and more frequent basis (daily, weekly) as needed during the temperature and dissolved oxygen management season.

3. The Project includes three dams on the Deschutes River. From upstream to downstream they are Round Butte Dam, which impounds the relatively large Lake Billy Chinook; Pelton Dam, which impounds the narrow Lake Simtustus; and the Reregulating Dam, which impounds a small reservoir and discharges directly to the Deschutes River at the

downstream end of the Project. Upstream of the Project, three rivers flow into Lake Billy Chinook: the Deschutes River, the Crooked River, and the Metolius River.

4. The Project's Federal Energy Regulatory Commission (FERC) license, as well as the DEQ and WCB certifications, require the construction and operation of the SWW at Round Butte Dam. The SWW is a tower in Lake Billy Chinook that includes two water intakes for the powerhouse at the base of the dam. As stated in the Declarations of Lee Cramer and Megan Hill, the intake at the top of the SWW withdraws water from the surface of Lake Billy Chinook through screens that channel downstream-migrating fish into a collection facility, where they can be sorted and either trucked downstream to the Deschutes River below the Project or returned to the reservoir. The surface water then flows down a vertical conduit to the SWW's low-level intake, approximately 240 feet below the surface of the reservoir. Here the surface water can combine with water withdrawn from the lower levels of the reservoir through fish screens and the SWW's "bottom control gates."

5. As stated in the Declaration of Lee Cramer, the position of the bottom gates can be adjusted to change the blend of low-level and surface water discharged downstream through the powerhouse at the base of the dam. The blend is controlled only by the bottom gates. There are no gates at the top of the SWW to shut off surface flow through the SWW. When the SWW's bottom gates are closed, the SWW draws water solely from the surface of the reservoir. When the bottom gates are fully open, water continues to flow through the top of the SWW. The maximum proportion of low-level flow that can be discharged through the SWW is approximately 60 percent. Flow from the surface of the reservoir through the SWW ceases only when the power generation units at the dam are not operating and no water is withdrawn from the reservoir through the powerhouse. The relationships between the bottom gate opening sizes

and the proportions of low-level and surface water withdrawn through the SWW have been established through flow evaluations conducted during the initial start-up of the SWW. These relationships have been included in the SWW's computerized control system. When a change in the proportion of surface and low-level water discharged through the SWW is needed, the Project operator inputs the desired proportion into the control system, which determines how far to open or close the bottom control gates and then adjusts the gate openings accordingly.

6. As stated in the Declarations of Megan Hill and Don Ratliff, the reservoir surface flows withdrawn through the SWW are essential for attracting downstream migrants into the fish collection facilities at the top of the SWW. The only reason for the SWW to withdraw water from the lower levels of the reservoir is to reduce the Project's effects on water quality—especially temperature—in the river downstream of the Project.

7. The SWW allows the Project to discharge a variable blend of surface and lower-level water from Lake Billy Chinook. By adjusting this blend throughout the year, the Project can better achieve downstream river conditions that reflect those that the river would have without the Project and thereby reduce the Project's contributions to deviations from water quality standards.

8. There are water quality and fish passage tradeoffs, however, associated with the operation of the SWW. Operating the SWW to achieve a single water quality objective may impair the Project's ability to achieve other water quality criteria and fish passage objectives.

9. For example, during portions of the year, the lower levels of Lake Billy Chinook are much colder than the surface. If the percentage of cold, lower-level water withdrawn through the SWW is increased to lower the temperature of the river downstream, this will have at least three negative effects. First, as stated in the Declaration of Megan Hill, the corresponding

reduction in surface withdrawals will reduce the surface flows in the reservoir forebay that are needed to attract downstream-migrating fish into the fish collection facilities at the SWW. There is a strong, positive relationship between SWW surface flows and the number of downstream migrating fish that can be captured and transported downstream below the Project. Second, because the lower levels of the reservoir tend to have lower concentrations of dissolved oxygen than the surface in mid- to late-summer, an increase in the proportion of water withdrawn from the lower levels will reduce dissolved oxygen concentrations in the river downstream. Third, discharging more of the reservoir's limited supply of low-level cold water early in the year will more quickly exhaust this supply, resulting in higher downstream river temperatures later in the year.

