SYSTEM OPERATIONAL REQUEST: #2012-4

The following State, Federal, and Tribal Salmon Managers have participated in the preparation and support this SOR: National Marine Fisheries Service, US Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, the Idaho Department of Fish and Game, and the Columbia River Inter-Tribal Fish Commission.

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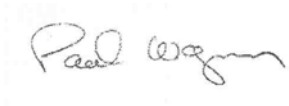

FROM: Paul Wagner, FPAC Chair

DATE: August 15, 2012

SUBJECT: Truck Transport from McNary Dam

OBJECTIVE: Do not initiate truck transport operations at McNary Dam on August 17, 2012.

SPECIFICATIONS: Delay the Start of truck Transport at McNary Dam until further notice. Due to relatively high existing water temperatures in the holding raceways at McNary Dam coupled with a very warm forecast in the Tri-Cities region, conditions would not be favorable to collect, hold for up to 48 hours, and transport by truck until conditions can be re-evaluated.

JUSTIFICATION: With regard to summer transportation at McNary Dam, the 2012 Fish Operations Plan (FOP) states:

> Transportation will be initiated at McNary Dam between July 15–30 per the 2010 Supplemental BiOp (RPA 30, Table 4) and in coordination with NOAA Fisheries and the

TMT. Fish will be transported from McNary Dam by barge through August 16, then transported by truck every other day. All fish collected will be transported except those marked for in-river studies. Fish are expected to be transported through September 30. The presence of factors such as excess shad, algae or bryozoans that can clog screens and flumes may result in discontinuing transport operations at McNary Dam before September 30. Detailed criteria for McNary transport are contained in the FPP, Appendix B.

Transportation operations may be adjusted for research purposes, due to conditions at the collection facilities, or as a result of the adaptive management process (to better match juvenile outmigration timing and/or to achieve or maintain performance standards). If new information indicates that modifying (or eliminating) transportation operations at McNary Dam is warranted, adaptive management will be used to make appropriate adjustments through coordination with the FPOM/TMT.

The recommendation to not implement truck transport at McNary Dam on August 17 is based on the following information.

1. Average water temperatures in the McNary Forebay have ranged between 68.5-68.9°F from August 8-14, with daily maximum temperatures as high as 69.5°F. Average water temperatures in the McNary tailwater have ranged between 68.6-69.0°F from August 8-14, with daily maximum temperatures as high as 69.2°F (http://www.nwd-wc.usace.army.mil/tmt/documents/ops/temp/201208.lcol.html).
2. The August 3-9, 2012 McNary Dam Temperature report issued by the PSMFC Smolt Monitoring Program recorded daily average water temperatures in Raceway #1 between 67.8-69.7°F with daily maximum temperatures between 69.1-71.8°F (see attachment).
3. Daily maximum air temperatures in the Tri-Cities area are expected to approach or exceed 100°F over the next five days, making it likely that water temperatures will continue to increase.
4. Special sampling protocol has been implemented at the Bonneville and John Day Dam which reduce sampling of juvenile fish to just two days a week at those facilities given the warm water conditions present at those facilities. While no such protocol currently exists for the McNary facility, the fish managers believe it is not prudent to hold fish for an extended period at this facility, especially when the flow in the river is in the 200 kcfs range.
5. A new juvenile outfall has been constructed at the McNary project which should improve survival at this project.

There is very little data on the relative benefits of transport during this time period because all previous studies conducted at McNary ceased prior to this date. Environmental conditions at the project form the basis for this decision. However, the improvements made to make the river environment a safer route of passage during this past decade deserve mention. These include:

McNary Dam:
- 24 hours spill
- Relocated bypass outfall

John Day Dam:
- Top spill weirs
- Improved spill patterns
- Improved avian wire array
- 24 hours spill

The Dalles Dam:
- Spillway wall and associated improved spill patterns
- Improved ice and trash sluiceway chain gate opening patterns
- Improved avian wire arrays

Bonneville Dam:
- Second Powerhouse corner collector (surface bypass)
- Improved spill patterns (increased minimum openings)
- Increased spill volume
- Finished minimum gap runners at the First Powerhouse
- Heavy-up on Pikeminnow program

The signatories to this SOR believe that due relatively high existing water temperatures at McNary Dam (Forebay, Tailwater, Raceways, etc.) coupled with a very warm forecast in the Tri-Cities region, conditions would not be favorable to collect, hold, and transport by truck until conditions can be re-evaluated. Future evaluations of whether to begin, delay, or discontinue truck transport at McNary dam will consider factors such future water temperatures as well as excessive numbers juvenile of shad that can result in discontinuing transport operations at McNary Dam before September 30.

