U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#39-2019

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: November 22 to 28, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
	X	All 14 turbine units available for service. (See table & comments below for details).	**Hard**	**Soft**
	X	Available turbines operated within 1% peak efficiency? Constraint in effect.		X

Table 1. McNary Unit Outages (OOS) and Return to Service (RTS).

	OOS		RTS		
Unit(s)	**Date**	**Time**	**Date**	**Time**	**Outage Description**
5	05/23	0943	01/09/20	NA	Turbine blade packing.
14	08/19	1221	01/02/20	NA	Thrust bearing.
8	10/31	0924	11/26	1223	Thrust bearing inspection.
7 & 12	11/26	1000	11/26	1034	ESBS camera inspections, rotated through units.

Comments: All return to service dates are subject to change. The soft one percent peak efficiency constraint continued. At times, units ran outside the constraint at BPA's request. Unit priority concluded on November 1.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on November 22, 24 and 27.

Fish Ladder Exits:

Yes	No	Location	Criteria	Comments
X		Oregon Exit	Head over weir 1.0' to 1.3'	
X		Oregon Count Station Differential	0.0' to 0.5'	
X		Washington Exit	Head over weir 1.0' to 1.3'	
X		Washington Count Station Differential	0.0' to 0.5'	

Comments: Debris loads were very light to light near the Oregon exit and minimal to light near the Washington exit. At the Oregon shore exit, weir 335 tripped an alarm and was reset November 22.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
X			North Oregon Entrance Head Differential	1.0' – 2.0'	
	X		NFEW2 Weir Depth	≥ 8.0'	7.9' on Nov 22 & 24.
X			NFEW3 Weir Depth	≥ 8.0'	
X			South Oregon Entrance Head Differential	1.0' – 2.0'	
X			SFEW1 Weir Depth	≥ 8.0'	
	X		SFEW2 Weir Depth	≥ 8.0'	Nov 22, see below.
X			Oregon Collection Channel Velocities	1.5 to 4.0 fps	Averaged 1.9 fps.
X			Washington Entrance Head Differential	1.0' – 2.0'	
X*			WFE2 Weir Depth	≥ 8.0'	
	X		WFE3 Weir Depth	≥ 8.0'	4.6' to 5.7' all week.

Comments: The out of criteria points listed above for the Oregon ladder entrance weir NFEW2 were possibly due to calibration or set point drifts and/or control issues.

Oregon ladder entrance weir SFEW2 continued to jam high, which resulted in the weir cables being slack. Accurate weir elevation readings could not be obtained but it can easily be assumed the weir was out of criteria on November 22 and at other times when inspections were not occurring. The operators resolved the issue each time. The biologist requested SFEW2 be switched to manual mode on November 24. SFEW1 has been able to maintain the pool differential and no other out of criteria points at the south powerhouse entrances have been observed.

The out of criteria points listed above for the Washington ladder entrance weir W3 were due to weir W2 being jammed. W2 was examined again on November 25 with no success in dislodging the weir. W2 will remained in manual mode. In order to maintain the pool differential, the control system or operators have raised W3 out of criterion. W3 has been in and out of automatic mode. The biologist asked that the weir remain in automatic mode on November 25.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
		Yes	WA shore Wasco County PUD Turbine Unit
Yes			WA shore Wasco PUD Bypass
		Yes	Oregon shore Fish Pump 1, OOS to December 31.
Yes			Oregon shore Fish Pump 2, Blade angle: 23 to 24°
Yes			Oregon shore Fish Pump 3, Blade angle: 26°
Yes			OR North Powerhouse Pool supply from juvenile fishway

*Comments: The Wasco County PUD remains out of service until the winter maintenance season. PUD personnel have asked for an early extension to the winter outage. The bypass system has been functioning satisfactorily.

When the operators had to reset SFEW2, they briefly reduced the blade angles on fish pumps 2 and 3 to zero degrees. This usually occurs in the afternoon.