10. On the other hand, if the percentage of low-oxygen water withdrawn from the lower levels of Lake Billy Chinook is reduced to increase dissolved oxygen in the river downstream, river temperatures will increase. Similarly, if the percentage of water withdrawn from the surface water of Lake Billy Chinook is increased in order to increase the capture of downstream migrating fish, that will decrease the percentage of cold water that is discharged from the lower levels of the reservoir, thereby increasing river temperatures. In addition, because the surface of the reservoir tends to have higher maximum pH values than the lower levels of the reservoir, increases in the proportion of surface water withdrawn can increase pH values in the river downstream.

11. Because of these tradeoffs, it is sometimes impossible for the Project to achieve all water quality and fish passage objectives simultaneously. But it was also impossible for the Project to achieve all water quality objectives simultaneously before the construction of the

SWW, when the Project could discharge only from the lower levels of Lake Billy Chinook, and when it also blocked all fish passage.

12. To balance these conflicting water quality and fish passage objectives, and as directed by DEQ and the WCB pursuant to their section 401 certifications for the Project, the SWW is operated in accordance with “Blend 17” unless a deviation from that blend is needed to reduce water temperatures in the river downstream of the Project. Blend 17 calls for the withdrawal of exclusively surface water through the SWW from November 1 through June 30. This promotes fish passage, particularly during the critical spring downstream migration of salmon and steelhead smolts, as well as the collection and storage of cold water in the reservoir for use later in the year when the cold water will be needed to reduce river temperatures downstream. Beginning on July 1 and continuing through October, Blend 17 calls for a gradual increase in the proportion of lower-level reservoir water withdrawn by the SWW until the proportion reaches 50 percent on October 1. The increases are intended to meet the increasing need for temperature reductions in the river during the summer and early autumn, while still providing the reservoir surface flows needed to maintain downstream fish passage through the Project outside the critical spring smolt migration season. Specifically, Blend 17 calls for the proportion of lower-level water withdrawn through the SWW to increase to 15 percent on July 1, 30 percent on August 1, 40 percent on September 1, and 50 percent on October 1, before returning to exclusively surface withdrawal on November 1.

13. The DEQ and WCB certifications for the Project incorporate the WQMMP, which includes a Temperature Management Plan (TMP). As provided in the DEQ certification, the TMP “identif[ies] those measures that the Joint Applicants [PGE and the CTWSRO] will undertake to reduce the Project’s contribution to exceedances of water quality standard criteria

for temperature.” The TMP requires temperature monitoring at numerous locations in the vicinity of the Project, including hourly monitoring in the Deschutes River just below the Reregulating Dam and in the three tributaries to Lake Billy Chinook. The tributary temperature monitoring provides inputs into a mathematical model that predicts the temperature that the river would have just below the Reregulating Dam if the Project were not in place (the “without Project temperature” (WPT)—sometimes also referred to as the “natural thermal potential” (NTP)), expressed as a moving 7-day average of daily maximum temperatures (7-DMax). The 7-DMax of river temperatures at the Reregulating Dam minus the WPT is the estimated effect of the Project on the river temperature at the Reregulating Dam.

14. The TMP provides that, when the 7-DMax temperature of the combined inflows to the Project reaches 8 °C, the Project will, if necessary, increase the proportion of lower-level reservoir water discharged through the SWW to maintain river temperatures at the Reregulating Dam no greater than 0.25 °F (0.14 °C) above the calculated WPT. These increases, however, are subject to the WQMMP’s adaptive management principles, which include that “changes in the operation of the selective withdrawal facility must consider all possible impacts, not merely a single water quality parameter,” including “fish passage success.” The Project’s adaptive management decisions regarding the timing and amount of the increase in low-level withdrawal through the SWW beyond that called for by Blend 17 are based on temperature needs and take into consideration the potential for adverse effects on fish passage and other water quality objectives, including the need to preserve cold, low-level reservoir water to meet temperature needs later in the year.

