OREGON WATER RESOURCES DEPARTMENT

Revised Proposed Final Order on the Potential for Cumulative Impacts Dorena Lake Dam Hydroelectric Project HE 559

This is a Proposed Final Order on the Potential that the Proposed Dorena Hydroelectric Project may contribute to Cumulative Impacts with other Existing, Proposed or Approved Hydroelectric Projects in the Willamette River Basin. A consolidated review with other existing, approved, or proposed projects is NOT required.

Any person may file a protest to this proposed order and request a contested case hearing within 30 days of issuance of the proposed order. A protest must be filed in writing and received at the Oregon Water Resources Department no later than 5 p.m. on **October 30, 2008**. A protest must be accompanied by a fee of $350.

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BEFORE THE OREGON WATER RESOURCES DEPARTMENT

Cumulative Impacts Review	**)**	
For Hydroelectric Application HE 559	**)**	**Revised**
At Dorena Lake Dam	**)**	**Proposed Final Order**
Symbiotics LLC, Applicant	**)**	**on Cumulative Impacts**

This matter comes before the Director on application of Symbiotics, LLC (Applicant) for a hydroelectric project. The issue before the Director is whether the proposed project may contribute to cumulative impacts with other existing, approved or proposed hydroelectric projects in the same river basin. ORS 543.255. It is presumed that if there are other existing, approved or proposed projects, in the same river basin, there is a potential for cumulative impacts. OAR 690-051-0290(1). This presumption may be rebutted by showing the impacts of the proposed project are so small in extent, short-termed or localized that there is no reasonable likelihood of cumulative impacts. *Id.*

The Department has consulted with other agencies listed in OAR 690-051-0060 on the potential for cumulative impacts for the proposed project. Natural resources on which the potential for cumulative impacts are considered are listed in OAR 690-051-0190 through 690-051-0250. *Id.* This Proposed Order presents findings of facts and conclusions of law to find that the impacts of the Project are so small in extent, short-termed or localized that there is no reasonable likelihood of cumulative impacts.

I. APPLICATION HISTORY

A. Preliminary Permit Application

On July 26, 2004, Symbiotics, LLC (Applicant) submitted an application for a preliminary permit for a major hydroelectric project to divert 1800 cubic feet per second (cfs) of water from Dorena Reservoir, tributary to the Row River, tributary to the Coast Fork Willamette River, in the Willamette basin. The Project would use 85 feet of hydraulic head and two turbines to generate up to 8.3 megawatts of power for sale to an electrical utility.

Notice of open comment period and public hearing was included in OWRD's weekly public notice published on May 17, May 24, May 31, June 7, and June 14, 2005. An e-mail notice was sent to city of Cottage Grove, Lane county planning department, state and federal agencies, the local watershed group and interested citizens. Agencies notified included:

Oregon Department of Fish and Wildlife (ODFW)
Oregon Department of Environmental Quality (ODEQ)
Oregon Division of State Lands
Lane County Planning Department
Oregon Department of Forestry
Oregon Department of Agriculture
Oregon State Historic Preservation Office
Michael Mattick, OWRD Watermaster, District 2

Legislative Commission on Indian Services

The notice of open comment period and public hearing were also published in the *Eugene Register Guard* on May 24, May 31, June 7, and June 14, 2005.

A public hearing was held at the Cottage Grove Community Center, in Cottage Grove on June 15, 2005, from 7 to 9 p.m. The purpose of the meeting was to receive comments on the application for preliminary permit and whether the impacts of this project are such that they might be cumulative with other proposed or existing projects in the Willamette basin. Requests for additional studies related to project impacts could also be submitted.

About 34 members of the public attended the hearing. A presentation about the project was given by Symbiotics LLC. Written comments were received from Diane Conrad, local resident; and Lindsey Haskell, city councilman. Doug Heiken of the Oregon Natural Resources Council filed comments about requirements for natural resources standards.

Comments were also filed by several parties in response to the Federal Energy Regulatory Commission (FERC) scoping meeting in May 2005. The FERC docket number is p-11945. Written comments were received from Herschel Henderly, Alison Dunlap Center, and Mark Buckbee of U. S. Bureau of Land Management.

OWRD issued a preliminary permit on November 25, 2005, to Symbiotics, LLC for the development of an 8.3 megawatt hydroelectric project on Dorena Reservoir.

B. Final Application

On July 26, 2006, Symbiotics, LLC submitted an application for a hydroelectric license for a major hydroelectric project to divert up to 812 cubic feet per second (cfs) of water from Dorena Reservoir, tributary to the Row River, tributary to the Coast Fork Willamette River, in the Willamette basin. The Project would use 85 feet of gross design head and two turbines for an installed capacity of 8.3 megawatts (MW) of power. The project is expected to operate only one turbine at a time, so the operating capacity will be a maximum of 4.5 MW.

The Department determined that the application, maps and information required by ORS 543.010 to 543.290 and OAR 690-51, together with the Final License Application and addenda filed with the Federal Energy Regulatory Committee (FERC) under project number p-11945, were complete. (See Record for Public Interest Hearing – attached pg 57).

Notice of open comment period was included in OWRD's weekly public notice published on August 8, 2006. An e-mail notice was sent to city of Cottage Grove, Lane county planning department, state and federal agencies, the local watershed group and interested citizens. Agencies notified included:

Oregon Department of Fish and Wildlife (ODFW)
Oregon Department of Environmental Quality (ODEQ)
Oregon Division of State Lands
Lane County Planning Department

Oregon Department of Forestry
Oregon Department of Agriculture
Oregon State Historic Preservation Office
Michael Mattick, OWRD Watermaster, District 2
Legislative Commission on Indian Services

The comment period was open 60 days until October 9, 2006. In that time period, agencies filed comments with FERC concerning the draft Environmental Assessment for the project.

A proposed final order on the potential for cumulative impacts was noticed for public comment and agency reviews on March 11, 2008. Four comments were received within the 60 day comment period, and are attached to this revised proposed order. The Director now issues this revised proposed final order concurrently with a proposed order on the public interest issues.

II. PROJECT DESCRIPTION

1. The hydroelectric project would be added to the existing Dorena Lake dam owned by the U. S. Army Corps of Engineers (USACE). The dam was constructed in 1949, under water right permit number R-1625. The earthfill dam is 145 feet in height, with a crest length of 2600 feet and a hydraulic head of 85 feet. Dorena Lake has a surface area of 1749 acres, with a storage capacity of 77,600 acre-feet at full pool surface elevation of 835 feet above mean sea level (m.s.l.). No changes are proposed to the area or capacity of the reservoir, the existing spillway, or the existing outlet works. There are no upstream or downstream fish passage facilities at the dam.

2. The project would add one 108-inch steel penstock through the north abutment of the dam. The penstock would be pressured grouted and tested to insure the dam integrity has not been compromised. The upstream section, 100 feet in length, will be placed on the floor of the reservoir on support structures. The intake trash racks will be located slightly below minimum pool elevation (770.5 m.s.l.). The lower portion of the penstock will extend approximately 250 feet to the powerhouse.

3. A valve house with a shutoff valve and siphon equipment will be located at the apex of the penstock on the downstream side of the dam to provide penstock isolation and starting (siphon) capability.

4. The powerhouse (approximately 40- by 50- feet) would contain one Francis turbine designed to operate under maximum head conditions of 85.3 feet with flows up to 741 cfs to produce up to 4.5 MW of power. A second turbine of Kaplan design would operate under lower head conditions up to 65.6 feet with flows up to 812 cfs to produce up to 3.8 MW of power. It is expected that only one turbine would operate at a time.

5. Eight-foot diameter butterfly isolation valves will be located within the powerhouse upstream of each turbine intake. To avoid over-stressing the outlet conduit by dynamic pressure resulting from rapid gate closure following a load rejection to the generating equipment, it is proposed to use slow-closing gates with equipment to withstand corresponding runaway speed.

6. Water would exit the powerhouse in a concrete-lined channel (tailrace) and be returned to the river immediately below the existing mixing basin from the outlet of Dorena dam.

7. A tailrace barrier will be constructed to prevent fish in the river from swimming upstream into the turbines.

8. The Project will not operate as a peaking facility, but will follow the rule curves and daily directions for release of water as established by the USACE for filling and drawing down the reservoir for ongoing flood protection, irrigation, water-based recreational needs, and improved navigation objectives downstream of the dam.

9. The Project also includes a switchyard and a 15kV underground transmission line to connect to the existing utility power lines approximately 500 feet northeast of the project site. The line transformer and switchgear will be located within a steel personnel fenced concrete pad, adjacent to the powerhouse. The project would generate an estimated 17.5 GWh annually.

10. Existing roads would provide access to the project.

III. EXISTING, APPROVED AND PROPOSED HYDROELECTRIC PROJECTS

In determining whether the impacts of the proposed project would be cumulative with existing, approved or proposed hydroelectric projects in the same river basin, the Director has made the following findings of fact.

1. Dorena dam is in Lane County, Oregon, within the SW ¼ NE ¼, Section 32, Township 20 South, Range 2 West, W.M. The dam is located in the upper portion of the Willamette River basin. It is at river mile 6.5 of the Row River (see Figure 1). The Row river confluences with the Coast Fork Willamette at river mile 21. The Coast Fork Willamette confluences with the Middle Fork Willamette at river mile 187 of the Willamette River (see Figure 2).

2. Table 1 is a list of the existing, approved and proposed hydroelectric projects in the Willamette River basin.

3. From Dorena Dam, there are no hydroelectric projects directly downstream on the Row River, the Coast Fork Willamette, or the mainstem Willamette River until the Willamette Falls Project at river mile 27 on the mainstem.

4. The Willamette Falls Project is owned and operated by Portland General Electric Co. The project was relicensed by FERC on December 8, 2005, and includes commitments for enhanced fish passage and flow control measures to aid salmon, steelhead and lamprey passage at the project.
   http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20051208-3053

5. The USACE has constructed 10 multipurpose dam projects and three reregulating dams on major tributary streams of the Willamette River. Fern Ridge Dam and Lake, completed in

1941, was the first storage project, followed by Cottage Grove, Dorena, Detroit, Lookout Point, Hills Creek, Cougar, Green Peter, Fall Creek, and Blue River. The three reregulating dams are Big Cliff, Foster, and Dexter. Hydroelectric facilities are installed at 8 of the dams. These projects are managed for flood control, navigation, irrigation and power generation. Table 2 summarizes the water storage capacities of each project. A publication of the U. S. Army Corps of Engineers, Portland District, Water Resources Development in Oregon 2000, http://www.nwp.usace.army.mil/pa/wrdb2000.asp describes the project facilities.

6. Hydroelectric facilities were not built at the USACE dams at Fern Ridge, Cottage Grove, Dorena, Fall Creek and Blue River. A FERC license has been issued to Eugene Water And Electric Board to construct a hydroelectric project at Blue River. On April 20, 2004, FERC extended the time to complete construction of this project to December 31, 2011. The project is on hold pending a decision by the USACE of whether to complete a temperature control structure for the project.
   http://elibrary.ferc.gov/idmws/File_list.asp?document_id=4196121

7. Fall Creek Hydro, LLC has filed a preliminary application document with FERC for a hydroelectric project on the USACE Fall Creek Dam on the Middle Fork Willamette River near Lowell, OR. Studies of the environmental resources that may be impacted by the project will conducted in the next couple of years.
   http://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20080129-5005

8. The Santiam Water Control District has applied to FERC to restart a hydroelectric facility on the North Fork of the Santiam River. (FERC docket p-12574). The project is being considered by FERC as a small hydro project (less than 5 MW) and is located on the Stayton Ditch, near the town of Stayton. Project facilities include the existing power canal head gate structure and fish ladder, and the fish screen and 28-inch-diameter, 600-foot-long juvenile fish bypassed return pipe located on the Stayton Ditch; the tailrace fish barrier; the Spill dam and fish ladder located on the North Channel of the Santiam River just upstream of the power canal head gate structure; and the North Channel of the Santiam River including the Upper and Lower Bennett dams and fish ladders.
   http://elibrary.ferc.gov/idmws/File_list.asp?document_id=4274422

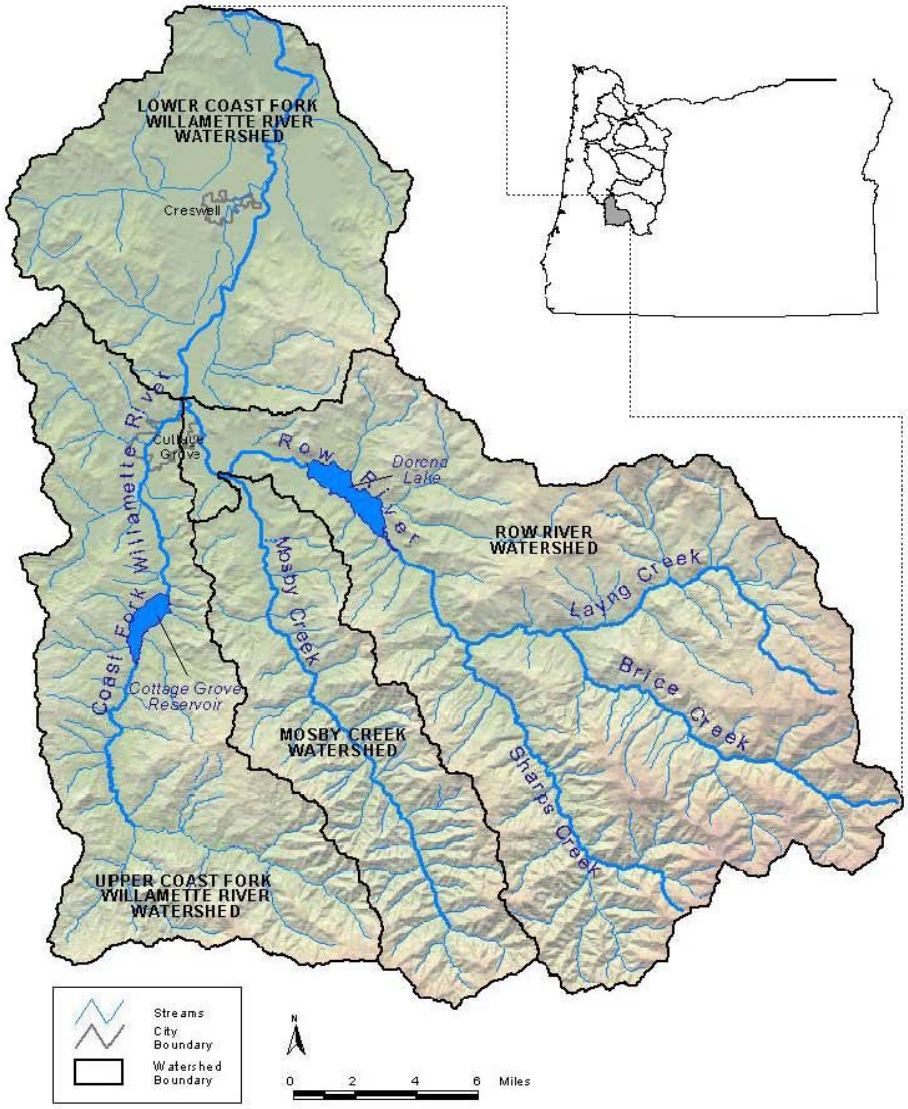

Figure 1 – Coast Fork Willamette River Subbasin


The Willamette Basin
LEGEND
Projects operating in 1964
Projects added since 1964
Re-regulating Dams
N
Columbia River
Forest Grove
Portland
Scoggins
Newberg
River
Oregon City
Willamette
Keizer
Salem
Independence
Detroit
Big Cliff
Albany
Corvallis
Foster
Green Peter
Harrisburg
Blue River
Cougar
Springfield
Fern Ridge
Eugene
Fall Creek
Dexter
Cottage Grove
Lookout Point
Dorena
Hills Creek
BASIN LOCATION MAP
Washington
Oregon
California
Nevada
Idaho
PACIFIC OCEAN

Figure 2.