PSMFC McNary Dam, P.O. Box 1230, Umatilla, Oregon 97882
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McNary Temperature Report #8
August 3 - 9, 2012

A total of 58,641 juvenile salmonids were collected at the McNary Juvenile Fish Facility (JFF) for this weekly period (Figure 1 and Table 1). Subyearling fall chinook accounted for 99.7% of the total collection. Daily flows for this week averaged 232.0kcfs. Spill averaged 116.3kcfs (50.1%). The system mortality averaged 0.05% for the week. Sample tank mortality averaged 1.03%. Mortalities are being enumerated from the separator, sample tanks and the recovery raceway before being returned to the river.

Fish are being sampled every other day with bypass return to the river. Bypass will continue until August 15. Units 3 and 8 are off for rewinding. All orifices are open.

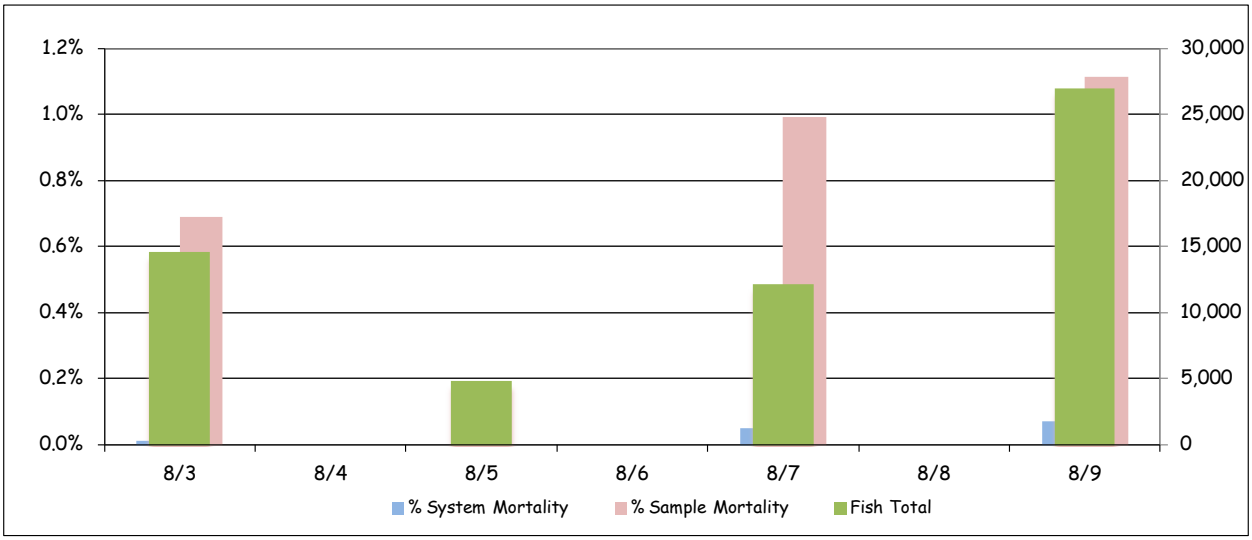

Figure 1: Collection and Mortality

Table 1: Collection and Mortality With Daily and Weekly Averages

		Mortality		Flow			Air Temp		Wind Speed	
	Collection	Sample	System	Total	Turbine	Spill	Avg.	Max.	Avg.	Max.
8/3/12	14,601	0.69%	0.01%	238.2	113.8	119.7	73.6	86.5	2.3	20.0
8/4/12				240.4	114.9	120.7	75.0	94.3	1.8	10.0
8/5/12	4,900	0.00%	0.00%	232.5	111.2	116.5	77.9	93.4	1.3	10.0
8/6/12				235.4	112.9	117.8	86.0	103.6	2.6	12.0
8/7/12	12,200	0.99%	0.05%	230.5	110.5	115.3	81.0	98.2	0.8	14.0
8/8/12				226.4	108.4	113.3	80.5	92.7	3.8	23.0
8/9/12	26,940	1.11%	0.07%	220.9	105.5	110.7	73.3	88.0	1.4	9.0
Weekly Average	14,660	1.03%	0.05%	232.0	111.0	116.3	78.2	103.6	2.0	23.0

Air temperatures at the McNary JFF averaged 78.2°F for the week. Maximum hourly air temperature was 103.6°F on August 6 (Figure 2). The minimum temperature was 57.8°F on August 4 from 5:30 until 6:30a.m. Winds over the course of the week averaged 1.97mph with gust peaking up to 23.0mph on August 8.