15. In response to water quality and fish passage data generated after the SWW began operation in December 2009, DEQ and the WCB have since 2011 directed PGE to operate the

SWW using temperature objectives that differ from those contained in the TMP, which they approved in 2004. DEQ's revised objectives, which are similar, but not identical to, those of the WCB, are described in the following paragraphs.

16. Exhibit A, attached to this declaration, is the "2011 SWW Interim Operating Procedure." This procedure directed PGE to follow Blend 17 during 2011. However, if the river temperature at the Reregulating Dam exceeded the WPT by 1 °C plus 0.25 °F (0.14 °C), PGE, after consultation with DEQ and the WCB, could increase the percentage of low-level reservoir water withdrawn through the SWW to reduce the river temperature at the Regulating Dam.

17. Exhibit B, attached to this declaration, is the 2012 "Interim Agreement" with DEQ concerning the operation of the Project. The Interim Agreement directed PGE, when inflow temperatures to Lake Billy Chinook exceeded 8 °C, to increase the percentage of low-level reservoir water withdrawn through the SWW so that the river temperature at the Reregulating Dam did not exceed the WPT by more than 0.25 °F (0.14 °C), except that the temperature could exceed the WPT by up to 0.5 °C (0.9 °F) for three days.

18. Exhibit C, attached to this declaration, is the 2013 "Interim Agreement" with DEQ concerning the operation of the Project. The Interim Agreement directed PGE, when the temperature at the Reregulating Dam exceeded 12.0 °C, to increase the percentage of low-level reservoir water withdrawn through the SWW so that the river temperature at the Reregulating Dam did not exceed the WPT by more than 0.3 °C (0.54 °F), except that the temperature could exceed the WPT by up to 0.5 °C (0.9 °F) for three days.

19. Exhibit D, attached to this declaration, is the 2014 "Interim Agreement" with DEQ concerning the operation of the Project. The Interim Agreement directed PGE, when the

temperature at the Reregulating Dam exceeded 12.0 °C, to increase the percentage of low-level reservoir water withdrawn through the SWW so that the river temperature at the Reregulating Dam did not exceed the WPT by more than 0.3 °C (0.54 °F), except that the temperature could exceed the WPT by up to 0.5 °C (0.9 °F) for three days.

20. Exhibit E, attached to this declaration, is the 2015 “Interim Agreement” with DEQ concerning the operation of the Project. The Interim Agreement directed PGE, when the temperature at the Reregulating Dam exceeded 13.0 °C, to increase the percentage of low-level reservoir water withdrawn through the SWW so that the river temperature at the Reregulating Dam did not exceed the WPT by more than 0.3 °C (0.54 °F), except that the temperature could exceed the WPT by up to 0.5 °C (0.9 °F) for three days.

21. Exhibit F, attached to this declaration, is the 2016 “Interim Agreement” with DEQ concerning the operation of the Project. The Interim Agreement directed PGE, when the temperature at the Reregulating Dam exceeded 13.0 °C, to increase the percentage of low-level reservoir water withdrawn through the SWW so that the river temperature at the Reregulating Dam did not exceed the WPT by more than 0.3 °C (0.54 °F), except that the temperature could exceed the WPT by up to 0.5 °C (0.9 °F) for three days.

22. Exhibit G, attached to this declaration, is the 2017-18 “Interim Agreement” with DEQ concerning the operation of the Project. The Interim Agreement directed PGE, when the temperature at the Reregulating Dam exceeded 13.0 °C, to increase the percentage of low-level reservoir water withdrawn through the SWW so that the river temperature at the Reregulating Dam did not exceed the WPT by more than 0.3 °C (0.54 °F), except that the temperature could exceed the WPT by up to 0.5 °C (0.9 °F) for three days.

