401 Certification-Order

Spokane River Hydroelectric Project Certification Amended Order No. 9802 FERC License No. 2545

March 13, 2013

WASHINGTON STATE DEPARTMENT OF ECOLOGY

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By:

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Table of Contents

Acronyms

401	Section 401 of the Clean Water Act
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
BPA	Bonneville Power Administration
CE-QUAL-W2	Water quality and hydrodynamic model
CFR	Code of Federal Regulation
cfs	Cubic feet per second
CPUE	Catch per unit effort
CSRSRI	Columbia-Snake River Spill Response Initiative
CWA	Clean Water Act
DO	Dissolved Oxygen
EIS	Environmental Impact Statement
EMD	Emergency Management Division
ERO	Eastern Regional Office of the Department of Ecology
ESHB	Engrossed Substitute House Bill
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FWPCA	Federal Water Pollution Control Act
HED	Hydroelectric Development
HPA	Hydrologic project approval
IA	Interagency Agreement
ICS	Incident Command System
IDEQ	Idaho Department of Environmental Quality
IDF&G	Idaho Fish and Game
IMP	Intermountain Province
IWWPP	In Water Work Pollutant Plan
NPDES	National Pollution Discharge Elimination System
NRC	National Response Center
NTU	Nephelometric Turbidity Unit
PCB	Polychlorinated Biphenyls
PHABSIM	Physical Habitat simulation model
PM&E	Protection, Mitigation and Enhancement
QAPP	Quality assurance project plan
RCW	Revised Code of Washington
RLUAWG	Recreation Land Use and Aesthetics Work Group
RM	River mile
SDCC	Spill Deterrent Control & Countermeasure Plan
SPCC	Spill Prevention Control & Countermeasure Plan
SWPPP	Stormwater Pollution Prevention Plan
TDG	Total Dissolved Gas
TMDL	Total Maximum Daily Load
USC	United States Court
USCOE	United States Corps of Engineers
USGS	United States Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDOE	Washington Department of Ecology
WQAP	Water quality attainment plan
WQPP	Water Quality Protection Plan
WRIA	Water Resource Inventory Area

DEPARTMENT OF ECOLOGY

IN THE MATTER OF GRANTING A	)	**CERTIFICATION**
WATER QUALITY CERTIFICATION TO:	)	**AMENDED ORDER NO. 6702**
Avista Corporation	)	Licensing of the Spokane Hydro-
in accordance with 33 U.S.C. § 1341	)	Electric Project (FERC No. 2545),
FWPCA § 401, RCW 90.48.120, RCW 90.48.260	)	Spokane, Stevens and Lincoln Counties,
and WAC 173-201A	)	Washington

TO: **Elvin Fitzhugh, License Manager**
Avista Corporation
P.O. Box 3727
Spokane, Washington 99220-3727

On July 12, 2006, Avista Corporation (Avista) filed an application for Section 401 Certification with The Department of Ecology (Ecology) on July 12, 2006 for the four Dams located along the Spokane River; Upper Falls, Monroe Street, Nine Mile and Long Lake, Federal Energy Regulatory Commission (FERC) License No. 2545. As the one year deadline provided by Section 401 approached, Avista withdrew that application at Ecology's request, and reapplied on June 13, 2007. Avista requested a 401 Certification for the Spokane hydroelectric project from Ecology pursuant to the provisions of 33 USC § 1341 (§401 of the Clean Water Act) on June 14, 2007. The 401 Certification was submitted to FERC on June 10, 2008. Amendments were made due to a settlement agreement on April 30, 2009 and then resubmitted on May 8, 2009 to FERC.

1.0 Nature of the Project

The Spokane River Project is owned and managed by Avista which operates under a license issued by the FERC as Project Number 2545. The Project consists of four hydroelectric developments located on the Spokane River in eastern Washington (Spokane, Stevens, and Lincoln counties). The Spokane River originates at the outlet of Coeur d'Alene Lake in Idaho and flows westerly approximately 111 miles to the confluence with the Columbia River in eastern Washington. The four developments (upstream to downstream) are Upper Falls (river mile 74.2), Monroe Street (river mile 74), Nine Mile (river mile 58.1), and Long Lake (river mile 33.9) (Figure 1-1).

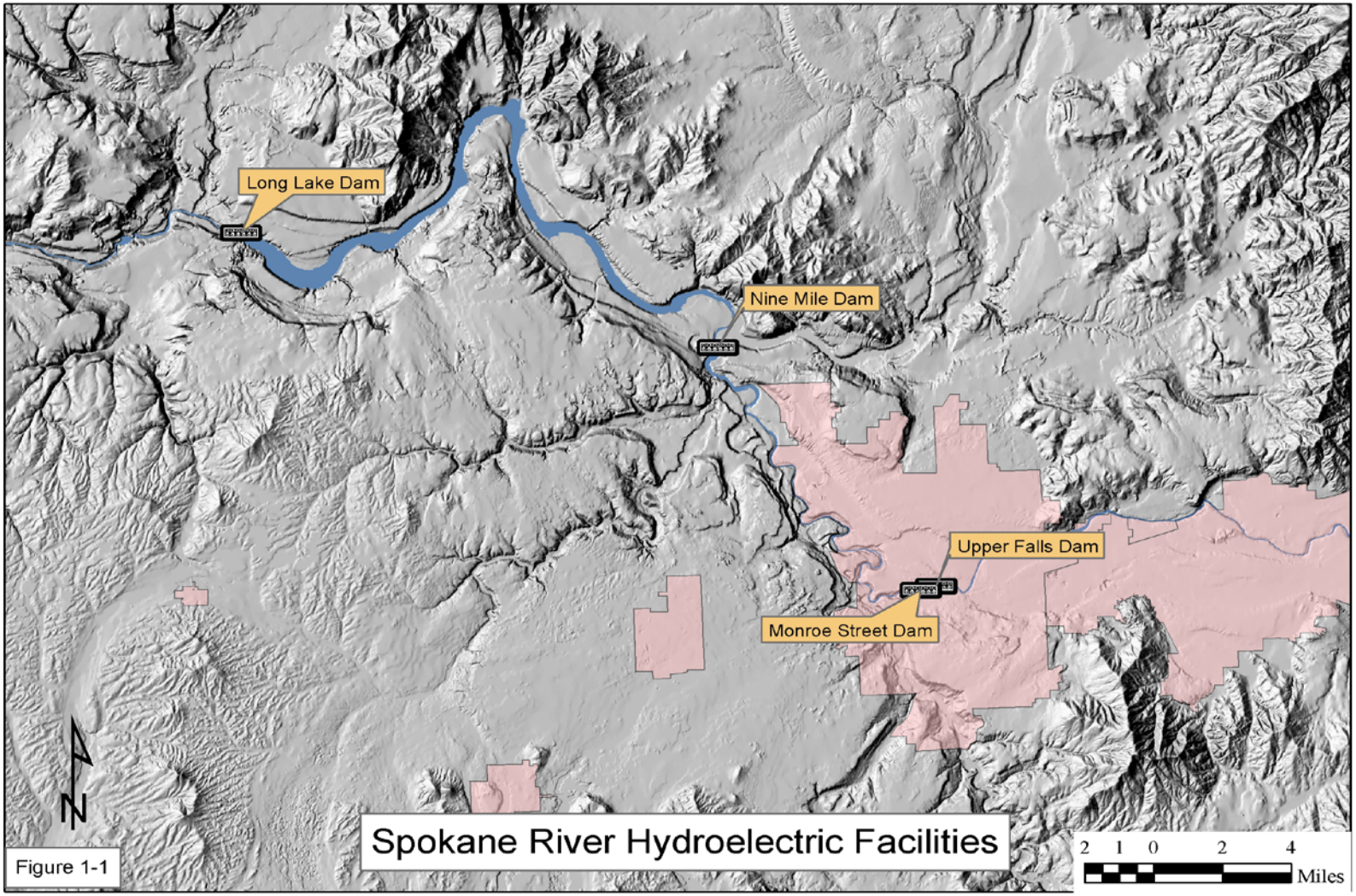
The Project boundary is visually represented in Avista's application through figures in Appendix A of the Spokane River Hydroelectric Project Application, Volume II July 2005. The figures are included in Appendix A of this 401 Certification. The following are brief descriptions of each dam.

1.1 Upper Falls Dam

- Run-of-river facility
- 366 feet long, 35.5 feet high dam across the north channel of the Spokane River;
- 70 feet long, 30 feet high intake structure across the south channel
- 800 acre foot reservoir
- 350 feet long, 18 feet in diameter penstock
- Single unit powerhouse with a generator nameplate capacity of 10 MW

1.2 Monroe Street Dam

- Run-of-river facility
- 240 feet long, 24 feet high dam
- 30 acre foot reservoir
- 332 feet long, 14 feet in diameter penstock
- Underground single unit powerhouse with a generator nameplate capacity of 14.82 MW



(Darnell, 2008)

1.3 Nine Mile Dam

- Run-of-river facility
- 466 feet long, 58 feet high dam
- 4,600 acre foot reservoir
- 120 feet long, 5 feet in diameter sediment diversion tunnel
- 4 unit power house with a nameplate capacity of 26.4 MW

1.4 Long Lake Dam

- Storage-type facility
- 593 feet long, 213 feet high main dam
- 247 feet long, 108 feet high cutoff dam
- 105,080 acre foot reservoir
- Four 236 feet long, 16 feet in diameter penstocks
- A 4 unit powerhouse with a nameplate capacity of 71.7 MW

2.0 Authorities

In exercising authority under Section 401 of the Clean Water Act (33 USC § 1341) and Revised Code of Washington (RCW) RCW 90.48.120 and 90.48.260, Ecology has investigated this proposal for:

Conformance with all applicable water quality based, technology based, toxic or pretreatment effluent limitations as provided under the Federal Water Pollution Control Act Sections 301, 302, 303, 306 and 307 and 33 USC §§ 1311, 1312, 1313, 1316, and 1317.

Conformance with the state water quality standards as provided for in Chapter 173-201A WAC and by Chapter 90.48 RCW, and with other appropriate requirements of state law; and,

Conformance with all known, available and reasonable methods to prevent and control pollution of state waters as required by RCW 90.48.010.

3.0 Current Standards

3.1 Washington State Water Pollution Control Act

This Certification supports the goals of the State of Washington Water Pollution Control Act (Chapter RCW 90.48). This Certification describes a program to effectively monitor and evaluate conditions and progress toward achieving biological goals and water quality requirements to improve conditions for fish and water quality over existing conditions.

3.2 Designated Uses

Waters of the state are assigned designated uses under WAC 173-201A. Designated uses for this section of the Spokane River include, but are not limited to the uses described in Table 3-1 below.

For aquatic life uses, it is also required that all indigenous fish and non-fish aquatic species be protected in waters of the state in addition to the key species described below (WAC 173-201A-200(1).

Table 3-1 Designated Uses

Spokane River Reach Description	Designated Uses
Stateline to Nine Mile Dam RM 96.5 to 58.0	• Aquatic Life Uses – Salmonid spawning, rearing, and migration. The key identifying characteristics of the use is salmon or trout spawning and emergence that only occurs outside of summer season (September 16 – June 14). Other common characteristic aquatic life uses for waters in this category include rearing and migration by salmonids. • Recreation – Primary contact • Water Supply – Domestic, Industrial, Agricultural, and Stock Watering. • Misc. Uses – Wildlife Habitat, Harvesting, Commerce and Navigation, Boating and Aesthetics.
Lake Spokane (Nine Mile Bridge to Long Lake Dam) RM 58.0 to RM 33.9	1. Aquatic Life Uses – Core summer salmonid habitat. The key identifying characteristics of this use are summer (June 15 – September 15) salmonid spawning or emergence, or adult holding; use as important summer rearing habitat by one or more salmonids; or foraging by adult and sub-adult native char. Other common characteristic aquatic life uses for waters in this category include spawning outside of summer season, rearing, and migration by salmonids. 2. Recreation – Extraordinary primary contact. 3. Water Supply – Wildlife Habitat, Harvesting, Commerce and Navigation, Boating and Aesthetics.
Long Lake Dam to mouth RM 33.9 to RM 0	4. Aquatic Life Uses – Salmonid spawning, rearing, and migration. The key identifying characteristic of the use is salmon or trout spawning and emergence that only occur outside of summer season (September 16 – June 14). Other common characteristic aquatic life uses for waters in this category include rearing and migration by salmonids. 5. Recreation – Primary contact 6. Water Supply – Domestic, Industrial, Agricultural, and Stock watering. 7. Misc. Uses – Wildlife Habitat, Harvesting, Commerce and Navigation, Boating and Aesthetics.

3.3 Numeric Criteria

Numeric criteria for the designated uses are found in WAC 173-201A. These include criteria for TDG, pH, dissolved oxygen (DO), fecal coliform, turbidity and temperature.

3.4 Narrative Criteria

Narrative criteria rely on the analysis of impacts to uses such as aquatic plants and animals, fish habitat (flow), wildlife habitat, recreation and aesthetics. These criteria are implemented on a case-by-case basis to protect water quality and beneficial uses and are used where numeric standards have not been developed or are not sufficient to protect an existing or designated use.

3.5 Anti-Degradation

Existing and designated uses must be maintained and protected in accordance with WAC 173-201A-300.

3.6. Compliance Schedule for Dams

Under WAC 173-201A-510(5), for dams that cause or contribute to a violation of water quality standards, the dam owner is required to provide a detailed strategy for achieving compliance with state water quality standards. A compliance schedule of ten years for dam owners who are currently violating water quality standards to develop a process for implementing all reasonable

and feasible structural and operational changes they can to meet water quality standards. After this time, other water quality standards tools such as use attainability analyses, variances, and site-specific criteria become available.

4.0 Evaluations and Findings

4.1 Aesthetic Flow

Aesthetic uses of hydropower affected waters are a significant hydropower water quality issue. Instream flows and reservoir levels play an important role in aesthetic uses. Water features are often valued for the aesthetic properties. Beyond the mere presence or absence of water features, however; it also is possible to determine preferences for specific attributes of water features themselves (e.g. flow quantity, water clarity) (WDOE, 2005b).

A. Water Quality Standard

Aesthetic values are uses specifically protected in Washington's water quality standards (WDOE, 2005b). Under WAC 173-201A-260(2)(b) aesthetic values must not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste (see WAC 173-201A-230 for guidance on establishing lake nutrient standards to protect aesthetics).

B. Upper Falls Dam

The Upper Falls Dam includes two dams located on each side (North and South channels) of a natural island (Havermale Island) in the Spokane River. The South Channel dam includes the headgate structure leading to the power house (river mile 74.2), and the North Channel dam includes the control works structure for water level and spill control (river mile 74.7) (Avista 2005). Approximately 1,360 feet downstream of the control works structure, the North Channel splits, forming the middle channel and Canada Island. Capacity at the south channel dam is 2,500 cfs and as flows drop below this, all water is typically diverted from the North and middle channels to the south headgate structure and through the power house.

With the exception of minor seepage around the control works, the North and middle channels, which form upper Spokane Falls, become dewatered when flows drop below 2,500 cfs. This may occur during low water periods in summer or winter but typically this occurs during late July through mid-September. The dewatering of Spokane Falls negatively impacts aesthetic values in downtown Spokane. Avista's proposal is to intermittently release 200 cfs of water through the North and middle channels for aesthetic purposes and is to occur between 10 a.m. and one-half hour after sunset. Potential affects to aquatic life from intermittent water releases/spills may include fish entrainment from the reservoir, downstream stranding of fish, and related flow/discharge fluctuations on other aquatic biota.

C. Reports, Studies and Recommendations

1. Aesthetics Study Report

During the FERC relicensing process, the Louis Berger Group prepared an Aesthetics study report for the Spokane River Project No. 2545 for Avista Corporation in 2003. The report concluded that at Upper Falls, the area causing the most concern to study participants was the North Channel. At the lowest flows the North Channel presents a view of a barren, dry riverbed that most participants did not like. As the flows increased over the course of the study, the participants began to notice flow in the North Channel at 200 cfs and the aesthetic quality of the flow appeared to be at least acceptable to most of the participants at 300 cfs, 400 cfs and 500 cfs. Most of the participants ranked 500 cfs as their most preferred flow.

2. Watershed Management Plan for Water Resource Inventory Area 55/57

The Middle/Little Spokane River planning unit formed under RCW 90.82 to address water resource management issues with WRIAs 55/57 was developing its watershed plan during the FERC relicensing process. The planning unit reviewed and debated the available information and technical reports, including the Louis Berger Group study, and adopted recommendations for aesthetic flows in the North Channel of the Spokane River in Riverfront Park. Ecology uses the watershed plan as the framework for making future water resource decisions for the Middle/Little Spokane River watershed, per RCW 90.82.130.

The plan recommendations were approved by the Little/Middle Spokane River watershed planning unit, a group composed of a broad base of water use interests, and also by the city of Spokane and Spokane County. The plan recommendations are therefore considered an expression of the public interest. The watershed plan, formally adopted in January 2006, includes the following recommendation.

- *II B.01.a. Support a consensus based agreement within the Avista Recreation, Land Use and Aesthetics Work Group of at least 300 cfs in the North Channel of the Spokane River through Riverfront Park as the basis for aesthetic flows.*

D. Monroe Street Dam

The Monroe Street Dam situated on lower Spokane Falls currently has an aesthetic flow of 200 cfs over the dam. This occurs between 10 a.m. and one-half hour after sunset for the period between Memorial Day weekend and September 30 annually. Intermittent water releases cause minor fluctuations in river stage at the USGS gage at Spokane as a result of the operation.

4.2 Aquatic Resources

The initial and cumulative affects of hydroelectric projects on the Spokane River have resulted in the alteration and/or loss of in-stream and riparian/wetland habitat associated with the Spokane River. There are approximately 64 miles of riverine habitat in Washington that are affected by Avista dams on the Spokane River. The dams contribute to fish passage blockage, turbine entrainment, increase total dissolved gas levels, induced river flow fluctuations, habitat degradation, and associated inundation impacts stretching from the Idaho to Washington state line to below the Long Lake Dam.

The Spokane River has diverse yet distinct fish populations depending on the type and quality of habitat conditions. Aquatic habitat conditions are greatly influenced by river flow, velocity, and temperature. Impounded portions of the river have vastly different environments than those of free flowing sections of the river. The impounded portions of the river create types of spawning and rearing habitats that favor reproduction of warm water fish species while free-flowing sections of the river allow for the reproduction of wild trout and other native salmonids. River sections with cobble and gravel beds generally support the greatest diversity of benthic macroinvertebrate life.

In impounded portions of the river where sand is aggrading or depositing, benthic macroinvertebrate species diversity is reduced due to shifting sands that destabilize surfaces to which organisms can attach. Slow water environments in larger impoundments such as Lake Spokane support the greatest amount of plant growth.

Present day fisheries are diverse and provide recreational opportunities along the river and in the reservoirs. Fisheries found in Lake Spokane include bass, perch, crappie, and trout (Osborne et al. 2003). Game fish in the free-flowing portions of the river consist primarily of salmonids: triploid rainbow trout, redband trout, and mountain whitefish. However, approximately 33 miles of riverine habitat in Washington were altered or eliminated with the impoundments created by the Spokane River Project. Spawning success and rearing habitat throughout free-flowing portions of the Spokane River are influenced by flow/discharge alterations. Flow reductions during the spawning period can dewater trout redds and strand juvenile trout after emergence (Parametrix, 2003).

The Columbia River redband trout *Oncorhynchus mykiss gairdneri* is a subspecies of rainbow trout native to the Columbia River drainage east of the Cascade Mountains as far as barrier falls on the Snake, Spokane, Pend Oreille, and Kootenai Rivers (Allendorf et al. 1980; Behnke 1992). Little is known about the status of redband trout in the Spokane River system (Thurow et al. 1997); however, we do know that their populations have been significantly impacted. Factors contributing to the decline in redband trout abundance, distribution, and genetic integrity include: habitat loss and degradation, passage barriers, dams, hybridization, and competition with non-native fish (Williams et al. 1989; Behnke 1992; Thurow et al. 1997). Redband trout are classified as sensitive species or species of special concern by several state and federal agencies (Muhlfeld et al. 2001). Rainbow trout are a WDFW Priority Species (WDFW, 2006).

A. Fresh Water Designated Uses and Criteria

Aquatic life uses are designated based on the presence of, or the intent to provide protection for, the key uses. It is required that all indigenous fish and non-fish aquatic species be protected in waters of the state in addition to the key species described below.

This use occurs from the Stateline to Nine Mile Dam (river mile 96.5 to river mile 58.0) and then again from Long Lake Dam to river mile zero of the Spokane River (river mile 33.9 to river mile 0). Spawning, rearing, and migration as defined by WAC 173-201A-200(a)(iii): The key identifying characteristic of this use is salmon or trout spawning and emergence that only occurs outside of the summer season (September 16 – June 14). Other common characteristic aquatic life uses for waters in this category include rearing and migration by salmonids.

This use occurs from Lake Spokane or Nine Mile Bridge to Long Lake Dam (river mile 58 to river mile 33.9). Core summer salmonid habitat as defined by WAC 173-201A-200(a)(ii): The key identifying characteristics of this use are summer (June 15 – September 15) salmonid spawning or emergence, or adult holding; use as important summer rearing habitat by one or more salmonids; or foraging by adult and sub-adult native char. Other common characteristic aquatic life uses for waters in this category include spawning outside of the summer season, rearing, and migration by salmonids.

B. Discharge Operations for Protection of Fish

Water quantity directly affects many other water quality parameters that affect fish. Flow for fish has been the single biggest Water Quality Certification issue related to hydropower in Washington State (WDOE, 2005b).

Adequate flows are necessary to protect fish and other aquatic organisms. In addressing discharge operations for the protection of fish habitat, the term "instream flow" is sometimes used to identify a specific stream flow (typically measured in cubic feet per second, or cfs) at a specific location for a defined time, and typically following seasonal variations. Instream flows are usually defined as the minimum stream flows needed to protect and preserve instream resources and values, such as fish, wildlife and recreation.

Key life stages for trout that are targeted for protection include spring spawning and summer rearing. Avista dam operations affect spawning success throughout the Spokane River in the spring when river discharge is curtailed to fill Lake Coeur d'Alene. During the summer and in low water years, discharge operations determine the quality and quantity of summer rearing habitat.

Water flows also greatly influence water quality parameters that have numeric criteria, such as temperature, gas super-saturation, dissolved oxygen, and turbidity. In order to fully understand the flow in the Spokane River, the entire system must be looked at, above ground and underground. There is a relationship between the Spokane River system and the Spokane Valley and Rathdrum Prairie Aquifer (Aquifer), the sole source of water for most of the people in Spokane County, Washington and Kootenai County, Idaho.

A strong connection between the Aquifer and the Spokane River is present throughout the river's length, from Lake Coeur d'Alene to the confluence with the Little Spokane River. Although the Aquifer-River interchange is complex, studies of the river have identified gaining and losing reaches along the river (Kahle et al., 2005; Kahle et al. 2007).

In areas along the Spokane River where the water table is far below the bed of the river, water percolates through the gravelly bed and downward into the Aquifer, recharging the groundwater system. Computer modeled and actual measured streamflow gains and losses have measured on various segments of the river (Hsieh et al., 2007). In these areas the reach of the river is losing water, and these reaches are signified with red numbers and negative numbers in Figure 4-1. In other areas where the water table in the adjacent river banks is higher than the river bed, the Aquifer loses water through springs and seeps and ultimately adds volume to the river flow. In these areas the reach of the river is gaining, and these reaches are shown as positive numbers in Figure 4-1.

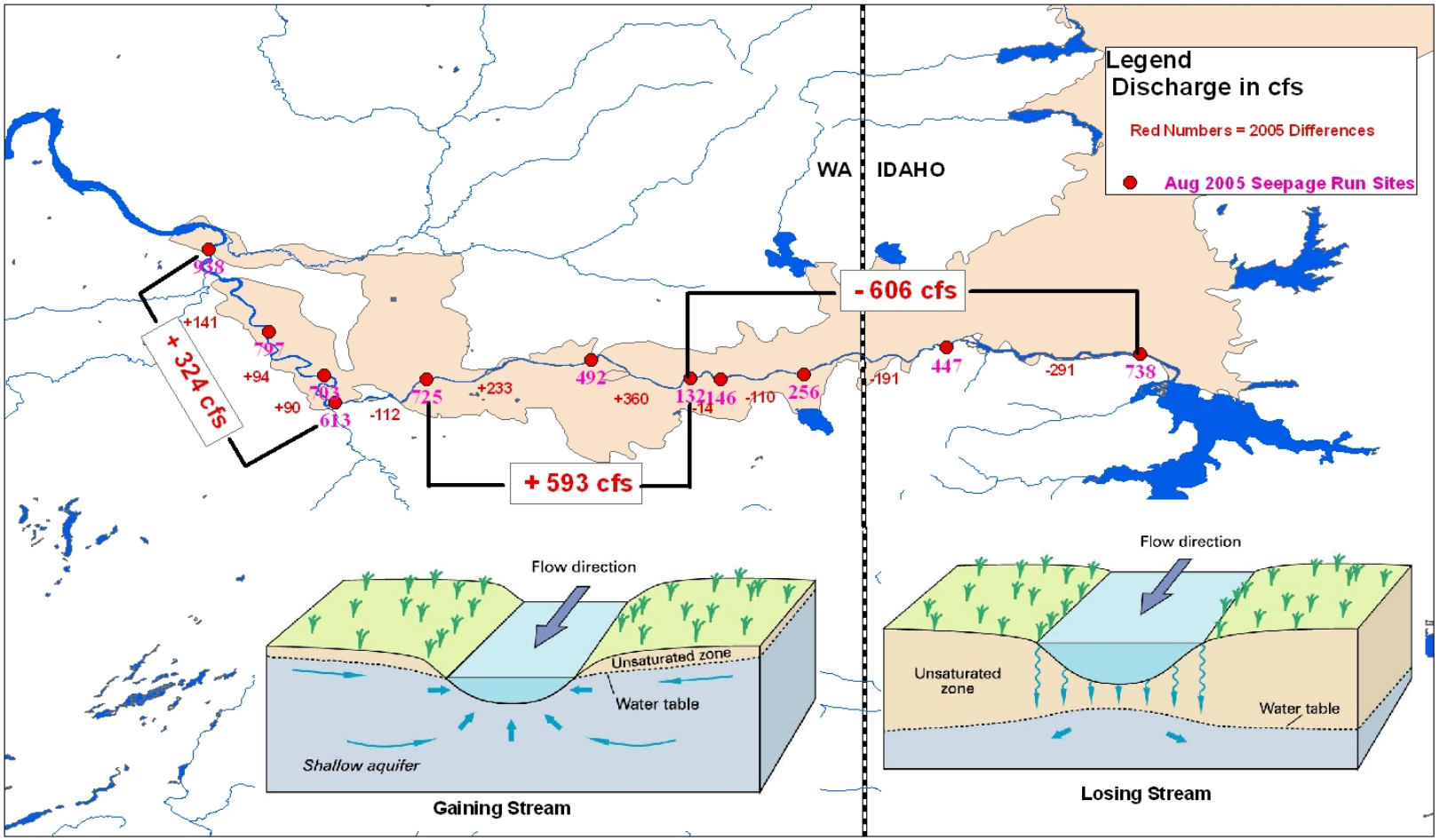
C. Upper Falls Dam

1. The Upper Falls Project area and river has been heavily modified for more than 100 years as the bank was shaped to stabilize roads, railroads, and to accommodate other urbanization and hydroelectric development activity (FERC, 2007). Little is known about the aquatic habitat and fish populations in this reach of river, and the potential effects of the proposed change in Project operations for the intermittent aesthetic discharge flow.