Juvenile Fish Passage Facility

The juvenile system remains in primary bypass for the fall season. Light maintenance and preparations for the winter outage continued at the facility. The full flow flume adult flush line valve remained partially closed.

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Powerhouse forebay debris load acceptable?	Light.
X			Trash rack differentials measured this week?	Daily.
X			Trash rack differentials acceptable	
	X		Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments: Debris was a mixture of aquatic vegetation and woody material. New incoming debris was minimal. The spillway debris load would be described as minimal. Much of the debris moved between the powerhouse and the Oregon shoreline, which is causing the debris to dissipate.

There are no problems to report.

Extended-length submersible bar screen (ESBSs)/Vertical barrier screen (VBSs):

Yes	No	NA	Item
X			ESBSs deployed in all slots and in service?
X			ESBSs inspected this week?
X			ESBSs inspection results acceptable?
X			VBSs differentials checked this week?
X			VBSs differentials acceptable?

Comments: The brush cycles for the screens in units 6, 8, 10 and 13 remained in timer mode. Camera inspections in units 7 and 12 revealed no problems.

Daily VBS differential monitoring continued. No high differentials were recorded and no screens were cleaned this week.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe:

Yes	No	NA	Item	Number of orifices in service
X			Orifices operating satisfactory?	42
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: The side screen cleaning brush tripped an alarm and was reset by the operators on November 26 at 1234 hours. This was a timing alarm, which was possibly due to debris. The brush ran successfully until 2223 hours. Again, another side brush timing alarm occurred. This time, due to the sequential brush cycle program, all three brushes (rectangular and transition included) tripped alarms. The operators again reset the alarms. When the next brush cycle was due on November 27 at 0338 hours, the side brush again tripped a timing alarm. This time only the transition brush alarmed. At this point, the operators waited for the biologist to come in on shift.

At 0745 hours, before the next brush cycle was to occur, the biologist went to the channel to examine the issue. After operating the side brush manually, the biologist determined the brush had jammed on debris on the lower guided, which is on the floor of the channel. The biologist was able to dislodge the debris, clear both alarms and return the side brush to automatic mode. All three brushes were operated to insure they were fully functional.

The nature of these brush alarms continues to raise concerns with the system programming, especially the sequential brush cycle. We believe a return to independent brush operation is warranted. The side brush did not appear to "bump" the debris as programmed. Thus, the brush did not dislodge the debris, which raises another concern. Finally, it appeared the brush operation timer self-reset, which delayed the next cleaning and raised more concerns with the system programming.

Bypass Facility:

Yes	No	NA	Item
		X	Sample gates on?
		X	PIT-tag sampling system on?

Comments: During the fall primary bypass season, all systems remain out of service with light maintenance ongoing.

The separator remained dewatered for inspection. The paint will again be tested for lead and other elements. The first test results will be reported to us on December 2. After which, the process needed to clean the separator will be determined and proceed. Next, measures of the wall and floor thickness will occur. Finally, a path forward for rehabilitation will be determined.

TSW Operations: The TSWs in spillbays 19 and 20 remained closed for the season.

River Conditions

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Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature (°F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
138.2	109.2	0.0	0.0	51.0	49.0	6.0	6.0

Comments: The above data is from the control room.

Other

Inline Cooling Water Strainers: The next cooling water strainer inspections will occur on December 3.

Avian Activity: Casual avian observations continued. Bird numbers appear to be fluctuating with their migration and the juvenile shad out migration. Overall, gull and cormorant numbers appear to be slowly declining. There appears to be more roosting activity than feeding. Adult and juvenile birds were observed. Gull activity fluctuated in the powerhouse zone with birds feeding and roosting.

In the spill zone, gull and cormorant numbers again fluctuated. Occasionally, a pelican was observed this week. All birds were roosting. Much fewer gulls and cormorants roosted on the top of the navigation lock and Washington ladder walls.

In the bypass outfall zone, a fair number of cormorants along with a few gulls were noted mostly roosting on the full flow pipe. However, at times, these birds were observed feeding.

