Avista's Lake Spokane DO WQAP

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Spokane River and Lake Spokane DO TMDL Advisory Committee Meeting

May 22, 2013

Outline

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3. Potential Reasonable & Feasible Nutrient Reduction Measures
4. Load Estimates
5. Prioritized Measures
6. Measuring Progress
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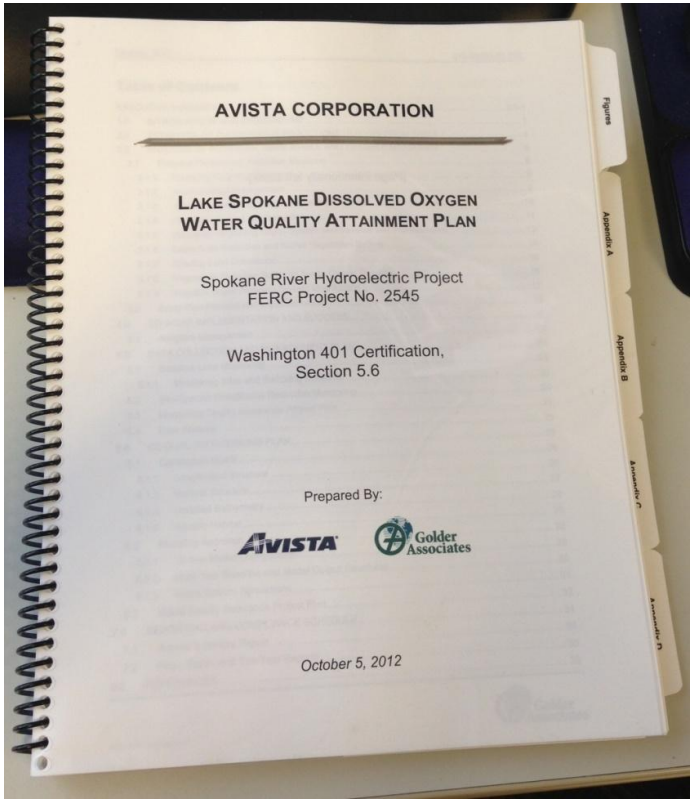
8. Status



Regulatory Context

- DO impairments, 303(d) Listed
  - Nutrients from Point and Non-point Sources
  - Impoundment creating Lake Spokane increases residence time for water flowing down the Spokane River
  - Thermal Stratification

Source: www.cosee.net

- Spokane River and Lake Spokane DO TMDL
  - WLA, LA, Avista
- WA 401 Certification License Amendments
- Lake Spokane DO WQAP