Table 1. Existing, Approved, and Proposed Hydroelectric Projects in the Willamette Basin

NAME	STREAM	TOWNSHIP	KW	THP	CFS
Existing Projects					
Lake Oswego Corporation	Tualatin R., trib to Willamette R	T 2 S R 1 E Sec 20	441	588	57.5
Portland General Electric Company	Willamette R., trib to Columbia R	T 2 S R 2 E Sec 31	43479	57973	11864
Angela M. Porter	Deep Creek, trib to Clackamas R	T 2 S R 5 E Sec 31	2	3	2.9
Minikahda Hydropower Co. LLC,.	Minikahda Creek, trib to Clear Creek	T 2 S R 7 E Sec 27	74	99	3.22
William Blacklaw	Unnamed str and res, trib to Parrott Creek	T 3 S R 2 E Sec 30	13	17	1
Clarence D. Billette	Chehalem Creek, trib to Willamette R	T 3 S R 2 W Sec 6	6	9	0.5
Robin & Robert Stern	Bronson Creek trib to Chehalem	T 3 S R 3 W Sec 14	6	8	4
Portland General Electric Company	Clackamas R., trib to Willamette R	T 3 S R 4 E Sec 19, 20	22090	29455	3200
Portland General Electric Company	Clackamas R., trib to Willamette R	T 3 S R 4 E Sec 20	5000	6666	950
Von-Family Limited Partnership	Kane Creek, trib to Panther Creek	T 3 S R 5 W Sec 28	71	95	4
John Vardanega	Honeyman Creek, trib to Scappoose Bay	T 4 N R 2 W Sec 25	7	9	13.2
Portland General Electric Company	Clackamas R., trib to Willamette R	T 4 S R 4 E Sec 2, 11	62130	82841	5400
Portland General Electric Company	Clackamas R., trib to Willamette R	T 4 S R 4 E Sec 3	29361	39148	2650
Portland General Electric Company	Clackamas R., trib to Willamette R	T 4 S R 4 E Sec 3	22159	29545	2000
Crown Hill Farm, Lucien Gunderman	Unnamed springs, trib to Baker Creek	T 4 S R 5 W Sec 26	43	57	4
Phillip L. Wurst	Woodcock Creek, trib of Mollala R	T 5 S R 3 E Sec 19	75	100	17.25
Douglas Pegar	Canyon Cr of Oak Grove Fk Clackamas R	T 5 S R 7 E Sec 31	75	100	2.4
Eugene Water and Electric Board	Oak Grove Fk., Clackamas R.,	T 5 S R 8 E Sec 27	13317	17756	250
Portland General Electric Co.	Oak Grove Fork of Clackamas R.,	T 5 S R 8 E Sec 27	28080	37437	300
Portland General Electric Company	Clackamas R., trib to Willamette R	T 6 S R 7 E Sec 4	43977	58636	600
Mission Mill Museum	Mill Creek Race	T 7 S R 3 W Sec 26	113	150	50
Santiam Water Control District	North Santiam, trib. To Santiam R	T 9 S R 1 W Sec 11	909	1212	762
Santiam Water Control District	North Santiam, trib. To Santiam R	T 9 S R 1 W Sec 11	231	309	185
Loyd F. Fery	North Santiam, trib to Santiam	T 9 S R 1 W Sec 11	51	68	70
Neil R. and Toni M. Roush	North Santiam, trib to Willamette	T 9 S R 1 W Sec 11	50	66	70
Army Corps of Engineers	Big Cliff, N Santiam River, RM 46	T 9 S R 4 E Sec 35	18000		
Breitenbush Retreat Center	North Santiam, trib to Santiam R	T 9 S R 7 E Sec 20	51	68	35
Army Corps of Engineers	Detroit Dam, N Santiam River, RM 49	T 10 S R 5 E Sec 7	100000		
Lacomb Irrigation District	Crab Tree Creek, trib to South Santiam	T 11 S R 1 E Sec 25	1301	1736	65
Piotr Zenczak	Unnamed stream, trib to Luckiamute R	T 11 S R 6 W Sec 9	12	16	1.2
City of Albany	South Santiam R	T 12 S R 1 W Sec 19	843	1125	275

Army Corps of Engineers	Foster Dam, Mid Santiam River, Rm 38.5	T 13 S	R 1 E	Sec 27	20000	
Army Corps of Engineers	Green Peter, Mid Santiam River, RM 5.5	T 13 S	R 2 E	Sec 10	80000	
Oregon Parks and Recreation Dept	Sodom Ditch, trib to Calapooia R	T 13 S	R 3 W	Sec 8	74	99	87.12
Falls Creek, H. P., LMT Partnership	Falls Creek, trib to South Santiam	T 14 S	R 4 E	Sec 5	5357	7143	26.4
Greg Wheeler	Belknap Creek trib to Muddy Creek	T 15 S	R 5 W	Sec 6	8	10	0.5
Eugene Water and Electric Board	McKenzie R. and Carmen diversion dam,	T 15 S	R 6 E	Sec 1	128007	170676	2850
Eugene Water and Electric Board	McKenzie R. and Trail Bridge Reservoir,	T 15 S	R 6 E	Sec 11	13350	17800	1780
Josh M. and Linda D. Fredricks	Cherry Creek, trib to Muddy Creek	T 15 S	R 6 W	Sec 1	11	14	3
Eugene Water and Electric Board	McKenzie R., Johnson Cr, Bear Cr Res	T 16 S	R 2 E	Sec 31	18750	25000	2500
Jack E. Barrowcliff, Triple-J Power Co	Whiskey Creek, trib Parsons Creek	T 16 S	R 2 W	Sec 11	20	27	4
Lynn E. Martin	Rough Creek, trib to McKenzie R	T 16 S	R 3 E	Sec 32	0		4.5
Army Corps of Engineers	Cougar Dam, S Fk McKenzie, RM 4.4	T 16 S	R 5 E	Sec 31	25000		
Eugene Water and Electric Board	McKenzie R, Jameson Cr.,	T 17 S	R 1 W	Sec 23	12079	16106	977
Alvin Hinchee	Unnamed stream, trib to McKenzie R	T 17 S	R 1 W	Sec 25	10	13	0.38
Garry Keable	Boulder Creek, trib to McKenzie R	T 17 S	R 1 W	Sec 35	5	7	5.3
Army Corps of Engineers	Lookout Point, Mid Fk Willamette RM 21.3	T 19 S	R 1 W	Sec 13	120000		
Army Corps of Engineers	Dexter, Middle Fk Willamette, RM 18	T 19 S	R 1 W	Sec 16	15000		
Norm McDougal	Doak Creek, trib to Coyote Creek	T 19 S	R 5 W	Sec 21	9	11	7.22
Army Corps of Engineers	Hills Creek, Mid Fk Willamette, RM 47.8	T 21 S	R 3 E	Sec 35	30000		
James L. Potterf	Crystal Reservoir, trib to Crystal Creek	T 23 S	R 1 E	Sec 11	83	110	
Allen D. Porter	Puddin Rock Creek, trib to Sharps Cr	T 23 S	R 1 E	Sec 20	24	32	1.29
Approved Projects							
Eugene Water and Electric Board	Blue River, trib to McKenzie R	T 16 S	R 4 E	Sec 21	25000		1500
Proposed Projects							
Symbiotics LLC	**Dorena Lake, trib to Coast Fk Willamette**	**T 20 S**	**R 2 W**	**Sec 32**	**8300**		**1800**
Santiam Water Control District	North Santiam River	T 9 S	R 1 W	Sec 11			
Symbiotics LLC/Emerald PUD	Fall Creek Dam, trib to Middle Fk Willamette	T 19 S	R 1 W	Sec 1			

Table 2. USACE Projects in the Willamette Basin

U.S. ARMY ENGINEER DISTRICT, PORTLAND							08 SEP 2006	
WILLAMETTE BASIN								
PROJECT	DRNG AREA SQ MI	MINIMUM FLOOD CONTROL POOL ELEV FT	MINIMUM FLOOD CONTROL POOL STORAGE AC-FT	MAXIMUM CONSERV. POOL ELEV FT	MAXIMUM CONSERV. POOL STORAGE AC-FT	FULL POOL ELEV FT	FULL POOL STORAGE AC-FT	
HILLS CREEK	389	1448.0	155370	1541.0	350010	1543.0	355570	
LOOKOUT POINT	991	825.0	118760	926.0	442990	929.0	455840	
FALL CREEK	184	728.0	9620	830.0	117830	834.0	125080	
COTTAGE GROVE	104	750.0	3140	790.0	31780	791.0	32930	
DORENA	265	770.5	7090	832.0	72050	835.0	77600	
COUGAR	208	1532.0	52200	1690.0	189000	1699.0	200000	
BLUE RIVER	88	1180.0	3970	1350.0	82820	1357.0	89520	
FERN RIDGE	252	353.0	2802	373.5	97320	375.1	111430	
GREEN PETER	277	922.0	159860	1010.0	409830	1015.0	428110	
FOSTER	494	613.0	31070	637.0	55870	641.0	60780	
DETROIT	438	1450.0	154380	1563.5	436010	1569.0	455100	
TOTALS			698262		2285510		2391960	

IV. MITIGATION MEASURES

A. Mitigation Measures: Design Parameters

The Director has made the following findings of fact regarding mitigation of project impacts set out in the project's design parameters.

Dam and Powerhouse Safety

1. USACE must review and approve all plans for construction and operation of the project prior to the start of construction. The project would be constructed so that the depth of the penstock intake is identical to the depth of the existing outlet works. The location of the penstock through the dam will be selected to avoid penetrating existing grouting tunnels, stairways, and ventilation shafts within the dam. The USACE must approve all anchorages to existing structures prior to construction.

2. The penstock shall be designed to incorporate a "slow-closing" valve to minimize over stressing the penstock associated with sudden shutdowns. It shall be designed to meet loading conditions resulting from a sudden shutdown.

3. The turbine and generator units shall be designed to operate at a "free-spin" or "runaway" speed in the event of a sudden shutdown until water can be transferred to the existing outlet works. The transfer process shall be fully automated. Backup power supplies shall be installed for all valves, gates, and other essential operating equipment. A flow measuring station shall be installed downstream of the powerhouse to monitor the flow in the river and the change in river elevations. Operation controls shall limit the increase or decrease in flows through the project to not more than 100 cfs/half hour.

Tailrace Barrier

4. Operation of the Project may result in attraction of upstream migrating fish into the turbine discharge flow. Fish can become attracted towards the source of the highest quantity of flow, and in some months the entire stream flow will be diverted through the powerhouse. Fish migrating upstream will be attracted to powerhouse discharge flow where they can become injured or killed. Depending on powerhouse operations, water velocities could range from approximately 4.1 to 12.8 feet per second. These velocities easily fall within the swimming abilities of salmonids (Weaver 1963, Bell 1986). The types of injury sustained by some fish entering draft tubes or contacting turbines vary from site to site, as do immediate and delayed mortality rates. Several studies, however, attribute injuries in migrating salmonids to powerhouse structures associated with tailrace structures (Department of Fisheries, Canada 1958; IPSFC 1976; Marshall 1973; Schadt et al. 1985; Williams 1985; PacifiCorp 1993). Symbiotics will construct a tailrace barrier at the project with 1 inch spacing to prevent spawning fishes such as steelhead, rainbow trout, cutthroat trout and potentially spring chinook from entering the tailrace and suffering turbine-related injury. In addition, Symbiotics will continue to work with ODFW in the final design of the tailrace to permit reservoir entrained fishes to exit the project's tailrace.

B. Mitigation of Project Impacts during Construction

The Director has made the following findings of fact regarding mitigation of project impacts during project construction.

Schedule

5. The construction schedule was developed to minimize effects on fisheries resources. Construction would begin with site mobilization in the month of May. Mobilization would be completed prior to October 1, or as soon as the reservoir is drawn down to its lowest target elevation in the fall so that work on the dam can begin immediately. The USACE would set parameters for construction of the project during the winter flood control season and the emergency notification plans for winter operations. The schedule would be implemented to avoid working upstream of the dam during times when the reservoir stage is high to minimize the effects on water quality and fisheries. Boring through the dam and installing the upstream bulkhead would be completed during low reservoir conditions, after October 1.

6. Due to the potential need to operate for flood damage reduction during all months of the year, the ability of the USACE to operate the dam to its maximum lake surface elevation must not be impeded, unless operation limiting flood damage reduction can be performed in brief periods (2 to 3 days) of no expected significant increase in inflow. This requirement would apply to the bulkhead on the dam, the cofferdam allowing penstock construction, and any other aspect of the operation.

7. The in-water work period will be restricted to the period from June 1 to October 31 of each year of construction. No blasting work will be performed during the bald eagle nesting period from January 1 to August 31 of each year.

Erosion Control

8. Ground disturbing activities at the Project site and the surrounding area, including transmission lines and access roads may result in erosion and increased turbidity in the Row River below the dam. Releases of sediment during project construction could impact the spawning success of trout, spring Chinook salmon, lamprey, and steelhead. Spawning habitat suitable for trout and anadromous fish is found below the dam (Symbiotics 2005 Juvenile Salmonid Sampling Report). Surveys conducted by the Applicant confirm that rainbow trout spawn in the Row River in the immediate vicinity of the Project (1-mile below the dam). The Row River also provides nursery habitat for juveniles. Pacific lamprey also use this portion of the river for spawning and rearing, and spring Chinook salmon likely use Project affected portions of the Row River in some years (Symbiotics 2005 Juvenile Salmonid Study Report).

9. The proposed project will be constructed on land that was previously disturbed when the dam was built. The land area being impacted by the penstock and powerhouse construction is less than one-sixth acre in size. Symbiotics proposes to control and mitigate the effects of project construction through the following measures.

10. A soil erosion control plan as approved by the Oregon Department of Environmental Quality shall include guidelines for the use of cofferdams at excavation sites, isolating topsoil and spoil materials, installing sedimentation basins, replacing all topsoil following construction, and reseeding of all areas of disturbed soil with a native grass/forbs mix.

Adaptive Water Quality Monitoring and Management Plan

11. A water quality monitoring plan as approved by the Oregon Department of Environmental Quality shall be implemented during construction which will include measurements of water flows, temperatures, dissolved oxygen, turbidity, and mercury. A hazardous substances and spill prevention and clean up plan will be required to be in place during construction and operation of the project.

Vegetation Management

12. A vegetation mitigation plan will be used to manage the 134,000 square feet of land used as staging areas. Revegetation in this area will be significantly larger than the small area of land displaced by the powerhouse and penstock. The plan will add contiguous habitat from the river to the woodlands which would benefit blacktailed deer and northwestern pond turtles. Management goals include: erosion control, habitat for native plants, wildlife habitat, and visual aesthetics. Symbiotics will replant big leaf maple and black cottonwood trees to replace any removed during construction.

13. A weed management plan will be implemented to prevent transport of weeds to and from the project area during construction, to prevent noxious weeds from becoming established on disturbed soils, and to provide long-term protection from weeds by establishing healthy native plant communities within the project area.

14. The applicant will comply with BLM guidelines for constructing the transmission lines within the Row River Trail right-of-way.

C. Mitigation of Project Impacts during Operations

The Director has made the following findings of fact regarding mitigation of project impacts during project operations.

15. On January 18, 2008, ODEQ granted a conditional Section 401 certification to Symbiotics, LLC for operation of the proposed Dorena Dam Hydroelectric Project. **http://www.deq.state.or.us/wq/sec401cert/sec401cert.htm#hp**

Flow releases and Ramping Rates

16. Flow releases from the Project will be the same as historical practices, unless modified by the USACE in accordance with revised plans with National Marine Fisheries Service under the Endangered Species Act. Symbiotics will release flows on a daily basis according to the directives of the USACE.

17. Flow releases from Dorena dam that are less than the lower limit of turbine operations (260 cfs) would cause the unit to shut down and flows to be diverted to the existing outlet works. Restarting the unit would only occur when the minimum turbine flow has been re-established. Flow releases from the dam in excess of the maximum turbine hydraulic capacity (812 cfs) would be diverted directly to the Row River via the existing outlet works. The Kaplan-type turbine would have a maximum hydraulic capacity of 812 cfs and would operate when the hydraulic head is less than 65.6 feet. The Francis-type turbine would have a maximum

hydraulic capacity of 745 cfs and would operate with hydraulic head between 65.7 and 85.3 feet. Only one turbine would operate at a time. Given the varying magnitude of available flows, there would be times when the available flows may be too low for unit operation. During such times, the generating units would not operate, and flows would be passed through the dam outlet works.