The laser for bypass outfall hazing remained in place. The laser did appear to be fairly effective on the wing wall. The outfall programming has not yet been verified. Thus, bird counts remained fairly high near the outfall. Though, bird numbers were down overall. At this point, further evaluation of laser technology will resume next spring.

In the forebay zone, an occasional gull, gull flock or cormorant was observed. Fluctuating numbers of gulls and cormorants were noted roosting outside the zone along the Washington shore line. Large gull flocks were still observed around the project.

Invasive Species: The mussel station examinations revealed no problems on November 24.

Fish Rescue/Salvage**:** No fish rescue occurred this week.

Research: The fall phase of the adult steelhead top spillway weir (TSW) passage efficiency study concluded on the night of November 15. A dive to repair/replace the cable on the trash rack in 1B slot is scheduled to occur on December 10. The equipment on the ESBSs will be removed on December 16.

Project: Ice Harbor
Biologist: Ken Fone
Dates: November 22 – November 28, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
	X	All 6 turbine units available for service (see table & comments below for details).	**Hard**	**Soft**
X		Available turbines operated within 1% peak efficiency? Constraint in effect.		X

Ice Harbor Unit Outages (OOS) and Return to Service (RTS):

	OOS		RTS		
Unit	**Date**	**Time**	**Date**	**Time**	**Outage Description**
3	5/3/19	0641	---	---	Turbine runner replacement and stator rewind
6	8/14/19	0743	11/21/19	1109	Annual maintenance and overhaul
5	10/15/19	0741	---	---	Install new head gate cylinder in 5A. Also annual maintenance.

Comments: None.

Adult Fish Passage Facility

Ice Harbor fish facility staff inspected the adult fishways on November 23, 26, and 27.

Fish Ladders:

Yes	No	Location	Criteria	Measurements
X		North Ladder Exit Differential	Head ≤ 0.3’	
X		North Ladder Picketed Lead Differential	Head ≤ 0.3’	
X		North Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	
	X	South Ladder Exit Differential	Head ≤ 0.3’	0.4’
X		South Ladder Picketed Lead Differential	Head ≤ 0.3’	
X		South Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
		X	South Shore Entrance (SFE-1) Weir Depth	≥ 8.0’ or on sill	
	X		South Shore Channel/Tailwater Differential	1.0’ – 2.0’	2.3’
X			South Shore Channel Velocity	1.5 – 4.0 fps	
		X	North Powerhouse Entrance (NFE-1) Weir Depth	≥ 8.0’ or on sill	
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0’ – 2.0’	
		X	North Shore Entrance (NEW-2) Weir Depth	≥ 8.0’ or on sill	
	X		North Shore Channel/Tailwater Differential	1.0’ – 2.0’	0.0’, 2.4’, 2.2’

Comments: As a result of the tailwater elevation being low, the north shore and south shore entrance channel/tailwater head differentials were above criteria for the November 26 and November 27 adult fishway inspections. From previous inspections conducted in November it was observed that the entrance head differentials were with in criteria when the tailwater was higher. The north and south shore fish ladders normally have two and at least six AWS pumps running, respectively, to meet entrance criteria. Shutting off an additional pump at each location may result in the head differentials being too low, especially when the tailwater increases.

There was no north shore entrance head differential on November 25 from 1130 hours to 1608 hours, when the north shore auxiliary water supply (AWS) pumps and the upper diffuser valve were shut off to support the ROV inspection of the north shore entrance (NEW-1) guide slots (see MOC 19 IHR 19 for more details). Also the depth over the north ladder weirs was well below criteria with the upper diffuser valve shut off.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
6 pumps	2 pumps		Status of the 8 South Shore AWS Pumps
2 pumps	1 pump		Status of the 3 North Shore AWS Pumps

Comments: The north shore AWS pumps were all turned off from 1130 hours to 1608 hours on November 25 to support the ROV inspection of NEW-1.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	Average of 67 square yards
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0-5%
	X		Any oil seen in gatewells?	

Comments: None.

