



Salmon Creek Stream Flow Monitoring Report

Water Year 2024

*Annex Creek/Salmon Creek Hydroelectric Project
(FERC Project No. 2307)*

Alaska Electric Light and Power Company
Juneau, Alaska

November 27, 2024

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1. INTRODUCTION AND PURPOSE

In October 2015, Alaska Electric Light & Power Company (AELP) requested an amendment to its license that would allow the operation of the stream gage to be performed by the licensee. By Order issued December 30, 2015, the Federal Energy Regulatory Commission (FERC) approved the amendment and stipulated that a new stream flow plan be developed after consultation with Alaska Department of Fish and Game (ADFG), National Marine Fisheries Service (NMFS), and the United State Fish and Wildlife Service (USFWS). AELP prepared a plan in consultation with ADFG, NMFS, and USFWS, as well as with the Alaska Department of Natural Resources (ADNR) Water Division and National Weather Service (NWS).

By Order issued August 9, 2016 the FERC approved the stream flow monitoring plan with a requirement to file an instream flow monitoring report biannually to the FERC, NMFS, USFWS and ADFG with the requirement changing to an annual report after four successful biannual reports. The report is to review operation of the gage, identify when supplemental water was released and include information on the operation of the supplemental water valve. The report is to be submitted for agency review, with a 30-day review and comment period, prior to filing with the FERC. Documentation of agency consultation should be included in the report.

Reports were submitted to FERC on April 19, 2017, August 16, 2017, February 20, 2018, and August 28, 2018. With the submission to FERC of the fourth report, AELP requested that the due date for the annual report be changed to December 1, 2019 to allow the entire water year to be analyzed in the report. This request was approved by FERC Order on October 9, 2018.

2. GAGE OPERATION

The stream gage started operation on April 27, 2016, taking level measurements on a 15-minute basis. This data is automatically distributed to www.aelp.com/About-Us/Salmon-Creek-Streamflow where it is available for public display. The page has multiple graph options for quick review of the data. Real-time flow data is supplied directly to the AELP Supervisory Control and Data Acquisition (SCADA) System where it is logged and monitored. Alarms are automatically generated for low flow conditions or for loss of communication with the sensor.

The communication path between the gage and the AELP SCADA system is through an AT&T cellular phone modem intended to provide a stable communications path. This communication link is continuously monitored by the AELP SCADA system at the AELP dispatch center which is manned 24 hours per day. The operators are trained to respond to all alarms, either by taking direct action or calling a technical specialist who can resolve the specific problem.

The cellular modem was reliable in water year 2024, with three short communication failures. Although the typical stream flow is well above the 9 CFS action level and the stream flow doesn't change rapidly, the AELP Operator opens the valve for any loss of communication event and leaves the valve open until communication is restored. This ensures that AELP remains in compliance with the license requirements.

Communication failures do not result in any data loss since the data is still stored locally on the datalogger, but it does result in a loss of real-time data to the AELP SCADA system.

Figures 1 through 4 below show the plots of daily mean discharge and field measured discharge for the by quarter for the water year. Discharge measurements were conducted to validate discharges for the 2024 Water Year. Calibration measurements ranged from 20 to 90 CFS.

Ed Neal with Alaska Hydroscience provided a new rating table for the stream on January 22, 2019, and the rating was continued in use, with slight shift adjustments, until a large peak discharge on Dec. 1, 2020. This large peak resulted in channel fill through the gage reach. Following that event, another rating was constructed based on seven discharge measurements and the highest recorded measurements conducted by the U.S. Geological Survey at this same site and gage datum. Alaska Hydroscience performs discharge measurements of the stream several times a year and adjusts the rating curve as necessary to provide accurate representation of the streamflow. A copy of the revised rating curve dated October 6, 2023, is included in Appendix B.

A table of the Daily Mean Discharge for the months of October 2016 through September 2024 is included in Appendix A.

