

# **Appendix E**

**2014 Percent TDG Instances**

**Tracking System**

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## **INTRODUCTION**

The U.S. Army Corps of Engineers (Corps) tracks the number of instances when the percent TDG exceeds the Oregon (ODEQ) and Washington (WDOE) water quality standards (WQS) as described in Part 1.1.6 of this report. This appendix provides the TDG tracking system results during the 2014 fish passage season from April 1 through August 31.

Additionally provided in this appendix the Corps developed a Chief Joseph Dam spill management policy that involves using Chief Joseph Dam for system-wide TDG management and the project's TDG instances are summarized herein. A description of each table follows.

Table E-1 provides a listing of the five TDG instance (Types) that are designated to each instance when the particular state's daily high 12-hour average is exceeded.

Table E-2 designates the specific daily TDG instance type (as defined in Table 1) for all the TDG instances that exceed the applicable WQS of ODEQ and WDOE. These daily TDG instance types are provided by project forebay and tailwater. For the four lower Columbia River projects (e.g. McNary, John Day, The Dalles, and Bonneville) the tailwater TDG instance type is represented for the more restrictive of the two applicable state WQS. If a TDG instance occurred according to both WQS on the same day and location an asterisk defines the less restrictive of the two, and this avoids double counting of an instance event.

Tables E-3A, E-3B and E-3C provide the percent TDG instance type totals for each project. Table E-3A is the lower Snake River projects. Table E-3B is the lower Columbia River projects. Table E-3C is Chief Joseph Dam.

Table E-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 E-5 provides a historical summary and ten-year average from 2005 to 2014 of the number of hours that exceeded the 125 percent TDG WQS during the spill season. The total number of hours is higher after 2010 due to the addition of Chief Joseph Dam data along with the higher flow years (and associated involuntary spill) occurring in 2011 and 2012.

Table E-6 provides the maximum hourly percent TDG value and number of instances that exceed the Colville Tribe / WDOE TDG WQS of 110 percent at the forebay and tailwater of the Chief Joseph Dam.

Table E-7 provides a list of TDG gauges that malfunctioned during the 2014 spill season, which resulted in TDG instances. Malfunction gauge TDG instances are noted as Type

2a instance in Tables E-2, E-3A, E-3B, and E-3C to indicate when a TDG instance occurred and appeared as part of the real-time operational review. Table E-2 is based on raw data and is populated during real-time operations. Tables E-4, E-5 and E-6 do not include the malfunctioning gauge data since they provide statistical information on hourly TDG levels.

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

<b>Type 1 Condition</b>	<b>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:</b>
	<ul style="list-style-type: none"> <li>• High runoff flows and flood control efforts.</li> </ul>
	<ul style="list-style-type: none"> <li>• BPA load requirements are lower than actual powerhouse capacity or project is carrying system-wide reserves.</li> </ul>
	<ul style="list-style-type: none"> <li>• Involuntary spill at Mid Columbia River dams resulting in high TDG levels entering the lower Columbia River.</li> </ul>
	<ul style="list-style-type: none"> <li>• Involuntary spill at Snake River dams resulting in high TDG levels entering the lower Columbia River.</li> </ul>
<b>Type 1a Condition</b>	<b>Planned and unplanned outages of hydro power equipment including generation unit, intertie line, or powerhouse outages.</b>
<b>Type 2 Exceedance</b>	<b>TDG exceedances due to the operation or mechanical failure of non-generating equipment. This exceedance type includes:</b>
	<ul style="list-style-type: none"> <li>• Flow deflectors unable to function for TDG abatement with tailwater elevations above 19 - 26 feet at Bonneville Dam.</li> </ul>
	<ul style="list-style-type: none"> <li>• Spill gates stuck in open position or inadvertently left open.</li> </ul>
	<ul style="list-style-type: none"> <li>• Increased spill in a bulk spill operation to pass debris or other special operations.</li> </ul>
	<ul style="list-style-type: none"> <li>• Communication errors, such as teletype were transmitted but change was not timely made or misinterpretation of intent of teletype by Project operator.</li> </ul>
<b>Type 2a Exceedance</b>	<b>Malfunctioning FMS gauge, resulting in fewer TDG or temperature measurements when setting TDG spill caps.</b>
<b>Type 3 Exceedance</b>	<b>TDG exceedances due to uncertainties when using best professional judgment, SYSTDG model and forecasts. This exceedance type includes:</b>
	<ul style="list-style-type: none"> <li>• Uncertainties when using best professional judgment to apply the spill guidance criteria, e.g., travel time, degassing, and spill patterns.</li> </ul>
	<ul style="list-style-type: none"> <li>• Uncertainties when using the SYSTDG model to predict the effects of various hydro system operations, temperature, degassing, and travel time.</li> </ul>
	<ul style="list-style-type: none"> <li>• Uncertainties when using forecasts for flows, temperature and wind.</li> </ul>
	<ul style="list-style-type: none"> <li>• Unanticipated sharp rise in water temperature (a 1.5 degree F. or greater change in a day).</li> </ul>
	<ul style="list-style-type: none"> <li>• Bulk spill pattern being used which generated more TDG than expected.</li> </ul>