18. Flow fluctuations can be immediately lethal or have indirect or delayed adverse effects on aquatic species (Hunter 1992). Sudden flow fluctuations in stream reaches due to Project operations can adversely impact fish of all life history stages and other aquatic resources. Significant rapid flow reduction could adversely affect fish populations by dewatering redds and stranding fry or juvenile fish. Symbiotics has not proposed to operate the facility for power peaking, and therefore no hourly flow fluctuations for power generation would occur. Ramping could occur due to Project startup and shut down, and during construction, operation, and maintenance of Project facilities. The Applicant has proposed measures for ramping associated with automatic (e.g. emergency) turbine shutdowns, and has proposed ramping rates of 1 inch per hour from March 1 through September 30, and no more than 2 inches per hour from October 1 through February 28/29.

19. Dissolved Oxygen

The Director has taken notice of the Oregon Department of Environmental Quality's review and evaluation of the impacts of the Project on dissolved oxygen in the river.

> "The USACE currently releases water through rectangular outlet structures located near the base of the dam. High velocity dam releases generate turbulent conditions which entrain atmospheric air including oxygen. Dam releases under current USACE operating conditions, therefore, tend to increase the concentration of dissolved gases, including DO, relative to incoming conditions.
>
> In contrast, turbine operations convert hydraulic energy into electrical energy. The hydraulic energy withdrawn from the water tends to reduce turbulence and lowers the potential DO concentrations in the tailrace discharge. The degree to which the Project will reduce DO concentrations is not known. However, measurements recorded by the Applicant in Dorena Reservoir indicate DO levels are at or below the DO criterion of 8.0 mg/L for much of the summer and decrease below the absolute minimum concentration of 6.0 mg/L at depth in late summer. The difference between ambient conditions and the DO criterion further increases on October 15 when the DO criterion increases to 11.0 mg/L to protect spawning habitat in the portion of Row River downstream of the dam. Further DO reductions during this period will, therefore, likely result in violations of the ODEQ water quality criterion for DO.
>
> Dissolved Oxygen and Total Dissolved Gas Management Plan:
>
> Within 12 months of FERC license issuance, Symbiotics shall submit for ODEQ approval a proposed adaptive Dissolved Oxygen and Total Dissolved Gas Management Plan. Upon ODEQ approval, Symbiotics shall implement the plan.

If the DO monitoring shows reduced DO concentrations, Symbiotics has proposed the following measures may be implemented:

Air Admission System
An air admission system (AAS) may be installed to introduce ambient air through the turbine blades. The purpose of the AAS is to increase the concentration of DO in the discharge. The Applicant estimates operation of the AAS will increase DO by as much as 3.5 mg/L. Symbiotics proposes to monitor DO concentrations closely during initial six (6) months operation of the AAS.

Adaptive Management
Upon completion of the initial six (6) month operating period, Symbiotics will submit a report to ODEQ which evaluates the performance of the AAS. The report will offer engineering or operation recommendations to correct any violations of ODEQ water quality standards. The following adaptive modifications may be considered:

System shutdown: Symbiotics may consider suspending operation of the Project when discharge from the Project fails to meet appropriate ODEQ water quality criteria.

Oxygen Injection: Symbiotics may evaluate substituting pure oxygen in place of ambient air to increase DO concentrations in water discharged from the Project.

Operation: Symbiotics may base a decision on the operation of the AAS on DO measurements recorded upstream of the powerhouse.

Monitoring
Symbiotics has proposed to monitor DO levels continuously during project operation at the following stations:
Reservoir bottom at intake;
Row River immediately below dam, but above the hydroelectric project tailrace;
Tailrace immediately prior to Row River entrance; and
Row River one-quarter (0.25) mile below tailrace.

Symbiotics will record minimum, maximum, and average values continuously during operation. The WQMMP states that monitoring data will be summarized in annual reports submitted to ODEQ. "

(pgs 27-28, ODEQ 401 Evaluation and Findings Report, Jan 2008.)

20. Comments received from John Steele raised the issue of whether the Project would cause increased problems with dissolved oxygen and total dissolved gases. ODEQ has adequately addressed this issue in its Water Quality Certification with appropriate mitigation measures, monitoring and adaptive management strategies. (See pgs 29-32, ODEQ 401 Evaluation and Findings Report, Jan 2008.)

Increased Sediment Transport

21. Comments received from John Steele raised the issue of whether the Project would cause increased scouring of the lake bottom resulting in increased sediment transported downstream. This issue was also reviewed by ODEQ in its Section 401 water quality certification.

    It is expected, especially during periods of natural high flows or when a gate is opened after a period of being closed, that suspended sediments will increase in discharge flows from the dam. Natural processes for moving sediment downstream are desirable to maintain. However, heavy sediment transport in late fall during spawning season could be harmful to anadromous salmon and steelhead. The USACE will maintain responsibility for managing turbidity levels at the existing regulating outlets from the dam in accordance with a Water Quality Management Plan prepared to meet ODEQ's TMDL standards.

    "Modeling studies performed by the Applicant indicate entrance velocities to the penstock will not exceed 0.3 fps near the reservoir floor under maximum flow conditions. The Applicant indicates that penstock inlets operating under similar conditions at similar projects result in no measurable scour to reservoir sediments. ODEQ does not expect that this low velocity, expected only under conditions of maximum capacity turbine operation, would be sufficient to cause sediment scour adjacent to the new intake structure. However, ODEQ considers it appropriate to monitor turbidity during operation to confirm this expectation and require corrective modifications if scour and excessive turbidity is identified.

    Turbidity Monitoring and Reporting: Symbiotics shall conduct turbidity monitoring and reporting in accordance with an AWQMMP submitted and approved by ODEQ. The turbidity monitoring and reporting shall be sufficient to identify turbidity violations that may potentially result from any water withdrawal-induced sediment scour adjacent to the hydropower penstock intakes.

    Turbidity Management: Symbiotics shall undertake and complete investigative actions in the event turbidity monitoring confirms Project-related violations to Oregon's turbidity standard. The investigations shall include visual inspection to measure for the occurrence of sediment scour or erosion in the vicinity of the penstock inlets. The investigation shall also include a review of operating conditions, including flow rates, through the penstock prior to the violation. The investigation shall provide an analysis of the violation including, if applicable, a discussion of similar historical occurrences, a discussion of likely or probable causes, turbidity trends preceding the violation, and proposed measures to prevent future occurrences. A report presenting the findings of the investigation shall be submitted to ODEQ within 60 days of the occurrence. Upon ODEQ approval, Symbiotics shall implement the proposed measures. "

(pgs 36-37, ODEQ 401 Evaluation and Findings Report, Jan 2008.)

Mercury

22. Comments received from John Steele raised the issue of whether the Project would cause increased transport of Mercury downstream. This issue was also reviewed by ODEQ in its

Section 401 water quality certification (pg 54, ODEQ 401 Evaluation and Findings Report, Jan 2008).

> "Sampling data confirm the presence of mercury in surface water, sediment, and fish tissue in the Row River watershed. Water sampling data indicate total recoverable mercury levels in Dorena Lake exceed the mercury TMDL water column guidance value of 0.92 ng/L. The primary source of mercury present in the Row River watershed appears to be from historical mining activities performed in the drainages of tributaries located upstream of Dorena Lake.
>
> Activities proposed by the Applicant do not result in the use or discharge of mercury to surface waters.
>
> In correspondence dated May 25, 2007, the Corps reiterated its authority over operation of the dam. Should a FERC license be issued, the Applicant may utilize only that water not otherwise used by the Corps to meet federally-authorized project objectives. Furthermore, activities proposed by the Applicant do not impact water quality upstream of the dam. Symbiotics is not responsible, therefore, for the quantity or quality of the water released from the dam and received by the Project.
>
> For this reason, ODEQ is reasonably assured that operation of the Project will not impact the level of mercury downstream of Dorena Dam. "

(pg 48, ODEQ 401 Evaluation and Findings Report, Jan 2008.)

Temperature

23. Comments received from John Steele raised the issue of whether the Project would cause increased temperatures downstream during July and August. Mr. Steele referred to a Figure 4 – Dorena Reservoir Temperature Profiles (pg 23, ODEQ Evaluation and Findings Report, Jan 2008) of August 2003, February 2004, March 2004, and July 2004. The profiles show water temperatures that decline in March, July, and August as measured from surface level to lower depths in the reservoir. In July and August, when the reservoir is at full pool, the intake pipe is at a depth of more than 20 meters below the surface of the water. The temperature profiles show that between depths of 10 to 12 meters the temperature levels decline rapidly and then are uniform from depths of 12 meters to 25 meters. Therefore, neither the size of the intake pipe, nor its placement near the floor of the reservoir will cause variation in outlet temperatures during July and August. Temperature variations are expected when the reservoir mixes or "destratifies" in late fall. Waters in the lake will be of fairly consistent temperature when the lake levels are low during the winter and early spring months.

> "The Corps is responsible for preparing a water quality management plan (WQMP) to address management strategies designed to comply with the TMDL conditions. Since the Corps administers the operation of Dorena Dam, temperature impairment resulting from the impoundment of water within Dorena Reservoir remains the responsibility of the Corps. Providing that operation of the proposed Project does not increase water temperature in excess allowed by Oregon water quality rules, Symbiotics is not required to correct for temperature impairments resulting from conditions created by the dam.

Notwithstanding the preceding statement, Symbiotics shall not propose or undertake actions which restrict the ability of the Corps to construct, operate, or modify TMDL implementation strategies or otherwise hinder the ability of the Corps to achieve and maintain compliance with current and/or future TMDL requirements. Symbiotics shall accept the implementation of remedies approved by ODEQ which allow the Corps to meet their TMDL obligations and/or the objectives set forth in current and/or future WQMPs." (pg 21, ODEQ Evaluation and Findings Report., Jan 2008)

"Symbiotics identifies that its proposed withdrawal of water from the same depth and vicinity of the existing Corps outlet structure, will ensure downstream temperatures will not be altered by operation of the proposed hydroelectric facilities relative to current Corps operations without hydroelectric facilities." (pg 23, ODEQ Evaluation and Findings Report, Jan 2008).

D. Mitigation Measures: Habitat Enhancement

The Director has made the following findings of fact regarding mitigation of project impacts through a habitat enhancement program.

24. Symbiotics, LLC has entered into an agreement with the Oregon Department of Fish and Wildlife to fund a fisheries mitigation program for the Row River above and below the project. Pursuant to this agreement, Symbiotics will provide a total of $523,413.00 (2007 dollars escalated to the year of payment into the account) for a fish habitat restoration and enhancement fund. Symbiotics will establish a segregated interest-bearing account dedicated to the funding of mitigation and enhancement projects

25. A Technical Oversight Committee (TOC) established by ODFW and comprised of members of ODFW, Symbiotics, and additional appropriate state and federal resource agencies, and the Coastal Fork of the Willamette Watershed Council (CFWWC) will be responsible for identifying and recommending potential projects to be paid for by the mitigation fund. Any member may propose potential mitigation projects for consideration by the TOC. ODFW reserves the authority to make final approval of projects and the amount to be released from the account. The Parties will invite TOC members to meet at least two times per year to identify potential mitigation projects and review progress on implementation, monitoring, and maintenance. The TOC will prioritize projects for funding that improve ecological conditions in the Upper and Lower Row River with an emphasis on improving the production of salmonids and the aquatic habitat upon which salmonids depend. However, to maintain flexibility, projects that are judged to have high potential to meet the goal of improving the overall riparian ecology in the Row River below Dorena Dam could also be considered for funding under this plan. Symbiotics will work with the CFWWC when possible and/or appropriate to aid with restoration and enhancement projects.

V. RESOURCE STANDARDS

In determining whether the proposed project may contribute to cumulative impacts with other existing, approved or proposed hydroelectric projects the Director has consulted with the agencies listed in OAR 690-051-0060 and has considered the potential for cumulative impacts on the natural resources listed below.

The Director considered the FERC Final Environmental Assessment, which provides a full discussion of environmental impacts and the recommended mitigation measures and is available at: http://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20070119-3020

Natural resources on which the potential for cumulative impacts will be considered are listed in OAR 690-051-0190 through 690-051-0250.

A. Water Resources (OAR 690-051-190)

Based on the discussion below, the proposed use is found to be consistent with the standards for water resources OAR 690-51-0190 as follows.

(1) Streamflow records for the Row River are available from the USGS gaging station #14155500 from January 1939, to September 30, 2006.
http://www1.wrd.state.or.us/cgi-bin/choose_gage.pl?huc=17090002

Water is to be released from the reservoir according to the schedule determined by the USACE. The project will not operate on flows of less than 260 cfs, therefore it will likely be shutdown during the months of July and August. There is available water to provide for reasonable operation of the proposed project during all other months of the year.

(2) The proposed water use is non-consumptive, and is available for other uses immediately downstream of the existing stilling basin. The Project will not preclude or interfere with any existing rights or permits for the use of water.

(3) The water basin plan that applies to the Dorena Lake area OAR 690-502-0070 states in part:

> "The Coast Fork Willamette River Subbasin includes the Coast Fork Willamette River and tributaries above the confluence with the Middle Fork Willamette River south of Springfield:
>
> (1) Surface water classification:
>
> (a) The Coast Fork Willamette River and tributaries below Cottage Grove Dam to the mouth and the Row River below Dorena Dam to the mouth are classified for domestic, livestock, irrigation, municipal, industrial, agricultural, commercial, power, mining, fish life, wildlife, recreation, pollution abatement, wetland enhancement and public instream uses from December 1 through April 30, and only for domestic, commercial use for customarily domestic purposes not to exceed 0.01 cfs, livestock and public instream uses from May 1 through November 30.

(b) The Coast Fork of the Willamette River and tributaries above Cottage Grove Dam and the Row River and tributaries above Dorena Dam are classified for domestic, commercial use for customarily domestic purposes not to exceed 0.01 cfs, livestock and public instream uses."

Under ORS 536.295 the Water Resources Commission may, under certain circumstances, allow the Department to consider an application to appropriate water for a use not classified as an allowable use by the applicable basin program. Symbiotics LLC (Symbiotics) has requested an exception to the Willamette Basin Program. According to their request, use of water in their proposed hydroelectric project would be largely non-consumptive in nature and not likely to be regulated for other water rights as provided in ORS 536.295(1)(c). On January 13, 2006, the Commission granted the exception to the basin program to allow consideration of year-round hydroelectric use for this project. The proposed use is consistent with the general policies of the Willamette Basin Program, including the policy to use reservoir operation guidelines of the USACE to meet state water management objectives.

(4) Electricity generated by this project will contribute to the economic benefit of the local community. The project is consistent with achieving maximum economic development of the waters involved.

(5) The project is consistent with making the fullest practical use of the stream's hydroelectric potential in the project vicinity.

(6) The project will not constitute wasteful, uneconomic, impracticable or unreasonable use of the waters involved.

(7) The project, including mitigation and enhancement measures, is consistent with conserving the highest use of the waters of the state for all beneficial purposes.

(8) The project is consistent with controlling the waters of the state for all beneficial purposes, including drainage, sanitation and flood control.

(9) Construction and operation of the proposed project shall comply with water quality standards established in OAR Chapter 340, Division 41. The applicant must comply with all water quality standards adopted by the Environmental Quality Commission pursuant to state and federal law, ORS 468B.048 and Section 303 of the Clean Water Act.

On January 18, 2008, ODEQ granted a conditional Section 401 certification to Symbiotics, LLC for operation of the proposed Dorena Dam Hydroelectric Project.
http://www.deq.state.or.us/wq/sec401cert/sec401cert.htm#hp

An additional Section 401 approval for construction of the Project must be obtained before the Project can begin.

The impacts of the proposed project on water resources are so small in extent, short-termed or localized that there is no reasonable likelihood of cumulative impacts with other existing, approved or proposed projects in the basin.