2. A recent survey by WDFW indicated a small population of redband rainbow trout exists in this reservoir and that natural spawning may be occurring in the free flowing section of river at the head of the reservoir. An isolated, self-sustaining mountain whitefish population is known to occur here, their numbers reflect this and they don't exist in the section of river above Upriver Dam. Other game fish such as sterile rainbow trout, smallmouth bass and brown trout, contribute to this diverse fishery (O'Connor and McLellan, 2008).

Figure 4-1

August 2005 Seepage Run



(Covert, 2008)

3. Current operations dewater the north and middle channels below Upper Falls Dam in the summer while water is routed through the South Channel dam (Avista, 2005). There is a proposal to intermittently release water through the north and middle channels for aesthetic purposes. Potential affects to aquatic life from intermittent water releases/spills may include fish entrainment from the reservoir, downstream stranding of fish, and related flow/discharge fluctuations on other aquatic biota.

D. Monroe Street Dam

1. Monroe Street impoundment is essentially isolated from the larger free-flowing portion of the river and has no tributary stream (FERC, 2007; Avista and WDFW, 2004). The impoundment provides for over-winter pool habitat, and deep, cool-water refugia in the summer for several species in the Spokane River.

2. During high flow years, erosion contributes to the mobilization of significant amounts of bedload material moving through the system. Bedload material gets deposited behind the Monroe Street Dam, and dredging of this material is required to clear the intakes to the Dam (permitted by WDFW and USCOE). Dredged material is deposited immediately downstream of the spillway for dispersal. The specific physical and chemical composition of this material is unknown; however, it is basically comprised of cobble, gravel, and sand according to Avista's HPA application in 2002. The dispersal of this material is dependent on the following year's flow, which may not be of the same magnitude that originally transported it there.

   Subsequent flows of lesser magnitude may not provide the required carrying capacity to adequately move the material and provide for habitat forming processes. The fate and transport of the dredged material is unknown as well as the potential effects on spawning habitat downstream.

3. Redband trout are known to spawn throughout the free-flowing portions of the Spokane River. Flow/discharge reductions and fluctuations can affect spawning success and contribute to redd dewatering in the lower Spokane River (Parametrix, 2003). Some successful spawning in the Spokane River is responsible for maintaining redband trout populations in both the upper and lower Spokane River, based on genetic data (Small et al. 2007). Critical information is lacking to understand the effects of flow/discharge alterations on the redband trout fishery below the Monroe Street Dam. This native trout population provides for an important recreational fishery.

4. It has been suggested that spawning gravel is a limiting factor to natural recruitment of native salmonids (Kleist, 1987). This was based on observations of limited spawning habitat, the apparent low success of spawning, and consequent fry survival. A later study verified the distribution, timing of spawning, and fry emergence in two free-flowing reaches of the Spokane River (Parametrix, 2003).

5. Spawning success, and subsequent year class strength, is related to flow/discharge in the upper Spokane River (Bennett and Underwood, 1988; Underwood and Bennett 1992; Avista, 2000).

   Current watershed planning efforts are attempting to address minimum discharge flows adequate for protecting spawning habitat and for providing adequate summer rearing habitat (EES, 2007).

6. The spring hydrograph as influenced by Avista's operations has changed since 1980 affecting redband trout spawning and incubation in the upper Spokane River (O'Connor and McLellan, 2008.). With reduced flows for incubation and emergence between 1985 and 1990, it was estimated that redband trout abundance in the upper Spokane River declined 75% (IDFG, 1990).

E. Nine Mile Dam

1. The Nine Mile Dam influences aquatic biota with high levels of sedimentation and reduced velocities in the reservoir and altered bedload and flow dynamics in the reach downstream of the dam. Nine Mile Dam captures bedload and passes mostly sand and silt (Golder 2005, NHC 1999). Shifting sand deposits within the reservoir are unsuitable habitat for most species of benthic macroinvertebrates. Macroinvertebrates are the primary food source for most fish species, with the exception of large piscivorous fish.

2. The confined, free flowing reach within one mile below the dam is comprised of mainly large boulder and cobbles, commonly referred to as riverbed armoring. The armoring of substrates below dams can result in substrates becoming too coarse for spawning salmonids (Parfitt and Buer 1980; Buer et al. 1981).

   The combination of bedload trapping upstream and altered bedload dynamics downstream affects potential trout spawning habitat between the Nine Mile tailrace and Lake Spokane.

3. It is uncertain how the installation of the proposed rubber dam atop Nine Mile Dam and a change in operations will influence aquatic biota upstream and downstream of the dam and wetland/riparian habitat in both reservoirs. Additional information is necessary to evaluate these affects. Other Dam operations potentially affecting fish and fish habitat include ramping rates and flow control.

F. Long Lake Dam

Long Lake Dam creates a reservoir of 5,060 surface acres referred to as Lake Spokane. The Project converts approximately 23.5 miles of river into lacustrine habitat. Approximately 1,100 acres of this reservoir is considered littoral (shallow-water) habitat (SCCD 2001), with the remaining 3,960 acres considered limnetic (open-water) habitat. Hydropower operations generally influence fish populations, habitat, and other aquatic biota in the Lake through management of the reservoir level, reservoir residence time, and habitat connectivity. Fishery and habitat issues related to hydropower operations in Lake Spokane include the following:

1. Winter drawdown reduces the water levels of the reservoir approximately 10 to 14 feet (Avista, 2005). The drawdown forces juvenile fish out of complex littoral habitats into limnetic habitat (Osborne et al., 2003), which can increase predation by adult fishes. As a result of reservoir conditions, the most abundant game fish species was yellow perch and the most abundant species overall were carp in littoral habitat and northern pike minnow in limnetic habitat (Osborne et al., 2003).

2. Drawdowns physically entrain fish at the Dam to some degree, resulting in reduced fish abundance. At Long Lake Dam the risk of fish entrainment for young littoral fish is probably moderate; however, there are no existing investigations of the rate of entrainment or survival of entrained fish for any of the five facilities in the Spokane River Project (Parametrix, 2004).

3. Warm water fish utilized in the recreational fishery predominantly occupy littoral habitats. In Lake Spokane littoral habitats account for roughly 25% of the habitat available to fishes. Although Lake Spokane is a nutrient rich impoundment with a high level of primary production (Soltero et al., 1992), Osborne et al. (2003) indicated that only a small proportion of the species present in Lake Spokane utilize the remaining 75% of the lake.

G. Plans, Agreements and Strategies to Protect Aquatic Life Uses

- The Watershed Planning Act: WRIA 54/57 and 55/57 Watershed Plans. The 1998 legislature passed ESHB 2514, codified into Ch. 90.82 RCW, to set a framework for developing local solutions to watershed issues on a watershed basis. Ch. 90.82 RCW states: The legislature finds that the local development of watershed plans for managing water resources and for protecting existing water rights is vital to both state and local interests. In this process, consideration is given to the needs of fish, wildlife, water quality, aesthetics, and recreation. Fish are markers for the vitality of river ecosystems, and require adequate stream flows at key life stages as an important part of their habitat. Planning efforts for WRIA 55/57 are completed but the process for WRIA 54/57 is ongoing. Please see Appendix B for a more complete summary of the WRIA 55/57 plan and its relationship to this Certification.

- Policy of the Washington Department of Fish and Wildlife Concerning Wild Salmonids. The goal of WDFW's Wild Salmonid Policy is to protect, restore, and enhance the productivity, production, and diversity of wild salmonids and their ecosystems to sustain ceremonial, subsistence, commercial, and recreational fisheries, non-consumptive fish benefits, and other related cultural and ecological values. Key elements of this policy applicable to the Spokane River Project are attached to this Certification in Appendix C.

- Intermountain Province Subbasin Plan. The Northwest Power Planning Council's (Council) 2000 Fish and Wildlife Program established a basin-wide vision for fish and wildlife, and included broad biological objectives, and a corollary set of action strategies to achieve that vision. The Council is implementing the Programs through sub basin plans developed locally in most of the 50 tributary sub basins of the Columbia River.

  Sub basin plans will be used to help direct Bonneville Power Administration (BPA) funding of projects that protect, mitigate and enhance fish and wildlife that have been adversely impacted by the development and operation of the Columbia River hydropower system including the Spokane River. The Intermountain Province (IMP) is located in the northeast corner of Washington State and the northern Idaho panhandle and includes the Spokane and Coeur d'Alene sub basins.

  Major elements of the plan include the following:

  - An assessment providing the technical foundation for the plan by describing the current condition of fish and wildlife in the sub basin and identifying limiting factors;
  - An inventory providing a summary of recent and ongoing projects to protect, mitigate, and enhance fish and wildlife in the sub basin, along with an analysis of evident gaps; and
  - A management plan describing the vision, objectives and prioritized implementation strategies in the sub basin.

- Interagency Agreement between Washington State Department of Ecology and Washington State Department of Fish and Wildlife. In 2007, Ecology entered into an Interagency Agreement (IA) with the WDFW for the purpose of obtaining WDFW's expert consultation and coordination on fishery issues involving the Spokane River Project. Under the Agreement, WDFW will provide technical support for Ecology on aquatic life issues as needed. A copy of this IA is attached to this Certification as Appendix D.

- Washington Department of Fish and Wildlife - Goals and Objectives for Fish, Wildlife and Habitat Management in the Spokane River Sub-Basin: Management Planning Framework With Enhancement Opportunities at High Priority Sites (2006):

  Key elements of this document highlight the following points:

  - Preserve and perpetuate diverse fish and wildlife populations
  - Maintain natural fish and wildlife production at levels that provide appropriate and optimal recreational opportunities.
  - Secure, maintain, and enhance diverse habitats of sufficient quantity and quality to provide for wildlife populations, while minimizing habitat damage and off-site conflicts.
  - Participate in the implementation of recovery plans and contribute to the restoration of all native fish and wildlife species classified as federal or state endangered, threatened, candidate or sensitive.
  - Maintain or develop habitat connectivity to provide for safe fish and wildlife movement.

H. Non-native Invasive Aquatic Plants

1. Lake Spokane

The formation and operation of Lake Spokane creates an aquatic environment that is suitable for various aquatic plants to thrive, including non-native and invasive aquatic weeds.

The Long Lake Dam contributes to proliferation of aquatic weed species by creating a relatively stable water level, a seasonally stratified lake environment with a warm epilimnion, and slack water environments that trap fine sediments and cycle nutrients. Eurasian watermilfoil (*Myriophyllum spicatum*), referred hereafter as milfoil, is the most detrimental and problematic of the aquatic weeds at present.

The aquatic bed wetlands contain substantial areas of floating-leaf, vascular aquatic vegetation that are found primarily in the upper portion of the reservoir where shallow water (littoral) areas are more extensive. Shallow littoral areas are dominated by non-native species, particularly yellow floating heart (*Nymphoides peltata*) and milfoil. Milfoil infests much of the sublittoral habitat as well. Other non-native aquatic species of concern in Lake Spokane, include purple loosestrife (*Lythrum salicaria*), and yellow flag iris (*Iris pseudacorus*) (Parametrix, 2004).

Milfoil became established in Lake Spokane during the 1990s, and under current dam operations, which includes winter drawdowns, its spread has been rapid. Its presence has affected the ecology and public use of the lake. The plant has invaded the lake's native plant beds and has formed a monoculture instead of the native plant mix that once existed (SCCD 2001). This monoculture of aquatic weeds limits habitat function and diversity that fish and wildlife species that depend on Lake Spokane.

Parametrix mapped 373 acres of yellow floating heart in 2003 and Tetra Tech (SCCD, 2001) mapped 470 acres of yellow floating heart/white lily in 2000. According to Tetra Tech's survey (2001), there were approximately 1,100 acres

of littoral habitat in Lake Spokane, where non-native plants covered about 700 acres; 230 acres were occupied by milfoil; and the remainder by yellow floating heart. In 2005, it was estimated that milfoil probably occupies over 90 percent of the littoral area (Winterowd, 2005). The difference between Parametrix and Tetra Tech survey results could be due to an annual variation, but is more likely due to differences in sampling and mapping methods, protocol, and the overall study purposes. Parametrix used aerial photographs taken at 20,000 feet above sea level, and Tetra Tech used detailed boat and diver surveys to view below the water's surface.

2. Nine Mile Reservoir

Lake Spokane has been most affected by milfoil; however, there is a high potential that it will occur in Nine Mile reservoir. Milfoil exists in waters above the Nine Mile Development, in Lake Coeur d'Alene, as well as below in Lake Spokane. With plant fragmentation as a natural means of plant proliferation, there is a very high likelihood that milfoil will spread and proliferate in the Nine Mile Project area. Currently, Nine Mile reservoir is operated with seasonal drawdowns of up to 10 feet from spring through summer. This type of operation may preclude the establishment of milfoil in this reservoir through desiccation of available habitat. However, the installation of a rubber dam may alter operations and stabilize the pool level, possibly promoting the establishment of milfoil. Small-motorized boats are allowed in this reservoir and are a common vector in the spreading of milfoil. With a potential change in operations combined with milfoil plant fragments from waters above, and motorized boat usage, Nine Mile reservoir is at risk of an infestation of milfoil.

I. Sediment

1. Upper Falls Dam

Upper Falls Dam is operated as a run-of-river facility, with little fluctuation in reservoir level. The urban and industrial developed areas of the shoreline around the reservoir have been greatly altered and are typically characterized by large rock, boulder fill, and other constructed materials. Undeveloped portions of the shoreline are well vegetated with a shrub and deciduous tree riparian fringe characteristic of a stable reservoir level.

The Upper Falls impoundment (2 miles below Upriver dam) is 6 miles long, 150 acres and is relatively shallow (Avista 2005). The North Channel spillway gates are situated near the channel bottom, and it is likely that sediment moves through this facility relatively unobstructed (Golder 2004, Avista 2005). In the upper Spokane River, sediment sources include normal bank erosion and bed scour during relatively high flows (Golder 2004).

2. Monroe Street Dam

Monroe Street Dam is 0.2 miles long, creates a 5-acre reservoir, and is operated as a run-of-river facility with very minimal reservoir fluctuations. The reservoir is located within the incised bedrock ledges that form the Spokane Falls. The bedrock-controlled reach of river and steeper gradient indicates an increased potential for sediment transport. However, the 24-foot high dam traps bedload sediment transported during high-flow events. The bedload material deposited behind the dam is comprised of cobble, gravel, and sand (as reported in Avista's 2002 HPA application). Sediment sampling within the Upriver Dam impoundment also indicates that the majority of the substrate is cobble, gravel, and sand but with elevated concentrations of PCBs and metals (Johnson, 1999; Johnson and Norton, 2001; as cited in Golder 2004).

Sediment deposition and buildup behind Monroe Street Dam blocks the power intake adjacent to the dam's south abutment. To alleviate the blockage, the material is dredged from the intake and placed in the spillway for redistribution in the river. Sediment sampling in the Spokane River above and below this dam indicates the presence of cadmium, lead, and zinc in various concentrations (WDOE, 2001; Grosbois et al., 2001).

3. Nine Mile Dam

The Nine Mile Dam is 16 miles downstream from the Monroe Street Dam. The reservoir is 6 miles long with a surface area of 440 acres at full pool (with flashboards). Riparian vegetation and forested wetlands along the reservoir have developed under fluctuating reservoir levels of up to 10 feet. Sediment deposition significantly influences the reservoir environment in terms of vegetation (riparian and aquatic), the fisheries, and benthic invertebrates. The reservoir is essentially full of sediment but proposed alterations to the dam structure and operations may further alter the reservoir environment.

It is estimated that approximately 2.2 million cubic yards of sediment has come to rest within the Nine Mile Reservoir (NHC, 1999). This rough estimate of the sediment accumulated in the reservoir since 1906 was made by assuming that most of the deposition occurred in the first mile upstream of the dam. This estimate also assumes an average deposition thickness of 40 ft, which was established from comparing surveyed bed levels in 1906 and 1996.

On average over this 90-year period, the deposition rate of sediment from outside the project area has been approximately 25,000 cubic yards per year. During high flow events, deposition rates can be much higher. A comparison survey done between 1996 and 1997 (NHC, 1999) showed that approximately 75,000 cubic yards were deposited in the reach just upstream of the dam during that year.

In 1999, it was estimated that five years of available storage remained before the area upstream of the spillway was filled (NHC, 1999). Once equilibrium is reached in the Nine Mile Reservoir, sediment accumulation in Lake Spokane should increase. Bank erosion occurs along portions of the reservoir shoreline where the main channel has filled in with sediment resulting in a lateral shift of the river (NHC, 1999).

4. Rubber Dam Proposal at Nine Mile Dam

There is a proposal to replace the wooden flashboards with a more permanent rubber dam. This modification has the potential to alter sediment transport and deposition in the Nine Mile pool. Currently, timber flashboards are installed on the spillway crest each year at the onset of the low flow season, typically late July or early August, to raise the effective crest height by 10 feet, creating relatively low velocities in the reservoir (NHC, 1999). During these low flow, high water level periods, little or no bed load movement occurs past the dam. Operation of the rubber dam would extend the time period these conditions occur. If the pool is maintained 10 feet higher for longer periods, it is possible that the area of deposition may increase (FEIS, 2007).

5. Long Lake Dam

Long Lake Dam creates a reservoir 23.5 miles long with a surface area of 5,060 acres. The slack water environment results in deposition of a majority of sediment that passes the Nine Mile Dam. Distribution of the sediment varies, but the majority of the sediment settles in the upper portion of the reservoir.

It is estimated that 35 to 50 percent of the fine suspended sediments passing through Nine Mile Reservoir are deposited in the deeper areas of Lake Spokane (NHC, 1999).

Virtually all of the coarser sediments passing Nine Mile Dam are deposited near the head of the reservoir approximately at the point where the bottom of the reservoir begins to deepen and velocities decrease. Remaining amounts of suspended sediments travel downstream during high flows.

Approximately 20 percent of Lake Spokane's total storage volume may be filled with sediment in the next 50 years (NHC, 1999). Should current levels of sediment load into the Spokane River continue, sediment deposition downstream of Nine Mile Reservoir in the upper six miles of Lake Spokane could increase bed elevations in some places by as much as 5 feet over the next 50 years. The changes and potential consequences will be most evident in existing shallow water areas in the upper portion of the reservoir.

Sediment deposition in Lake Spokane contributes to nutrient loading and new substrate for invasive aquatic plants, while decreasing water depth and altering habitat for fish and wildlife species.

The Hangman Creek watershed is 431,000 acres. A TMDL is under development for the Washington portion of the watershed and will set allocations to reduce total suspended solids throughout the watershed resulting in less sediment delivery to the Spokane River.

IDEQ has an approved TMDL in place for a relatively small area in the Upper Hangman Creek watershed (10,000 acres) that includes daily sediment load targets (IDEQ, 2007).

J. Wetlands

- Importance of Wetlands

  Wetlands are important for maintaining water quality. Important functions of wetlands include, but are not limited to:

  - Removing sediment, phosphorus, nitrogen, and toxics
  - Providing habitat for cover, rearing, and food chain support
  - Retaining waters and further reducing impacts from runoff
  - Providing water during low flow periods
  - Cooling water
  - Abating erosion

- Effects of Dam Operations

  The following are types of activities related to dam operations that can cause impairment of the use:

  - Dam operations and construction can exceed the wetland's ability to assimilate sediments, nutrients, and toxins.
  - The introduction of nutrients or organic material to a wetland can lead to a high biochemical oxygen demand (BOD), which in turn can lead to reduced dissolved oxygen. Increases in nutrients can favor one group of organisms (such as algae) to the detriment of other types such as submerged aquatic vegetation. This potentially causes adverse health effects, objectionable tastes and odors, detrimental impacts to aquatic organisms and wildlife, and other problems.
  - Changes in water height and flow can significantly affect a wetland's ability to provide water quality and water quantity support to the use of water supply.
  - Severe water fluctuations limit denitrification and phosphorus retention. Changes in pH to more acidic conditions can reduce the wetland's ability to process nitrogen and phosphorus.
  - Increases in water volume and/or velocity increase loading and decrease sedimentation rates in the wetland, thereby decreasing the effectiveness of the wetland's ability to remove and retain nutrients and sediments.
  - Increased velocities can also cause decreased water storage time in the wetland, which will reduce the opportunity for the wetland to serve as a groundwater recharge source.
  - Drawdown of wetland water levels often concentrates and mobilizes nutrients locked up in the exposed substrate.
  - Changes in water velocity and volume may result in reduction of wetland quality and diversity of wetland types.
  - Changes to a wetland's outlet can also significantly affect the water within the wetland. Wetlands with no outlets or constricted outlets have an increased probability of adsorption, biological processing, and retention of nutrients. Alterations to the outfall that increase the flow out of the wetland will reduce the ability of the wetland to perform these functions.
  - Removal, change, or death of vegetation, because of dam operations or construction activities, alters the wetland's ability to remove or store water, nutrients, and other materials.

- Water Quality Standard

  The antidegradation policy in the water quality standards requires the protection of wetlands by ensuring all human activities that may lower water quality are:

  - Necessary
  - In the overriding public interest
  - Do not harm any existing or designated uses

  Along the 27 miles of free-flowing sections of the Spokane River within the study area, palustrine forested and scrub-shrub wetlands occur intermittently in narrow bands along the shorelines.

- Nine Mile Dam to Long Lake Dam

  As part of the relicensing process, a wetland study was developed by Avista (Spokane River Hydroelectric Project Wetland and Riparian Habitat Mapping and Assessment, Parametrix, July 9, 2004). The objectives of the study were to:

  a. Prepare a map and database of current wetland and riparian habitat types to describe current conditions and to facilitate assessment of the effects of continuing operations of the Spokane River Hydroelectric Project (Project).

  b. Determine changes in wetland/riparian habitat types and areas from the Spokane River Project covering the period before operations began to the present.

  Based on the Parametrix study, the following conclusions were reached for this portion of the Spokane River and the page numbers are cited in parenthesis after each section:

  Because of the limitation of the pre-project and other historic data in some areas, particularly along the Spokane River, a complete historical comparison of quantitative and qualitative habitat changes was not possible for the entire study area (page v).

  Lacustrine littoral aquatic bed covers 373 acres of this total containing primarily yellow floating heart, a non-native species. Yellow floating heart forms dense monotypic stands. These low diversity stands exclude native species and provide relatively low habitat functions (page vi).

  Since 1957, or during the last 46 years of project operations, aquatic bed wetlands have increased 64 percent in Lake Spokane, or an average increase of 3.3 acres/year. These wetlands are comprised of mostly non-native invasive plants, which can out compete and preclude establishment of native aquatic plants (page vi).

  Over time, diverse and valuable wetlands along the Lake Spokane arm of the Spokane River, immediately downstream of Nine Mile Dam, have been converted to 465 acres of aquatic bed wetlands through periodic inundation. This wetland monoculture promotes negative impacts to the system. An example would be aquatic weed proliferation and promoting dominance of particular wildlife and non-native fish species.

4.3 Total Dissolved Gas

TDG can be a concern at hydroelectric projects due to the effects of water pouring over the spillway of a dam and plunging into tailrace waters thereby creating air bubbles. When these are carried to the depth in the dam's stilling basin, the higher hydrostatic pressure forces air from the bubbles into solution. The result is water supersaturated with dissolved nitrogen, oxygen, and the other constituents of air. As the bubbles rise in the aerated zone of the tailrace, some of the gas leaves solution. However, as the bubbles dissipate and the water enters the downstream reach, the remaining TDG will remain unless wind or channel induced turbulence causes more degassing. TDG may also be increased or decreased by natural phenomena, for instance in the case of the Spokane River system, the Spokane Falls. Plunging waterfalls can generate gas.

TDG levels in the river downstream of Upper Falls and Monroe Street Dam are the result of TDG produced from Spokane Falls and are not related to Dam operation. TDG levels produced by Spokane Falls were some of the highest observed in the Project area during 2003 and 2004 monitoring. Although some dissipation of TDG occurs between Monroe Street and Nine Mile Dams, the elevated TDG levels in the forebay of Nine Mile may be the result of TDG produced at Spokane Falls. Very little, if any, additional TDG is generated by Nine Mile Dam. Based on monitoring data during 2004, spill at Nine Mile Dam appeared to dissipate TDG, although, TDG concentrations did exceed standards at Long Lake Dam. The Spokane River is listed on Washington State's Water Quality Assessment 303(d) list for TDG at the tailrace of Long Lake Dam.

A. Numeric Criteria, Narrative Criteria and Critical Period

Total dissolved gas (TDG) is measured in percent saturation. Washington state's water quality regulations establish a numeric TDG criterion of 110 percent saturation for the protection of aquatic species. The standards specify that when a water body does not meet its assigned criterion due to natural climatic or landscape attributes, the natural conditions constitute the water quality criteria (WAC173-201A-260(1)(a). The critical period for TDG exceedances of the 110 percent saturation criteria is usually during the mid March to mid April timeframe.

B. 7Q10

The 7Q10 flood flow is the highest seven consecutive day average flow with a 10-year recurrence frequency. The 7Q10 flood flow was calculated to be approximately 32,000 cfs with a spill flow of 27,000 cfs (WDOE, 2005a). The TDG standard is waived for flows equal to and greater than the 7Q10 flood flow.

C. Upper Falls Dam

1. Continuous measurements of TDG upstream of Upper Falls indicate that TDG remained below 110 percent during the spill season of 2003 (WDOE, 2005a) (Golder, 2003). All TDG measurements for the Upper Falls Development forebay, tailrace, and immediately downstream of the spillway were below the 110 percent criterion.

2. No compliance issues are necessary for Upper Falls Dam regarding TDG.

D. Monroe Street Dam

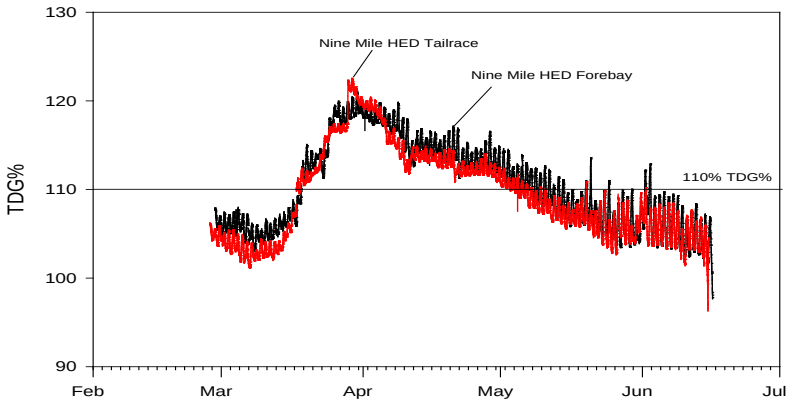
1. At the Monroe Street Dam forebay, spot TDG measurements ranged from 103 to 114 percent and measurements at the intake and in the tailrace were essentially similar (Golder, 2003). Water flowing over the lower falls attained levels of 128 TDG% and was one of the highest TDG sources identified in the study area. TDG measurements at a station 0.7 mile downstream of the lower falls ranged from 104 to 128 percent of saturation during peak flows in late March to early April 2003. TDG levels dissipated further in the 10.3 mile long reach between this station and Nine Mile Dam.

