

Appendix F

2013 Percent TDG Instance

Tracking System

This page is purposely left blank for duplex printing.

INTRODUCTION

The US Army Corps of Engineers (Corps) tracks the number of instances when the percent TDG exceeds the Oregon and Washington water quality standards (WQS) as described in Part 1.1.6 of this report. This appendix provides the TDG tracking system results from April 1 through August 31. As discussed in Part 1.1.7, the Corps developed a Chief Joseph Dam spill management policy that involves using Chief Joseph Dam for systemwide TDG management. As a result, Chief Joseph is included in this appendix in order to account the TDG instances associated with system-wide spill operations.

Table F-1 provides a listing of the five TDG instance (Types) that are designated to each instance when the daily high 12-hour average is exceeded. In 2009, the definitions were condensed to three main types and two sub-types, which included all the previous 14 instance types used from 2002 to 2008.

Table F-2 designates a specific instance type for all the TDG instances that exceed the Oregon and Washington state WQS¹ at the Corps' lower Columbia River and lower Snake River dams plus Chief Joseph Dam at the Mid-Columbia River. Tables F-3A and F-3B provide the percent TDG instance type totals for each project. Table F-4 breaks down the maximum hourly percent TDG value and number of hours of percent TDG instances per project that exceed the state WQS of 125 percent. Table F-5 provides a historical summary and ten-year average from 2004 to 2013 of the number of hours that exceeded the 125 percent TDG state standards during the spill season. The number of hours after 2010 are higher due to the addition of Chief Joseph Dam data.

Table F-6 provides the maximum hourly percent TDG value and number of instances that exceed the Colville Tribe TDG WQS of 110 percent at the forebay and tailwater of the Chief Joseph Dam at the Mid-Columbia River.

Table F-7 provides a list of TDG gauges that malfunctioned during the 2013 spill season, which resulted in TDG instances. Malfunction gauge TDG instances are noted as Type 2a instance in Tables F-2, F-3A and F-3B to indicate when a TDG instance occurred and appeared as part of the real-time operational review. Table F-2 is based on raw data and is populated during real-time operations. Tables F-4, F-5 and F-6 do not include the malfunctioning gauge data since they provide statistical information on hourly TDG levels.

¹ Changes made to these state water quality standard exceptions in recent years have not been fully applied because the Corps is operating under a Court Order to continue spill for juvenile fish as implemented in 2006 through 2013. The Corps continues to use the Camas Washougal water quality monitoring station and also calculates TDG using the 12-hour average based on the twelve highest hourly reading in any one day (Oregon method).

**TABLE F-1
TRACKING TYPES OF TDG INSTANCE**

Type 1 Condition	TDG levels exceed the TDG standard due to exceeding powerhouse capacity at run-of-river projects resulting in spill above the BiOp fish spill levels. This condition type includes:
	<ul style="list-style-type: none"> • High runoff flows and flood control efforts. • BPA load requirements are lower than actual powerhouse capacity or project is carrying • Involuntary spill at Mid Columbia River dams resulting in high TDG levels entering the • Involuntary spill at Snake River dams resulting in high TDG levels entering the lower Columbia River.
Type 1a Condition	Planned and unplanned outages of hydro power equipment including generation unit, intertie line, or powerhouse outages.
Type 2 Exceedance	TDG exceedances due to the operation or mechanical failure of non-generating equipment. This exceedance type includes:
	<ul style="list-style-type: none"> • Flow deflectors unable to function for TDG abatement with tailwater elevations above • Spill gates stuck in open position or inadvertently left open. • Increased spill in a bulk spill operation to pass debris or other special operations. • Communication errors, such as teletype were transmitted but change was not timely made or misinterpretation of intent of teletype by Project operator.
Type 2a Exceedance	Malfunctioning FMS gauge, resulting in fewer TDG or temperature measurements when setting TDG spill caps.
Type 3 Exceedance	TDG exceedances due to uncertainties when using best professional judgment, SYSTDG model and forecasts. This exceedance type includes:
	<ul style="list-style-type: none"> • Uncertainties when using best professional judgment to apply the spill guidance criteria, e.g., travel time, degassing, and spill patterns. • Uncertainties when using the SYSTDG model to predict the effects of various hydro system operations, temperature, degassing, and travel time. • Uncertainties when using forecasts for flows, temperature and wind. • Unanticipated sharp rise in water temperature (a 1.5 degree F. or greater change in a • Bulk spill pattern being used which generated more TDG than expected.