B. Fish Resources (OAR 690-051-0200)

The Director makes the following findings regarding fish resources.

1. Native migratory fish present in the Row River include spring Chinook salmon (*Oncorhynchus tshawystscha*), rainbow trout (*Oncorhynchus mykiss*), cutthroat trout (*O. clarki*), and Pacific lamprey (*Lampetra tridentata*)**.** Winter and summer steelhead historically occurred in the Coast Fork Willamette.

2. Prior to construction of Dorena Dam, spring Chinook salmon, and possibly winter steelhead (*O. mykiss*), entered the Row River (ODFW 1966, Dimick and Merryfield 1945, ODFW 1960). Upper Willamette spring Chinook salmon is a species considered by NMFS to be threatened, and therefore listed under the Federal Endangered Species Act. The Willamette Basin Task Force (1969) reported small sporadic runs of both spring Chinook salmon and winter steelhead entered the lower portion of the Row River. The Applicant notes that although spring Chinook salmon were not observed in the Row River below the dam during stream sampling in 2005, it is likely that this species uses the Project-affected portion of the Row River in some years.

3. Pacific lamprey is a Federal Species of Concern and is listed as sensitive vulnerable by ODFW. ODFW has documented the presence of Pacific lamprey in the Coast Fork of the Willamette River near its confluence with the Middle Fork Willamette River. In addition, the Applicant positively identified a Pacific lamprey ammocoete approximately 1.25 miles below the dam, during fisheries surveys related to the Project, indicating that Pacific lamprey spawn within the project vicinity (Symbiotics 2005 Pacific Lamprey Status Report).

4. Several species of introduced fish found in the Row River and Dorena Reservoir are also classified as "game fish" and provide a substantial recreational fishery. These species include; largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieui*), white crappie (*Pomoxis annularis*), black crappie (*P. nigromaculatus*), bluegill (*Lepomis macrochirus*), warmouth (*L. gulosus*), yellow bullhead (*Ictalurus natalis*), brown bullhead (*I. melas*), channel catfish (*I. punctatus*), and walleye (*Stizostedion vitreum)*.

Based on implementation of the mitigation measures in Section IV A through D and those required by resource management agencies, the proposed Project is found to be consistent with the standards for fish resources OAR 690-51-0200 as follows.

(1) Symbiotics' proposal would not alter the flow releases from the dam established by the USACE. Because Symbiotics does not propose changes to the ramping or flow releases to the river, no additional effects on fish resources from project ramping activities are anticipated. Symbiotics shall consult with Oregon Department of Fish and Wildlife (ODFW) in the final design of the powerhouse tailrace channel and the tailrace barrier to prevent adult fish in the Row River from swimming into the turbines. Habitat improvement projects in the lower Row River are expected to enhance anadromous fish populations within the Row River basin.

(a) By following the standards and prescriptions of ODFW the Project facilities, mitigation measures and operations plan will not have significant adverse impacts on fish populations including wild fish, anadromous salmon or steelhead, or their respective habitats.

(b) Fish are presently prevented from safely passing upstream and downstream of Dorena dam. In lieu of constructing fish screens on the penstock, Symbiotics has entered into an agreement with ODFW to provide funding for a fisheries mitigation program for projects that will improve ecological conditions in the Upper and Lower Row River with an emphasis on improving the production of salmonids and the aquatic habitat upon which salmonids depend.

(c) Project facilities and operation have been designed to mitigate, to the greatest extent practicable, adverse impacts upon spawning, rearing or other habitat areas necessary to maintain the levels and existing diversity of fish species.

(d) Unavoidable adverse impacts on fish or to fish management programs will be mitigated through new projects funded by the fisheries mitigation program.

(e) Project construction, timing and procedures are designed to minimize fishery impacts from instream construction work and premature or unnecessary land clearing and disturbances.

(f) All fishery protective measures are scheduled to be fully functional when the project commences operations.

(g) The proposed project is consistent with current ODFW management programs.

(2)(a) The mitigation measures for this project:

(A) are to be located in the project vicinity at Dorena Dam or on the Row River,
(B) will be in effect at the time of potential adverse impact or start of project operation, whichever is first,
(C) will prevent a net loss to individual species of wild game fish,
(D) will not cause conversion of a wild game fish population and fishery to a hatchery dependent resource,
(E) are consistent with ODFW management plans and programs, and
(F) employ workable and generally accepted methods and techniques of mitigation best suited to the affected fish resources.

(3)(b) The proposed project is at an existing USACE facility on a stream reach that is used by anadromous salmon or steelhead or provides anadromous salmon or steelhead habitat.

(A) The funds to enhance habitat areas in the Row River will be used on projects to restore, enhance or improve existing salmon and steelhead populations.
(B) The mitigation measures will be implemented with ODFW oversight and will comply with wild game fish standards in (2)(a)(C) and (D) above.
(C) The mitigation measures are consistent with ODFW Fishery management plans and programs .
(D) The mitigation measures employ workable and generally accepted methods and techniques best suited to the fish resources affected by the proposed project.
(E) The mitigation measures shall be in effect at the time of adverse impact or start of project operation, whichever comes first.

(4) The project does comply with the fish protection, mitigation and enhancement requirements of the Northwest Power and Conservation Council's Columbia River Basin Fish and Wildlife Program.

The impacts of the proposed project on fish resources are so small in extent, short-termed or localized that there is no reasonable likelihood of cumulative impacts with other existing, approved or proposed projects in the basin.

C. Wildlife (OAR 690-051-0210)

The Director makes the following findings regarding wildlife resources.

1. Dorena reservoir provides open water feeding areas for osprey (*Pandion haliaeetus*) and bald eagles (*Haliaeetus luecocephalus*), and resting areas for waterfowl. Shorelines are also used for feeding and shelter by small mammals, and by migrating shorebirds. Northwestern pond turtles (*Clemmys marmorata marmorata*) use project waters, and swallows nest and feed in the area. Riparian habitats immediately downstream of Dorena Dam provide nesting and feeding areas for songbirds; feeding and breeding areas for small mammals, reptiles, and amphibians; agricultural lands in association with riparian provide feeding and cover areas for deer, songbirds, and small mammals. Mixed conifer deciduous habitat around Dorena Reservoir provides cover, moderate microclimates, and forage and prey. Canopy trees and understory shrubs provide nesting habitat for birds, and habitat for small mammals, amphibians, and large mammals.

2. Within 1-mile of Dorena Dam, current Oregon Natural Heritage Program records show two sensitive wildlife species, the northwestern pond turtle and bald eagle. Symbiotics reported a spotted owl (*Strix occidentalis*) nest is found within ¼ mile of the dam. Additional sensitive species found in the Project vicinity include the western rattlesnake (*Crotalus viridis*), red-legged frog (*Rana aurora aurora*), and Yuma myotis (*Myotis yumanensis*).

3. The northwestern pond turtle is a U.S. Fish and Wildlife Service (FWS) species of concern and is listed by ODFW as sensitive critical. A population of pond turtles inhabits Schwarz Park Pond, a side-channel pond immediately downstream of the dam. These turtles may use the Row River when the main channel becomes warm late in the season.

4. The bald eagle is listed as threatened by the State of Oregon and the FWS. Two bald eagle nesting territories are known in the Dorena Reservoir area, and eagle roosting areas are also known in the reservoir vicinity. The nesting pair from Dorena Reservoir feed in the tailrace waters, and eagles are frequently seen hunting from trees in Schwartz Park Campground adjacent to the tailrace.

5. The northern spotted owl is listed as threatened by the State of Oregon and the FWS. According to information in the FLA, the ONHP records do not include the spotted owl as being within 1-mile of the dam. However, it is also reported that the home range for a pair of spotted owls encompasses Dorena Dam; with the nest reportedly over ¼ mile from the dam.

6. The red-legged frog has been documented to occur in three ponds used for breeding, located in the USACE's Lower Row management unit below the dam on the south side of the river.

7. In 1997, the USACE trapped bats night-roosting in the bridge below Dorena Dam. At least two Yuma myotis were captured, and 3 more were identified as either *M. yumanensis* or *M. lucifigus*.

8. The following measures will be implemented to protect wildlife resources in the project area.

> Replace all riprap and boulder habitats that are disturbed by project construction activities to restore reptile habitat.
>
> Complete construction in a timely manner to avoid prolonged disruption of wildlife in the area.
>
> Do not leave trenches or pits open overnight that might trap wildlife.
>
> To avoid unforeseen conflicts, communicate with local Oregon DFW biologists regularly during construction regarding the status of bald eagle and spotted owl nests in the project vicinity
>
> Develop and implement a plan in consultation with the USACE and Oregon DFW to minimize construction effects on western pond turtle.
>
> Limit construction activities in the transmission line corridor to avoid disturbance to denning western rattlesnakes.
>
> The applicant will comply with BLM guidelines for constructing the transmission lines within the Row River Trail right-of-way.

9. In a Letter of Concurrence, September 6, 2007 (page 6), the U.S. Fish and Wildlife Service concluded that

> "Based on the Project description and including the PDFs proposed on behalf of the applicant, the Service concurs that the proposed action may affect but is not likely to adversely affect the spotted owl. The Service bases this concurrence on the fact that intermittent noise associated with blasting and boring will be prohibited during the critical spotted owl nesting season. Other disturbance associated with construction and operation of the facility would not significantly disturb spotted owls due to the distance to the nest site and intervening topography. Additionally, the proposed action will not remove or alter critical habitat for the spotted owl and therefore will have no effect on spotted owl critical habitat."

also on page 9 of the letter,

> "Based on the above Project description, and including the bald eagle protective PDFs committed to by the applicant, the Service feels that sufficient protection has been provided to bald eagles to conclude that the proposed action is not likely to adversely affect the bald eagle. The Service bases this decision on the fact that daily restrictions on potentially disturbing construction activities during the critical nesting season for bald eagles will allow foraging to continue during that period when bald eagles are actively feeding young birds in the nest and are most susceptible to harassment. Avoiding instream work during the nesting season, and loud intermittent blasting and boring from March 1 through June 30 will also

facilitate undisturbed foraging opportunities at the construction site. No bald eagle habitat, nest trees, or roosting sites will be impacted by the proposed action."

Letter of Concurrence from U.S. Fish and Wildlife Service on ESA Consultation -September 6, 2007. http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20070906-5083

Based upon the above findings, the proposed use is found to be consistent with the standards on wildlife resources OAR 690-51-0210 as follows.

(1) The location, design, construction or operation of the proposed project will not jeopardize the continued existence of animal species which have been designated, or officially proposed as threatened or endangered by the U.S. Fish & Wildlife Service, NMFS or the 1973 Endangered Species Act, or by the Oregon Natural Heritage Data Base, or by ODFW.

(2) The location design, construction, or operation of the proposed project will minimize adverse impacts on wildlife habitat, nesting and wintering grounds, and wildlife migratory routes.

(3) Project construction methods and scheduling will minimize disruption of wildlife and avoid premature or unnecessary land clearing in the project vicinity.

(4) Unavoidable adverse impacts on wildlife or wildlife habitat will be mitigated in the project vicinity by removal of noxious weeds, restoration of natural vegetation, and improvements in wildlife carrying capacity by restoring more than 3 acres of land for less than 0.2 acre that is being taken out of wildlife habitat.

(5) The project is consistent with applicable ODFW management programs.

(6) The project is consistent with the provisions of the Northwest Power and Conservation Council's Columbia River Basin Fish and Wildlife Program and the Northwest Conservation and Electric Power Plan.

The impacts of the proposed project on wildlife resources are so small in extent, short-termed or localized that there is no reasonable likelihood of cumulative impacts with other existing, approved or proposed projects in the basin.

D. Plant Life (OAR 690-051-0220)

The Director makes the following findings regarding plant resources.

1. A vegetation mitigation plan will be used to manage the 134,000 square feet of land used as staging areas. Revegetation in this area will be significantly larger than the small area of land displaced by the powerhouse and penstock. The plan will add contiguous habitat from the river to the woodlands which would benefit blacktailed deer and northwestern pond turtles. Management goals include: erosion control, habitat for native plants, wildlife habitat, and visual aesthetics. Symbiotics will replant big leaf maple and black cottonwood trees to replace any removed during construction.

2. A weed management plan will be implemented to prevent transport of weeds to and from the project area during construction, to prevent noxious weeds from becoming established on disturbed soils, and to provide long-term protection from weeds by establishing healthy native plant communities within the project area.

3. The applicant will comply with BLM guidelines for constructing the transmission lines within the Row River Trail right-of-way.

Based on the above findings, the proposed Project is found to be consistent with the standards for plant life OAR 690-51-0220(1) and (2) as follows.

The location, design, construction or operation of the proposed project will not jeopardize the continued existence of plant species which have been designated, or officially proposed as threatened or endangered by the U.S. Fish & Wildlife Service, the 1973 Endangered Species Act, or in the Oregon Natural Heritage Data Base.

The impacts of the proposed project on plant resources, or on threatened or endangered or limited species are so small in extent, short-termed or localized that there is no reasonable likelihood of cumulative impacts with other existing, approved or proposed projects in the basin.

E. Recreation (OAR 690-051-0230)

The Director makes the following findings regarding recreation resources.

1. Schwarz Park is located on the south bank of the Row River across from the proposed powerhouse. The powerhouse will be made of colored concrete in order to blend with the adjacent concrete wall and rock rip-rap. A large portion of the powerhouse will be hidden behind an existing concrete retaining wall to substantially avoid visible or audible intrusion on the natural setting.

2. The proposed transmission line will be buried from the powerhouse to an existing power pole on the southern edge of the Row River Trail (approximately 500 feet) in the vicinity of Dorena Dam. The powerline will then be elevated above the Row River Trail in the same location where power lines currently cross over it.

3. No changes will be made in the water releases from the dam as a result of Project operations. Therefore, no recreation activities downstream from the stilling basin of the dam will be affected by the Project.

Based upon the findings above, the proposed use is found to be consistent with the standards for recreation OAR 690-51-0230.

(1) Project facilities will be designed, located and operated to substantially avoid visible or audible intrusion on the natural setting integral to existing recreational facilities, activities or opportunities.

(2) The proposed project will not reduce the abundance or variety of recreational facilities or opportunities available in the project vicinity.

(3) Unavoidable adverse impacts on nonwater-dependent recreation facilities, activities or opportunities will be mitigated in the project vicinity by providing replacement facilities or opportunities of the same or similar nature and abundance.

(4) The project will not have significant adverse impacts on any unique, unusual or distinct natural feature which provides the focus or attraction for non water-dependent recreational facilities or activities.

(5) Unavoidable adverse impacts on any water-dependent recreational opportunity will be mitigated with replacement by or enhancement or another water-dependent recreational opportunity available in the project vicinity.

(6) The proposed project will not cause the loss of or significant adverse impact to any water-dependent recreational opportunities of statewide significance.

(7) Adverse impacts on any specific elements, such as flow regime, length of reach, access, season of use, degree of difficulty, of a water-dependent recreational opportunity of statewide significance, will be offset by enhancement to other element(s) of the same water-dependent recreational opportunity in the project vicinity.

No cumulative effects on the abundance or variety of recreational facilities or opportunities available in the vicinity of Dorena Lake are expected from the Project. The impacts of the proposed project on recreation are so small in extent, short-termed or localized that there is no reasonable likelihood of cumulative impacts with other existing, approved or proposed projects in the basin.

F. Historic, Cultural, and Archaeological Resources (OAR 690-051-240)

The Director makes the following findings regarding historic, cultural and archaeological resources.

1. The Oregon State Historic Preservation Office (SHPO) established an area of potential effect (APE) for the Dorena project in early summer of 2005. A Cultural Resource Assessment Survey (CRAS) was completed in October 2004. The CRAS identified no archeological sites or traditional cultural properties with the Project's APE that would be displaced by project construction or operation. (Application pg 20)

2. A Determination of Eligibility (DOE) was conducted to consider whether Dorena Dam was eligible for the National Registry of Historic Places. A consultant reviewed that project and concluded that the project was eligible, and that the " modifications are either below grade or are designed in a visually compatible fashion with the property's historic design." On October 20, 2005, SHPO concurred that Dorena Dam was eligible for inclusion on the National Registry as a part of a historic district, and that the project would result in a finding of "No Historic Properties Adversely Affected."