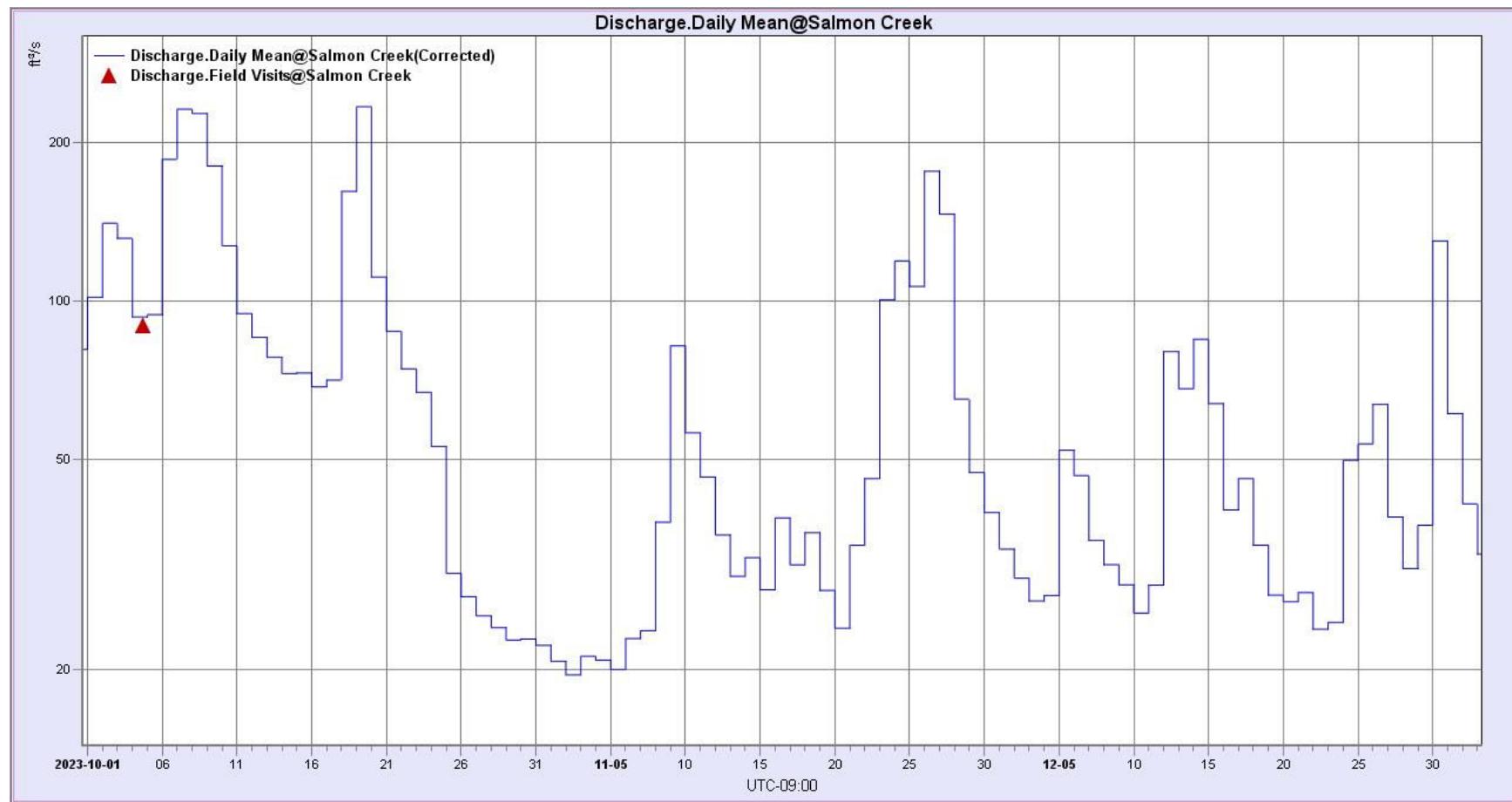


Figure 1 – Fourth Quarter 2023 Corrected Discharge

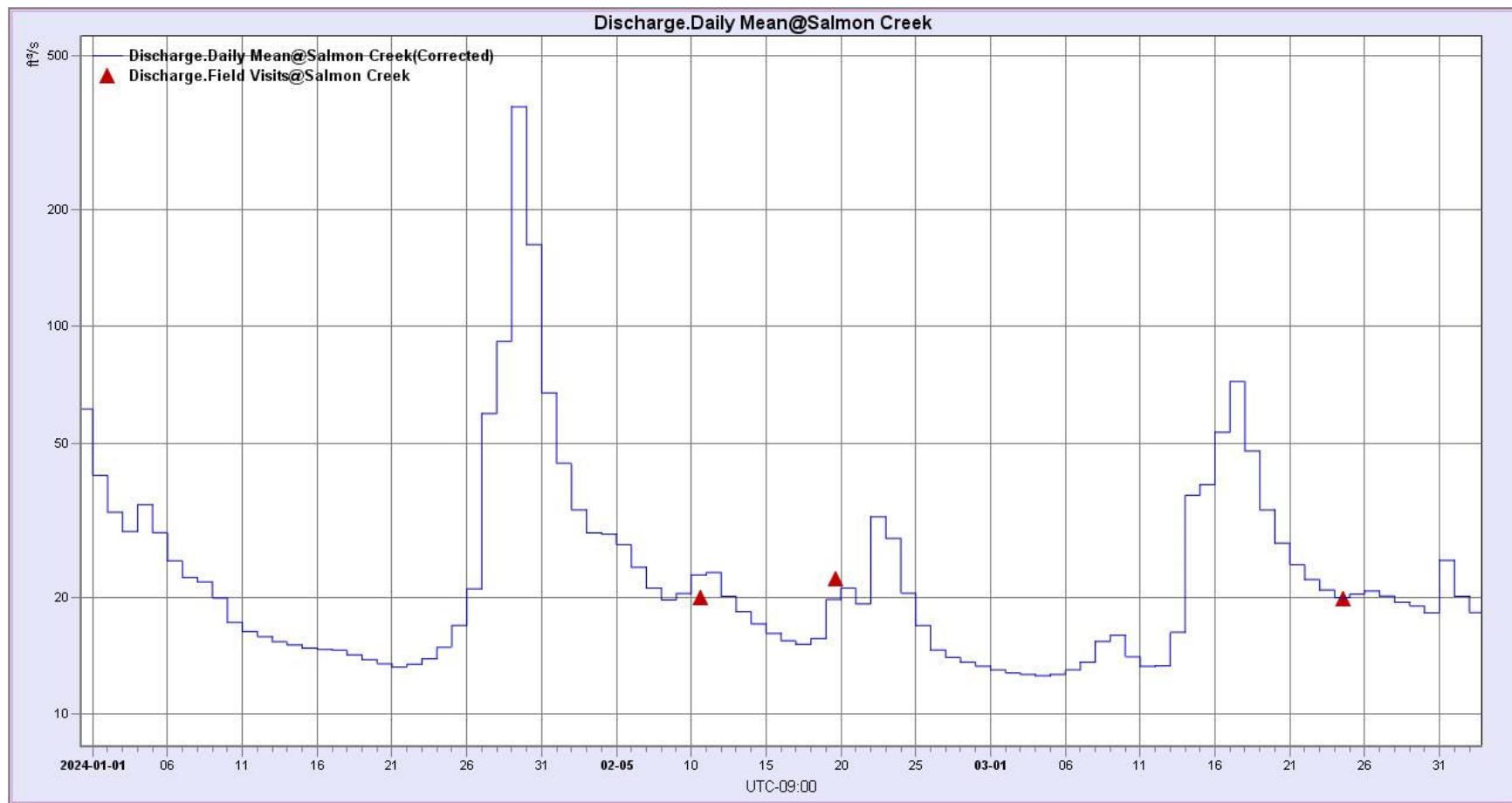


Figure 2 – First Quarter 2024 Corrected Discharge

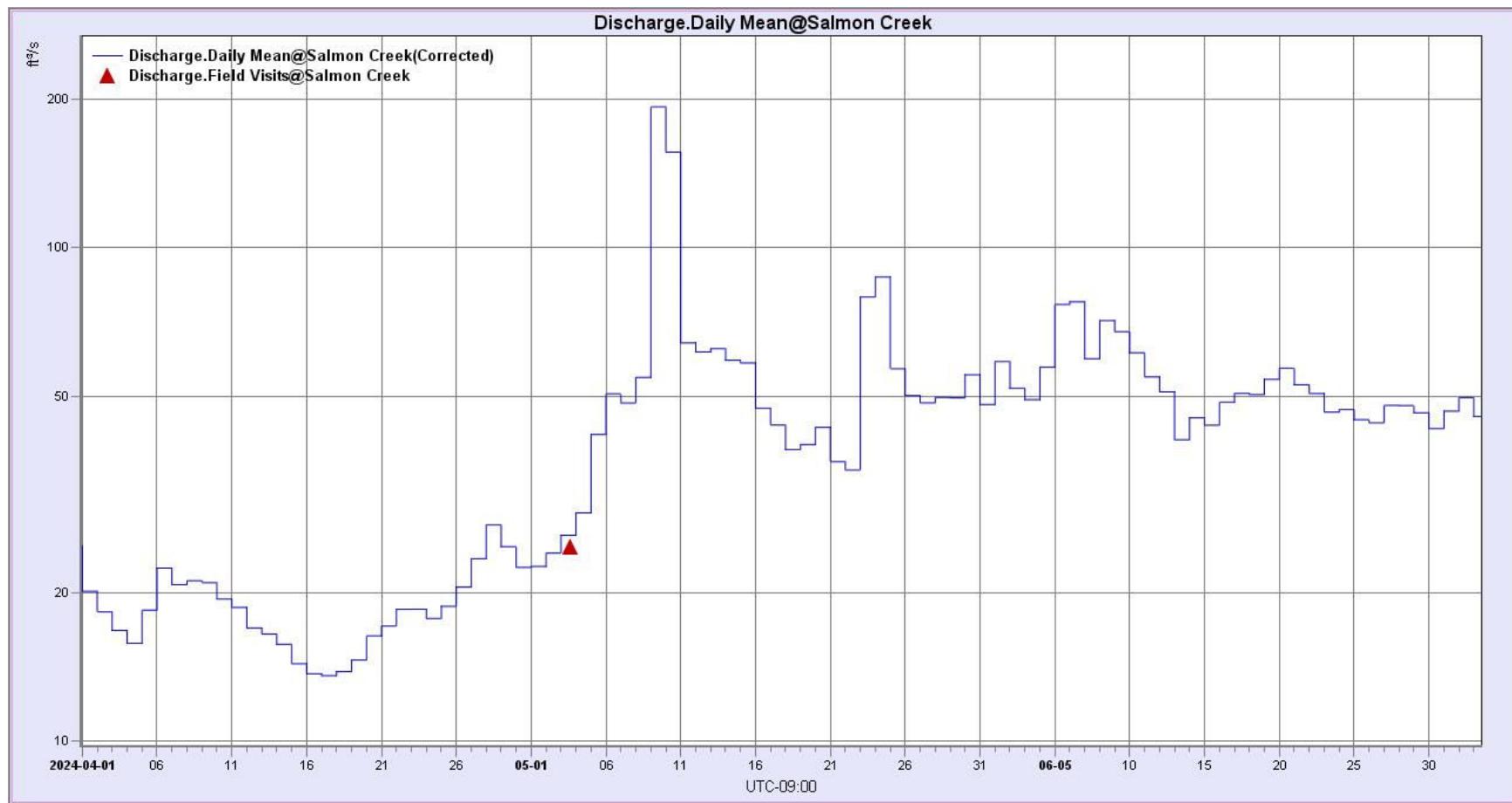


Figure 3 – Second Quarter 2024 Corrected Discharge

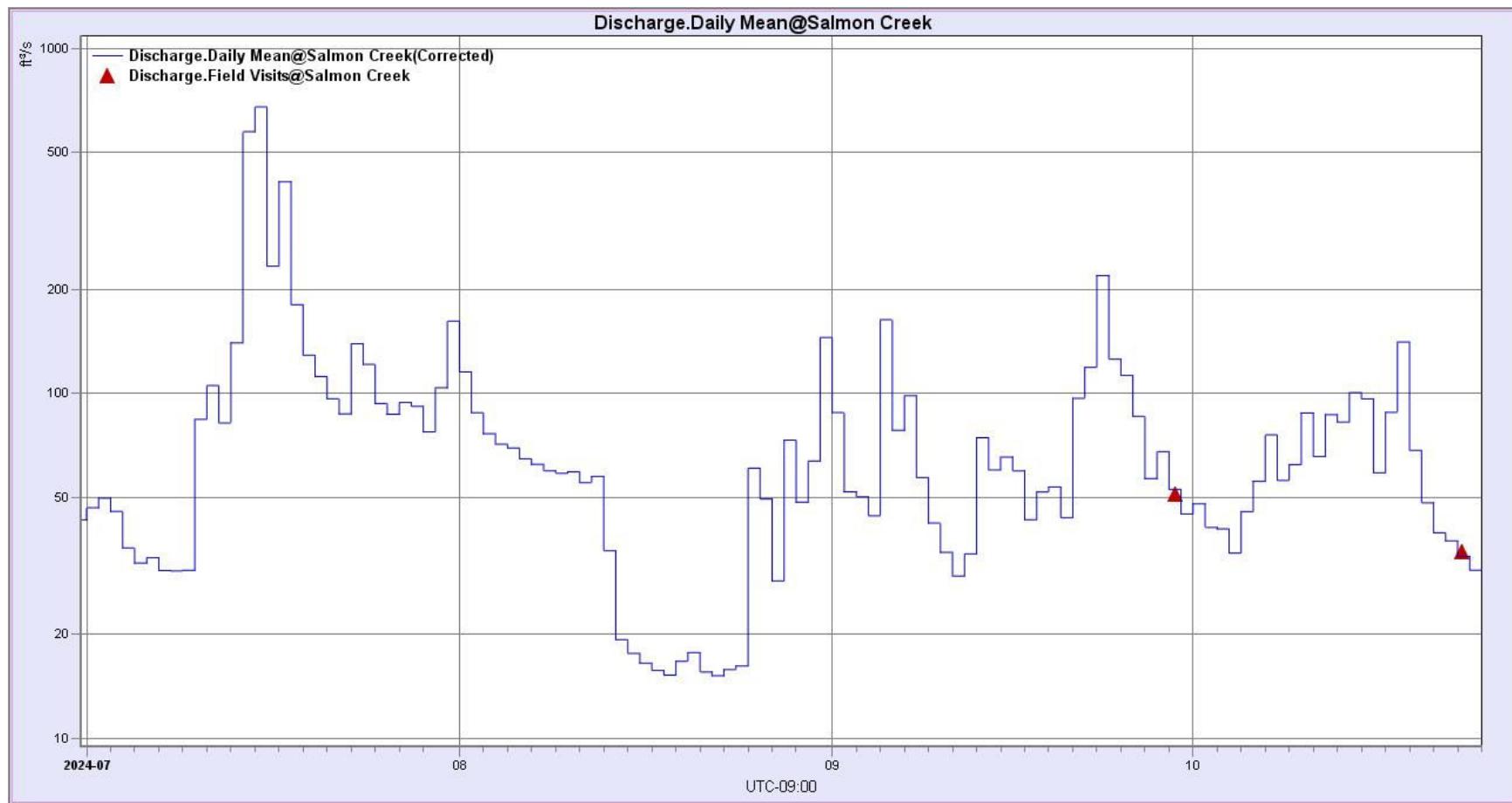


Figure 4 – Third Quarter 2024 Corrected Discharge

3. SUPPLEMENTAL VALVE OPERATION

The supplemental water valve is a 6" valve tapped off the penstock at the base of the dam. The valve discharges water directly into the natural drainage. Operation of the valve is performed remotely by the AELP System Operator who also has real-time indication of the streamflow. When the flow drops to 9CFS, an alarm is generated, and the Operator opens the valve and logs the operation.

The valve is either open or closed. There are no intermediate positions. The Operator has feedback on the valve position, provided by limit switches which show the valve position as well as an analog signal which reflects valve position. In addition to valve position, there is a flowmeter on the outlet of the valve. The amount of flow through the valve when open varies with the reservoir elevation. The valve has been sized to ensure a minimum of 3CFS of flow at minimum reservoir elevation, so typically more than 3 CFS is discharged to the stream.

Station service at the valve house located at the base of the dam is provided by a small hydroelectric DC generator. This power is used for monitoring, valve operation, and battery charging. The output of the turbine is discharged into the stream at the base of the dam.

4. SUPPLEMENTAL VALVE RELEASE