**TABLE F-2
DAILY TDG INSTANCES BY TYPE AT EACH PROJECT APRIL 2013**

DATE	Lower Granite Forebay	Lower Granite Tailwater	Little Goose Forebay	Little Goose Tailwater	Lower Monum. Forebay	Lower Monum. Tailwater	Ice Harbor Forebay	Ice Harbor Tailwater	Chief Joseph Forebay	Chief Joseph Tailwater	McNary Forebay	McNary Tailwater	John Day Forebay	John Day Tailwater	The Dalles Forebay	The Dalles Tailwater	Bonneville Forebay	Bonneville Tailwater	Camas Forebay
4/1/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/2/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/3/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/4/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/5/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/6/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/7/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/8/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/9/13	---	---	---	---	---	---	---	---	---	---	---	3	---	---	---	---	---	---	---
4/10/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/11/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/12/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---
4/13/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/14/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/15/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/16/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/17/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/18/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/19/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
4/20/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/21/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/22/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/23/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	3
4/24/13	---	---	---	---	---	3	3	---	---	---	---	---	---	---	---	---	3	---	2
4/25/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3	---	3
4/26/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	3
4/27/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	3
4/28/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
4/29/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
4/30/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Totals	0	0	0	0	0	1	7	0	0	0	0	1	0	0	0	0	3	1	5
APRIL GRAND TOTAL = 18																			

**TABLE F-2
DAILY TDG INSTANCES BY TYPE AT EACH PROJECT MAY 2013**

DATE	Lower Granite Forebay	Lower Granite Tailwater	Little Goose Forebay	Little Goose Tailwater	Lower Monum. Forebay	Lower Monum. Tailwater	Ice Harbor Forebay	Ice Harbor Tailwater	Chief Joseph Forebay	Chief Joseph Tailwater	McNary Forebay	McNary Tailwater	John Day Forebay	John Day Tailwater	The Dalles Forebay	The Dalles Tailwater	Bonneville Forebay	Bonneville Tailwater	Camas Forebay
5/1/13	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---
5/2/13	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---
5/3/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3	---	3
5/4/13	---	---	2	---	---	3	3	---	---	---	---	---	---	---	---	---	3	---	3
5/5/13	---	---	2	---	2	---	3	---	---	---	---	---	---	---	---	---	3	---	3
5/6/13	---	---	2	---	2	3	3	---	---	---	---	---	---	---	---	---	3	---	3
5/7/13	---	---	2	---	2	3	3	---	---	---	---	---	---	---	---	---	---	---	3
5/8/13	---	---	2	---	2	---	3	---	---	---	---	---	---	---	---	---	---	---	---
5/9/13	---	---	2	---	2	---	3	---	---	---	---	---	---	---	---	---	---	---	---
5/10/13	---	---	2	---	2	---	3	---	---	---	---	---	---	---	---	---	1	1	1
5/11/13	---	---	---	---	2	---	3	---	---	---	1	---	---	---	1	---	1	1	1
5/12/13	---	---	---	---	1	---	3	1	---	---	1	1	1	---	3	---	1	1	1
5/13/13	---	---	---	---	1	---	3	3	---	---	1	---	1	---	---	---	3	1	1
5/14/13	---	---	---	---	---	---	1	1	---	---	---	---	1	---	1	---	---	1	1
5/15/13	---	---	---	---	1	---	1	1	---	---	1	---	---	---	---	---	1	1	1
5/16/13	---	---	---	---	1	---	1	---	---	---	1	---	---	---	1	---	1	2a	1
5/17/13	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	1	2a	1
5/18/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---
5/19/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2a	---	---	1	---
5/20/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2a	---	3	1	3
5/21/13	---	---	---	---	---	---	3	---	---	---	1	---	---	---	1	---	3	1	---
5/22/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/23/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	1	---
5/24/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	3	---
5/25/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	3
5/26/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	3	3
5/27/13	---	---	---	---	---	3	3	---	---	---	---	---	---	---	---	---	3	3	3
5/28/13	---	---	---	---	---	3	3	---	---	---	---	---	---	---	---	---	3	3	---
5/29/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3	3	---
5/30/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
5/31/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
Totals	0	0	7	0	11	7	20	4	0	0	6	1	3	0	7	0	20	18	18
MAY GRAND TOTAL = 122																			