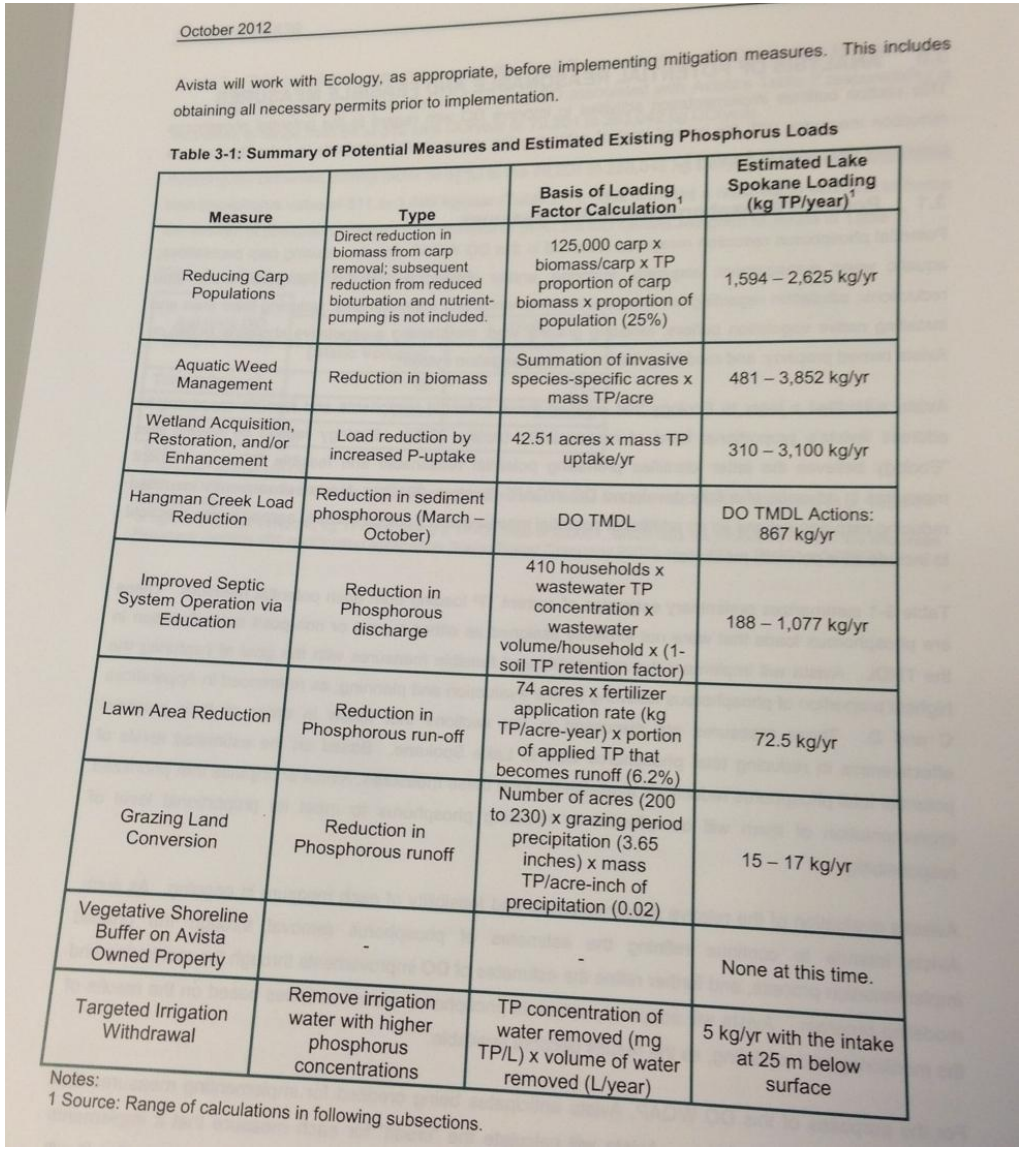
Lake Spokane DO WQAP Contents

- Estimates proportional responsibility in TP
- Identifies potentially reasonable & feasible measures to improve DO in Lake Spokane
- Schedule to analyze, evaluate & implement such measures
- Benchmarks & reporting to track progress
- 10 Years to implement

Potential Reasonable & Feasible Nutrient Reduction Measures

- Carp Reduction
- Aquatic Weed Management
- Wetland Restoration
- Lawn Area Reduction
- Hangman Creek
- Grazing Land Conversion
- Septic Systems Education
- Irrigation Pump

Load Estimates



Avista will work with Ecology, as appropriate, before implementing mitigation measures. This includes obtaining all necessary permits prior to implementation.