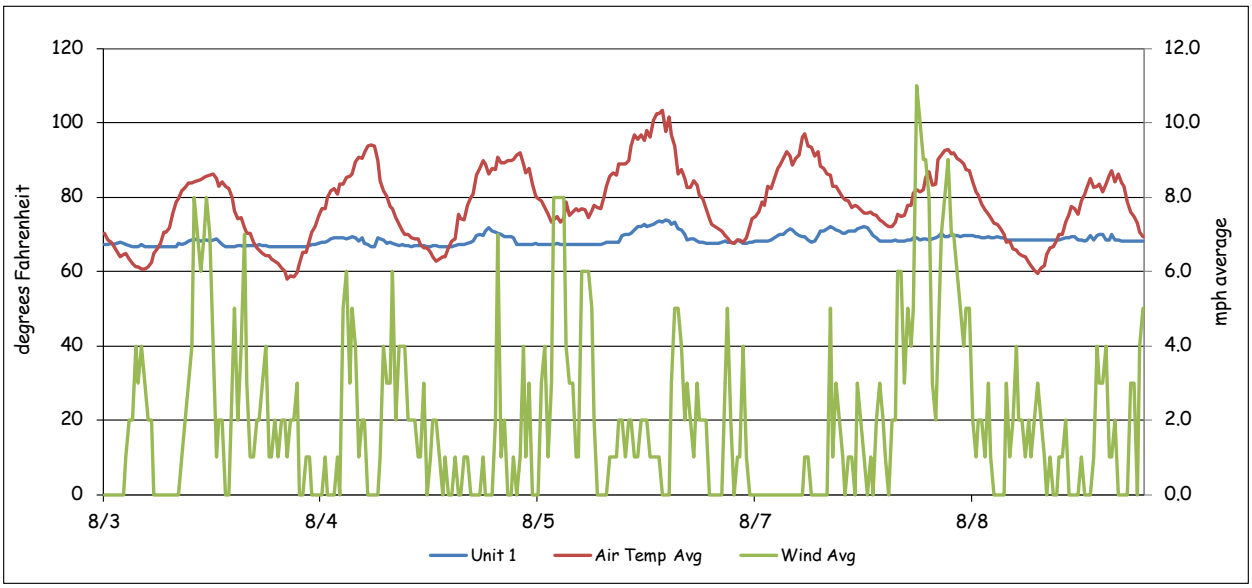

Figure 2: Weather and Forebay Water Temperature

There are 36 temperature probes located throughout the Project and the JFF. These probes are set to record temperatures at 30-minute intervals. These probes are located at the following locations:

1) Forebay, near elevation 335 approximately 5 feet below the surface. These are attached to the pier noses in front of turbine units 1, 3, 5, 7, 8, 10, 12, and 14.
2) In front of spillbays 22, 17, 12, 7 and 2, approximately 5 feet below the surface. These probes are hung in the center of the spillbay, on the tailrace side.
3) Attached to the handrail in the center of the "B" turbine gatewell slots, approximately 2 to 3 feet below the surface, in all 14 turbine units.
4) Tailwater locations are at turbine unit 1 and 14 (tailrace), and the wingwall of the navigation lock. These were placed 5 feet below the water surface.
5) The collection channel had probes installed below turbine units 12, 8 and past unit 1 at the beginning of the transition screen.
6) The barge transportation dock.

7) Fish separator.
8) Transport holding raceway #1 at a depth of 2 – 3 feet.

Forebay water temperatures (Table 2) peaked this week with 75.9°F on August 6 at 6:30p.m., in front of unit 1. The average was 69.3°F across the forebay. Gatewell water temperatures for all units combined averaged 68.7°F (Table 3). Gatewell temperatures peaked at 75.0°F on August 6 in unit 5 at 6:00p.m.