2. No compliance issues are necessary for Monroe Street Dam regarding TDG.

E. Nine Mile Dam

1. TDG levels measured in the Nine Mile Dam forebay ranged from 93 to 121 percent of saturation (Golder, 2003). Over the majority of the monitoring period, TDG levels fluctuated substantially (e.g., from 3 to 7 TDG %) on a daily basis. However, daily minimum TDG levels were in excess of 110 TDG% from 18 March to 7 May. TDG measurements obtained 0.4 mile downstream of the Nine Mile dam ranged from 96 to 123 percent (Figure 4-2). During peak spill periods in 2004, tailrace TDG levels were typically 2 to 4 TDG% lower than forebay TDG values (Golder, 2004).

Figure 4-2 A comparison of forebay and tailrace TDG% data recorded at Nine Mile Dam during the Spokane River TDG study from 24 February to 17 June 2003

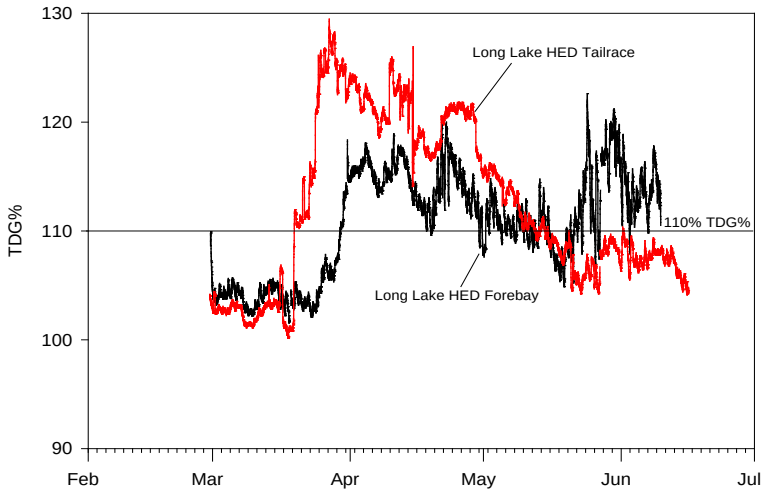


2. 2004 data demonstrated that Nine Mile Dam did not contribute to elevated TDG concentrations at some flow conditions, but may in fact reduce TDG levels (Golder, 2004). However, there is an uncertainty in this conclusion due to a lack of data recorded at higher flows. More studies and information is needed to identify what is occurring at Nine Mile Dam.

F. Long Lake Dam

1. TDG measurements in the Long Lake Dam forebay ranged from 101 to 123 percent, and typically had daily fluctuations of less than 5 percent (Golder, 2003). TDG levels at the forebay station were generally in excess of 110 TDG% from 30 March to 15 May and from 21 May to 10 June. TDG measurements obtained 0.6 mile downstream of Long Lake Dam ranged from 90 to 129 percent. Total dissolved gas levels in the Long Lake tailrace were in excess of 110 TDG% from 20 March to 15 May. TDG levels were generally in excess of 120 TDG% from 24 March to 14 April and from 21 April to 29 April (Figure 4-3).

Figure 4-3. A comparison of forebay and tailrace TDG% data recorded at Long Lake Dam during the Spokane River TDG study from 24 February to 17 June 2003



2. Vertical TDG profiles conducted near maximum stratification in 2004 suggested that random mixing of the stratified layers of water (e.g. wind events, dam operations, etc) was likely the cause of the rapid and typical large fluctuations in forebay TDG recorded in late spring 2003 and 2004. These fluctuations in forebay TDG generally were not reflected in the tailrace TDG data.

3. Monitoring of TDG levels in the forebay and generation plume during a 20 day period during May 2006 suggested that average TDG levels in the generation plume (i.e. below the powerplant) were the similar to average levels in the forebay and were less variable (Golder, 2006). Flows ranged from 14,430 to 19,690 cfs.

4. Further downstream, the water flowing into the forebay of Long Lake Dam contains TDG levels above 110 percent due to the falls from Spokane Falls mentioned previously. Those TDG levels are increased between the Long Lake forebay and Long Lake tailrace due to spill operations at Long Lake Dam.

G. Important Observations Regarding Figures 4-2 and 4-3

TDG levels in the Long Lake Dam forebay are consistent with TDG levels exiting in the Nine Mile Dam tailrace, and may be the result of TDG produced at Spokane Falls or by TDG produced at Nine Mile Dam. Important observations regarding Figures 4-2 and 4-3 are summarized below (Data from Golder and Associates Reports, 2003 and 2004):

1. During the onset of spill (prior to April 1 in 2003) there is about a two-week lag between TDG levels in the Nine Mile tailrace and the Long Lake forebay. When TDG is elevated above 110 percent in the Nine Mile tailrace, TDG in the Long Lake forebay is less than 110 percent.

2. After peak spill (after April 1 in 2003), TDG levels increase between the Long Lake forebay and Long Lake tailrace due to Long Lake Dam spill operations. This TDG is based on measurements in the tailrace below the spillway. TDG in the generation plume below the powerplant is representative of conditions in the forebay (see Figure 4-3 and discussion below).

3. Measured TDG levels in the forebay are influenced by temperature or other hydrodynamic factors during the late spring. As shown on Figure 4-2, higher TDG levels may be observed in the forebay even when low TDG levels are observed in the tailrace. Under conditions when the reservoir is thermally stratified, the highest forebay TDG levels will be recorded near the surface (i.e., at the standard monitoring depth of 3 m). However, these data are not representative of the TDG of the whole reservoir or of the water released downstream through generation. Consequently, reliance on forebay TDG monitoring data at Long Lake may result in erroneous estimates of TDG formation by the spillway if forebay data are used in a mass balance calculation of spillway TDG formation.

This discussion illustrates that, while TDG formation from the operation of the Long Lake Dam spillway does occur, the levels of TDG attributed to the spillway operation are not clearly measurable and are less than the absolute levels of TDG measured below the Dam.

H. Plans, Agreements and Strategies

1. Initial abatement feasibility through spill gate configuration

   Avista conducted an initial evaluation of TDG abatement feasibility by testing different spill gate configurations (Golder, 2003). The results of the gate tests suggest that to reduce downstream TDG levels during high flows, gates 1, 2, 7 and 8 are preferred over gates 3 through 6. Based on discussions with Avista personnel, gates 1 and 2 are typically not used. Spill through gates 7 and 8 are also avoided to minimize erosion of the north river bank. Downstream TDG level would likely be reduced by not using gate 5 and splitting flows among gates 3, 4, and 6.

2. Initial abatement feasibility through structural modifications

   An initial abatement feasibility report for Long Lake Hydroelectric Dam (EES, 2006) evaluated operating policies and structural alternatives for reducing TDG generation at Long Lake. Twelve potential structural alternatives were identified and evaluated. Five alternatives were based on modifying the existing Long Lake spillway dam, and ranged from the addition of simple flow deflectors below the existing spill bays, to complex spillway chutes and downstream rock excavation efforts that divert flows away from the deep plunge pool. Seven bypass options were considered, including three diversion tunnels or pipes around the dam, two new spillway alternatives, and two options that add generating units in a powerhouse extension or a new powerplant below the cut-off dam. Based on the evaluation, the following four alternatives were identified as warranting further evaluation (including an estimated TDG performance at hydraulic capacity):

   - Spill Bay 7-8 deflectors
   - Spill Bay 7-8 deflectors/training walls
   - Spill Bay 1-2 deflectors
   - New spillway below cut-off dam

In summary, these structural modification alternatives were an initial screening to which the report concluded additional TDG data from flow events near the 7Q10 level are required to determine their accuracy in reducing TDG concentrations.

4.4 Water Temperature

The Spokane River is listed on Washington State's Water Quality Assessment 303(d) list for temperature from monitoring at river mile 96 during summer months. Continuing on, temperatures tend to decrease downstream of Sullivan Road due to groundwater inflow. Data collected during the drought conditions in 2001 indicate that temperatures of less than 20ºC occurred from near the Sullivan River Bridge to the Monroe Street diversion dam with the exceptions of areas within the Upriver Dam Pool. The stretch of the Spokane River between Monroe Street Dam and Nine Mile Dam are relatively cool, generally less than 20ºC largely due to the cool ground water entering the river upstream as well as within this reach (Avista, 2005; WDOE, 2003b; Golder and HDR, 2004).

Continuing downstream, Lake Spokane stratifies in the summer and fall with a warm upper layer, middle layer and cool lower layer. The monitoring data indicates that the maximum 2001 water temperature reached 24 to 25ºC. The critical period for temperatures above the 20ºC criterion is largely during the summer months (Avista, 2005; WDOE, 2003b; Golder and HDR, 2005).

Downstream of Long Lake Dam, water temperatures are approximately 18 to 19ºC, due to the fact that the penstocks draw at a depth of 30 to 40 feet below the surface sending cooler water downstream. The water at this depth is much cooler that the surface water temperatures of Lake Spokane (Avista, 2005; WDOE, 2003b; Golder and HDR, 2005).

A. Numeric Criteria

There are special Water Quality numeric criteria for the Spokane River that apply to the entire project area. These are: 1)temperatures shall not exceed a one day max of 20ºC, due to human activities, when natural conditions exceed this, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3ºC; and 2) nor shall such temperature increases, at any time, exceed t=34/(T+9), where "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge (Water Quality Standards for Surface Waters of the State of Washington, WAC 173-201A, Table 602).

B. Modeling Long Lake Dam and Lake Spokane

Two modeling efforts were undertaken to quantify the effect of the Dams on water temperature. The modeling was conducted using Ecology's water quality model of the Spokane River; a CE-QUAL-W2 model developed by Portland State University that simulates the years 2000 and 2001. The two modeling efforts are summarized below.

Impounded versus Unimpounded. The first modeling effort compared the current (impounded) scenario (all Dams in place) with a "natural" (unimpounded) scenario (all Dams removed). Water temperature comparisons under this scenario compare different water body types (e.g. a stratified lake versus a flowing river). As a lake, surface layer temperatures in Lake Spokane are higher than under riverine conditions. Under riverine conditions, water temperature in this portion of the Spokane River would be less than 20^{o} C. Under current conditions, daily maximum temperatures at the outflow of Lake Spokane are lower than under riverine conditions. Water temperature in the Spokane River below Long Lake Dam is less than 20^{o} C under both current and "natural" conditions.

C. Border to Upper Falls Dam

The Spokane River is listed on Washington State's Water Quality Assessment 303(d) list for temperature from monitoring at river mile 96 during summer months. The River generally exceeds the 20°C criterion from July through early September for the first 11.5 river miles (Avista, 2005). The Spokane River originates from surface-level outflows from a large natural lake with a dam at the outflow that may cause temperature criteria exceedances under natural conditions. However, there is insufficient data to rule out the possibility that human activities have increased water temperatures over natural conditions in excess of allowable limits (303(d) list).

D. Monroe Street Dam to Nine Mile Dam

1. Below the Monroe Street Dam, groundwater provides a cooling influence and the river water temperature is typically below 20°C. Nine Mile Dam causes only weak stratification of the river and residence time and storage volume is not sufficient to cause significant heating (HDR, 2005).

2. Monitoring data collected 0.1 miles downstream from the Nine Mile Dam during 2001 indicate that water temperatures are less than 20°C. Additional cool water enters the Spokane River from the Little Spokane River, just downstream from Nine Mile Dam.

3. The data show that water temperatures are in compliance with numeric water quality criteria under current and proposed operation of the Upper Falls, Monroe Street, and Nine Mile Dams (HDR, 2005)

E. Nine Mile Dam to Long Lake Dam

The following information is from the Spokane River Hydroelectric Project Current Operations Water Quality Report, HDR March 2005. See Figure 4-4 for sampling locations:

1. Below Nine Mile Dam (Spokane River at Riverside), water temperature is consistently less than 20^{o} C. Maximum and minimum monthly temperatures vary significantly, ranging from 14^{o} C to 19^{o} C. During the summer, the long-term summer average temperature (June through September) of the inflow to Lake Spokane is approximately 16°C.

2. Lake Spokane stratification is strongest during August when the river inflow is least and when solar heating is the greatest. The highest temperatures are generally observed in August.

3. At the uppermost segment of Lake Spokane (Station LL4), average August water temperature (during 1991 and 2000) is greater than 20^{o} C at the surface layer and at 3m depth. Below a depth of 6m, average August water temperature (during 1991 and 2000) is less than 20^{o} C.

4. At the upper end of Lake Spokane (Station LL3), average August water temperatures (during 1966, 1991 and 2000) are similar to Station LL4 and greater than 20^{o} C at the surface layer and at 3m depth. Below a depth of 6m, average August water temperature (during 1966, 1991 and 2000) is less than 20^{o} C.

5. At the middle segments of Lake Spokane (Station LL2), average August water temperatures (during 1966, 1991 and 2000) in the surface layer are similar to Station LL3 and greater than 20^{o} C. Below a depth of 3m, average August water temperature (during 1966, 1991 and 2000) is less than 20^{o} C.

6. At the lower segments of Lake Spokane (Station LL1), average August water temperatures (during 1966, 1991 and 2000) in the surface layer are similar to Station LL2 and greater than 20^{o} C. Below a depth of 3m, average August water temperature (during 1966, 1991 and 2000) is less than 20^{o} C.

7. At Long Lake Dam (Station LL0 near the Long Lake Dam Forebay), average August water temperature (during 1966, 1991 and 2000) in the surface layer are similar to Station LL1 and greater than 20^{o} C. Below a depth of 3m, average August water temperature (during 1966, 1991 and 2000) is less than 20^{o} C.

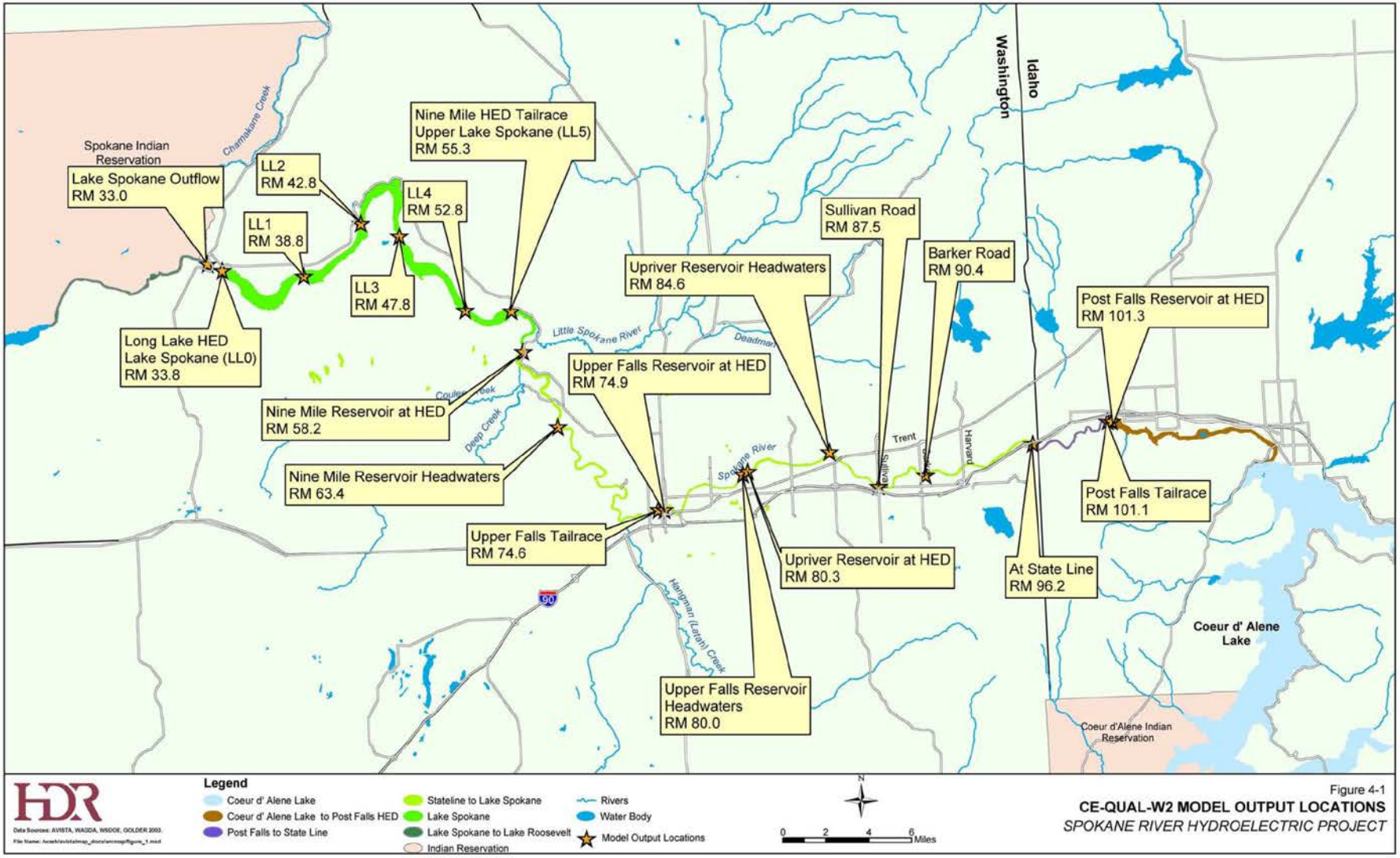
8. In 1991 and 2001, surface layer of Lake Spokane reached a maximum temperature of 24 to 25°C in August.

9. Below Long Lake Dam (Spokane River at Long Lake, USGS station), available August water temperature data over a 19-year period between 1963 and 2003 are typically less than 20^{o} C. In some years (1968, 1971, 1973, 1977, and 1981), water temperatures slightly above 20^{o} C were observed. A continuous data set of discharge temperatures is not available.

10. Water temperature in the surface layer of Lake Spokane is above 20^{o} C during the summer, largely as a result of solar heating. Deeper layers (below about 6 m depth) in Lake Spokane are cooler than 20^{o} C during the same periods. Because the discharge from Long Lake Dam is located at a depth of about 6m, water discharged downstream to the lower Spokane River is less than 20^{o} C and in compliance with Washington State numeric water temperature criteria.

11. Modeling indicates that the ability to influence water temperatures in Lake Spokane through operational changes at Long Lake Dam is limited. The surface layer of the lake is warmed by solar radiation, regardless of how the Dam is operated. All lakes in Eastern Washington have elevated surface layer temperatures. The location of the discharge outlet at Long Lake Dam prevents warmer water from being discharged downstream as it pulls cooler water from about 6 meters below the surface.

Figure 4-4. Monitoring Stations (HDR, 2005)



F. Plans, Studies, Operational Changes

Temperature Analysis

A second modeling effort compared the current (impounded) scenario with two operational changes at Long Lake Dam; a late-fill scenario and a mid-season drawdown scenario (Golder, 2007). The late-fill scenario had negligible effects on water temperature, and is not discussed further here. The mid-season drawdown scenario predicted some temperature changes in the upper portions of Lake Spokane where the drawdown creates a more riverine condition. Surface layer temperatures as a lake are higher than as a river. Mid season drawdown was predicted to cause outflow water temperatures from Lake Spokane to be slightly warmer (0.4 to 0.6 ^{o}C) compared to current conditions during July and August. The increase in downstream temperature is mainly due to the elevation of the discharge outlet, which is fixed. Therefore, in a mid-season drawdown water nearer the surface is discharged, leading to increased temperatures downstream.

Overall, the ability to influence water temperatures on Lake Spokane with operational measures is severely limited. Even a drastic 12-foot change in operating levels is predicted to produce limited effects in water temperature. Smaller changes in operating levels would be expected to produce even smaller changes. The surface layer of the lake is predicted to be warm as a result of solar radiation, regardless of how the Dam is operated (Golder, 2007).

4.5 Dissolved Oxygen

Dissolved oxygen (DO) is necessary to support aquatic life in rivers and reservoirs. The concentration of DO in the water is mainly regulated by photosynthesis, atmospheric diffusion and biologic respiration. The concentration of DO in water is also influenced by temperature, pressure and other chemical reactions. The maximum amount of oxygen that can be dissolved in water is termed the saturation concentration. Saturation is reached when no additional oxygen can be dissolved in water, and the saturation concentration changes based on ambient pressure and temperature. The amount of oxygen that can be dissolved in water decreases at higher temperatures and increases at higher pressure.

The Spokane River receives nutrients from a number of substantial point sources as well as non-point sources. Excessive nutrient loading of the Spokane River in the state of Washington has contributed to its inclusion on Washington's 303(d) list as being impaired for dissolved oxygen (DO) as well as other parameters.

Ecology released a Draft DO TMDL on September 12, 2007. The Final TMDL is expected to be approved in the summer of 2008.

This 401 Certification and the DO TMDL are parallel processes which share the similar goals of improving water quality in Lake Spokane. Avista must meet the Water Quality Standards below Long Lake Dam and has a 10 year compliance schedule to do so. This 10 year compliance schedule coincides with the TMDL's 10-year Assessment. At that time a determination will be made as to whether or not additional steps need to be taken to improve dissolved oxygen levels in the reservoir, and the appropriate mechanism to achieve this (See Appendix G).

A. Numeric Criteria

The entire reach of the Spokane River within the Project area with the exception of Lake Spokane has a numeric criterion of 8.0 mg/L for DO. The reservoir qualifies as a lake since it meets the residence time standards. The lake standards for DO state that; human actions considered cumulatively may not decrease the dissolved oxygen concentration more than 0.2 mg/L. To address this, the guidance Certification manual for Ecology states that hydroelectric utilities focus on meeting the standards downstream of their reservoirs and achieving the highest attainable water quality conditions within their reservoirs (WDOE, 2005b).

The critical period for DO depletion generally takes place in the late summer months when the reservoir is thermally stratified. Oxygen sags occur in the hypolimnion of regional lakes during this period. The summer months and beginning of fall is the time period for decomposition of aquatic plants in lakes such as Lake Spokane contributing to low DO concentrations.

B. Modeling Long Lake Dam and Lake Spokane

1. Modeling was conducted using Ecology's water quality model of the Spokane River; a CE-QUAL-W2 model, developed by Portland State University (same model used for DO TMDL purposes, see Appendix G).

2. The model (HDR, 2005) was used to evaluate DO under an unimpounded condition for the simulation period 2000 and 2001. The model compared the current (impounded) scenario (all Dams in place) with a "natural" (unimpounded) scenario (all Dams removed). DO comparisons under this scenario compare different water body types (e.g. a stratified lake versus a flowing river). The unimpounded scenario did not have simulated daily minimum DO concentrations below 8mg/L.

As a thermally stratified lake, DO levels at depths in Lake Spokane are lower than what would typically occur in a well-mixed river-like condition. The lake does; however, attenuate nutrients that would otherwise pass downstream to the next reservoir, affecting DO conditions downstream of Lake Spokane. The model does not; however, identify Avista's contribution to the DO problem of Lake Spokane.

C. Upper Falls, Monroe Street and Nine Mile Dams

The following information is from the Spokane River Hydroelectric Project Current Operations Water Quality Report, HDR March 2005:

1. DO concentrations are in compliance with numeric water quality criteria under current and proposed operation of the Upper Falls, Monroe Street and Nine Mile Dams.

2. Under current and proposed operations at these facilities, DO is expected to meet numeric criteria from Monroe Street Dam to Nine Mile Dam.

3. No adverse changes to DO attributable to Avista operations are anticipated for these facilities.

D. Nine Mile Dam to Long Lake Dam

A summary of DO data at various locations and depths downstream of Nine Mile Dam is provided below taken from the Spokane River Hydroelectric Project Current Operations Water Quality Report, HDR March 2005. See Figure 4-4 for sampling locations:

1. Above Nine Mile Dam (Spokane River at Riverside), DO is consistently greater than 10 mg/L meeting water quality DO standards.
2. At the uppermost segment of Lake Spokane (Station LL4), average August DO (during 1991 and 2000) is greater than 8 mg/L. This segment of the lake is well mixed and relatively shallow (less than 10 m water depth).
3. At the upper-middle segment of Lake Spokane (Station LL3), average August DO (during 1966, 1991 and 2000) is greater than 8 mg/l at depths above 15 m. At a depth of 24 m, average August DO was 4.8 in 1991.
4. At the lower-middle segment of Lake Spokane (Station LL2), average August DO (during 1966, 1991 and 2000) is greater than 8 mg/L at depths above the thermocline (6m). Below the thermocline (9-21m) average August DO is about 6.5 mg/L. At the bottom of the lake (24-36 m depth) average August DO is about 5.2 mg/L.
5. At the lower segment of Lake Spokane (Station LL1), average August DO is very similar to LL2. In the surface layer, DO is greater than 8 mg/L at depths above the thermocline (6m). Below the thermocline (9-21m) average August DO is about 6.1 mg/L. At the bottom of the lake (24-36 m depth) average August DO is about 4.6 mg/L.
6. At Long Lake Dam (Station LL0 near the Long Lake Dam Forebay), average August DO is greater than 8 mg/L at depths above the thermocline (6m). Below the thermocline (9-21m) average August DO is about 6.1 mg/L. At the bottom (24-36 m depth) average August DO is about 5.9 mg/L.

E. Tailrace of Long Lake Dam

A summary of DO data taken from the Long Lake tailrace is provided below from the Spokane River Hydroelectric Project Current Operations Water Quality Report, HDR March 2005.

1. DO monitoring data collected at the Long Lake Dam tailrace in 2000 and 2001 indicate that DO concentrations have been recorded below 8 mg/L from July to October.
2. The minimum DO concentrations recorded during these periods were between 4 to 5 mg/L.
3. These data indicate that the daily DO minimum concentrations in the Long Lake Dam discharge are below the 8 mg/L DO criterion for about 4 months of the year by an average magnitude of about 1.2 mg/L.
4. The monitoring and model scenario results indicate that Long Lake Dam causes DO concentrations at the Long Lake Dam tailrace to be below the 8 mg/L minimum DO criterion due to the depth of the penstock intake.

F. Plans, Studies

1. Spokane River Dissolved Oxygen TMDL

The DO TMDL being developed by Ecology contains an aggressive adaptive management approach to reduce nonpoint and point source phosphorus nutrient contributions to the Spokane River significantly over the next 10 years. These reductions will result in decreased nutrient loading to Lake Spokane which will improve DO levels in Lake Spokane and further downstream.

2. Long Lake Hydroelectric Development Phase I Aeration Study

Avista has initiated a DO enhancement study (HDR, 2006), and is considering techniques that would increase DO levels in the penstock, turbines or forebay and tailrace of the Dam in order to increase downstream DO during the summer. This was an initial screening level analysis designed to determine which options would be considered for further study. Specific recommendations for more detailed investigations are presented in the Long Lake Hydroelectric Development Phase I Aeration Study.

4.6 Turbidity

Wind and boat waves as well as high runoff flows are the main factors that raise turbidity in the Project system. Introduction of sediment from basin erosion from roads, farms, and construction areas also change turbidity in the system. Water level fluctuation rates are not considered an erosion factor causing water turbidity because of the relatively slower rates of level changes used for the Project reservoirs (FEIS, 2007).