Table 3-1: Summary of Potential Measures and Estimated Existing Phosphorus Loads

Measure	Type	Basis of Loading Factor Calculation[1]	Estimated Lake Spokane Loading (kg TP/year)[1]
Reducing Carp Populations	Direct reduction in biomass from carp removal; subsequent reduction from reduced bioturbation and nutrient-pumping is not included.	125,000 carp x biomass/carp x TP proportion of carp biomass x proportion of population (25%)	1,594 – 2,625 kg/yr
Aquatic Weed Management	Reduction in biomass	Summation of invasive species-specific acres x mass TP/acre	481 – 3,852 kg/yr
Wetland Acquisition, Restoration, and/or Enhancement	Load reduction by increased P-uptake	42.51 acres x mass TP uptake/yr	310 – 3,100 kg/yr
Hangman Creek Load Reduction	Reduction in sediment phosphorous (March – October)	DO TMDL	DO TMDL Actions: 867 kg/yr
Improved Septic System Operation via Education	Reduction in Phosphorous discharge	410 households x wastewater TP concentration x wastewater volume/household x (1-soil TP retention factor)	188 – 1,077 kg/yr
Lawn Area Reduction	Reduction in Phosphorous run-off	74 acres x fertilizer application rate (kg TP/acre-year) x portion of applied TP that becomes runoff (6.2%)	72.5 kg/yr
Grazing Land Conversion	Reduction in Phosphorous runoff	Number of acres (200 to 230) x grazing period precipitation (3.65 inches) x mass TP/acre-inch of precipitation (0.02)	15 – 17 kg/yr
Vegetative Shoreline Buffer on Avista Owned Property	-	-	None at this time.
Targeted Irrigation Withdrawal	Remove irrigation water with higher phosphorus concentrations	TP concentration of water removed (mg TP/L) x volume of water removed (L/year)	5 kg/yr with the intake at 25 m below surface

Notes:
1 Source: Range of calculations in following subsections.

Prioritized Measures

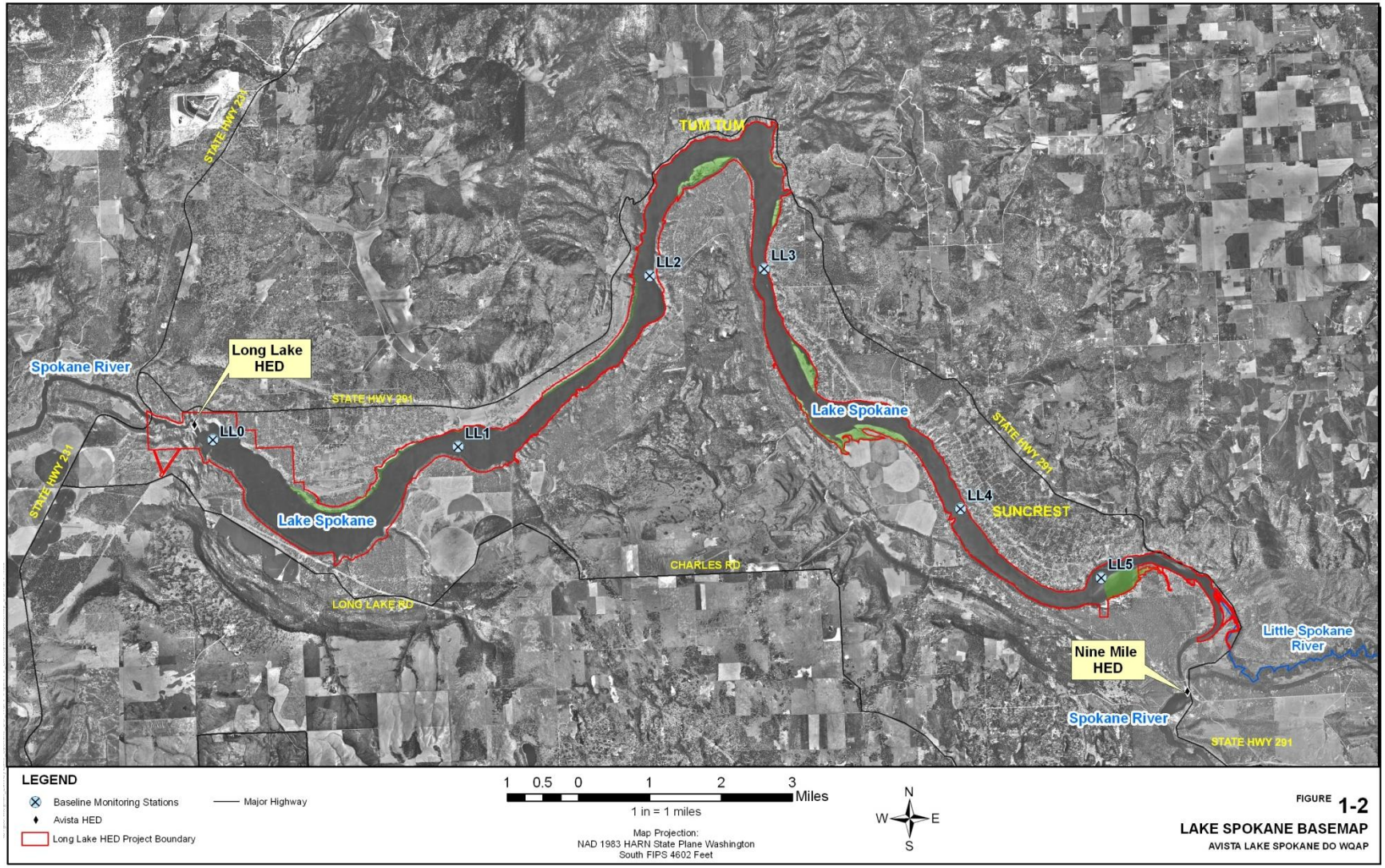
- Avista will focus initial efforts on two of these measures:
  - Carp Population Reduction
  - Aquatic Weed Management