**TABLE E-2**  
**DAILY TDG INSTANCES BY TYPE AT EACH PROJECT, APRIL 2014**  
**ODEQ / WDOE COMBINED METHODS**

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	McNary Forebay	McNary Tailwater	John Day Forebay	John Day Tailwater	The Dalles Forebay	The Dalles Tailwater	Bonn Forebay	Bonneville Tailwater					
Method:	WA	WA	WA	WA	WA	WA	WA	WA	WA	OR	WA	WA	OR	WA	WA	OR	WA	WA	OR	WA	
4/1/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/2/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/3/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/4/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/5/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/6/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/7/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/8/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/9/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/10/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/11/14	---	---	---	---	---	3	3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/12/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/13/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/14/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/15/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/16/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/17/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/18/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/19/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/20/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/21/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	---	---
4/22/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	---	---	---
4/23/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/24/14	---	---	---	---	---	---	---	---	---	---	---	---	---	1	*	1	---	---	---	---	---
4/25/14	---	---	---	---	---	---	---	---	---	---	---	---	---	1	*	1	---	---	---	---	---
4/26/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	1	---	---	---	---	---
4/27/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---
4/28/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/29/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/30/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<b>Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	

APRIL GRAND TOTAL = 13

\* Asterisk indicates there was an exceedance, but it was less restrictive than the other states method, therefore it was not counted

**TABLE E-2**  
**DAILY TDG INSTANCES BY TYPE AT EACH PROJECT, MAY 2014**  
**ODEQ / WDOE COMBINED METHODS**

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	McNary Forebay	McNary Tailwater	John Day Forebay	John Day Tailwater	The Dalles Forebay	The Dalles Tailwater	Bonn Forebay	Bonneville Tailwater					
Method:	WA	WA	WA	WA	WA	WA	WA	WA	WA	OR	WA	WA	OR	WA	WA	OR	WA	WA	OR	WA	
5/1/14	---	---	---	---	---	---	3	---	1	---	---	---	---	---	---	---	1	---	---		
5/2/14	---	---	---	---	---	---	3	---	1	---	---	---	---	---	---	---	1	---	---		
5/3/14	---	---	---	---	3	---	3	---	1	---	---	---	---	---	---	---	1	---	---		
5/4/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	1	---	---		
5/5/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	1	---	---		
5/6/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	*		
5/7/14	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	
5/8/14	---	---	---	---	3	3	3	---	---	---	---	---	---	---	---	---	---	---	---	---	
5/9/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---	
5/10/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
5/11/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
5/12/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
5/13/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	---	---	
5/14/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	---	---	
5/15/14	---	---	---	---	---	---	3	---	1	---	---	---	---	---	---	---	3	---	---	---	
5/16/14	---	---	---	---	---	---	3	---	1	---	---	---	---	---	---	---	3	---	---	---	
5/17/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	1	*	
5/18/14	---	---	---	---	1	---	1	---	---	---	---	---	---	---	---	---	---	---	1	*	
5/19/14	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	1	*	
5/20/14	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---	1	1	*	---	
5/21/14	---	---	---	---	1	---	1	---	---	---	---	---	---	---	---	---	1	*	1	---	
5/22/14	---	---	---	---	1	---	1	---	---	---	1	---	---	---	---	---	1	*	1	---	
5/23/14	---	---	---	---	1	---	1	---	1	---	1	---	---	---	---	---	1	1	---	---	
5/24/14	---	1	---	---	1	---	1	---	---	1	*	1	---	---	---	---	1	1	*	---	
5/25/14	---	1	---	---	---	---	---	1	---	1	*	1	---	---	---	---	1	1	*	---	
5/26/14	---	1	1	---	---	---	---	1	---	1	*	---	---	---	---	---	1	1	*	---	
5/27/14	---	1	1	---	1	---	---	1	---	1	*	---	---	---	---	---	1	1	*	---	
5/28/14	---	---	1	---	1	---	---	---	---	*	1	---	---	---	---	---	---	---	1	*	1
5/29/14	---	---	1	---	1	---	---	---	---	1	*	---	---	---	---	---	---	---	*	1	---
5/30/14	---	1	1	---	1	---	1	---	---	2	*	---	---	---	---	---	1	---	1	*	---
5/31/14	---	---	1	---	1	---	1	---	---	---	2	---	---	---	---	---	1	---	1	*	1
<b>Totals</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>0</b>	<b>15</b>	<b>1</b>	<b>17</b>	<b>3</b>	<b>6</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>11</b>	<b>6</b>	