The supplemental valve was operated 5 times in water year 2024.

It was operated only once for low stream flow as indicated by stream flow measurement and one other time for low flow indicated by extreme cold, which resulted in inaccuracies in the stream flow measurement. In July of 2024 the valve was opened to help mitigate high reservoir level. The remainder of the valve operations were due to short communications failures.

In June of 2024 the valve was open for less than 15 minutes due to a communication failure. The valve flow is logged on a 15-minute interval. Due to the timing, flow through the valve was logged during operation of the valve and not when it was fully open, so full flow was not recorded.

| Date Open | Stream Flow | Date Closed | Release Flow (CFS) | Reason |
|------------------|-------------|------------------|--------------------|----------------|
| 1/21/24 07:24 AM | 9.05 | 1/26/24 02:12 PM | 4.20 | Low flow |
| 3/3/24 08:26 AM | 62.17 | 3/14/24 01:57 PM | 4.02 | Low flow (ice) |
| 6/23/24 04:26 | 46.42 | 6/23/24 04:41 | 3.26 | Comm failure |
| 7/15/24 10:30 AM | 667.87 | 7/29/24 08:34 AM | 4.3 | High reservoir |
| 8/7/24 04:44 AM | 55.41 | 8/7/24 08:35 AM | 4.31 | Comm failure |

5. AGENCY CONSULTATION

A copy of the report with a request for consultation was sent out on October 25, 2024, by Bryan Farrell with AELP to ADFG, USFWS and NMFS by e-mail.

A copy of the request for consultation and comments received are included in Appendix E.

APPENDIX A: DAILY DISCHARGE TABLE OCTOBER 2016-SEPTEMBER 2024

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Identifier: Discharge.Daily Mean@Salmon Creek
 Location: Salmon Creek Juneau
 Units: ft^3/s
 Filter: None