STSs/VBSs:

Yes	No	NA	Item
	X		STSs deployed in all slots and in service?
	X		STSs in continuous-run mode (Note: if not, then STSs are in cycle-run mode)?
	X		STSs inspected this week?
		X	STSs inspection results acceptable?
		X	VBSs differentials checked this week?
		X	VBSs differentials acceptable?

Comments: None,

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	20
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: None.

Juvenile Fish Facility: The fish facility is being operated in primary bypass.

Fish Sampling: Sampling is ended for the year.

Removable Spillway Weir (RSW): Voluntary spill for fish passage is ended for the year.

River Conditions

River conditions at Ice Harbor Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (°F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
27.8	13.9	0	0	49	49	9.3	9.3

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Monthly strainer inspections for lamprey ended in June and will start again in December. Unit 1, 2, and 4 strainers were cleaned on November 16th, 18th, and 21st, because of higher water pressure differentials across the strainers. A total of approximately 2,576 juvenile shad mortalities were found.

Avian Activity: There were moderate to high numbers of gulls and pelicans observed around the project. The birds were observed to be foraging downstream of the powerhouse.

Invasive Species: No new exotic species have been found.

Siberian Prawn: Siberian prawns collected in the sample at the Juvenile Fish Facility are humanely euthanized by Anchor, frozen and properly disposed of in a landfill. Sampling is done for the year.

Fish Rescue/Salvage: Unit 6 tailrace stoplogs were removed on November 19, in preparation for returning the unit to service. Fish facility personnel recovered 1 channel catfish, 1 smallmouth bass, and 12 crayfish from the ribbing of the stoplogs, and released them to the river in good condition. An estimated 70 Siberian prawns were on the stoplogs, but most of them could not be recovered because of the difficulty in seeing, accessing, and handling them.

Research: None.

Project: Lower Monumental
Biologists: Chuck Barnes and Raymond Addis
Dates: November 22 - 28, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
	X	All 6 turbine units available for service (see table & comments below for details).	Hard	Soft
X		Available turbines operated within 1% peak efficiency? Constraint in effect.		X

Lower Monumental Unit Outages (OOS) and Return to Service (RTS)

	OOS		RTS		
Unit	Date	Time	Date	Time	Outage Description
Unit 2	7/15/2019	07:20	2/28/2020	ERTS	Annual Maintenance/Draft Tube Liner Repair
Unit 4	10/09/2019	16:05	12/12/2019	ERTS	Governor Control
Unit 5	10/03/2019	15:50	1/23/2020	ERTS	Governor Control
Unit 6	8/05/2019	12:20	11/25/2019	15:27	6 Year maintenance/Blade Seal Replacement

Comments: None.

Adult Fish Passage Facility

The adult fishways were inspected by USACE biologists on November 25 and 26.

Fish Ladder:

Yes	No	Location	Criteria	Measurements
X		North Ladder Exit Differential	Head $\leq$ 0.5’	
X		North Ladder Picketed Lead Differential	Head $\leq$ 0.4’	
X		North Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	
X		South Ladder Exit Differential	Head $\leq$ 0.5’	
X		South Ladder Picketed Lead Differential	Head $\leq$ 0.3’	
X		South Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	

Comments: None.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
X			North Shore Entrance (NSE-1) Weir Depth	$\geq$ 8.0’ or on sill	
X			North Shore Entrance (NSE-2) Weir Depth	$\geq$ 8.0’ or on sill	
X			North Shore Channel/Tailwater Differential	1.0’–2.0’	
		X	South Powerhouse Entrance (SPE-1) Weir Depth	$\geq$ 8.0’ or on sill	
		X	South Powerhouse Entrance (SPE-2) Weir Depth	$\geq$ 8.0’ or on sill	
X			South Powerhouse Entrance Channel/Tailwater Differential	1.0’–2.0’	
		X	South Shore Entrance (SSE-1) Weir Depth	$\geq$ 8.0’	
X			South Shore Entrance (SSE-2) Weir Depth	$\geq$ 6.0’	
X			South Shore Channel/Tailwater Differential	1.0’ – 2.0’	