Based upon these findings, the proposed use is found to be consistent with the standards for historic, cultural and archaeological resources OAR 690-51-0240.

(a) The project will not result in significant adverse impact(s) on any historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places.

(b) The project shall comply with state laws to protect Indian graves (ORS 97.740-97.760), historical materials (ORS 273.705-273.711, and archaeological objects and sites (ORS 358.905-358.955).

(c) Unavoidable adverse impacts on historic, cultural and archaeological resources will be mitigated in accordance with generally accepted professional standards; and

(d) Archaeological data of significance associated with a site not eligible for inclusion in the National Register of Historic Places will be recovered in accordance with generally accepted professional standards.

The applicant has consulted with SHPO, the State Legislative Commission on Indian Services and appropriate Indian Tribes about historic and cultural resources.

The impacts of the proposed project on historic, cultural or archeological resources are so small in extent, short-termed or localized that there is no reasonable likelihood of cumulative impacts with other existing, approved or proposed projects in the basin.

G. Land Resources (OAR 690-051-0250)

The Director makes the following findings regarding land resources.

1. The project will not be located in an area of prime forest lands, high value or important farmlands, agricultural lands, or wetlands. It is in an area that was previously disturbed during the construction of Dorena dam. The project area is dominated by invasive plant species and shallow soils (Application pg 21).

2. Oregon Department of Forestry reported (Dave Degenhardt, 9/9/2005) there would be no forest land effects from this project.

3. The project shall be designed to avoid or minimize adverse impacts on outstanding scenic and aesthetic views and sights. The powerhouse will be made of colored concrete in order to blend with the adjacent wall and rock rip-rap. The proposed transmission line will be buried from the powerhouse to an existing power pole on the southern edge of the Row River Trail. The completed transmission lines will cross the trail where power lines currently cross over it (Application pg 17).

Based on implementation of the mitigation measures in Section IV A through D and those required by resource management agencies, the proposed Project is found to be consistent with the standards for land resources OAR 690-51-0250.

(1) No adverse impacts on high value or important farmlands or agricultural land as identified in OAR Chapter 660, Division 33, are expected from this project.

(2) No adverse impacts on prime forestlands as defined by the city or county and by the Oregon Forestry Department are expected from this project.

(3) Adverse impacts on wetlands as defined by OAR 141-085-0010(20) or identified by the Oregon Natural Heritage Data Base will be avoided, minimized, or offset by acceptable mitigation.

(4) Project facilities shall be designed and located to avoid or minimize adverse impacts on:
(a) Outstanding scenic and aesthetic views and sights inventoried in city and county comprehensive plans as required by Statewide Planning Goal 5; and
(b) Scenic and aesthetic resources identified by state or federal agencies as outstanding, significant or deserving special protection.

(5) Project facilities will be designed and located to blend with adjacent features.

(6) Mechanical noise caused by the project will comply with applicable noise standards in OAR Chapter 340, Division 35.

(7) The location, design, construction or operation of the project will not a) disturb fragile or unstable soils; or b) cause soil erosion which would impair other water uses. A soil erosion control plan will be implemented during construction, and a vegetation management plan shall be in place during construction and throughout the term of the operating license.

(8) Design, location, construction and operation of the proposed project will avoid or minimize adverse impacts on natural communities or geological features identified by the Oregon Natural Heritage Data Base as threatened or endangered in Oregon.

(9) Project facilities located in geologically unstable areas shall be designed with appropriate safeguards to meet the dam safety guidelines of the USACE.

(10) Project facilities shall be designed in conjunction with the USACE to meet appropriate safety standards with regards to geological hazards and naturally occurring conditions or hazards, such as flooding or ice formation. The project shall be designed to withstand damage and allow reasonable access for project maintenance or operation under such conditions.

The impacts of the proposed project on land resources are so small in extent, short-termed or localized that there is no reasonable likelihood of cumulative impacts with other existing, approved or proposed projects in the basin.

VI. ULTIMATE FINDINGS

1. Application HE 559 is a proposed hydroelectric project on an existing dam in the Willamette basin.

2. Mitigation measures for the proposed project's design, construction, and operation will result in the impacts of the proposed project being small in extent, short- termed or localized. (Sections IV A through C).

3. The Director has consulted with the agencies listed in OAR 690-051-0060 regarding the cumulative impacts on the resources listed in OAR 690-051-0190 thru– 0250. (Section V).

4. Mitigation measures for habitat enhancement and resource protection (Section IV D) will offset impacts of the existing dam and help to restore, enhance or improve anadromous fish populations in the Row River system.

5 Because of its location on the Row River, the proposed project including its required mitigation measures will have only localized impacts on natural resources in the basin. (Section III).

VII. CONCLUSIONS OF LAW

1. Since there are other existing and proposed hydroelectric projects in the Willamette basin, there is a rebuttable presumption of a potential for cumulative impacts. ORS 543.255; OAR 690-51-290 (1)**.**

2. The impacts of the proposed project on water resources, fish resources, wildlife, plants, land resources, historical, cultural and archaeological resources are so small in extent, short-termed or localized that there is no reasonable likelihood of cumulative impacts**.** The presumption of a potential for cumulative impacts has been rebutted. ORS 543.255;OAR 690-51-290 (1).

3. A consolidated review of all pending hydroelectric projects in the basin is NOT required.

4. The applicant must demonstrate in a contested case hearing that the proposed project will not impair or be detrimental to the public interest.

VIII. PROPOSED ORDER

Based upon the above findings and conclusions, the presumption that the proposed project may contribute to cumulative impacts with other existing, approved or proposed hydroelectric projects in the same river basin is rebutted and a consolidated review is not required.

Issued September ____, 2008

_____
DWIGHT W. FRENCH, Administrator of Water Rights & Adjudications
{For}
PHILLIP C. WARD, DIRECTOR
Water Resources Department

IX. PROTESTS

Any person may protest this proposed order and request a hearing as provided by the Administrative Procedures Act, Oregon Revised Statutes Chapter 183 by filing a protest and request for hearing by **October 30, 2008**. A protest must be in writing, accompanied by a fee of $350, and received at the Oregon Water Resources Department by **5 p.m.** on **October 30, 2008**. ORS 536.050(1)(j). Persons may mail or deliver protests and requests for hearing to:

Mary Grainey
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

Any person may be represented by legal counsel at the hearing. Any person requesting a hearing will be notified of the time and place of the hearing and given information on the procedures, right of representation and other rights of parties relating to the conduct of the hearing before the commencement of the hearing. Any hearing will be held by an administrative law judge from the Office of Administrative Hearings.

If you do not request a hearing within the time specified in this notice, or if you withdraw a request for hearing, notify the Department or the administrative law judge that you will not appear or fail to appear at a scheduled hearing, the Director may issue a final order. If the Director issues a final order by default, the Director will designate the Department's file on this matter as the record for the purpose of proving a prima facie case upon default.

For Further Information Contact: Mary Grainey 503-986-0833, Mary.S.Grainey@wrd.state.or.us .

ATTACHMENT 1. COMMENTS

Modifications have been made to the findings in the final order in response to the following comments.

1. May 5, 2008

Oregon Water Resources Department
Attention: Mary Grainey
Subject: Protesting the proposed Hydro Electric Power Plant at Dorena Lake
Dear Mary,
I am writing you to protest the proposed Hydro Electric Power Plant by Symbiotics LLC at Dorena Lake. My name is Gene Cardle and I live three miles up from the lake on the Row River. My address is 36953 Shoreview Drive, Dorena, OR 97434. Listed below are the reasons I feel that the Hydro Plant **SHOULD NOT** be built.

1. I am an avid fisherman and I fish Dorena Lake regularly for largemouth bass. By the way in case you didn't know Dorena Lake is listed as one of the top bass lakes in Oregon and known for the **BIG BASS** that populate the lake. The company that is proposing the Hydro Plant, Symbiotics has stated that there is no need to install fish screens to prevent the fish from being sucked into the pipe and chewed up in the big turbines that they propose to generate electricity. I strongly disagree with that decision. First of all the turbines will be running when the Army Corp of Engineers draw the lake down to a minimum pool starting in September through March. At the time the fish will all be in the lowest water level and be very susceptible to being sucked into the turbines. This action will decimate the bass population and ruin the great fishery that Dorena Lake is. Numerous bass clubs throughout the state of Oregon regularly schedule bass tournaments at Dorena and I'm sure they will all agree that they would not allow any company to build the Hydro Plant that would kill the fish in the lake.

2. Dorena Lake already has high levels of **Mercury** from all the mines up the Row River that have been polluting the river with **Mercury** and other heavy metals for years. Because of high **Mercury** levels found in the fish that populate Dorena Lake, the ODFW recommends not eating any fish or maybe a fish a week. All the bass clubs that fish the lake practice "catch and release" thereby making sure there will be plenty of fish left for the generations to come. Over the years the **Mercury** has settled in the bottom of the lake near the dam. Symbiotics plans to install a huge diameter pipe on the bottom of the lake near the dam. When the Hydro Plant is operating the turbines will suck in the water through the huge pipe, which in turn will suck in all the **Mercury** that has settled in the bottom of the lake and discharge the water right back into the Willamette river system. This will have a devastating effect on the fish in the river and the humans who eat the fish. Presently there are two pairs of nesting Bald Eagles and numerous Osprey that live on the lake and who regularly eat fish from the lake and river. With the excessive amount of **Mercury** being released from the Hydro Plant operation these birds and other wildlife will be subject to being poisoned from the **Mercury**.

3. When FERC published the **D**raft **E**nvironmental **A**ssessment last year there was a very disturbing fact revealed on page 82, item A. Under the heading of "Power and Economic Benefit of the Proposed Project", the last line states " Therefore at current power values the project power would cost $287,650, or 16.44/MH more than the likely cost of alternative sources of power. In laymen turns they are saying that it will cost more to build the Hydro Plant than what revenue they will receive on generating the electricity. Why would any company want to build a Hydro Plant or anything else knowing that they will be loosing money from the start. Well I will now explain why Symbiotics, knowing the project will be built at a loss is so eager to push FERC for the permit approval. A few years ago the Federal Government encouraged power companies to build more "green friendly projects" like a Hydro Plant. In turn the Federal Government would issue the power companies "GREEN CREDITS" to offset the "BAD CREDITS" they received from the E.P.A. for the polluting coal fired plants they operate. In 2001 Symbiotics submitted numerous applications to build Hydro Plants in Oregon, Washington, Idaho and other states with the intent of selling these permits to the highest bidder from the power companies for millions of dollars. In the Dorena Hydro Plant Project the bidder will be Pacific Power. Pacific Power have some of those polluting coal fire power plants in Wyoming and other states and will build the Hydro Plant at Dorena at a loss just to receive the "GREEN CREDITS" from the Federal Government. We must stop the "GREED" of these corporations from profiting at the expense of all the citizens of Lane County and other Oregon communities who frequent Dorena Lake for fishing and recreation.

   I urge you, Mary and the other members of the Oregon Water Resources Department to deny Symbiotics LLC from building the Hydro Plant at Dorena Lake.
   Thank you for letting me voice my opinion and I would appreciate a response from you.

   Best Regards,

   Gene Cardle

RESPONSE: (1) Big Bass It is not expected that fish populations in the reservoir will change as a result of the project. The project intake will be located at the same depth as the existing outlet structure and will include a trash rack so that large fish, that may be at the same depth of the reservoir as the intake, will be excluded from entering the pipeline.

(2) Mercury Modeling studies performed by the Applicant indicate entrance velocities to the penstock will not exceed 0.3 fps near the reservoir floor under maximum flow conditions. The Applicant indicates that penstock inlets operating under similar conditions at similar projects result in no measurable scour to reservoir sediments. ODEQ does not expect that this low velocity, expected only under conditions of maximum capacity turbine operation, would be sufficient to cause sediment scour adjacent to the new intake structure. However, ODEQ considers it appropriate to monitor turbidity during operation to confirm this expectation and require corrective modifications if scour and excessive turbidity is identified.

Sampling data confirm the presence of mercury in surface water, sediment, and fish tissue in the Row River watershed. Water sampling data indicate total recoverable mercury levels in Dorena

Lake exceed the mercury TMDL water column guidance value of 0.92 ng/L. The primary source of mercury present in the Row River watershed appears to be from historical mining activities performed in the drainages of tributaries located upstream of Dorena Lake.

Activities proposed by the Applicant do not result in the use or discharge of mercury to surface waters.

In correspondence dated May 25, 2007, the Corps reiterated its authority over operation of the dam. Should a FERC license be issued, the Applicant may utilize only that water not otherwise used by the Corps to meet federally-authorized project objectives. Furthermore, activities proposed by the Applicant do not impact water quality upstream of the dam. Symbiotics is not responsible, therefore, for the quantity or quality of the water released from the dam and received by the Project.

For this reason, ODEQ is reasonably assured that operation of the Project will not impact the level of mercury downstream of Dorena Dam. "(pg 48, ODEQ Evaluation and Findings Report, Jan 2008.)

(3) Green Credits The State of Oregon also encourages the development of "green" energy projects. This project must be constructed and operated to meet the environmental resource standards of ORS 543. This project includes a fish habitat restoration and enhancement fund for mitigation and enhancement projects above and below Dorena Dam on the Row River. It is the intent of the State to continue managing the fisheries resources for benefit of Oregonians.

2.
From: Chuck and Mary Lang [chuckandmarylang@msn.com]
Sent: Tuesday, May 06, 2008 7:31 AM
To: Mary Grainey
Subject: Dorena Lake FERC Project # 11945

Ms. Grainey,

Thank you for accepting comment on the proposed Hydro Plant at Dorena Lake.

Recent events at the Willow Valley Res. near Heppner Or. have shown us that schedules of water draw-downs have a huge influence on the successful reproduction of fish and recreational uses of a lake. Historic values are easily waved by the greedy when profits are possible. Oregon is not adding lakes to it's inventory of places families can go to enjoy the outdoors. I urge you to reject project # 11945 that would surely reduce the inventory even future. Please save something for our kids.

Chuck Lang,
Prineville, Or.

RESPONSE: The construction of a hydroelectric project at the Dorena Dam is not expected to impact the lake above the dam in terms of its filling or water releases. The U.S. Army Corps of Engineers will continue to operate the dam for flood control, irrigation, water-based recreational needs, and improved navigation objectives downstream of the dam as part of its 13 dam Willamette

Project and ongoing water management strategies as defined in biological opinions by the federal agencies.

3.
From: Lonnie Johnson [damaro@budget.net]
Sent: Tuesday, May 06, 2008 8:45 PM
To: Mary Grainey
Subject: Dorena Lake Hydro Project
Dear Ms. Grainey,

I understand you are accepting public comment on the hydroelectric project proposed for Dorena Lake. I represent approximately 350 bass anglers in southern Oregon who fish Dorena Lake as a destination for both tournaments and fun fishing. After considerable polling amongst our members, it has become clear that we do not wish to have FERC Project #11945 go forward. We feel it will be devastating to the fishery, and will only serve to line the pockets of a few. We would most heartily urge you to reject this proposal.

Thank you for your time and consideration.

Lonnie Johnson
Oregon Black Bass
Action Committee

RESPONSE: As above, the construction of a hydroelectric project at the Dorena Dam is not expected to impact the lake above the dam in terms of its filling or water releases. The U.S. Army Corps of Engineers will continue to operate the dam for flood control, irrigation, water-based recreational needs, and improved navigation objectives downstream of the dam as part of its 13 dam Willamette Project and ongoing water management strategies as defined in biological opinions by the federal agencies.

It is not expected that fish populations in the reservoir will change as a result of the project. The project intake will be located at the same depth as the existing outlet structure and will include a trash rack so that most large fish that may be at that depth of the reservoir will be excluded from entering the intake pipeline.

4.

