2014 Fish Passage Plan

Section 4 – John Day Dam

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John Day Dam

Project Acronym	JDA
River Mile (RM)	Columbia River - RM 215.6
Reservoir	Lake Umatilla
Minimum Instantaneous Flow (kcfs)	Dec–Feb: 12.5 kcfs \ Mar–Nov: 50 kcfs
Forebay Normal Operating Range (ft)	Nov–Jun: 260'–265' \ Jul–Oct: 265'–268'
Tailrace Rate of Change Limit (ft)	3'/hr
Powerhouse Length (ft)	1,975'
Powerhouse Hydraulic Capacity (kcfs)	322 kcfs
Turbine Units (#)	16 (Units 1-16 BLH Kaplan)
Turbine Generating Capacity (MW)	Rated: 2,160 MW (135 MW/unit) \ Maximum: 2,480 MW (155 MW/unit)
Gatewell Orifice Diameter (in)	One 14" orifice per gatewell (3 per unit) = 48 total
Spillway Length (ft)	1,228'
Spillway Hydraulic Capacity (kcfs)	2,250 kcfs
Spillbays (#)	20
# Spillway Weirs (#)	2 (Bays 18 & 19)
Navigation Lock Length x Width (ft)	650' x 86'
Navigation Lock Max. Lift (ft)	113'

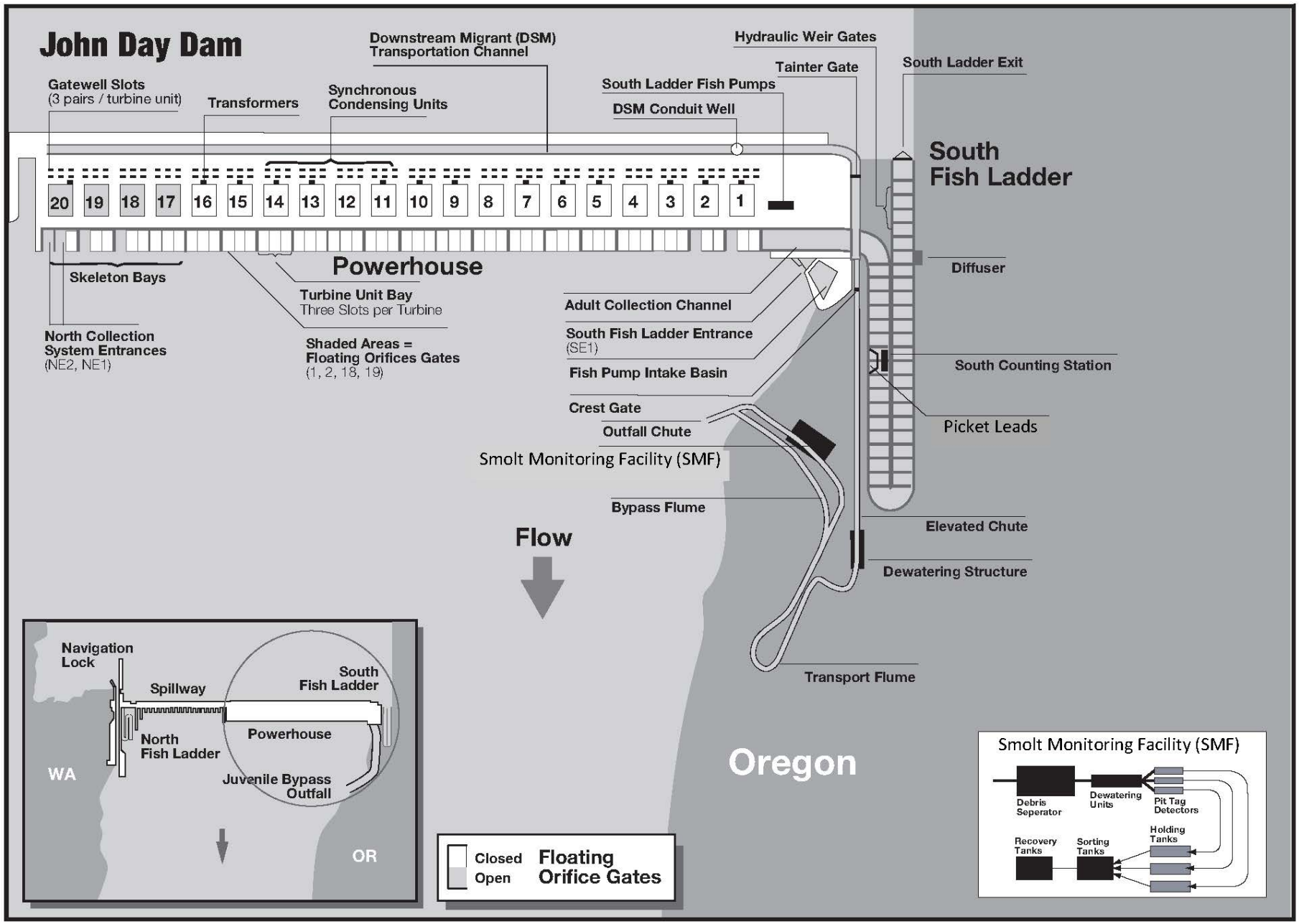


Figure JDA-1. John Day Dam South Fish Ladder, Powerhouse Collection System, and Juvenile Bypass System.

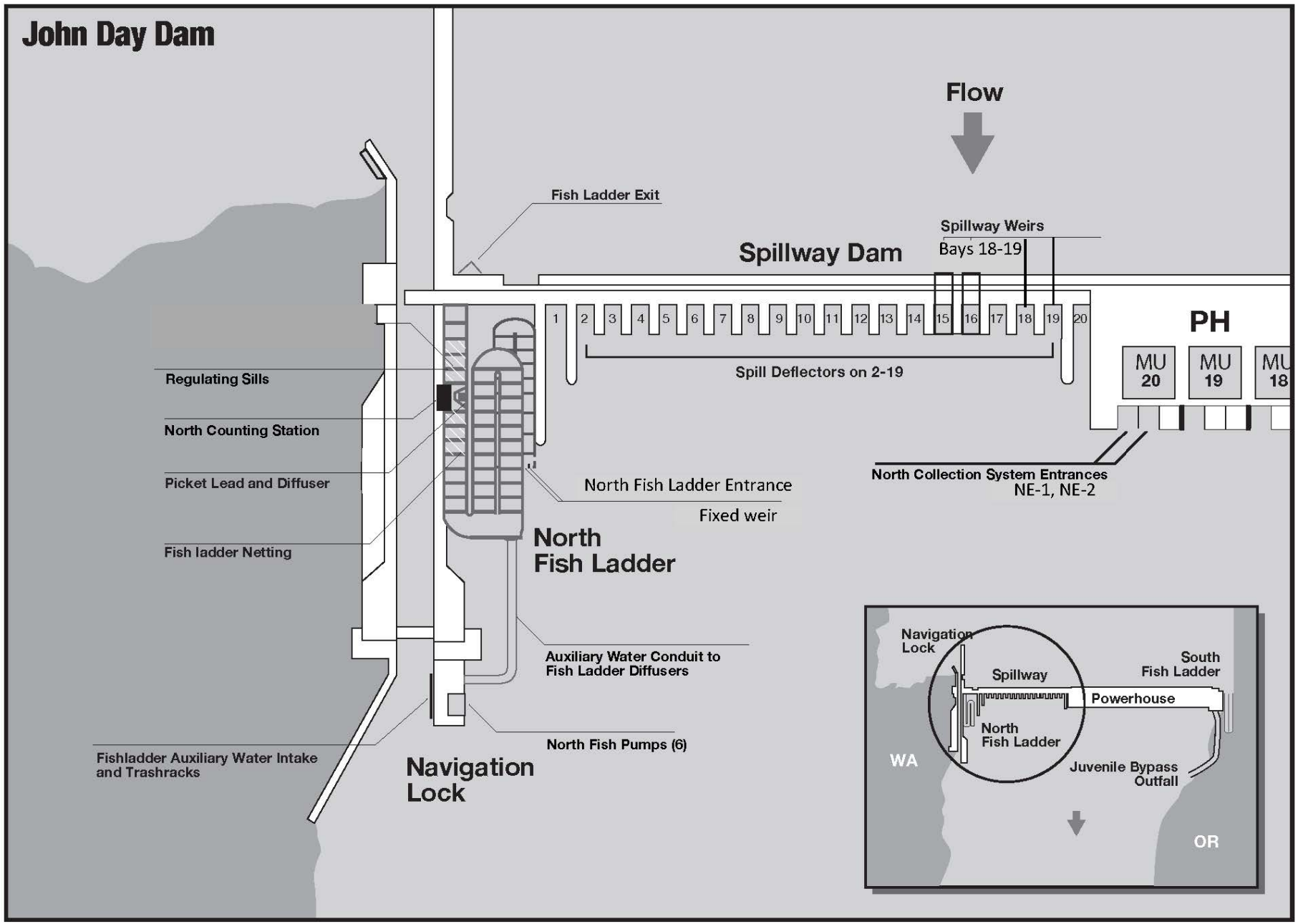
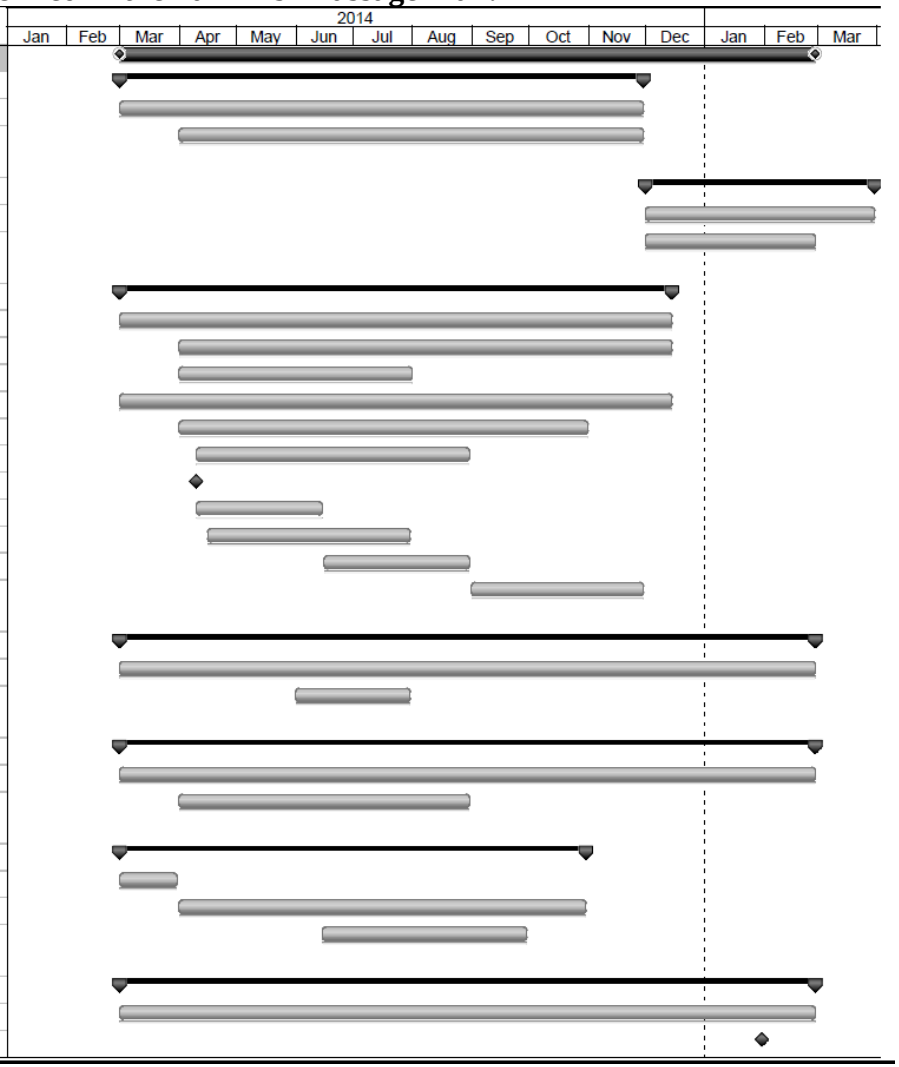


Figure JDA-2. John Day Dam Spillway and North Fish Ladder.

Table JDA-1. John Day Dam Schedule of Operations and Actions Defined in the 2014 Fish Passage Plan.

Task Name	Start Date	End Date	FPP Reference
2014 FPP Operations & Actions - John Day	**3/1/14**	**2/28/15**	**JDA**
Fish Passage Facilities Operation	**3/1/14**	**11/30/14**	**2.4. and 2.5.**
Adult Fish Facilities	3/1/14	11/30/14	2.5.1.2.
Juvenile Fish Facilities	4/1/14	11/30/14	2.4.1.2.
Fish Passage Facilities Maintenance	**12/1/14**	**3/31/15**	**2.4. and 2.5.**
Juvenile Fish Facilities Winter Maintenance	12/1/14	3/31/15	2.4.1.1.
Adult Fish Facilities Winter Maintenance	12/1/14	2/28/15	2.5.1.1.
Project Operations for Fish Passage	**3/1/14**	**12/15/14**	
Unit 1 and/or Unit 2 operate for fish passage	3/1/14	12/15/14	5.1.1.
STS operation	4/1/14	12/15/14	2.4.1.2.
Units 1-16 alternate monthly raking	4/1/14	8/1/14	2.4.1.2.b.
Turbine operating priority order	3/1/14	12/15/14	Table JDA-6
Turbine 1% operating range - hard constraint	4/1/14	10/31/14	5.2.1.
TSW operation	4/10/14	8/31/14	2.2.2
Avian Wires installed no later than April 10	4/10/14	4/10/14	9.1.2.
Spring Spill operations	4/10/14	6/15/14	FOP
Avian Hazing	4/16/14	7/31/14	9.1.1.
Summer Spill operations	6/16/14	8/31/14	FOP
Spill from Bay 2 for adult attraction	9/1/14	11/30/14	2.2.3.
Special Operations & Studies (dates approximate)	**3/1/14**	**2/28/15**	**Appendix A**
Adult Salmon Studies	3/1/14	2/28/15	4.2.1.
BiOp Performance Standard Test (Summer)	6/1/14	7/31/14	4.2.2.
TDG Monitoring	**3/1/14**	**2/28/15**	**2.3.1.**
TDG Monitoring - Tailrace (year-round)	3/1/14	2/28/15	station JHAW
TDG Monitoring - Forebay	4/1/14	8/31/14	station JDY
Adult Fish Counting	**3/1/14**	**10/31/14**	**Table JDA-3**
Daytime Video 0400-2000 PST	3/1/14	3/31/14	
Daytime Visual 0500-2100 DST	4/1/14	10/31/14	
Night Video 2100-0500 DST	6/15/14	9/30/14	
Reports	**3/1/14**	**2/28/15**	**3.3.**
Weekly Reports	3/1/14	2/28/15	
Annual Report	1/31/15	1/31/15	



1. FISH PASSAGE INFORMATION

The locations of fish passage facilities at John Day Dam are shown on the general site plans in **Figures JDA-1** and **JDA-2**. The schedule for project operations described in the Fish Passage Plan (FPP) and appendices is included in **Table JDA-1**.

1.1. Juvenile Fish Passage.

1.1.1. Juvenile Bypass Facilities Description. Juvenile fish bypass facilities at John Day Dam were completed in 1987. The Smolt Monitoring Facility (SMF) was completed in 1998 and includes one vertical barrier screen (VBS), submersible traveling screen (STS) and one 14"-diameter orifice per gatewell in each of the project's 16 turbine units for a total of 48 orifices. The bypass collection conduit leads to a transport channel which carries collected juvenile fish to the river below the dam when the SMF is not in operation (bypass mode). Differential between the forebay and bypass conduit is controlled by the tainter gate.

1.1.2. Smolt Monitoring Facilities (SMF) Description. During the juvenile sampling season, flow with collected fish from the SMF is sent over the crest gate and down an elevated chute to the dewatering structure. Most of the flow is dewatered and the remaining 30 cfs of water is directed to the transport flume and past a switch gate. This gate directs fish to either the SMF or directly to the outfall (emergency bypass only). Fish diverted for sampling pass a fish and debris separator, where debris and adult fish are directed into a separate discharge flume leading to the outfall. Juvenile fish are interrogated by PIT-tag detectors and are diverted either to the outfall or to the SMF for sampling (**Figure JDA-1**).

1.1.3. Juvenile Migration Timing. Juvenile passage timing has been determined by gatewell and SMF sampling at John Day Dam (**Table JDA-2**) Results to date of ongoing research show significant daytime passage during daytime operations. Bull trout, lamprey, juvenile sturgeon, and other listed salmonids are recorded in the by-catch of the SMF report. The juvenile bypass system (JBS) will operate through December 15. Sample collection in lab will operate through September 15. PIT-tag interrogation will continue through November 30, weather permitting. Maintenance of juvenile fish facilities is scheduled from approximately December 16 through March 31 to minimize impact on downstream migrants and reduce the possibility of adult fallbacks through turbine units. During this time, the JBS will be dewatered.

1.1.3.1. Juvenile fish peak passage occurs from 2300–2400 hours with a long period of elevated passage until dawn when passage decreases. Passage increases dramatically at dusk. Gatewell sampling data indicate that roughly 80% of the juvenile migrants pass John Day Dam between 2100 and 0600 hours. During the peak spring juvenile migration period at John Day Dam, 40% of the spring Chinook and steelhead daily passage occurred between 0700 and 2200 hours. Note the above information is for powerhouse passage only. Recent radio-tracking and hydroacoustic data indicate different passage patterns for the spillway and project when spill is occurring 24 hours/day.

Table JDA-2. Juvenile Salmonid Passage Timing at John Day Dam for Most Recent 10-Years (2004-2013) Based on Daily & Yearly Collection Data.

Year	10%	50%	90%	# Days	10%	50%	90%	# Days
	Yearling Chinook				Subyearling Chinook *			
2004	28-Apr	16-May	30-May	33	14-Jun	28-Jun	23-Jul	40
2005	25-Apr	12-May	22-May	28	19-Jun	5-Jul	27-Jul	39
2006	25-Apr	11-May	24-May	30	14-Jun	3-Jul	18-Jul	35
2007	2-May	13-May	25-May	24	25-Jun	8-Jul	17-Jul	23
2008	4-May	22-May	1-Jun	29	24-Jun	9-Jul	5-Aug	43
2009	27-Apr	17-May	1-Jun	36	17-Jun	1-Jul	17-Jul	31
2010	1-May	18-May	6-Jun	37	14-Jun	1-Jul	20-Jul	37
2011	2-May	17-May	28-May	27	16-Jun	14-Jul	3-Aug	49
2012	27-Apr	6-May	22-May	26	27-Jun	13-Jul	29-Jul	33
2013	27-Apr	12-May	24-May	28	20-Jun	3-Jul	15-Jul	26
MEDIAN	**27-Apr**	**14-May**	**26-May**	**30**	**16-Jun ***	**29-Jun ***	**28-Jul ***	**43 ***
MIN	**25-Apr**	**6-May**	**22-May**	**24**	**6-Jun ***	**27-Jun ***	**20-Jul ***	**31 ***
MAX	**4-May**	**22-May**	**6-Jun**	**37**	**27-Jun ***	**30-Jul ***	**22-Aug ***	**59 ***
	Unclipped Steelhead				Clipped Steelhead			
2004	30-Apr	23-May	2-Jun	34	7-May	20-May	29-May	23
2005	1-May	14-May	24-May	24	4-May	19-May	26-May	23
2006	24-Apr	13-May	29-May	36	28-Apr	10-May	29-May	32
2007	29-Apr	13-May	28-May	30	4-May	12-May	26-May	23
2008	6-May	21-May	1-Jun	27	7-May	16-May	30-May	24
2009	26-Apr	11-May	28-May	33	29-Apr	10-May	27-May	29
2010	27-Apr	12-May	8-Jun	43	3-May	11-May	9-Jun	38
2011	25-Apr	19-May	31-May	37	19-Apr	19-May	30-May	42
2012	25-Apr	1-May	19-May	25	25-Apr	3-May	15-May	21
2013	21-Apr	13-May	27-May	37	29-Apr	8-May	21-May	23
MEDIAN	**26-Apr**	**13-May**	**28-May**	**33**	**1-May**	**11-May**	**28-May**	**28**
MIN	**21-Apr**	**1-May**	**19-May**	**24**	**19-Apr**	**3-May**	**15-May**	**21**
MAX	**6-May**	**23-May**	**8-Jun**	**43**	**7-May**	**20-May**	**9-Jun**	**42**
	Coho				Sockeye (Wild & Hatchery)			
2004	12-May	27-May	12-Jun	32	20-May	1-Jun	12-Jun	24
2005	5-May	16-May	3-Jun	30	16-May	21-May	31-May	16
2006	10-May	26-May	12-Jun	27	7-May	20-May	30-May	24
2007	5-May	16-May	4-Jun	31	9-May	25-May	7-Jun	30
2008	11-May	25-May	6-Jun	27	22-May	29-May	6-Jun	16
2009	16-May	29-May	13-Jun	29	10-May	25-May	7-Jun	29
2010	9-May	3-Jun	16-Jun	39	11-May	29-May	9-Jun	30
2011	10-May	23-May	6-Jun	28	10-May	22-May	2-Jun	24
2012	6-May	21-May	5-Jun	31	2-May	11-May	25-May	24
2013	6-May	19-May	1-Jun	27	10-May	19-May	28-May	19
MEDIAN	**9-May**	**24-May**	**5-Jun**	**28**	**10-May**	**23-May**	**4-Jun**	**26**
MIN	**May 05**	**16-May**	**1-Jun**	**27**	**2-May**	**11-May**	**25-May**	**16**
MAX	**16-May**	**3-Jun**	**16-Jun**	**39**	**22-May**	**1-Jun**	**12-Jun**	**30**

*Subyearling Chinook MEDIAN, MIN, MAX based on 1998-2005 data. Data from 2006-present not included due to potential bias from missed sample days during high water temperature sampling protocols (**Appendix K**).

1.2. Adult Fish Passage.

1.2.1. Facilities Description. The John Day Dam adult fish passage facilities include a north shore ladder to pass fish from entrances at the north end of the spillway and a south shore ladder to pass fish from entrances along a collection channel extending the full length of the powerhouse. Auxiliary water is pumped from the tailrace to all collection systems. South auxiliary water also includes forebay water from the fish turbines. Counting stations are provided in both fishways.

1.2.2. Adult Fish Migration Timing and Count Schedule. Upstream migrants are present throughout the year and adult passage facilities are operated year-round. Adult salmon, steelhead, lamprey and shad are typically counted April 1 through October 31 (**Table JDA-3**), and daily data are posted online at: http://www.nwp.usace.army.mil/Missions/Environment/Fishdata.aspx. Sturgeon and bull trout are relatively infrequent and counts are posted online periodically during the passage season in *Miscellaneous Fish Count*s and summarized in the *Annual Fish Passage Report*.

1.2.2.1. Peak timing of adult fish passage at John Day Dam is determined based on yearly counts through the most recent passage year, beginning in 1968 for adult salmon and steelhead and in 2000 for lamprey (**Table JDA-4**).

1.2.2.2. Annual maintenance of adult passage facilities is scheduled December 1 through February (winter maintenance period) to minimize impacts on upstream migrants.

Table JDA-3. Adult Fish Count Schedule at John Day Dam (3/1/2014–2/28/2015).