Measure Progress

- Monitoring
  - Measure specific monitoring
  - Baseline nutrient monitoring
  - Habitat analysis

- Modeling
  - Incorporate additional flow regimes (10 years)
  - Update with new bathymetry

Lake Spokane Nutrient Monitoring



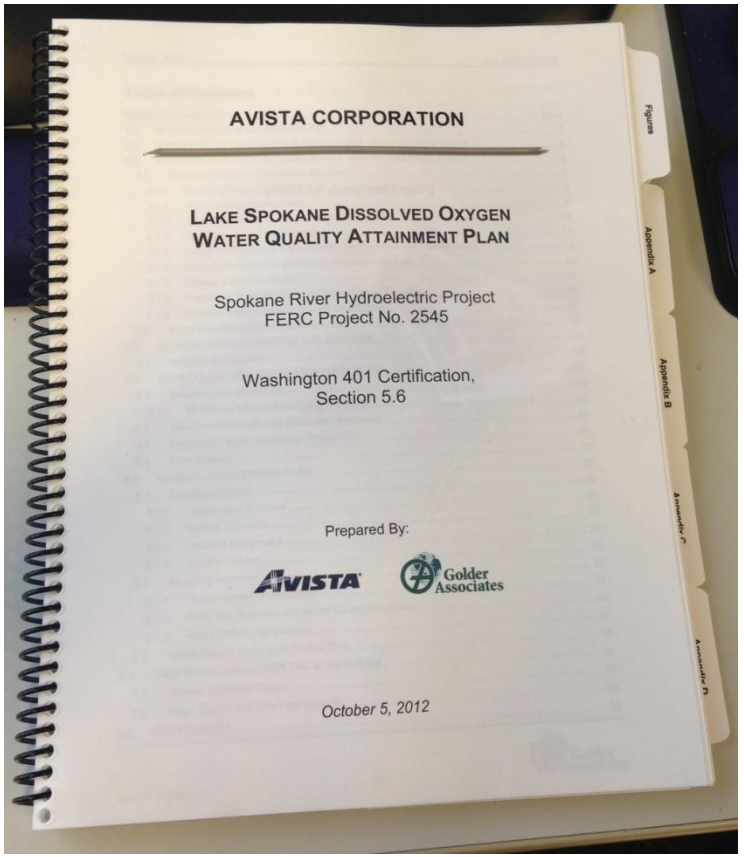
Reporting

- Annual Reports
  - Results of Baseline Monitoring
  - Summarize Implemented Control Measures
  - Summarize Mitigation Measures to be Implemented in Upcoming Year
  - Ongoing Habitat Analysis

- Five, Eight, and Ten Year Reports
  - Annual Reporting Content, plus….
  - Document Progress Towards Improving DO and Habitat Conditions in Lake Spokane

Lake Spokane DO WQAP Status

- Submitted to Ecology in May 2012
- Revised and resubmitted it to Ecology
- Received Ecology Approval in September 2012
- Submitted to FERC for Approval October 2012
- Approved by FERC August 2012



QUESTIONS?