23. Exhibit H, attached to this declaration, is a table of temperature data for each of the days during 2011 through 2017 that Plaintiff Deschutes River Alliance (DRA) alleges that the Project violated the temperature provisions of the DEQ section 401 certification. The table columns, reading from left to right, include: the date; the maximum river temperature recorded for that date at the Reregulating Dam; the 7-DMax river temperature for that date at the Reregulating Dam; the WPT for that date; the river temperature increase attributable to the Project on that date (the Reregulating Dam 7-DMax temperature minus the WPT); the applicable temperature objective for the river on that date; the applicable temperature allowance for the Project on that date; the Blend 17 low-level withdrawal percentage for that date; the actual low-level withdrawal percentage for that date; and an evaluation of the data for that date.

24. For the days listed in Exhibit H, and with limited exceptions, one of the following is true: the river temperature at the Reregulating Dam met the applicable temperature objective; the river temperature at the Reregulating Dam was within the applicable Project temperature allowance; the SWW was discharging an increased percentage of low-level reservoir water than called for by Blend 17; or the SWW was discharging the maximum percentage of low-level reservoir water possible. The only exceptions are 10 days in 2011, 36 days in 2012, and 1 day in 2014. On each of these days, the SWW was discharging at Blend 17 but the river temperature at the Reregulating Dam exceeded the applicable Project allowance. On all of these days, however, the 7-DMax river temperature was less than 13.0 °C, and so the applicable temperature objective under the Interim Agreements that have been in place since 2015 would have been met.

25. In accordance with the TMP, PGE reports temperature data to DEQ and the WCB at least monthly. In addition, PGE reports to DEQ and the WCB within 24 hours any decision to increase the percentage of low-level reservoir water withdrawn through the SWW in order to

reduce river temperatures. To my knowledge, neither DEQ nor the WCB has requested a further increase in the percentage of low-level reservoir water withdrawn through the SWW during the period addressed in Exhibit H.

26. The WQMMP includes a Dissolved Oxygen Management Plan (DOMP). As provided in the DEQ certification, the DOMP “identif[ies] those measures that the Joint Applicants [PGE and the CTWSRO] will undertake to reduce the Project’s contribution to violations of water quality standard criteria for dissolved oxygen.”

27. For much of the year, and particularly during the warmer part of the year when high temperatures and low dissolved oxygen are a concern in the river downstream of the Project, the water in the lower levels of Lake Billy Chinook is cold but low in dissolved oxygen, whereas the surface of the reservoir is warmer but higher in dissolved oxygen. Discharges of cold, low-level water through the SWW to reduce river temperatures—the very operation of the SWW that Plaintiff DRA seeks—will reduce dissolved oxygen concentrations in the river, making it more difficult for the Project to achieve the applicable dissolved oxygen criteria.

28. The DOMP anticipates that the SWW adaptive management blends used to meet the temperature objectives in the river will also achieve the dissolved oxygen objectives at the Reregulating Dam. If, however, adaptive management of the SWW for temperature does not achieve the dissolved oxygen objectives, PGE’s understanding is that the DOMP does not provide for further adjustments of the SWW blend. Any adjustment of the SWW blend to increase dissolved oxygen downstream would require reducing low-level withdrawals, which would conflict with achieving the temperature objective in the river. Instead, the DOMP requires the Project to monitor dissolved oxygen at the Reregulating Dam and initiate controlled spills at

the dam to increase dissolved oxygen if the concentrations fall below the applicable dissolved oxygen objective.

29. As described in the DOMP, the dissolved oxygen objective at the Reregulating Dam was 11.0 milligrams per liter (mg/L) year-round. Based on the adaptive management principles and water quality and fish passage data generated after the SWW began operation in December 2009, DEQ and the WCB have since 2012 directed PGE to operate the SWW using dissolved oxygen objectives that differ from those contained in the DOMP that they approved in 2004. DEQ's revised objectives, which are similar, but not identical to, those of the WCB, are described in the following paragraphs.