Salmon Creek

| Year: Oct. 2016 to Sept. 2017 | | | | | | | | | | | | |
|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Day | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| 1 | 25 | 11 | 19 | 12 | 13 | 12 | 34 | 34 | 64 | 63 | 21 | 150 |
| 2 | 22 | 12 | 67 | 12 | 12 | 12 | 21 | 37 | 62 | 92 | 19 | 96 |
| 3 | 20 | 24 | 98 | 12 | 11 | 12 | 16 | 39 | 57 | 110 | 18 | 59 |
| 4 | 19 | 33 | 38 | 11 | 11 | 11 | 13 | 32 | 46 | 70 | 17 | 120 |
| 5 | 17 | 59 | 25 | 11 | 12 | 11 | 17 | 27 | 45 | 52 | 16 | 76 |
| 6 | 16 | 31 | 20 | 11 | 13 | 11 | 17 | 25 | 59 | 47 | 15 | 56 |
| 7 | 15 | 27 | 19 | 9.9 | 12 | 11 | 14 | 25 | 68 | 40 | 14 | 75 |
| 8 | 14 | 51 | 17 | 9.5 | 11 | 10 | 13 | 34 | 78 | 36 | 13 | 80 |
| 9 | 13 | 64 | 15 | 9 | 10 | 10 | 19 | 69 | 67 | 54 | 12 | 140 |
| 10 | 13 | 76 | 14 | 8.6 | 11 | 10 | 16 | 42 | 48 | 46 | 12 | 120 |
| 11 | 12 | 120 | 13 | 8.3 | 19 | 9.8 | 16 | 46 | 39 | 49 | 12 | 72 |
| 12 | 12 | 95 | 14 | 8.8 | 31 | 9.6 | 18 | 55 | 37 | 46 | 14 | 57 |
| 13 | 12 | 65 | 16 | 16 | 53 | 9.4 | 22 | 50 | 36 | 69 | 16 | 46 |
| 14 | 11 | 63 | 15 | 43 | 74 | 9.2 | 20 | 49 | 33 | 82 | 33 | 39 |
| 15 | 11 | 43 | 14 | 45 | 77 | 9 | 18 | 43 | 35 | 54 | 30 | 34 |
| 16 | 12 | 33 | 13 | 130 | 43 | 8.7 | 18 | 44 | 51 | 57 | 69 | 31 |
| 17 | 17 | 27 | 15 | 55 | 27 | 8.6 | 17 | 48 | 77 | 46 | 130 | 32 |
| 18 | 37 | 23 | 17 | 29 | 21 | 8.4 | 16 | 49 | 49 | 37 | 110 | 27 |
| 19 | 32 | 20 | 19 | 34 | 17 | 8.3 | 13 | 81 | 45 | 33 | 73 | 23 |
| 20 | 31 | 18 | 20 | 22 | 15 | 8.3 | 12 | 81 | 53 | 29 | 73 | 21 |
| 21 | 23 | 16 | 24 | 17 | 14 | 8.2 | 13 | 300 | 43 | 27 | 110 | 20 |
| 22 | 26 | 16 | 15 | 15 | 13 | 8.2 | 18 | 150 | 42 | 37 | 150 | 27 |
| 23 | 25 | 16 | 12 | 14 | 12 | 8.3 | 22 | 94 | 37 | 39 | 75 | 31 |
| 24 | 19 | 15 | 11 | 15 | 11 | 8.2 | 25 | 73 | 42 | 30 | 51 | 68 |
| 25 | 16 | 14 | 10 | 23 | 11 | 8.2 | 32 | 59 | 40 | 27 | 68 | 50 |
| 26 | 15 | 14 | 12 | 22 | 12 | 8.2 | 30 | 58 | 37 | 35 | 95 | 74 |
| 27 | 14 | 14 | 13 | 27 | 13 | 8.6 | 41 | 52 | 41 | 76 | 70 | 150 |
| 28 | 13 | 13 | 15 | 33 | 13 | 12 | 62 | 47 | 36 | 48 | 55 | 130 |
| 29 | 12 | 27 | 11 | 25 | | 16 | 38 | 61 | 34 | 35 | 43 | 60 |
| 30 | 12 | 30 | 13 | 18 | | 13 | 29 | 64 | 50 | 29 | 42 | 41 |
| 31 | 11 | | 12 | 15 | | 42 | | 62 | | 24 | 100 | |
| Aggr | 18 | 36 | 21 | 23 | 21 | 11 | 22 | 62 | 48 | 49 | 51 | 67 |
| Min | 11 | 11 | 10 | 8.3 | 10 | 8.2 | 12 | 25 | 33 | 24 | 12 | 20 |
| Max | 37 | 120 | 98 | 130 | 77 | 42 | 62 | 300 | 78 | 110 | 150 | 150 |

Salmon Creek - Daily Mean Discharge

Identifier: Discharge.Daily Mean@Salmon Creek

Location: Salmon Creek Juneau

Units: ft^3/s

Filter: None

Year: Oct. 2017-Sept. 2018

Aggr:

28

Min:

7.8

Max:

210

| Day | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 33 | 42 | 12 | 10 | 14 | 8.6 | 8.7 | 37 | 31 | 31 | 12 | 43 |
| 2 | 28 | 35 | 10 | 25 | 14 | 8.2 | 8.6 | 50 | 31 | 24 | 11 | 33 |
| 3 | 39 | 32 | 11 | 48 | 13 | 8.2 | 8.5 | 28 | 29 | 23 | 9.7 | 27 |
| 4 | 35 | 29 | 27 | 41 | 13 | 8 | 8.3 | 56 | 33 | 21 | 12 | 23 |
| 5 | 41 | 26 | 20 | 45 | 12 | 7.8 | 8.3 | 100 | 35 | 20 | 11 | 20 |
| 6 | 75 | 24 | 24 | 35 | 11 | 8 | 8.4 | 71 | 31 | 18 | 11 | 18 |
| 7 | 47 | 22 | 25 | 28 | 11 | 7.8 | 8.7 | 54 | 31 | 17 | 14 | 16 |
| 8 | 60 | 20 | 52 | 18 | 10 | 7.9 | 9.9 | 53 | 29 | 15 | 23 | 15 |
| 9 | 60 | 19 | 120 | 16 | 9.4 | 7.9 | 18 | 63 | 26 | 14 | 100 | 14 |
| 10 | 40 | 17 | 72 | 15 | 9.1 | 8.1 | 22 | 64 | 33 | 16 | 53 | 13 |
| 11 | 31 | 16 | 200 | 13 | 9.7 | 12 | 21 | 79 | 38 | 20 | 30 | 12 |
| 12 | 26 | 15 | 95 | 18 | 10 | 16 | 16 | 110 | 32 | 20 | 25 | 11 |
| 13 | 23 | 14 | 130 | 20 | 10 | 25 | 15 | 75 | 29 | 16 | 39 | 11 |
| 14 | 24 | 13 | 210 | 57 | 10 | 22 | 15 | 56 | 31 | 15 | 100 | 10 |
| 15 | 42 | 12 | 83 | 63 | 9.9 | 16 | 14 | 37 | 27 | 32 | 38 | 9.9 |
| 16 | 49 | 11 | 70 | 50 | 9.8 | 15 | 13 | 31 | 28 | 100 | 28 | 9.5 |
| 17 | 40 | 11 | 52 | 35 | 9.6 | 14 | 12 | 30 | 44 | 40 | 26 | 9.5 |
| 18 | 32 | 11 | 38 | 26 | 9.5 | 12 | 16 | 36 | 40 | 28 | 21 | 12 |
| 19 | 27 | 11 | 31 | 22 | 9.3 | 14 | 28 | 39 | 35 | 24 | 18 | 12 |
| 20 | 35 | 10 | 28 | 20 | 9.2 | 16 | 20 | 41 | 33 | 20 | 16 | 11 |
| 21 | 33 | 10 | 24 | 17 | 9 | 13 | 14 | 77 | 31 | 18 | 16 | 11 |
| 22 | 27 | 10 | 21 | 16 | 8.9 | 11 | 15 | 85 | 25 | 17 | 21 | 11 |
| 23 | 37 | 10 | 19 | 15 | 8.9 | 11 | 49 | 49 | 21 | 15 | 23 | 16 |
| 24 | 37 | 9.9 | 18 | 16 | 8.7 | 9.8 | 41 | 43 | 20 | 14 | 26 | 12 |
| 25 | 28 | 9.5 | 17 | 17 | 8.7 | 9.9 | 27 | 42 | 18 | 13 | 57 | 18 |
| 26 | 57 | 9.2 | 16 | 16 | 8.4 | 10 | 36 | 66 | 19 | 12 | 35 | 32 |
| 27 | 560 | 9.2 | 15 | 16 | 8.4 | 10 | 36 | 69 | 20 | 11 | 36 | 18 |
| 28 | 110 | 9.1 | 14 | 15 | 8.3 | 9.9 | 24 | 51 | 18 | 11 | 96 | 14 |
| 29 | 61 | 12 | 14 | 15 | | 9.5 | 19 | 42 | 30 | 10 | 50 | 12 |
| 30 | 52 | 18 | 12 | 15 | | 9.1 | 17 | 37 | 39 | 9.5 | 34 | 11 |
| 31 | 54 | | 11 | 15 | | 8.8 | | 34 | | 9.9 | 43 | |
| Aggr | 59 | 17 | 48 | 25 | 10 | 11 | 19 | 55 | 30 | 21 | 33 | 16 |
| Min | 23 | 9.1 | 10 | 10 | 8.3 | 7.8 | 8.3 | 28 | 18 | 9.5 | 9.7 | 9.5 |
| Max | 560 | 42 | 210 | 63 | 14 | 25 | 49 | 110 | 44 | 100 | 100 | 43 |