Numeric criteria for the uses in the project area require that turbidity shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.

Monroe Street Rock Removal

Avista has reapplied for a permit from WDFW to remove rocky debris from the Monroe Street Dam's forebay. According to the description of work, "A hydro static suction device, a track hoe, and/or clam shell may need to be used alone or in combination to remove up to 10,000 cubic yards of rocky debris from the forbay. To the extent feasible, rocky debris will be put over the dam to allow for the natural redistribution of this native cobble, gravel, and sand material downstream." This activity is to meet the turbidity water quality standards.

4.7 Spills

Monitoring of lubricants, stormwater, and related discharges, and inventory procedures for these products has been completed for these Dams as required by 40 CFR 112. Upper Falls Dam and Monroe Street Dam were inspected on March 5, 2008 by the Department of Ecology Spills Program. On March 4, 2008, Nine Mile Dam and Long Lake Dam were inspected as well. All four dams were found to be well maintained and in good condition although some improvements in spill prevention can be made.

5.0 Conditions

In view of the foregoing and in accordance with Section 401 of the Clean Water Act (33 USC 1341), RCW 90.48.260 and WAC Chapter 173-201A, Ecology finds reasonable assurance that implementation of the compliance schedule and adaptive management strategy contained in the proposed license will result in the attainment and compliance with state and federal water quality standards and other appropriate requirements of state law provided the following conditions are met. Accordingly, through this Order issued and enforceable under RCW 90.48, Ecology grants Section 401 water quality Certification to the Licensee, Avista Utilities (Avista) for the Spokane River Hydroelectric Project (FERC No. 2545) subject to the following conditions. This Order will hereafter be referred to as the "Certification".

5.1 General Requirements

A. The Project shall comply with all water quality standards (currently codified in WAC 173-201A), ground water standards (currently codified in WAC 173-200), and sediment quality standards (currently codified in WAC 173-204) and other appropriate requirements of state law that are related to compliance with such standards, as all such standards are applied in this Certification.

B. Discharge of any solid or liquid waste to the waters of the state of Washington is prohibited, Water Pollution Control Act (RCW 90.48).

C. In the event of changes or amendments to the state water quality, ground water, or sediment standards, or changes in or amendments to the state Water Pollution Control Act (RCW 90.48), or changes in or amendments to the Federal Clean Water Act, Ecology may by Administrative Order incorporate such provisions, standards, criteria or requirements into this Certification and any attendant agreements, orders or permits, to the fullest extent permitted by law.

D. The Licensee shall notify Ecology before undertaking any change to the Project or Project operations that might significantly and adversely affect the water quality (including impairment of designated uses) or compliance with any applicable water quality standard (including designated uses) or other appropriate requirement of state law. If, following such notification, Ecology determines that such a change would violate state water quality standards or other appropriate requirements of state law. Ecology reserves the right to condition or deny such change by Administrative Order, in accordance with applicable federal and state law.

E. This Certification does not exempt compliance with other statutes and codes administered by federal, state, and local agencies.

F. The Washington State Department of Fish and Wildlife (WDFW) require a Hydraulic Project Approval (HPA) (under 75.20 RCW) for work in waters of the State. The Licensee will obtain an HPA from WDFW for any activity that may affect water quality or designated uses, prior to the beginning of those activities, and must comply with all conditions of the applicable WDFW HPA. To ensure compliance with HPA requirements, contact WDFW, currently available at: Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia, WA 98501-1091, (360) 902-2200. For further information on HPA requirements and WDFW contacts, visit the following respective web pages: http://www.wa.gov/wdfw/hab/hpapage.htm, http://www.wa.gov/wdfw/depinfo.htm .

G. Ecology retains the right by Administrative Order to require additional monitoring, studies, or measures, in consultation with the Licensee, if it determines there is likelihood or probability that violations of water quality standards or other appropriate requirements of state law have or may occur, or insufficient information exists to make such a determination.

H. Ecology reserves the right to issue Administrative Orders, assess or seek penalties, and to initiate legal actions in any court or forum of competent jurisdiction for the purposes of enforcing the requirements of this Certification.

I. Ecology retains the right by Administrative Order to modify schedules and deadlines, in consultation with the Licensee, provided under this Certification or provisions it incorporates.

J. If a conflict or inconsistency arises between this Certification and any Settlement Agreement or any part thereof, the terms of this Certification shall govern.

K. Ecology reserves the right, if five or more years elapse, between the date this Certification is issued and issuance of the new FERC license for the Project, to issue an Administrative Order declaring that this Certification shall be deemed to be expired and denied at such time, and instructing the Licensee to send Ecology an updated 401 application that reflects the current conditions, regulations and technologies. This provision shall not be construed to otherwise limit the reserved authority of Ecology to withdraw, amend, or correct the Certification before or after the issuance of a FERC license.

L. This Certification may be modified or withdrawn by Ecology by Administrative Order prior to the issuance of the license based upon significant new information or changes to any Settlement Agreement or water quality standards or appropriate requirements of state law.

M. Ecology reserves the right to amend this Certification by further Administrative Order if it determines that the provisions hereof are no longer adequate to provide reasonable assurance of compliance with applicable water quality standards or other appropriate requirements of state law. Such determination shall be based upon provisions in the new FERC license or new information or changes in: (i) the construction or operation of the Project; (ii) characteristics of the water; (iii) water quality criteria or standards; (iv) Total Maximum Daily Load (TMDL) requirements; or (v) effluent limitations or other applicable requirements of state law. Amendments of this Certification shall take effect immediately upon issuance, unless otherwise provided in the Administrative Order containing the amendment. Ecology shall transmit such amending orders to FERC to update FERC's records as to the current Certification conditions.

N. Copies of this Certification and associated permits, licenses, approvals and other documents shall be kept on site and made readily available for reference by the Licensee, its contractors and consultants, and Ecology.

O. The Licensee shall allow Ecology access to inspect the Project and Project records required by this Certification for the purpose of monitoring compliance with the conditions of this Certification. Access will occur after reasonable notice, except in emergency circumstances.

P. The Licensee shall, upon request by Ecology, fully respond to all reasonable requests for materials to assist Ecology in making determinations under this Certification and any resulting rulemaking or other process.

Q. The conditions of this Certification should not be construed to prevent or prohibit the Licensee from either voluntarily or in response to legal requirements imposed by a court, the FERC, or any other body with competent jurisdiction, taking actions which will provide a greater level of protection, mitigation, or enhancement of water quality or of existing or designated uses.

R. If an action required under or pursuant to this Certification requires as a matter of federal law that the FERC approve the action before it may be undertaken, the Licensee shall not be considered in violation of these requirements to the extent that FERC refuses to provide such approval, provided that the Licensee diligently seeks such approval and so notifies Ecology.

S. Any work that is out of compliance with the provisions of this Certification, or conditions that result in distressed, dying or dead fish, or any unpermitted discharge of oil, fuel, or chemicals directly or indirectly into state waters, is prohibited. If these occur, the Licensee shall immediately take the following actions:

1. Cease work at the location of the violation to the extent such work is causing or contributing to the problem.

2. Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.

3. Notify Ecology of the failure to comply.

   Spill events shall be reported immediately to Ecology's 24-Hour Spill Response Team at 509-329-3400. Other non-compliance events shall be reported to Ecology's permit manager, or to Ecology's ERO Water Quality Permit Unit Manager.

4. Submit a detailed written report to Ecology within two weeks that describes the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.

   Compliance with these requirements does not relieve Avista from responsibility to maintain continuous compliance with the terms and conditions of this Certification or the resulting liability from failure to comply.

T. Submittals required by this Certification are summarized in Appendix E. Unless indicated otherwise, submittals shall be sent to the permit manager at the Department of Ecology, Eastern Regional Office, Water Quality Section, 4601 North Monroe, Spokane, Washington 99205-1295.

U. This Certification addresses work associated with the Project. Any additional work not specified in this Certification that may impact water quality (e.g. hatcheries, riparian habitat restoration projects, etc.) will require attaining of the applicable permits and/or Certifications at the appropriate time. The Licensee shall consult with Ecology to determine whether a specific project triggers the need of additional permits or a new Section 401 Certification. If a project would result in a new discharge or alteration to an existing discharge that is not specifically addressed in this Certification, it will in most cases require a new Section 401 Certification.

V. All information prepared or collected as a requirement of this Certification (e.g. plans, reports, monitoring results, meeting minutes, and raw data) shall be made available to the public on the Licensee's website or other readily accessible means. Where data or quantitative analysis is involved, it shall be provided in a format that allows others to efficiently validate and analyze data and results.

W. Where this Certification refers to "reasonable and feasible" actions and measures, Ecology retains the authority to ultimately determine if an action or measure qualifies as "reasonable and feasible".

X. Within this Certification, Ecology has required the use of an Adaptive Management process to meet a number of state water quality standards. As used in this Certification, Adaptive Management means an iterative and rigorous process used to improve decision-making and achieve objectives in the face of uncertainty. It is intended to improve the management of natural resources affected by Project in order to achieve desired objectives as effectively and efficiently as possible.

Y. Ecology acknowledges that Avista reserves the right to appeal to the Pollution Control Hearings Board pursuant to RCW 43.21B, or to any court or other forum of competent jurisdiction pursuant to applicable law, any Administrative Order or civil penalty issued by Ecology relating to this Certification, including the right to challenge Ecology's authority to issue such Administrative Order or penalty. Ecology also acknowledges that Avista reserves the right to appeal to the Hydraulics Appeals Board pursuant to RCW 77.55, or to any court or other forum of competent jurisdiction pursuant to applicable law, any HPA issued by WDFW, and to challenge WDFW's authority to require that Avista obtain an HPA.

5.2 Aesthetic Flow

A. Upper Falls Dam

1. Upon issuance of the new license, and as an interim measure before channel modifications, the Licensee shall provide aesthetic spill through the Upper Falls Dam bypass reach, year-round, for the term of the FERC License, subject to the following qualifications:

    i. Day-time aesthetic spill of a minimum of approximately 500 cfs shall occur between 6:00 a.m. and one-half hour after sunset. However, when flows are between 800 cfs and 1,000 cfs at the Spokane Gage, the Licensee shall provide approximately 500 cfs through the Upper Falls Powerhouse, and shall provide the remaining flow, with a minimum of 300 cfs, as aesthetic spill through the bypass reach. If flows drop below 800 cfs at the Spokane Gage, the minimum aesthetic spill through the bypass reach will be at least 300 cfs.

    ii. Night-time aesthetic spill of at least 100 cfs shall occur between one-half hour after sunset and 6:00 a.m.

b. Within one year of the issuance of the FERC License, the Licensee shall develop an Upper Falls Aesthetics Spill Plan ("Aesthetic Spill Plan"), in consultation with the Washington Department of Ecology ("Ecology") and the Washington Department of Fish and Wildlife ("WDFW"). The purpose of the Aesthetic Spill Plan is to achieve desired aesthetic characteristics similar to or better than those observed at 500 cfs spills, as indicated in the Louis Berger Aesthetic Study Report, by modifying the north and south channels of the Upper Falls bypass reach, subject to the following qualifications:

    i. Day-time aesthetic spill of at least 300 cfs through the Upper Falls bypass reach between 6:00 a.m. and one-half hour after sunset, year-round, for the term of the FERC License. However, if flows drop below 800 cfs at the Spokane Gage, the minimum aesthetic spill through the bypass reach will be at least 250 cfs.

    ii. Night-time aesthetic spill of at least 100 cfs shall occur between one-half hour after sunset and 6:00 a.m., year-round, for the term of the FERC License.

    iii. A design objective of achieving, through channel modifications, the most desired visual and audible effects similar to or better than those achieved by a spill of 500 cfs through the bypass reach without channel modifications, in part by dividing the aesthetic spill between the north and south channels. A design objective of achieving desirable aesthetic effects at multiple viewpoints of major falls features (e.g., not just the final drops in the north and south channels).

    iv. A pilot study to evaluate the effectiveness of potential channel modifications developed and conducted cooperatively and in good faith with interested Stakeholders, including opportunities for public input.

    v. Review and approval by Ecology, in consultation with WDFW, of the proposed channel modifications, including engineering documents describing how the channels will be modified to direct flows, and documentation of the related visual and audible effects.

vi. An inventory and analysis of resources and ecological functions of the impacted channels, and potential impacts of variable flows and rate of flow adjustments. A monitoring plan that examines fish entrainment, stranding and trapping.

vii. A schedule for identifying and securing all permits needed for the pilot study and permanent channel modifications.

viii. A schedule for implementation of any proposed channel modifications.

ix. Following completion of the channel modifications, the falls will be assessed to determine whether the modifications have achieved the design objectives as provided for in subsection 2.c. If it is not mutually agreed upon that the results adequately achieve the design objectives, the Licensee will work in good faith to achieve the design objectives through 1) the implementation of additional channel modifications; and/or 2) aesthetic spill up to 300 cfs (instead of the 250 cfs identified in 2.a).

If the evaluation discussed in subsection 2.f above indicates that significant ecological functions are being negatively impacted by diurnal timing of the flows, the Licensee shall provide to Ecology a plan to address those impacts.

c. In the event the Licensee is unable to complete the channel modifications either due to failure to obtain all the necessary permits, or for other reasons mutually agreed upon, the Licensee shall continue the aesthetic spills identified in 1 above for the term of the FERC license (provided Aesthetic Spill Plan 2.f above is met).

B. Monroe Street Dam

Upon issuance of the new license, the Licensee shall provide aesthetic spill over the Monroe Street Dam, year-round, for the term of the FERC License, subject to the following qualifications:

1. Day-time aesthetic spill of at least 200 cfs shall occur between 10:00 a.m. and one-half hour after sunset.

2. Night-time aesthetic spill of at least 100 cfs shall occur between one-half hour after sunset and 10:00 a.m.

5.3 Aquatic Resources

A. General Conditions

The Licensee shall operate the Project in compliance with the conditions set forth below.

Ecology expects the conditions contained within this section will be adequate to protect aquatic life as required under state law and the Clean Water Act. In the event that the conditions fail, or begin to fail, as determined by Ecology in consultation with WDFW, to adequately protect in a timely manner existing and designated uses or water quality, Ecology reserves the right by Administrative Order to require such reasonable and feasible changes or additions to, the conditions as it determines necessary to address the impacts of Project operations.

Ecology, in consultation with WDFW, reserves the right by Administrative Order to modify the processes or decisions described herein, including timeframes. If timely progress is not made or plans or reports are not timely submitted, Ecology reserves the right to impose penalties.

B. Biological Objectives

Appendix F lists biological and management goals and objectives (Biological Objectives) that Ecology and WDFW have identified for the Spokane River. The Biological Objectives are expected to guide a long-term process for addressing the many factors affecting fish habitat and populations in the Spokane River.

The Biological Objectives are important but not exclusive goals and objectives for the Spokane River. They are not intended to serve as a surrogate for the requirement to support and protect designated uses of the waters. The Biological Objectives are attached to provide context for this Certification. Ecology, in consultation with WDFW, reserves the authority to modify or supplement any of the Biological Objectives.

C. Minimum Discharge Operational Releases for the Protection of Fish

Monroe Street and Upper Falls Dam Operations

Avista shall operate the Monroe Street and Upper Falls facilities as provided in this condition to discharge the following minimum flows as measured at the Spokane River at Spokane Gage (USGS 12422500) during the specified times of the year:

June 16 - September 30	850 cfs
October 1 - March 31	1,100 cfs

The minimum discharge flows included in this condition are based on recommended flows necessary to protect rainbow trout and mountain whitefish habitat.

4. However, should the instantaneous flow at that gage fall below 850 cfs, Avista shall collect pertinent data to verify that during the period(s) when 850 cfs flows are not being met, changes in the storage of water behind the Monroe Street and Upper Falls Dam is not occurring due to the operations of those dams. However, minor changes in storage or flows that are necessary to meet aesthetic spill requirements shall not be considered a change in storage or flows for the purpose of this condition. In addition, short-term changes due to safety, emergencies, or mechanical failure beyond the Licensee's control, shall not be considered a change in storage or flows for the purposes of this condition.

5. When the daily average discharge is below 850 cfs for more than five consecutive days at the Spokane Gage (USGS 12422500), Avista shall convene with Ecology for the purpose of reviewing the data and other information to determine whether flows at the Spokane Gage are below 850 cfs due to discharges from Avista's Post Falls, Idaho facility.

   If it is determined that the low flows are due to the operation of Avista's Post Falls, Idaho facility, Avista and Ecology will convene with IDEQ to determine if Avista should alter Post Falls' discharge flows/levels and timing to meet the 850 cfs flow at the Spokane Gage. Any alteration of discharge flows/levels and timing at Avista's Post Falls, Idaho facility shall be made pursuant to the process and terms set forth in Idaho's 401Certification, and Avista shall implement any such alteration.

Spawning Flow Requirement (April 1 - June 15):

Spawning flows shall be determined based on a quantitative analysis of spawning habitat, spawning success, and population response to flow alterations in the lower Spokane River. This analysis is described in Condition D.2.

Relationship to the Idaho 401 Certificate:

The minimum discharge provisions in this 401 Certification apply to the Monroe Street and Upper Falls Dams. Although the Avista Post Falls, Idaho facility is the first control structure on the Spokane River system, the operation of the Post Falls, Idaho facility is subject to the Idaho 401 Certification and the terms and conditions of the final FERC license for that facility. Nothing in this Certification is intended as a condition on the Post Falls facility.

Pursuant to the section 401 certification of the State of Idaho issued on June 5, 2008, for the Post Falls facility, Avista is required to complete certain monitoring studies on how incremental increases of flow in specified summer periods will affect temperature and water quality, including temperature and water quality downstream in the State of Washington. Avista shall provide Ecology and the FERC with copies of all reports and other submittals relating to such monitoring studies at such time as they are submitted to the State of Idaho. If the section 401(a)(2) process of the CWA relating to the Post Falls certification is triggered by the State of Washington, the FERC shall condition the related license "in such manner as may be necessary to insure compliance with applicable water quality standards."

D. Fisheries

The Spokane River dams influence aquatic conditions in the reservoirs including habitat types, species composition and abundance, and harvest opportunities. Discharge operations influence spawning success, rearing habitat, population abundance, and harvest opportunities in the river. Development and implementation of the following measures, is required:

1. Upper Falls Dam

Avista shall conduct a three-year baseline assessment to provide information pertinent to understanding potential effects of the proposed operational change related to aesthetic flows, on resident fish.

The baseline assessment shall include data analyses of the fish population between Upper Falls Dam and Upriver Dam for three years: specifics include the calculation of indices and statistics related to species composition, abundance catch per unit effort (CPUE), age, growth, and condition. This assessment shall begin in year two of the FERC license.

2. Monroe Street Dam to the Nine Mile Dam Pool

Operation of the dams on the Spokane River influences flows, bedload movement and spawning success. The river portion between Monroe Street dam and the Nine Mile dam pool includes spawning habitat important to native trout.

Additional information is needed to better understand how the following specific factors relate to trout spawning success between Monroe Street dam and the Nine Mile dam pool. Within two years after issuance of the new FERC license (except for subparagraph d), below), the Licensee shall in consultation with WDFW and Ecology:

a) Quantify the quality and quantity of trout spawning habitat: determine the most productive and least productive spawning areas by developing quality strata at all flow/discharge elevations.

b) Quantify spawn to emergence success: determine survival from egg to emergence by strata using artificial redd construction. Correlate egg-to-emergence survival for each stratum with corresponding flow/discharge and include velocity, depth, and temperature as variables.

c) Quantify redd dewatering at different flow/discharge elevations for each habitat quality stratum.

d) Determine redband trout abundance estimates annually (for 10 years) to assess year class association with flow/discharge levels. Correlate year class strength with flow/discharge and egg to emergence survival. Determine overall spawning success with regard to flow/discharge levels and timing.

Once this information is gathered and provided to Ecology and WDFW, Avista shall, in consultation with Ecology, and WDFW, develop an adaptive management plan to be approved by Ecology regarding discharge flows/levels and timing to improve spawing success and produce successful year classes consistent with the Upper Spokane River Rainbow Trout Spawning and Fry Emergence Plan and pursuant to the Idaho 401 certification.

In addition, implementation measures may result from the Monroe Street Dam Sediment Management Plan as it relates to downstream spawning habitat.

E. Non–Native Aquatic Invasive Plants

The Licensee shall develop a Lake Spokane Aquatic Weed Management Program in conjunction with FERC, WDFW and Ecology for review and approval within one year of issuance of the FERC license. The Program shall include but not be limited to:

a) Cooperation/Coordination

The development of monitoring plans to identify, design, and implement an agreed upon in-field action to control the spread and occurrence of Eurasian watermilfoil with a primary focus on access sites.

The Licensee will also work with the cooperating parties to monitor and control the other existing exotic aquatic weeds and any new exotic aquatic weeds that may become established. This may also include educating the public and area landowners about the threats posed by the spread of aquatic weeds and the appropriate means of limiting their spread or reducing their occurrence.

b) Site-specific Weed Control

Specific in-field weed control actions supported by or implemented under this Program may include but not be limited to any or all of the following: mechanical removal of plants, bottom barriers, chemical treatments, biological treatments, and Project operational measures. It is anticipated that, as new technologies for weed control are developed, they will be implemented when and where appropriate.

The Licensee will work with and coordinate Project operational measures related to this Program with the cooperating parties. This includes scheduled drawdowns of Lake Spokane on a multi-year (2 to 4 year) cycle of up to 10 to 14 feet (levels necessary) to accommodate the installation, maintenance and/or replacement of bottom or physical barriers with the cooperating parties. The Licensee shall target anticipated periods of below-freezing temperatures during the months of January or February for these scheduled drawdowns in order to accomplish more reservoir-wide aquatic weed control as outlined below.

c) Weed Control Lake Drawdowns

In addition to scheduled drawdowns associated with placement and maintenance of bottom barriers or other site-specific weed control efforts, the Licensee shall also implement lake drawdowns for the specific purpose of aquatic weed control. Ecology recognizes that winter drawdowns have varying rates of success due to the amount of the exposed lake bed, duration of exposure, presence of springs, and weather conditions at the time of drawndown. This type of operational measure will entail periodic winter drawdowns of Lake Spokane specifically intended to take advantage of freezing conditions that can kill or otherwise adversely affect the exposed aquatic weeds on a reservoir-wide basis.

In order to maximize the effectiveness of these drawdowns for reservoir-wide weed control purposes, the Licensee will seek to:

1. Achieve a 13-14 foot drawdown in order to maximize the amount of exposed aquatic weeds;
2. Achieve the desired drawdown level at a time when an extended period of below-freezing temperatures are anticipated;
3. Maintain the desired drawdown level for a sufficient period of time to achieve the desired adverse effects on the targeted weed species (i.e. freezing and mortality of the plants); and
4. Conduct these types of drawdowns on a frequency sufficient to maintain at least a moderate level of ongoing aquatic weed control in the exposed areas (i.e., between 0-14 foot depths) as determined appropriate by follow-up monitoring of weed response and subsequent reestablishment.

d) Monitoring

Monitoring plans specific to evaluating bottom barriers and drawdowns will be developed and implemented. The cooperating parties will select representative sites (reservoir-wide and at the public access sites) to assess the effectiveness of the weed control strategies (e.g. bottom barriers and winter drawdowns). An initial base-line assessment will be conducted at the sites to assess weed species occurrence, stem densities, plant heights, etc.

Water level, air temperature, subsurface temperature, and other relevant variables will be monitored and recorded during the lake drawdowns done for weed control.

One year after the weed control strategies are implemented, associated sites will be reassessed to evaluate weed species occurrence and density. Following this, periodic monitoring will be conducted as identified in the monitoring plans. The monitoring results will be included in the annual report and will be used in the decision-making process for future years.

e) Nine Mile Reservoir

The Licensee shall also discuss non-native invasive aquatic plant issues regarding Nine Mile reservoir in the Lake Spokane Aquatic Weed Management Program. Avista shall monitor Nine Mile reservoir for non-native aquatic plants during even-numbered years. If non-native plants are detected within the Nine Mile reservoir, Avista shall develop a revised monitoring and control plan within one year of detection.

f) Reporting

The Licensee will prepare an annual report that summarizes the activities conducted in the previous year and results that were achieved for submission to Ecology. The report will include discussions on the effectiveness of the weed control efforts that have been implemented and any proposed changes or adjustments and will be used to guide weed control efforts for the upcoming year.

F. Sediments

- Monroe Street Dam

Sediment and dredging activities at Monroe Street Dam shall be evaluated to ensure compliance with state water quality standards and to protect downstream beneficial uses.

This Certification shall apply to all of Avista's dredging activities that occur at Monroe Street Dam pursuant to the current Army Corps of Engineers permit #1997-4-0098, and to all future 404 permits issued by the Corps of Engineers for Avista's dredging activities at Monroe Street Dam during the term of the new FERC license; provided, however, that this Certification shall not apply to any 404 permit issued after the effective date of a change in applicable water quality standards.

Prior to the first dredging activity after issuance of the FERC license, the Licensee shall develop a Sediment Management Plan to be approved by Ecology in consultation with WDFW that addresses the periodic removal of sediments behind the Monroe Street Dam, the placement of the sediments below the dam or off-site, long-term monitoring, and the predredge sampling requirements identified below.

The Licensee shall provide Ecology with at least 2 business days written notice prior to undertaking any dredging.

The Licensee shall provide sample results from the sediments that it expects to remove from behind the dam prior to the first and second dredging activities after issuance of the FERC license, and prior to the first dredging activity that takes place on or after every tenth anniversary of issuance of the FERC license. The Licensee shall also provide sample results from sediments in advance of other dredging activity if Ecology determines that a spill or other event that has occurred upstream of the dam is likely to result in deposition of sediments behind the dam that exceed water quality standards, or if the results from the last sampling event indicate that the sediments exceeded water quality standards.

The Licensee shall provide the following information to Ecology at least 2 business days prior to any dredging, based on pre-dredge sediment samples taken from the dredging area behind the dam:

- A characterization of the hydrological event(s) responsible for the deposits;
- A determination of the size-class of the sediments;
- An analysis of the chemical composition of the sediments;
- A volumetric estimate of the sediments that are to be, removed, and placed downstream;
- The expected dates and duration of each dredging occurrence; and
- A description of the type(s) of equipment expected to be used for moving the, sediments and method of placement if applicable.

Sixty days after dredging, the licensee shall submit a post dredging assessment that addresses dredging results and sediment redistribution for activities listed in the aforementioned dredging schedule. Information provided by these assessments may be used to supplement the Monroe Street Dam to the Nine Mile Dam Pool studies identified in Section 5.3.D. If the sample results indicate that the sediments exceed applicable water quality standards, the Licensee will manage the sediments in accordance with the Sediment Management Plan to protect downstream beneficial uses. Nothing in the Sediment Management Plan shall prevent Ecology from requiring another party responsible for an upstream spill or other event that triggers pre-dredging sampling by Avista to sample and/or clean up sediments from behind the dam in accordance with existing law.