**TABLE F-2
DAILY TDG INSTANCES BY TYPE AT EACH PROJECT JUNE 2013**

DATE	Lower Granite Forebay	Lower Granite Tailwater	Little Goose Forebay	Little Goose Tailwater	Lower Monum. Forebay	Lower Monum. Tailwater	Ice Harbor Forebay	Ice Harbor Tailwater	Chief Joseph Forebay	Chief Joseph Tailwater	McNary Forebay	McNary Tailwater	John Day Forebay	John Day Tailwater	The Dalles Forebay	The Dalles Tailwater	Bonneville Forebay	Bonneville Tailwater	Camas Forebay
6/1/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	3
6/2/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	3
6/3/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
6/4/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	3
6/5/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3	---	3
6/6/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3	---	3
6/7/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	3
6/8/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
6/9/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
6/10/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
6/11/13	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---
6/12/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/13/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/14/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/15/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/16/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/17/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/18/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/19/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/20/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/21/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/22/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/23/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	3
6/24/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	3
6/25/13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/26/13	---	---	---	---	---	---	---	---	---	---	---	2a	---	---	---	---	---	---	---
6/27/13	---	---	---	---	---	---	---	---	---	---	---	2a	---	---	---	---	3	---	3
6/28/13	---	---	---	---	---	---	---	---	---	---	---	2a	---	---	---	---	3	---	3
6/29/13	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	3	---	3
6/30/13	---	---	1	---	---	---	---	---	---	---	1	---	1	---	3	---	3	---	1
Totals	0	0	1	0	0	0	11	0	0	0	2	3	1	0	1	0	8	0	12

JUNE GRAND TOTAL = 39

**TABLE F-2
DAILY TDG INSTANCES BY TYPE AT EACH PROJECT JULY 2013**

DATE	Lower Granite Forebay	Lower Granite Tailwater	Little Goose Forebay	Little Goose Tailwater	Lower Monum. Forebay	Lower Monum. Tailwater	Ice Harbor Forebay	Ice Harbor Tailwater	Chief Joseph Forebay	Chief Joseph Tailwater	McNary Forebay	McNary Tailwater	John Day Forebay	John Day Tailwater	The Dalles Forebay	The Dalles Tailwater	Bonneville Forebay	Bonneville Tailwater	Camas Forebay	
7/1/2013	---	---	1	---	---	---	1	---	---	---	1	---	1	---	3	---	3	---	1	
7/2/2013	---	---	1	---	---	---	1	---	---	---	1	---	1	---	---	---	3	---	3	
7/3/2013	---	---	1	---	---	---	1	---	---	---	1	---	1	---	---	---	---	---	---	
7/4/2013	---	---	1	---	---	---	1	---	---	---	1	---	---	---	---	---	---	---	---	
7/5/2013	---	---	1	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	
7/6/2013	---	---	1	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	
7/7/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/8/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/9/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/10/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/11/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/12/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/13/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/14/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/15/2013	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	
7/16/2013	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/17/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/18/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/19/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/20/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/21/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/22/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/23/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/24/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/25/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	
7/26/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/27/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/28/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/29/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/30/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
7/31/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Totals	0	2	6	0	0	0	6	0	0	0	4	0	3	0	1	0	2	0	4	
JULY GRAND TOTAL = 28																				

**TABLE F-2
DAILY TDG INSTANCES BY TYPE AT EACH PROJECT AUGUST 2013**

DATE	Lower Granite Forebay	Lower Granite Tailwater	Little Goose Forebay	Little Goose Tailwater	Lower Monum. Forebay	Lower Monum. Tailwater	Ice Harbor Forebay	Ice Harbor Tailwater	Chief Joseph Forebay	Chief Joseph Tailwater	McNary Forebay	McNary Tailwater	John Day Forebay	John Day Tailwater	The Dalles Forebay	The Dalles Tailwater	Bonneville Forebay	Bonneville Tailwater	Camas Forebay
8/1/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/2/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/3/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/4/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/5/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
8/6/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
8/7/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/8/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/9/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/10/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/11/2013	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/12/2013	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/13/2013	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/14/2013	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/15/2013	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/16/2013	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
8/17/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/18/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/19/2013	---	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/20/2013	---	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/21/2013	---	---	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/22/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
8/23/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/24/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/25/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/26/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/27/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/28/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
8/29/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
8/30/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2a	3
8/31/2013	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2a	3
Totals	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8
AUGUST GRAND TOTAL = 19																			
SEASONAL GRAND TOTAL = 226																			