Salmon Creek - Daily Mean Discharge

Identifier: Discharge.Daily Mean@Salmon Creek

Location: Salmon Creek Juneau

Units: ft^3/s

Filter: None

Year: Oct. 2018-Sept. 2019

| Day | Oct | Nov | Dec | Jan | Feb | 32 | Min: | 7.4 | Max: | 600 | | |
|-------|-----|-----|-----|-----|-----|-----|------|-----|------|-----|-----|-----|
| Aggr: | | | | | | | | | | | | |
| 1 | 9.9 | 23 | 20 | 120 | 19 | 9.5 | 15 | 14 | 39 | 14 | 13 | 10 |
| 2 | 9.3 | 22 | 18 | 50 | 18 | 9.2 | 15 | 17 | 36 | 13 | 12 | 14 |
| 3 | 11 | 20 | 17 | 29 | 16 | 8.9 | 15 | 26 | 31 | 13 | 11 | 20 |
| 4 | 12 | 19 | 17 | 21 | 16 | 8.8 | 16 | 31 | 37 | 12 | 10 | 14 |
| 5 | 16 | 17 | 16 | 20 | 16 | 8.7 | 14 | 44 | 31 | 12 | 9.9 | 12 |
| 6 | 17 | 16 | 15 | 18 | 16 | 8.5 | 13 | 78 | 26 | 11 | 9.5 | 10 |
| 7 | 14 | 15 | 14 | 18 | 15 | 8.4 | 14 | 130 | 27 | 13 | 9.2 | 12 |
| 8 | 28 | 22 | 16 | 18 | 15 | 8.3 | 19 | 120 | 28 | 14 | 8.7 | 11 |
| 9 | 19 | 34 | 30 | 17 | 15 | 8.4 | 18 | 110 | 35 | 14 | 8.3 | 10 |
| 10 | 16 | 27 | 42 | 14 | 14 | 9.1 | 20 | 71 | 32 | 13 | 8.1 | 10 |
| 11 | 26 | 64 | 56 | 15 | 14 | 9.4 | 17 | 52 | 81 | 13 | 7.8 | 9.8 |
| 12 | 19 | 40 | 32 | 15 | 13 | 9.5 | 17 | 37 | 54 | 12 | 7.7 | 10 |
| 13 | 28 | 46 | 25 | 35 | 13 | 10 | 15 | 33 | 36 | 12 | 7.5 | 29 |
| 14 | 160 | 58 | 20 | 61 | 12 | 11 | 13 | 31 | 29 | 12 | 7.4 | 23 |
| 15 | 190 | 38 | 18 | 33 | 12 | 11 | 12 | 37 | 30 | 11 | 7.7 | 13 |
| 16 | 81 | 30 | 18 | 26 | 11 | 15 | 12 | 40 | 45 | 13 | 7.4 | 12 |
| 17 | 100 | 79 | 25 | 21 | 11 | 29 | 13 | 46 | 52 | 12 | 13 | 12 |
| 18 | 56 | 110 | 24 | 18 | 11 | 76 | 45 | 41 | 69 | 14 | 10 | 18 |
| 19 | 71 | 83 | 31 | 16 | 11 | 45 | 39 | 38 | 45 | 13 | 8.6 | 33 |
| 20 | 56 | 70 | 23 | 15 | 11 | 38 | 24 | 39 | 34 | 14 | 7.9 | 330 |
| 21 | 42 | 50 | 19 | 16 | 11 | 40 | 19 | 48 | 32 | 12 | 7.6 | 340 |
| 22 | 47 | 37 | 17 | 15 | 10 | 41 | 26 | 41 | 30 | 11 | 9.5 | 99 |
| 23 | 46 | 31 | 16 | 13 | 10 | 42 | 25 | 35 | 28 | 11 | 21 | 67 |
| 24 | 37 | 27 | 15 | 16 | 9.8 | 35 | 20 | 31 | 25 | 11 | 27 | 170 |
| 25 | 49 | 26 | 14 | 47 | 9.6 | 27 | 17 | 31 | 22 | 11 | 35 | 130 |
| 26 | 44 | 37 | 13 | 160 | 9.6 | 22 | 16 | 40 | 21 | 14 | 32 | 94 |
| 27 | 39 | 32 | 16 | 55 | 9.6 | 20 | 14 | 43 | 24 | 15 | 52 | 57 |
| 28 | 31 | 26 | 16 | 35 | 9.6 | 19 | 13 | 41 | 22 | 40 | 26 | 41 |
| 29 | 27 | 24 | 14 | 33 | | 18 | 13 | 33 | 17 | 19 | 17 | 33 |
| 30 | 31 | 22 | 13 | 35 | | 17 | 13 | 30 | 16 | 13 | 13 | 34 |
| 31 | 27 | | 23 | 30 | | 16 | | 35 | | 12 | | 11 |
| Aggr: | 44 | 38 | 21 | 33 | 13 | 21 | 18 | 47 | 34 | 14 | 14 | 56 |
| Min: | 9.3 | 15 | 13 | 13 | 9.6 | 8.3 | 12 | 14 | 16 | 11 | 7.4 | 9.8 |
| Max: | 190 | 110 | 56 | 160 | 19 | 76 | 45 | 130 | 81 | 40 | 52 | 340 |

Identifier: Discharge.Daily Mean@Salmon Creek
Location: Salmon Creek Juneau
Units: ft^3/s
Filter: None