Count Period	Counting Method and Hours *
March 1 – March 31	Video 0400–2000 hours (PST)
April 1 – October 31	Visual 0500–2100 hours (DST)
June 15 – September 30	Night Video 2100–0500 hours (DST)

*****In 2014, Daylight Saving Time (DST) is in effect March 9 – November 2 and hours are adjusted forward 1 hour from Pacific Standard Time (PST). DST = PST+1.

Table JDA-4. Adult Count Period and Peak Passage Timing at John Day Dam Based on Yearly Counts since 1968 (except lamprey since 2000).

Species	Count Period	Earliest Peak	Latest Peak
Spring Chinook	Feb 20 – Jun 5	Apr 14	May 22
Summer Chinook	Jun 6 – Aug 5	Jun 7	Aug 2
Fall Chinook	Aug 6 – Dec 7	Sep 2	Sep 25
Steelhead	Feb 20 – Dec 7	Aug 25	Oct 6
Sockeye	Feb 20 – Dec 7	Jun 21	Jul 10
Coho	Feb 20 – Dec 7	Sep 4	Oct 26
Lamprey	Feb 20 – Dec 7	Jul 16	Aug 12

1.2.2.3. Time-of-day (diel) distributions of adult salmonid activity at John Day Dam fishway entrances and exits are summarized in **Figure JDA-3** (see *Keefer & Caudill 2008* at: http://www.nwd-wc.usace.army.mil/tmt/documents/FPOM/2010/2013_FPOM_MEET/2013_JUN/).

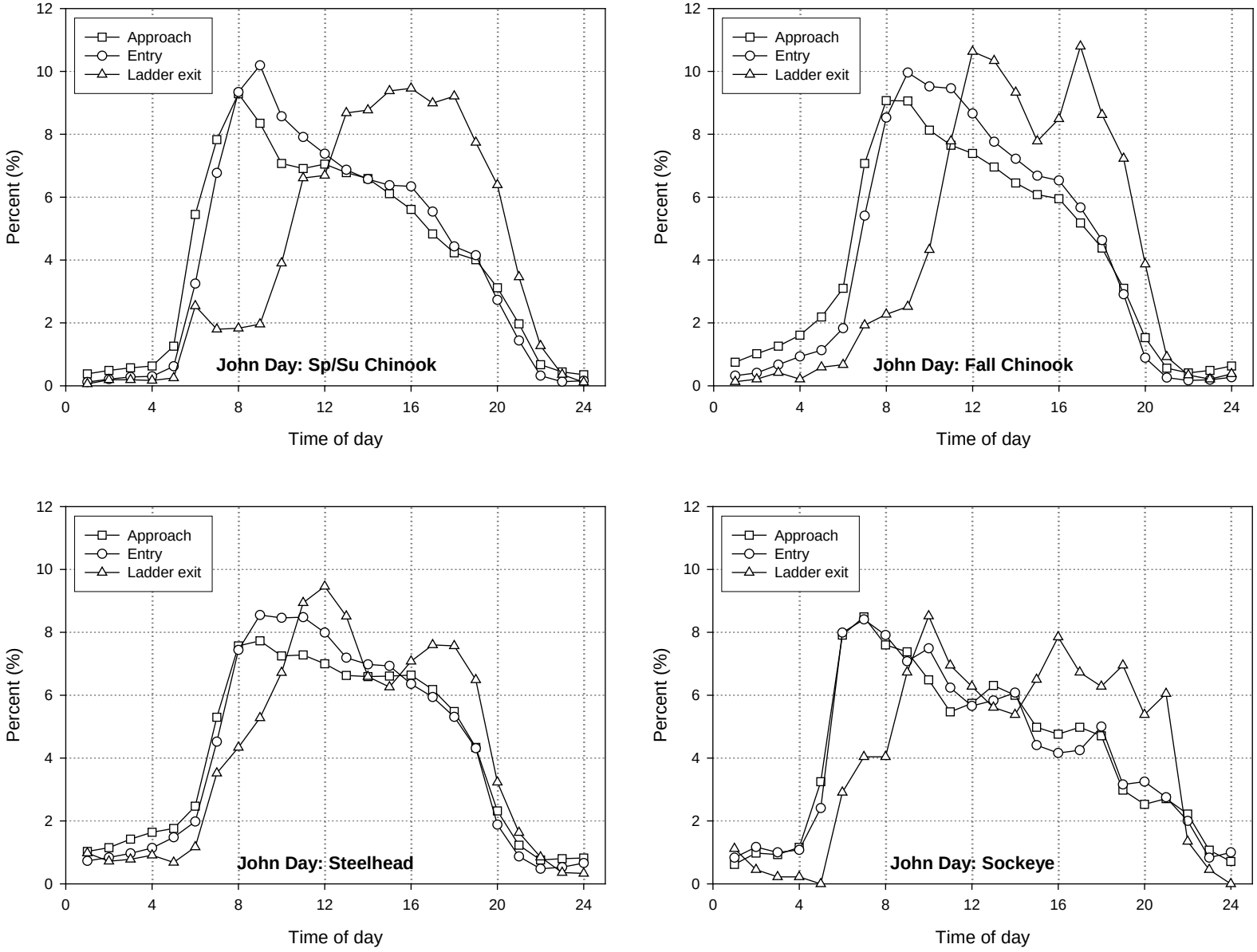


Figure JDA-3. Diel Distribution of Adult Salmonids at John Day Dam Fishway Entrances and Exits (*Keefer & Caudill 2008*).

2. PROJECT OPERATIONS

2.1. General.

2.1.1. Research, non-routine maintenance, other fish related activities, and construction activities will not be conducted within 100' of any fishway entrance or exit, within 50' of any other part of the adult fishway, or directly in, above, or adjacent to any fishway, unless coordinated by the project, Portland District Operations and/or Planning, or CENWP Construction office through FPOM or FFDRWG. Currently coordinated special operations related to research are described in Appendix A. Alternate actions will be considered by district and project biologists in conjunction with the Regional fish agencies on a case by case basis. Emergency situations should be dealt with immediately by the project in coordination with the project or district biologist. If unavailable, the biologists will be informed of steps taken to correct the situation immediately following the incident. All activities within boat restricted zone (BRZ) will be coordinated at least two weeks in advance with the project, unless it is deemed an emergency (see also **Overview** for coordination guidance).

2.2. Spill Management.

2.2.1. See the Fish Operations Plan (FOP), included in the Fish Passage Plan as **Appendix E**, for more information. Spill patterns formulated with spillway deflectors in place are provided in **Table JDA-8** for spill with temporary spillway weirs (TSWs) installed in bays 18 and 19 and **Table JDA-9** for spill with no TSWs installed (bays 18 and 19 closed). These tables will be used for both adult and juvenile patterns. Minimum spill of 25% is to provide adequate tailrace egress for juvenile salmonids.

2.2.2. Temporary Spillway Weirs (TSWs). [1] Both TSWs will be installed as early as possible on the first day of spring spill operations and operated throughout the spring and summer spill seasons. During high flow events, TSW removal is recommended prior to river flows exceeding 685 kcfs. Both TSWs will be removed from service as late as possible on the last normal work day of the summer spill season (on or no later than August 31). Spill for juvenile fish passage will be maintained through August 31, in accordance with the FOP (**Appendix E**).

2.2.3. From September 1–November 30, spill from Bay 2 (1 stop = approximately 1.6 kcfs spill) is provided for adult attraction during daylight hours (**Table JDA-5**).

2.2.4. Provisions are in place for deviations from normal spill patterns for barge traffic entering the navigation lock and have been coordinated with the fish agencies and tribes through the proper fish regulatory forums (e.g., TMT, FPOM, FFDRWG). Minimum spill rate is 30% from April 10–August 31.

[1] Spillway weirs provide surface passage routes via spillbay(s). Temporary, or Top, Spillway Weirs (*TSW*s) at Little Goose, McNary and John Day dams can be installed, uninstalled and moved between bays using the gantry crane. Removable Spillway Weirs (*RSW*s) at Lower Granite, Lower Monumental and Ice Harbor dams are "removed" by controlled descent to the bottom of the forebay.

Table JDA-5. Daytime Spill Schedule for John Day Dam.

Date Range	Daytime Spill Hours	
	Begin	End
Jan 1 – Jan 19	0700	1730
Jan 20 – Feb 14	0630	1800
Feb 15 – Mar 1	0600	1830
Mar 2 – Apr 2	0600	1930
Apr 3 – Apr 20	0500	2030
Apr 21 – May 16	0500	2100
May 17 – May 31	0430	2130
Jun 1 – Jun 30	0430	2130
Jul 1 – Jul 31	0430	2200
Aug 1 – Aug 15	0500	2145
Aug 16 – Aug 31	0500	2030
Sep 1 – Sep 16	0530	2000
Sep 17 – Oct 4	0600	1930
Oct 5 – Oct 19	0630	1900
Oct 20 – Oct 29	0630	1830
Oct 30 – Nov 30	0600	1700
Dec 1 – Dec 31	0630	1700

2.3. Total Dissolved Gas (TDG) Management.

2.3.1. Total dissolved gas (TDG) levels at all projects are monitored in accordance with the TDG *Monitoring Plan*, included in the *Water Management Plan* as Appendix 4, and available online at: http://www.nwd-wc.usace.army.mil/tmt/documents/wmp/.

2.3.2. Excessive total TDG levels, which may harm fish, will be controlled to the extent possible, subject to river flow conditions. Control measures will include system spill allocations through the spill priority list issued by Reservoir Control Center (RCC), nighttime or daytime spill limits, and shaping of spill discharge.

2.4. Juvenile Fish Passage Facilities.

2.4.1. Operating Criteria.

2.4.1.1. December 1 – March 31 (Winter Maintenance Period).

2.4.1.1.a. Remove debris from forebay, all trash racks, and gatewell slots, so these areas are debris-free by April 1.

2.4.1.1.b. Inspect all VBSs for damage, holes, debris accumulations, or protrusions (video inspection acceptable). Clean and repair when necessary.

2.4.1.1.c. Inspect and operate each STS.

2.4.1.1.d. By April 1, place STSs in each intake slot of all operational units unless otherwise coordinated with the fish agencies and tribes.

2.4.1.1.e. Inspect and, where necessary, clean and/or repair all gatewell orifices and orifice lighting systems, such that these systems are debris-free and operable on April 1.

2.4.1.1.f. Check automatic control calibration/operation for the DSM tainter gate and other necessary sensors weekly and recalibrate as necessary. Report summaries of equipment recalibration in the weekly SMF operation monitoring reports.

2.4.1.1.g. Inspect, maintain and, where necessary, repair the DSM conduit tainter gate.

2.4.1.1.h. Inspect and, where necessary, correct any deficiencies of walls and floor of DSM conduit, raceway, and outfall.

2.4.1.1.i. Inspect and, where necessary, repair spill gates and the associated control system. Spillways, except for coordinated exceptions, must be able to achieve standard spill patterns on April 1.

2.4.1.1.j. Avian Abatement Measures. Avian abatement measures shall be in place by April 1. Repair avian predator control lines as soon as possible following damage or removal. Install and maintain new avian predator control lines in locations determined to be significantly impacted by avian predators. Avian hazing will occur mid-April – July 31. However, there will be no avian abatement measures, other than avian lines, performed from August through mid-April each year.

2.4.1.1.k. Smolt Monitoring Facility (SMF): Insure all following items are fully operational:

k.1. Dewatering facilities, including weir gates, clean perforated plates, the screens (free of holes or gaps), and the screen cleaner brush system;

k.2. All valves and auxiliary water systems;

k.3. Flushing water valves and their perforated plates;

k.4. All gates, including the crest, tainter, switch, and rotating gates;

k.5. Fish and debris separator, including perforated plates and adult passage chamber;

k.6. PIT-tag detectors;

k.7. All sampling building systems, including holding tanks, valves, and conduits. (Note: A specific list can be found in the *SMF Operation & Maintenance Manual*.)

2.4.1.2. April 1 – November 30 (Juvenile Fish Passage Season). Juvenile fish protection devices, submersible traveling screens (STSs), will be in place prior to the beginning of the juvenile fish passage season. STSs will remain in operation through December 15 to prevent

adult salmonids from falling back through turbine units, even though the juvenile passage season officially ends November 30.

2.4.1.2.a. Measure gatewell drawdown across the trashrack a minimum of once per week. Remove debris from forebay and trash racks as required to maintain gatewell drawdown less than 1.5'. If VBS drawdown reaches 1.2', the Project will inspect the screen and prepare to clean as necessary.

2.4.1.2.b. From April 1 through August 1, units 1–5 will be raked monthly, and units 6–10 *or* units 11–16 will be alternately raked monthly. After August 1, units will be raked as necessary as determined by ROV inspection, or as needed to maintain gatewell drawdown in criteria.

2.4.1.2.c. Debris accumulations in the forebay of 300' or more in any direction from the face of the dam will be removed within 48 hours. Debris removal efforts should continue until the debris load has been removed.

2.4.1.2.d. If debris loads are obvious in the forebay, trash will be raked in front of the affected units weekly until the debris load has been removed.

2.4.1.2.e. Additional raking will occur whenever trash accumulations are suspected because of increased differential (≥1.5') across the trash racks, or as determined by the project biologist in reference to indicators such as increased juvenile fish descaling at the dam, deteriorating fish condition as noted by SMF personnel, or increased accumulation of tumbleweeds in the forebay. Gatewell orifices of the unit being raked must be closed during the raking operation.

2.4.1.2.f. Inspect each STS, VBS, and orifices once per month or every 720 hours run time. Video inspections are acceptable. More frequent inspections may be required under the following conditions: deterioration of fish condition, increased debris load in bypass system, or other indications of STS or VBS malfunction or failure. If STS or VBS damage or plugging is detected, follow procedures in **Section 3. Fish Facilities Maintenance**. Records of inspections will be reported in weekly fishway status reports and provided to FPOM. Unit 2 will operate when unit 1 is out of service for STS inspections.

2.4.1.2.g. Open all gatewell orifices April 1–December 15. Inspect orifice lights daily to ensure orifice lights are operating. Replace all burned out orifice lights within 24 hours. Close and open each orifice three times daily, or more frequently as determined by the project biologist, due to heavy debris accumulation in gatewells. If a unit goes out of service, orifices are to remain open in associated gatewells unless that gatewell is dewatered.

2.4.1.2.h. Observe each STS amp and/or watt meter readings at least once per shift. If an STS failure occurs, then follow procedures in **Section 3. Fish Facilities Maintenance**.

2.4.1.2.i. Inspect all STS gatewells daily. The project will clean gatewells before the gatewell water surface becomes 50% covered with debris. If due to the volume of debris

it is not possible to keep the gatewell surfaces at least 50% clear, they will be cleaned at least once daily. Turbines with a gatewell fully covered with debris will not be operated except to be in compliance with other coordinated fish measures, and then only on a last-on/first-off basis. The powerhouse gatewell orifices will be closed during cleaning. After gatewell de-barking, cycle the orifice in that gatewell. Check gatewell drawdown.

2.4.1.2.j. Efforts should be made to keep all petroleum out of gatewells. Project environmental section will determine cleanup efforts if needed. Regardless of unit operating status, oil accumulations will be dealt with promptly.

2.4.1.2.k. When using a dip basket for gatewell cleaning, coordinate with SMF personnel.

2.4.1.2.l. Reinstall or repair avian predator control lines as soon as possible following damage or removal. Install and maintain new avian predator control lines in locations determined to be significantly impacted by avian predators. Implement other avian abatement (hazing) as necessary from April through August only.

2.4.1.2.m. Turbine units without a full complement of rotating STSs will not operate, except to be in compliance with other coordinated fish measures.

2.4.1.2.n. Maintain water level in the bypass conduit between 4.0–5.0' as measured at Unit 16.

2.4.1.2.o. Smolt Monitoring Facility (SMF). Ensure the proper function of sampling systems. Direct particular attention to the following:

o.1. Dewatering facilities, including the screens being free of holes or gaps, and the screen cleaner brush system;

o.2. All valves and auxiliary water systems;

o.3. Flushing water valves and their perforated plates;

o.4. All gates, including the crest, tainter, switch, and rotating gates;

o.5. Fish and debris separator, including perforated plates and adult passage chamber;

o.6. PIT-tag detectors;

o.7. All sampling building systems, including holding tanks, valves, and conduits;

o.8. From April 1–September 15, the SMF will be monitored 24 hours/day, 7 days/week by Project fish personnel to ensure proper functioning and to provide quick response to an emergency. Inspect every 2 hours. Therefore, the system will be fully staffed while the SMF is in operation (i.e., crest gate is deployed and the secondary dewatering structure is receiving fish-laden flow).

o.9. Cycle the Primary Dewatering Screen (PDS) sweepers twice per shift (6 per day) during low to normal debris loads. If debris loads increase, increase frequency of screen sweeper cycling as determined by the project biologist through inspections.

o.10. A person on duty will perform a walking inspection of the entire SMF system every two hours to ensure safe passage conditions.

o.11. Particular attention will be paid to the fish/debris separator (FDS) that needs to be visually inspected every 30 minutes to prevent injury and/or mortality to passing fish.

o.12. During any high debris loading periods (likely during spring runoff) additional personnel may be required to keep the FDS free of any obstruction to fish passage. The project biologist will decide to assign a person to remove debris from the FDS on a shift basis (possible constant, 24 hours/day presence) for as long as it is necessary to assure the safety of passing fish.

o.13. For adult fish removal from the PDS area when river temperatures reach 70°F or greater, all fish handling will be coordinated through FPOM.

2.4.1.3. December 1 – March 31 (Winter Maintenance Period).

2.4.1.3.a. Submersible traveling screens (STS) will remain in place through December 15 to prevent adult salmonids from falling back through turbine units, thereby shortening some aspects of the winter maintenance period by two weeks. To reduce adult fallback mortality, the juvenile bypass system (JBS) channel will operate through December 15. Priority units will be left screened during this period to the extent practicable (barring operational failure) and screens will only be removed from non-priority units when necessary to begin maintenance. After December 15, all STSs may be removed.

2.4.1.3.b. Dewater DSM channel only when required for inspection, maintenance or structural modifications (see **section 5. Dewatering Plans**; also, **3.2.1.2. Juvenile Bypass System).** The outage period will be minimized to the extent practicable.

2.4.1.3.c. All units are available to meet power demands.

2.5. Adult Fish Passage Facilities.

2.5.1. Operating Criteria.

2.5.1.1. December 1 – February (Winter Maintenance Period).

2.5.1.1.a. Inspect and calibrate all staff gages, water level sensors, and indicators. Repair and/or clean where necessary.

2.5.1.1.b. Dewater and inspect repair as needed all ladders and all other dewatered sections of fish facilities for projections, debris, or plugged orifices which could injure fish, or slow their progress up the ladder.

2.5.1.1.c. Inspect for and, when necessary, clear debris in ladder exits.

2.5.1.1.d. Reinstall picket leads at counting stations prior to watering up ladders during maintenance.

2.5.1.1.e. Repair or, when necessary, upgrade netting and padding at top of north fish ladders to address the fish jumping problem in this area.

2.5.1.1.f. Outage periods will be minimized to the extent practicable. Only one ladder may be out of service or operating out of standard operating criteria at any one time, unless specifically coordinated.

2.5.1.2. March 1 – November 30 (Adult Fish Passage Season).

2.5.1.2.a. All Adult Facilities.

a.1. Water depth over fish ladder weirs 1.0' ±0.1'. When shad numbers exceed 5,000/day per count station at Bonneville Dam, water depth should be increased to 1.3' ±0.1'.

a.2. Measure water temperatures at the count stations of each ladder and include the weekly means in the status report. When water temperature reaches 70°F all fish handling activities will be coordinated with the Regional fish agencies through FPOM prior to any action to verify protocols that will be followed.

a.3. Head on all entrances: 1'–2' (1.5' optimum). Refer to paragraph **3.3.1** when unable to achieve head criteria.

a.4. Maintain water velocity at 1.5–4.0 feet per second (2 fps optimum) in all channels and the lower ends of fish ladders that are below the tailwater. Open floating orifice gates 1, 2, 18 and 19, and operate three fish pumps to maintain fishway criteria. The entrance gate should be submerged 8’ deep or greater to be in criteria. Fishway channel water velocities will be measured a minimum of three times weekly (daily preferred) during adult fish passage season (Mar 1 – Dec 1) as part of the fishway inspection program. Floats will be timed through all fishway channels that are supplemented by auxiliary water, and results reported in the project weekly fishway status report.

a.5. Maximum head of 0.5' on attraction water intakes and trash racks at all the ladder exits, with a 0.3' maximum head on all picket leads. Debris shall be removed when significant amounts accumulate.

a.6. Staff gages and water level indicators will be readable at all water levels encountered during the fish passage period, and calibration checked weekly. Instruments will be cleaned and/or recalibrated when necessary as soon as practicable.

a.7. Main entrance weir depths: 8' or greater below tailwater. Maintain tailwater elevation above 158’msl to stay within criteria operation range for entrance weirs.

a.8. The current fish counting program is conducted 16 hours per day from April through October (see **Table JDA-3**). The crowder shall be opened to full count slot width when not counting. The crowder shall be open as far as possible to allow accurate counting and shall not be closed to less than 18 inches while counting. This will usually occur during high turbidity conditions to maintain count accuracy.

i. Count station crowders shall be at maximum width that allows count or video tape accuracy. The minimum count slot width shall be no less than 18". Crowder ranges are as follows:

- JDA-North = 18"–28"
- JDA-South = 18"–30"

ii. If passage is impaired by narrow count slot conditions, the count slot will be widened until proper passage conditions are achieved, despite count accuracy.

iii. Project biologists, FFU, and the fish count supervisor shall coordinate to achieve optimum count slot passage and/or count accuracy conditions.

iv. If counting is temporarily discontinued due to unscheduled events, the crowder shall be fully opened.

v. The crowder may remain in operating position during the counters' hourly ten-minute break period.

2.5.1.2.b. North Fishway.

b.1. Starting September 1, spill from Bay 2 (1 stop = 1.5K) for adult attraction during daylight hours through November.

b.2. Maintain netting and padding for the North fishway to address the adult salmonid jumping problem. All holes in the netting large enough to catch or allow escapement of an adult salmonid must be closed.

2.5.1.2.c. South Fishway. Operate entrance weir SE-1.

2.5.1.2.d. Powerhouse.

d.1. Operate entrances NE-1 and NE-2.

d.2. Operate four powerhouse floating orifices (1, 2, 18, 19) and open associated auxiliary water diffusers (see also **2.5.1.2.a.4.**).

d.3. From 0400–2000 hours, operate unit 1 near 100 megawatts (±10 MW) to facilitate best entrance conditions. If additional load is required by BPA, unit 1 may be operated at above 100MW, but it should be the last to be brought up to full load when demand increases and the first to drop off when demand decreases. (See also *Load Shaping Guidelines*, **Appendix C**).

2.5.1.3. December 16 – February (Winter Maintenance Period).

2.5.1.3.a. Operate according to fish passage season standards, except facilities may be dewatered or operated out of criteria for maintenance or repair. Outage periods will be minimized to the extent practicable.

2.5.1.3.b. Only one of the two adult fish passage facilities may be out of service at a time. The other facility must be operated at full passage season criteria unless specially coordinated with the Regional fish agencies through FPOM. However, operation of unit 2 may be substituted for unit 1 without special coordination when the south fishway is in service.