MAY GRAND TOTAL = 109

\*Asterisk indicates there was an exceedance, but it was less restrictive than the other states method, therefore it was not counted

**TABLE E-2  
DAILY TDG INSTANCES BY TYPE AT EACH PROJECT, JUNE 2014  
ODEQ / WDOE COMBINED METHODS**

DATE	Lower Granite	Lower Granite	Little Goose	Little Goose	Lower Monum.	Lower Monum.	Ice Harbor	Ice Harbor	McNary	McNary	John Day	John Day	The Dalles	The Dalles	Bonn	Bonneville				
	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater				
Method:	WA	WA	WA	WA	WA	WA	WA	WA	WA	OR	WA	WA	OR	WA	WA	OR	WA	WA	OR	WA
6/1/14	---	---	1	---	1	---	1	---	1	---	---	1	---	---	2a	---	---	1	1	*
6/2/14	---	---	1	---	1	---	1	---	1	1	*	1	---	---	1	1	*	---	*	1
6/3/14	---	---	1	---	1	---	1	---	1	---	1	1	---	---	1	*	1	---	*	1
6/4/14	---	---	---	---	1	---	1	---	1	---	---	---	---	---	---	---	---	---	*	1
6/5/14	---	---	---	---	---	---	1	---	1	---	---	---	---	---	---	---	---	---	---	---
6/6/14	---	---	---	---	---	---	---	---	---	1	*	---	---	---	---	---	---	---	---	---
6/7/14	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/8/14	---	---	---	---	3	---	3	---	1	---	---	1	---	---	---	---	---	---	---	---
6/9/14	---	---	---	---	3	---	3	---	1	2	*	1	---	---	---	---	---	---	---	---
6/10/14	---	---	---	---	3	---	3	---	---	2	*	1	---	---	---	---	---	---	---	---
6/11/14	---	---	---	---	---	---	3	---	---	---	2	---	---	---	---	---	---	---	---	---
6/12/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	3	---	---	3	---	---
6/13/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/14/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/15/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/16/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/17/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/18/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/19/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/20/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/21/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/22/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/23/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---	---	---	---
6/24/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/25/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---
6/26/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	---	---
6/27/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/28/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/29/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/30/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<b>Totals</b>		<b>0</b>	<b>3</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>7</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>3</b>
<b>JUNE GRAND TOTAL = 55</b>																				

\*Asterisk indicates there was an exceedance, but it was less restrictive than the other states method, therefore it was not counted