BEFORE THE OREGON WATER RESOURCES DEPARTMENT

A response to:

Cumulative Impacts Review
For Hydroelectric Application He 559
At Dorena Dam
Symbiotics LLC , Applicant

Submitted by Coast Fork Coalition
Prepared by John Steele

5/11/08

We contend that the hydroelectric project proposed on Dorena Reservoir will cause cumulative impacts with other existing, proposed or approved hydroelectric projects in the Willamette River Basin. This position is based upon facts of current data collected by the applicant and others during the application process plus other published studies conducted in this area. These data also support the termination of this project by not meeting the criteria set forth by the NWPPC's Columbia River Basin Fish and Wildlife Program and the Federal Clean Water Act.

The given parameters of OAR 690-51-200 (1) (a), {The project facilities and operations will not have significant adverse impacts on fish populations}, will be violated. The violations occur within these categories; increased sediment movement downstream, increased mercury transportation, DO reduction, and increased temperature of downstream project outflow. Due to severity of these violations other OAR guidelines will be noncompliant due to inability of any know mitigation procedure. For example, OAR 690-51-200 (2) (a){A project, any part of which is located on a river or stream,…….shall include mitigation measures which: (C){Will prevent a net loss to individual species of wild game fish;} and (D) {Will prevent conversion of a wild game fish population and fishery to hatchery dependent resource;}. Also, from conversations with the local sport fishing people in this area regarding the existence of a steelhead population within a mile downstream of Dorena Dam, the following guideline(s) are in violation: OAR 690-51-200 (3) (b) (A) and (B).

Increased Sediment Transportation:

The current design of this project will increase the amount of sediment transport and a subsequent increase in mercury transportation downstream from Dorena dam. This is an issue to be taken into account to the fullest extent possible and to avoid any violate of state and federal laws. Our reasons are as follows.

1. It is a general agreement that any closure of any one of the existing floodgates allows sedimentation to occur on the lakeside of the floodgate. This is substantiated by observing extremely high levels of turbidity occurring during initial periods of high flow. This occurs during any increase in ramping rates but is particularly obvious in situations where floodgates have been previously closed for a period of time. This is easily observed during the high flow rates during late fall and into February.

The pictures below were taken from the top of Dorena Dam spillway looking straight down at the water surface above the floodgates on the lakeside of the dam. In the ten days prior, there was only one floodgate open and now all five floodgates are open. The pictures show (better in color than black and white) a brown sediment cloud forming due to the extreme scouring taking place. Notice that this sediment cloud is coming from bottom sediment not from any existing sediment currently suspended in the water column. We think it is important to distinguish between the different sources of sediment that are moving through the floodgates. Eventually, the flow rate and water depth caused a whirlpool effect moving floating debris and trash in a circular motion on the top layer of this sediment cloud.

Notice the clarity of the water near the edge. One can see sunken debris on the lake bottom at about a depth of two feet. The sediment cloud is about 15 feet from the shoreline.

2. If one increases the time either a penstock or floodgate is closed, one has increased the amount of sediment available to be washed through the opening. (This will be a very important point to consider when we examine the frequency of opening and closing of both penstock and floodgates. The details of this frequency will be discussed below)
3. Extreme debris accumulation occurs in the proposed penstock location due to the following;
-Prevailing wind direction especially during storms will move debris toward the spillway,
-Water flowing through existing floodgates moves debris into the general vicinity,
-The affect of the extreme slopes of the lake bottom from both sides of the spillway abutments,
-The gravitational forces in combination with wave action and dropping water levels. All of these will push debris toward the floodgate locations and proposed penstock location. The following picture shows both the extreme slope of the lake bottom in the vicinity of the floodgates and the proposed penstock location. It also shows large accumulation of debris on the far (south) side abutment lake edge, which is in the upper left corner of the photograph. Notice the two logs in the center of the photograph depicting the previously mentioned forces that concentrate debris in the floodgate intake channel.

4. The volume of water moving through the proposed penstock and existing floodgates is projected to follow the same historical flow rates/patterns/regime used in the past. However, the horizontal surface area in which the equivalent volume of water must now pass over has increased significantly. This horizontal surface, which could be debris or actual lake bottom, is a sediment resource that is scoured whenever an existing floodgate or proposed penstock is opened. By increasing the substrate surface area over which water flows, one will increase

sediment transportation downstream. By installing a new additional opening, (the penstock), one has increased the surface area for scouring and therefore will increase sediment transportation downstream. The applicant has offered a new design of the penstock inlet and claims the inlet water velocity is low enough not to cause sediment movement. It is my opinion that debris accumulation will occur over a (short) time period to a sufficient depth either horizontally (or completely covering the inlet) and therefore allowing sediment transportation to occur. In a different section we will discuss the new penstock inlet design.

5. If one could look vertically straight down on the proposed penstock location and the existing floodgates, one would notice the horizontal area around the penstock is somewhat circular in shape due to the penstock's location being in the center of this scouring area. The horizontal area around the existing floodgates is more rectangular in shape with the floodgates located on one long side of this rectangle. This is due to the fact that the penstock is located 100 feet away from the vertical lakeside wall of the spillway while the floodgates are at the base of the vertical wall of the spillway. Here, the penstock opening could have an area for sediment scouring approximately 1/3 to _ of the area available to the existing floodgates. Again, increasing the inlet's surface area available for scouring increases the sediment transportation.

6. Lets consider the frequency of opening and closing of the penstock and existing floodgates under the current penstock design and location. Knowing the maximum flow rate capacity of the proposed Kaplan-type turbine is 812cfs and the minimum flow rate capacity causing the Francis-type turbine to shut down (and the penstock closing) is at 260cfs. Using the graph on page 28 of the FERC proposal, we have marked the location where either floodgates or a penstock is opened or closed due to these benchmarks of 812 and 260cfs. At each numbered location, I will describe the current condition of both penstock and floodgates. (Please turn to the next page).

storage of approximately 72,000 acre-feet) by the middle of May. On average, the reservoir is kept at full pool until the beginning of August. From August to November, the lake is drained to the 735-foot NGVD elevation.

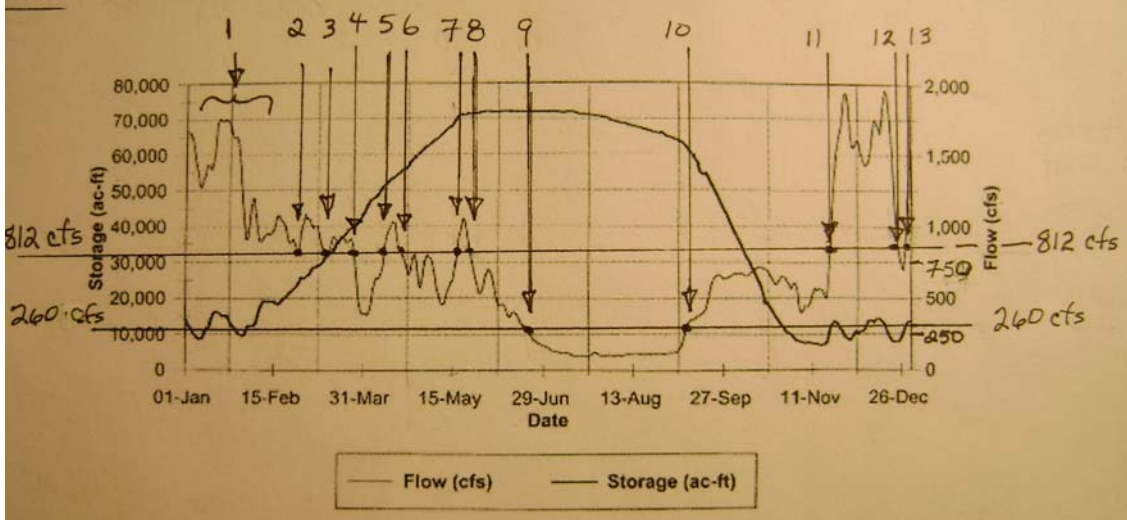

Figure 4. Average daily storage for Dorena Lake from 1990 to 2002. Average daily outflows for the same period measured at USGS Gage No. 14155500 near Cottage Grove, Oregon. (Source: ERI and NW Power Services, 2004a, as modified by staff)

First let's notice this graph comes from FERC application, September 1,'06 page 28. The handwritten numbers at the top of this graph are highlighting the intersections of flow rates (cfs) to horizontal lines of the maximum 812 cfs and the minimum 260 cfs for the turbine facility. In the #1 area, the flow rate is high enough to meet the maximum level of the turbine and the excess flow is diverted through the existing floodgates. As the flow rate decreases, some of the existing floodgates are being closed and sediment naturally accumulates in front of these gates. As we reach the flow rate at position # 2, all existing floodgates are closed (allowing sediment to accumulate in front of all such gates) and only the penstock is open. As we move across the graph, the increase in flow rate causes the existing floodgates to be opened. Upon this opening, a large initial 'slug' of sediment is transported downstream due to the fact that all floodgates have been previously closed.

A similar situation occurs over the following positions numbered 3 through 13 whereby all existing floodgates are closed for a period of time and then opened. This occurs between the numbers 4&5, 6&7, 8&9, 10&11, 12&13. Notice the span of time is getting longer in which all the existing floodgates are closed (except for positions 12&13). The longest time period occurs between the set of numbers 10&11. It covers a time period of approximately 2 months. (Actually, the calculation comes out to 77 days.) As you increase the time of complete floodgate closure, you increase the large initial 'slug' of sediment transport downstream upon opening those gates. It is true that the current operation of the floodgates causes the same affect during changes in flow rate. This is easily observed in the river. High flow rates will initially have high sediment transportation and after a period of time, anywhere from 1 to 3 days depending on the time of year, sediment

concentration will decrease even though the flow rate has remained constant. However, the current affect is much smaller because there is at least one floodgate that is always open. By using the above graph and measuring the time interval in which all existing floodgates could be closed, it calculates out to be approximately 0.449 of a calendar year or approximately 5 months and 3 weeks. This would have a substantial negative impact on the existing (known and unknown) fish populations by increasing the size of initial 'slug' of sediment downstream and the frequency in which it would occur. As one would expect, mercury transportation downstream would also increase.

According to this graph of averaged flow rates, the penstock only closes and opens once a year at positions 9&10. (Please note in item # 7 below we quote data from the FERC document denoting a flow rate below 250 cfs that would cause an additional penstock closure). However, the time span it is closed is approximately 2 months. Once again, with the circular area available for scouring being larger than an individual floodgate, another 'slug' of sediment will be transported downstream upon its opening.

After looking at the individual critical points of sediment movement and gate operations, we need to consider how these can cause a greater problem when sequenced together. Consider the extensive changes in sediment accumulation in front of the existing floodgates by the fact that all existing floodgates will be closed for a sum total of ~ 5 months, 3 weeks. Out these 'closed periods', two of the longest time periods occur on either side of the time period where only one floodgate is typically open during late June through August. On the picture above, the intervals of 8&9 and 10&11 represent the time periods where all floodgates are closed and the interval of 9&10 represents the time interval where one floodgate is open. If you look at the total number of days where the floodgates are completely closed it is approximately 106 days and add this to the number of days where only one floodgate is open, ~79 days, we have ~185 days of continuous sediment accumulation taking place in front of the floodgates. The sediment accumulation in this period would be greater than the typical sediment accumulation that now occurs during the months of late-June and August. As the winter rains begin, the typical increase in flow rates starting in late November will necessitate several floodgates to be opened that were previously closed. The following winter season will experience the largest sediment transport that has ever occurred at Dorena Dam. These 'slugs' of sediment will have a negative impact on all downstream biological systems. We need comprehensive data on Dorena Dam regarding the 'slug' sediment transports during the winter months in terms of tonnage and total mercury concentrations. Remember, August has the third highest turbidity measured in Dorena Reservoir that may further augment the sediment accumulation during this time period. (see turbidity chart on page 34, 401 document). . Note the ODEQ's turbidity criterion is to operate below a 10% increase in turbidity. We anticipate this to be easily exceeded.

7. Sediment transport through the Dorena dam is a complex issue. It is highly dependent upon many factors. By just considering the time of year, you can vary your data results. For example, in the data presented by FERC on page 33 of the DEA, (Sept. '06) shows a flow rate of "…under 250 cfs" occurring during March. This would have caused a shut down of the turbine thus creating another interval of sediment accumulation not depicted by the above graph. This is a good example of how average data will not tell us the complete information about total sediment transport downstream.

During slow flow rates during June through August, sediment accumulation in front of the floodgates is significantly higher this time of year. After this accumulation, high flow rates and especially high ramping rates during November through the beginning of February you find

the greatest amount of sediment transport for the entire year. The variation in ramping rates alone can vary sediment movement downstream. The faster the ramping rate, the more sediment movement will occur. Once a higher flow rate is established, the sediment transport will slowly decreased to a fixed level while the flow rate is unchanged. Again, change the time of year to late February through the end of May and all these factors have a different impact on sediment transportation. The reduction of sediment from the frequent scouring affect caused by alternating high and low flow rates is largely completed by the first of February. After this time, any increases in the flow rate will have a comparatively decreased, yet still significant, sediment 'slug' transport. As you would expect, these parameters in various combinations create variations in sediment transportation. Coupled with these variations of time period, ramping rates and flow rates there are three other factors to be considered. The number of gates opened, how long a gate (or gates) has been closed, and any unusual sediment transport into the reservoir by water sources flowing into the reservoir. Clearly, any data collection now and in the future must take these factors into account.

8. These factors would help to explain the statement on FERC's September 1, '06 document page 26: "Regardless of the exact mechanism, it is clear that other mechanisms besides large flow events, precipitation, or bank disturbance are at play relative to fine sediment deposition on spawning areas." Here, the confusion is the presence of a fine sediment deposition observed during an October sample activity and it was not observed during March or August sampling times. The complexity of sediment transportation due to the variation in physical factors discussed previously might explain why the fine sediment is observed during one part of the year, the winter months, and not in the remaining part of the year. FERC's statement supports the need for better sampling techniques regarding sediment transportation.

9. At present, data on downstream sediment transport is inaccurate. Because of this, a multitude of conclusions and findings need to be re-evaluated. All of which need further study to establish a baseline of data to be used in this project and to clarify the ODEQ's TMDL study of mercury. This 'slug' affect would explain the variations in mercury loading in the Willamette River Basin. These efficiently flushed 'slug' phenomena would help to explain the source and the activity regarding sediment re-suspension throughout the WRB. At the same time, a well-flushed 'slug' of sediment would explain why relative low concentrations of mercury exist in downstream areas near Dorena dam. The power of high flow rates is easily observed by the effect it has on the riparian vegetation. During the winter and early spring months, the high flow rate will strip leaves and, in some cases even the thorns, leaving only a shortened battered main vine of a blackberry plant. This efficient scouring affect during high flow rates needs to be taken into account when evaluating data.

Mercury concerns regarding this project.

1. From the statement of the Willamette River Basin TMDL Project report page 8 (revised), "Because mercury is both contained in, and bound to, soil and sediment particles, there is a positive correlation between total mercury concentrations and TSS.." Knowing this correlation we are very concerned about how the proposed project transports mercury downstream. As mentioned in the sedimentation section, consider the extensive changes in sediment accumulation in front of the existing floodgates by the fact that all existing floodgates will be closed for a sum total of ~ 5 months, 3 weeks. Within this 'closed period', two of the longest time periods occur on

either side of the time period where only one floodgate is typically open during late June through August. As mentioned earlier, we have ~185 days (1/2 year) of continuous sediment accumulation taking place in front of the floodgates. The sediment accumulation in this period would be greater than the typical sediment accumulation that now occurs during the months of late-June and August. The winter season will experience the largest sediment transport for the year. These 'slugs' of sediment will carry larger quantities of mercury downstream than what is occurring now.

2. Recent sampling of mercury in the lake and below the lake is not comprehensive enough to predict outcomes or to establish a baseline of comparison for eventual project monitoring. The data in both fish samples and sediment samples vary considerably compared to past measurements by ODEQ and others. This wide variation is in contrast to findings by Amber and Hygelund (Oct. 7, 1999) that show " the general pattern is one of relatively constant input (of mercury) over time." If this is true, then why do we have such misalignment of data?