Comments: South Powerhouse Entrance weir (SPE-1) was on sill during all inspections with readings of 7.6 and 7.1 feet respectively.
South Powerhouse Entrance weir (SPE-2) was on sill during all inspections with readings of 7.6 and 7.1 respectively.
South Shore Entrance weir (SSE-1) was on sill during all inspections with readings of 8.6 and 7.8 feet respectively.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
Yes			AWS Fish Pump 1
Yes			AWS Fish Pump 2
Yes			AWS Fish Pump 3

Comments: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	75 yd^2
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0 – 20 %
	X		Any oil seen in gatewells?	

Comments: None.

STSs/VBSs:

Yes	No	NA	Item
X			STSs deployed in all slots and in service?
	X		STSs in continuous-run mode (Note: if not, then STSs are in cycle-run mode)?
	X		STSs inspected this week?
		X	STSs inspection results acceptable?
		X	VBSs differentials checked this week?
		X	VBSs differentials acceptable?

Comments: STS's were operating in Cycle mode due to average sub-yearling Chinook and sockeye lengths being greater than 120 mm.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	18
	X		Dewaterer and cleaning systems operating satisfactory?	

Comments: None.

Collection Facility: The facility was dewatered at 1200 on October 3 for cleaning and winter maintenance.

Transport Summary: Transport season ended on September 30.

Spillway Weir: There was no spill during this reporting period.

River Conditions

River conditions at Lower Monumental Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature (°F)*		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
26.6	16.1	0.0	0.0	45.6	45.2	6.1	5.5

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were not checked during this reporting period.

Avian Activity: Gulls and cormorants were the predominant piscivorous bird species observed in the tailrace during fish ladder inspections this week.

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
11/25/2019	15:00	6	40	0	0	0
11/26/2019	13:00	2	42	0	0	0

Comments: Bird hazing efforts by USDA personnel ended at the end of the working day on June 2.
Daily bird hazing effectiveness tailrace observations ended with the June 30 observation.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on November 18.

Siberian Prawn: Siberian prawns collected in the sample at the Juvenile Fish Facility are humanely euthanized by PSMFC and Anchor, frozen and properly disposed of in a landfill. Juvenile fish collection ended at 0700 on September 30.

Fish Rescue/Salvage: No Fish Rescue/Salvage took place during this reporting period.

Research: No Research took place during this reporting

Project: Little Goose
Biologists: Scott St. John and Richard Weis
Dates: November 22-28, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
	X	All 6 turbine units available for service (see table & comments below for details).	**Hard**	**Soft**
X		Available turbines operated within 1% peak efficiency? Constraint in effect.		X

Little Goose Unit Outages (OOS) and Return to Service (RTS)

	OOS		RTS		
Unit	**Date**	**Time**	**Date**	**Time**	**Outage Description**
5	04/21/17	00:54	03/31/21	17:00	Spider and Upper Guide Bearing Repair
2	10/07/19	07:15	11/25/19	14:45	Unit Annual, VBS/ESBS Inspection
1	11/25/19	15:30	12/20/19	17:00	Unit Annual, VBS/ESBS Inspection

Comments: None.

Adult Fish Passage Facility

Little Goose fish facility staff inspected the adult fishway on November 25, 26 and 27.

Fish Ladder:

Yes	No	NA	Location	Criteria	Measurements
X			Fish Ladder Exit Differential	Head ≤ 0.5’	
X			Fish Ladder Picketed Lead Differential	Head ≤ 0.3’	
X			Fish Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	0.8
	X		Fish Ladder Cooling Water Pump in Service		
		X	Fish Ladder Exit Cooling Water Pump Operating Satisfactorily		