**TABLE E-2  
DAILY TDG INSTANCES BY TYPE AT EACH PROJECT, JULY 2014  
ODEQ / WDOE COMBINED METHODS**

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	McNary Forebay	McNary Tailwater	John Day Forebay	John Day Tailwater	The Dalles Forebay	The Dalles Tailwater	Bonn Forebay	Bonneville Tailwater				
Method:	WA	WA	WA	WA	WA	WA	WA	WA	WA	OR	WA	OR	WA	OR	WA	OR	WA			
7/1/14	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---			
7/2/14	---	---	---	---	---	---	1	---	1	---	---	---	---	---	---	---	---			
7/3/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/4/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/5/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/6/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/7/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/8/14	---	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/9/14	---	---	1	---	---	---	3	---	3	---	---	---	---	---	---	---	---			
7/10/14	---	---	3	---	---	---	3	---	3	---	---	---	---	---	---	---	---			
7/11/14	---	---	3	---	---	---	3	---	---	---	---	---	---	---	---	---	---			
7/12/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/13/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---			
7/14/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---			
7/15/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---			
7/16/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---			
7/17/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---			
7/18/14	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---			
7/19/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/20/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/21/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/22/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/23/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/24/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/25/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/26/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/27/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/28/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/29/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/30/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
7/31/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
<b>Totals</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	
<b>JULY GRAND TOTAL = 20</b>																				

**TABLE E-2**  
**DAILY TDG INSTANCES BY TYPE AT EACH PROJECT, AUGUST 2014**  
**ODEQ / WDOE COMBINED METHODS**

DATE	Lower Granite	Lower Granite	Little Goose	Little Goose	Lower Monum.	Lower Monum.	Ice Harbor	Ice Harbor	McNary	McNary	John Day	John Day	The Dalles	The Dalles	Bonn	Bonneville	
	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	Forebay	Tailwater	
Method:	WA	WA	WA	WA	WA	WA	WA	WA	WA	OR	WA	WA	OR	WA	WA	OR	WA
8/1/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/2/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/3/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/4/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/5/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/6/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/7/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/8/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/9/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/10/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/11/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/12/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/13/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/14/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/15/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/16/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/17/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/18/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/19/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/20/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/21/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/22/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/23/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/24/14	---	---	---	---	---	2a	---	---	---	---	---	*	2a	---	---	---	---
8/25/14	---	---	---	---	---	2a	---	---	---	---	---	*	2a	---	---	---	---
8/26/14	---	---	---	---	---	---	---	---	---	---	---	*	2a	---	---	---	---
8/27/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/28/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/29/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/30/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/31/14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
<b>Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>AUGUST GRAND TOTAL = 21</b>																	
<b>SEASONAL GRAND TOTAL = 218</b>																	

**TABLE E-3A  
WDOE METHOD ONLY  
LOWER SNAKE RIVER TDG INSTANCE TYPE  
BY PROJECT TOTALS 2014 FISH PASSAGE SEASON**

<b>TDG Instance Types</b>	<b>Lower Granite Forbay</b>	<b>Lower Granite Tailwater</b>	<b>Little Goose Forbay</b>	<b>Little Goose Tailwater</b>	<b>Lower Monumental Forebay</b>	<b>Lower Monumental Tailwater</b>	<b>Ice Harbor Forbay</b>	<b>Ice Harbor Tailwater</b>	<b>Totals</b>
1	0	5	11	0	16	0	13	3	48
1a	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
2a	0	0	0	0	0	2	0	0	2
3	0	0	2	0	7	2	28	0	39
<b>Grand Total</b>	<b>0</b>	<b>5</b>	<b>13</b>	<b>0</b>	<b>23</b>	<b>4</b>	<b>41</b>	<b>3</b>	<b>89</b>

Note: TDG thresholds are 115% Forebay; 120% Tailwater

**TABLE E-3B  
ODEQ / WDOE COMBINED METHOD  
MID AND LOWER COLUMBIA RIVER TDG INSTANCE TYPE  
BY PROJECT TOTALS 2014 FISH PASSAGE SEASON**

<b>TDG Instance Types</b>	<b>McNary Forbay</b>	<b>McNary Tailwater</b>	<b>John Day Forbay</b>	<b>John Day Tailwater</b>	<b>The Dalles Forbay</b>	<b>The Dalles Tailwater</b>	<b>BON Forbay</b>	<b>BON Tailwater</b>	<b>Totals</b>
1	15	9	10	0	9	5	23	21	92
1a	0	0	0	0	0	0	0	0	0
2	0	5	0	0	0	0	0	0	5
2a	0	0	0	19	1	0	0	0	20
3	2	0	0	0	1	0	9	0	12
<b>Grand Total</b>	<b>17</b>	<b>14</b>	<b>10</b>	<b>19</b>	<b>11</b>	<b>5</b>	<b>32</b>	<b>21</b>	<b>129</b>