2.5.1.3.c. Pull picket leads at counting stations and have crowders adjusted such that the counting slots are fully opened at the end of the counting season (this will be done shortly after adult fish counting ends).

2.5.1.3.d. Maximum head of 0.5' on attraction water intakes and trash racks at all ladder exits. Debris shall be removed when significant amounts accumulate.

3. FACILITY MONITORING AND REPORTING

3.1. Inspections.

3.1.1. The results of all inspections and the readiness of the facilities for operation will be reported to the FPOM at the meeting immediately prior to the fish passage season.

3.1.2. During fish passage season, fish passage facilities will be inspected at least twice per day/seven days a week to assure operation according to established criteria.

3.1.3. During winter maintenance season, fish passage facilities will be inspected once/day, seven days/week.

3.1.4. More frequent inspections of some facility components will occur as described throughout this document.

3.1.5. Additional fishway inspections may be performed by FFU and fish agencies.

3.2. Zebra Mussel Monitoring.

A zebra mussel monitoring program will continue. These organisms are a serious problem elsewhere in the country and may become introduced into the Columbia River basin. Inspections should also be made when dewatering all project facilities.

3.3. Reporting.

3.3.1. Project biologists shall prepare weekly reports throughout the year summarizing project operations. The weekly reports will provide an overview of how the project and the fish passage

facilities operated during the week and an evaluation of resulting fish passage conditions. The reports shall include:

i. Any out-of-criteria situations observed and subsequent corrective actions taken;

ii. Any equipment malfunctions, breakdowns, or damage along with a summary of resulting repair activities;

iii. Adult fishway control calibrations;

iv. STS and VBS inspections;

v. AWS closures (i.e. cleaning times);

vi. Any unusual activities which occurred at the project which may affect fish passage.

3.3.2. Weekly reports shall cover Sunday–Saturday period and shall be e-mailed to CENWP-OD, CENWD-PDW-RCC, and other interested parties as soon as possible the following week.

3.3.3. The project biologists shall prepare a memo for the record for any negative impact to fish or fishways. This memo will be sent to FPOM by the next working day. Items that shall be included in the memo are:

i. Time and date;

ii. Nature of activity that lead to fish impact;

iii. Agency responsible for the impact or the reporter if no responsible party can be identified;

iv. Fish numbers, species, origin, discernible external injuries, tags, etc;

v. Future actions to avoid a similar impact;

vi. Any relevant photos.

3.3.4. The project biologists shall prepare an annual report by January 31, summarizing the operation of the project fish passage facilities for the previous year.

3.3.4.1. The report will cover from the beginning of one adult fish facility winter maintenance period to the beginning of the next.

3.3.4.2. The annual report also will include a description of all actions taken to discourage avian predation at the project, with an overview of the effectiveness of the activities in discouraging avian predation.

3.3.4.3. The annual report will be provided to CENWP-OD in time for distribution to FPOM members at the February meeting.

4. FISH FACILITIES MAINTENANCE

4.1. General.

4.1.1. Routine Maintenance. Scheduled fishway maintenance, to the extent practicable, will be conducted during periods when passage has been documented to be at its lowest to minimize impacts to migrating salmonids. Maintenance activities that occur during the fish passage period, and that may affect fish passage, will be reported in the weekly reports (**section 3.3**).

4.1.1.1. Staff gages will be installed, cleaned, and/or repaired as required.

4.2. Juvenile Fish Passage Facilities Maintenance.

4.2.1. Routine Maintenance.

4.2.1.1. Submersible Traveling Screens (STS). The STS system may receive preventive maintenance or repair any time of the year as necessary. Most maintenance will occur during the winter maintenance period when all STSs may be removed from intakes. From April 1–December 15, a turbine unit cannot operate without a full complement of functioning STSs.

4.2.1.2. Juvenile Bypass System (JBS). The JBS facilities may receive preventive maintenance at any time of the year as necessary in coordination with FPOM. During the juvenile fish passage season, this will normally be out-of-water work (e.g., maintenance of automatic systems, air lines, electrical systems, and monitoring equipment). During the winter maintenance period, the system is dewatered and visually inspected in all accessible areas for damaged equipment and areas that may cause potential problems to juvenile fish. Identified problems will be repaired by project maintenance or the contractor as soon as possible. Extended repair projects will be coordinated through FPOM.

4.2.1.3. Turbines and Spillway. Maintenance and routine repair of project turbines and spillways is a regular and recurring process which requires that units be shut down for extended periods of time (see **section 5. Dewatering Plans**). Maintenance schedules for these turbines and spillways will be coordinated through FPOM. Certain turbine and spillway discharges at the projects are secondarily used to attract adult fish near fishway entrances to keep predator fish from accumulating in the area of juvenile release sites and to move juveniles downstream away from the project. The maintenance schedules for these turbines and spillways will reflect equal weight given to fish, power, and water management and will be coordinated with the appropriate fish agencies. Units that should not be scheduled for maintenance during the fish passage season are 1, 2, and 5. Some types of turbine maintenance will require testing turbine operation throughout the full operating range before returning it to normal service.

4.2.2. Non-Routine Maintenance. Non-routine maintenance of facilities will be carried out as described below. Activities that will have a significant impact on juvenile fish passage shall be coordinated through FPOM on a case-by-case basis by project and CENWP-OD biologists. The CENWP-OD biologists will be notified as soon as possible after it becomes apparent that maintenance repairs are required. The Project Operations Manager has the authority to initiate work prior to notifying CENWP-OD when delay of the work will result in an unsafe situation for

people, property, or fish. Information required by CENWP-OD includes (see also **Overview** for the coordination form):

i. Description of the problem.

ii. Type of outage required.

iii. Impact on facility operation.

iv. Length of time for repairs.

v. Expected impacts on fish passage.

4.2.2.1. Submersible Traveling Screens (STS). If an STS or VBS is damaged or inoperative in an operating unit, the unit will be regarded as an unscreened unit. The screen will be repaired or replaced before returning the unit to service.

4.2.2.2. Juvenile Bypass System (JBS).

4.2.2.2.a. The JBS is automatically controlled. If the automatic system fails, it will be operated manually until automation repairs are made. If the orifices become plugged with debris, the turbine will not be operated until it has been cleaned.

4.2.2.2.b. Inspect all STS gatewells daily. The project will clean gatewells before the water surface becomes 50% covered with debris. If due to the volume of debris it is not possible to keep the gatewell surfaces at least 50% clear, they will be cleaned at least daily. Turbines with a gatewell fully covered with debris will not be operated except on a last-on/first-off basis if required to be in compliance with other coordinated fish measures. The gatewell orifices must be closed during the cleaning process. Juvenile mortality numbers will be monitored in all gatewells, as potential indicators of gatewell environment problems. Mortality estimates will be recorded and reported in the weekly status reports.

4.2.2.2.c. If the bypass system fails in the powerhouse conduit, tainter gate, or transportation outfall making the system unsafe for fish, an action decision will be made in coordination with the FPOM. During this emergency operating mode, power generation will be minimized to the extent practicable. If this operating mode is expected to last longer than four days, then all units required for generation will be sequentially shut down, fish salvaged from the gatewells, the STSs removed, and the unit restarted. The orifice gates will be closed during this process.

4.2.2.2.d. During fishway inspection activities, VBSs may be found plugged with debris, damaged or not properly seated. In these cases, the associated unit will be regarded as if unscreened and repairs will be made before returning the unit to operation.

4.2.2.3. Turbines and Spillways.

4.2.2.3.a. If a spill gate becomes inoperable, the operators will make the changes necessary to accommodate the spill and then immediately notify the operations supervisor and project biologist to determine the best pattern to follow until repairs can

be made. This interim operation shall be coordinated with the FPOM through the district biologist who will provide additional guidance to the project.

4.2.2.3.b. Unit 2 will replace unit 1 for adult attraction whenever unit 1 is not operating.

4.2.2.3.c. From September 15 through the end of February, spillbay gate 2 may be closed for up to one work day for maintenance activities. During the outage, spill gate 3 will be opened to provide attraction flow.

4.3. Adult Passage Facilities Maintenance.

4.3.2. Routine Maintenance. Maintenance activities that occur during the fish passage period and that may affect fish passage will be reported in the weekly reports (**section 3.0**).

4.3.2.1. Fishway Auxiliary Water Systems. John Day Dam has tailwater pump auxiliary water systems. Preventive maintenance and normal repair are carried out throughout the year. Trash racks for the AWS intakes will be raked when drawdown exceeds criteria. When practicable, rake trash racks during the time of day when fish passage is least affected. During the annual navigation lock maintenance outage, the north fish ladder auxiliary water is shut off for about half a day. This is required to allow divers to clean off the navigation lock discharge sill so that a bulkhead can be placed.

4.3.2.2. Powerhouse and Spillway Fish Collection Systems. Preventive maintenance and repair occurs throughout the year as needed. During the adult fish passage season, this maintenance will not involve operation that will cause failure to comply with the adult fishway criteria, unless coordinated through FPOM. During the winter maintenance period, an inspection will occur through dewatering or divers per discretion of the project biologists. One additional underwater diver/ROV will occur during August 1 - 15. Timing of this inspection will be coordinated through FPOM. The project biologist or alternate Corps fish personnel will attend all dewatering and inspection activities potentially involving fish (**section 5. Dewatering Plans**).

4.3.2.3. Adult Fish Ladders and Counting Stations. Adult fish ladders will be dewatered once per year during the winter maintenance period. Unless specially coordinated, only one ladder will be dewatered at a time with the other ladder operating within criteria. During this time, the ladders are inspected for necessary maintenance needs and potential fish passage problems (e.g., blocked orifices, projections into the fishway that may injure fish, unstable weirs, damaged picket leads, exit gate problems, loose diffuser gratings, unreadable or damaged staff gauges, defective diffuser valves, and malfunctioning equipment at the counting stations). Potential problems identified throughout the passage year that do not impact fish passage, as well as those identified during the dewatered period, are then repaired. Trash racks at ladder exits will be raked when criteria are exceeded. When practicable, rake trash racks during the time of day when fish passage would be least impacted. Fish count station windows, light panels, and crowder panels will be cleaned as needed to achieve accurate counts and, when practicable, during the time of day when fish passage is least impacted. North netting installed on ladders to prevent fish leaping will be

inspected daily and maintained as necessary. Inspection summaries will be included in the weekly activity report.

4.3.3. Non-Routine Maintenance. Maintenance activities that occur during the fish passage period and that may affect fish passage will be reported in the weekly reports (**section 3.3.1**.). Non-routine maintenance that will significantly affect the operation of a facility, such as repair of displaced diffuser gratings, will be coordinated through FPOM. Coordination procedures for non-routine maintenance of adult facilities are the same as for juvenile facilities (**section 4.2.2**).

4.3.3.1. Fishway Auxiliary Water Systems. The fishway auxiliary water systems are mostly automated. If the automatic system fails, the system will be operated manually by project personnel. This will allow the fish facility to operate according to criteria while the automatic system is repaired. When this operation becomes necessary, project personnel will increase the surveillance of the adult system to ensure that criteria are being met. The FPOM will work with the project to determine the best operation in the event of an AWS failure during the adult passage season.

4.3.3.1.a. South Ladder. If one of the three auxiliary water turbines fails, assuming all three turbines are being used to meet criteria, the output of the two remaining turbines will be increased to meet adult fishway criteria. If a second turbine unit fails, the adult fish facility will be operated as follows until a fishway head of 1' is achieved:

a.1. Increase discharge of remaining unit to maximum capacity;

a.2. Close NE-1;

a.3. Leave NE-2 at a depth of 8';

a.4. Close remaining floating submerged orifice gate entrances starting at north end;

a.5. Leave south powerhouse entrance weir (SE-1) at 8' depth below tailwater surface.

a.6. If criteria still not achieved, reduce entrance weirs depth to 6' then to 4' if necessary until more auxiliary water becomes available. Then reverse above procedure.

a.7. If all three turbine units fail, operate as follows until repairs can be made:

i. Open SE-1 with the weir crest 6' below the tailwater surface;

ii. Close NE1 and NE2;

iii. Place cross-channel bulkheads in powerhouse collection channel between Units 2 and 3;

iv. Close floating orifice gate in front of Unit 2, leaving the floating orifice gate in front of Unit 1 open. (See also **2.5.1.2.a.4.**).

4.3.3.1.b. North Ladder. The six AWS pumps installed in 2011 are capable of achieving the optimal attraction criteria of 1.5' at all tailrace elevations. There is a built-in contingency as one of the six pumps is always spare; it will automatically started by PLC in case of another pump's failure.

4.3.3.2. Powerhouse and Spillway Fish Collection Systems. John Day Dam contains several types of fishway entrances. If failures occur, in most cases the entrance can be operated manually by project personnel until repaired. When this operation becomes necessary, project personnel will increase the surveillance of the adult system to ensure criteria are being met. In those cases in which the failure will not allow the entrance to be operated manually, the gate will be maintained, to the extent possible, in an operational position. If this is not possible, the entrance will be repaired expediently and the entrance will be returned to manual or automatic control at the earliest possible date.

4.3.3.3. Adult Fish Ladders and Counting Stations. Pickets with excessive spacing (>1"), erosion of concrete around the picket leads, or missing pickets can allow fish into areas where escape is not possible. The north count station upstream picket leads have an exit hatch that can be opened to allow fish to escape. Repair will be required for picket lead failure at the south count station. In the instances of picket lead failure or concrete erosion, the timing and method of repair will depend upon the severity of the problem. The decision of whether or not to dewater the fishway and repair any problem will be made in coordination with FPOM.

4.3.3.4. Diffuser Gratings. Diffuser chambers for adding auxiliary water to fish ladders and collection channels are covered by gratings attached by several different methods. Diffuser gratings are normally inspected during the winter maintenance period to assure integrity. These inspections are done by either dewatering the fishway and/or collection channel, or by using video cameras and divers or other methods to inspect the gratings underwater. Diffuser gratings may come loose during the fish passage season due to a variety of reasons. Daily inspections of the fish ladders and collection systems should include looking for any flow changes that may indicate problems with diffuser gratings. If a diffuser grating is known to or suspected of having moved, creating an opening into a diffuser chamber, efforts must immediately be taken to correct the situation and minimize impacts on adult fish in the fishway. If possible, a video inspection should be made as soon as possible to determine the extent of the problem. If diffusers gratings are found to be missing or displaced, close associated diffuser and develop a method of repair as coordinated with FPOM. Repair as quickly as possible unless coordinated differently.

5. TURBINE UNIT OPERATION & MAINTENANCE

5.1. Turbine Unit Priority.

5.1.1. Unit operating priority (**Table JDA-6**) includes that time when synchronous condensing occurs. Unit maintenance schedules will be reviewed by project and district biologists for fish impacts.

Table JDA-6. Turbine Unit Operating Priorities at John Day Dam.

Season	TSWs [1]	Unit Operating Priority*
Fish Passage Season March 1–November 30 (24 hours/day)	no TSWs	1-4 in any order, then 5-16 in any order.
	with TSWs [1]	5,1,3,16,14,12,10,8,15,2,11,7,4,13,9,6
Winter Maintenance Season December 1–February 28 (24 hours/day)	n/a	any unit

*When a main unit is not available, the paired adjacent unit will be used to comply with requested priority.

5.2. Turbine Unit O&M.

5.2.1. Operating points for turbine units within ±1% of peak turbine efficiency (1% range) at various heads are shown in **Table JDA-7**. To the extent technically feasible, units will be operated within the 1% range unless operation outside of that range is necessary to meet BPA load requirements consistent with *BPA System Load Shaping Guidelines* (**Appendix C**), or to comply with other coordinated fish measures. The *Guidelines* apply April 1–October 31. During the rest of the year, the project will continue to operate units within the 1% range except as specifically requested by BPA for power production.

5.2.2. Juvenile fish passage decreases through units from south to north, making inefficient operation of unit 16 least likely to impact fish. Based on this, if it is necessary to select turbines to operate outside the 1% efficiency range, they will be selected in sequence from north to south. However, allowance will also be given to special project requirements for stable voltage control which require load distribution between transformer banks.

5.2.3. Units may be operationally tested for up to 30 minutes before going into maintenance status by running the unit at speed no load and various loads within the 1% criteria to allow pre-maintenance measurements and testing AND TO ALLOW ALL FISH TO MOVE THROUGH THE UNIT. Units may be operationally tested after maintenance or repair while remaining in maintenance or forced outage status. Operational testing may consist of running the unit for up to a cumulative time of 30 minutes (within 1% criteria) before it is returned to operational status. Operational testing OF UNIT UNDER MAINTENANCE is in addition to a unit in run status (E.G. MINIMUM GENERATION) required for power plant reliability. Operational testing may deviate from fish priority units and may require water that would otherwise be used for spill if the running unit for reliability is at its 1% minimum load. Water will be used from the powerhouse allocation if possible, and water diverted from spill for operational testing will be minimized to that necessary to maintain and assure generation system reliability.

5.2.4. Wicket gate opening for functional testing on a watered-up unit will be no more than 15 minutes total open time.

Table JDA-7. John Day Dam Turbine Unit Output (MW) and Discharge (cfs) Per Unit at Upper and Lower Limits of 1% Peak Efficiency Operating Range with and without STSs. [1]

Project Head (feet)	With STSs				No STSs			
	1% Lower Limit		1% Upper Limit		1% Lower Limit		1% Upper Limit	
	MW	cfs	MW	cfs	MW	cfs	MW	cfs
80	65.4	11,338	118.0	20,472	71.7	12,305	122.8	21,074
81	66.7	11,416	120.8	20,671	73.2	12,391	125.7	21,290
82	68.1	11,492	123.6	20,864	74.7	12,473	128.7	21,500
83	69.4	11,566	126.4	21,052	76.1	12,554	131.6	21,703
84	70.8	11,638	129.1	21,234	77.6	12,631	134.6	21,901
85	72.1	11,707	131.9	21,411	79.1	12,707	137.5	22,093
86	72.9	11,692	134.7	21,593	80.0	12,690	140.1	22,223
87	73.7	11,676	137.5	21,770	80.9	12,674	142.6	22,349
88	74.5	11,661	140.2	21,942	81.7	12,657	145.1	22,471
89	75.3	11,646	143.0	22,110	82.6	12,641	147.6	22,591
90	76.1	11,632	145.8	22,274	83.5	12,625	150.2	22,707
91	77.0	11,622	146.9	22,164	84.5	12,616	151.7	22,656
92	77.9	11,613	148.0	22,057	85.5	12,606	153.2	22,606
93	78.8	11,604	149.1	21,951	86.4	12,596	154.8	22,556
94	79.7	11,595	150.2	21,848	87.4	12,586	155.1	22,321
95	80.6	11,585	151.3	21,746	88.4	12,576	155.2	22,062
96	81.7	11,604	151.6	21,532	89.6	12,597	155.2	21,797
97	82.8	11,623	151.8	21,323	90.8	12,617	155.2	21,538
98	83.8	11,640	152.1	21,118	92.0	12,636	155.2	21,284
99	84.9	11,657	152.4	20,917	93.1	12,655	155.2	21,035
100	86.0	11,674	152.7	20,720	94.3	12,673	155.2	20,792
101	86.9	11,675	154.9	20,800	95.3	12,675	155.2	20,554
102	87.9	11,677	155.2	20,613	96.4	12,676	155.2	20,321
103	88.8	11,678	155.2	20,378	97.4	12,678	155.2	20,092
104	89.7	11,679	155.2	20,149	98.4	12,679	155.2	19,868
105	90.6	11,680	155.2	19,923	99.4	12,680	155.2	19,649
106	91.4	11,658	155.2	19,711	100.2	12,656	155.2	19,442
107	92.1	11,637	155.2	19,503	101.0	12,633	155.2	19,239
108	92.8	11,615	155.2	19,299	101.8	12,610	155.2	19,040
109	93.6	11,594	155.2	19,098	102.6	12,587	155.2	18,845
110	94.3	11,574	155.2	18,901	103.5	12,565	155.2	18,653

1. Table prepared by HDC November 2002. Table revised in 2005 to reflect information using a 2001 Unit 9 NS index test and a 1962 model test with STS adjustment Factor.

6. DEWATERING PLANS

Guidelines for dewatering and fish handling plans (**Appendix F**) have been developed and are followed for dewatering project facilities. Dewatering Plans are available online at: http://www.nwd-wc.usace.army.mil/tmt/documents/FPOM/2010/. These plans include consideration for fish safety and are consistent with the following general guidance. The appropriate plans are reviewed by participants before each salvage operation. The project fish biologist and/or alternate Corps fish personnel will attend all project activities involving fish handling. The fish agencies and tribes will be encouraged to participate in all ladder dewaterings. During the pumping or draining operation to dewater a portion or all, the water level will not be allowed to drop so low it strands fish. Personnel shall remain present onsite during pumping operations to ensure stranding does not occur or a water level sensor that deactivates the dewatering process will be used.

6.1. Adult Fish Ladders.

6.1.1. Routine Maintenance.

6.1.1.1. When possible, operate ladders to be dewatered at orifice flow, with the AWS off, for at least 24 hours, but not more than 96 hours prior to dewatering.

6.1.1.2. The project biologist will ensure that fish rescue equipment is available and will coordinate to provide adequate personnel to move fish out of the dewatered ladder.

6.1.1.3. Project personnel will install head gates to shut down ladder flow.[2] Where possible, a flushing flow of 1”–2" will be maintained in the ladder until fish are rescued.

6.1.1.4. The project biologist or alternate Corps fish personnel will oversee fish rescue when the ladders are dewatered. The project biologist will invite fish agency and/or tribal biologists to participate in the dewatering activities. Captured fish will then be transported to the forebay or tailwater, depending on the fish life stage (adults to forebay, juveniles to tailrace), for release. If a ladder is dewatered in the spring or summer, steelhead kelts should be released into the tailrace.

6.1.1.5. Orifice blocking devices, which are placed in the lower-most weirs to prevent fish from re-ascending the dewatered portion of the adult fishway, shall have ropes attached to them by project operations and be tied off to fishway railings. The blocking devices shall be removed just before the fishway is returned to service. These devices will be noted on the pre-water-up checklist maintained by project fish biologists. This will prevent the orifice blocks from being unintentionally left in place following fishway water-up.

6.1.2. Non-Routine Maintenance. When possible, discontinue auxiliary water and operate ladder at reduced flow as long as possible for up to 72 hours prior to dewatering. Follow guidance in **section 6.4**.

[2] Head gates may also be referred to as “operating” gates at some projects. The terms are interchangeable.

6.2. Powerhouse Fish Collection System.

6.2.1. Routine Maintenance. During the pumping or draining operation to dewater a portion or the entire collection channel, the water will not be allowed to drop to a level which strands fish. Personnel shall remain present onsite during pumping operations to ensure that stranding does not occur. The project biologist will assure that all necessary rescue equipment is available. The project biologist or alternate Corps fish personnel will provide technical guidance on fish safety and will assist directly in rescue operations.

6.3. Juvenile Bypass System (JBS).

6.3.1. Routine Maintenance. When draining the juvenile bypass channel, it is typical to flush the channel with only bay 16 bypass orifices open. Bay 16 gatewells will be dipped in advance to minimize the number of fish contained in this flushing water during fish passage season.

6.4. Turbines.

6.4.1. Remove juvenile fish from the gatewell(s) that will be drained. This is done by use of a special dipping basket. Dipping is not required when fish screens have been removed. Immediately before setting the head gates, spin the unit to move fish out of the draft tube.

