

Appendix M

2012 TDG TMDL

Implementation Summary

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Introduction

This appendix provides a summary of the status of the short-term, operational and long-term Corps TDG TMDL implementation activities recommended in the Summary Implementation Strategy (SIS) of the TDG TMDLs for the lower Columbia River (approved by EPA on November 18, 2002) and the lower Snake River (approved by EPA on September 30, 2003). The summary implementation strategy (SIS) incorporates actions described and analyzed by the NOAA Fisheries in the 2000 and 2004 Biological Opinions and by the Corps in the Dissolved Gas Abatement Study (DGAS). The SIS was developed in consultation with NOAA Fisheries, so that TMDL implementation would be coordinated with requirements of the ESA. Both short-term (Phase I) and long-term (Phase II) measures are described with specific TDG and spill reduction measures. Phase I was in effect through 2011. Phase II began after 2011 and continues through 2020.

The TMDL summary implementation Actions:

The following summary tables provide an overview of the status of the short-term and long-term Corps TDG TMDL implementation activities. Table M-1 provides the current status of the short-term TDG TMDL implementation actions. Table M-2 provides the operational implementation actions that are used to minimize TDG. Table M-3 provides the current status of the long-term TDG TMDL implementation activities.

TABLE M-1
SHORT TERM – PHASE I TMDL IMPLEMENTATION ACTIVITIES
Structural Implementation Actions

2000 BiOp Action Item Description	Status	Estimated Completion Date	Actual Completion Date
Chief Joseph Deflectors	Construction completed October 2008. Tested in 2009 and 2010.	2008	2008
Lower Granite Removable Spillway Weir	Construction completed.	2001	2001
Little Goose Endbay Deflectors	Installed in 2009. Tested in 2010.	2009	2009
Lower Monumental Endbay Deflectors	Construction completed 2003. Final testing completed in 2009.	2003	2003
Lower Monumental Bypass Outfall Relocation	Construction completed.	2003 or 2004	2012
Ice Harbor Deflectors	Construction completed.	2002	2002
McNary End Deflectors	Construction completed.	2002	2002
John Day Deflectors	Deflectors in bays 2-19 construction completed	2002	2002
John Day Endbay Deflectors	Endbay #20 construction completed. Bay #1 not considered due to interruption of fish attraction flow.	2010	2010
The Dalles Deflectors	Evaluated but not considered effective due to existing bathymetry degassing properties.	N/A	N/A
The Dalles Spillwall	First spillwall completed in 2004. Second, longer spillwall completed in 2010	2010	2010
The Dalles Turbine Intake Blocks	Construction completed in 2001, but later removed based on fish impacts.	2001	2001
The Dalles Sluiceway Outfall Relocation	***	N/A	N/A
Bonneville Endbay Deflectors	Construction completed.	2002	2002
Bonneville Powerhouse 2 Corner Collector (B2CC)	Construction completed in 2004. Behavioral Guidance System for B2CC installed in 2008.	2004	2004
Bonneville Powerhouse 2 Fish Guidance Efficiency Improvement	Installed turning vanes on Submerged Traveling Screens and ceiling gap closure device in 1997. Installed intake improvements and Modified Vertical Barrier Screens in 2008.	1997 2008	1997 2008
Bonneville Powerhouse 1 Surface Bypass or Extended Screens	Biological evaluations completed, but not constructed due to cost outweighing biological benefits.	2002	2002
Divider Walls at Appropriate Dams	Evaluated and selected for The Dalles (Spillwall), Other projects not considered due to cost outweighing biological benefits.	2002	2002

**TABLE M-2
OPERATIONAL TMDL IMPLEMENTATION ACTIONS**

Operational Action	Status
Scheduling routine turbine maintenance and repair during low-power load and river flow periods.	Ongoing
Preventative maintenance of turbines to prevent breakdown.	Ongoing
System management of water release from upstream storage reservoirs to minimize involuntary spill at dams in the TMDL area.	Ongoing
Optimizing power purchasing to allow maximum use of powerhouse capacity and minimization of involuntary spill. This has become more complex with the increase in wind energy in the Columbia River Basin.	Ongoing
Testing various spill patterns to find the most effective for fish passage and TDG production. If spill pattern produces undesirable results, modify spill pattern.	Ongoing

**TABLE M-3
LONG TERM – PHASE II TMDL IMPLEMENTATION ACTIVITIES
Fish Passage Actions That Support TDG Water Quality Goals**

2000 BiOp Action Item Description	Status	Estimated Completion Date	Actual Completion Date
John Day Surface Bypass (may be Removable Spillway Weir)	Two weirs installed in 2008, then moved closer to powerhouse in 2010.	2008	2008
Removable Spillway Weirs at Lower Monumental, Little Goose, and Ice Harbor	Ice Harbor weir installed in 2005. Lower Monumental and Little Goose weirs installed in 2009	2001	2001
McNary Bypass Improvements (outfall, temperature)	Two weirs installed in 2007. Outfall completed in 2012. Temperature improvement prototyped developed.	2012	2012
Lower Monumental Extended Screens	Evaluated but not considered due to cost outweighing biological benefits.	N/A	N/A
John Day Extended Screens	Prototype evaluated but not developed due to low fish survival and high O&M costs.	2003 or 2004	2011
Spill Effectiveness Studies	Ongoing at most projects - determined successful.	N/A	N/A
Predator Removal and Abatement	Ongoing at Lower Columbia River projects including avian hazing and wires, pike minnow removal, and sea lion hazing.	N/A	N/A
Improved Operation and Maintenance	Ongoing.	N/A	N/A
Bonneville Powerhouse 1 Minimum Gap Runners	All ten units completed (1990-2010).	2010	2010
Implement Turbine Survival Program Results	Ongoing.	N/A	N/A