- Nine Mile and Long Lake Reservoirs

The Licensee shall prepare a sediment management plan for Nine Mile and Long Lake Reservoirs as described in the Final EIS, Spokane River and Post Falls Hydroelectric Projects. This plan shall be submitted for approval to Ecology within four years of issuance of the FERC license. The plan shall address:

1. Sediment transport and the impacts to the river system
2. Sediment characterization
3. A process for regular monitoring of sediments trapped by the developments/dams
4. Document the current deposition and transport rates and patterns in the reservoirs including the effect of the dams on how sediment is stored in the reach
5. A plan for final disposition of sediments
6. Develop and implement a Sediment Management Plan to enhance fish and wildlife habitat in Nine Mile Reservoir and Lake Spokane

G. Wetlands

The applicant provided no data to determine pre-project existence of wetlands along the Spokane River between Nine Mile Dam and Lake Spokane Dam. However, a cursory wetlands inventory was developed by the applicant for the relicensing process.

In its relicensing application, the applicant proposed to purchase a piece of property roughly 47 acres in size along Lake Spokane for the purpose of protecting high quality wetlands (PM&E SRP-TR-1).

Because of a lack of baseline data, a comparative analysis was performed between wetlands present along the free-flowing reaches of the river and wetlands present downstream of Nine Mile Dam. Both acreage and type of wetlands were analyzed. This in no way accounts for what has been lost or converted along the entire system through inundation or altered flow regimes, but does attempt to restore diversity of wetlands and wetland functions below Nine-Mile Dam to present day levels. Nor does it accurately reflect lost function which serves as the basis for determining mitigation ratios.

Based on the Parametrix inventory (Table 3-1), the following types of wetlands exist along the free-flowing stretches of the river and Lake Spokane.

Table 5-1 Existing Wetlands along the Spokane River

Type	Spokane River	Lake Spokane
Palustrine acres	138	92
Lacustrine acres	0	373
Riverine acres	6	0
Total	**144**	**465**
River miles	**27.5**	**23**

Table 5-2 Acres of Palustrine Wetlands along the Spokane River

Type of wetland	Spokane River acreage	Lake Spokane acreage
Acres Palustrine – scrub-shrub	39	12
Acres Palustrine – forested	60	10
Acres Palustrine – forested cottonwood	5	0
Acres Palustrine - emergent	36	70

The existing acreage of Palustrine wetland per river-mile is:

Table 5-3 Acreage of Palustrine Wetland per River Mile

Type	Spokane River	Lake Spokane
Ac/mile Scrub Shrub	1.42	.52
Ac/mile Forested	2.18	.43
Ac/mile Forested Cottonwood	.19	0
Ac/Mile Emergent	1.31	2.95

Based on the present day ratios along free flowing stretches of Spokane River, Palustrine wetlands along the Lake Spokane reach would be expected to compare in the following manner:

Table 5-4 Comparison of Acreage that should Exist and Acreage that Does Exist.

	Expected acreage along Lake Spokane based on river ratios	Existing acreage along Lake Spokane	Acreage Gained (+) or Lost(-)
Scrub Shrub	32.66	12	-20.66
Forested	50.14	10	-40.14
Forested Cottonwood	4.37	0	- 4.37
Emergent Other	0	22.66 *	+22.66
Total Acreage			**-42.51**

*There is presently 68 acres in the emergent category; however, because the creation was the result of dam operation, Ecology guidance is to apply a ratio of 1:3 for this wetland category. For three acres currently present, one acre of credit will be given for mitigating losses (68x.33 – 22.66).

The Licensee shall, in collaboration with Ecology, develop a site-specific wetland creation, restoration, enhancement, and protection plan ("Wetlands Plan" or "Plan") based on the conditions specified below and the *Guidance on Wetland Mitigation in Washington State,* Ecology publication 04-06-013a.

The Wetland Plan(s) shall be completed and submitted to Ecology for approval prior to the end of the third year following the issuance of this Certification.

The Wetland Plan(s) shall include, but not be limited to, schedules, developmental plans, permitting, construction, operation and maintenance and monitoring plans.

Access and acquisition to all properties identified for wetland protection, creation, restoration or enhancement shall be completed no later than five years following the issuance of this Certification.

The Licensee shall acquire, restore and/or enhance a minimum of 42.51 acres of wetlands downstream of Nine Mile Dam (42.51 was rounded down due to baseline data limitations). The primary objective is to create proportions of wetland type based on existing proportions along free-flowing stretches of the Spokane River:

7. Scrub shrub – 37%
8. Forested – 58%
9. Forested/Cottonwood – 5 %

Mitigation credit will be applied in the following manner:

Table 5-5 Credit for Type of Mitigation

Type of Mitigation	Acreage proposed	Credit toward the 42.51 acres
Enhancement/Restoration	1	1
Creation	1	1
Preservation (must include long term protection tools. i.e. easements, etc)	10	1

Note: The ratios proposed are conservative when compared to existing state policy because the baseline data is so general in nature. For example, forested wetlands in particular tend to provide higher and more diverse ecological function, and therefore tend to rate higher under the Eastside Rating System upon which replacement ratios are based. All forested wetlands within a floodplain are Category 2 wetlands, but may have higher functional scores that warrant Category 1 rating. Ecology guidelines state that Category 2 forested wetlands should be replaced, in-kind, at ratios of between 4:1 to 16:1. The specific ratio depends on the type of mitigation proposed, but in any case these ratios assume that the replacement wetlands are of the same type and quality as those lost. Using this ratio would make such a project economically infeasible and unreasonable from a practicality standpoint. However, more appropriate ratios would be required if a detailed historical analysis had been performed including field verification and functional assessments of comparison reaches.

1. Buffers and uplands at mitigation sites may be considered as part of the mitigation package. Credit is determined on a case-by-case basis in accordance with Guidance on Wetland Mitigation in Washington State, Ecology publication 04-06-013a.
2. Nothing shall prohibit the applicant from proposing to fulfill its mitigation requirements within the immediate vicinity of the confluence of the Spokane River and the Little Spokane River, and/or the confluence of Hangman Creek and the Spokane River.
3. Nothing shall prevent the applicant from proposing "In-Lieu of" mitigation, or utilizing mitigation bank credits.
4. Nothing shall prevent the applicant from proposing “Off-site Mitigation” to achieve mitigation credit for a minimum of 42.51 acres if it can be shown that on-site mitigation is not practicable and environmentally preferable by following the conditions below.

   The applicant must conform to all appropriate local, state, and federal regulatory requirements and permit processes.

   If “off-site mitigation” is used, the applicant shall develop a mitigation plan for Ecology’s review and approval consistent with the most current Eastern Washington’s Ecology guidance, *Selecting Wetland Mitigation Sites Using a Watershed Approach*, Ecology Publication #10-06-007, and *Wetland Mitigation in Washington State: Part 2 – Developing Mitigation Plans*, Ecology Publication #06-06-011b.

   The mitigation plan shall include, but not be limited to the following:
   - Characterization of the site and how it sustains, restores watershed processes, and replaces functions lost in other wetlands from a watershed perspective to include;
     a. Detailed and adequate documentation of baseline conditions (e.g., wetland delineation and functional assessments, wetland category based on the

Ecology rating form, condition of riparian or wetland buffers, and condition of stream and fish species if present)

b. The size/acreage and type of mitigation proposed to be established, restored, rehabilitated, enhanced, and/or preserved,

- Protection of site in perpetuity prior to use, including information on what site protection mechanism has been or is being established (restrictive covenant, deed restriction, conservation easement, etc.),
- Specific goals that are appropriate for the site based on an analysis of the surrounding landscape,
- Limiting factors or constraints,
- Prioritized constraints, if needed,
- Address constraints,
- Monitoring system to insure watershed, water quality, and functions are met and maintained and,
- Adaptive management to maintain the system.

5.4 Total Dissolved Gas

A. General Conditions

The Project shall not cause any exceedances of the TDG water quality criteria as specified in WAC 173-201A 030 (5)(c)(iii) and 173-201A-060 (4)(a) in any waters of the Project.

The Licensee shall provide a TDG monitoring plan for Ecology review and approval within one year of license issuance and each year thereafter to be submitted yearly with the annual monitoring report.

The TDG monitoring plan shall include a quality assurance portion with a description of compliance locations, short-term and long term studies, monitoring and a schedule (see section 5.10).

B. 7Q10

The Project shall meet water quality standards of 110 percent saturation for TDG at the tailrace for Nine Mile and Long Lake Dams.

Provided that all reasonable and feasible operational efforts to minimize TDG exceedances are made, compliance with the 110 percent TDG criterion does not apply when: Flows exceed the rate equivalent to the 7Q10 flows as defined in WAC 173-201A-060(4)(a). The 7Q10 flow for the Spokane River at Long Lake Dam and Nine Mile Dam is 32,000 cfs.

C. Nine Mile Dam

The Licensee shall monitor TDG in the forebay and near the end of the aerated zone (the area of bubble entrainment and dissipation) of Nine Mile Dam. The Licensee shall collect TDG data for two years when flows occur during the 7Q10 median flow of 25,400 cfs or higher at the Spokane gage (USGS 12422500). The flows may or may not be consecutive years. If within these two years, the data show that Nine Mile Dam is not exceeding the 110 percent TDG criterion then Ecology will consider the dam in compliance with the 110 percent water quality standards criterion for TDG of 110 percent saturation and may allow the Licensee to cease or reduce this monitoring.

If any modifications to the dam such as construction (i.e. installation of a rubber dam), the Licensee shall collect TDG data for two years when flows occur during the 7Q10 median flow of 25,400 cfs or higher at the Spokane gage (USGS 12422500) after such

installation or construction has occurred. The flows may or may not be consecutive years.

The Licensee shall develop a compliance schedule if Nine Mile Dam is creating TDG greater than 110 percent.

Within six months of the discovery of any exceedance of the 110 percent TDG criterion caused by spill, the Licensee shall submit a TDG Water Quality Attainment Plan (TDG WQAP) to Ecology for review and approval. The TDG WQAP plan shall include:

1. A description of standard Dam operations with regard to minimizing TDG associated with spills;
2. A description of how the Licensee will minimize all spills that produce TDG exceedances at the Dam;
3. An evaluation of all reasonable and feasible potential and preferred structural and/or operational improvements to minimize TDG production;
4. A timeline showing when operational adjustments will occur;
5. A schedule for construction, if appropriate; and
6. Monitoring plans to further evaluate TDG production and to test effectiveness of gas abatement controls at the Dam.

The Licensee shall operate according to the approved TDG WQAP with the objective of eliminating TDG exceedances.

Upon approval of the TDG WQAP, the Licensee shall immediately begin the necessary steps identified in the TDG WQAP to eliminate TDG criteria exceedances.

If monitoring to test the effectiveness of gas abatement controls implemented through the TDG WQAP shows the TDG abatement measures identified in the Plan and subsequently employed are not successful in meeting the TDG water quality criteria at the end of the ten year compliance period, and the Licensee is unable to meet water quality standards after evaluating all reasonable and feasible alternatives under WAC 173-201A-510(5)(g), then the Licensee will propose an alternative action to achieve compliance with the TDG standards, such as new reasonable and feasible technologies or other options to achieve compliance with the standards, a new compliance schedule, or other alternatives as allowed by WAC173-201A-510.

D. Long Lake Dam

The Licensee shall monitor TDG in the forebay or generation plume and near the end of the aerated zone (the area of bubble entrainment and dissipation) of Long Lake Dam upon issuance of the FERC license.

The Licensee shall monitor for TDG to assess gas production from Long Lake Dam during flows close to the 7Q10.

Within one year of the issuance of the FERC license, the Licensee shall develop a compliance schedule and TDG Water Quality Attainment Plan for Long Lake Dam for Ecology review and approval. The plan shall include:

1. Submit to Ecology a Detailed Phase II Feasibility and Implementation Plan based on Long Lake Dam TDG Abatement Initial Feasibility Study Report. Avista may request a special temporary permit to spill from Long Lake Dam to achieve higher spill closer to the 7Q10. This does not guarantee that Ecology will grant this special permit. Ecology must first consult with other agencies and the Spokane Tribe before doing so;
2. A description of standard Project operations with regard to minimizing TDG associated with spills;

3. A description of how the Project will minimize all spills that produce TDG exceedances at the Project;
4. An evaluation of all potential and preferred structural and operational improvements to minimize TDG production;
5. A timeline showing when operational adjustments will occur;
6. A schedule for construction; and
7. Monitoring plans to further evaluate TDG production and to test effectiveness of gas abatement controls.

The Project shall operate according to the approved TDG WQAP with the objective of eliminating TDG exceedances.

Upon approval of the TDG WQAP, the Licensee shall immediately begin the necessary steps identified in the TDG WQAP to eliminate TDG criteria exceedances.

If monitoring to test the effectiveness of gas abatement controls implemented through the TDG WQAP shows the TDG abatement measures identified in the Plan and subsequently employed are not successful in meeting the water quality criterion within the ten year compliance period, and the Licensee is unable to meet water quality standards after evaluating all reasonable and feasible alternatives under WAC 173-201A-510(5)(g), then the Licensee will propose an alternative action to achieve compliance with the standards, such as new reasonable and feasible technologies or other options to achieve compliance with the standards, a new compliance schedule, or other alternatives as allowed by WAC173-201A-510.

5.5 Temperature

A. General Conditions

The primary purpose of the following conditions is to achieve water quality, protects aquatic uses, and achieves numeric criteria for temperature. The Project shall comply with the standards found in WAC 173-201A, as further described in this Certification.

If at the end of the ten year compliance period, the Licensee is unable to meet water quality standards, after evaluating and implementing all reasonable and feasible alternatives under WAC 173-201A-510(5)(g), then the Licensee will propose an alternative action to achieve compliance with the standards, such as new reasonable and feasible technologies or other options to achieve compliance with the standards, a new compliance schedule, or other alternatives as allowed by WAC173-201A-510.

B. Lake Spokane

The Licensee shall develop a temperature Water Quality Attainment Plan (WQAP) for review and approval by Ecology within 18 months of FERC license issuance, in accordance with WAC 173-201A-510(5), that provides a detailed strategy for maintaining the highest attainable water quality condition to best protect the biota with respect to temperature that is reasonable and feasible to achieve in the Long Lake Dam reservoir and tailrace. Any operational or structural change that conflicts with other conditions of this Certification requires prior approval by Ecology.

The WQAP shall also identify a temperature regime that is reasonably and feasibly achievable based upon such evaluation, such that the summer temperature discharge from the Dam is not increased from current levels. Ecology recognizes that a trade-off between surface temperature and downstream temperatures may be required (i.e. discharging the preferred cooler waters from deep in a reservoir as opposed to mixing in the reservoir).

Thus, when it is not reasonable and feasible to meet the temperature criteria both upstream and downstream, the intent is to find the balance where biological protection would be optimized.

If at the end of the ten year compliance period, the Licensee is unable to meet water quality standards, after evaluating and implementing all reasonable and feasible alternatives under WAC 173-201A-510(5)(g), then the Licensee will propose an alternative action to achieve compliance with the standards, such as new reasonable and feasible technologies or other options to achieve compliance with the standards, a new compliance schedule, or other alternatives as allowed by WAC173-201A-510.

5.6 Dissolved Oxygen

A. General Conditions

The primary purpose of the following conditions is to achieve water quality numeric criteria for DO, in order to protect beneficial uses. The Project shall comply with the standards found in WAC 173-201A, as further described in this Certification.

Upon completion of the ten year compliance period, the Licensee shall operate the Project in full compliance with the state water quality standards.

Ecology has developed a Total Maximum Daily Load for Dissolved Oxygen in the Spokane River (DO TMDL). As part of that process, Ecology has determined the Project's contribution to the DO problem in the Spokane River, and the Licensee's proportional level of responsibility for control measures. The Project's dissolved oxygen responsibility for Lake Spokane can be found in the Spokane River/Lake Spokane Dissolved Oxygen Water Quality Improvement Report, www.ecy.wa.gov/biblio/0710073.html.

B. Long Lake Dam

The Licensee shall submit to Ecology a Detailed Phase II Feasibility and Implementation Plan based on the Long Lake HED DO Aeration Study within one year of license issuance, choosing one or several options to implement. The plan shall contain:

- Anticipated compliance schedule for conducting preliminary and final implementation plans; and
- A monitoring plan to evaluate compliance (including avoidance of super-saturation) and coordinate results with the DO TMDL efforts.

C. Lake Spokane

Within two years of the effective date of this amendment, the Licensee shall develop a DO WQAP for review and approval by Ecology, in accordance with WAC 173-201A-510(5).

The DO WQAP will provide a detailed strategy to address the Licensee's proportional level of responsibility, based on its contribution to the dissolved oxygen problem in Lake Spokane as determined in the DO TMDL.

The DO WQAP shall include, at a minimum, the following elements:

1. Implementation plan – A plan to analyze, evaluate and implement reasonable and feasible measures to improve dissolved oxygen conditions in Lake Spokane, based on the DO TMDL. The Licensee's commitments shall be sufficient to address its proportional level of responsibility, based on its contribution to the dissolved oxygen problem in the Lake. Any operational or structural change that conflicts with other conditions of this Certification requires prior approval by Ecology.
2. Schedule – A compliance schedule for implementation that to the degree reasonable and feasible, is synchronized with the milestones and assessments of the DO TMDL for the Spokane River and that does not exceed ten years (WAC 173-201A-510(5)).

If, at any time during the ten year compliance period, the Licensee demonstrates to Ecology's satisfaction that the Project is able to address and continue to address the Licensee's proportional level of responsibility as determined in the DO TMDL consistent with the provisions of this Certification, Ecology may make appropriate changes to reduce or ease the burden of reporting and monitoring requirements.

If at the end of the ten year compliance period, the Licensee is unable to address its proportional level of responsibility as determined in the DO TMDL, after evaluating and implementing all reasonable and feasible alternatives under WAC 173-201A-510(5)(g), then the Licensee will propose an alternative action to achieve compliance with the DO TMDL, such as new reasonable and feasible technologies or other options to achieve compliance with the DO TMDL, a new compliance schedule, or other alternatives as allowed by WAC173-201A-510(5)(g).

5.7 Turbidity

The primary purpose of the following conditions is to achieve water quality numeric criteria for turbidity measured in NTUs, while protecting aquatic uses.

The Project shall comply with the standards found in WAC 173-201A, as further described in this Certification. Upon completion of the compliance period, the Licensee shall operate the project in full compliance with the state water quality standards.

5.8 Spills

The primary purpose of the following conditions is to achieve water quality numeric criteria for water quality, while protecting aquatic uses. The Project shall comply with the standards found in WAC 173-201A, as further described in this Certification. Upon completion of the compliance period, the Licensee shall operate the project in full compliance with the state water quality standards.

A. General Oil Spill Prevention & Control Conditions (applies to all four projects)

1. No oil, fuel or chemicals shall be discharged into waters of the state, or onto land with a potential for entry into waters of the state as prohibited by Chapter 90.56 RCW and Chapter 90.48 RCW.
2. Wash water containing oils, grease or other hazardous materials resulting from wash down of equipment or working areas shall be contained for proper disposal, and shall not be discharged into state waters.
3. Any visible floating oils released from project operation, maintenance activities or construction must be contained and removed from the water.
    a) In the event of a discharge of oil, fuel or chemicals in state waters, or onto land with a potential for entry into state waters, immediately begin and complete containment and clean-up efforts, taking precedence over normal work. Clean-up shall include proper disposal of any spilled material and used clean-up materials.
    b) Spills into state waters and spills onto land with a potential for entry into state waters, or other significant water quality impacts, shall be reported immediately (within one hour) to the Department of Ecology, Eastern Regional Office at (509) 329-4000 (24-hour phone number).
    c) The Licensee shall participate in the Incident Command System (ICS) whenever a Unified Command is established in response to a spill incident that involves or potentially impacts one or more Projects.
    d) Do not use emulsifiers or dispersants in state waters including water contained in sumps or other areas that discharge to sumps or the Spokane River.

e) Project Operators shall be familiar with and trained on use of oil spill cleanup materials. In the event of a spill, properly dispose of used/contaminated materials and oil and as soon as possible restock new supplies. Include records of proper disposal in the oil consumption records and keep copies of disposal records of contaminated cleanup supplies on-site and available for inspection by Ecology.

f) Install, or have on-site to deploy, stair cases, ladders, etc., which will allow oil spill response personnel to safely reach areas that could, in the event of an oil spill, need to be accessed to deploy sorbent pads, boom material or other clean-up equipment.

g) Following all spills into state waters, or onto land with a potential for discharge to state waters, the Licensee will provide a written follow-up report to Ecology's Eastern Regional Office within 15 days of the incident. The report shall include a copy of the Licensee's Spill Report Form, a description of the incident, response actions taken and any spill prevention measures taken or recommended to prevent similar spills.

h) Within 90 days, the Licensee shall identify and map floor drains in each Project. Post these maps at each Project in a conspicuous location for use by Operators and other personnel in the event of a spill. Floor drains that are no longer needed shall be blocked or sealed.

1. Oil, fuel and chemical storage containers, containment areas, conveyance systems and oil-filled operating equipment.

a) Within 180 days, the Licensee shall provide Ecology with oil inventory lists and diagrams noting location of containers and oil-filled operating equipment holding less than 55-gallons of oil. The Project-specific oil inventories shall include location, type of container, number of containers, volume per container, total shell volume, spill potential, type of oil, PCB content and direction of flow in the event of a spill. Project-specific diagrams should note location of these containers and oil-filled equipment and general oil spill flow direction;

b) The Licensee shall keep records of the amounts of oil used on-site for all project equipment containing or using oil. These records shall be kept on-site and available for inspection by Ecology;

c) Provide proper containment around each storage container (including transformers) or around a combination of storage containers as appropriate. Proper containment equals the volume of the largest container plus 10 percent;

d) Provide appropriate level markings for all oil gauges (including sight-glass gauges) to ensure Project Operators and maintenance personnel can easily identify an unusual condition;

e) Check all fuel and lubrication hoses, oil drums, oil or fuel transfer valves and fittings, etc., for drips and leaks daily. Maintain and properly store them to prevent spills into state waters;

f) Inspect equipment containing oil and view oil-level gauges daily;

g) Provide full oil spill containment capacity plus 10 percent when working on oil-containing equipment that might spill or drip oil.

2. Sumps

a) Visually inspect sumps daily or immediately if oil is suspected to be present, such as in the event of an oil level alarm or other indication that oil could reach the sump. Any oil detected in the sumps requires immediate cleanup and Emergency Management Division (EMD) and National Response Center (NRC) notification.

b) Immediately repair oil leaks that are of sufficient volume to reach the sump and that cannot be contained by placing a container underneath the leak.

c) Provide water-proof lighting in the sumps or spotlights adequate to observe oil sheens on the surface of the water in the sumps.

d) Within 90 days, the Licensee shall develop an annual maintenance schedule for cleaning the sumps to remove all oil and oil residue from walls, piping and other structures in contact with sump water and provide that schedule to Ecology.

3. Transformers

a) Verify that transformer containment areas are impervious and fill cracks, caulk pipe penetrations or otherwise ensure that containment areas will contain spills.

b) Conduct daily inspections of transformer containment areas.

c) Obtain prior approval from Ecology before breaching containment areas for reasons other than containment area maintenance.

d) Conform to industry standards, use Best Management Practices or utilize other control measures for protecting water quality and preventing and containing oil spills when conducting in-place maintenance work on transformers, transporting transformers and transferring transformer oil.

7. Stormwater Pollution Prevention and Containment Area Management

a) The Licensee will utilize Best Management Practices or other control measures to prevent any oil-contaminated stormwater on the Project site from entering state waters.

b) Stormwater in transformer and oil-filled operating equipment containment areas will be monitored for the presence of oil. If oil is present, the oil-contaminated stormwater shall not be discharged to the ground or state waters but properly disposed of and recorded.

c) Discharge of non-contaminated stormwater from containment areas will be also recorded. Records of all stormwater removed or discharged from containment areas will be kept on-site and available for inspection by Ecology.

d) Snowy or icy conditions require close and at minimum daily inspection of containment areas and containment drains. Remove any observed stormwater pooling in containment areas as per condition 8 (b)/(c).

8. Other

a) Maintain site security at the Projects to reduce chance of oil spills.

b) The Licensee shall coordinate spill response planning and response efforts with other oil-handling facilities and spill response agencies on the Spokane River, such as, through participation in the Ecology-initiated Spokane River Response Group, a component of the Columbia-Snake River Spill Response Initiative (CSRSRI).

c) Compliance with these conditions does not relieve the Licensee from responsibility to maintain continuous compliance with terms and conditions of this Certification or resulting liability from further failure to comply.

B. Facility-Specific Oil Spill Prevention & Control Conditions

1. Upper Falls Dam

a) The Licensee shall comply with its most recent/current version of the Spill Deterrent Control & Countermeasure (SDCC) Plan for this Project. The Licensee shall provide Ecology, Eastern Regional Office, with copies of its most up-to-date SDCC Plan.

b) Within 30 days, the Licensee shall evaluate measures (including the plugging of floor drains and equipment vault openings) to prevent oil spilled inside the powerhouse from discharging to the Spokane River. Proposed measures to prevent spilled oil from discharging to the Spokane River shall be submitted to Ecology, Eastern Regional Office, for approval.

c) Within 30 days, the Licensee shall modify the metal cover over the trough where turbine pit water flows (located in the room adjacent to station service transformers) prior to discharge to the Spokane River to allow easy access for opening to facilitate inspection and access in the event of a spill.

d) Within 60 days, the Licensee shall amend the SDCC Plan as appropriate to be consistent with the conditions of this Certification and specifically to include:

- The correct agency notification procedures (page 12 SDCC) per state and federal law; and,
- Written procedures for oil transfers (non-tank truck transfers) to equipment and oil drip collection.

2. Monroe Street Dam

a) The Licensee shall comply with its most recent/current version of the Spill Deterrent Control & Countermeasure (SDCC) Plan for this Project. The Licensee shall provide Ecology, Eastern Regional Office, with copies of its most up-to-date SDCC Plan.

b) Sorbent material, such as a ten foot section of sausage boom, shall be deployed continuously in the sump. A mechanism, such as rope, should be used to facilitate deployment and retrieval of the boom in the sump. The boom should be removed whenever oil is detected in the sump or on the boom, or when the boom has become water-saturated and is no longer effective in collecting oil.

c) Within 30 days, the Licensee shall provide Ecology with an evaluation of the need for containment for the station service transformer located east of the Project roof deck to prevent a release of oil from flowing into the Spokane River under adverse weather conditions.

d) Within 60 days, the Licensee shall amend the SDCC Plan as appropriate to be consistent with the conditions of this 401 Certification and specifically to include:

- The correct agency notification procedures (page 12 SDCC) per state and federal law;
- Written procedures for oil transfers (non-tank truck transfers) to equipment and oil drip collection; and
- Inspection checklists (similar to the Long Lake SPCC Plan).