6.4.2. If the turbine unit draft tube is dewatered, operate unit with full load for a minimum 15 minutes prior to immediately installing tail logs. If not possible to load, run unit at speed-no-load for minimum 15 minutes. Install bottom two tail logs side-by-side first before stacking the remainder to minimize sturgeon from entering the draft tube before dewatering. This is necessary for both scheduled and unscheduled outages.

6.4.3. If a turbine unit is idle and partially dewatered, and tail logs are to be put into place, an adequate safety pool may be maintained for up to 4 days to accommodate fish trapped in the draft tube. If longer timeframes are needed for the safety pool, project fisheries will coordinate with FPOM on a case-by-case basis. Adequate inspections will need to be conducted to ensure that the safety pool is maintained and fish are in good condition. Water levels in the draft tube will not be allowed to drop to a level that strands fish.

6.4.4. Fish rescue personnel will inspect dewatered turbine draft tubes, scroll cases, and intakes as soon as they can gain access and the water levels reach a depth permitting visual inspection. The project biologist or alternative fish personnel will provide technical guidance on fish safety and will directly participate in fish salvage.

6.4.5. The project biologist will assure that all necessary rescue equipment is available.

6.5. Navigation Lock.

6.5.1. The navigation lock is frequently dewatered for routine maintenance in late February/early March, in conjunction with navigation lock outages at The Dalles and Bonneville dams.

6.5.2. The area between the upstream bulkhead and the upstream gate is surveyed for fish as water levels allow. The lateral and pool areas on the floor of the lock are surveyed for fish from

above. Most of these areas remain full of water, precluding the ability to implement successful fish salvage operations. Areas where water levels slowly decrease are accessed via crane when pool levels reach a depth of approximately 3 feet. The fill conduits are accessed and checked for fish only if needed and can be done safely. All salvaged fish are removed, transported via bag or tank and released to the river .

7. FOREBAY DEBRIS REMOVAL

Debris at projects can impact fish passage conditions. It can plug or block trash racks, VBSs, gatewell orifices, dewatering screens, separators, and facility piping resulting in impingement, injuries, and descaling of fish. Removing debris at its source in the forebay is sometimes necessary to maintain safe and efficient fish passage conditions, navigation, and other project activities. In this case, the only viable alternative is to spill to pass the debris.

Special spill operations that don't follow the normal spill schedule or volume limits will be coordinated prior to their execution. Normally, the project shall contact CENWP-OD at least two workdays prior to the day the special operation is required. Using information provided by the project, CENWP-OD will coordinate with FPOM and with RCC, as necessary. Once the coordination is complete, RCC will issue a teletype detailing the special operations.

8. RESPONSE TO HAZARDOUS MATERIALS SPILLS

John Day Project's guidance for responding to hazardous substance spills is contained in its *Emergency Spill Response Plan*. This guidance will be followed in case of a spill.

Project Fisheries will be contacted as soon as possible after a hazardous material release and prior to any modification to fishway operations. The project biologist will in turn contact the CENWP-OD biologist and FPOM. Attempts should be made to first contact the project biologist on duty. During fish passage season there is a project biologist on duty seven days a week. If a project biologist cannot be reached by radio or in the office, attempts to contact Project Fisheries will occur in the following order:

i. Miro Zyndol (541) 506-7860 or 980-9958. Home # available in Control Room.

ii. Bern Klatte (503) 808-4318 or Tammy Mackey (503) 961-5733.

9. HAZING ACTIVITIES

9.1. Avian Hazing (Piscivorous Birds).

9.1.1. From April 16–July 31, piscivorous birds shall be hazed at John Day Dam 7 days/week during all daylight hours (or up to 8 hours/day) between the hours of 0500–2000. Hours of hazing should vary so that birds do not acclimate to long periods without hazing.

9.1.2. Avian Wires. Avian wires shall be installed prior to 10 April each year.

9.1.3. Hazing techniques are detailed in the approved *Operating Plan*. The objective of the program is to reduce avian predation of migrating juvenile salmonids and lamprey by hazing or harassing piscivorous birds in a manner that impedes their ability to successfully forage on fish and/or forces them to leave the area.

9.1.4. Avian hazing shall occur primarily near dam locations where predation risk is high (e.g., tailrace areas where fish may be disoriented after passing the project or forebay areas where fish may be delayed from passing the project).

9.1.4.1. Birds shall be hazed near the spillway and powerhouse discharge areas, the juvenile bypass outfall(s), and where birds congregate or feed, ranging up to approximately 2,000 feet downstream of the dam and outfall site. Roosting and actively foraging birds shall also be hazed within the forebay boat restricted zones (BRZ).

9.1.4.2. During juvenile lamprey outmigration, Wildlife Service (WS) specialists may be requested to focus hazing at specific areas of the project where juvenile lamprey are known to pass.

9.1.5. Boat hazing shall occur in the John Day Dam tailrace outside of the BRZ for an 8-hour shift during daylight hours (approximately between 0630-1900 hours), or as needed and deemed safe by WS boat operators.

9.1.5.1. One boat will be provided and operated by WS. If the primary boat is out of service for repairs/maintenance, WS will provide a back-up boat on-site within 24 hours. The Corps will provide a secure location on-site for storage of WS boats and trailers.

9.1.5.2. In the event weather and/or other conditions preclude safe boat operation, WS specialists shall haze from dam structures and/or adjacent shorelines.

9.1.5.3. In accordance with Corps and other safety requirements, all boats must have a minimum of two crew members and must remain outside of the BRZ unless accompanied by a safety boat. Boat operators must meet all applicable Federal and State safety laws and requirements.

Table JDA-8. [*pg 1 of 12*] John Day Dam Spill Patterns with Temporary Spillway Weirs (TSWs) in Bays 18-19. *See notes at end of table.*

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
19.4																		6.1	6.1		12.2
21.0																		6.1	6.1	1	13.2
21.8																		6.1	6.1	1.5	13.7
23.4		1																6.1	6.1	1.5	14.7
25.0		1	1															6.1	6.1	1.5	15.7
26.6		1	1														1	6.1	6.1	1.5	16.7
28.2		1	1													1	1	6.1	6.1	1.5	17.7
29.8		1	1												1	1	1	6.1	6.1	1.5	18.7
31.4		1	1											1	1	1	1	6.1	6.1	1.5	19.7
33.0		1	1										1	1	1	1	1	6.1	6.1	1.5	20.7
34.6		1	1									1	1	1	1	1	1	6.1	6.1	1.5	21.7
36.2		1	1								1	1	1	1	1	1	1	6.1	6.1	1.5	22.7
37.8		1	1							1	1	1	1	1	1	1	1	6.1	6.1	1.5	23.7
39.4		1	1						1	1	1	1	1	1	1	1	1	6.1	6.1	1.5	24.7
41.0		1	1					1	1	1	1	1	1	1	1	1	1	6.1	6.1	1.5	25.7
42.6		1	1				1	1	1	1	1	1	1	1	1	1	1	6.1	6.1	1.5	26.7
44.2		1	1	1			1	1	1	1	1	1	1	1	1	1	1	6.1	6.1	1.5	27.7
45.0		1	1	1			1	1	1	1	1	1	1	1	1	1	1.5	6.1	6.1	1.5	28.2
45.8		1.5	1	1			1	1	1	1	1	1	1	1	1	1	1.5	6.1	6.1	1.5	28.7
46.6		1.5	1.5	1			1	1	1	1	1	1	1	1	1	1	1.5	6.1	6.1	1.5	29.2
48.2		1.5	1.5	1	1		1	1	1	1	1	1	1	1	1	1	1.5	6.1	6.1	1.5	30.2
49.0		1.5	1.5	1	1		1	1	1	1	1	1	1	1	1	1.5	1.5	6.1	6.1	1.5	30.7
49.8		1.5	1.5	1.5	1		1	1	1	1	1	1	1	1	1	1.5	1.5	6.1	6.1	1.5	31.2
50.6		1.5	1.5	1.5	1		1	1	1	1	1	1	1	1	1	1.5	1.5	6.1	6.1	2	31.7
51.4		1.5	1.5	1.5	1		1	1	1	1	1	1	1	1	1	1.5	2	6.1	6.1	2	32.2
53.0		1.5	1.5	1.5	1	1	1	1	1	1	1	1	1	1	1	1.5	2	6.1	6.1	2	33.2
53.8		1.5	1.5	1.5	1.5	1	1	1	1	1	1	1	1	1	1	1.5	2	6.1	6.1	2	33.7
54.6		2	1.5	1	1.5	1	1	1	1.5	1	1	1	1	1	1	1.5	2	6.1	6.1	2	34.2
55.4		2	1.5	1	1.5	1	1.5	1	1.5	1	1	1	1	1	1	1.5	2	6.1	6.1	2	34.7
56.2		2	1.5	1	1.5	1	1.5	1	1.5	1	1	1	1	1	1.5	1.5	2	6.1	6.1	2	35.2
57.0		2	1.5	1	1.5	1	1.5	1	1.5	1	1	1	1	1	1.5	2	2	6.1	6.1	2	35.7
57.8		2.5	1.5	1	1.5	1	1.5	1	1.5	1	1	1	1	1	1.5	2	2	6.1	6.1	2	36.2
58.6		2.5	1.5	1	1.5	1	1.5	1	1.5	1.5	1	1	1	1	1.5	2	2	6.1	6.1	2	36.7
59.4		2.5	1.5	1	1.5	1	1.5	1.5	1.5	1.5	1	1	1	1	1.5	2	2	6.1	6.1	2	37.2
60.2		2.5	1.5	1	1.5	1	1.5	1.5	1.5	1.5	1	1	1	1.5	1.5	2	2	6.1	6.1	2	37.7
61.0		2.5	1.5	1	1.5	1	1.5	1.5	2	1.5	1	1	1	1.5	1.5	2	2	6.1	6.1	2	38.2
61.8		2.5	1.5	1	1.5	1.5	1.5	1.5	2	1.5	1	1	1	1.5	1.5	2	2	6.1	6.1	2	38.7
62.6		2.5	1.5	1	1.5	1.5	1.5	1.5	2	1.5	1	1	1.5	1.5	1.5	2	2	6.1	6.1	2	39.2
63.4		2.5	1.5	1	1.5	1.5	1.5	1.5	2	1.5	1	1.5	1.5	1.5	1.5	2	2	6.1	6.1	2	39.7
64.2		2.5	1.5	1	1.5	1.5	2	1.5	2	1.5	1	1.5	1.5	1.5	1.5	2	2	6.1	6.1	2	40.2
65.0		2.5	1.5	1	1.5	1.5	2	1.5	2	1.5	1	1.5	1.5	1.5	1.5	2	2.5	6.1	6.1	2	40.7
65.8		2.5	1.5	1	1.5	1.5	2	1.5	2	1.5	1	1.5	1.5	1.5	2	2	2.5	6.1	6.1	2	41.2
66.6		2.5	1.5	1	1.5	1.5	2	1.5	2	1.5	1.5	1.5	1.5	1.5	2	2	2.5	6.1	6.1	2	41.7
67.4		2.5	1.5	1.5	1.5	1.5	2	1.5	2	1.5	1.5	1.5	1.5	1.5	2	2	2.5	6.1	6.1	2	42.2
68.2		2.5	1.5	1.5	1.5	1.5	2	2	2	1.5	1.5	1.5	1.5	1.5	2	2	2.5	6.1	6.1	2	42.7

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
69.0		2.5	1.5	1.5	1.5	1.5	2	2	2	1.5	1.5	1.5	1.5	2	2	2	2.5	6.1	6.1	2	**43.2**
69.8		2.5	1.5	1.5	1.5	1.5	2	2	2	1.5	1.5	1.5	1.5	2	2	2.5	2.5	6.1	6.1	2	**43.7**
70.6		2.5	2	1.5	1.5	1.5	2	2	2	1.5	1.5	1.5	1.5	2	2	2.5	2.5	6.1	6.1	2	**44.2**
71.4		2.5	2	1.5	1.5	1.5	2	2	2	1.5	1.5	1.5	1.5	2	2	2.5	2.5	6.1	6.1	2.5	**44.7**
72.2		2.5	2	1.5	1.5	1.5	2	2	2	1.5	1.5	1.5	2	2	2	2.5	2.5	6.1	6.1	2.5	**45.2**
73.0		3	2	1.5	1.5	1.5	2	2	2	1.5	1.5	1.5	2	2	2	2.5	2.5	6.1	6.1	2.5	**45.7**
73.8		3	2	1.5	2	1.5	2	2	2	1.5	1.5	1.5	2	2	2	2.5	2.5	6.1	6.1	2.5	**46.2**
74.6		3	2	1.5	2	1.5	2	2	2	1.5	1.5	2	2	2	2	2.5	2.5	6.1	6.1	2.5	**46.7**
75.4		3	2	1.5	2	1.5	2	2	2	2	1.5	2	2	2	2	2.5	2.5	6.1	6.1	2.5	**47.2**
76.2		3	2	1.5	2	1.5	2	2	2	2	2	2	2	2	2	2.5	2.5	6.1	6.1	2.5	**47.7**
77.0		3	2	1.5	2	2	2	2	2	2	2	2	2	2	2	2.5	2.5	6.1	6.1	2.5	**48.2**
77.8		3	2	1.5	2	2	2.5	2	2	2	2	2	2	2	2	2.5	2.5	6.1	6.1	2.5	**48.7**
78.6		3	2	2	2	2	2.5	2	2	2	2	2	2	2	2	2.5	2.5	6.1	6.1	2.5	**49.2**
79.4		3	2.5	2	2	2	2.5	2	2	2	2	2	2	2	2	2.5	2.5	6.1	6.1	2.5	**49.7**
80.2		3	2.5	2	2	2.5	2.5	2	2	2	2	2	2	2	2	2.5	2.5	6.1	6.1	2.5	**50.2**
81.0		3.5	2.5	2	2	2.5	2.5	2	2	2	2	2	2	2	2	2.5	2.5	6.1	6.1	2.5	**50.7**
81.8		3.5	2.5	2	2	2.5	2.5	2	2	2	2	2	2	2	2.5	2.5	2.5	6.1	6.1	2.5	**51.2**
82.6		3.5	2.5	2	2	2.5	2.5	2.5	2	2	2	2	2	2	2.5	2.5	2.5	6.1	6.1	2.5	**51.7**
83.4		3.5	2.5	2	2	2.5	2.5	2.5	2	2	2	2	2	2.5	2.5	2.5	2.5	6.1	6.1	2.5	**52.2**
84.2		3.5	2.5	1.5	2	2.5	2.5	2.5	2.5	2	2	2	2.5	2.5	2.5	2.5	2.5	6.1	6.1	2.5	**52.7**
85.0		3.5	2.5	1.5	2	2.5	2.5	2.5	2.5	2.5	2	2	2.5	2.5	2.5	2.5	2.5	6.1	6.1	2.5	**53.2**
85.8		3.5	2.5	1.5	2	2.5	2.5	2.5	2.5	2.5	2	2	2.5	2.5	2.5	3	2.5	6.1	6.1	2.5	**53.7**
86.6		3.5	2.5	1.5	2	2.5	2.5	2.5	2.5	2.5	2	2	2.5	2.5	3	3	2.5	6.1	6.1	2.5	**54.2**
87.4		3.5	2.5	1.5	2	2.5	2.5	2.5	2.5	2.5	2	2.5	2.5	2.5	3	3	2.5	6.1	6.1	2.5	**54.7**
88.2		3.5	3	1.5	2	2.5	2.5	2.5	2.5	2.5	2	2.5	2.5	2.5	3	3	2.5	6.1	6.1	2.5	**55.2**
89.0		3.5	3	1.5	2	2.5	2.5	2.5	2.5	2.5	2	2.5	2.5	3	3	3	2.5	6.1	6.1	2.5	**55.7**
89.8		3.5	3	1.5	2	2.5	3	2.5	2.5	2.5	2	2.5	2.5	3	3	3	2.5	6.1	6.1	2.5	**56.2**
90.6		3.5	3	1.5	2	2.5	3	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	2.5	6.1	6.1	2.5	**56.7**
91.4		3.5	3	2	2	2.5	3	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	2.5	6.1	6.1	2.5	**57.2**
92.2		3.5	3	2	2	2.5	3	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	3	6.1	6.1	2.5	**57.7**
93.0		3.5	3	2	2.5	2.5	3	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	3	6.1	6.1	2.5	**58.2**
93.8		3.5	3	2	2.5	2.5	3	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3.5	3	6.1	6.1	2.5	**58.7**
94.6		3.5	3.5	2	2.5	2.5	3	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3.5	3	6.1	6.1	2.5	**59.2**
95.4		3.5	3.5	2	2.5	2.5	3	3	2.5	2.5	2.5	2.5	2.5	3	3	3.5	3	6.1	6.1	2.5	**59.7**
96.2		3.5	3.5	2	2.5	2.5	3	3	2.5	2.5	2.5	2.5	2.5	3	3	3.5	3.5	6.1	6.1	2.5	**60.2**
97.0		3.5	3.5	2	3	2.5	3	3	2.5	2.5	2.5	2.5	2.5	3	3	3.5	3.5	6.1	6.1	2.5	**60.7**
97.8		3.5	3.5	2.5	3	2.5	3	3	2.5	2.5	2.5	2.5	2.5	3	3	3.5	3.5	6.1	6.1	2.5	**61.2**
98.6		3.5	3.5	2.5	3	2.5	3	3	2.5	2.5	2.5	3	2.5	3	3	3.5	3.5	6.1	6.1	2.5	**61.7**
99.4		3.5	3.5	2.5	3	2.5	3	3	3	2.5	2.5	3	2.5	3	3	3.5	3.5	6.1	6.1	2.5	**62.2**
100.2		3.5	3.5	2.5	3	2.5	3	3	3	3	2.5	3	2.5	3	3	3.5	3.5	6.1	6.1	2.5	**62.7**
101.0		3.5	3.5	2.5	3	2.5	3	3	3	3	2.5	3	3	3	3	3.5	3.5	6.1	6.1	2.5	**63.2**
101.8		3.5	3.5	2.5	3.5	2.5	3	3	3	3	2.5	3	3	3	3	3.5	3.5	6.1	6.1	2.5	**63.7**
102.6		3.5	3.5	3	3.5	2.5	3	3	3	3	2.5	3	3	3	3	3.5	3.5	6.1	6.1	2.5	**64.2**
103.4		3.5	3.5	3	3.5	2.5	3	3	3	3	2.5	3	3	3	3	3.5	4	6.1	6.1	2.5	**64.7**
104.2		3.5	3.5	3	3.5	2.5	3	3	3	3	2.5	3	3	3	3.5	3.5	4	6.1	6.1	2.5	**65.2**
105.0		4	3.5	3	3.5	2.5	3	3	3	3	2.5	3	3	3	3.5	3.5	4	6.1	6.1	2.5	**65.7**
105.8		4	3.5	3	3.5	2.5	3	3	3	3	3	3	3	3	3.5	3.5	4	6.1	6.1	2.5	**66.2**
106.6		4	3.5	3	3.5	3	3	3	3	3	3	3	3	3	3.5	3.5	4	6.1	6.1	2.5	**66.7**

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
107.4		4	3.5	3	3.5	3	3	3	3	3	3	3	3	3	3.5	4	4	6.1	6.1	2.5	**67.2**
108.2		4	3.5	3	3.5	3	3	3	3	3	3	3	3	3.5	3.5	4	4	6.1	6.1	2.5	**67.7**
109.0		4	4	3	3.5	3	3	3	3	3	3	3	3	3.5	3.5	4	4	6.1	6.1	2.5	**68.2**
109.8		4	4	3	3.5	3	3	3	3	3	3	3.5	3	3.5	3.5	4	4	6.1	6.1	2.5	**68.7**
110.6		4	4	3	3.5	3	3.5	3	3	3	3	3.5	3	3.5	3.5	4	4	6.1	6.1	2.5	**69.2**
111.4		4	4	3	3.5	3	3.5	3	3	3	3.5	3.5	3	3.5	3.5	4	4	6.1	6.1	2.5	**69.7**
112.2		4	4	3	3.5	3	3.5	3	3	3	3.5	3.5	3.5	3.5	3.5	4	4	6.1	6.1	2.5	**70.2**
113.0		4	4	3	3.5	3.5	3.5	3	3	3	3.5	3.5	3.5	3.5	3.5	4	4	6.1	6.1	2.5	**70.7**
113.8		4	4	3	3.5	3.5	3.5	3	3.5	3	3.5	3.5	3.5	3.5	3.5	4	4	6.1	6.1	2.5	**71.2**
114.6		4	4	3	3.5	3.5	3.5	3	3.5	3	3.5	3.5	3.5	3.5	3.5	4	4.5	6.1	6.1	2.5	**71.7**
115.4		4	4	3	3.5	3.5	3.5	3	3.5	3	3.5	3.5	3.5	3.5	3.5	4	4.5	6.1	6.1	3	**72.2**
116.2		4	4	3	3.5	3.5	3.5	3	3.5	3	3.5	3.5	3.5	3.5	4	4	4.5	6.1	6.1	3	**72.7**
117.0		4	4	3.5	3.5	3.5	3.5	3	3.5	3	3.5	3.5	3.5	3.5	4	4	4.5	6.1	6.1	3	**73.2**
117.8		4	4	3.5	3.5	3.5	3.5	3.5	3.5	3	3.5	3.5	3.5	3.5	4	4	4.5	6.1	6.1	3	**73.7**
118.6		4	4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4.5	6.1	6.1	3	**74.2**
119.4		4	4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4.5	4.5	6.1	6.1	3	**74.7**
120.2		4	4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4.5	4.5	6.1	6.1	3	**75.2**
121.0		4	4.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4.5	4.5	6.1	6.1	3	**75.7**
121.8		4	4.5	3.5	4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4.5	4.5	6.1	6.1	3	**76.2**
122.6		4	4.5	3.5	4	3.5	3.5	3.5	3.5	3.5	3.5	4	3.5	4	4	4.5	4.5	6.1	6.1	3	**76.7**
123.4		4	4.5	3.5	4	3.5	4	3.5	3.5	3.5	3.5	4	3.5	4	4	4.5	4.5	6.1	6.1	3	**77.2**
124.2		4	4.5	3.5	4	3.5	4	3.5	3.5	3.5	4	4	3.5	4	4	4.5	4.5	6.1	6.1	3	**77.7**
125.0		4	4.5	3.5	4	3.5	4	3.5	3.5	3.5	4	4	4	4	4	4.5	4.5	6.1	6.1	3	**78.2**
125.8		4	4.5	3.5	4	4	4	3.5	3.5	3.5	4	4	4	4	4	4.5	4.5	6.1	6.1	3	**78.7**
126.6		4	4.5	3.5	4	4	4	3.5	4	3.5	4	4	4	4	4	4.5	4.5	6.1	6.1	3	**79.2**
127.4		4	4.5	3.5	4	4	4	3.5	4	3.5	4	4	4	4	4	4.5	5	6.1	6.1	3	**79.7**
128.2		4	4.5	3.5	4	4	4	3.5	4	3.5	4	4	4	4	4	4.5	5	6.1	6.1	3.5	**80.2**
129.0		4	4.5	3.5	4	4	4	3.5	4	3.5	4	4	4	4	4.5	4.5	5	6.1	6.1	3.5	**80.7**
129.8		4	4.5	4	4	4	4	3.5	4	3.5	4	4	4	4	4.5	4.5	5	6.1	6.1	3.5	**81.2**
130.6		4	4.5	4	4	4	4	4	4	3.5	4	4	4	4	4.5	4.5	5	6.1	6.1	3.5	**81.7**
131.4		4	4.5	4	4	4	4	4	4	4	4	4	4	4	4.5	4.5	5	6.1	6.1	3.5	**82.2**
132.2		4	4.5	4	4	4	4	4	4	4	4	4	4	4	4.5	5	5	6.1	6.1	3.5	**82.7**
133.0		4	4.5	4	4	4	4	4	4	4	4	4	4	4.5	4.5	5	5	6.1	6.1	3.5	**83.2**
133.8		4	5	4	4	4	4	4	4	4	4	4	4	4.5	4.5	5	5	6.1	6.1	3.5	**83.7**
134.6		4	5	4	4.5	4	4	4	4	4	4	4	4	4.5	4.5	5	5	6.1	6.1	3.5	**84.2**
135.4		4	5	4	4.5	4	4	4	4	4	4	4.5	4	4.5	4.5	5	5	6.1	6.1	3.5	**84.7**
136.2		4	5	4	4.5	4	4.5	4	4	4	4	4.5	4	4.5	4.5	5	5	6.1	6.1	3.5	**85.2**
137.0		4	5	4	4.5	4	4.5	4	4	4	4.5	4.5	4	4.5	4.5	5	5	6.1	6.1	3.5	**85.7**
137.8		4	5	4	4.5	4	4.5	4	4	4	4.5	4.5	4.5	4.5	4.5	5	5	6.1	6.1	3.5	**86.2**
138.6		4	5	4	4.5	4.5	4.5	4	4	4	4.5	4.5	4.5	4.5	4.5	5	5	6.1	6.1	3.5	**86.7**
139.4		4	5	4	4.5	4.5	4.5	4	4.5	4	4.5	4.5	4.5	4.5	4.5	5	5	6.1	6.1	3.5	**87.2**
140.2		4	5	4	4.5	4.5	4.5	4	4.5	4	4.5	4.5	4.5	4.5	4.5	5	5.5	6.1	6.1	3.5	**87.7**
141.0		4	5	4	4.5	4.5	4.5	4	4.5	4	4.5	4.5	4.5	4.5	4.5	5	5.5	6.1	6.1	4	**88.2**
141.8		4	5	4	4.5	4.5	4.5	4	4.5	4	4.5	4.5	4.5	4.5	5	5	5.5	6.1	6.1	4	**88.7**
142.6		4	5	4.5	4.5	4.5	4.5	4	4.5	4	4.5	4.5	4.5	4.5	5	5	5.5	6.1	6.1	4	**89.2**
143.4		4	5	4.5	4.5	4.5	4.5	4.5	4.5	4	4.5	4.5	4.5	4.5	5	5	5.5	6.1	6.1	4	**89.7**
144.2		4	5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	5	5	5.5	6.1	6.1	4	**90.2**
145.0		4	5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	5	5.5	5.5	6.1	6.1	4	**90.7**