30. The 2012 Interim Agreement with DEQ (Exhibit B) directed PGE to apply an 11.0 mg/L dissolved oxygen objective from October 15 through June 15 (or, in the alternative, a minimum of 95% saturation) and 8.0 mg/L during the remainder of the year (or, in the alternative, a minimum of 90% saturation).

31. The 2013 Interim Agreement with DEQ (Exhibit C) directed PGE to apply a 9.0 mg/L dissolved oxygen objective year-round (or, in the alternative, a minimum of 95% saturation). On August 28, 2013, however, DEQ orally directed PGE to apply until October 14 objectives of 8.0 mg/L (as a 30-day moving average of daily mean concentrations), 6.5 mg/L as a 7-day moving average of daily minimum concentrations, and 6.0 mg/L as an absolute minimum. This oral directive was followed on September 18, 2013 by the confirming written directive attached as Exhibit I to this declaration.

32. The 2014 Interim Agreement with DEQ (Exhibit D) directed PGE to apply a 9.0 mg/L dissolved oxygen objective from October 15 through June 15 (or, in the alternative, a minimum of 95% saturation) and, during the remainder of the year, objectives of 8.0 mg/L (as a

30-day moving average of daily mean concentrations), 6.5 mg/L as a 7-day moving average of daily minimum concentrations, and 6.0 mg/L as an absolute minimum.

33. The 2015 Interim Agreement with DEQ (Exhibit E) directed PGE to apply a 9.0 mg/L dissolved oxygen objective from October 15 through June 15 (or, in the alternative, a minimum of 95% saturation) and, during the remainder of the year, objectives of 8.0 mg/L (as a 30-day moving average of daily mean concentrations), 6.5 mg/L as a 7-day moving average of daily minimum concentrations, and 6.0 mg/L as an absolute minimum.

34. The 2016 Interim Agreement with DEQ (Exhibit F) directed PGE to apply a 9.0 mg/L dissolved oxygen objective from October 15 through June 15 (or, in the alternative, a minimum of 95% saturation) and, during the remainder of the year, objectives of 8.0 mg/L (as a 30-day moving average of daily mean concentrations), 6.5 mg/L as a 7-day moving average of daily minimum concentrations, and 6.0 mg/L as an absolute minimum.

35. The 2017-18 Interim Agreement with DEQ (Exhibit G) directs PGE to apply a 9.0 mg/L dissolved oxygen objective from October 15 through June 15 (or, in the alternative, a minimum of 95% saturation) and, during the remainder of the year, objectives of 8.0 mg/L (as a 30-day moving average of daily mean concentrations), 6.5 mg/L as a 7-day moving average of daily minimum concentrations, and 6.0 mg/L as an absolute minimum.

36. Exhibit J, attached to this declaration, is a table of dissolved oxygen data for each of the days during 2012 through 2017 that DRA alleges that the Project violated the dissolved oxygen provisions of the DEQ section 401 certification. The table columns, reading from left to right, include: the date; the minimum river dissolved oxygen concentration recorded for that date at the Reregulating Dam; the 7-day moving average of daily river minimum concentrations recorded for that date at the Reregulating Dam; the 30-day moving average of daily river mean

concentrations recorded for that date at the Reregulating Dam; the applicable dissolved oxygen objective for the river on that date; the river dissolved oxygen saturation percentage for that date; the applicable alternative saturation criterion for that date; whether spill was occurring at the Reregulating Dam on that date, either as full spill or more limited spill; and an evaluation of the data for that date.