3. Nine Mile Dam

a) The Licensee shall comply with its most recent/current version of the Spill Prevention Control & Countermeasure (SPCC) Plan for this Project. The Licensee shall provide Ecology, Eastern Regional Office, with copies of its most up-to-date SPCC Plan.

b) Sorbent material, such as a ten foot section of sausage boom or bilge pillows, shall be deployed continuously in the sump. A mechanism, such as rope, should be used to facilitate deployment and retrieval of the sorbent material. The sorbent material should be removed whenever oil is detected in the sump or on the sorbent material, or when it has become water-saturated and is no longer effective in collecting oil.

c) Within one year, the Licensee shall pressure wash the sump when it is dewatered for cleaning including the removal of sediment. The Licensee shall have the sediment tested for the presence and concentration of petroleum products and report those results to Ecology.

d) Within 30 days, the Licensee shall evaluate and report to Ecology regarding the adequacy of the containment structures for the transformer located at the northwest corner of the powerhouse, and outside the building (2.3/115kV Transformer #1).

e) Within 30 days, the Licensee shall evaluate the containment structure under the transformer in the Main Entrance Substation (13.8/115kV Transformer) and report to Ecology the method of detecting and removing stormwater.

f) Within 60 days, the Licensee shall amend the SPCC Plan as appropriate to be consistent with the conditions of this Certification and specifically to include:

- The correct agency notification procedures (page 11 SPCC Plan) per state and federal law;
- Revisions to the section addressing secondary containment for the headgate hydraulic oil reservoirs on the Power House Roof;
- Revised written procedures for oil transfers (non-tank truck transfers) to equipment and oil drip collection; and
- Inspection checklists (similar to the Long Lake SPCC Plan).

4. Long Lake Dam

a) The Licensee shall comply with its most recent/current version of the Spill Prevention Control & Countermeasure (SPCC) Plan for this Project. The Licensee shall provide Ecology, Eastern Regional Office, with copies of its most up-to-date SPCC Plan.

b) Drums and containers of oil located in the Wheelroom shall be staged on containment pallets (as stated on page 8 of the SPCC Plan).

c) Every effort shall be made to keep grease on the wicket gate control wheels from discharging to the turbine pits. Sorbent material deployed in the turbine pits should be removed and properly disposed of whenever grease is observed on the material.

d) Sorbent material, such as a ten foot section of sausage boom, shall be deployed continuously in the sump. A mechanism, such as rope, should be used to facilitate deployment and retrieval of the boom in the sump. The boom should be removed whenever oil is detected in the sump or on the boom, or when the boom has become water-saturated and is no longer effective in collecting oil.

e) Within 30 days, the Licensee shall provide Ecology a plan addressing containment for the two transformers located in the Switchyard to prevent a release of oil from flowing down to the parking lot area west of the powerhouse that at times is under water during high flows.

f) Within 60 days, the Licensee shall amend the SPCC Plan as appropriate to be consistent with the conditions of this Certification and specifically to include:

- The correct agency notification procedures (page 14 SPCC Plan) per state and federal law; and
- Revised written procedures for addressing oil transfers (non-tank truck transfers) to equipment (including the tug boat kept on Long Lake) and oil drip collection.

5.9 Construction Projects, Miscellaneous Discharges and Habitat Modifications

The following applies to all over-water or near-water work related to the Project that can impact surface or ground water quality. This includes, but is not limited to, construction, operation, and maintenance of fish collection structures, generation turbines, penstocks, transportation facilities, portable toilets, boat ramps, transmission corridors, structures, and staging areas. This also includes emergencies for all activities related to Project operation.

a. If water quality exceedances are predicted as being unavoidable during construction or maintenance of a project, a short term modification must be applied for in writing to Ecology at least three months prior to project initiation. If any project has a long term impact on a regulated water quality parameter, characterization monitoring must be performed for the impacted parameter(s), and a monitoring plan must be outlined in the Water Quality Protection Plan discussed below. This may require additional management practices to minimize impacts of the license period.

b. A Water Quality Protection Plan (WQPP) shall be prepared, and followed for all Project related work that is in or near water that has the potential to impact surface and/or ground water quality. The WQPP shall include control measures to prevent contaminants from entering surface water and groundwaters, and shall include, but not be limited to, the following elements:

1. A Stormwater Pollution Prevention Plan (SWPPP) shall specify the Best Management Practices (BMPs) and other control measures to prevent contaminants entering the Project's surface water and groundwaters. The SWPPP shall address the pollution control measures for the Licensee's activities that could lead to the discharge of stormwater or other contaminated water from upland areas. The SWPPP must also specify the management of chemicals, hazardous materials and petroleum (spill prevention and containment procedures), including refueling procedures, the measures to take in the event of a spill, and reporting and training requirements.

2. An In Water Work Protection Plan (IWWPP) shall be consistent with SWPPP and shall specifically address the BMPs and other control measures for the Licensee activities that require work within surface waters.

   Turbidity and dissolved oxygen shall be monitored upstream of the location where in-water construction is taking place and at the point of compliance (as defined in WAC 173-201A-110) during construction. Samples shall be taken at a minimum of once each day during construction in or adjacent to any water bodies within the Project area that may be affected by the construction. The IWWPP shall include all water quality protection measures consistent with a Hydraulics Project Approval (HPA) for the Project.

3. The WQPP shall include procedures for monitoring water quality, actions to implement should water quality exceedances occur, and procedures for reporting any water quality violations to Ecology. The WQPP shall include all water quality protection measures consistent with a HPA for the Project. The WQPP shall be submitted to Ecology for review and approval at least three months prior to Project initiation and a copy of the WQPP shall be in the possession of the on-site construction manager and available for review by Ecology staff whenever construction work is under way.

4. When a construction project meets the coverage requirements of the National Pollutant Discharge Elimination System (NPDES) permit and Stat Waste Discharge General Permit for Stormwater Discharges associated with construction activity, the Licensee shall, at Ecology's discretion, either apply for this permit and comply with the terms and conditions of the permit or apply for and comply with the terms of an individual NPDES permit.

C. Best Management Practices

1. Work in or near the reservoir, water within the dam, the river, or any wetlands shall

include all reasonable measures to minimize the impacts of construction activity on waters of the state.

Water quality constituents of particular concern are turbidity, suspended sediment, settleable solids, oil and grease, and pH. These measures include use of Best Management Practices (BMPs) to control erosion and sedimentation, proper use of chemicals, oil and chemical spill prevention and control, and clean up of surplus construction supplies and other solid wastes.

2. During construction, all necessary measures shall be taken to minimize the disturbance of existing riparian, wetland, or upland vegetation.
3. All construction debris shall be properly disposed of on land so that the debris cannot enter a waterway or cause water quality degradation to state waters. Retention areas or swales shall be used to prevent discharging of water from construction placement areas.
4. The Licensee shall ensure that any fill materials that are placed for the proposed habitat improvements in any waters of the State do not contain toxic materials in toxic amounts.

5.10 Water Quality Monitoring

A. Quality Assurance Project Plan

Within 60 days after the new license is issued, the Licensee shall prepare a water quality monitoring and quality assurance project plan (QAPP) for each parameter to be approved by Ecology. Ecology requests coordination with the Licensee to locate its monitoring locations prior to the development of the QAPP.

Monitoring occurring in Long Lake related to dissolved oxygen and temperature parameters will be located in similar locations identified in the Ecology document Data Summary: Spokane River and Lake Spokane (Long Lake)Pollutant Loading Assessment for Protecting Dissolved Oxygen August 2003 Publication No.03-03-023 to maintain consistency in monitoring for the future of the DO TMDL and compliance points. This document can be found online at http://www.ecy.wa.gov/biblio/0303023.html.

The QAPPs shall follow the Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (July 2004 Ecology Publication Number 04-03-030) or its successor.

The QAPPs shall contain, at a minimum, a list of parameter(s) to be monitored, a map of sampling locations, and descriptions of the purpose of the monitoring, sampling frequency, sampling procedures and equipment, analytical methods, quality control procedures, data handling and data assessment procedures, and reporting protocols.

B. Updates

The Licensee shall review and update the QAPPs annually based on a yearly review of data and data quality. Ecology may also require future revisions to the QAPP based on monitoring results, regulatory changes, changes in project operations and/or the requirements of Total Maximum Daily Load. Implementation of the monitoring program shall begin as soon as Ecology has provided the Licensee with written approval of the QAPP. Changes to the QAPP need written approval by Ecology before taking effect. Ecology may unilaterally require implementation of the QAPP.

C. Reporting Results

Water quality monitoring results, along with a summary report, shall be submitted by March 1st of each year to the Department of Ecology, Eastern Region Office. Ecology will use the monitoring results to track the project's progress toward meeting and remaining in compliance with state water quality standards.

D. Duration

The monitoring without specific limiting timelines required under this Certification shall continue throughout the life of the new license and any subsequent renewals of that license, unless modified by Ecology

5.11 Penalties and Appeals

Any person who fails to comply with any provision of this Certification shall be liable for criminal and civil penalties under state and/or federal law.

This Certification may be appealed. The appeal must be filed with the Pollution Control Hearings Board, P.O. Box 40903, Olympia, Washington 98504-0903 within thirty days of receipt of this Order. At the same time, the appeal must also be sent to the Department of Ecology, Eastern Regional Office, North 4601 Monroe, Spokane, Washington 99205-1295. An appeal alone will not stay the effectiveness of this Certification. Stay requests must be submitted in accordance with RCW 43.21B.320. These procedures are consistent with Chapter 43.21B RCW.

Dated this 8th day of May 2009, at Spokane, Washington.

James M. Bellatty
Water Quality Section Manager
Eastern Regional Office
Department of Ecology

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APPENDIX A

Project Boundary

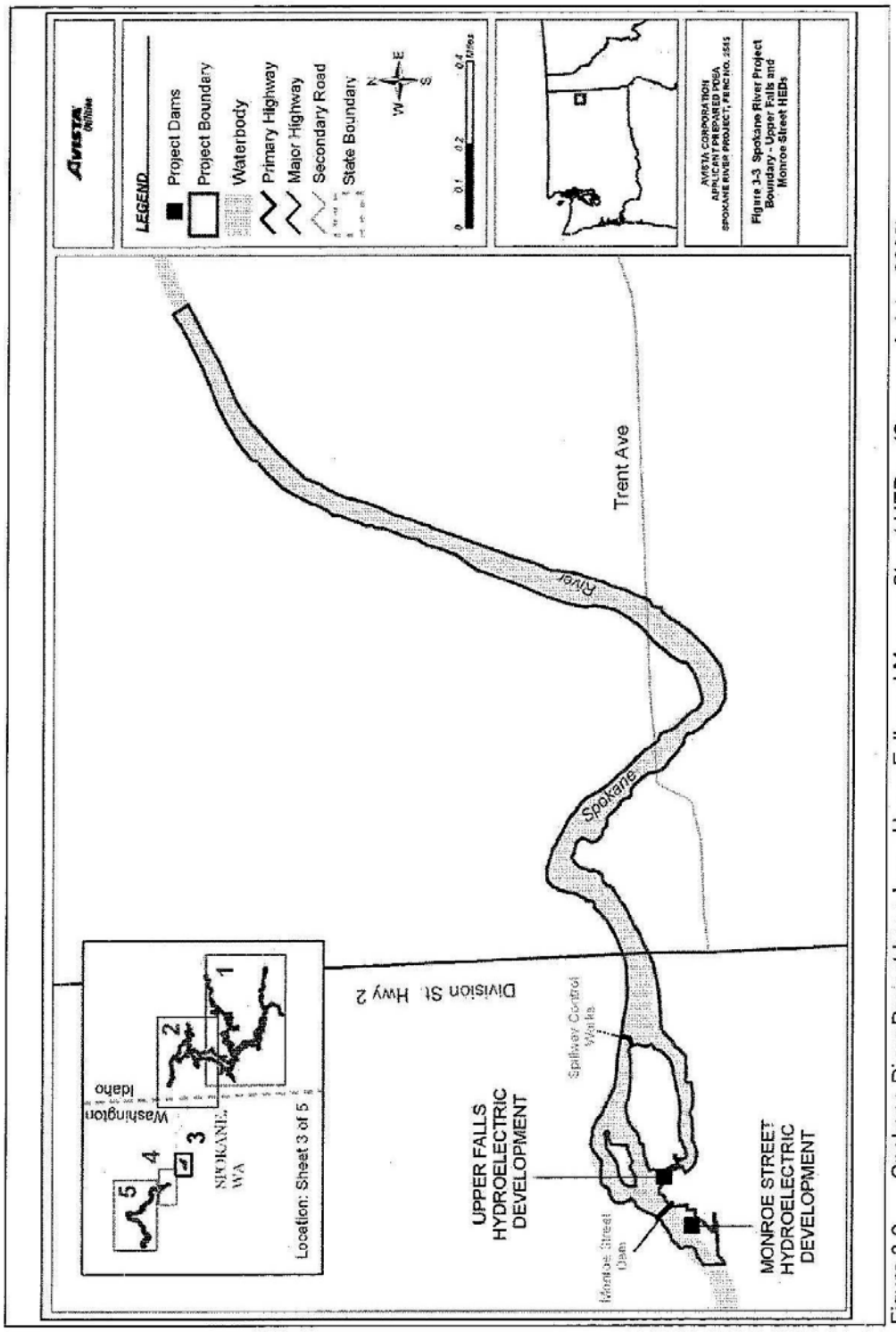

Figure 3-2. Spokane River Project boundary—Upper Falls and Monroe Street HEDs. (Source: Avista, 2002)

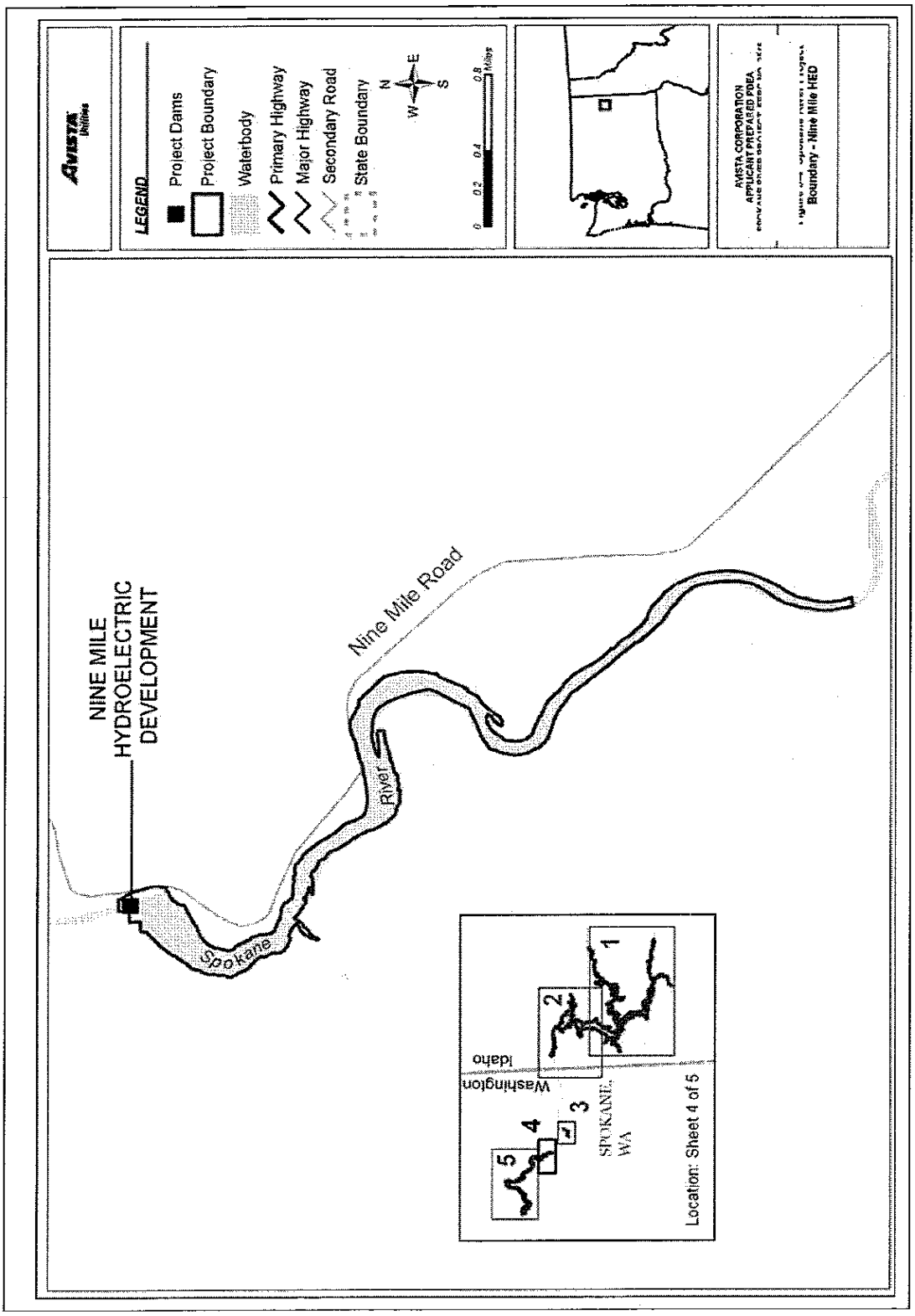

Figure 3-3. Spokane River Project—Nine Mile HED. (Source: Avista, 2002)

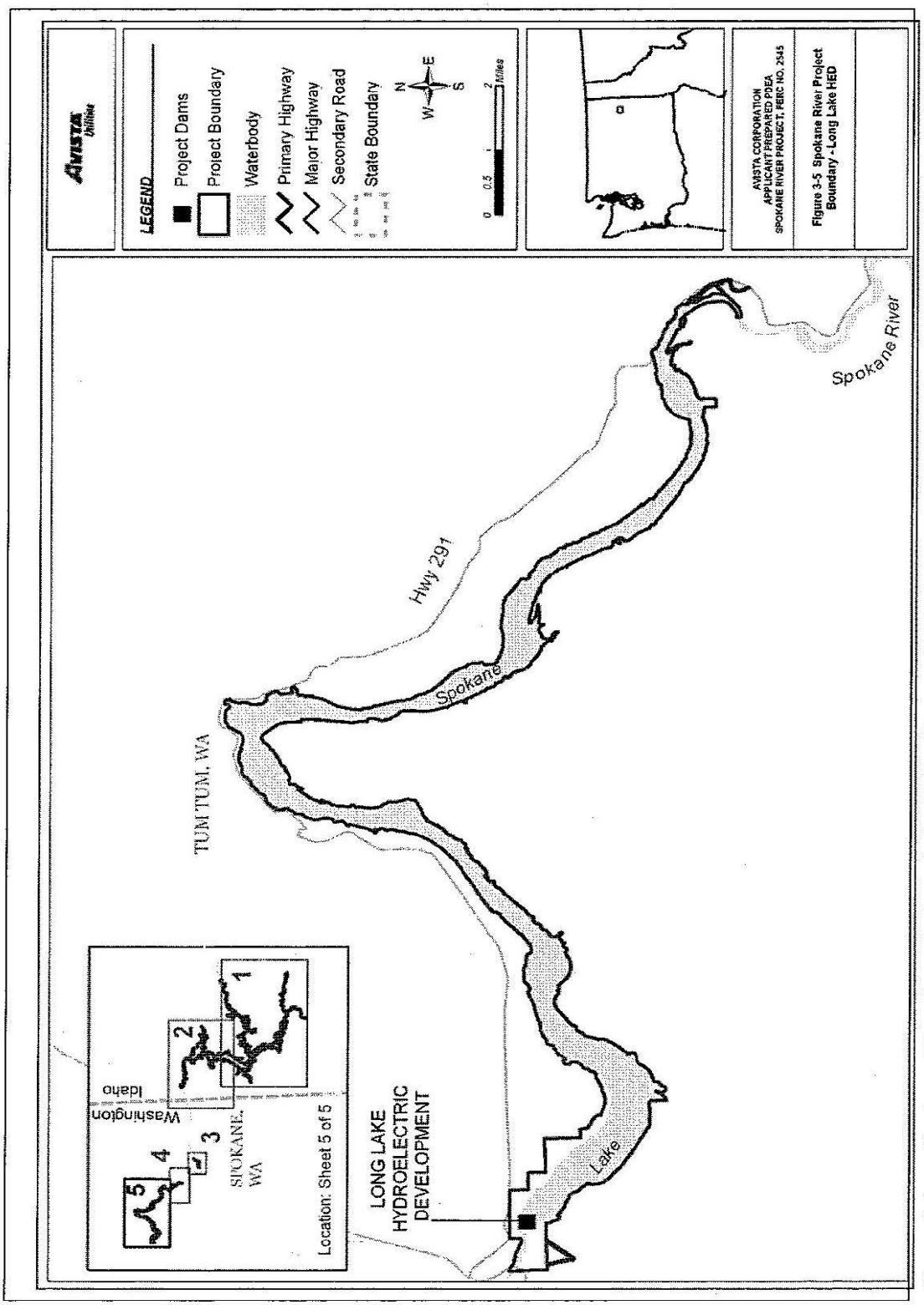

Figure 3-4. Spokane River Project—Long Lake HED. (Source: Avista, 2002)

APPENDIX B

The Watershed Planning Act: WRIA 54/57 and 55/57 Watershed Plans

The Watershed Planning Act: WRIA 54/57 and 55/57 Watershed Plans Spokane River Minimum Instream Flow Recommendations

The Middle/Little Spokane River planning unit, formed under RCW 90.82 to address water resource management issues within Water Resource Inventory Areas (WRIAs) 55/57, was developing its watershed plan during the FERC relicensing process. The planning unit reviewed and evaluated the available information and technical reports, including the Instream Flow and Fish Habitat Assessment prepared by Northwest Hydraulic Consultants and Hardin-Davis, Inc. in June 2004. This study was undertaken to provide information for the relicensing of the Spokane River Project (FERC No. 2545) and for the planning process on the middle Spokane River by WRIAs 55/57. The relationship between instream flows and rainbow trout spawning, fry emergence, and summer rearing habitat were examined by employing a Physical Habitat Simulation (PHABSIM) model. This study focused on the mainstem Spokane River from the Post Falls Dam in Idaho, downstream to the confluence with Latah Creek. For most of the study area, spawning and rearing life stages were evaluated. However, only spawning was assessed in the one-mile reach of WRIA 57 below the Monroe Street Bridge.

An additional study was completed in May 2007 by EES Consulting, Inc. (EESC) for the WRIA 54 and WRIA 55/57 Planning Units. This study focuses on the free-flowing portion of the Spokane River above Nine Mile Reservoir and below the Monroe Street Bridge in Spokane, spanning lower WRIA 57 and upper WRIA 54. This study assessed rainbow trout rearing habitat flow requirements using the PHABSIM modeling approach. The report documents habitat values, relative to flow for rearing salmonids, including both rainbow trout and mountain whitefish. Results for spawning are reported for both species in WRIA 54 and mountain whitefish in WRIA 57.

The Department of Ecology uses the watershed plan as the framework for making future water resource decisions for the Middle/Little Spokane River watershed, per RCW 90.82.130. The WRIA 55/57 plan recommendations were approved by the Little/Middle Spokane River watershed planning unit, a group composed of a broad base of water use interests, and also by the City of Spokane and Spokane County. T he State Caucus, which includes the Departments of Ecology and Fish and Wildlife, voted in support of the plan and these recommendations. The plan recommendations are considered an expression of the public interest. The watershed plan, formally adopted in January 2006, includes the following recommendation for minimum instream flows at Barker Road.

> *II.A.01.a Establish a minimum instream flow for the Spokane River at the Barker Road transect (USGS Gage 12420500) of 500 cfs to provide significant weighted useable area for juvenile and adult rainbow trout.*
>
> *II.A.01.b Avista's 2007 operating license for the Spokane River Hydroelectric Development should require a minimum discharge to provide habitat for juvenile and adult rainbow trout that would be protected through a minimum instream flow for the Spokane River at the Barker Road transect (USGS gage 12420500) of 500 cfs.*
>
> *II.A.01.c Flow in the Middle Spokane River should be managed to optimize spring spawning, incubation and emergence for rainbow trout. A protocol should be established between the WDFW, IDF&G and Avista to accomplish this task. Specific flow levels and timing would be established as early as possible each year and based on snow pack and expected runoff conditions for that year.*
>
> *II.A.02.b. Instream flow for the Lower Spokane River could be managed using USGS Gage 12422500, the Spokane River at Spokane. Conduct fish habitat studies focusing on juvenile and adult rearing on at least 3 sites in the Lower Spokane River between the Monroe Street HED and the Nine-Mile HED pool. This work could be conducted as part of the WRIA 54, Lower Spokane River Watershed Plan and/or as an Avista relicensing PM&E.*

II.E.01.a. After the Avista HED license application is filed, the Spokane River / Lake Spokane Dissolved Oxygen TMDL data gathering phase, and instream studies on rearing below Monroe Street HED are completed, integrate all of the recommended instream flows into one regime for the whole watershed. The flow regime will be submitted to the Department of Ecology for instream flow rule making.

II.B.02.a Use the Avista Recreation, Land Use, and Aesthetics Work Group findings as the basis for recreation flows in the Middle Spokane River.

II.B.02.b Evaluate the use of periodic increases in flow during low flow periods for recreational use in the Middle Spokane River while taking into account effects on aquatic biota, water quality, and safety.

II.B.02.c Evaluate the impact on aquatic biota, water quality, and safety of managing the declining spring runoff and fall drawdown with releases from the Post Falls HED to optimize recreational use of the Spokane River according to the Avista Recreation, Land Use, and Aesthetics Work Group.

As recommended in the WRIA 55/57 watershed plan, the WRIA 54 (Lower Spokane River) and WRIA 55/57 planning units are working together to develop minimum instream flow numbers for the Lower Spokane River. A broad-based working group formed in June 2007 includes members from both planning units and other interested stakeholders. This working group has been reviewing the recent instream flow studies and other technical information. The Washington Departments of Ecology and Fish and Wildlife have recommended the following minimum instream flows for the Lower Spokane River that are protective of rainbow trout and mountain whitefish habitat (January 14, 2008 memo from Sara Hunt, Department of Ecology to Rob Lindsay, Spokane County).

Minimum Instream Flow Recommendations a the Spokane Gage (ID#12422500)

January 1 – March 31	*1,100 cfs*
April 1 – June 15	*3,000 cfs**
June 16 – September 30	*850 cfs*
October - December 31	*1,100 cfs*

*(The spawning flow recommendation is currently being re-evaluated with specific attention given to the spawning habitat analysis conducted by Hardin-Davis, Inc. in the WRIA 55/57 Plan.)

The Spokane River instream flow working group is currently deliberating various recommendations for minimum instream flows for a variety of purposes, including aesthetics and recreation. Recommendations from the working group will be forwarded to the WRIA 54 and 55/57 planning units for consideration in May 2008. The planning units may formally adopt minimum instream flow recommendations in accordance with RCW 90.82, and these minimum instream flow numbers may differ from the state caucus recommendation.

The Department of Ecology is required by law to protect instream flows by adopting regulations and to manage water uses that affect stream flows. An instream flow rule adopted for the Spokane River would be based on the recommendations of the watershed planning units under RCW 90.82. Once adopted, an instream flow rule acquires a priority date similar to a water right. Minimum instream flows set in rule are used to manage water rights.

Additional flow management requirements related to dam operations are the purview of the FERC license and the Clean Water Act Section 401 Certifications, and are not incorporated into the state's or the planning units' minimum instream flow recommendations.

While minimum instream flow recommendations are proposed for Middle Spokane River at Barker Road and for the Lower Spokane River at the "at Spokane" gage, achievement of these flows is dependent on both dam operations in Idaho at Post Falls Dam and in Washington at the Monroe Street Bridge Dam. Minimum flows in the Spokane River are affected by diversions from the Spokane River and the Spokane Valley/Rathdrum Prairie Aquifer, which are managed by Ecology though administration of surface and ground water rights in Washington. Adaptive management tools must be integrated into the Section 401 Certifications in Washington and Idaho, and the FERC license to address the complex relationships among instream flow needs for habitat, recreation, aesthetics, and water quality and the effects of flow releases and water temperature on salmonids.