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
145.8		4	5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	5	5	5.5	5.5	6.1	6.1	4	**91.2**
146.6		4	5.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	5	5	5.5	5.5	6.1	6.1	4	**91.7**
147.4		4	5.5	4.5	5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	5	5	5.5	5.5	6.1	6.1	4	**92.2**
148.2		4	5.5	4.5	5	4.5	4.5	4.5	4.5	4.5	4.5	5	4.5	5	5	5.5	5.5	6.1	6.1	4	**92.7**
149.0		4	5.5	4.5	5	4.5	5	4.5	4.5	4.5	4.5	5	4.5	5	5	5.5	5.5	6.1	6.1	4	**93.2**
149.8		4	5.5	4.5	5	4.5	5	4.5	4.5	4.5	5	5	4.5	5	5	5.5	5.5	6.1	6.1	4	**93.7**
150.6		4	5.5	4.5	5	4.5	5	4.5	4.5	4.5	5	5	5	5	5	5.5	5.5	6.1	6.1	4	**94.2**
151.4		4	5.5	4.5	5	5	5	4.5	4.5	4.5	5	5	5	5	5	5.5	5.5	6.1	6.1	4	**94.7**
152.2		4	5.5	4.5	5	5	5	4.5	5	4.5	5	5	5	5	5	5.5	5.5	6.1	6.1	4	**95.2**
153.0		4	5.5	4.5	5	5	5	4.5	5	4.5	5	5	5	5	5	5.5	6	6.1	6.1	4	**95.7**
153.8		4	5.5	4.5	5	5	5	4.5	5	4.5	5	5	5	5	5	5.5	6	6.1	6.1	4.5	**96.2**
154.6		4	5.5	4.5	5	5	5	4.5	5	4.5	5	5	5	5	5.5	5.5	6	6.1	6.1	4.5	**96.7**
155.4		4	5.5	5	5	5	5	4.5	5	4.5	5	5	5	5	5.5	5.5	6	6.1	6.1	4.5	**97.2**
156.2		4	5.5	5	5	5	5	5	5	4.5	5	5	5	5	5.5	5.5	6	6.1	6.1	4.5	**97.7**
157.0		4	5.5	5	5	5	5	5	5	5	5	5	5	5	5.5	5.5	6	6.1	6.1	4.5	**98.2**
157.8		4	5.5	5	5	5	5	5	5	5	5	5	5	5	5.5	6	6	6.1	6.1	4.5	**98.7**
158.6		4	5.5	5	5	5	5	5	5	5	5	5	5	5.5	5.5	6	6	6.1	6.1	4.5	**99.2**
159.4		4	6	5	5	5	5	5	5	5	5	5	5	5.5	5.5	6	6	6.1	6.1	4.5	**99.7**
160.2		4	6	5	5.5	5	5	5	5	5	5	5	5	5.5	5.5	6	6	6.1	6.1	4.5	**100.2**
161.0		4	6	5	5.5	5	5	5	5	5	5	5.5	5	5.5	5.5	6	6	6.1	6.1	4.5	**100.7**
161.8		4	6	5	5.5	5	5.5	5	5	5	5	5.5	5	5.5	5.5	6	6	6.1	6.1	4.5	**101.2**
162.6		4	6	5	5.5	5	5.5	5	5	5	5.5	5.5	5	5.5	5.5	6	6	6.1	6.1	4.5	**101.7**
163.4		4	6	5	5.5	5	5.5	5	5	5	5.5	5.5	5.5	5.5	5.5	6	6	6.1	6.1	4.5	**102.2**
164.2		4	6	5	5.5	5.5	5.5	5	5	5	5.5	5.5	5.5	5.5	5.5	6	6	6.1	6.1	4.5	**102.7**
165.0		4	6	5	5.5	5.5	5.5	5	5.5	5	5.5	5.5	5.5	5.5	5.5	6	6	6.1	6.1	4.5	**103.2**
165.8		4	6	5	5.5	5.5	5.5	5	5.5	5	5.5	5.5	5.5	5.5	5.5	6	6.5	6.1	6.1	4.5	**103.7**
166.6		4	6	5	5.5	5.5	5.5	5	5.5	5	5.5	5.5	5.5	5.5	5.5	6	6.5	6.1	6.1	5	**104.2**
167.4		4	6	5	5.5	5.5	5.5	5	5.5	5	5.5	5.5	5.5	5.5	6	6	6.5	6.1	6.1	5	**104.7**
168.2		4	6	5.5	5.5	5.5	5.5	5	5.5	5	5.5	5.5	5.5	5.5	6	6	6.5	6.1	6.1	5	**105.2**
169.0		4	6	5.5	5.5	5.5	5.5	5.5	5.5	5	5.5	5.5	5.5	5.5	6	6	6.5	6.1	6.1	5	**105.7**
169.8		4	6	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	6	6	6.5	6.1	6.1	5	**106.2**
170.6		4	6	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	6	6.5	6.5	6.1	6.1	5	**106.7**
171.4		4	6	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	6	6	6.5	6.5	6.1	6.1	5	**107.2**
172.2		4	6	5.5	6	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	6	6	6.5	6.5	6.1	6.1	5	**107.7**
173.0		4	6	5.5	6	5.5	5.5	5.5	5.5	5.5	5.5	6	5.5	6	6	6.5	6.5	6.1	6.1	5	**108.2**
173.8		4	6	5.5	6	5.5	6	5.5	5.5	5.5	5.5	6	5.5	6	6	6.5	6.5	6.1	6.1	5	**108.7**
174.6		4	6	5.5	6	5.5	6	5.5	5.5	5.5	6	6	5.5	6	6	6.5	6.5	6.1	6.1	5	**109.2**
175.4		4	6	5.5	6	5.5	6	5.5	5.5	5.5	6	6	6	6	6	6.5	6.5	6.1	6.1	5	**109.7**
176.2		4	6	5.5	6	6	6	5.5	5.5	5.5	6	6	6	6	6	6.5	6.5	6.1	6.1	5	**110.2**
177.0		4	6	5.5	6	6	6	5.5	6	5.5	6	6	6	6	6	6.5	6.5	6.1	6.1	5	**110.7**
177.8		4	6	5.5	6	6	6	5.5	6	5.5	6	6	6	6	6	6.5	7	6.1	6.1	5	**111.2**
178.6		4	6	5.5	6	6	6	5.5	6	5.5	6	6	6	6	6	6.5	7	6.1	6.1	5.5	**111.7**
179.4		4	6	5.5	6	6	6	5.5	6	5.5	6	6	6	6	6.5	6.5	7	6.1	6.1	5.5	**112.2**
180.2		4	6	6	6	6	6	5.5	6	5.5	6	6	6	6	6.5	6.5	7	6.1	6.1	5.5	**112.7**
181.0		4	6	6	6	6	6	6	6	5.5	6	6	6	6	6.5	6.5	7	6.1	6.1	5.5	**113.2**
181.8		4	6	6	6	6	6	6	6	6	6	6	6	6	6.5	6.5	7	6.1	6.1	5.5	**113.7**
182.6		4	6	6	6	6	6	6	6	6	6	6	6	6	6.5	7	7	6.1	6.1	5.5	**114.2**
183.4		4	6	6	6	6	6	6	6	6	6	6	6	6.5	6.5	7	7	6.1	6.1	5.5	**114.7**

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
184.2		4	6	6	6.5	6	6	6	6	6	6	6	6	6.5	6.5	7	7	6.1	6.1	5.5	115.2
185.0		4	6	6	6.5	6	6	6	6	6	6	6.5	6	6.5	6.5	7	7	6.1	6.1	5.5	115.7
185.8		4	6	6	6.5	6	6.5	6	6	6	6	6.5	6	6.5	6.5	7	7	6.1	6.1	5.5	116.2
186.6		4	6	6	6.5	6	6.5	6	6	6	6.5	6.5	6	6.5	6.5	7	7	6.1	6.1	5.5	116.7
187.4		4	6	6	6.5	6	6.5	6	6	6	6.5	6.5	6.5	6.5	6.5	7	7	6.1	6.1	5.5	117.2
188.2		4	6	6	6.5	6.5	6.5	6	6	6	6.5	6.5	6.5	6.5	6.5	7	7	6.1	6.1	5.5	117.7
189.0		4	6	6	6.5	6.5	6.5	6	6.5	6	6.5	6.5	6.5	6.5	6.5	7	7	6.1	6.1	5.5	118.2
189.8		4	6	6	6.5	6.5	6.5	6	6.5	6	6.5	6.5	6.5	6.5	6.5	7	7.5	6.1	6.1	5.5	118.7
190.6		4	6	6	6.5	6.5	6.5	6	6.5	6	6.5	6.5	6.5	6.5	6.5	7	7.5	6.1	6.1	6	119.2
191.4		4	6	6	6.5	6.5	6.5	6	6.5	6	6.5	6.5	6.5	6.5	7	7	7.5	6.1	6.1	6	119.7
192.2		4	6	6.5	6.5	6.5	6.5	6	6.5	6	6.5	6.5	6.5	6.5	7	7	7.5	6.1	6.1	6	120.2
193.0		4	6	6.5	6.5	6.5	6.5	6.5	6.5	6	6.5	6.5	6.5	6.5	7	7	7.5	6.1	6.1	6	120.7
193.8		4	6	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	7	7	7.5	6.1	6.1	6	121.2
194.6		4	6	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	7	7.5	7.5	6.1	6.1	6	121.7
195.4		4	6	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	7	7	7.5	7.5	6.1	6.1	6	122.2
196.2		4	6	6.5	7	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	7	7	7.5	7.5	6.1	6.1	6	122.7
197.0		4	6	6.5	7	6.5	6.5	6.5	6.5	6.5	6.5	7	6.5	7	7	7.5	7.5	6.1	6.1	6	123.2
197.8		4	6	6.5	7	6.5	7	6.5	6.5	6.5	6.5	7	6.5	7	7	7.5	7.5	6.1	6.1	6	123.7
198.6		4	6	6.5	7	6.5	7	6.5	6.5	6.5	7	7	6.5	7	7	7.5	7.5	6.1	6.1	6	124.2
199.4		4	6	6.5	7	6.5	7	6.5	6.5	6.5	7	7	7	7	7	7.5	7.5	6.1	6.1	6	124.7
200.2		4	6	6.5	7	7	7	6.5	6.5	6.5	7	7	7	7	7	7.5	7.5	6.1	6.1	6	125.2
201.0		4	6	6.5	7	7	7	6.5	7	6.5	7	7	7	7	7	7.5	7.5	6.1	6.1	6	125.7
201.8		4	6	6.5	7	7	7	6.5	7	6.5	7	7	7	7	7	7.5	8	6.1	6.1	6	126.2
202.6		4	6	6.5	7	7	7	6.5	7	6.5	7	7	7	7	7	7.5	8	6.1	6.1	6.5	126.7
203.4		4	6	6.5	7	7	7	6.5	7	6.5	7	7	7	7	7.5	7.5	8	6.1	6.1	6.5	127.2
204.2		4	6	7	7	7	7	6.5	7	6.5	7	7	7	7	7.5	7.5	8	6.1	6.1	6.5	127.7
205.0		4	6	7	7	7	7	7	7	6.5	7	7	7	7	7.5	7.5	8	6.1	6.1	6.5	128.2
205.8		4	6	7	7	7	7	7	7	7	7	7	7	7	7.5	7.5	8	6.1	6.1	6.5	128.7
206.6		4	6	7	7	7	7	7	7	7	7	7	7	7	7.5	8	8	6.1	6.1	6.5	129.2
207.4		4	6	7	7	7	7	7	7	7	7	7	7	7.5	7.5	8	8	6.1	6.1	6.5	129.7
208.2		4	6	7	7.5	7	7	7	7	7	7	7	7	7.5	7.5	8	8	6.1	6.1	6.5	130.2
209.0		4	6	7	7.5	7	7	7	7	7	7	7.5	7	7.5	7.5	8	8	6.1	6.1	6.5	130.7
209.8		4	6	7	7.5	7	7.5	7	7	7	7	7.5	7	7.5	7.5	8	8	6.1	6.1	6.5	131.2
210.6		4	6	7	7.5	7	7.5	7	7	7	7.5	7.5	7	7.5	7.5	8	8	6.1	6.1	6.5	131.7
211.4		4	6	7	7.5	7	7.5	7	7	7	7.5	7.5	7.5	7.5	7.5	8	8	6.1	6.1	6.5	132.2
212.2		4	6	7	7.5	7.5	7.5	7	7	7	7.5	7.5	7.5	7.5	7.5	8	8	6.1	6.1	6.5	132.7
213.0		4	6	7	7.5	7.5	7.5	7	7.5	7	7.5	7.5	7.5	7.5	7.5	8	8	6.1	6.1	6.5	133.2
213.8		4	6	7	7.5	7.5	7.5	7	7.5	7	7.5	7.5	7.5	7.5	7.5	8	8.5	6.1	6.1	6.5	133.7
214.6		4	6	7	7.5	7.5	7.5	7	7.5	7	7.5	7.5	7.5	7.5	7.5	8	8.5	6.1	6.1	7	134.2
215.4		4	6	7	7.5	7.5	7.5	7	7.5	7	7.5	7.5	7.5	7.5	8	8	8.5	6.1	6.1	7	134.7
216.2		4	6	7.5	7.5	7.5	7.5	7	7.5	7	7.5	7.5	7.5	7.5	8	8	8.5	6.1	6.1	7	135.2
217.0		4	6	7.5	7.5	7.5	7.5	7.5	7.5	7	7.5	7.5	7.5	7.5	8	8	8.5	6.1	6.1	7	135.7
217.8		4	6	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	8	8	8.5	6.1	6.1	7	136.2
218.6		4	6	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	8	8.5	8.5	6.1	6.1	7	136.7
219.4		4	6	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	8	8	8.5	8.5	6.1	6.1	7	137.2
220.2		4	6	7.5	8	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	8	8	8.5	8.5	6.1	6.1	7	137.7
221.0		4	6	7.5	8	7.5	7.5	7.5	7.5	7.5	7.5	8	7.5	8	8	8.5	8.5	6.1	6.1	7	138.2
221.8		4	6	7.5	8	7.5	8	7.5	7.5	7.5	7.5	8	7.5	8	8	8.5	8.5	6.1	6.1	7	138.7

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
222.6		4	6	7.5	8	7.5	8	7.5	7.5	7.5	8	8	7.5	8	8	8.5	8.5	6.1	6.1	7	139.2
223.4		4	6	7.5	8	7.5	8	7.5	7.5	7.5	8	8	8	8	8	8.5	8.5	6.1	6.1	7	139.7
224.2		4	6	7.5	8	8	8	7.5	7.5	7.5	8	8	8	8	8	8.5	8.5	6.1	6.1	7	140.2
225.0		4	6	7.5	8	8	8	7.5	8	7.5	8	8	8	8	8	8.5	8.5	6.1	6.1	7	140.7
225.8		4	6	7.5	8	8	8	7.5	8	7.5	8	8	8	8	8	8.5	9	6.1	6.1	7	141.2
226.6		4	6	7.5	8	8	8	7.5	8	7.5	8	8	8	8	8	8.5	9	6.1	6.1	7.5	141.7
227.4		4	6	7.5	8	8	8	7.5	8	7.5	8	8	8	8	8.5	8.5	9	6.1	6.1	7.5	142.2
228.2		4	6	8	8	8	8	7.5	8	7.5	8	8	8	8	8.5	8.5	9	6.1	6.1	7.5	142.7
229.0		4	6	8	8	8	8	8	8	7.5	8	8	8	8	8.5	8.5	9	6.1	6.1	7.5	143.2
229.8		4	6	8	8	8	8	8	8	8	8	8	8	8	8.5	8.5	9	6.1	6.1	7.5	143.7
230.6		4	6	8	8	8	8	8	8	8	8	8	8	8	8.5	9	9	6.1	6.1	7.5	144.2
231.4		4	6	8	8	8	8	8	8	8	8	8	8	8.5	8.5	9	9	6.1	6.1	7.5	144.7
232.2		4	6	8	8.5	8	8	8	8	8	8	8	8	8.5	8.5	9	9	6.1	6.1	7.5	145.2
233.0		4	6	8	8.5	8	8	8	8	8	8	8.5	8	8.5	8.5	9	9	6.1	6.1	7.5	145.7
233.8		4	6	8	8.5	8	8.5	8	8	8	8	8.5	8	8.5	8.5	9	9	6.1	6.1	7.5	146.2
234.6		4	6	8	8.5	8	8.5	8	8	8	8.5	8.5	8	8.5	8.5	9	9	6.1	6.1	7.5	146.7
235.4		4	6	8	8.5	8	8.5	8	8	8	8.5	8.5	8.5	8.5	8.5	9	9	6.1	6.1	7.5	147.2
236.2		4	6	8	8.5	8.5	8.5	8	8	8	8.5	8.5	8.5	8.5	8.5	9	9	6.1	6.1	7.5	147.7
237.0		4	6	8	8.5	8.5	8.5	8	8.5	8	8.5	8.5	8.5	8.5	8.5	9	9	6.1	6.1	7.5	148.2
237.8		4	6	8	8.5	8.5	8.5	8	8.5	8	8.5	8.5	8.5	8.5	8.5	9	9.5	6.1	6.1	7.5	148.7
238.6		4	6	8	8.5	8.5	8.5	8	8.5	8	8.5	8.5	8.5	8.5	8.5	9	9.5	6.1	6.1	8	149.2
239.4		4	6	8	8.5	8.5	8.5	8	8.5	8	8.5	8.5	8.5	8.5	9	9	9.5	6.1	6.1	8	149.7
240.2		4	6	8	8.5	8.5	8.5	8.5	8.5	8	8.5	8.5	8.5	8.5	9	9	9.5	6.1	6.1	8	150.2
241.0		4	6	8	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	9	9	9.5	6.1	6.1	8	150.7
241.8		4	6	8	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	9	9.5	9.5	6.1	6.1	8	151.2
242.6		4	6	8	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	9	9	9.5	9.5	6.1	6.1	8	151.7
243.4		4	6	8	9	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	9	9	9.5	9.5	6.1	6.1	8	152.2
244.2		4	6	8	9	8.5	8.5	8.5	8.5	8.5	8.5	9	8.5	9	9	9.5	9.5	6.1	6.1	8	152.7
245.0		4	6	8	9	8.5	9	8.5	8.5	8.5	8.5	9	8.5	9	9	9.5	9.5	6.1	6.1	8	153.2
245.8		4	6	8	9	8.5	9	8.5	8.5	8.5	9	9	8.5	9	9	9.5	9.5	6.1	6.1	8	153.7
246.6		4	6	8	9	8.5	9	8.5	8.5	8.5	9	9	9	9	9	9.5	9.5	6.1	6.1	8	154.2
247.4		4	6	8	9	9	9	8.5	8.5	8.5	9	9	9	9	9	9.5	9.5	6.1	6.1	8	154.7
248.2		4	6	8	9	9	9	8.5	9	8.5	9	9	9	9	9	9.5	9.5	6.1	6.1	8	155.2
249.0		4	6	8	9	9	9	8.5	9	8.5	9	9	9	9	9	9.5	10	6.1	6.1	8	155.7
249.8		4	6	8	9	9	9	8.5	9	8.5	9	9	9	9	9	9.5	10	6.1	6.1	8.5	156.2
250.6		4	6	8	9	9	9	8.5	9	8.5	9	9	9	9	9.5	9.5	10	6.1	6.1	8.5	156.7
251.4		4	6	8	9	9	9	9	9	8.5	9	9	9	9	9.5	9.5	10	6.1	6.1	8.5	157.2
252.2		4	6	8	9	9	9	9	9	9	9	9	9	9	9.5	9.5	10	6.1	6.1	8.5	157.7
253.0		4	6	8	9	9	9	9	9	9	9	9	9	9	9.5	10	10	6.1	6.1	8.5	158.2
253.8		4	6	8	9	9	9	9	9	9	9	9	9	9.5	9.5	10	10	6.1	6.1	8.5	158.7
254.6		4	6	8	9.5	9	9	9	9	9	9	9	9	9.5	9.5	10	10	6.1	6.1	8.5	159.2
255.4		4	6	8	9.5	9	9	9	9	9	9	9.5	9	9.5	9.5	10	10	6.1	6.1	8.5	159.7
256.2		4	6	8	9.5	9	9.5	9	9	9	9	9.5	9	9.5	9.5	10	10	6.1	6.1	8.5	160.2
257.0		4	6	8	9.5	9	9.5	9	9	9	9.5	9.5	9	9.5	9.5	10	10	6.1	6.1	8.5	160.7
257.8		4	6	8	9.5	9	9.5	9	9	9	9.5	9.5	9.5	9.5	9.5	10	10	6.1	6.1	8.5	161.2
258.6		4	6	8	9.5	9.5	9.5	9	9	9	9.5	9.5	9.5	9.5	9.5	10	10	6.1	6.1	8.5	161.7
259.4		4	6	8	9.5	9.5	9.5	9	9.5	9	9.5	9.5	9.5	9.5	9.5	10	10	6.1	6.1	8.5	162.2
260.2		4	6	8	9.5	9.5	9.5	9	9.5	9	9.5	9.5	9.5	9.5	9.5	10	11	6.1	6.1	8.5	162.7