Table 2: Forebay Water Temperatures

	Daily Average								Daily
	1F	**3F**	**5F**	**7F**	**8F**	**10F**	**12F**	**14F**	**Max**
8/3/12	68.0	67.3	68.4	68.3	67.9	68.6	68.9	69.1	71.8
8/4/12	68.0	68.1	68.5	68.8	68.5	68.9	69.1	69.1	73.0
8/5/12	68.5	68.2	69.2	68.8	68.6	69.2	69.4	69.4	74.8
8/6/12	70.0	69.7	70.6	69.9	69.4	70.2	70.0	69.6	75.9
8/7/12	69.8	69.5	70.7	70.5	69.9	71.2	70.9	70.4	74.5
8/8/12	69.7	69.7	70.1	69.8	69.6	69.8	69.7	69.4	72.3
8/9/12	69.2	69.0	69.4	69.4	69.0	69.8	70.3	70.1	74.1
Weekly Average	69.0	68.8	69.5	69.4	69.0	69.7	69.7	69.6	75.9

Table 3: Gatewell Water Temperatures for Units 1, 7 & 14

	Daily Avg.			Daily Max.			Daily Min.		
	1	**7**	**14**	**1**	**7**	**14**	**1**	**7**	**14**
8/3/12	67.3	67.5	68.9	68.7	69.1	70.5	66.6	66.6	67.8
8/4/12	67.6	67.9	69.2	69.4	69.6	70.7	66.6	66.6	68.4
8/5/12	67.9	68.0	69.6	71.8	70.9	71.2	66.7	66.9	68.5
8/6/12	69.5	69.0	68.7	73.9	71.4	70.5	67.1	67.3	67.3
8/7/12	69.0	69.1	67.9	72.0	71.2	70.3	67.6	67.8	65.5
8/8/12	69.3	69.4	65.7	72.0	70.7	68.7	68.0	68.9	62.6
8/9/12	68.6	68.8	66.4	70.0	70.0	69.1	68.0	68.4	62.2
Weekly Average	68.5	68.5	68.1	71.1	70.4	70.2	67.2	67.5	66.0

The differences in temperatures between the gatewell at unit 1 and the gatewell at unit 14 are illustrated in Figure 3. This graph takes the temperature in the gatewell and subtracts unit 14 from that gatewell (unit 1 – 14). It then continues down the powerhouse subtracting unit 14 from each consecutive unit. A negative number indicates that unit 14 was the warmer unit. Conversely, a positive number indicates that unit 1 was warmer. This shows the reader the amount of variance from one end of the powerhouse to the other that can be seen through out a 24-hour period.