APPENDIX C

Policy of the Washington Department of Fish and Wildlife Concerning Wild Salmonids

Policy of the Washington Department of Fish and Wildlife Concerning Wild Salmonids.

The goal of WDFW's Wild Salmonid Policy is to protect, restore, and enhance the productivity, production, and diversity of wild salmonids and their ecosystems to sustain ceremonial, subsistence, commercial, and recreational fisheries, non-consumptive fish benefits, and other related cultural and ecological values. Highlights of the policy include the following.

- Spawner abundance goals will be established for individual, separate breeding populations (stocks) in all areas that have existing or restorable habitat capacity to support naturally reproducing, self-sustaining stocks, with the intent to encourage local adaptation (high productivity) and maximize long-term surplus production that sustains harvest, recreational opportunities and other ecological benefits.
- Genetic diversity within and among stocks will be maintained or increased to encourage local adaptation and sustain long-term productivity. Conditions will be created that allow natural patterns of genetic diversity and local adaptation to occur and evolve.
- Wild salmonid stocks will be maintained at levels that naturally sustain ecosystem processes and diverse indigenous species and their habitats. Healthy populations of other indigenous species will be maintained within levels that sustain or promote abundant wild salmonid populations and their habitats.
- Use programs of stable, cost-effective artificial production to provide significant fishery benefits while maintaining the long-term productivity of naturally spawning salmonids and their ecosystems. Protect, rehabilitate, and re-establish naturally spawning populations using integrated principles of genetic conservation, ecology, hatchery production, and fish management.
- Maintain or increase the quality and quantity of habitat necessary to sustain and restore salmonid populations.
- Maintain or restore the physical processes affecting natural basin hydrology. In addition, manage water use and allocation in a manner that would optimize in-stream flows for salmonid spawning, incubation, rearing, adult residency, and migration, that would address the need for channel-forming and maintenance flows, and that would address the impacts of water withdrawals on estuarine and marine habitats.
- Provide for water and sediments of a quality that will support productive, harvestable, wild salmonid populations, unimpaired by toxic or deleterious effects of environmental pollutants. Manage watersheds, stream channels, and wetlands for natural rates of sediment erosion, deposition, and routing, to within the limits of salmonid life requirements.
- Functional riparian habitat and associated wetlands are protected and restored on all water bodies that support, or directly or indirectly impact, salmonids and their habitat.
- Maintain or restore lake and reservoir habitats that are conducive to wild salmonid passage, rearing, adult residency and spawning.

APPENDIX D

Interagency Agreement between Washington State Department of Ecology and Washington State Department of Fish and Wildlife

INTER-AGENCY AGREEMENT
Between
WASHINGTON STATE
DEPARTMENT OF ECOLOGY
And
WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

REGARDING COORDINATION ON
SPOKANE RIVER HYDROELECTRIC PROJECT
May 2007

THIS INTER-AGENCY AGREEMENT (IA) is entered by Washington State Department of Ecology (Ecology) and Washington State Department of Fish and Wildlife (WDFW) (collectively the "Agencies") and describes the commitments and procedures to enhance coordination and cooperation between the agencies with respect to protecting water quality and aquatic species of the State of Washington affected by the Spokane River Hydroelectric Project.

I. PURPOSE AND SCOPE

A. Ecology expects to issue a Clean Water Act (CWA) section 401 water quality certification (33 USC sec 401) to Avista Corporation, Spokane, Washington (Avista) in the context of Avista's application to the Federal Energy Regulatory Commission (FERC) for a new long-term license for operation of the Spokane River Hydroelectric Project (FERC No. 2545, 12606). The 401 certification will assess and address the impacts to water quality and beneficial uses resulting from the operation of the Spokane River Project (Project) and establish conditions to assure compliance with water quality standards, including the protection of designated uses of resident fish and other aquatic resources.

B. This IA is intended to provide a process for Ecology and WDFW to share technical expertise with respect to the drafting of 401 certification terms for resource protection, implementation, and monitoring for the protection of water quality and aquatic species affected by the Project. This IA also provides that, after 401 certificate issuance, WDFW, as the agency with greater expertise on resident fish and other aquatic resources, will monitor Avista's implementation of the protection, mitigation, and enhancement measures for these resources and periodically report and consult with Ecology on these matters, as provided below. This assistance is intended to minimize the duplication of efforts, and recognizes that WDFW has certain expertise that Ecology does not currently possess. Ecology, as the agency with water quality authority, shall coordinate its implementation of water quality improvements with WDFW. This agreement does not in any way limit, delegate, or diminish Ecology's legal authority, including but not limited to Ecology's authority to enforce or modify the section 401 certification, issue penalties, or seek any other relief.

II. CRITERIA FOR USE

A. WDFW shall:

1. Provide technical support and coordinate on drafting provisions of the 401 certification that address the protection of fish and other aquatic species affected by the Project.
2. Provide technical support to Ecology with respect to Avista's compliance with the terms and conditions of its FERC license and the associated section 401 certification that address the protection of fish and other aquatic species affected by the Project.
3. Upon request provide periodic written progress reports, or oral briefings to Ecology regarding this subject.
4. In the event that urgent problems may arise regarding fish or other aquatic species covered by the FERC license or 401 certification, promptly notify Ecology's primary contact and keep Ecology informed of actions being taken to address any such problems. WDFW shall to the extent feasible coordinate efforts to address such problems with Ecology.

5. Provide technical expertise for the modification of compliance measures, biological objectives, or water quality standards applicable to the Project, if needed.
6. Provide litigation support related to the Project in the form of technical advice and expert witnesses with respect to fish and other aquatic species.

B. Ecology shall:

1. Respond promptly to WDFW requests for coordination on fish management and water quality issues under the FERC license and the section 401 certification.
2. Consult with WDFW on Ecology decisions relating to the Project that specifically address or have potential to affect fish and other aquatic species.
3. Coordinate implementation of water quality improvements with WDFW.
4. Upon request provide written progress reports or oral briefings to WDFW staff regarding compliance with the section 401 conditions.

C. Both Agencies shall:

1. Designate a primary contact for purposes of this Interagency Agreement. This person shall be the one to whom notices are provided.
2. Work together to ensure consistent application of the section 401 certification with regard to the protection of water quality, fish, and other aquatic species.
3. Generally provide notice to and consultation with each other prior to taking any non-routine regulatory or compliance actions regarding areas covered by this IA. Specifically, it is intended that the agencies will consult prior to taking action on new section 401 certification or hydraulic permit conditions or enforcement of existing conditions.
4. In the event that a dispute may arise with respect to the implementation of this agreement, the parties' appropriate staff will meet to resolve the issue. If such meetings are unable to resolve any issues satisfactorily, disputes may be elevated within the respective agencies, with final resolution, if needed, by agency directors.

III. REVISIONS

A. Revisions to this IA shall be provided in writing, and agreed to and signed by both parties.

IV. EFFECTIVE DATE AND TERMINATION

This IA is to be effective upon the date of last signature below. This IA contains all the terms and conditions agreed upon by the parties. No other understandings, oral or otherwise, regarding the subject matter of this IA shall be deemed to exist or to bind either of the parties hereto. This IA may be terminated by either party upon a minimum of thirty (30) days written notice to the other party.

IN WITNESS WHEREOF, the parties execute this IA:

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

WILLIAM C. BROOKS, Contracts Officer

Date: JUN 2 0 2007

WASHINGTON STATE
DEPARTMENT OF ECOLOGY

JAY MANNING, Ecology Director

Date: 7/9/07

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APPENDIX E

Summary of Studies and Reports Required by this Certification

Plans and Reports Due
Under this Certification

Note: This list may not be all inclusive

Product Type	Description	Due Date	Section of Certification
Aesthetic Flow			
Plan	Upper Falls Aesthetics Plan	1 year after license issuance	5.2.A.2
Fisheries and Aquatic Resources			
Assessment	Upper Falls Dam – three year assessment	4 years after license issuance	5.3 D(1)
Plan	Monroe Street Dam to the Nine Mile Pool – Plan Development	2 years after license issuance	5.3 D(2)(a)
Evaluation	Monroe Street Dam to the Nine Mile Pool – Spawning Evaluation	3 years after license issuance	5.3 D(2)(b) 5.3 D(2)(c)
Aquatic Weed Management Plan			
Program/Plan	Lake Spokane Aquatic Weed Management Program (includes Nine Mile Reservoir)	One year of issuance of the license	5.3 E 5.3 E(5)
Annual Monitoring Report	Lake Spokane Aquatic Weed Management Program Monitoring	Annually after the first year of implementation of the above mentioned plan	5.3 E(4)
Annual Report	Lake Spokane Aquatic Weed Management Program Activities Conducted	Annually after the first year of implementation of the above mentioned plan	5.3 E(5)
Sediments			
Plan	Monroe Street Dam Sediment Management Plan	Prior to dredging after license issuance	5.3 F(1)
Plan	Nine Mile and Long Lake Reservoir Sediment Management Plan	Four years after issuance of the license	5.3 F(2)
Wetlands			
Plan	Wetland site-specific plan	End of third year after the issuance of license	5.3 G
Access/Acquisition	Properties	No later than five years after the license issuance	5.3 G
Total Dissolved Gas			
Monitoring plan	Monitoring plan for Nine Mile and Long Lake Dam	Within one year of license issuance	5.4 A
TDG WQAP	If not in compliance with TDG WQAP for Nine Mile Dam	If not in compliance within six month of license issuance	5.4 C
Plan	Detailed Phase II and Implementation Plan for Long Lake Dam	Within 6 months of the license issuance	5.4 D

Product Type	Description	Due Date	Section of Certification
Compliance Schedule and WQAP	WQAP for Long Lake Dam	Within six months of license issuance	5.4 D
Temperature			
Plan	Temperature WQAP for Lake Spokane	18 months of license issuance	5.5 B
Dissolved Oxygen			
Plan	Long Lake Dam Feasibility and Implementation Plan	1 year of license issuance	5.6 B
Plan	Lake Spokane DO WQAP Plan	Within 2 years after EPA approves DO TMDL, and Ecology amends 401 to require submittal of WQAP	5.6 C
Spills			
Map	Upper Falls, Monroe Street, Nine Mile, and Long Lake Dams will map floor drains	Within 90 days of license issuance	5.8 A(4)
Inventory and diagram	Upper Falls, Monroe Street, Nine Mile, and Long Lake Dams will locate oil containers	Within 180 days of license issuance	5.8 A(5)
Maintenance schedule	Upper Falls, Monroe Street, Nine Mile, and Long Lake Dams schedule for cleaning sumps	Within 90 days of license issuance	5.8 A(6)(d)
Proposed Measures/Plan	Upper Falls Dam proposed measures to prevent oil spills	Within 30 days of license issuance	5.8 B(1)(b)
Modification	Upper Falls Dam modification of metal cover	Within 30 days of license issuance	5.8 B(1)(c)
SDCC Plan amendment	Upper Falls Dam SDCC Plan amendment	Within 60 days of license issuance	5.9 B(1)(d)
Evaluation	Monroe Street Dam containment for station service transformer	Within 30 days of license issuance	5.8 B(2)(c)
SDCC Plan amendment	Monroe Street Dam SDCC Plan amendment	Within 60 days of license issuance	5.8 B(2)(d)
Notification letter and report	Nine Mile Dam pressure wash sump when dewatered, sediment tested	Within one year of license issuance	5.8 B(3)(c)
Report	Nine Mile Dam; adequacy of containment structure for transformer	Within 30 days of license issuance	5.8 B(3)(d)
Report	Nine Mile Dam; adequacy of containment structure for transformer and method of detecting and removing stormwater	Within 30 days of license issuance	5.8 B(3)(e)
SPCC Plan	Amendment of Nine Mile Dam SPCC Plan	Within 60 days of license issuance	5.8 B(3)(f)
Plan	Long Lake Dam; Plan addressing containment for the two transformers in Switchyard	Within 30 days of license issuance	5.8 B(4)(e)

Product Type	Description	Due Date	Section of Certification
SPCC Plan	Amendment of SPCC Long Lake Dam Plan	Within 60 days of license issuance	5.8 B(4)(f)
Water Quality Monitoring			
Report/Plan	QAPP for each parameter to be monitored	Within 60 days after license issuance	5.10 A
Updates	Updates of QAPP	Annually based on yearly review of data	5.10 B
Data reports and summary report	Water quality monitoring results	March 1 of every year after the issuance of the license throughout the life of the license	5.10 C

APPENDIX F

Spokane River Fisheries

Biological and Management Goals and Objectives

Spokane River Fisheries – Biological and Management Goals & Objectives

Biological and management objectives focus on protecting and providing healthy, sustainable, and harvestable resident fish populations in the Spokane River. Wild salmonid conservation requires the protection and restoration of the productive capacity of salmonid habitat to the extent possible.

The focal species is native redband trout: WDFW's specific biological objective for redband trout in the free-flowing portions of the Spokane River is to achieve and maintain a population abundance of 800-1,000 wild redband trout *Oncorhynchus mykiss gairdneri* (two years and older) per river mile.

In altered environments such as reservoirs, biological objectives focus on rearing habitat.

GOALS

Protect and expand habitat and ecosystem functions as the means to significantly increase the abundance, productivity, and life history diversity of resident fish to the extent that they have been affected by human activities, including but not limited to the development and operation of dams on the Spokane River.

Restore native resident fish species (subspecies, stocks and populations) to near historic abundance throughout their historic ranges where suitable habitat conditions exist and/or where habitats can be restored, with emphasis on sensitive, native salmonid stocks.

Administer and increase opportunities for consumptive and non-consumptive resident fisheries for native, introduced, wild, and hatchery reared stocks that are compatible with the continued persistence of native resident fish species and their restoration to near historic abundance.

BIOLOGICAL AND MANAGEMENT OBJECTIVES

Mitigate or compensate for fish losses caused by human activities, including but not limited to the operation of dams.

Develop and meet conservation plan goals for sensitive native resident fish species.

Protect and restore instream and riparian habitat to maintain functional ecosystems for resident fish, including addressing the chemical, biological, and physical factors influencing aquatic productivity.

Develop and implement projects directed at protecting, restoring, and enhancing fish habitat for fish, through improvements in riparian conditions, hydropower operations, and aquatic conditions.

APPENDIX G

Foundational Concepts for the Spokane DO TMDL & Spokane Oversight Committee Members Organization Tree

Foundational Concepts for the Spokane River TMDL Managed Implementation Plan

June 30, 2006

The Spokane River does not have enough dissolved oxygen (DO) during the months of April through October to meet current Water Quality Standards. The best available science shows that excess phosphorus is the main cause of this problem. There is agreement among those who petitioned Ecology in 2004, other interested parties and Ecology that actions are needed as soon as possible to improve the River's condition, and, by assuring treatment capacity for septic tank discharges, further protect the quality of the Spokane Valley – Rathdrum Prairie Aquifer. Low dissolved oxygen also results from carbonaceous biochemical oxygen demand (CBOD) and ammonia. For the purpose of implementing the Spokane River Dissolved Oxygen TMDL, it is assumed that efforts to control phosphorus will also serve to control CBOD and ammonia. Reducing significant amounts of phosphorus in the River during the April-October season and achieving Water Quality Standards for dissolved oxygen are the goals of the Spokane River Dissolved Oxygen TMDL Managed Implementation Plan (MIP).

In the October 2004 *Draft Total Maximum Daily Load to Restore and Maintain Dissolved Oxygen in the Spokane River and Lake Spokane (Long Lake)*, Ecology estimated a reduction target of approximately 208 pounds/day of phosphorus from point sources, non-point sources and other controllable sources. Most of this reduction is anticipated to come from improvements in point source wastewater treatment technology located between the Idaho state line and the Lake Spokane Dam.

The best available science conclusively demonstrates significant phosphorus reductions will improve DO in the River and Lake Spokane. How the River will respond to significant phosphorus reductions, the full extent of the reductions necessary to alleviate DO deficiencies, and the phosphorus reductions possible over the next 20 years are not precisely clear at this time. Hence, an aggressive, managed approach that removes phosphorus from a variety of sources through a variety of methods and monitors and assesses the impacts on DO over the next 20 years is a reasonable way to maximize the effectiveness of the sizable investments necessary to improve the River.

4.5 Capsule Summary of Approach

Currently there is not well-established technology that can reliably treat a variety of wastewater discharges and achieve the River phosphorus levels required to improve DO sufficiently to meet Water Quality Standards. There is; however, technology that significantly reduces phosphorus from effluent and that can bring current discharges much closer to the levels required by Water Quality Standards. The Spokane River Collaboration refers to the difference between what technology improvements can achieve and the TMDL levels to meet Water Quality Standards as "the Delta."

The MIP provides reasonable assurance that Water Quality Standards can be achieved during the first ten years of MIP effort by installing the most effective feasible phosphorus removal treatment technology and completing a planned and scheduled group of actions aimed at eliminating the Delta. The foundational concepts described here will begin guiding TMDL implementation when accepted by Ecology and affected National Pollutant Discharge Elimination System (NPDES) permit holders.

While phosphorus reductions from technology improvements and other actions can be estimated, their true impact on DO requires actual implementation experience and resultant measurement of DO levels in the River and Lake Spokane. The first ten years of MIP efforts need to be in place and operational prior to their consequences being fully assessed. A thorough assessment after the 10^{th} year of the MIP will provide the information necessary to guide actions for a second ten year MIP period. These second period actions will include continuation of successful actions conducted in the first ten years, such as operation of the treatment technology and other permanent phosphorous reduction efforts, and they could include new actions such as consideration of river oxygenation and/or reconsideration of Water Quality Standards applied to the River and Lake Spokane. The MIP's actions necessary to eliminate an NPDES permit holder's Delta will be enforceable over the 20 year life of the MIP and the TMDL phosphorous waste load allocation will become enforceable requirements at the end of the 20 years covered by the MIP.

During the MIP term, the NPDES permits applicable to individual dischargers will include interim limits and other requirements as described below in the section titled "*NPDES Permit Cycle*."

4.6 Ecology Will Complete the Dissolved Oxygen TMDL Consistent with the Foundational Concepts

The foundational concepts in this document are the result of substantial deliberation by the Spokane River Collaboration. This effort placed completion of the Draft TMDL "on hold" prior to its being made final and submitted to the Environmental Protection Agency for review. Ecology will re-draft the Draft Spokane River Dissolved Oxygen TMDL to include a MIP consistent with the principles described here. The re-draft will be subject to the same public review process and administrative procedures used for the earlier Draft TMDL. As well, Ecology will continue to work on a government-to-government basis with the Spokane Tribe of Indians to ensure compliance with downstream Tribal water quality standards.

4.7 Waste Load Allocation Targets

A TMDL requires waste load allocations (WLA) for the affected NPDES permit holders. These targets, expressed in concentrations in the draft TMDL, will be slightly revised in the re-drafted TMDL to reflect upstream permitting in Idaho and an April-October rather than June-October critical period (see the boxed table on page 24, Draft Total Maximum Daily Load to Restore and Maintain Dissolved Oxygen in the Spokane River and Lake Spokane, October 2004). The total phosphorus concentrations, as allocations in the TMDL rounded to the nearest microgram will remain 10µg/l.

In the MIP; however, the 10 µg/l total phosphorus targets will be expressed as pounds of phosphorus discharge in the River based on the discharge volume estimates established through the Collaboration.

The translation from concentration to pounds of phosphorus forms the basis for measuring success in meeting each phosphorus waste load allocation target under the MIP. Success in meeting the pounds of phosphorus target will be achieved by the installation of the most effective feasible phosphorus removal treatment technology **and** implementation of other phosphorus reduction actions that **together** result in the net pounds of phosphorus discharged to the River by the dischargers being equal to or less than the target pounds.

The following table shows the pounds per day phosphorus targets for each Washington State NPDES permit holder as they will be expressed in the MIP based on projected flows for 2017 and 2027 using estimates produced through the Spokane River TMDL Collaboration.

Discharger	Projected 2017 WWTP Influent (mgd) [a]	2017 Target Phosphorus (lbs/day) [b]	Projected 2027 WWTP Influent (mgd) [a]	TMDL WLA Phosphorus (lbs/day) [b c]
Liberty Lake	1.41	0.12	1.51	0.13
Kaiser Aluminum	15.4	1.29	15.4	1.29
Inland Empire Paper	4.1	0.34	4.1	0.34
City of Spokane:				
- from City of Spokane only	36		41.77	
- from Spokane County	5.76		9	
- from Airway Heights	0		0	
Total City of Spokane	41.76	3.49	50.77	4.24
Spokane County (new plant)	8	0.67	8	0.67

NOTES:
[a] Influent flow projections based upon data from Flow & Loading Work Group and dischargers
[b] lbs/day for point sources = Influent MGD x 10 µg/L P x 0.0083454
[c] MIP achieves Waste Load Allocation by 2027

The "(lbs/day)" numbers listed above will be used as the target pounds to determine each NPDES permit holder's Delta. An NPDES permit holder's Delta is the actual pounds of phosphorus discharged per day minus the target pounds. NPDES permit limits will be based on a seasonal average with appropriate daily, weekly, and monthly limits that recognize the uncertainties and start-up complexities of new treatment technology.

The 2017 phosphorus targets are goals during the first ten years of the MIP. These phosphorus targets will not be binding during the first ten years so as to allow assessment of the beneficial impact on DO from all MIP-related technology improvements and phosphorus reduction actions initiated during this time, and to allow measurement of the actual Delta reduction by the dischargers based on experience. By the end of the 20th year, NPDES permit holders are required to be in compliance with the phosphorus WLA in the right hand column of the chart above.

Once an NPDES permit holder demonstrates reliable ability to continually meet its target, either by treatment technology or technology combined with actions to eliminate the Delta, that permit holder will have met its responsibilities for meeting waste load allocations as expressed in either the MIP or the TMDL.

Aggressive efforts, initiated as quickly as possible, to reach the targets during the first ten year period of the MIP are required. These efforts will include both phosphorous removing treatment technology upgrades and a suite of other phosphorus reducing actions from the list of "target pursuit actions" described below.

Some aggressive programs to meet phosphorus targets may be conducted jointly by several dischargers. These efforts need to result in assignment of reduced pounds of phosphorus to individual dischargers because dischargers must meet individual targets.

A trading program of dischargers' demonstrated surplus phosphorus may be implemented consistent with EPA guidelines pending Ecology's verification of any surplus phosphorus offset pounds.

As part of the implementation of the MIP, each National Pollution Discharge Elimination System permit holder in Washington State covered by the Spokane River Dissolved Oxygen TMDL will, in accord with the section titled **"***Schedule of Activities,***"** prepare a technology selection protocol and an Engineering Report with construction schedule for the treatment technology improvements the permit holder intends to install. The permit holder will also prepare a Delta elimination plan with a schedule of target pursuit actions (see details below) that, in combination with the technology improvements, provide reasonable assurance the April-October phosphorus target will be achieved in the first ten years of the MIP. The ways these targets and associated requirements will be reflected in each NPDES permit is explained in the section below titled "*NPDES Permit Cycle*."

4.5 Target Pursuit Actions

Target pursuit actions are the steps that are either required or available for NPDES permit holders to both upgrade their technology and eliminate their Delta within the first ten years of the MIP in order to provide reasonable assurance of meeting targets. The target pursuit actions may be modified as a result of the 10th Year Assessment. Dischargers without a Delta do not need to perform target pursuit actions for Delta elimination.

Technology selection protocols and Delta-eliminating target pursuit actions will both be initiated as soon as possible, and Delta-eliminating actions will not be deferred until technology improvements are actually selected and installed.

Enforceable terms of each NPDES permit will include the obligation to meet the interim or final effluent limit and the obligation to complete implementation of the target pursuit actions, although the details of the target pursuit actions may be set forth in a separate administrative order.

After the 10th year of implementation, a thorough review (see the section titled "*Tenth Year Assessment"*) will be conducted to determine what, if any, additional phosphorus reduction actions are necessary, what actions should be continued or discontinued, and/or whether any changes to the phosphorus reduction goal in the TMDL or the Water Quality Standards for DO in the River and Lake Spokane are warranted. By the end of the 20th year of the MIP, NPDES permit holders are required to be in compliance with the then current TMDL phosphorus waste load allocations (the targets may have been modified as a result of the Tenth Year Assessment) to assure applicable Water Quality Standards are being met.

Required Actions: Required target pursuit actions for each NPDES permit holder with a Delta are as follows:

- ***Technology Selection Protocol:*** NPDES permit holders will prepare, and submit to Ecology for approval, a comprehensive technology selection protocol for choosing the most effective feasible technology for seasonally removing phosphorus from their effluent with an objective of achieving a discharge with seasonal average 50µg/l phosphorus or lower. If pilot testing is a part of the protocol, there will be appropriate provisions for quality assurance and control. The protocol will include a preliminary schedule for construction of the treatment technology.
- ***Delta Elimination Plan:*** In addition to the technology selection protocol, NPDES permit holders will also prepare and submit for Ecology's approval a Delta elimination plan and schedule for other phosphorus removal actions such as conservation, effluent re-use, source control through support of regional phosphorus reduction efforts (such as limiting use of fertilizers and dishwasher detergents), and supporting regional non-point source control efforts to be established. The plan, in combination with the phosphorus reduction from technology, will provide reasonable assurance of meeting the permit holder's target in ten years.
- ***Expeditious Decision:*** Ecology will expeditiously review and decide on the proposed technology selection protocol, preliminary construction schedule and Delta elimination actions.
- ***Engineering Report:*** After a permit holder implements the technology selection protocol, the permit holder will prepare, and submit to Ecology for approval, an Engineering Report concerning the chosen technology, including any updates to the construction schedule. The Engineering Report will (if necessary) be accompanied by amendments to the schedule and substance of the target pursuit actions so that in combination with the Engineering Report on expected technology performance, there is reasonable assurance of meeting the target in ten years. Ecology will expeditiously review and decide on these submittals.
- ***Interim Limits:*** When new treatment technology is installed, Ecology will set interim phosphorus permit limits based on the engineering reports. It is recognized that, because modern phosphorus removal technology is challenging, achieving normal, and routine operation may require two years, assuming average seasonal conditions (temperature and flow) during both years. During this period, Ecology will recognize these conditions and their effects on compliance with interim discharge limits.
- ***Final Limits:*** Final limits applicable during the remaining term of the MIP will be set based on the actual performance of the technology installed and operated at optimum reliable efficiency (see the section titled "*NPDES Permit Cycle*").
    - ***Investment Stability:*** The investment in phosphorus removal technology is recognized by Ecology as having a 20-year life, and no significant modifications or replacements of phosphorus removal facilities will be required during the term of the MIP. Modifications to installed technology that best available data indicate would enhance phosphorus removal performance and are efficient and cost-effective may be required.

- ***Conservation:*** Public NPDES permit holders, in cooperation with water purveyors, will as soon as possible develop individual and regional programs that reduce flows by funding "LOTT-style" indoor conservation efforts that target 20 percent water conservation per household in older urban areas and 10 percent water conservation per household in newer (post 1992) urban areas. These programs will have local ordinances, avoided cost investment principles and per connection expenditures similar to the LOTT program. To the extent these actions are demonstrated as reducing phosphorus loading to the river, they will be recognized as contributing toward achieving phosphorus waste load targets.
- ***Class A Effluent:*** Each publicly owned treatment plant covered by the Spokane DO TMDL will, through their technology updates, produce effluent meeting the State of Washington Class A reclaimed water quality standards in place when the MIP takes effect.