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
261.0		4	6	8	9.5	9.5	9.5	9	9.5	9	9.5	9.5	9.5	9.5	9.5	10	11	6.1	6.1	9	**163.2**
261.8		4	6	8	9.5	9.5	9.5	9	9.5	9	9.5	9.5	9.5	9.5	10	10	11	6.1	6.1	9	**163.7**
262.6		4	6	8	9.5	9.5	9.5	9.5	9.5	9	9.5	9.5	9.5	9.5	10	10	11	6.1	6.1	9	**164.2**
263.4		4	6	8	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	10	10	11	6.1	6.1	9	**164.7**
264.2		4	6	8	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	10	11	11	6.1	6.1	9	**165.2**
265.0		4	6	8	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	10	10	11	11	6.1	6.1	9	**165.7**
265.8		4	6	8	10	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	10	10	11	11	6.1	6.1	9	**166.2**
266.6		4	6	8	10	9.5	9.5	9.5	9.5	9.5	9.5	10	9.5	10	10	11	11	6.1	6.1	9	**166.7**
267.4		4	6	8	10	9.5	10	9.5	9.5	9.5	9.5	10	9.5	10	10	11	11	6.1	6.1	9	**167.2**
268.2		4	6	8	10	9.5	10	9.5	9.5	9.5	10	10	9.5	10	10	11	11	6.1	6.1	9	**167.7**
269.0		4	6	8	10	9.5	10	9.5	9.5	9.5	10	10	10	10	10	11	11	6.1	6.1	9	**168.2**
269.8		4	6	8	10	10	10	9.5	9.5	9.5	10	10	10	10	10	11	11	6.1	6.1	9	**168.7**
270.6		4	6	8	10	10	10	9.5	10	9.5	10	10	10	10	10	11	11	6.1	6.1	9	**169.2**
271.4		4	6	8	10	10	10	9.5	10	9.5	10	10	10	10	10	11	11	6.1	6.1	9	**169.7**
272.2		4	6	8	10	10	10	9.5	10	9.5	10	10	10	10	10	11	11	6.1	6.1	9.5	**170.2**
273.0		4	6	8	10	10	10	9.5	10	9.5	10	10	10	10	11	11	11	6.1	6.1	9.5	**170.7**
273.8		4	6	8	10	10	10	10	10	9.5	10	10	10	10	11	11	11	6.1	6.1	9.5	**171.2**
274.6		4	6	8	10	10	10	10	10	10	10	10	10	10	11	11	11	6.1	6.1	9.5	**171.7**
275.4		4	6	8	10	10	10	10	10	10	10	10	10	10	11	11	11	6.1	6.1	9.5	**172.2**
276.2		4	6	8	10	10	10	10	10	10	10	10	10	11	11	11	11	6.1	6.1	9.5	**172.7**
277.0		4	6	8	11	10	10	10	10	10	10	10	10	11	11	11	11	6.1	6.1	9.5	**173.2**
277.8		4	6	8	11	10	10	10	10	10	10	11	10	11	11	11	11	6.1	6.1	9.5	**173.7**
278.6		4	6	8	11	10	11	10	10	10	10	11	10	11	11	11	11	6.1	6.1	9.5	**174.2**
279.4		4	6	8	11	10	11	10	10	10	11	11	10	11	11	11	11	6.1	6.1	9.5	**174.7**
280.2		4	6	8	11	10	11	10	10	10	11	11	11	11	11	11	11	6.1	6.1	9.5	**175.2**
281.0		4	6	8	11	11	11	10	10	10	11	11	11	11	11	11	11	6.1	6.1	9.5	**175.7**
281.8		4	6	8	11	11	11	10	11	10	11	11	11	11	11	11	11	6.1	6.1	9.5	**176.2**
282.6		4	6	8	11	11	11	10	11	10	11	11	11	11	11	11	12	6.1	6.1	9.5	**176.7**
283.4		4	6	8	11	11	11	10	11	10	11	11	11	11	11	11	12	6.1	6.1	10	**177.2**
284.2		4	6	8	11	11	11	10	11	10	11	11	11	11	11	11	12	6.1	6.1	10	**177.7**
285.0		4	6	8	11	11	11	11	11	10	11	11	11	11	11	11	12	6.1	6.1	10	**178.2**
285.8		4	6	8	11	11	11	11	11	11	11	11	11	11	11	11	12	6.1	6.1	10	**178.7**
286.6		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10	**179.2**
287.4		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10	**179.7**
288.2		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10	**180.2**
289.0		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10	**180.7**
289.8		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10	**181.2**
290.6		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10	**181.7**
291.4		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10	**182.2**
292.2		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10	**182.7**
293.0		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10	**183.2**
293.8		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10	**183.7**
294.6		4	6	8	11	11	11	11	11	11	11	11	11	11	11	12	12	6.1	6.1	10.5	**184.2**
295.4		4	6	8	11	11	11	11	11	11	11	11	11	11	12	12	12	6.1	6.1	10.5	**184.7**
296.2		4	6	8	11	11	11	11	11	11	11	11	11	11	12	12	12	6.1	6.1	10.5	**185.2**
297.0		4	6	8	11	11	11	11	11	11	11	11	11	11	12	12	12	6.1	6.1	10.5	**185.7**
297.8		4	6	8	11	11	11	11	11	11	11	11	11	11	12	12	12	6.1	6.1	10.5	**186.2**
298.6		4	6	8	11	11	11	11	11	11	11	11	11	12	12	12	12	6.1	6.1	10.5	**186.7**

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
299.4		4	6	8	12	11	11	11	11	11	11	11	11	12	12	12	12	6.1	6.1	10.5	**187.2**
300.2		4	6	8	12	11	11	11	11	11	11	12	11	12	12	12	12	6.1	6.1	10.5	**187.7**
301.0		4	6	8	12	11	12	11	11	11	11	12	11	12	12	12	12	6.1	6.1	10.5	**188.2**
301.8		4	6	8	12	11	12	11	11	11	12	12	11	12	12	12	12	6.1	6.1	10.5	**188.7**
302.6		4	6	8	12	11	12	11	11	11	12	12	12	12	12	12	12	6.1	6.1	10.5	**189.2**
303.4		4	6	8	12	12	12	11	11	11	12	12	12	12	12	12	12	6.1	6.1	10.5	**189.7**
304.2		4	6	8	12	12	12	11	12	11	12	12	12	12	12	12	12	6.1	6.1	10.5	**190.2**
305.0 [a]		4	6	8	12	12	12	11	12	11	12	12	12	12	12	12	12	6.1	6.1	11	**190.7**
305.8		4	6	8	12	12	12	12	12	11	12	12	12	12	12	12	12	6.1	6.1	11	**191.2**
306.6		4	6	8	12	12	12	12	12	11	12	12	12	12	12	12	12	6.1	6.1	11	**191.7**
307.4		4	6	8	12	12	12	12	12	11	12	12	12	12	12	12	12	6.1	6.1	11	**192.2**
308.2		4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**192.7**
309.0		4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**193.2**
309.8		4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**193.7**
310.6		4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**194.2**
311.4		4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**194.7**
312.2		4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**195.2**
313.0		4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**195.7**
313.8		4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**196.2**
314.6		4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**196.7**
315.4 [b]		4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**197.2**
317.0	1	4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**198.2**
318.6	2	4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**199.2**
320.2	3	4	6	8	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**200.2**
321.8	3	4	6	9	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**201.2**
323.4	4	4	6	9	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**202.2**
325.0	4	5	6	9	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**203.2**
326.6	4	5	7	9	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**204.2**
328.2	4	5	7	10	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**205.2**
329.8	5	5	7	10	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**206.2**
331.4	5	6	7	10	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**207.2**
333.0	5	6	8	10	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**208.2**
334.6	5	6	8	11	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**209.2**
336.2	6	6	8	11	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**210.2**
337.8	6	7	8	11	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**211.2**
339.4	6	7	9	11	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**212.2**
341.0	6	7	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**213.2**
342.6	7	7	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**214.2**
344.2	7	8	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**215.2**
345.8	7	8	10	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**216.2**
347.4	8	8	10	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**217.2**
349.0	8	9	10	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**218.2**
350.6	8	9	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**219.2**
352.2	9	9	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**220.2**
353.8	9	10	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**221.2**
355.4	10	10	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**222.2**
357.0	10	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**223.2**

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
358.6	10	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**224.2**
360.2 [c]	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**225.2**
361.8	11	11	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6.1	6.1	11	**226.2**
363.4	11	11	13	12	12	12	12	12	12	12	12	12	12	12	12	12	13	6.1	6.1	11	**227.2**
365.0	11	11	13	13	12	12	12	12	12	12	12	12	12	12	12	12	13	6.1	6.1	11	**228.2**
366.6	11	11	13	13	12	12	12	12	12	12	12	12	12	12	13	12	13	6.1	6.1	11	**229.2**
368.2	11	11	13	13	13	12	12	12	12	12	12	12	12	12	13	12	13	6.1	6.1	11	**230.2**
369.8	11	11	13	13	13	12	12	13	12	12	12	12	12	12	13	12	13	6.1	6.1	11	**231.2**
371.4	11	11	13	13	13	12	12	13	12	13	12	12	12	12	13	12	13	6.1	6.1	11	**232.2**
373.0	11	11	13	13	13	12	12	13	12	13	12	13	12	12	13	12	13	6.1	6.1	11	**233.2**
374.6	11	11	13	13	13	13	12	13	12	13	12	13	12	12	13	12	13	6.1	6.1	11	**234.2**
376.2	11	11	13	13	13	13	12	13	12	13	12	13	12	12	13	13	13	6.1	6.1	11	**235.2**
377.8	11	11	13	13	13	13	13	13	12	13	12	13	12	12	13	13	13	6.1	6.1	11	**236.2**
379.4	11	11	13	13	13	13	13	13	12	13	12	13	12	13	13	13	13	6.1	6.1	11	**237.2**
381.0	11	11	13	13	13	13	13	13	13	13	12	13	12	13	13	13	13	6.1	6.1	11	**238.2**
382.6	11	11	13	13	13	13	13	13	13	13	13	13	12	13	13	13	13	6.1	6.1	11	**239.2**
384.2	11	11	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	6.1	6.1	11	**240.2**
385.8	11	11	14	13	13	13	13	13	13	13	13	13	13	13	13	13	13	6.1	6.1	11	**241.2**
387.4	11	11	14	13	13	13	13	13	13	13	13	13	13	13	13	13	14	6.1	6.1	11	**242.2**
389.0	11	11	14	14	13	13	13	13	13	13	13	13	13	13	13	13	14	6.1	6.1	11	**243.2**
390.6	11	11	14	14	13	13	13	13	13	13	13	13	13	13	14	13	14	6.1	6.1	11	**244.2**
392.2	11	11	14	14	14	13	13	13	13	13	13	13	13	13	14	13	14	6.1	6.1	11	**245.2**
393.8	11	11	14	14	14	13	13	14	13	13	13	13	13	13	14	13	14	6.1	6.1	11	**246.2**
395.4	11	11	14	14	14	13	13	14	13	14	13	13	13	13	14	13	14	6.1	6.1	11	**247.2**
397.0	11	11	14	14	14	13	13	14	13	14	13	14	13	13	14	13	14	6.1	6.1	11	**248.2**
398.6	11	11	14	14	14	14	13	14	13	14	13	14	13	13	14	13	14	6.1	6.1	11	**249.2**
400.2	11	11	14	14	14	14	13	14	13	14	13	14	13	13	14	14	14	6.1	6.1	11	**250.2**
401.8	11	11	14	14	14	14	14	14	13	14	13	14	13	13	14	14	14	6.1	6.1	11	**251.2**
403.4	11	11	14	14	14	14	14	14	13	14	13	14	13	14	14	14	14	6.1	6.1	11	**252.2**
405.0	11	11	14	14	14	14	14	14	14	14	13	14	13	14	14	14	14	6.1	6.1	11	**253.2**
406.6	11	11	14	14	14	14	14	14	14	14	14	14	13	14	14	14	14	6.1	6.1	11	**254.2**
408.2	11	11	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	6.1	6.1	11	**255.2**
409.8	11	11	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14	6.1	6.1	11	**256.2**
411.4	11	11	15	14	14	14	14	14	14	14	14	14	14	14	14	14	15	6.1	6.1	11	**257.2**
413.0	11	11	15	15	14	14	14	14	14	14	14	14	14	14	14	14	15	6.1	6.1	11	**258.2**
414.6	11	11	15	15	14	14	14	14	14	14	14	14	14	14	15	14	15	6.1	6.1	11	**259.2**
416.2	11	11	15	15	15	14	14	14	14	14	14	14	14	14	15	14	15	6.1	6.1	11	**260.2**
417.8	11	11	15	15	15	14	14	15	14	14	14	14	14	14	15	14	15	6.1	6.1	11	**261.2**
419.4	11	11	15	15	15	14	14	15	14	15	14	14	14	14	15	14	15	6.1	6.1	11	**262.2**
421.0	11	11	15	15	15	14	14	15	14	15	14	15	14	14	15	14	15	6.1	6.1	11	**263.2**
422.6	11	11	15	15	15	15	14	15	14	15	14	15	14	14	15	14	15	6.1	6.1	11	**264.2**
424.2	11	11	15	15	15	15	14	15	14	15	14	15	14	14	15	15	15	6.1	6.1	11	**265.2**
425.8	11	11	15	15	15	15	15	15	14	15	14	15	14	14	15	15	15	6.1	6.1	11	**266.2**
427.4	11	11	15	15	15	15	15	15	14	15	14	15	14	15	15	15	15	6.1	6.1	11	**267.2**
429.0	11	11	15	15	15	15	15	15	15	15	14	15	14	15	15	15	15	6.1	6.1	11	**268.2**
430.6	11	11	15	15	15	15	15	15	15	15	15	15	14	15	15	15	15	6.1	6.1	11	**269.2**
432.2	11	11	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	6.1	6.1	11	**270.2**
433.8	11	11	16	15	15	15	15	15	15	15	15	15	15	15	15	15	15	6.1	6.1	11	**271.2**

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
435.4	11	11	16	15	15	15	15	15	15	15	15	15	15	15	15	15	16	6.1	6.1	11	**272.2**
437.0	11	11	16	16	15	15	15	15	15	15	15	15	15	15	15	15	16	6.1	6.1	11	**273.2**
438.6	11	11	16	16	15	15	15	15	15	15	15	15	15	15	16	15	16	6.1	6.1	11	**274.2**
440.2	11	11	16	16	16	15	15	15	15	15	15	15	15	15	16	15	16	6.1	6.1	11	**275.2**
441.8	11	11	16	16	16	15	15	16	15	15	15	15	15	15	16	15	16	6.1	6.1	11	**276.2**
443.4	11	11	16	16	16	15	15	16	15	16	15	15	15	15	16	15	16	6.1	6.1	11	**277.2**
445.0	11	11	16	16	16	15	15	16	15	16	15	16	15	15	16	15	16	6.1	6.1	11	**278.2**
446.6	11	11	16	16	16	16	15	16	15	16	15	16	15	15	16	15	16	6.1	6.1	11	**279.2**
448.2	11	11	16	16	16	16	15	16	15	16	15	16	15	15	16	16	16	6.1	6.1	11	**280.2**
449.8	11	11	16	16	16	16	16	16	15	16	15	16	15	15	16	16	16	6.1	6.1	11	**281.2**
451.4	11	11	16	16	16	16	16	16	15	16	15	16	15	16	16	16	16	6.1	6.1	11	**282.2**
453.0	11	11	16	16	16	16	16	16	16	16	15	16	15	16	16	16	16	6.1	6.1	11	**283.2**
454.6	11	11	16	16	16	16	16	16	16	16	16	16	15	16	16	16	16	6.1	6.1	11	**284.2**
456.2	11	11	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	6.1	6.1	11	**285.2**
457.8	11	11	17	16	16	16	16	16	16	16	16	16	16	16	16	16	16	6.1	6.1	11	**286.2**
459.4	11	11	17	16	16	16	16	16	16	16	16	16	16	16	16	16	17	6.1	6.1	11	**287.2**
461.0	11	11	17	17	16	16	16	16	16	16	16	16	16	16	16	16	17	6.1	6.1	11	**288.2**
462.6	11	11	17	17	16	16	16	16	16	16	16	16	16	16	17	16	17	6.1	6.1	11	**289.2**
464.2	11	11	17	17	17	16	16	16	16	16	16	16	16	16	17	16	17	6.1	6.1	11	**290.2**
465.8	11	11	17	17	17	16	16	17	16	16	16	16	16	16	17	16	17	6.1	6.1	11	**291.2**
467.4	11	11	17	17	17	16	16	17	16	17	16	16	16	16	17	16	17	6.1	6.1	11	**292.2**
469.0	11	11	17	17	17	16	16	17	16	17	16	17	16	16	17	16	17	6.1	6.1	11	**293.2**
470.6	11	11	17	17	17	17	16	17	16	17	16	17	16	16	17	16	17	6.1	6.1	11	**294.2**
472.2	11	11	17	17	17	17	16	17	16	17	16	17	16	16	17	17	17	6.1	6.1	11	**295.2**
473.8	11	11	17	17	17	17	17	17	16	17	16	17	16	16	17	17	17	6.1	6.1	11	**296.2**
475.4	11	11	17	17	17	17	17	17	16	17	16	17	16	17	17	17	17	6.1	6.1	11	**297.2**
477.0	11	11	17	17	17	17	17	17	17	17	16	17	16	17	17	17	17	6.1	6.1	11	**298.2**
478.6	11	11	17	17	17	17	17	17	17	17	17	17	16	17	17	17	17	6.1	6.1	11	**299.2**
480.2	11	11	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	6.1	6.1	11	**300.2**
481.8	11	11	18	17	17	17	17	17	17	17	17	17	17	17	17	17	17	6.1	6.1	11	**301.2**
483.4	11	11	18	17	17	17	17	17	17	17	17	17	17	17	17	17	18	6.1	6.1	11	**302.2**
485.0	11	11	18	18	17	17	17	17	17	17	17	17	17	17	17	17	18	6.1	6.1	11	**303.2**
486.6	11	11	18	18	17	17	17	17	17	17	17	17	17	17	18	17	18	6.1	6.1	11	**304.2**
488.2	11	11	18	18	18	17	17	17	17	17	17	17	17	17	18	17	18	6.1	6.1	11	**305.2**
489.8	11	11	18	18	18	17	17	18	17	17	17	17	17	17	18	17	18	6.1	6.1	11	**306.2**
491.4	11	11	18	18	18	17	17	18	17	18	17	17	17	17	18	17	18	6.1	6.1	11	**307.2**
493.0	11	11	18	18	18	17	17	18	17	18	17	18	17	17	18	17	18	6.1	6.1	11	**308.2**
494.6	11	11	18	18	18	18	17	18	17	18	17	18	17	17	18	17	18	6.1	6.1	11	**309.2**
496.2	11	11	18	18	18	18	17	18	17	18	17	18	17	17	18	18	18	6.1	6.1	11	**310.2**
497.8	11	11	18	18	18	18	18	18	17	18	17	18	17	17	18	18	18	6.1	6.1	11	**311.2**
499.4	11	11	18	18	18	18	18	18	17	18	17	18	17	18	18	18	18	6.1	6.1	11	**312.2**
501.0	11	11	18	18	18	18	18	18	18	18	17	18	17	18	18	18	18	6.1	6.1	11	**313.2**
502.6	11	11	18	18	18	18	18	18	18	18	18	18	17	18	18	18	18	6.1	6.1	11	**314.2**
504.2	11	11	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	6.1	6.1	11	**315.2**
505.8	11	11	19	18	18	18	18	18	18	18	18	18	18	18	18	18	18	6.1	6.1	11	**316.2**
507.4	11	11	19	18	18	18	18	18	18	18	18	18	18	18	18	18	19	6.1	6.1	11	**317.2**
509.0	11	11	19	19	18	18	18	18	18	18	18	18	18	18	18	18	19	6.1	6.1	11	**318.2**
510.6	11	11	19	19	18	18	18	18	18	18	18	18	18	18	19	18	19	6.1	6.1	11	**319.2**