Comments: Cooling water pumps was shut off for the season on September 23.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurement
X			South Shore Entrance (SSE-1) Weir Depth	≥ 8.0’	
X			South Shore Entrance (SSE-2) Weir Depth	≥ 8.0’	
X			South Shore Channel/Tailwater Differential	1.0’ – 2.0’	
		X	North Powerhouse Entrance (NPE-1) Weir Depth	≥ 7.0’ or on sill	
		X	North Powerhouse Entrance (NPE-2) Weir Depth	≥ 7.0’ or on sill	
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0’–2.0’	
X			North Shore Entrance (NSE-1) Weir Depth	≥ 6.0’ or on sill	
X			North Shore Entrance (NSE-2) Weir Depth	≥ 6.0’ or on sill	
X			North Shore Channel/Tailwater Differential	1.0’–2.0’	
X			Collection Channel Surface Velocity	1.5 – 4.0 fps	

Comments: Subsurface water velocity was measured near NPE on October 27 using a Rickly velocity meter and averaged 2.7 feet per second.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
X			AWS Fish Pump 1
X			AWS Fish Pump 2
X			AWS Fish Pump 3

Comments: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comment
X			Forebay debris load acceptable? (amount)	
	X		Trash rack differentials measured this week?	
		X	Trash rack differentials acceptable	
	X		Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments: There is approximately 8,000 square feet of floating woody debris inside the trash shear boom in the immediate forebay.

ESBS/VBS:

Yes	No	NA	Item
X			ESBSs deployed in all slots and in service?
	X		ESBSs inspected this week?
		X	ESBSs inspection results acceptable?
	X		VBSs differentials checked this week?
		X	VBSs differentials acceptable?

Comments: ESBS/VBS underwater camera inspections were conducted on Unit 2 on October 10 and 11. The inspection found a VBS fastener bar in gatewell 2B partially dislodged. Powerhouse maintenance crews conducted fastener upgrades in gatewell 2A and replaced VBS screens and fasteners in gatewell 2B during the Unit 2 annual maintenance outage.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	18
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: None.

Collection Facility: The juvenile bypass system is currently operating in primary bypass, with the Juvenile Fish Facility dewatered for winter maintenance.

Transport Summary: Daily collection and transport ended on November 01 at 07:00.

Spillway Weir: The adjustable spillway weir (ASW) was closed on July 23 at 15:17 per the guidance outlined in the Columbia Basin Teletype (CBT). The ASW will remain closed for the season.

River Conditions

River conditions at Little Goose Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (°F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
21.6	14.4	0.0	0.0	45.9	45.2	6.0	5.8

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were last inspected on July 3 with no lamprey being observed. Inspections will resume in December per the Fish Passage Plan.

Avian Activity: Daily Piscivorous bird counts at Little Goose Dam ended on October 31 for the 2019 season.

Invasive Species: No zebra or Quagga mussels were observed.

Siberian Prawn: Sampling has been completed for the year.

Gas Bubble Trauma (GBT): The last gas bubble monitoring occurred on July 15.

Fish Rescue/Salvage: Gatewell 2B was dipped for fish on November 20 prior to dewatering for VBS replacement. No fish were seen.

Research: N/A

Project: Lower Granite
Biologists: Elizabeth Holdren and David Miller
Dates: November 22-28, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
	X	All 6 turbine units available for service (see table & comments below for details).	Hard	Soft
X		Available turbines operated within 1% peak efficiency? Constraint in effect.		X

Lower Granite Unit Outages (OOS) and Return to Service (RTS)

	OOS		RTS		
Unit	Date	Time	Date	Time	Outage Description
Unit 2	11/04	0800			Overhaul
Unit 1	11/23	0545			Forced OOS due to field ground (rotor)

Comments: None.

Adult Fish Passage Facility

Lower Granite Corps biologist's inspected the adult fish ladder November 25, 26, and 27.

Fish Ladder:

Yes	No	NA	Location	Criteria	Comments
X			Fish Ladder Exit Differential	Head $\leq$ 0.5'	
X			Fish Ladder Picketed Lead Differential	Head $\leq$ 0.3'	
X			Fish Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	
		X	Fish Ladder Cooling Water Pumps in Service		
		X	Fish Ladder Cooling Water Pumps Operating Satisfactorily		

Comments: None.