Daily Mean Discharge 2020 WY-Salmon Creek

| Year: 2020 Water Year | | | Aggr: | | 48 | Min: | 7 | Max: | 300 | | | |
|-----------------------|-----|-----|-------|-----|-----|------|-----|------|-----|-----|-----|-----|
| Day | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| 1 | | 270 | 51 | 25 | 56 | 11 | 18 | 7.4 | 56 | 84 | 48 | 46 |
| 2 | | 160 | 47 | 47 | 35 | 12 | 17 | 7.2 | 46 | 83 | 55 | 44 |
| 3 | | 70 | 49 | 29 | 26 | 13 | 15 | 7.4 | 61 | 110 | 51 | 73 |
| 4 | | 49 | 61 | 23 | 21 | 13 | 12 | 7.2 | 64 | 83 | 55 | 120 |
| 5 | | 62 | 51 | 24 | 18 | 15 | 11 | 7.1 | 53 | 60 | 45 | 59 |
| 6 | | 590 | 44 | 23 | 17 | 12 | 12 | 7.2 | 46 | 53 | 36 | 41 |
| 7 | | 86 | 79 | 19 | 16 | 11 | 12 | 7 | 48 | 82 | 33 | 83 |
| 8 | | 52 | 45 | 21 | 15 | 14 | 12 | 8.3 | 52 | 93 | 45 | 120 |
| 9 | | 40 | 31 | 21 | 13 | 13 | 14 | 7.8 | 83 | 66 | 61 | 170 |
| 10 | | 38 | 26 | 23 | 12 | 68 | 11 | 7.4 | 130 | 64 | 56 | 260 |
| 11 | | 66 | 25 | 26 | 12 | 32 | 11 | 7.3 | 110 | 64 | 42 | 140 |
| 12 | | 53 | 24 | 23 | 12 | 23 | 11 | 7.4 | 78 | 61 | 41 | 110 |
| 13 | | 41 | 44 | 20 | 12 | 18 | 9.7 | 8.5 | 71 | 66 | 36 | 100 |
| 14 | | 32 | 67 | 18 | 12 | 14 | 9.1 | 17 | 72 | 93 | 83 | 98 |
| 15 | | 34 | 66 | 16 | 12 | 13 | 10 | 19 | 70 | 61 | 61 | 110 |
| 16 | | 38 | 100 | 15 | 12 | 11 | 9.8 | 26 | 70 | 70 | 41 | 100 |
| 17 | | 33 | 270 | 14 | 12 | 12 | 9.5 | 32 | 70 | 69 | 36 | 110 |
| 18 | | 39 | 89 | 16 | 12 | 13 | 9.4 | 35 | 63 | 88 | 79 | 93 |
| 19 | | 37 | 60 | 16 | 12 | 13 | 9.2 | 39 | 89 | 96 | 110 | 87 |
| 20 | | 31 | 180 | 15 | 12 | 16 | 9.2 | 44 | 100 | 120 | 190 | 81 |
| 21 | | 26 | 190 | 13 | 11 | 21 | 9.1 | 68 | 67 | 87 | 85 | 80 |
| 22 | | 23 | 210 | 13 | 11 | 14 | 9.4 | 130 | 59 | 68 | 55 | 76 |
| 23 | | 62 | 120 | 18 | 15 | 11 | 9 | 100 | 62 | 60 | 48 | 78 |
| 24 | | 60 | 74 | 16 | 15 | 12 | 8.7 | 65 | 100 | 56 | 41 | 86 |
| 25 | | 46 | 52 | 17 | 15 | 13 | 8.6 | 52 | 87 | 60 | 93 | 91 |
| 26 | | 34 | 39 | 41 | 27 | 17 | 8.8 | 55 | 72 | 110 | 300 | 73 |
| 27 | | 31 | 31 | 27 | 17 | 30 | 8.8 | 63 | 53 | 72 | 130 | 47 |
| 28 | | 25 | 27 | 43 | 12 | 29 | 8.3 | 92 | 48 | 60 | 66 | 44 |
| 29 | | 33 | 24 | 29 | 30 | 19 | 7.8 | 78 | 58 | 68 | 53 | 39 |
| 30 | | 41 | 22 | 120 | 17 | | 7.5 | 70 | 61 | 52 | 49 | 61 |
| 31 | | 32 | | 72 | 13 | | 7.5 | | 61 | | 43 | 97 |
| Aggr | 72 | 74 | 27 | 17 | 18 | 10 | 36 | 70 | 75 | 70 | 91 | 35 |
| Min | 23 | 22 | 13 | 11 | 11 | 7.5 | 7 | 46 | 52 | 33 | 39 | 14 |
| Max | 590 | 270 | 120 | 56 | 68 | 18 | 130 | 130 | 120 | 300 | 260 | 100 |

Identifier: Discharge.1@Salmon Creek

Location: Salmon Creek Juneau

Units: ft^3/s

Filter: None

Daily Mean Discharge 2021 WY Salmon Creek

Year: 2021 Water Year

| Day | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|------|-----|
| 1 | | 27 | 94 | 590 | 35 | 30 | 20 | 13 | 74 | 320 | 94 | 31 |
| 2 | | 120 | 62 | 620 | 34 | 30 | 14 | 11 | 50 | 250 | 89 | 28 |
| 3 | | 77 | 40 | 200 | 34 | 29 | 11 | 12 | 42 | 270 | 85 | 25 |
| 4 | | 76 | 32 | 190 | 34 | 30 | 13 | 11 | 63 | 150 | 83 | 29 |
| 5 | | 110 | 26 | 210 | 36 | 29 | 13 | 13 | 59 | 110 | 86 | 33 |
| 6 | | 73 | 23 | 250 | 38 | 29 | 14 | 11 | 60 | 100 | 89 | 33 |
| 7 | | 50 | 21 | 250 | 37 | 28 | 12 | 12 | 80 | 91 | 83 | 35 |
| 8 | | 39 | 22 | 190 | 37 | 28 | 11 | 11 | 73 | 83 | 85 | 34 |
| 9 | | 33 | 32 | 120 | 36 | 27 | 11 | 12 | 72 | 86 | 90 | 63 |
| 10 | | 29 | 23 | 98 | 46 | 26 | 11 | 10 | 60 | 88 | 81 | 69 |
| 11 | | 29 | 20 | 89 | 54 | 26 | 11 | 9.8 | 69 | 78 | 75 | 55 |
| 12 | | 29 | 26 | 83 | 56 | 25 | 10 | 11 | 67 | 71 | 130 | 81 |
| 13 | | 28 | 28 | 77 | 46 | 24 | 9.8 | 18 | 59 | 69 | 150 | 350 |
| 14 | | 25 | 22 | 74 | 42 | 24 | 9.6 | 31 | 91 | 72 | 170 | 110 |
| 15 | | 22 | 19 | 71 | 74 | 24 | 9.7 | 23 | 130 | 170 | 100 | 120 |
| 16 | | 20 | 17 | 69 | 60 | 25 | 11 | 30 | 91 | 110 | 89 | 87 |
| 17 | | 18 | 16 | 68 | 74 | 26 | 14 | 49 | 60 | 85 | 90 | 81 |
| 18 | | 17 | 15 | 62 | 120 | 26 | 11 | 80 | 50 | 83 | 84 | 110 |
| 19 | | 17 | 14 | 53 | 100 | 28 | 11 | 68 | 50 | 76 | 75 | 94 |
| 20 | | 17 | 14 | 49 | 60 | 28 | 10 | 62 | 52 | 110 | 72 | 77 |
| 21 | | 15 | 14 | 45 | 49 | 41 | 9.9 | 51 | 66 | 180 | 74 | 70 |
| 22 | | 14 | 14 | 42 | 44 | 30 | 9.6 | 39 | 120 | 92 | 64 | 65 |
| 23 | | 14 | 15 | 55 | 41 | 19 | 12 | 32 | 120 | 74 | 45 | 61 |
| 24 | | 13 | 17 | 48 | 39 | 11 | 12 | 32 | 78 | 250 | 44 | 47 |
| 25 | | 14 | 16 | 43 | 37 | 11 | 11 | 33 | 65 | 190 | 40 | 40 |
| 26 | | 75 | 31 | 40 | 35 | 11 | 11 | 36 | 65 | 180 | 32 | 30 |
| 27 | | 37 | 19 | 38 | 32 | 12 | 13 | 35 | 59 | 140 | 30 | 31 |
| 28 | | 29 | 24 | 37 | 32 | 30 | 12 | 29 | 56 | 130 | 29 | 95 |
| 29 | | 25 | 27 | 38 | 32 | | 10 | 61 | 93 | 120 | 27 | 70 |
| 30 | | 25 | 24 | 37 | 32 | | 12 | 84 | 95 | 110 | 28 | 49 |
| 31 | | 200 | | 36 | 31 | | 23 | | 350 | | 32 | 38 |
| Aggr | 42 | 26 | 120 | 47 | 25 | 12 | 31 | 81 | 130 | 76 | 69 | 54 |
| Min | 13 | 13 | 34 | 30 | 9.5 | 9.4 | 9.5 | 39 | 63 | 24 | 23 | 30 |
| Max | 410 | 140 | 1300 | 230 | 52 | 30 | 100 | 890 | 780 | 220 | 1000 | 160 |