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
512.2	11	11	19	19	19	18	18	18	18	18	18	18	18	18	19	18	19	6.1	6.1	11	**320.2**
513.8	11	11	19	19	19	18	18	19	18	18	18	18	18	18	19	18	19	6.1	6.1	11	**321.2**
515.4	11	11	19	19	19	18	18	19	18	19	18	18	18	18	19	18	19	6.1	6.1	11	**322.2**
517.0	11	11	19	19	19	18	18	19	18	19	18	19	18	18	19	18	19	6.1	6.1	11	**323.2**
518.6	11	11	19	19	19	19	18	19	18	19	18	19	18	18	19	18	19	6.1	6.1	11	**324.2**
520.2	11	11	19	19	19	19	18	19	18	19	18	19	18	18	19	19	19	6.1	6.1	11	**325.2**
521.8	11	11	19	19	19	19	19	19	18	19	18	19	18	18	19	19	19	6.1	6.1	11	**326.2**
523.4	11	11	19	19	19	19	19	19	18	19	18	19	18	19	19	19	19	6.1	6.1	11	**327.2**
525.0	11	11	19	19	19	19	19	19	19	19	18	19	18	19	19	19	19	6.1	6.1	11	**328.2**
526.6	11	11	19	19	19	19	19	19	19	19	19	19	18	19	19	19	19	6.1	6.1	11	**329.2**
528.2	11	11	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	6.1	6.1	11	**330.2**
529.8	11	11	20	19	19	19	19	19	19	19	19	19	19	19	19	19	19	6.1	6.1	11	**331.2**
531.4	11	11	20	19	19	19	19	19	19	19	19	19	19	19	19	19	20	6.1	6.1	11	**332.2**
533.0	11	11	20	20	19	19	19	19	19	19	19	19	19	19	19	19	20	6.1	6.1	11	**333.2**
534.6	11	11	20	20	19	19	19	19	19	19	19	19	19	19	20	19	20	6.1	6.1	11	**334.2**
536.2	11	11	20	20	20	19	19	19	19	19	19	19	19	19	20	19	20	6.1	6.1	11	**335.2**
537.8	11	11	20	20	20	19	19	20	19	19	19	19	19	19	20	19	20	6.1	6.1	11	**336.2**
539.4	11	11	20	20	20	19	19	20	19	20	19	19	19	19	20	19	20	6.1	6.1	11	**337.2**
541.0	11	11	20	20	20	19	19	20	19	20	19	20	19	19	20	19	20	6.1	6.1	11	**338.2**
542.6	11	11	20	20	20	20	19	20	19	20	19	20	19	19	20	19	20	6.1	6.1	11	**339.2**
544.2	11	11	20	20	20	20	19	20	19	20	19	20	19	19	20	20	20	6.1	6.1	11	**340.2**
545.8	11	11	20	20	20	20	20	20	19	20	19	20	19	19	20	20	20	6.1	6.1	11	**341.2**
547.4	11	11	20	20	20	20	20	20	19	20	19	20	19	20	20	20	20	6.1	6.1	11	**342.2**
549.0	11	11	20	20	20	20	20	20	20	20	19	20	19	20	20	20	20	6.1	6.1	11	**343.2**
550.6	11	11	20	20	20	20	20	20	20	20	20	20	19	20	20	20	20	6.1	6.1	11	**344.2**
552.2	11	11	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	6.1	6.1	11	**345.2**
553.8	11	11	21	20	20	20	20	20	20	20	20	20	20	20	20	20	20	6.1	6.1	11	**346.2**
555.4	11	11	21	20	20	20	20	20	20	20	20	20	20	20	20	20	21	6.1	6.1	11	**347.2**
557.0	11	11	21	21	20	20	20	20	20	20	20	20	20	20	20	20	21	6.1	6.1	11	**348.2**
558.6	11	11	21	21	20	20	20	20	20	20	20	20	20	20	21	20	21	6.1	6.1	11	**349.2**
560.2	11	11	21	21	21	20	20	20	20	20	20	20	20	20	21	20	21	6.1	6.1	11	**350.2**
561.8	11	11	21	21	21	20	20	21	20	20	20	20	20	20	21	20	21	6.1	6.1	11	**351.2**
563.4	11	11	21	21	21	20	20	21	20	21	20	20	20	20	21	20	21	6.1	6.1	11	**352.2**
565.0	11	11	21	21	21	20	20	21	20	21	20	21	20	20	21	20	21	6.1	6.1	11	**353.2**
566.6	11	11	21	21	21	21	20	21	20	21	20	21	20	20	21	20	21	6.1	6.1	11	**354.2**
568.2	11	11	21	21	21	21	20	21	20	21	20	21	20	20	21	21	21	6.1	6.1	11	**355.2**
569.8	11	11	21	21	21	21	21	21	20	21	20	21	20	20	21	21	21	6.1	6.1	11	**356.2**
571.4	11	11	21	21	21	21	21	21	20	21	20	21	20	21	21	21	21	6.1	6.1	11	**357.2**
573.0	11	11	21	21	21	21	21	21	21	21	20	21	20	21	21	21	21	6.1	6.1	11	**358.2**
574.6	11	11	21	21	21	21	21	21	21	21	21	21	20	21	21	21	21	6.1	6.1	11	**359.2**
576.2	11	11	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	6.1	6.1	11	**360.2**
577.8	11	11	22	21	21	21	21	21	21	21	21	21	21	21	21	21	21	6.1	6.1	11	**361.2**
579.4	11	11	22	21	21	21	21	21	21	21	21	21	21	21	21	21	22	6.1	6.1	11	**362.2**
581.0	11	11	22	22	21	21	21	21	21	21	21	21	21	21	21	21	22	6.1	6.1	11	**363.2**
582.6	11	11	22	22	21	21	21	21	21	21	21	21	21	21	22	21	22	6.1	6.1	11	**364.2**
584.2	11	11	22	22	22	21	21	21	21	21	21	21	21	21	22	21	22	6.1	6.1	11	**365.2**
585.8	11	11	22	22	22	21	21	22	21	21	21	21	21	21	22	21	22	6.1	6.1	11	**366.2**
587.4	11	11	22	22	22	21	21	22	21	22	21	21	21	21	22	21	22	6.1	6.1	11	**367.2**

Total Spill	John Day Dam Spill Patterns with TSWs in Bays 18 & 19 # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
589.0	11	11	22	22	22	21	21	22	21	22	21	22	21	21	22	21	22	6.1	6.1	11	**368.2**
590.6	11	11	22	22	22	22	21	22	21	22	21	22	21	21	22	21	22	6.1	6.1	11	**369.2**
592.2	11	11	22	22	22	22	21	22	21	22	21	22	21	21	22	22	22	6.1	6.1	11	**370.2**
593.8	11	11	22	22	22	22	22	22	21	22	21	22	21	21	22	22	22	6.1	6.1	11	**371.2**
595.4	11	11	22	22	22	22	22	22	21	22	21	22	21	22	22	22	22	6.1	6.1	11	**372.2**
597.0	11	11	22	22	22	22	22	22	22	22	21	22	21	22	22	22	22	6.1	6.1	11	**373.2**
598.6	11	11	22	22	22	22	22	22	22	22	22	22	21	22	22	22	22	6.1	6.1	11	**374.2**
600.2 [d]	11	11	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	6.1	6.1	11	**375.2**

a. Begin transition from juvenile fish patterns to flood patterns.

b. Gate 20 blocked at 10.3 ft opening.

c. Gate 1 blocked at 10.3 ft opening.

d. TSWs do not affect spillway flood capacity until flow ≥1,492 kcfs. Recommend remove TSWs before river flow >685 kcfs.

Table JDA-9. [*pg 1 of 9*] John Day Dam Spill Pattern with No Temporary Spillway Weirs (TSWs).
See notes at end of table.

Total Spill	John Day Dam Spill Patterns with No TSWs # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
9.6		3	2	1														CLOSED	CLOSED		6
11.2		3	2	2														CLOSED	CLOSED		7
12.8		3	3	2														CLOSED	CLOSED		8
14.4		3	3	2	1													CLOSED	CLOSED		9
16.0		3	3	2	2													CLOSED	CLOSED		10
17.6		3	3	2	2	1												CLOSED	CLOSED		11
19.2		3	3	2	2	2												CLOSED	CLOSED		12
20.8		3	3	2	2	2	1											CLOSED	CLOSED		13
22.4		3	3	2	2	2	2											CLOSED	CLOSED		14
24.0		3	3	2	2	2	2	1										CLOSED	CLOSED		15
25.6		3	3	3	2	2	2	1										CLOSED	CLOSED		16
27.2		3	3	3	2	2	2	2										CLOSED	CLOSED		17
28.8		3	3	3	2	2	2	2	1									CLOSED	CLOSED		18
30.4		3	3	3	3	2	2	2	1									CLOSED	CLOSED		19
32.0		3	3	3	3	3	2	2	1									CLOSED	CLOSED		20
33.6		3	3	3	3	3	2	2	2									CLOSED	CLOSED		21
35.2		3	3	3	3	3	2	2	2	1								CLOSED	CLOSED		22
36.8		3	3	3	3	3	2	2	2	2								CLOSED	CLOSED		23
38.4		3	3	3	3	3	2	2	2	2	1							CLOSED	CLOSED		24
40.0		3	3	3	3	3	2	2	2	2	2							CLOSED	CLOSED		25
41.6		3	3	3	3	3	2	2	2	2	2	1						CLOSED	CLOSED		26
43.2		3	3	3	3	3	2	2	2	2	2	2						CLOSED	CLOSED		27
44.8		3	3	3	3	3	3	2	2	2	2	2						CLOSED	CLOSED		28
46.4		3	3	3	3	3	3	2	2	2	2	2	1					CLOSED	CLOSED		29
48.0		3	3	3	3	3	3	2	2	2	2	2	2					CLOSED	CLOSED		30
49.6		3	3	3	3	3	3	2	2	2	2	2	2	1				CLOSED	CLOSED		31
51.2		3	3	3	3	3	3	3	2	2	2	2	2	1				CLOSED	CLOSED		32
52.8		3	3	3	3	3	3	3	2	2	2	2	2	2				CLOSED	CLOSED		33
54.4		3	3	3	3	3	3	3	2	2	2	2	2	2	1			CLOSED	CLOSED		34
56.0		3	3	3	3	3	3	3	2	2	2	2	2	2	2			CLOSED	CLOSED		35
57.6		3	3	3	3	3	3	3	2	2	2	2	2	2	2	1		CLOSED	CLOSED		36
59.2		3	3	3	3	3	3	3	2	2	2	2	2	2	2	2		CLOSED	CLOSED		37
60.8		3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	1	CLOSED	CLOSED		38
62.4		4	3	3	3	3	3	3	2	2	2	2	2	2	2	2	1	CLOSED	CLOSED		39
64.0		4	4	3	3	3	3	3	2	2	2	2	2	2	2	2	1	CLOSED	CLOSED		40
65.6		4	4	4	3	3	3	3	2	2	2	2	2	2	2	2	1	CLOSED	CLOSED		41
67.2		4	4	4	4	3	3	3	2	2	2	2	2	2	2	2	1	CLOSED	CLOSED		42
68.8		4	4	4	4	3	3	3	3	2	2	2	2	2	2	2	1	CLOSED	CLOSED		43
70.4		4	4	4	4	3	3	3	3	3	2	2	2	2	2	2	1	CLOSED	CLOSED		44
72.0		4	4	4	4	4	3	3	3	3	2	2	2	2	2	2	1	CLOSED	CLOSED		45

Total Spill	John Day Dam Spill Patterns with No TSWs # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
73.6		4	5	4	4	4	3	3	3	3	2	2	2	2	2	2	1	CLOSED	CLOSED		46
75.2		4	5	4	4	4	3	3	3	3	2	2	2	2	2	2	2	CLOSED	CLOSED		47
76.8		4	5	4	4	4	3	3	3	3	3	2	2	2	2	2	2	CLOSED	CLOSED		48
78.4		4	5	4	4	4	3	3	3	3	3	3	2	2	2	2	2	CLOSED	CLOSED		49
80.0		4	5	5	4	4	3	3	3	3	3	3	2	2	2	2	2	CLOSED	CLOSED		50
81.6		4	5	5	4	4	4	3	3	3	3	3	2	2	2	2	2	CLOSED	CLOSED		51
83.2		4	5	5	4	4	4	3	3	3	3	3	3	2	2	2	2	CLOSED	CLOSED		52
84.8		4	5	5	4	4	4	3	3	3	3	3	3	3	2	2	2	CLOSED	CLOSED		53
86.4		4	5	5	4	4	4	3	3	3	3	3	3	3	3	2	2	CLOSED	CLOSED		54
88.0		4	5	5	4	4	4	3	3	3	3	3	3	3	3	3	2	CLOSED	CLOSED		55
89.6		4	5	5	4	4	4	4	3	3	3	3	3	3	3	3	2	CLOSED	CLOSED		56
91.2		4	5	5	4	4	4	4	4	3	3	3	3	3	3	3	2	CLOSED	CLOSED		57
92.8		4	5	5	5	4	4	4	4	3	3	3	3	3	3	3	2	CLOSED	CLOSED		58
94.4		4	5	5	5	4	4	4	4	4	3	3	3	3	3	3	2	CLOSED	CLOSED		59
96.0		4	5	5	5	4	4	4	4	4	4	3	3	3	3	3	2	CLOSED	CLOSED		60
97.6		4	5	5	5	4	4	4	4	4	4	3	3	3	3	3	3	CLOSED	CLOSED		61
99.2		4	5	5	5	4	4	4	4	4	4	4	3	3	3	3	3	CLOSED	CLOSED		62
100.8		4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	CLOSED	CLOSED		63
102.4		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	CLOSED	CLOSED		64
104.0		4	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	CLOSED	CLOSED		65
105.6		4	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	CLOSED	CLOSED		66
107.2		4	5	5	4	4	4	4	4	4	4	4	4	4	4	4	5	CLOSED	CLOSED		67
108.8		4	5	5	4	4	4	4	4	4	4	4	4	4	5	4	5	CLOSED	CLOSED		68
110.4		4	5	5	5	4	4	4	4	4	4	4	4	4	5	4	5	CLOSED	CLOSED		69
112.0		4	5	5	5	4	4	5	4	4	4	4	4	4	5	4	5	CLOSED	CLOSED		70
113.6		4	5	5	5	4	4	5	4	5	4	4	4	4	5	4	5	CLOSED	CLOSED		71
115.2		4	5	5	5	4	4	5	4	5	4	5	4	4	5	4	5	CLOSED	CLOSED		72
116.8		4	5	5	5	5	4	5	4	5	4	5	4	4	5	4	5	CLOSED	CLOSED		73
118.4		4	5	5	5	5	4	5	4	5	4	5	4	4	5	5	5	CLOSED	CLOSED		74
120.0		4	5	5	5	5	5	5	4	5	4	5	4	4	5	5	5	CLOSED	CLOSED		75
121.6		4	5	5	5	5	5	5	4	5	4	5	4	5	5	5	5	CLOSED	CLOSED		76
123.2		4	5	5	5	5	5	5	5	5	4	5	4	5	5	5	5	CLOSED	CLOSED		77
124.8		4	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	CLOSED	CLOSED		78
126.4		4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	CLOSED	CLOSED		79
128.0		4	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	CLOSED	CLOSED		80
129.6		4	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	CLOSED	CLOSED		81
131.2		4	6	6	5	5	5	5	5	5	5	5	5	5	5	5	6	CLOSED	CLOSED		82
132.8		4	6	6	5	5	5	5	5	5	5	5	5	5	6	5	6	CLOSED	CLOSED		83
134.4		4	6	6	6	5	5	5	5	5	5	5	5	5	6	5	6	CLOSED	CLOSED		84
136.0		4	6	6	6	5	5	6	5	5	5	5	5	5	6	5	6	CLOSED	CLOSED		85
137.6		4	6	6	6	5	5	6	5	6	5	5	5	5	6	5	6	CLOSED	CLOSED		86
139.2		4	6	6	6	5	5	6	5	6	5	6	5	5	6	5	6	CLOSED	CLOSED		87
140.8		4	6	6	6	6	5	6	5	6	5	6	5	5	6	5	6	CLOSED	CLOSED		88

Total Spill	John Day Dam Spill Patterns with No TSWs # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
142.4		4	6	6	6	6	5	6	5	6	5	6	5	5	6	6	6	CLOSED	CLOSED		89
144.0		4	6	6	6	6	6	6	5	6	5	6	5	5	6	6	6	CLOSED	CLOSED		90
145.6		4	6	6	6	6	6	6	5	6	5	6	5	6	6	6	6	CLOSED	CLOSED		91
147.2		4	6	6	6	6	6	6	6	6	5	6	5	6	6	6	6	CLOSED	CLOSED		92
148.8		4	6	6	6	6	6	6	6	6	6	6	5	6	6	6	6	CLOSED	CLOSED		93
150.4		4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	CLOSED	CLOSED		94
152.0		4	6	7	6	6	6	6	6	6	6	6	6	6	6	6	6	CLOSED	CLOSED		95
153.6		4	6	7	6	6	6	6	6	6	6	6	6	6	6	6	7	CLOSED	CLOSED		96
155.2		4	6	7	6	6	6	6	6	6	6	6	6	6	7	6	7	CLOSED	CLOSED		97
156.8		4	6	7	7	6	6	6	6	6	6	6	6	6	7	6	7	CLOSED	CLOSED		98
158.4		4	6	7	7	6	6	7	6	6	6	6	6	6	7	6	7	CLOSED	CLOSED		99
160.0		4	6	7	7	6	6	7	6	7	6	6	6	6	7	6	7	CLOSED	CLOSED		100
161.6		4	6	7	7	6	6	7	6	7	6	7	6	6	7	6	7	CLOSED	CLOSED		101
163.2		4	6	7	7	7	6	7	6	7	6	7	6	6	7	6	7	CLOSED	CLOSED		102
164.8		4	6	7	7	7	6	7	6	7	6	7	6	6	7	7	7	CLOSED	CLOSED		103
166.4		4	6	7	7	7	7	7	6	7	6	7	6	6	7	7	7	CLOSED	CLOSED		104
168.0		4	6	7	7	7	7	7	6	7	6	7	6	7	7	7	7	CLOSED	CLOSED		105
169.6		4	6	7	7	7	7	7	7	7	6	7	6	7	7	7	7	CLOSED	CLOSED		106
171.2		4	6	7	7	7	7	7	7	7	7	7	6	7	7	7	7	CLOSED	CLOSED		107
172.8		4	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	CLOSED	CLOSED		108
174.4		4	6	8	7	7	7	7	7	7	7	7	7	7	7	7	7	CLOSED	CLOSED		109
176.0		4	6	8	7	7	7	7	7	7	7	7	7	7	7	7	8	CLOSED	CLOSED		110
177.6		4	6	8	7	7	7	7	7	7	7	7	7	7	8	7	8	CLOSED	CLOSED		111
179.2		4	6	8	8	7	7	7	7	7	7	7	7	7	8	7	8	CLOSED	CLOSED		112
180.8		4	6	8	8	7	7	8	7	7	7	7	7	7	8	7	8	CLOSED	CLOSED		113
182.4		4	6	8	8	7	7	8	7	8	7	7	7	7	8	7	8	CLOSED	CLOSED		114
184.0		4	6	8	8	7	7	8	7	8	7	8	7	7	8	7	8	CLOSED	CLOSED		115
185.6		4	6	8	8	8	7	8	7	8	7	8	7	7	8	7	8	CLOSED	CLOSED		116
187.2		4	6	8	8	8	7	8	7	8	7	8	7	7	8	8	8	CLOSED	CLOSED		117
188.8		4	6	8	8	8	8	8	7	8	7	8	7	7	8	8	8	CLOSED	CLOSED		118
190.4		4	6	8	8	8	8	8	7	8	7	8	7	8	8	8	8	CLOSED	CLOSED		119
192.0		4	6	8	8	8	8	8	8	8	7	8	7	8	8	8	8	CLOSED	CLOSED		120
193.6		4	6	8	8	8	8	8	8	8	8	8	7	8	8	8	8	CLOSED	CLOSED		121
195.2		4	6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	CLOSED	CLOSED		122
196.8		4	6	8	8	8	8	8	8	8	8	8	8	8	8	8	9	CLOSED	CLOSED		123
198.4		4	6	8	8	8	8	8	8	8	8	8	8	8	9	8	9	CLOSED	CLOSED		124
200.0		4	6	8	9	8	8	8	8	8	8	8	8	8	9	8	9	CLOSED	CLOSED		125
201.6		4	6	8	9	8	8	9	8	8	8	8	8	8	9	8	9	CLOSED	CLOSED		126
203.2		4	6	8	9	8	8	9	8	9	8	8	8	8	9	8	9	CLOSED	CLOSED		127
204.8		4	6	8	9	8	8	9	8	9	8	9	8	8	9	8	9	CLOSED	CLOSED		128
206.4		4	6	8	9	9	8	9	8	9	8	9	8	8	9	8	9	CLOSED	CLOSED		129
208.0		4	6	8	9	9	8	9	8	9	8	9	8	8	9	9	9	CLOSED	CLOSED		130
209.6		4	6	8	9	9	9	9	8	9	8	9	8	8	9	9	9	CLOSED	CLOSED		131

Total Spill	John Day Dam Spill Patterns with No TSWs # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
211.2		4	6	8	9	9	9	9	8	9	8	9	8	9	9	9	9	CLOSED	CLOSED		132
212.8		4	6	8	9	9	9	9	9	9	8	9	8	9	9	9	9	CLOSED	CLOSED		133
214.4		4	6	8	9	9	9	9	9	9	9	9	8	9	9	9	9	CLOSED	CLOSED		134
216.0		4	6	8	9	9	9	9	9	9	9	9	9	9	9	9	9	CLOSED	CLOSED		135
217.6		4	6	8	9	9	9	9	9	9	9	9	9	9	9	9	10	CLOSED	CLOSED		136
219.2		4	6	8	9	9	9	9	9	9	9	9	9	9	10	9	10	CLOSED	CLOSED		137
220.8		4	6	8	10	9	9	9	9	9	9	9	9	9	10	9	10	CLOSED	CLOSED		138
222.4		4	6	8	10	9	9	10	9	9	9	9	9	9	10	9	10	CLOSED	CLOSED		139
224.0		4	6	8	10	9	9	10	9	10	9	9	9	9	10	9	10	CLOSED	CLOSED		140
225.6		4	6	8	10	9	9	10	9	10	9	10	9	9	10	9	10	CLOSED	CLOSED		141
227.2		4	6	8	10	10	9	10	9	10	9	10	9	9	10	9	10	CLOSED	CLOSED		142
228.8		4	6	8	10	10	9	10	9	10	9	10	9	9	10	10	10	CLOSED	CLOSED		143
230.4		4	6	8	10	10	10	10	9	10	9	10	9	9	10	10	10	CLOSED	CLOSED		144
232.0		4	6	8	10	10	10	10	9	10	9	10	9	10	10	10	10	CLOSED	CLOSED		145
233.6		4	6	8	10	10	10	10	10	10	9	10	9	10	10	10	10	CLOSED	CLOSED		146
235.2		4	6	8	10	10	10	10	10	10	10	10	9	10	10	10	10	CLOSED	CLOSED		147
236.8		4	6	8	10	10	10	10	10	10	10	10	10	10	10	10	10	CLOSED	CLOSED		148
238.4		4	6	8	10	10	10	10	10	10	10	10	10	10	10	10	11	CLOSED	CLOSED		149
240.0		4	6	8	10	10	10	10	10	10	10	10	10	10	11	10	11	CLOSED	CLOSED		150
241.6		4	6	8	10	10	10	11	10	10	10	10	10	10	11	10	11	CLOSED	CLOSED		151
243.2		4	6	8	10	10	10	11	10	11	10	10	10	10	11	10	11	CLOSED	CLOSED		152
244.8		4	6	8	10	10	10	11	10	11	10	11	10	10	11	10	11	CLOSED	CLOSED		153
246.4		4	6	8	10	11	10	11	10	11	10	11	10	10	11	10	11	CLOSED	CLOSED		154
248.0		4	6	8	10	11	10	11	10	11	10	11	10	10	11	11	11	CLOSED	CLOSED		155
249.6		4	6	8	10	11	11	11	10	11	10	11	10	10	11	11	11	CLOSED	CLOSED		156
251.2		4	6	8	10	11	11	11	10	11	10	11	10	11	11	11	11	CLOSED	CLOSED		157
252.8		4	6	8	10	11	11	11	11	11	10	11	10	11	11	11	11	CLOSED	CLOSED		158
254.4		4	6	8	10	11	11	11	11	11	11	11	10	11	11	11	11	CLOSED	CLOSED		159
256.0		4	6	8	10	11	11	11	11	11	11	11	11	11	11	11	11	CLOSED	CLOSED		160
257.6		4	6	8	10	11	11	11	11	11	11	11	11	11	12	11	11	CLOSED	CLOSED		161
259.2		4	6	8	10	11	11	12	11	11	11	11	11	11	12	11	11	CLOSED	CLOSED		162
260.8		4	6	8	10	11	11	12	11	12	11	11	11	11	12	11	11	CLOSED	CLOSED		163
262.4		4	6	8	10	11	11	12	11	12	11	12	11	11	12	11	11	CLOSED	CLOSED		164
264.0		4	6	8	10	12	11	12	11	12	11	12	11	11	12	11	11	CLOSED	CLOSED		165
265.6		4	6	8	10	12	11	12	11	12	11	12	11	11	12	12	11	CLOSED	CLOSED		166
267.2		4	6	8	10	12	12	12	11	12	11	12	11	11	12	12	11	CLOSED	CLOSED		167
268.8		4	6	8	10	12	12	12	11	12	11	12	11	12	12	12	11	CLOSED	CLOSED		168
270.4		4	6	8	10	12	12	12	12	12	11	12	11	12	12	12	11	CLOSED	CLOSED		169
272.0		4	6	8	10	12	12	12	12	12	12	12	11	12	12	12	11	CLOSED	CLOSED		170
273.6		4	6	8	10	12	12	12	12	12	12	12	12	12	12	12	11	CLOSED	CLOSED		171
275.2		4	6	8	10	12	12	12	12	12	12	12	12	12	13	12	11	CLOSED	CLOSED		172
276.8		4	6	8	10	12	12	13	12	12	12	12	12	12	13	12	11	CLOSED	CLOSED		173
278.4		4	6	8	10	12	12	13	12	13	12	12	12	12	13	12	11	CLOSED	CLOSED		174