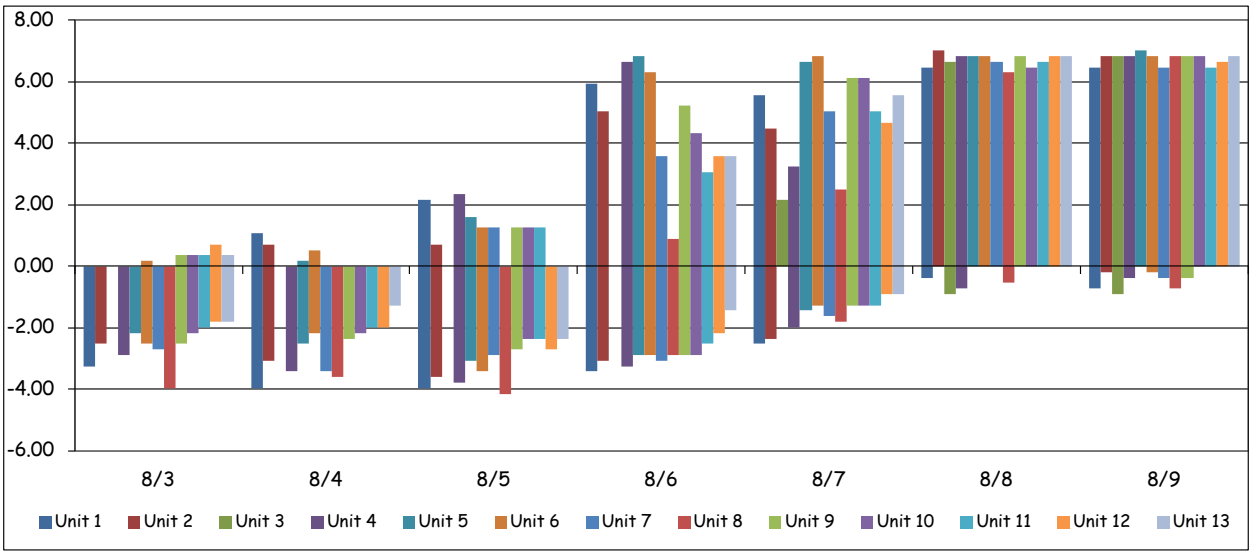

Figure 3: Average Gatewell Temperature Differentials for Units 1 - 14

Forebay differentials (Figure 4) are calculated by taking the forbay temperature and subtracting the corresponding gatewell temperature from it (1F – unit 1). A negative number would indicate that the gatewell was warmer. Conversely, a positive number indicates that the forebay is warmer. Again, this shows the reader the amount of variance that can be seen between the forebay and the gatewell throughout a 24-hour period.

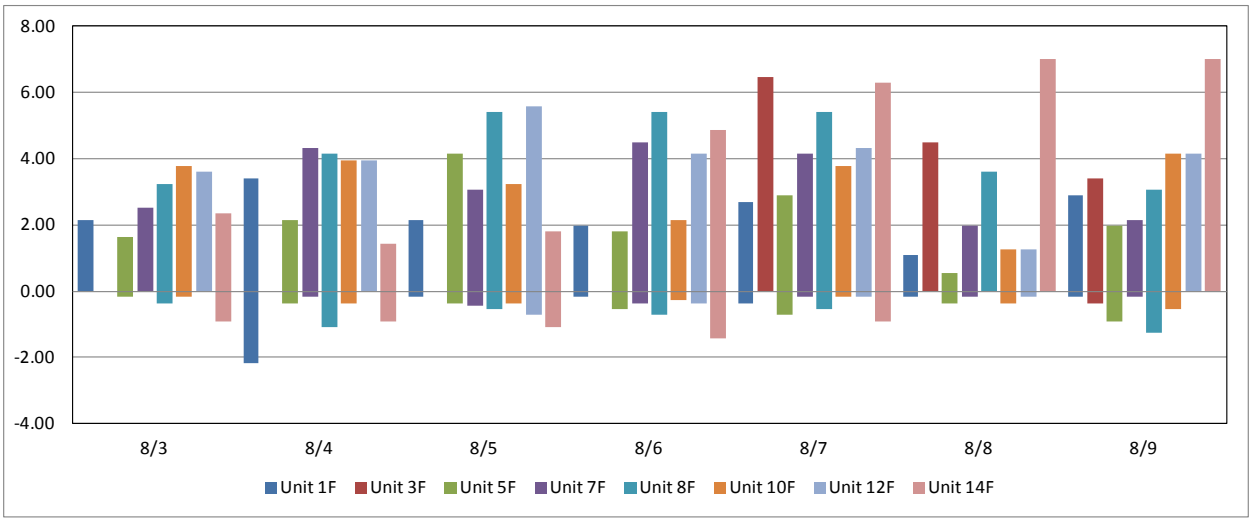

Figure 4: Average Temperature Differentials Between Forebay and Gatewell

Average water temperature in the collection channel was 68.7°F (Table 4) for the week. A maximum temperature of 71.2°F was recorded on August 5 at 7:00pm, below Unit 12. Temperatures at the separator averaged 68.3°F for the week with a maximum daily temperature of 71.1°F (Table 5). The temperature in raceway #1 averaged 68.9°F with a high of 71.8°F August 6 at 6:30pm.