Identifier: Discharge Daily Mean@Salmon Creek

Location: Salmon Creek Juneau

Units: ft^3/s

Filter: None

Daily Mean Discharge 2022 WY Salmon Creek

| 2022 Water Year | | | | | | | | | | | | |
|-----------------|-----|-----|-----|-----|-----|-------|----|------|-----|------|-----|-----|
| Day | Oct | Nov | Dec | Jan | Feb | Aggr: | 49 | Min: | 7.4 | Max: | 490 | Sep |
| 1 | 120 | 23 | 19 | 8.7 | 21 | 16 | 20 | 26 | 92 | 61 | 68 | 84 |
| 2 | 180 | 22 | 17 | 8.2 | 19 | 15 | 18 | 45 | 110 | 62 | 140 | 87 |
| 3 | 73 | 32 | 15 | 7.9 | 18 | 14 | 19 | 54 | 110 | 67 | 110 | 91 |
| 4 | 52 | 28 | 13 | 7.7 | 33 | 12 | 17 | 43 | 100 | 67 | 87 | 110 |
| 5 | 41 | 24 | 13 | 7.7 | 58 | 12 | 15 | 32 | 90 | 70 | 120 | 86 |
| 6 | 29 | 22 | 13 | 7.6 | 88 | 34 | 13 | 26 | 110 | 69 | 200 | 62 |
| 7 | 34 | 20 | 13 | 7.6 | 66 | 21 | 14 | 23 | 96 | 57 | 150 | 38 |
| 8 | 120 | 18 | 12 | 7.4 | 91 | 16 | 14 | 23 | 86 | 60 | 98 | 34 |
| 9 | 100 | 17 | 12 | 7.5 | 140 | 14 | 13 | 28 | 78 | 53 | 82 | 36 |
| 10 | 67 | 16 | 12 | 10 | 72 | 13 | 12 | 35 | 85 | 57 | 74 | 34 |
| 11 | 120 | 15 | 10 | 55 | 47 | 22 | 10 | 29 | 77 | 69 | 70 | 29 |
| 12 | 150 | 24 | 9.3 | 36 | 86 | 18 | 11 | 26 | 75 | 49 | 67 | 26 |
| 13 | 140 | 23 | 11 | 12 | 44 | 16 | 12 | 26 | 90 | 43 | 66 | 24 |
| 14 | 150 | 18 | 12 | 22 | 31 | 13 | 12 | 27 | 91 | 39 | 69 | 26 |
| 15 | 80 | 16 | 13 | 22 | 26 | 13 | 12 | 27 | 68 | 37 | 80 | 51 |
| 16 | 55 | 17 | 11 | 20 | 28 | 17 | 12 | 28 | 80 | 38 | 69 | 34 |
| 17 | 42 | 32 | 11 | 14 | 29 | 21 | 11 | 29 | 83 | 60 | 140 | 28 |
| 18 | 36 | 25 | 11 | 11 | 53 | 19 | 11 | 28 | 73 | 94 | 96 | 27 |
| 19 | 31 | 19 | 11 | 10 | 39 | 16 | 11 | 33 | 67 | 56 | 78 | 24 |
| 20 | 29 | 15 | 10 | 11 | 28 | 14 | 11 | 41 | 78 | 54 | 70 | 22 |
| 21 | 30 | 34 | 10 | 190 | 21 | 15 | 11 | 48 | 75 | 70 | 66 | 25 |
| 22 | 46 | 38 | 9.8 | 310 | 19 | 29 | 12 | 52 | 61 | 59 | 63 | 53 |
| 23 | 44 | 24 | 9.6 | 100 | 17 | 26 | 13 | 58 | 58 | 71 | 62 | 110 |
| 24 | 34 | 25 | 9.4 | 61 | 15 | 21 | 17 | 63 | 66 | 130 | 61 | 67 |
| 25 | 28 | 88 | 9.3 | 82 | 16 | 17 | 21 | 46 | 70 | 110 | 61 | 62 |
| 26 | 27 | 43 | 9.1 | 42 | 17 | 16 | 31 | 40 | 73 | 84 | 59 | 220 |
| 27 | 38 | 29 | 8.9 | 34 | 18 | 14 | 28 | 42 | 73 | 58 | 89 | 170 |
| 28 | 48 | 24 | 8.8 | 44 | 18 | 13 | 24 | 56 | 85 | 120 | 100 | 64 |
| 29 | 34 | 20 | 8.7 | 72 | | 20 | 20 | 62 | 82 | 140 | 240 | 110 |
| 30 | 30 | 19 | 8.5 | 42 | | 23 | 19 | 62 | 72 | 79 | 130 | 330 |
| 31 | 26 | | 8.6 | 28 | | 22 | | 70 | | 97 | 99 | |
| Aggr | 66 | 26 | 11 | 42 | 41 | 18 | 16 | 40 | 82 | 70 | 96 | 72 |
| Min | 26 | 15 | 8.5 | 7.4 | 15 | 12 | 10 | 23 | 58 | 37 | 59 | 22 |
| Max | 180 | 88 | 19 | 310 | 140 | 34 | 31 | 70 | 110 | 140 | 240 | 330 |