Total Spill	John Day Dam Spill Patterns with No TSWs # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
280.0		4	6	8	10	12	12	13	12	13	12	13	12	12	13	12	11	CLOSED	CLOSED		175
281.6		4	6	8	10	12	12	13	12	13	12	13	12	12	13	13	11	CLOSED	CLOSED		176
283.2		4	6	8	10	12	13	13	12	13	12	13	12	12	13	13	11	CLOSED	CLOSED		177
284.8		4	6	8	10	12	13	13	12	13	12	13	12	13	13	13	11	CLOSED	CLOSED		178
286.4		4	6	8	10	12	13	13	13	13	12	13	12	13	13	13	11	CLOSED	CLOSED		179
288.0		4	6	8	10	12	13	13	13	13	13	13	12	13	13	13	11	CLOSED	CLOSED		180
289.6		4	6	8	10	12	13	13	13	13	13	13	13	13	13	13	11	CLOSED	CLOSED		181
291.2		4	6	8	10	12	13	13	13	13	13	13	13	13	14	13	11	CLOSED	CLOSED		182
292.8		4	6	8	10	12	13	14	13	13	13	13	13	13	14	13	11	CLOSED	CLOSED		183
294.4		4	6	8	10	12	13	14	13	14	13	13	13	13	14	13	11	CLOSED	CLOSED		184
296.0		4	6	8	10	12	13	14	13	14	13	14	13	13	14	13	11	CLOSED	CLOSED		185
297.6		4	6	8	10	12	13	14	13	14	13	14	13	13	14	14	11	CLOSED	CLOSED		186
299.2		4	6	8	10	12	14	14	13	14	13	14	13	13	14	14	11	CLOSED	CLOSED		187
300.8		4	6	8	10	12	14	14	13	14	13	14	13	14	14	14	11	CLOSED	CLOSED		188
302.4		4	6	8	10	12	14	14	14	14	13	14	13	14	14	14	11	CLOSED	CLOSED		189
304.0		4	6	8	10	12	14	14	14	14	14	14	13	14	14	14	11	CLOSED	CLOSED		190
305.6		4	6	8	10	12	14	14	14	14	14	14	14	14	14	14	11	CLOSED	CLOSED		191
307.2		4	6	8	10	12	14	14	14	14	14	14	14	14	15	14	11	CLOSED	CLOSED		192
308.8		4	6	8	10	12	14	15	14	14	14	14	14	14	15	14	11	CLOSED	CLOSED		193
310.4		4	6	8	10	12	14	15	14	15	14	14	14	14	15	14	11	CLOSED	CLOSED		194
312.0		4	6	8	10	12	14	15	14	15	14	15	14	14	15	14	11	CLOSED	CLOSED		195
313.6		4	6	8	10	12	14	15	14	15	14	15	14	14	15	15	11	CLOSED	CLOSED		196
315.2		4	6	8	10	12	14	15	14	15	14	15	14	15	15	15	11	CLOSED	CLOSED		197
316.8		4	6	8	10	12	14	15	15	15	14	15	14	15	15	15	11	CLOSED	CLOSED		198
318.4		4	6	8	10	12	14	15	15	15	15	15	14	15	15	15	11	CLOSED	CLOSED		199
320.0		4	6	8	10	12	14	15	15	15	15	15	15	15	15	15	11	CLOSED	CLOSED		200
321.6		4	6	8	10	12	14	15	15	15	15	15	15	15	16	15	11	CLOSED	CLOSED		201
323.2		4	6	8	10	12	14	16	15	15	15	15	15	15	16	15	11	CLOSED	CLOSED		202
324.8		4	6	8	10	12	14	16	15	16	15	15	15	15	16	15	11	CLOSED	CLOSED		203
326.4		4	6	8	10	12	14	16	15	16	15	16	15	15	16	15	11	CLOSED	CLOSED		204
328.0		4	6	8	10	12	14	16	15	16	15	16	15	15	16	16	11	CLOSED	CLOSED		205
329.6		4	6	8	10	12	14	16	15	16	15	16	15	16	16	16	11	CLOSED	CLOSED		206
331.2		4	6	8	10	12	14	16	16	16	15	16	15	16	16	16	11	CLOSED	CLOSED		207
332.8		4	6	8	10	12	14	16	16	16	16	16	15	16	16	16	11	CLOSED	CLOSED		208
334.4 [a]		4	6	8	10	12	14	16	16	16	16	16	16	16	16	16	11	CLOSED	CLOSED		209
336.0		4	6	8	10	12	15	16	16	16	16	16	16	16	16	16	11	CLOSED	CLOSED		210
337.6		4	6	8	10	13	15	16	16	16	16	16	16	16	16	16	11	CLOSED	CLOSED		211
339.2		4	6	8	11	13	15	16	16	16	16	16	16	16	16	16	11	CLOSED	CLOSED		212
340.8		4	6	9	11	13	15	16	16	16	16	16	16	16	16	16	11	CLOSED	CLOSED		213
342.4		4	7	9	11	13	15	16	16	16	16	16	16	16	16	16	11	CLOSED	CLOSED		214
344.0		5	7	9	11	13	15	16	16	16	16	16	16	16	16	16	11	CLOSED	CLOSED		215
345.6	1	5	7	9	11	13	15	16	16	16	16	16	16	16	16	16	11	CLOSED	CLOSED		216
347.2	1	5	7	9	11	13	16	16	16	16	16	16	16	16	16	16	11	CLOSED	CLOSED		217

Total Spill	John Day Dam Spill Patterns with No TSWs # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
348.8	1	5	7	9	11	14	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**218**
350.4	1	5	7	9	12	14	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**219**
352.0	1	5	7	10	12	14	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**220**
353.6	1	5	8	10	12	14	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**221**
355.2	1	6	8	10	12	14	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**222**
356.8	2	6	8	10	12	14	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**223**
358.4	2	6	8	10	12	15	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**224**
360.0	2	6	8	10	13	15	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**225**
361.6	2	6	8	11	13	15	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**226**
363.2	2	6	9	11	13	15	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**227**
364.8	2	7	9	11	13	15	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**228**
366.4	3	7	9	11	13	15	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**229**
368.0	3	7	9	11	13	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**230**
369.6	3	7	9	11	14	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**231**
371.2	3	7	9	12	14	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**232**
372.8	3	7	10	12	14	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**233**
374.4	3	8	10	12	14	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**234**
376.0	4	8	10	12	14	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**235**
377.6	4	8	10	12	15	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**236**
379.2	4	8	10	13	15	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**237**
380.8	4	8	11	13	15	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**238**
382.4	4	9	11	13	15	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**239**
384.0	5	9	11	13	15	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**240**
385.6	5	9	11	13	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**241**
387.2	5	9	11	14	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**242**
388.8	5	9	12	14	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**243**
390.4	5	10	12	14	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**244**
392.0	6	10	12	14	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**245**
393.6	6	10	12	15	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**246**
395.2	6	10	13	15	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**247**
396.8 [b]	6	11	13	15	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**248**
398.4	7	11	13	15	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**249**
400.0	7	11	13	16	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**250**
401.6	7	11	14	16	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**251**
403.2	8	11	14	16	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**252**
404.8	8	11	15	16	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**253**
406.4	9	11	15	16	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**254**
408.0	9	11	16	16	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**255**
409.6	10	11	16	16	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**256**
411.2 [c]	11	11	16	16	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**257**
412.8	11	11	17	16	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**258**
414.4	11	11	17	17	16	16	16	16	16	16	16	16	16	16	16	16	11	*CLOSED*	*CLOSED*		**259**
416.0	11	11	17	17	16	16	16	16	16	16	16	16	16	16	17	16	11	*CLOSED*	*CLOSED*		**260**

Total Spill	John Day Dam Spill Patterns with No TSWs # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
417.6	11	11	17	17	17	16	16	16	16	16	16	16	16	16	17	16	11	CLOSED	CLOSED		261
419.2	11	11	17	17	17	16	16	17	16	16	16	16	16	16	17	16	11	CLOSED	CLOSED		262
420.8	11	11	17	17	17	16	16	17	16	17	16	16	16	16	17	16	11	CLOSED	CLOSED		263
422.4	11	11	17	17	17	16	16	17	16	17	16	17	16	16	17	16	11	CLOSED	CLOSED		264
424.0	11	11	17	17	17	17	16	17	16	17	16	17	16	16	17	16	11	CLOSED	CLOSED		265
425.6	11	11	17	17	17	17	16	17	16	17	16	17	16	16	17	17	11	CLOSED	CLOSED		266
427.2	11	11	17	17	17	17	17	17	16	17	16	17	16	16	17	17	11	CLOSED	CLOSED		267
428.8	11	11	17	17	17	17	17	17	16	17	16	17	16	17	17	17	11	CLOSED	CLOSED		268
430.4	11	11	17	17	17	17	17	17	17	17	16	17	16	17	17	17	11	CLOSED	CLOSED		269
432.0	11	11	17	17	17	17	17	17	17	17	17	17	16	17	17	17	11	CLOSED	CLOSED		270
433.6	11	11	17	17	17	17	17	17	17	17	17	17	17	17	17	17	11	CLOSED	CLOSED		271
435.2	11	11	18	17	17	17	17	17	17	17	17	17	17	17	17	17	11	CLOSED	CLOSED		272
436.8	11	11	18	18	17	17	17	17	17	17	17	17	17	17	17	17	11	CLOSED	CLOSED		273
438.4	11	11	18	18	17	17	17	17	17	17	17	17	17	17	18	17	11	CLOSED	CLOSED		274
440.0	11	11	18	18	18	17	17	17	17	17	17	17	17	17	18	17	11	CLOSED	CLOSED		275
441.6	11	11	18	18	18	17	17	18	17	17	17	17	17	17	18	17	11	CLOSED	CLOSED		276
443.2	11	11	18	18	18	17	17	18	17	18	17	17	17	17	18	17	11	CLOSED	CLOSED		277
444.8	11	11	18	18	18	17	17	18	17	18	17	18	17	17	18	17	11	CLOSED	CLOSED		278
446.4	11	11	18	18	18	18	17	18	17	18	17	18	17	17	18	17	11	CLOSED	CLOSED		279
448.0	11	11	18	18	18	18	17	18	17	18	17	18	17	17	18	18	11	CLOSED	CLOSED		280
449.6	11	11	18	18	18	18	18	18	17	18	17	18	17	17	18	18	11	CLOSED	CLOSED		281
451.2	11	11	18	18	18	18	18	18	17	18	17	18	17	18	18	18	11	CLOSED	CLOSED		282
452.8	11	11	18	18	18	18	18	18	18	18	17	18	17	18	18	18	11	CLOSED	CLOSED		283
454.4	11	11	18	18	18	18	18	18	18	18	18	18	17	18	18	18	11	CLOSED	CLOSED		284
456.0	11	11	18	18	18	18	18	18	18	18	18	18	18	18	18	18	11	CLOSED	CLOSED		285
457.6	11	11	19	18	18	18	18	18	18	18	18	18	18	18	18	18	11	CLOSED	CLOSED		286
459.2	11	11	19	19	18	18	18	18	18	18	18	18	18	18	18	18	11	CLOSED	CLOSED		287
460.8	11	11	19	19	18	18	18	18	18	18	18	18	18	18	19	18	11	CLOSED	CLOSED		288
462.4	11	11	19	19	19	18	18	18	18	18	18	18	18	18	19	18	11	CLOSED	CLOSED		289
464.0	11	11	19	19	19	18	18	19	18	18	18	18	18	18	19	18	11	CLOSED	CLOSED		290
465.6	11	11	19	19	19	18	18	19	18	19	18	18	18	18	19	18	11	CLOSED	CLOSED		291
467.2	11	11	19	19	19	18	18	19	18	19	18	19	18	18	19	18	11	CLOSED	CLOSED		292
468.8	11	11	19	19	19	19	18	19	18	19	18	19	18	18	19	18	11	CLOSED	CLOSED		293
470.4	11	11	19	19	19	19	18	19	18	19	18	19	18	18	19	19	11	CLOSED	CLOSED		294
472.0	11	11	19	19	19	19	19	19	18	19	18	19	18	18	19	19	11	CLOSED	CLOSED		295
473.6	11	11	19	19	19	19	19	19	18	19	18	19	18	19	19	19	11	CLOSED	CLOSED		296
475.2	11	11	19	19	19	19	19	19	19	19	18	19	18	19	19	19	11	CLOSED	CLOSED		297
476.8	11	11	19	19	19	19	19	19	19	19	19	19	18	19	19	19	11	CLOSED	CLOSED		298
478.4	11	11	19	19	19	19	19	19	19	19	19	19	19	19	19	19	11	CLOSED	CLOSED		299
480.0	11	11	20	19	19	19	19	19	19	19	19	19	19	19	19	19	11	CLOSED	CLOSED		300
481.6	11	11	20	20	19	19	19	19	19	19	19	19	19	19	19	19	11	CLOSED	CLOSED		301
483.2	11	11	20	20	19	19	19	19	19	19	19	19	19	19	20	19	11	CLOSED	CLOSED		302
484.8	11	11	20	20	20	19	19	19	19	19	19	19	19	19	20	19	11	CLOSED	CLOSED		303

Total Spill	John Day Dam Spill Patterns with No TSWs # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
486.4	11	11	20	20	20	19	19	20	19	19	19	19	19	19	20	19	11	CLOSED	CLOSED		304
488.0	11	11	20	20	20	19	19	20	19	20	19	19	19	19	20	19	11	CLOSED	CLOSED		305
489.6	11	11	20	20	20	19	19	20	19	20	19	20	19	19	20	19	11	CLOSED	CLOSED		306
491.2	11	11	20	20	20	20	19	20	19	20	19	20	19	19	20	19	11	CLOSED	CLOSED		307
492.8	11	11	20	20	20	20	19	20	19	20	19	20	19	19	20	20	11	CLOSED	CLOSED		308
494.4	11	11	20	20	20	20	20	20	19	20	19	20	19	19	20	20	11	CLOSED	CLOSED		309
496.0	11	11	20	20	20	20	20	20	19	20	19	20	19	20	20	20	11	CLOSED	CLOSED		310
497.6	11	11	20	20	20	20	20	20	20	20	19	20	19	20	20	20	11	CLOSED	CLOSED		311
499.2	11	11	20	20	20	20	20	20	20	20	20	20	19	20	20	20	11	CLOSED	CLOSED		312
500.8	11	11	20	20	20	20	20	20	20	20	20	20	20	20	20	20	11	CLOSED	CLOSED		313
502.4	11	11	21	20	20	20	20	20	20	20	20	20	20	20	20	20	11	CLOSED	CLOSED		314
504.0	11	11	21	21	20	20	20	20	20	20	20	20	20	20	20	20	11	CLOSED	CLOSED		315
505.6	11	11	21	21	20	20	20	20	20	20	20	20	20	20	21	20	11	CLOSED	CLOSED		316
507.2	11	11	21	21	21	20	20	20	20	20	20	20	20	20	21	20	11	CLOSED	CLOSED		317
508.8	11	11	21	21	21	20	20	21	20	20	20	20	20	20	21	20	11	CLOSED	CLOSED		318
510.4	11	11	21	21	21	20	20	21	20	21	20	20	20	20	21	20	11	CLOSED	CLOSED		319
512.0	11	11	21	21	21	20	20	21	20	21	20	21	20	20	21	20	11	CLOSED	CLOSED		320
513.6	11	11	21	21	21	21	20	21	20	21	20	21	20	20	21	20	11	CLOSED	CLOSED		321
515.2	11	11	21	21	21	21	20	21	20	21	20	21	20	20	21	21	11	CLOSED	CLOSED		322
516.8	11	11	21	21	21	21	21	21	20	21	20	21	20	20	21	21	11	CLOSED	CLOSED		323
518.4	11	11	21	21	21	21	21	21	20	21	20	21	20	21	21	21	11	CLOSED	CLOSED		324
520.0	11	11	21	21	21	21	21	21	21	21	20	21	20	21	21	21	11	CLOSED	CLOSED		325
521.6	11	11	21	21	21	21	21	21	21	21	21	21	20	21	21	21	11	CLOSED	CLOSED		326
523.2	11	11	21	21	21	21	21	21	21	21	21	21	21	21	21	21	11	CLOSED	CLOSED		327
524.8	11	11	22	21	21	21	21	21	21	21	21	21	21	21	21	21	11	CLOSED	CLOSED		328
526.4	11	11	22	22	21	21	21	21	21	21	21	21	21	21	21	21	11	CLOSED	CLOSED		329
528.0	11	11	22	22	21	21	21	21	21	21	21	21	21	21	22	21	11	CLOSED	CLOSED		330
529.6	11	11	22	22	22	21	21	21	21	21	21	21	21	21	22	21	11	CLOSED	CLOSED		331
531.2	11	11	22	22	22	21	21	22	21	21	21	21	21	21	22	21	11	CLOSED	CLOSED		332
532.8	11	11	22	22	22	21	21	22	21	22	21	21	21	21	22	21	11	CLOSED	CLOSED		333
534.4	11	11	22	22	22	21	21	22	21	22	21	22	21	21	22	21	11	CLOSED	CLOSED		334
536.0	11	11	22	22	22	22	21	22	21	22	21	22	21	21	22	21	11	CLOSED	CLOSED		335
537.6	11	11	22	22	22	22	21	22	21	22	21	22	21	21	22	22	11	CLOSED	CLOSED		336
539.2	11	11	22	22	22	22	22	22	21	22	21	22	21	21	22	22	11	CLOSED	CLOSED		337
540.8	11	11	22	22	22	22	22	22	21	22	21	22	21	22	22	22	11	CLOSED	CLOSED		338
542.4	11	11	22	22	22	22	22	22	22	22	21	22	21	22	22	22	11	CLOSED	CLOSED		339
544.0	11	11	22	22	22	22	22	22	22	22	22	22	21	22	22	22	11	CLOSED	CLOSED		340
545.6	11	11	22	22	22	22	22	22	22	22	22	22	22	22	22	22	11	CLOSED	CLOSED		341
547.2	11	11	23	22	22	22	22	22	22	22	22	22	22	22	22	22	11	CLOSED	CLOSED		342
548.8	11	11	23	23	22	22	22	22	22	22	22	22	22	22	22	22	11	CLOSED	CLOSED		343
550.4	11	11	23	23	22	22	22	22	22	22	22	22	22	22	23	22	11	CLOSED	CLOSED		344
552.0	11	11	23	23	23	22	22	22	22	22	22	22	22	22	23	22	11	CLOSED	CLOSED		345
553.6	11	11	23	23	23	22	22	23	22	22	22	22	22	22	23	22	11	CLOSED	CLOSED		346

Total Spill	John Day Dam Spill Patterns with No TSWs # Gate Stops per Spillbay																				Total Stops
(kcfs)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 TSW	19 TSW	20	(#)
555.2	11	11	23	23	23	22	22	23	22	23	22	22	22	22	23	22	11	*CLOSED*	*CLOSED*		**347**
556.8	11	11	23	23	23	22	22	23	22	23	22	23	22	22	23	22	11	*CLOSED*	*CLOSED*		**348**
558.4	11	11	23	23	23	23	22	23	22	23	22	23	22	22	23	22	11	*CLOSED*	*CLOSED*		**349**
560.0	11	11	23	23	23	23	22	23	22	23	22	23	22	22	23	23	11	*CLOSED*	*CLOSED*		**350**
561.6	11	11	23	23	23	23	23	23	22	23	22	23	22	22	23	23	11	*CLOSED*	*CLOSED*		**351**
563.2	11	11	23	23	23	23	23	23	22	23	22	23	22	23	23	23	11	*CLOSED*	*CLOSED*		**352**
564.8	11	11	23	23	23	23	23	23	23	23	22	23	22	23	23	23	11	*CLOSED*	*CLOSED*		**353**
566.4	11	11	23	23	23	23	23	23	23	23	23	23	22	23	23	23	11	*CLOSED*	*CLOSED*		**354**
568.0	11	11	23	23	23	23	23	23	23	23	23	23	23	23	23	23	11	*CLOSED*	*CLOSED*		**355**
569.6	11	11	24	23	23	23	23	23	23	23	23	23	23	23	23	23	11	*CLOSED*	*CLOSED*		**356**
571.2	11	11	24	24	23	23	23	23	23	23	23	23	23	23	23	23	11	*CLOSED*	*CLOSED*		**357**
572.8	11	11	24	24	23	23	23	23	23	23	23	23	23	23	24	23	11	*CLOSED*	*CLOSED*		**358**
574.4	11	11	24	24	24	23	23	23	23	23	23	23	23	23	24	23	11	*CLOSED*	*CLOSED*		**359**
576.0	11	11	24	24	24	23	23	24	23	23	23	23	23	23	24	23	11	*CLOSED*	*CLOSED*		**360**
577.6	11	11	24	24	24	23	23	24	23	24	23	23	23	23	24	23	11	*CLOSED*	*CLOSED*		**361**
579.2	11	11	24	24	24	23	23	24	23	24	23	24	23	23	24	23	11	*CLOSED*	*CLOSED*		**362**
580.8	11	11	24	24	24	24	23	24	23	24	23	24	23	23	24	23	11	*CLOSED*	*CLOSED*		**363**
582.4	11	11	24	24	24	24	23	24	23	24	23	24	23	23	24	24	11	*CLOSED*	*CLOSED*		**364**
584.0	11	11	24	24	24	24	24	24	23	24	23	24	23	23	24	24	11	*CLOSED*	*CLOSED*		**365**
585.6	11	11	24	24	24	24	24	24	23	24	23	24	23	24	24	24	11	*CLOSED*	*CLOSED*		**366**
587.2	11	11	24	24	24	24	24	24	24	24	23	24	23	24	24	24	11	*CLOSED*	*CLOSED*		**367**
588.8	11	11	24	24	24	24	24	24	24	24	24	24	23	24	24	24	11	*CLOSED*	*CLOSED*		**368**
590.4	11	11	24	24	24	24	24	24	24	24	24	24	24	24	24	24	11	*CLOSED*	*CLOSED*		**369**
592.0	11	11	25	24	24	24	24	24	24	24	24	24	24	24	24	24	11	*CLOSED*	*CLOSED*		**370**
593.6	11	11	25	25	24	24	24	24	24	24	24	24	24	24	24	24	11	*CLOSED*	*CLOSED*		**371**
595.2	11	11	25	25	24	24	24	24	24	24	24	24	24	24	25	24	11	*CLOSED*	*CLOSED*		**372**
596.8	11	11	25	25	25	24	24	24	24	24	24	24	24	24	25	24	11	*CLOSED*	*CLOSED*		**373**
598.4	11	11	25	25	25	24	24	25	24	24	24	24	24	24	25	24	11	*CLOSED*	*CLOSED*		**374**
600.0 [d]	11	11	25	25	25	24	24	25	24	25	24	24	24	24	25	24	11	*CLOSED*	*CLOSED*		**375**

a. Begin transition from juvenile fish patterns to flood patterns.
b. Gate 20 blocked at 10.3 ft opening.
c. Gate 1 blocked at 10.3 ft opening.
d. TSWs do not affect spillway flood capacity until flow ≥1,492 kcfs. Recommend remove TSWs before river flow >685 kcfs.