Fish Ladder Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
X			South Shore Entrance (SSE-1) Weir Depth	$\geq$ 8.0'	
X			South Shore Entrance (SSE-2) Weir Depth	$\geq$ 8.0'	
X			South Shore Channel/Tailwater Differential	1.0' – 2.0'	
		X	North Powerhouse Entrance (NPE-1) Weir Depth	$\geq$ 8.0' or on sill	
		X	North Powerhouse Entrance (NPE-2) Weir Depth	$\geq$ 8.0' or on sill	
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0'–2.0'	
X			North Shore Entrance (NSE-1) Weir Depth	$\geq$ 7.0' or on sill	
X			North Shore Entrance (NSE-2) Weir Depth	$\geq$ 7.0' or on sill	Closed
X			North Shore Channel/Tailwater Differential	1.0'–2.0'	0.9'
	X		Collection Channel Surface Velocity	1.5 – 4.0 fps	1.0, 1.1, 1.0

Comments: Since May 4 the fish ladder control system screen and local reading for the south shore channel/tailwater and depth over the SSEs have been inconsistent. SSE gates remain in local operation until Operation and District

engineering can resolve the control system issues. SSEs out of criteria readings were due to the gated inability to adjust to changing tailwater. SSE gates were repositioned to a depth of greater than 8.0 feet in response to out of criteria readings.

NPE channel velocity sensor readings have consistently read below 1.5 fps. Surface velocity is being verified using tape measure and stopwatch and found to be in criteria. Velocities have been reading below 1.5 fps at both north powerhouse and north shore sensors. Biologists, operators, and District engineers are working to resolve fish ladder velocity issues and control system issues.

Auxiliary Water Supply System:

Operating Satisfactorily	Standby	Out of Service	Auxiliary Water Supply (AWS)
Yes			AWS Fish Pump 1
	Yes		AWS Fish Pump 2
Yes			AWS Fish Pump 3

Comments: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	
X			Trash rack differentials measured this week?	
X			Trash rack differentials acceptable	
	X		Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments: None.

ESBSs/VBSs:

Yes	No	NA	Item
X			ESBSs deployed in all slots and in service?
	X		ESBSs inspected this week?
		X	ESBSs inspection results acceptable?
X			VBSs differentials checked this week?
	X		VBSs differentials acceptable?

Comments: ESBS removal for unit 1 and unit 2 began November 25 due to these units not being returned to service until after December 15. Underwater camera inspections are being used to identify issues with removal of the ESBS in slot 1A.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	18
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: The collection channel is operating with primarily 14” orifices with 10” orifices opened to maintain optimal flume flow in response to forebay elevation. The north makeup water valve remains in local control due to

an automatic control motor hardware failure. Intermittent issues with local and remote operation of orifices for back flushing continue to be observed. Problems are reported to operations when they are identified. Orifices 2BN and 5AN were inoperable due to failed solenoids last reporting week. Attempting to operate these orifices results in a blown the fuse in the panel. Orifices 2BN and 5AN were repaired and returned to service November 25. Orifices in 1A were tagged closed to facilitate under water inspection of the ESBS in slot 1A. The gatewell was constantly monitored during this time.

Collection Facility: Dewatered for winter maintenance.

Transport Summary: N/A

Spillway Weir: No spill

River Conditions

River conditions at Lower Granite Dam.

Daily Average River Flow (kcfs)		**Daily Average Spill (kcfs)**		**Water Temperature* (°F)**		**Water Clarity (Secchi disk - feet)**	
High	Low	High	Low	High	Low	High	Low
21.7	16.5	0	0	45.4	44.0	5.0+	5.0+

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were not inspected during this reporting period.

Invasive Species: No signs of Zebra/Quagga mussels were found on submerged substrates.

Avian Activity: N/A

Gas Bubble Trauma (GBT) Monitoring: N/A

Adult Fish Trap Operations: The adult trap is closed for the season.

Fish Rescue/Salvage: No fish salvage/rescues occurred during this reporting period.

Research: No research is currently occurring.