37. For the days listed in Exhibit J, and with limited exceptions, the dissolved oxygen concentration either met the applicable objective or the Project was spilling at the Reregulating Dam. For several days in 2012 and 2013, the applicable dissolved oxygen criterion was not met, and there was no spill at the Reregulating Dam. However, the dissolved oxygen concentrations on most of those days would have met the dissolved oxygen objectives under the Interim Agreements that have been in effect since 2014. For eight days in late October and November of 2017, the applicable dissolved oxygen criterion was not met, and there was no spill at the Reregulating Dam due to an oversight.

38. Dissolved oxygen data are reported to DEQ and the WCB at least monthly, and decisions to initiate spill are reported to DEQ and the WCB within 24 hours.

39. The WQMMP includes a pH (hydrogen ion) Management Plan (PHMP). As provided in the DEQ certification, the PHMP “identif[ies] those measures . . . that the Joint Applicants [PGE and the CTWSRO] will undertake to reduce the Project’s contribution to exceedances of the water quality criterion for pH.”

40. The PHMP acknowledges that photosynthetic activity in the surface water of Lake Billy Chinook may increase pH. Surface withdrawals from the SWW, then, may increase pH in the river downstream. Increasing low-level withdrawals from the SWW, however, could have a negative effect on both fish passage and dissolved oxygen in the river downstream. The

PHMP recognizes that any Project measures to reduce pH should not be undertaken without considering the potential effects on fish passage and other water quality criteria.

41. The PHMP anticipates that the SWW blends used to meet the temperature objectives in the river will also achieve the pH objective of 6.5 to 8.5 at the Reregulating Dam (when the weighted average of the pH in the three tributaries to Lake Billy Chinook is lower, and thus the Project is assumed to be contributing to the pH increase at the Reregulating Dam). If, however, the pH objective is not met in the river at the Reregulating Dam, the PHMP does not identify any management measures in response. Instead, the PHMP directs PGE to notify DEQ and the WCB of any pH criterion excursion in the river at the Reregulating Dam and, “[u]nder the guidance of” those agencies, “develop an approach to reduce pH that is consistent with maintaining compliant temperature and DO [dissolved oxygen] values and surface withdrawal volumes necessary to facilitate smolt movement in Lake Billy Chinook.” In particular, any modification of the SWW blend to address pH may be made only “if such modification can be undertaken consistent with temperature, DO, and fish passage considerations.”

42. Exhibit K, attached to this declaration, is a table of pH data for each of the days during 2012 through 2017 that DRA alleges that the Project violated the pH provisions of the DEQ section 401 certification. The table columns, reading from left to right, include: the date; the maximum pH measured in the river at the Reregulating Dam on that date; the tributary flow-weighted pH for that date; the difference between the Reregulating Dam pH and the tributary flow-weighted pH for that date; the applicable pH criterion; the Blend 17 low-level withdrawal percentage for that date; the actual low-level withdrawal percentage for that date; and an evaluation of the data for that date. Note that, because the tributary flow-weighted pH is based

on weekly pH measurements, the value stated for a given day is the value for that day or for the most recently calculated value prior to that day.

43. For most of the days listed in Exhibit K, the pH criterion was met, the Project did not contribute to the excursion from the criterion, or the low-level withdrawal from the SWW was higher than called for by Blend 17 or at its maximum. Moreover, for those days on which the Project is assumed to have contributed to a pH excursion and the low-level withdrawal from the SWW was not higher than called for by Blend 17, both the pH excursions and the Project's contribution to them was limited. The highest pH value measured at the Reregulating Dam throughout 2012-17 was 9.2, and there were very few values in excess of 9.0. The average of all excursions did not exceed 8.7 in any year, and the Project's average contribution to these exceedances was generally less than 0.5 in each year. PGE reports the pH monitoring data and excursions to DEQ and the WCB as required by the PHMP, but to my knowledge, neither DEQ nor the WCB has directed or requested the Project to take any additional measures to address these limited exceedances and the limited Project contributions to them.

I declare under penalty of perjury that the foregoing is true and correct.

DATED this 26th day of April, 2018, in Madras, Oregon.



Lori Campbell