Available Actions: The following target pursuit actions are not required of every NPDES permit holder with a Delta. The non-point source program, however, needs to have sufficient participation to achieve the TMDL-required phosphorus reduction.

- ***Reclaimed Water:*** Publicly owned dischargers may seek to re-use the Class A reclaimed water they produce as result of technology improvements. All reasonable efforts to re-use and/or recharge the aquifer rather than directly discharging it to the River, particularly in the April-October timeframe, are strongly encouraged consistent with circumstances and opportunities. Ecology will work with each NPDES permit holder and the Washington State Department of Health to prepare approvable permits that enable timely and successful implementation of these opportunities. Specifically, Ecology commits to the following:
    - Ecology will assist in permitting re-use efforts by actively coordinating state permitting with the Washington State Department of Health.
    - Ecology will assist dischargers proposing re-use target pursuit actions in assessing whether any water rights/quality impairments might occur and how any impairment might be addressed.
    - Any revisions of Washington State in Class A reclaimed water guidelines or standards in place when the MIP takes effect will serve as a basis for requesting Ecology's reconsideration of an NPDES permit holders approved target pursuit action plan that relies on re-use target pursuit actions envisioned prior to the revisions.
    - To the extent these water re-use actions are demonstrated as reducing phosphorus loading to the river, they will be recognized as contributing toward achieving phosphorus waste load targets.
- ***Regional Phosphorus Reduction Programs:*** Privately owned treatment plants may participate with other NPDES permit holders in regional phosphorus reduction programs, such as conservation (see above) and non-point source control (see below). To the extent these actions are demonstrated as reducing phosphorus loading to the river, they will be recognized as contributing toward achieving phosphorus waste load targets.
- ***Bio-available Phosphorus:*** NPDES permit holders may seek to prove to Ecology that a certain stable fraction of their phosphorus discharge is not bio-available in the River environment for a time sufficient to consider it not reactive and not a nutrient source. If Ecology agrees, the pounds of phosphorus that are not bio-available will be recognized as contributing toward achieving the total phosphorus waste load target.
    - ***Source Control Programs:*** To the extent that source control actions to limit phosphorus inputs through regulation of phosphorus-containing products and through enforced phosphorus-limiting pre-treatment ordinances are demonstrated as reducing phosphorus loading to the river, they will be recognized as contributing toward achieving dischargers' phosphorus waste load targets.

- ***Regional Non-Point Source Reduction Program:*** Participating NPDES permit holders and Ecology will jointly fund and implement a regional non-point source (NPS) phosphorus reduction program at $2 million/year. The program will begin in the second year of the MIP following completion of an initial study (50 percent funded by Ecology) to determine the best opportunities for non-point phosphorus reductions.

  The regional non-point source program will be designed to achieve the NPS phosphorus reduction identified in the TMDL **and** to contribute to the Delta reduction efforts of the participants, as necessary. If sufficient reduction in NPS phosphorus as determined by the 10th Year Assessment has not yet been achieved, the jointly funded and implemented regional NPS program will continue for the second ten years of the MIP.

  The program will be closely managed by the oversight and coordination group described below, and it will be monitored to routinely identify cost-effective strategies and verify actual phosphorus reductions. Resources could be shifted to other more effective actions for phosphorus reduction by mutual agreement with Ecology.

  Successful phosphorus-reducing actions funded by the NPDES permit holders through the NPS program will be recognized as contributing toward achieving dischargers' phosphorus waste load targets.

- ***Septic Tank Elimination Program:*** Spokane County may submit to Ecology information and calculations demonstrating the phosphorus removal impact on the Spokane River and Lake Spokane of its Septic Tank Elimination Program. Pending Ecology's expeditious review and decision regarding the information and calculations, the county may, if Ecology approves, use the pounds of phosphorus prevented from reaching the River and Lake Spokane through septic tank elimination as part of any needed offsets for the County's new treatment plant (see the section titled "*New County Treatment Plant*").

Oversight and Coordination: The above target pursuit actions require careful monitoring and accounting to assure genuine phosphorus reductions and proper Delta reduction recognition. The following will occur:

- Ecology and the dischargers will immediately collaborate to develop an oversight and coordination group. The intent is to form a collaborative group to oversee and coordinate the required regional actions including, but not limited to, the NPS, monitoring, modeling, reporting and public outreach programs, however the participating entities retain their individual authorities. Ecology and the dischargers will share in the administrative cost of this group.

- The oversight and coordination group, in cooperation with Ecology, will manage the non-point source program described above.

- The oversight and coordination group will implement a monitoring and research program for the River to routinely track and evaluate the amount of phosphorus removal, the impact of phosphorus reductions and associated improvements on dissolved oxygen levels. Also, there will be additional studies such as those concerning sediment oxygen demand, the efficacy of river aeration/oxygenation, and bio-availability of phosphorus in discharges and other areas that advance the understanding of and refine the science concerning the River's health. Modeling capabilities for the River will also be enhanced by gathering and including sediment oxygen demand data, noting and examining episodic events that contribute to increased phosphorus loading, and other relevant data and by considering current measurement of minimum river flow as adjusted by regulation. Ecology and the dischargers will share in the cost of implementing and operating this monitoring and research program.

  - Dischargers will prepare and submit annual reports to Ecology, describing each discharger's performance of the target pursuit actions and any measurable successes. For joint actions (such as the NPS Program), the dischargers may provide a joint report.

- Ecology will prepare annual performance reviews concerning the status of agreed-upon, committed target pursuit actions described above. Every two years Ecology, using monitoring information, will prepare and present a report and, in collaboration with the oversight and coordination group, conduct other public engagement efforts regarding the River's health and the performance and effects of the target pursuit actions described in the MIP.
- Ecology will address Avista Corporation's DO responsibilities through the 401 Certification process.

4.6 New Spokane County Treatment Plant

A new Spokane County treatment plant will be constructed to meet its phosphorus allocation target through a combination of advanced treatment and other offsets that are in place and accepted by Ecology as effective as the plant begins routine, normal (i.e., beyond shakedown or start up) operations. As with the engineering reports and target pursuit action plans and schedules for NPDES permit holders, the county will submit to Ecology for approval the county's engineering report for the plant showing how the most effective, feasible phosphorus removal technology has been selected, and how the offsets will be timely developed. At the time the plant begins normal, routine operations, it is expected the combination of offset actions and the plant's treatment of water to be discharged in the River will together achieve compliance with 10µg/l phosphorus.

Consistent with NPDES requirements, the plant will be permitted by Ecology in order to enable rapid conversion of septic systems to sewers consistent with the approved septic tank elimination program prior to the completion of the county plant. The county will construct the plant within the first six years of the MIP as the county's offsets from the target pursuit actions are being developed and made operative. It is recognized that any phosphorous reduction actions selected by the county that rely on the plant achieving normal, routine operation for their full implementation (such as completing septic tank hookups and/or water re-use) can still contribute to the county's offsets. It is further recognized that, because modern phosphorus removal technology is challenging, achieving normal, and routine operation may require two years, assuming average seasonal conditions (temperature and flow) during both years.

During this period, Ecology will recognize these conditions and their effects on compliance with interim discharge limits.

4.7 The County will also develop a comprehensive program for reclaimed water production, re-use and aquifer recharge of effluent. This re-use program will be subject to the same conditions described for other re-use target pursuit action plans described above.

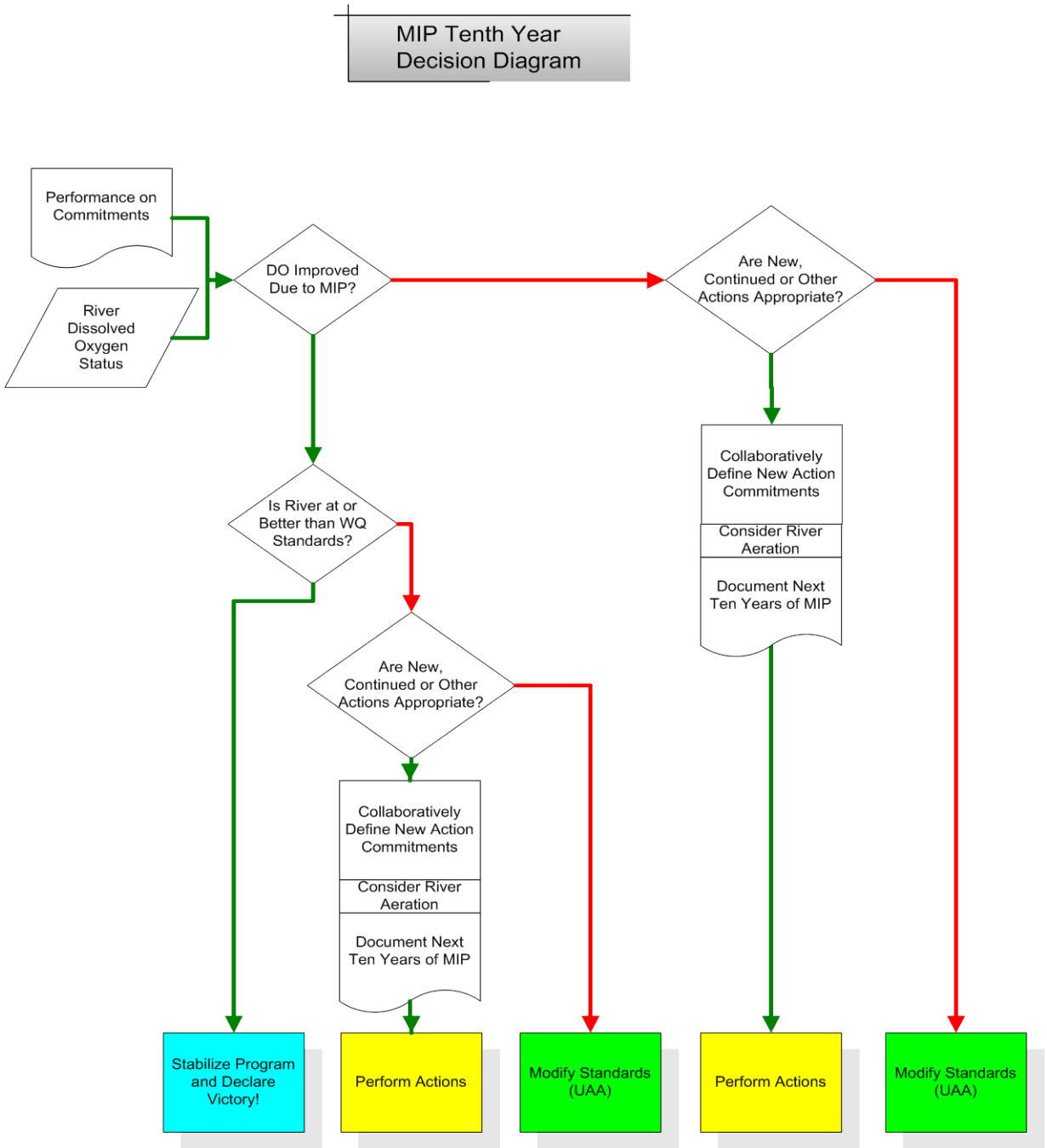
4.8 10th Year Assessment

Following the 10th year of the MIP there will be a major assessment of the plan's impact. A collaborative process will be used to make determinations about the relevant actions appropriate for the second ten years of the MIP. The assessment will be a data-based, objective review designed to assess:

- The amount of phosphorous removed from the River by the actions taken to date compared to phosphorus reduction targets.
- The River response to those reductions and associated changes in DO.
- The necessity, if any, for further reductions in phosphorous, CBOD and ammonia in order to achieve Water Quality Standards for DO.
- The likelihood of further phosphorous reductions occurring in the next ten years of the MIP if the actions begun in the first ten years were continued.
    - The set of actions that could be initiated in the next ten years of the MIP that would more likely than not result in further phosphorous reductions, if necessary, to achieve DO Water Quality Standards for Lake Spokane.

- The reasonableness of pursuing these actions and/or the reasonableness of pursuing other strategies such as Lake Spokane oxygenation and/or the appropriateness of modifying DO Water Quality Standards if continuing existing or implementing additional phosphorous removal strategies will more likely than not fail to improve DO sufficiently to meet existing DO Water Quality Standards.
- Particular attention will be given to Lake Spokane's hypolimnion (lowest) layer where DO levels may be least likely to be significantly improved by upstream phosphorus reduction.
- Data and actions will be carefully reviewed to determine whether technology improvements and target pursuit actions can result in the hypolimnian meeting DO Water Quality Standards, whether lake oxygenation or other techniques may be effective in improving DO and/or whether modified Water Quality Standards for this layer are appropriate.

These decisions will be made consistent with the MIP Decision Diagram below:



This assessment will occur following the 10th year of the MIP. The assessment may need to be extended if the timing of the installation of treatment technology has not resulted in operation for a long enough time to produce sufficient data about river conditions and DO response. If this occurs, the assessment would not be completed until there has been at least three years of operation of all treatment technology upgrades by all dischargers.

4.9 NPDES Permit Cycle

Four 5-year NPDES permit cycles are expected to be covered under the MIP. Currently, all four existing NPDES permits are under administrative extensions. Each of the existing NPDES permits will be handled somewhat differently due to varying conditions associated with each discharge.

In general, the NPDES permits will follow this sequence:

Cycle	*Term*	*Permit Elements*
I	2007 - 2011	The permit is issued with effluent limits adjusted based on performance history. The permit will state the goal of achieving an equivalent of an effluent phosphorus concentration of 10µg/l phosphorus by the end of the following permit cycle (i.e., in ten years) through a combination of phosphorus treatment technology and target pursuit actions. Enforceable terms of each NPDES permit will include the obligation to meet the effluent limit and the obligation to start, continue, and/or complete the target pursuit actions. The details of the target pursuit actions may be set forth in a separate administrative order. The permit, depending on date of issue, may also specify dates for submitting a technology selection protocol and an Engineering Report with an estimated construction schedule, all as described in the section titled "Target Pursuit Actions."
II	2012 - 2016	The permit is issued with interim effluent limits taking effect with the completion of technology upgrades. Implementation of the phosphorus target pursuit actions to reduce the Delta is continued during this permit cycle. The permit will state the goal of achieving an equivalent of an effluent phosphorus concentration of 10µg/l phosphorus by the end of the permit cycle (i.e., in five years) through a combination of phosphorus treatment technology and target pursuit actions. As in the first Permit Cycle, enforceable terms of the NPDES permit will include the obligation to meet the effluent limit and the obligation to continue and/or complete the target pursuit actions. The details of the target pursuit actions may be set forth in a separate administrative order. The interim limits will be based on the Engineering Report that provides Ecology with reasonable assurance that an equivalent of an effluent phosphorus concentration of 10µg/l phosphorus will be achieved by the end of the permit cycle. It is recognized that, because modern phosphorus removal technology is challenging, achieving normal and routine operation may require two years, assuming average seasonal conditions (temperature and flow) during both years.
II	2012 - 2016	During this period, Ecology will recognize these conditions and their effects on compliance with interim discharge limits. Operational characteristics for the newly installed technology will be assessed so that final limits can be established.

Cycle	*Term*	*Permit Elements*
III	2017 - 2021	The permit is issued with final effluent limits based on observed operational characteristics. The permit will reflect results of the 10th Year Assessment. The permit will state the goal of achieving an equivalent of an effluent phosphorus concentration of 10µg/l phosphorus through a combination of phosphorus treatment technology and target pursuit actions. As in the first Permit Cycle, enforceable terms of the NPDES permit will include the obligation to meet the effluent limit and the obligation to continue and/or complete the target pursuit actions. The details of the target pursuit actions may be set forth in a separate administrative order.
IV	2022 - 2026	The permit is issued with established final effluent limits that, in combination with completed and continuing target pursuit actions, meet the final waste load allocations since they will be enforceable at the end of the MIP.

A Gantt chart version of the anticipated permit cycles for each existing NPDES permit holder plus the permit cycle for Spokane County is included for illustrative purposes as *Attachment A.*

4.10 Schedule of Activities to Initiate the MIP

Based on and consistent with the principles and foundational concepts in this Agreement, several tasks need to be completed as the Spokane River TMDL and accompanying MIP are made final.

These actions include the following:

- Re-drafting of the TMDL, completion of the MIP by Ecology, and submittal of the final TMDL to EPA – target date 1/1/2007.
- Submittal to Ecology of technology selection protocols, Delta elimination plans and treatment technology implementation schedule by each discharger – target date 1/1/2007.
- Creation of the oversight and coordination structure necessary to implement the actions that will be conducted on a regional scale such as the operation of the NPS and monitoring programs – target date 1/1/2007.

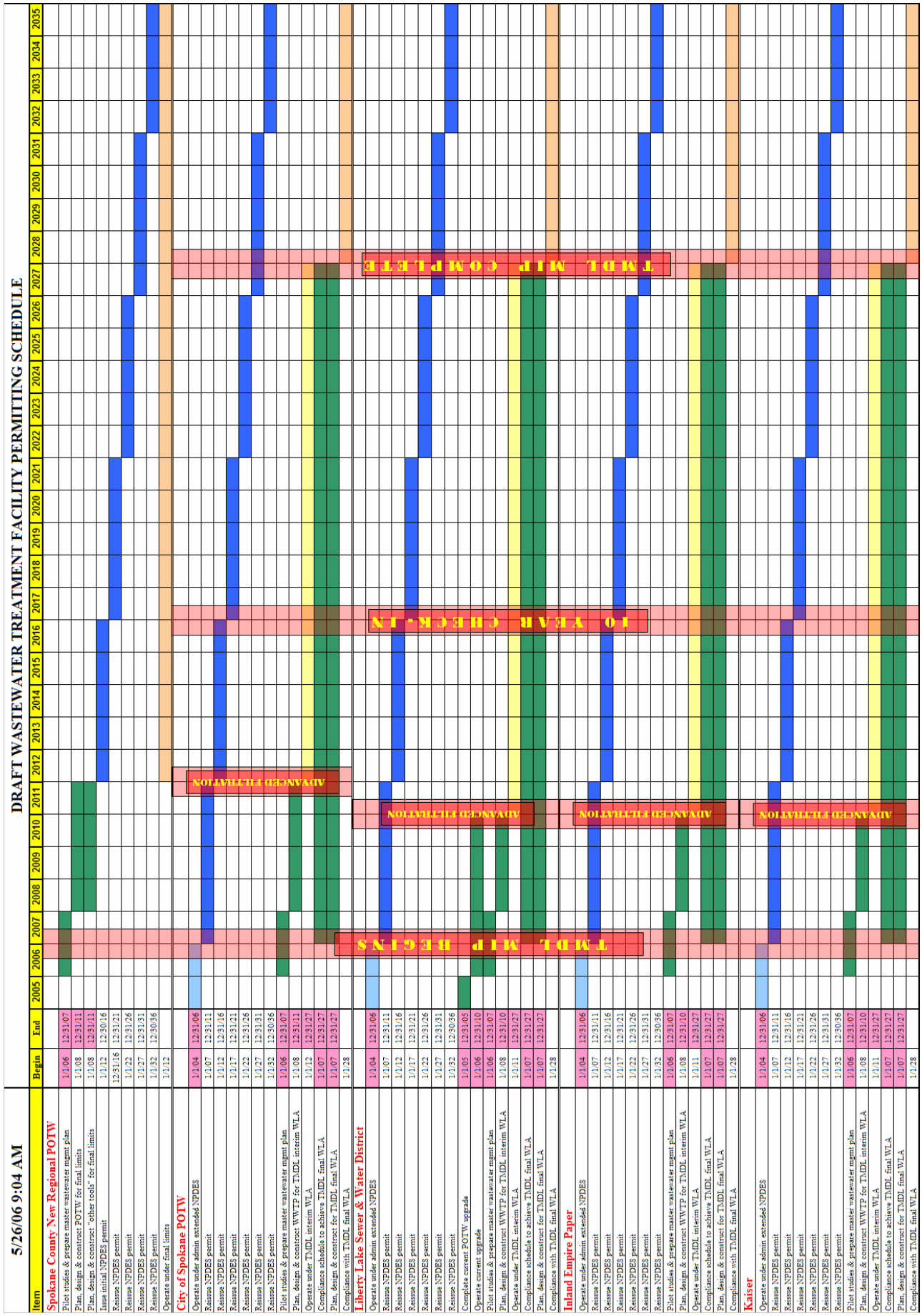
  Assuming the Foundational Concepts in this paper become an Agreement in Principle that is endorsed by Ecology and the dischargers this summer, and the TMDL is completed by Ecology and approved by EPA, it appears likely the first permitting sequence and the start of the MIP's first ten year period could begin in early 2007. Ecology and the dischargers agree that local elected officials in the Spokane area should share the lead with Ecology in developing the appropriate oversight and coordination structure for overseeing the implementation of the MIP and securing the necessary inter-agency agreements and funding commitments sufficient to support it.

  Applying the Foundational Concepts, the Agreement in Principle does not require any party to engage in any future action or make any subsequent decision in violation of established rules and procedures for engaging in such actions or making such decisions.

  Nothing in this document changes any party's authorities or responsibilities under law or regulation. The parties embracing this Agreement recognize and support that this path forward is the appropriate way to establish the legally sufficient framework for completing the Spokane River DO TMDL and to quickly begin the important work of improving the health of the Spokane River. All parties agree to conduct themselves over the next months and years consistent with these Foundational Concepts and resulting Agreement in Principle so that this can be successfully and efficiently accomplished.

Attachment A: Draft Wastewater Treatment Facility Permitting Schedule

- INCLUDED FOR ILLUSTRATIVE PURPOSES ONLY -



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Spokane TMDL Oversight Committee

February 14, 2007

The Foundational Concepts for the Spokane River TMDL Managed Implementation Plan document (Ecology, June 2006) specifies the formation of an Oversight Committee to perform the following:

Ecology and the dischargers will immediately collaborate to develop an oversight and coordination group. The intent is to form a collaborative group to oversee and coordinate the required regional actions including, but not limited to, the NPS, monitoring, modeling, reporting and public outreach programs, however the participating entities retain their individual authorities. Ecology and the dischargers will share in the administrative cost of this group.

PURPOSE

The Oversight Committee will have three principal responsibilities:

1. Track implementation of the Foundational Concept Agreement and assess progress on each.
2. Direct the implementation of specific elements of the Foundational Concepts. The Oversight Committee will work each of the jurisdictions, the Washington Conservation Commission and the Spokane Conservation District as well as other government and non-government organizations in the design, funding and implementation of a non-point source control program to control phosphorus discharges to the Spokane River and Lake Spokane Reservoir. Specifically, the Oversight Committee will carry out the following responsibilities:

    1. Non-point source control program. The Oversight Committee will direct the implementation of the non-point source control program.

        a. Approve the scope of work for the Regional Non-point Source study.

        b. Allocate funds contributed from those entities signing the Foundational Concepts, Memorandum of Agreement, to non-point source control programs.

        c. Coordinate and assess progress in reducing non-point sources of phosphorus.

        d. Allocation of credit to Dischargers from Non-point source phosphorus reduction

2. Monitoring program to collect information needed to assess how well the River and reservoir respond to phosphorus reduction and to refine the model used for the TMDL report.

    a. The Oversight Committee is expected to create a monitoring team or committee of agency staff who will develop and manage through cooperative efforts a monitoring program. The Oversight Committee will provide approval on scope, schedule and budget for the monitoring program.

3. Monitoring implementation of delta management programs.

    a. The Oversight Committee will periodically review the progress of entities implementing actions agreed upon in the Foundational Concepts and report progress to the public.

4. Development and implementation of a phosphorus trading program or exchange program consistent with the Environmental Protection Agency rules and regulations guiding trading programs.

5. Communication of a consistent message regading water conservation

    a. Water conservation will be carried out by the individual jurisdictions as independent actions. However, the Oversight Committee will coordinate with the participating jurisdictions to facilitate coordination of programs and work to assure a consistent message is being communicated to the public.

6. Communication of a consistent message regarding water re-use:

    a. Water re-use will be carried out by the individual jurisdictions as independent actions. The Oversight Committee will coordinate with the participating jurisdictions to facilitate coordination of water re-use programs and work to assure that a consistent message is being communicated to the public about the value of water re-use.

7. Report on a bi-annual basis, through a major public conference, actions taken and progress made in reducing the discharge of phosphorus and improving the dissolved oxygen in the Spokane River and Lake Spokane Reservoir.

FORMATION

The Oversight Committee will be formed through an Interlocal Cooperative Agreement.

1. An Executive Committee will be formed to manage the affairs of the Oversight Committee. The Executive Committee will be composed of Elected Officials: City of Spokane, Spokane County and Liberty Lake Sewer and Water Authority.

2. Technical Committees will be used to implement Oversight Committee responsibilities. The Technical Committees will be formed as needed and serve the Oversight Committee.

3. Advisory Bodies will be created to provide advice and guidance to the Oversight Committee.

4. The Oversight Committee will be staffed and managed with an independent staff. Staff will report to the Executive Committee.

COMPOSITION

The Oversight Committee will be composed of the following organizations:

1. City of Spokane
2. Spokane County
3. City of Spokane Valley
4. Liberty Lake Water and Sewer District
5. One at-large member (to be defined). At-large member will be nominated by the Executive Committee and approved by the Oversight Committee. The At-large member may serve as the Chair of the Oversight Committee.
6. Ex-officio members
    a. Spokane Tribe of Indians
    b. Washington Department of Ecology
    c. City of Coeur d'Alene, Idaho
    d. Stevens County

A Standing Advisory Committee will be formed for the purpose of advancing the goals of the Oversight Committee as described in the Foundational Concepts. The Advisory Committee shall consist of approximately 9 members. It may be composed of representatives from the following organizations and/or interest groups:

1. Idaho Department of Environmental Quality
3. Environmental interest groups
4. Conservation District(s)
5. Avista
6. Industrial dischargers
7. Other as may be recommended by the Executive Committee and approved by the Oversight Committee

Representatives named by their respective organization and/or interest group to participate on the Advisory Committee will be expected to participate fully in Advisory Committee work on a timely basis.

FUNDING

The Oversight Committee will be funded through contributions from the participating jurisdictions.

1. Development of an Inter-local Agreement (ILA) to form the Oversight Committee will be lead, jointly, by the City of Spokane, Spokane County and the Washington Department of Ecology.
2. Seed money to fund the initial work of the Oversight Committee will be contributed from each jurisdiction, including the Washington Department of Ecology.
3. The Executive Committee will develop an initial and an on-going funding mechanism for Oversight Committee responsibilities. Legal review of initial funding sources will be done, jointly, by City of Spokane and Spokane County.

   Potential funding sources include:

   a. Administrative charge to the non-point source control program grants.
   b. Creation of a Watershed Protection Authority
   c. Annual assessment to each wastewater utility
   d. Other

4. Spokane County will serve as the Fiscal Agent for initial grant funding and administration of the ILA until such time as the Oversight Committee is established and operating with proper authority and procedures in-place to function independently.

Spokane River TMDL Oversight Committee
DRAFT

3/6/07