**TABLE F-3A
2013 SPILL SEASON
LOWER SNAKE RIVER TDG INSTANCE TYPE BY PROJECT TOTALS**

TDG Instance Types	Lower Granite Forbay	Lower Granite Tailwater	Little Goose Forbay	Little Goose Tailwater	Low Monumental forebay	Low Monumental Tailwater	Ice Harbor Forbay	Ice Harbor Tailwater	Totals
1	0	2	7	0	4	0	10	3	26
1a	0	0	0	0	0	0	0	0	0
2	0	6	10	0	7	0	0	0	23
2a	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	8	34	1	43
Grand Total	0	8	17	0	11	8	44	4	92

**TABLE F-3B
2013 MID and LOWER COLUMBIA RIVER TDG INSTANCE TYPE BY
PROJECT TOTALS**

TDG Instance Types	Chief Joseph Forebay	Chief Joseph Tailwater	McNary Forbay	McNary Tailwater	John Day Forbay	John Day Tailwater	The Dalles Forbay	The Dalles Tailwater	BON Forbay	BON Tailwater	Camas/Washougal Forbay	Totals
1	0	0	12	1	7	0	4	0	6	11	10	51
1a	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	1	1
2a	0	0	0	3	0	0	2	0	0	4	0	9
3	0	0	0	1	0	0	3	0	27	6	36	73
Grand Total	0	0	12	5	7	0	9	0	33	21	47	134

TABLE F-4
2013 – MAXIMUM HOURLY TDG and NUMBER
of HOURS OVER 125% TDG

April 1 – August 31, Lower Snake and Columbia R. and Mid. Columbia R.

Station	Gauge ID	Maximum TDG	Number of Hours
Chief Joseph Tailwater	CHQW	>125%	0
Lower Granite Tailwater	LGNW	>125%	0
Little Goose Tailwater	LGSW	>125%	0
Lower Monumental Tailwater	LMNW	>125%	0
Ice Harbor Tailwater	IDSW	>125%	0
McNary Tailwater	MCPW	>125%	0
John Day Tailwater	JHAW	>125%	0
The Dalles Tailwater	TDDO	>125%	0
Bonneville Tailwater	CCIW	>125%	0
TOTAL HOURS:			0

TABLE F-5
2004 -2013 – NUMBER of HOURS OVER 125% TDG

Year	Number of Hours
2013*	0
2012*	346
2011*	3174
2010	555
2009	52
2008	668
2007	0
2006	589
2005	0
2004	0
Average	538

* Includes Chief Joseph Dam.

TABLE F-6
2013 - MAXIMUM HOURLY PERCENT TDG and NUMBER of
HOURS OVER 110 PERCENT TDG
Colville Tribe TDG Water Quality Standards

Station	Apr	May	Jun	Jul	Aug	TOTAL
Chief Joseph Forebay (CHJ)						
Maximum hourly %TDG	110.1	111.3	115.2	114.7	112.1	
Number of hours over 110%	1	86	720	744	171	1,722
Chief Joseph Tailwater (CHQW)						
Maximum hourly %TDG	110.5	111.0	116.0	114.0	113.3	
Number of hours over 110%	15	283	673	699	147	1,817

TABLE F-7 ²
2013 –MALFUNCTIONING TDG GAUGE

PROJECT	Gauge ID	Dates	Number of Days*	Hours with Questionable Data	Reason for Failed Gauge	Effects on % TDG Reading
McNary Tailwater	MCPW	6/26 - 6/27	2	1900 - 2100	Membrane failure	Increased values - deleted
McNary Tailwater	MCPW	6/28	1	1200 - 1800	Membrane failure	Increased values - deleted
The Dalles Forebay	TDA	5/19 - 5/20	2	0100 - 1000	A/C power interrupted	Missing values
Bonneville Tailwater (Cascade Island)	CCIW	5/16 - 5/17	2	0300 - 1500	TDG sensor malfunctioning	Erroneous values - deleted
Bonneville Tailwater (Cascade Island)	CCIW	8/30 - 8/31	2	0100 - 2400	Instrument stuck in probe housing pipe, possible lost downstream	Missing values
TOTAL DAYS:			9			

² Table F-7 provides additional information on instance Type 2a in Tables F-2 and F-3. Tables F-4, F-5, and F-6 do not include malfunctioning gauge data. * Table F-7 includes only days with either erroneous data that resulted in a percent TDG instance or days that had more than 8 hours of malfunctioning data.