3. Let's consider the mercury found in sediment samples. The applicant's data on lake sediment is quite different from past data by Ambers in 2000. If you compare the applicant's data to the data collected by Ambers and Hygelund (Oct 7, 1999) you will find a significant variance in the two data sets. Amber's sediment core samples varied from 0.155 to 0.723 mg/kg. Their core sample values remained relatively constant with depth varying from 0.5 meters to 2 meters. Any changes in the concentration, "minor increases", were results from extensive period of flooding. In their discussion, there were no comments about decreases in the mercury concentrations. Their implied lower limit is 0.155 mg/kg. In comparison, the applicant's data of sediment samples collected in 2004 and 2005 ranged up to 0.07 mg/kg. It is disturbing to find such differences. Note, the applicant's upper value limit (0.07 mg/kg) is less than half of the lower limit (0.155mg/kg) of the Amber's findings.

4. In terms of sampling for mercury in fish tissue above and below the dam, the applicant's data has the same problem of not falling in the same range as previous sampling activities by ODEQ. For example, the applicant's results for fish tissue taken in the lake was an average of 0.16 mg/kg (whole fish) compare to ODEQ of 0.53 mg/kg, 0.23 mg/kg, and 0.64 mg/kg for years 1994,1995,2003 respectively.

Looking at numbers below the dam, they caught "likely" 3 year-old fish and got a sample of less than 0.2 mg/kg (whole body) compared to ODEQ's (2004) sample of 0.29 mg/kg. Again, poor sampling technique has occurred in both size and appropriate age of fish. If samples are compared with different age categories, the data will be skewed by the fact that older fish have higher concentrations of mercury. In some of these samples the age of the fish are unknown thus not comparable.

5. The missing data of actual amounts of mercury being transported through the floodgates is a major problem. ODEQ's method of monitoring the transport of mercury by looking at fish tissue concentrations is highly inaccurate (see latest TMDL report). As mentioned in item 4 above, sample characteristics of number of fish taken and age of fish measured are problematic. The same issue occurs when the data collected in the Coast Fork was compared to all other fish collected downstream in the Willamette River Basin (other than the Coast Fork). All such fish data was divided into four sets of data (page 19 revised final WRB TMDL report). By comparing the concentration of mercury in Largemouth Bass in the Coast Fork to the concentration of all other Largemouth Bass caught elsewhere in the Basin, (0.29 versus 0.43 mg/kg), ODEQ concludes that the mercury discharges from the upstream mining activities does not extend below the reservoirs into the main stem of the Willamette River (see page 19 of

revised TMDL report). By grouping the largemouth Bass into one group and not by age one cannot make this type of conclusion. Also, if you were to raise the same species of fish in two different concentrations of mercury, the tank with the greater concentration would always have the greater amount of mercury per liter of biomass. Consequently, the bass in the lower sections of the Willamette (this tank has the higher concentration of mercury) will always have a greater mercury concentration than the Coast Fork bass (tank of lower mercury concentrations). This is assuming that both systems are closed and stable. This is not the case with the Willamette River Basin. In this dynamic system, mercury releases from the Dorena and Cottage Grove Lake dams are not held within the system long enough to be bio-accumulated due to the flush of water at high flow rates pushing the 'slug' of sediment downstream. This larger concentration of mercury will be transported downstream and be available to the bass located in the remaining portion of the Willamette River Basin. This due to the differences in the speed of the current where the slower downstream speeds allow sediment deposition to occur. This will cause the downstream biomass accumulation values to increase accordingly and still give you the same result no mater how high the mercury concentration is found in the dam's outflow.

In these data there is no reference to the individual trends of biomagnifications within each set of data. For example, over time has the Coast Fork fish samples taken below the dams indicate any general increase in concentration? What about the remaining portion of the Willamette River Basin, does it indicate any increase or decrease and how does it compare to the Coast Fork trend? Again, we are assuming same species and age of fish (and sample type, whole or fillet) to adequately compare the data trends. Meanwhile, there is no clear explanation for the higher rate of bioaccumulation within Dorena compared to Cottage Grove even though Cottage Grove Lake has a higher concentration of mercury in the sediment samples.

6. FERC quoted some unpublished data (see page 21, September 1, '06 document) regarding TSS where input into Dorena Lake was measured at 31mg/L (upstream to the lake) and 24 mg/L at the spillway outflow. This about 80% of the TSS coming into the lake was leaving through the spillway on that particular day. (This seems reasonable considering the possible flow characteristics discussed in the sediment section of this response paper.) This TSS of 24mg/L calculates to about 10 tons of sediment per hour. Keeping this in mind with the Amber's findings of 0.155 to 0.723 mg/kg being constant with depth of the sediment sample. If one uses 0.155 mg/kg (the lowest concentration found in Amber's samples) and move this concentration out the spillway at 10 tons of sediment per hour which gives an unbelievable 3.921 kg/hr mercury load from Dorena Reservoir. Meanwhile, the estimated total load from both reservoirs is 3.2 kg/yr. Clearly, this calculation is making several assumptions and yet, one must remember, the sediment cloud being formed, (as seen on page 3), is sediment coming from the bottom of the lake. And at the same time, using the TSS of 24mg/L in the regression equation adjusted for the source load of Dorena and Cottage Grove Lakes, from of the final draft of TMDL report of Aug. '03 findings, one also gets strange results of 0.00008062 kg/day. This translates into 27,289 days would be required at the flow rate of 3950 cfs to reach the predicted annual mercury mean source load from Dorena Reservoir of 2.2 kg/yr. Obviously we need more information. More data need to be collected from the spillway outflow to determine the source and mercury concentration of the turbidity during an entire cycle of high water flow. Collecting data during a complete ramping up and down of the flow rate and during certain times of the year, one would obtain a complete picture of sediment and mercury transportation. Also, data needs to be collected from various locations and at various water levels to understand the composition or sources of sediment transport.

7. We believe Dorena Reservoir is transporting huge amounts of sediment downstream during the initial periods of high water flow. Once downstream, the associated mercury in the suspended solids are not permitted to settle out or form any significant concentration due to the continuing high water flow that continues to push this initial high sediment concentration downstream. As the flow continues out of the dam, its sediment concentration drops over time and the constant flow continues to push the initial 'slug' of sediment down the river and also picks up or re-suspends any other deposition along the way. This would help to understand the re-suspended sediment loads experienced downstream.

The implications of these data discrepancies and omissions are long reaching and critical. The long reaching aspects are focused around the accuracy of present day decisions and how this impacts all biological systems. The presence of trout, steelhead and (possibly) salmon spawning beds within a mile of Dorena Lake's floodgates will be the first casualty of this project. The quality and viability of all systems hang in the balance of such decisions based upon real data. These inaccurate data lead us to decisions that become critical life long mistakes whereby the biological systems never recover.

Dissolved Oxygen and Total Dissolved Gases Concerns

The comments/conclusions made by the ODEQ's 401 document actually supported our position. The comment (page 28), "the degree to which the Project will reduce DO concentrations is not known." Combined with the statement, "No data were collected to evaluate IDGO concentrations in gravels in affected reaches of Row River downstream of Dorena Dam," indicate problems of how one will make a clear ruling on this project. Without baseline data how will the ODEQ determine the Project's ability to comply with state and federal standards? This is not sound scientific methodology.

The statement, "With exception of DO and, potentially TDO, Project operations are not expected to significantly impact water quality criteria as addressed by the numeric and narrative standards…" is in conflict with the last sentence of ODEQ's evaluation, "Based upon on an evaluation of biological criteria, ODEQ is reasonably assured the Project…will not result in detrimental changes to the resident biological communities." We read these two statements in conflict with each other.

Are we that desperate for electricity to go to the extreme measures of using pure oxygen to augment the reduction of oxygen caused by this hydro project? Will this work? Has any other hydro project used this approach to solve a DO problem? What will it cost to raise the DO level enough to meet ODEQ standards? The expense and danger of pure oxygen would only further delay the break-even cost of this unprofitable project.

Again, we must protect, maintain, and improve these biological communities. We find the 401 report lacking data to support its findings and to monitor future project operations. Sound scientific methodology is needed to show this project will not impact downstream biological communities.

Concerns regarding temperature (and the new penstock design).

1. As originally stated in the application, the penstock was to be positioned at the same level of the existing floodgates in an attempt to mimic the exact same conditions of water flowing through the floodgates. This is quoted in the original FERC September 1,06 document and in the

401 document page 36. Having seen a sketch of the new penstock design (during a public hearing held on Dec. 20th?), those assumptions need to be reevaluated. The new design(?) has the penstock laying on top of the lake bottom with an inlet opening seven feet above the bottom of the 9 ft pipe (and thus 7 ft above the lake bottom) with the trash racks pointing upward slightly below the minimum pool level, see page 8 of application report for section 401. This gives an unclear picture of the exact elevation of the inlet opening of the penstock. In the sketch, the existing floodgates have a concrete retainment basin in front of them (on the lakeside) that slopes upward. Outside of this possible 'U' shape of the cross-section of the retainment basin, the surrounding area must gain some vertical elevation due to the vertical sidewalls of the retainment basin. To this unknown height we are going to add the vertical distance from the bottom of the penstock pipe to the top edge of the actual penstock opening, approximately 7 feet. This is probably an attempt to reduce sediment transportation through the penstock. Imagine standing on the bottom next to the 9 foot tall penstock pipe (visualize a 9 ft diameter pipe running 100 ft horizontally) with an opening cut out of the top at the 7 foot level. Mounted on top of the opening are screens that reach vertically 9.2 feet above the 7 foot level. (See page 36 of the Draft 401 findings, Dec. 07). Mentally set everything in motion: the amount of debris in this area, the swirling current activities from the high flow through the floodgates, (visualize a sink draining a basin of water in a circular motion containing some carrot peelings), the trash racks at a steep vertical angle acting like a debris catching nets all of which is slightly below the minimal pool level, and the continuous 9 foot vertical height along the lake bottom of the 100 foot pipe causing further obstructions (like standing next to a 100 foot long, nine foot high wall), you have got one of the best debris catching inventions of the century. As the height of accumulated debris quickly becomes equal to or greater than the lowest edge of the inlet opening, sediment will accumulate on the debris and be available for scouring through this new penstock design. What has been an attempt to prevent sediment transportation with this new design will net the same outcome as the previous design.

2. Having a clear picture of this new penstock design, we now have an issue with the 7 to 10 foot increase in elevation above the existing floodgates regarding the change in temperature. By using the data graph of temperature, we can look at water depth and see how temperature is depth sensitive during critical times of the year. The picture below is from page 23 of the draft 401 document.

conditions, downstream temperatures may increase during later months. Warmer temperatures in the Fall again conflict with cooler thermal regimes required during late season spawning periods of resident and anadromous fishes.

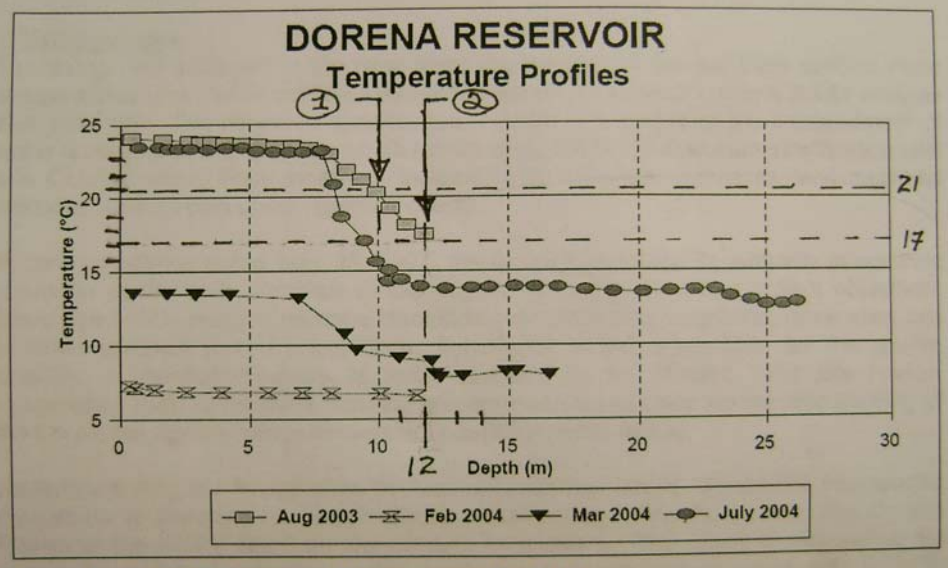

Figure 4 – Dorena Reservoir Temperature Profiles

During summer stratification, the measured depth of the epilimnion was approximately eight meters in thickness and ranged from about 23°C to 24°C. The survey results revealed a metalimnion extending down from the epilimnion to a depth of about 12 meters with temperatures decreasing to about 14°C in summer. It appears that the hypolimnion temperatures were cold year-round and seasonally ranged from 7°C to

It shows the temperature of four different sample times; August, February, March, and July. In the August and February data, it looks as if the deepest sample available (due to low lake levels) is about 12 meters of water. By the location of the three sample sites, I will assume is it is a representative 'average'(?) of the temperature strata found in similar locations near the floodgates. The graph of the August sample implies that going from a depth of 10 meters to a depth of 12 meters will change the temperature by 4 degrees centigrade. Note the handwritten numbers of 1 and 2 showing the temperatures of 21 degrees and 17 degrees at the corresponding depths of 10 and 12 meters. The difference of 2 meters could have the same affect (change of 4 degrees) with the new penstock design being elevated by 7 to 10 feet. This has serious implications on all biological communities downstream and assumptions made in the 401 draft document. Needless to say that the Row River/Dorena Dam is on temperature watch and this will cause further degradation of downstream biological communities.

In conclusion

The management history of the Willamette River Basin is a legacy of decisions and strategies that sometimes fall into a short-term solution perspective. We have come a long way from the early strategies where we erect dams as flood control devices and omitted fish ladders since salmon were thought to be permanently lost from the ecosystem. Here, the logic is that the fish population would never recover or never be re-established. Only to find out later after releasing extra salmon fry into Dorena Lake to augment the ocean fisheries, we found several salmon returning Dorena Dam only to die and litter the banks of landowners near the dams. And still today, salmon fry are being caught

in fish traps in the Coast Fork. Let us not forget the strategy of 'Augmented Flow' for solving the pollution problem in the Willamette River. Knowing the correct solution, we eventually took the big step and moved toward sewage treatment as the main strategy toward solving this problem. Next, we needed to respond to the dwindling salmon populations. Here, the environmental parameter of DO became the new focus of our attention as an indicator whether or not salmon might pass through Willamette Falls.

We appreciate the clarity of the statement in the TDML report on page 3, "However, because these estimates are derived from different data sources, with differing degrees of uncertainty, and with differing degrees of robustness, they should be seen as only an initial view of mercury movement in the Basin and as a point of departure for further information gathering and analysis." Without accurate data, the ODEQ's draft 401 report cannot claim that the project will not have any impact on the water quality downstream of Dorena Dam, (page 44 of Draft 401 report). ODEQ's inaccurate assumption of unchanged water quality parameters will negatively impact all downstream biological communities and specifically endanger the excellent spawning beds below Dorena Dam.

As we move forward, what is the parameter we are not seeing? What is the assumption or strategy that we are about to use to cause further loss of habitat? What if we make decisions based upon inaccurate data? Will decisions be made upon real important needs based upon long-term perspective? Our current quality of life is a direct result of our past decisions and of how we made those decisions.

With better decisions framed in a long-term perspective, perhaps we would not be experiencing our current situation of low numbers of salmon (166 in late April?) crossing the Willamette Falls. Perhaps if we had taken a different decision pathway, things might have proceeded differently. What if we had decided to maintain, enhance, and improve these watersheds with fish ladders to make the headwaters available to salmon? With salmon accessing new habitat, the diversity and density of populations could have co-evolved and thus survived some of the unavoidable changes that are taking place within the Willamette River Basin. But through our decisions using a short-term perspective, this is not an option.

We need to take big steps and do the things necessary to promote diversity and density of our fish populations. With reference to this hydroelectric project and others, we need to stop diverting our resources where the outcomes are vague, uneconomical or potentially detrimental to our ecosystem.