Note: TDG thresholds are 115% Forebay; 120% Tailwater

**TABLE E-3C  
CHIEF JOSEPH DAM TDG INSTANCES BY TYPE  
2014 FISH PASSAGE SEASON**

<b>TDG Instance Types</b>	<b>Chief Joseph Forebay</b>	<b>Chief Joseph Tailwater</b>	<b>Totals</b>
<b>1</b>	<b>106</b>	<b>106</b>	<b>212</b>
<b>1a</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>2a</b>	<b>0</b>	<b>2</b>	<b>2</b>
<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Grand Total</b>	<b>106</b>	<b>108</b>	<b>214</b>

Note: TDG threshold is 110% for Chief Joseph Dam

**TABLE E-4  
MAXIMUM HOURLY PERCENT TDG and  
NUMBER of HOURS OVER 125% TDG  
April 1 to August 31, 2014**

<b>Station</b>	<b>Gauge ID</b>	<b>Maximum % TDG</b>	<b>Number of Hours</b>
Chief Joseph Forebay	CHJ	---	0
Chief Joseph Tailwater	CHQW	---	0
Lower Granite Forebay	LWG	---	0
Lower Granite Tailwater	LGNW	---	0
Little Goose Forebay	LGSA	---	0
Little Goose Tailwater	LGSW	---	0
Lower Monumental Forebay	LMNA	---	0
Lower Monumental Tailwater	LMNW	---	0
Ice Harbor Forebay	IHRA	---	0
Ice Harbor Tailwater	IDSW	---	0
McNary Forebay	MCNA	134	11
McNary Tailwater	MCPW	---	0
John Day Forebay	JDY	---	0
John Day Tailwater	JHAW	---	0
The Dalles Forebay	TDA	---	0
The Dalles Tailwater	TDDO	---	0
Bonneville Forebay	BON	---	0
Bonneville Tailwater	CCIW	---	0
<b>TOTAL HOURS:</b>			<b>11</b>

**TABLE E-5  
NUMBER of HOURS OVER 125% TDG 2005-2014**

<b>Year</b>	<b>Number of Hours (FP Projects only)</b>	<b>Number of Hours (Chief Joseph Dam only)</b>
2014	11	0
2013	0	0
2012	342	4
2011	2381	793
2010	555	---
2009	52	---
2008	668	---
2007	0	---
2006	589	---
2005	0	---
<b>Average</b>	<b>460</b>	<b>199</b>

Note: The 2nd column is the eight fish passage projects

**TABLE E-6  
MAXIMUM HOURLY PERCENT TDG and  
NUMBER of HOURS OVER 110 PERCENT TDG  
COLVILLE TRIBE / WDOE TDG WQS - 2014**

<b>Station</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>TOTAL</b>
Chief Joseph Forebay (CHJ)						
Maximum hourly %TDG	116	120	120	116	113	
Number of hours over 110%	168	609	713	743	143	2376
Chief Joseph Tailwater (CHQW)						
Maximum hourly %TDG	113	116	116	117	118	
Number of hours over 110%	145	558	715	727	181	2326

**TABLE E-7 <sup>1</sup>**  
**MALFUNCTIONING TDG GAUGE - 2014**

<b>PROJECT</b>	<b>Gauge ID</b>	<b>Dates</b>	<b>Number of Days*</b>	<b>Hours with Questionable Data</b>	<b>Reason for Failed Gauge</b>	<b>Effects on % TDG Reading</b>
Chief Joseph Tailwater	CHQW	8/13 - 8/14	2	1300 - 1100	Damaged membrane	Mostly high values
Lower Monumental Tailwater	LMNW	8/24 - 8/25	2	2100 - 1100	Damaged membrane	High values
John Day Tailwater	JHAW	8/8 - 8/26	19	0100 - 1300	Possible membrane issue	Drifting downward
The Dalles Forebay	TDA	6/1	1	0100 - 2400	Communication problems	Missing or null values
<b>TOTAL DAYS:</b>			<b>24</b>			

<sup>1</sup> Table E-7 provides additional information on instance Type 2a in Tables E-2 and E-3. Tables E-4, E-5, and E-6 do not include malfunctioning gauge data. \* Table E-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.