Table 4: Collection Channel Average and Maximum Water Temperatures

	Daily Avg.			Daily Max.		
	1	**8**	**12**	**1**	**8**	**12**
8/3/12	67.3	67.7	68.3	68.4	69.4	70.3
8/4/12	67.5	68.0	68.5	69.1	69.6	70.3
8/5/12	67.9	68.4	68.9	69.6	70.3	71.2
8/6/12	68.9	69.1	69.0	71.2	70.7	70.2
8/7/12	68.8	69.4	69.5	70.2	70.5	70.2
8/8/12	69.1	69.3	69.4	70.0	70.2	70.0
8/9/12	68.7	69.1	69.5	69.4	70.2	70.5
Weekly Average	68.3	68.7	69.0	69.7	70.1	70.4

Table 5: Raceway, Barge Dock and Separator Maximum and Average Water Temperatures

	Daily Avg.			Daily Max.		
	Separator	**Raceway 1**	**Dock**	**Separator**	**Raceway 1**	**Dock**
8/3/12	67.3	67.8	67.0	68.7	69.1	67.3
8/4/12	67.6	68.1	67.2	69.1	69.6	68.2
8/5/12	67.9	68.4	67.3	69.6	70.2	68.0
8/6/12	68.9	69.5	67.9	71.1	71.8	68.7
8/7/12	68.9	69.4	68.2	70.2	70.5	68.9
8/8/12	69.1	69.7	68.9	69.8	70.5	69.4
8/9/12	68.7	69.3	68.6	69.6	70.0	69.3
Average	68.3	68.9	67.9	69.7	70.2	68.5

Collection channel differentials (Table 6) are calculated by taking the forebay temperature and subtracting the collection channel temperature from it at the three corresponding points. This is an average of the variances between the forebay and the collection channel. A negative number indicates that the collection channel was warmer. A positive number indicates the forebay was warmer. The graph (Figure 5) shows the variance through out the week.

Table 6: Average Differences between Forebay and Collection Channel

	1	**8**	**12**
8/3/12	0.8	0.3	0.6
8/4/12	0.4	0.4	0.6
8/5/12	0.6	0.2	0.5
8/6/12	1.1	0.3	0.9
8/7/12	1.0	0.5	1.4
8/8/12	0.6	0.3	0.3
8/9/12	0.5	-0.1	0.9
Average	0.7	0.3	0.7
Maximum	4.9	3.8	5.6
Minimum	-2.0	-1.6	-1.3

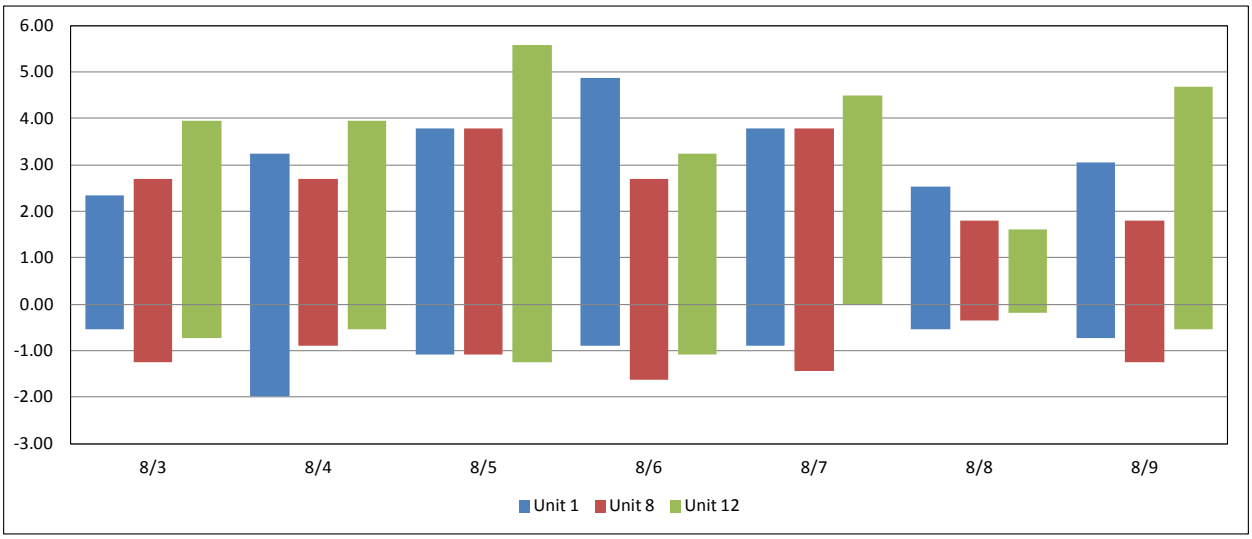

Figure 5: Average Temperature Differentials Between Forebay and Collection Channel