According to our analysis, this project is beyond the concept of causing a potential, temporary or minimal negative impact. This project will cause irreversible effects on the entire Willamette Watershed basin. This project should be terminated.

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Coast Fork Coalition
5/10/08

RESPONSE:

Increased Sediment Transport

Comments received from John Steele raised the issue of whether the Project would cause increased scouring of the lake bottom resulting in increased sediment transported downstream. This issue was

also reviewed by ODEQ in its Section 401 water quality certification.

It is expected, especially during periods of natural high flows or when a gate is opened after a period of being closed, that suspended sediments will increase in discharge flows from the dam. Natural processes for moving sediment downstream are desirable to maintain. However, heavy sediment transport in late fall during spawning season could be harmful to anadromous salmon and steelhead. The USACE will maintain responsibility for managing turbidity levels at the existing regulating outlets from the dam in accordance with a Water Quality Management Plan prepared to meet ODEQ's TMDL standards.

> "Modeling studies performed by the Applicant indicate entrance velocities to the penstock will not exceed 0.3 fps near the reservoir floor under maximum flow conditions. The Applicant indicates that penstock inlets operating under similar conditions at similar projects result in no measurable scour to reservoir sediments. ODEQ does not expect that this low velocity, expected only under conditions of maximum capacity turbine operation, would be sufficient to cause sediment scour adjacent to the new intake structure. However, ODEQ considers it appropriate to monitor turbidity during operation to confirm this expectation and require corrective modifications if scour and excessive turbidity is identified.
>
> Turbidity Monitoring and Reporting: Symbiotics shall conduct turbidity monitoring and reporting in accordance with an AWQMMP submitted and approved by ODEQ. The turbidity monitoring and reporting shall be sufficient to identify turbidity violations that may potentially result from any water withdrawal-induced sediment scour adjacent to the hydropower penstock intakes.
>
> Turbidity Management: Symbiotics shall undertake and complete investigative actions in the event turbidity monitoring confirms Project-related violations to Oregon's turbidity standard. The investigations shall include visual inspection to measure for the occurrence of sediment scour or erosion in the vicinity of the penstock inlets. The investigation shall also include a review of operating conditions, including flow rates, through the penstock prior to the violation. The investigation shall provide an analysis of the violation including, if applicable, a discussion of similar historical occurrences, a discussion of likely or probable causes, turbidity trends preceding the violation, and proposed measures to prevent future occurrences. A report presenting the findings of the investigation shall be submitted to ODEQ within 60 days of the occurrence. Upon ODEQ approval, Symbiotics shall implement the proposed measures. "(pgs 36-37, ODEQ Evaluation and Findings Report, Jan 2008.)

<u>Mercury</u>

Comments received from John Steele raised the issue of whether the Project would cause increased transport of Mercury downstream. This issue was also reviewed by ODEQ in its Section 401 water quality certification (ODEQ Evaluation and Findings Report, Dorena Dam Hydroelectric Project, 2008, p 54).

> "Sampling data confirm the presence of mercury in surface water, sediment, and fish tissue

in the Row River watershed. Water sampling data indicate total recoverable mercury levels in Dorena Lake exceed the mercury TMDL water column guidance value of 0.92 ng/L. The primary source of mercury present in the Row River watershed appears to be from historical mining activities performed in the drainages of tributaries located upstream of Dorena Lake.

Activities proposed by the Applicant do not result in the use or discharge of mercury to surface waters.

In correspondence dated May 25, 2007, the Corps reiterated its authority over operation of the dam. Should a FERC license be issued, the Applicant may utilize only that water not otherwise used by the Corps to meet federally-authorized project objectives. Furthermore, activities proposed by the Applicant do not impact water quality upstream of the dam. Symbiotics is not responsible, therefore, for the quantity or quality of the water released from the dam and received by the Project.

For this reason, ODEQ is reasonably assured that operation of the Project will not impact the level of mercury downstream of Dorena Dam. "(pg 48, ODEQ Evaluation and Findings Report, Jan 2008.)

Dissolved Oxygen

Comments received from John Steele raised the issue of whether the Project would cause increased problems with dissolved oxygen and total dissolved gases. ODEQ has adequately addressed this issue in its Water Quality Certification with appropriate mitigation measures, monitoring and adaptive management strategies. (See pgs 29-32, ODEQ Evaluation and Findings Report, Jan 2008.)

"The USACE currently releases water through rectangular outlet structures located near the base of the dam. High velocity dam releases generate turbulent conditions which entrain atmospheric air including oxygen. Dam releases under current USACE operating conditions, therefore, tend to increase the concentration of dissolved gases, including DO, relative to incoming conditions.

In contrast, turbine operations convert hydraulic energy into electrical energy. The hydraulic energy withdrawn from the water tends to reduce turbulence and lowers the potential DO concentrations in the tailrace discharge. The degree to which the Project will reduce DO concentrations is not known. However, measurements recorded by the Applicant in Dorena Reservoir indicate DO levels are at or below the DO criterion of 8.0 mg/L for much of the summer and decrease below the absolute minimum concentration of 6.0 mg/L at depth in late summer. The difference between ambient conditions and the DO criterion further increases on October 15 when the DO criterion increases to 11.0 mg/L to protect spawning habitat in the portion of Row River downstream of the dam. Further DO reductions during this period will, therefore, likely result in violations of the ODEQ water quality criterion for DO.

Dissolved Oxygen and Total Dissolved Gas Management Plan:

Within 12 months of FERC license issuance, Symbiotics shall submit for ODEQ approval

a proposed adaptive Dissolved Oxygen and Total Dissolved Gas Management Plan. Upon ODEQ approval, Symbiotics shall implement the plan.

If the DO monitoring shows reduced DO concentrations, Symbiotics has proposed the following measures may be implemented:

Air Admission System
An air admission system (AAS) may be installed to introduce ambient air through the turbine blades. The purpose of the AAS is to increase the concentration of DO in the discharge. The Applicant estimates operation of the AAS will increase DO by as much as 3.5 mg/L. Symbiotics proposes to monitor DO concentrations closely during initial six (6) months operation of the AAS.

Adaptive Management
Upon completion of the initial six (6) month operating period, Symbiotics will submit a report to ODEQ which evaluates the performance of the AAS. The report will offer engineering or operation recommendations to correct any violations of ODEQ water quality standards. The following adaptive modifications may be considered:

System shutdown: Symbiotics may consider suspending operation of the Project when discharge from the Project fails to meet appropriate ODEQ water quality criteria.

Oxygen Injection: Symbiotics may evaluate substituting pure oxygen in place of ambient air to increase DO concentrations in water discharged from the Project.

Operation: Symbiotics may base a decision on the operation of the AAS on DO measurements recorded upstream of the powerhouse.

Monitoring
Symbiotics has proposed to monitor DO levels continuously during project operation at the following stations:
Reservoir bottom at intake;
Row River immediately below dam, but above the hydroelectric project tailrace;
Tailrace immediately prior to Row River entrance; and
Row River one-quarter (0.25) mile below tailrace.

Symbiotics will record minimum, maximum, and average values continuously during operation. The WQMMP states that monitoring data will be summarized in annual reports submitted to ODEQ. “ (pgs 27-28, ODEQ Evaluation and Findings Report, Jan 2008.)

Temperature
Comments received from John Steele raised the issue of whether the Project would cause increased temperatures downstream during July and August. Mr. Steele referred to a Figure 4 – Dorena Reservoir Temperature Profiles (pg 23, ODEQ Evaluation and Findings Report, Jan 2008) of August 2003, February 2004, March 2004, and July 2004. The profiles show water temperatures that decline in March, July, and August as measured from surface level to lower depths in the

reservoir. In July and August, when the reservoir is at full pool, the intake pipe is at a depth of more than 20 meters below the surface of the water. The temperature profiles show that between depths of 10 to 12 meters the temperature levels decline rapidly and then are uniform from depths of 12 meters to 25 meters. Therefore, neither the size of the intake pipe, nor its placement near the floor of the reservoir will cause variation in outlet temperatures during July and August. Temperature variations are expected when the reservoir mixes or "destratifies" in late fall. Waters in the lake will be of fairly consistent temperature when the lake levels are low during the winter and early spring months.

> "The Corps is responsible for preparing a water quality management plan (WQMP) to address management strategies designed to comply with the TMDL conditions. Since the Corps administers the operation of Dorena Dam, temperature impairment resulting from the impoundment of water within Dorena Reservoir remains the responsibility of the Corps. Providing that operation of the proposed Project does not increase water temperature in excess allowed by Oregon water quality rules, Symbiotics is not required to correct for temperature impairments resulting from conditions created by the dam. Notwithstanding the preceding statement, Symbiotics shall not propose or undertake actions which restrict the ability of the Corps to construct, operate, or modify TMDL implementation strategies or otherwise hinder the ability of the Corps to achieve and maintain compliance with current and/or future TMDL requirements. Symbiotics shall accept the implementation of remedies approved by ODEQ which allow the Corps to meet their TMDL obligations and/or the objectives set forth in current and/or future WQMPs." (pg 21, ODEQ Evaluation and Findings Report., Jan 2008)

> "Symbiotics identifies that its proposed withdrawal of water from the same depth and vicinity of the existing Corps outlet structure, will ensure downstream temperatures will not be altered by operation of the proposed hydroelectric facilities relative to current Corps operations without hydroelectric facilities." (pg 23, ODEQ Evaluation and Findings Report, Jan 2008).

BEFORE THE OREGON WATER RESOURCES DEPARTMENT

Hydroelectric Application HE 559	**)**	
At Dorena Lake Dam	**)**	**Record for Public Interest**
Symbiotics LLC, Applicant	**)**	**Hearing**

Preliminary Permit

Application – July 26, 2004
Fee Receipt – July 26, 2004
OWRD Public Notice – May 17, 24, and 31, and June 7 and 14, 2005
Email Notice May 12, 2005
Newspaper Notice, Eugene Register Guard, May 24 and 31, June 7 and 14, 2005
Public Hearing – June 15, 2005
List of Attendees
Public Comments – Diane Conrad, Doug Heiken, Susan Kanich
Email Notice of Proposed Preliminary Permit – September 9, 2005
Email from Oregon Department of Forestry, "No forestland effect" - September 9, 2005
Proposed Preliminary Permit – September 9, 2005
Notice of Proposed Preliminary Permit – September 13, 2005
State Historic Preservation Office – "No Historic Properties Adversely Affected" - October 20, 2005
http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20051101-5048
Public Comments – William Anthony, Kathryn L. Owens,
Preliminary Permit – November 25, 2005
Public Comments – Alice Doyle

Request for Basin Plan Exception

Request from Applicant- October 13, 2005
Email Notice of Commission Meeting – December 28, 2005
Notice of Commission Meeting – December 29, 2005
Report to Commission, Agenda Item F, January 13, 2006
Commission Agenda – January 13, 2006
Minutes of Commission Meeting – January 13, 2006

Water Rights Application

Application - July 26, 2006
Fee Receipt - July 26, 2006
Application Check List – Mary Grainey – August 1, 2006
Letter of Acceptance – August 1, 2006
OWRD Public Notice – August 8, 2006
Email Notice – August 8, 2006
Public Comments – Phil Lake, Gene Cardle

Settlement Agreement with Oregon Department of Fish and Wildlife

Order on Potential for Cumulative Impacts

Proposed Order on Potential for Cumulative Impacts- March 6, 2008
Email Notice of Proposed Order – March 6, 2008
Notice of Proposed Order – March 11, 2008
Public Comments- Gene Cardle; Chuck Lang; Lonnie Johnson for Oregon Black Bass Action Committee; John Steele for Coast Fork Coalition
Revised Proposed Final Order on Potential for Cumulative Impacts – July 29, 2008

Oregon Department of Environmental Quality Section 401 Review

Application - January 19, 2007
http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20070119-5112
ODEQ Draft Evaluations and Findings Report - December 2007
ODEQ Notice of Proposed Order - November 28, 2007
ODEQ Certification Letter - January 18, 2008
ODEQ Certification Conditions - January 18, 2008
ODEQ Evaluations and Findings Report - January 18, 2008
http://www.deq.state.or.us/wq/sec401cert/sec401cert.htm#hp

FERC Docket p-11945

Environmental Reviews

Notice of Ready for Environmental Analysis - January 26, 2006
http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20060126-3033
HART response to NREA - March 24, 2006
http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20060324-5056
Draft Environmental Assessment - September 1, 2006
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Studies and Response to Information Requests

Juvenile Salmonid Sampling Study - November 2005

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Benthic Aquatic Invertebrate Study - October 2005
Interstitial Void Measurement Study - October 2005

Response to FERC items 2, 7, 8 and 9 - September 6, 2005.
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http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20050906-0165
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Mercury Contamination Study, updated mercury data for macroinvertebrates - June 7, 2005.
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Transcript of 5/5/05 public comment meeting that commenced at 2:00 pm at Lane Community College in Eugene, OR
http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20050505-4010
Transcript of 5/5/05 public comment meeting that commenced at 7:00 pm
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Response to FERC Request for Additional Information Letter sent April 22, 2005
http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20050426-0124

Scoping 1 Document – April 14, 2005
http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20050414-3026

FERC request for additional information - February 24, 2005.
http://elibrary.ferc.gov/idmws/File_list.asp?document_id=4279069

Addendum #3 to the Final License Application, response to letter dated August 27, 2004 and received after Addendum #2 was filed, January 19, 2005.
http://elibrary.ferc.gov/idmws/File_list.asp?document_id=4268735

Final Mercury Study Contamination Report
Final False Fish Attraction Tailrace Screen Proposal
Final Rainbow Trout Spawning Study
Final Juvenile Salmonid Sampling Proposal
Final Interstitial Void Measurement Proposal
http://elibrary.ferc.gov/idmws/File_list.asp?document_id=4269734

Addendum #2 to the Final License Application, November 23, 2004
Appendix A: Affidavit of Publication
Appendix B: Exhibit G - Project Maps
Appendix C: Land Management Report And Associated Correspondence
Appendix D: Mercury Study Contamination Report And Associated Correspondence
Appendix E: Memoranda Of Agency Meetings, Summer 2004
Appendix F: Agency Requests For Additional Studies
Appendix G: False Fish Attraction Tailrace Screen Proposal And Associated Correspondence
Appendix H: Ramping Proposal Correspondence
Appendix I: Rainbow Trout Spawning Study And Associated Correspondence
Appendix J: Juvenile Salmonid Sampling Proposal And Associated Correspondence
Appendix K: Recreational Resources Correspondence 6238 KB
Appendix L: Visual Resources Correspondence 12959 KB
Appendix M: Soil Erosion Control Plan And Associated Correspondence 5760 KB
Appendix N: Documentation Of Tribal Correspondence 930 KB
Appendix O: Documentation Of Ape Approval 193 KB
Appendix P: Corps Water Control Plan 536 KB
Appendix Q: Construction Schedule And Associated Correspondence 1175 KB
http://elibrary.ferc.gov/idmws/File_list.asp?document_id=4255287

FERC Deficiency of License Application and Additional Information Request, August 27, 2004
http://elibrary.ferc.gov/idmws/File_list.asp?document_id=4231206

Addendum #1 to the Final License Application, August 24, 2004.
http://elibrary.ferc.gov/idmws/File_list.asp?document_id=4230848

Final License Application: Stage III Consultation Document:, June 2004
Cover Page, Table of Contents and Initial Statement
Exhibit A: Project Description
Exhibit B: Project Operations
Exhibit C: Construction History and Schedule
Exhibit D: Statement of Costs and Financing
Exhibit E: Environmental Studies Report
Exhibit F: General Drawings
Exhibit G: Project Maps
http://elibrary.ferc.gov/idmws/File_list.asp?document_id=4217118

Draft License Application for Dorena Lake Dam Hydroelectric Project, FERC No. 11945, April 2004

Proposed Resource Monitoring and Field Investigations for the Dorena Lake Hydroelectric Project, FERC No. 11945, January 2004

Dorena Lake, FERC No. 11945 - Stage One Consultation, April 2003
http://elibrary.ferc.gov/idmws/File_list.asp?document_id=4106824