Identifier: Discharge.Daily Mean@Salmon Creek

Location: Salmon Creek Juneau

Units: ft^3/s

Filter: None

Daily Mean Discharge 2023 WY - Salmon Creek

Year: 2023 Water Year

| Day | Oct | Nov | Dec | Jan | Feb | 42 | Mar | Min: | 7.3 | Max: | 370 | Jul | Aug | Sep |
|------|-----|-----|-----|-----|-----|-----|-----|------|-----|------|-----|-----|-----|-----|
| 1 | 490 | 79 | 18 | 16 | 17 | 8.3 | 12 | 46 | 68 | 67 | 32 | | | 29 |
| 2 | 140 | 54 | 17 | 21 | 15 | 9.2 | 11 | 120 | 61 | 60 | 25 | | | 30 |
| 3 | 97 | 35 | 16 | 13 | 14 | 10 | 11 | 150 | 61 | 53 | 22 | | | 28 |
| 4 | 82 | 32 | 15 | 12 | 13 | 10 | 10 | 62 | 59 | 53 | 21 | | | 37 |
| 5 | 74 | 27 | 14 | 11 | 13 | 11 | 12 | 46 | 56 | 49 | 21 | | | 30 |
| 6 | 69 | 23 | 14 | 10 | 16 | 9.9 | 20 | 43 | 56 | 48 | 21 | | | 25 |
| 7 | 64 | 21 | 17 | 15 | 13 | 7.7 | 25 | 45 | 59 | 54 | 24 | | | 27 |
| 8 | 67 | 20 | 19 | 16 | 12 | 7.3 | 21 | 44 | 67 | 55 | 29 | | | 34 |
| 9 | 120 | 19 | 14 | 12 | 11 | 7.6 | 29 | 43 | 74 | 45 | 23 | | | 29 |
| 10 | 81 | 19 | 12 | 10 | 12 | 9 | 21 | 48 | 68 | 39 | 38 | | | 25 |
| 11 | 83 | 18 | 11 | 9.7 | 13 | 9.8 | 15 | 59 | 65 | 35 | 34 | | | 25 |
| 12 | 120 | 27 | 12 | 9.3 | 28 | 8.9 | 13 | 84 | 98 | 33 | 200 | | | 43 |
| 13 | 490 | 46 | 11 | 8.9 | 27 | 8.7 | 13 | 93 | 62 | 33 | 110 | | | 40 |
| 14 | 150 | 120 | 15 | 9.4 | 16 | 8.1 | 12 | 81 | 51 | 36 | 59 | | | 100 |
| 15 | 180 | 82 | 18 | 14 | 14 | 7.9 | 12 | 75 | 51 | 38 | 95 | | | 82 |
| 16 | 110 | 53 | 18 | 13 | 13 | 10 | 14 | 70 | 91 | 38 | 140 | | | 47 |
| 17 | 120 | 37 | 13 | 15 | 12 | 11 | 13 | 78 | 100 | 47 | 71 | | | 96 |
| 18 | 110 | 30 | 12 | 13 | 13 | 10 | 13 | 88 | 72 | 35 | 50 | | | 200 |
| 19 | 150 | 27 | 12 | 16 | 14 | 13 | 13 | 100 | 72 | 40 | 40 | | | 99 |
| 20 | 140 | 34 | 12 | 71 | 12 | 12 | 15 | 100 | 74 | 35 | 35 | | | 110 |
| 21 | 160 | 83 | 11 | 43 | 10 | 12 | 19 | 77 | 66 | 35 | 30 | | | 370 |
| 22 | 100 | 87 | 11 | 25 | 11 | 11 | 19 | 59 | 62 | 35 | 27 | | | 250 |
| 23 | 82 | 81 | 11 | 26 | 11 | 11 | 21 | 53 | 63 | 52 | 25 | | | 140 |
| 24 | 73 | 92 | 11 | 42 | 9 | 11 | 38 | 52 | 77 | 37 | 23 | | | 110 |
| 25 | 67 | 51 | 11 | 160 | 8.7 | 10 | 26 | 73 | 77 | 29 | 21 | | | 92 |
| 26 | 130 | 40 | 10 | 89 | 8.5 | 10 | 22 | 130 | 120 | 26 | 22 | | | 82 |
| 27 | 160 | 31 | 9.5 | 57 | 8.4 | 11 | 32 | 100 | 93 | 24 | 20 | | | 110 |
| 28 | 130 | 25 | 8.7 | 35 | 8.3 | 11 | 29 | 180 | 81 | 24 | 20 | | | 120 |
| 29 | 93 | 21 | 11 | 26 | | 11 | 31 | 130 | 84 | 24 | 19 | | | 87 |
| 30 | 170 | 19 | 11 | 22 | | 11 | 45 | 120 | 95 | 24 | 19 | | | 81 |
| 31 | 110 | | 12 | 19 | | 11 | | 83 | | 23 | 24 | | | |
| Aggr | 140 | 44 | 13 | 28 | 13 | 10 | 20 | 82 | 73 | 40 | 43 | | | 86 |
| Min | 64 | 18 | 8.7 | 8.9 | 8.3 | 7.3 | 10 | 43 | 51 | 23 | 19 | | | 25 |
| Max | 490 | 120 | 19 | 160 | 28 | 13 | 45 | 180 | 120 | 67 | 200 | | | 370 |

Identifier: Discharge.1@Salmon Creek

Location: Salmon Creek Juneau

Units: ft^3/s

Filter: None

Daily Mean Discharge 2024 WY - Salmon Creek

| Year: 2024 Water Year | | Aggr: | | 53 | | Min: | | 13 | | Max: | | 1100 | |
|-----------------------|-----|-------|-----|-----|-----|------|-----|-----|-----|------|-----|------|--|
| Day | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | |
| 1 | 100 | 21 | 34 | 41 | 44 | 13 | 20 | 23 | 59 | 47 | 120 | 88 | |
| 2 | 140 | 20 | 30 | 33 | 34 | 13 | 18 | 24 | 52 | 50 | 88 | 52 | |
| 3 | 130 | 21 | 27 | 30 | 29 | 13 | 17 | 26 | 49 | 45 | 76 | 50 | |
| 4 | 93 | 21 | 28 | 35 | 29 | 13 | 16 | 29 | 57 | 36 | 71 | 44 | |
| 5 | 94 | 20 | 52 | 29 | 27 | 13 | 18 | 42 | 77 | 32 | 69 | 160 | |
| 6 | 190 | 23 | 47 | 25 | 24 | 13 | 22 | 51 | 78 | 33 | 65 | 78 | |
| 7 | 230 | 24 | 35 | 23 | 21 | 14 | 21 | 48 | 60 | 31 | 62 | 98 | |
| 8 | 230 | 38 | 32 | 22 | 20 | 15 | 21 | 55 | 71 | 31 | 60 | 57 | |
| 9 | 180 | 82 | 29 | 20 | 20 | 16 | 21 | 190 | 68 | 31 | 59 | 42 | |
| 10 | 130 | 56 | 26 | 17 | 23 | 14 | 19 | 160 | 61 | 84 | 59 | 35 | |
| 11 | 95 | 46 | 29 | 16 | 23 | 13 | 19 | 64 | 55 | 110 | 55 | 30 | |
| 12 | 85 | 36 | 80 | 16 | 20 | 13 | 17 | 62 | 51 | 82 | 57 | 34 | |
| 13 | 78 | 30 | 68 | 15 | 18 | 16 | 16 | 62 | 41 | 140 | 35 | 74 | |
| 14 | 73 | 33 | 85 | 15 | 17 | 37 | 16 | 59 | 45 | 570 | 19 | 60 | |
| 15 | 73 | 28 | 64 | 15 | 16 | 39 | 14 | 58 | 44 | 680 | 18 | 65 | |
| 16 | 69 | 39 | 40 | 15 | 15 | 53 | 14 | 47 | 49 | 230 | 17 | 60 | |
| 17 | 71 | 32 | 46 | 15 | 15 | 72 | 14 | 44 | 51 | 410 | 16 | 43 | |
| 18 | 160 | 36 | 34 | 14 | 16 | 48 | 14 | 39 | 50 | 180 | 15 | 52 | |
| 19 | 230 | 28 | 28 | 14 | 20 | 34 | 15 | 40 | 54 | 130 | 17 | 54 | |
| 20 | 110 | 24 | 27 | 13 | 21 | 28 | 16 | 43 | 57 | 110 | 18 | 44 | |
| 21 | 88 | 34 | 28 | 13 | 19 | 24 | 17 | 37 | 53 | 96 | 16 | 97 | |
| 22 | 74 | 46 | 24 | 13 | 32 | 22 | 18 | 35 | 51 | 87 | 15 | 120 | |
| 23 | 67 | 100 | 25 | 14 | 28 | 21 | 18 | 79 | 46 | 140 | 16 | 220 | |
| 24 | 53 | 120 | 50 | 15 | 20 | 20 | 18 | 87 | 47 | 120 | 16 | 130 | |
| 25 | 30 | 110 | 54 | 17 | 17 | 20 | 19 | 57 | 45 | 93 | 61 | 110 | |
| 26 | 28 | 180 | 64 | 21 | 15 | 21 | 20 | 50 | 44 | 87 | 49 | 86 | |
| 27 | 25 | 150 | 39 | 60 | 14 | 20 | 23 | 48 | 48 | 94 | 29 | 57 | |
| 28 | 24 | 65 | 31 | 91 | 14 | 19 | 27 | 50 | 48 | 92 | 73 | 68 | |
| 29 | 23 | 47 | 38 | 370 | 13 | 19 | 25 | 50 | 46 | 77 | 48 | 53 | |
| 30 | 23 | 40 | 130 | 160 | | 18 | 22 | 55 | 43 | 100 | 64 | 45 | |
| 31 | 22 | | 61 | 67 | | 25 | | 48 | | 160 | 150 | | |
| Aggr | 97 | 51 | 45 | 41 | 22 | 23 | 19 | 57 | 53 | 140 | 49 | 73 | |
| Min | 21 | 19 | 22 | 13 | 13 | 13 | 13 | 22 | 36 | 28 | 14 | 27 | |
| Max | 470 | 430 | 220 | 840 | 55 | 110 | 28 | 610 | 93 | 1100 | 250 | 710 | |

APPENDIX B: STREAM RATING CURVE

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Rating Curve

Rating #3

Label: Salmon Creek

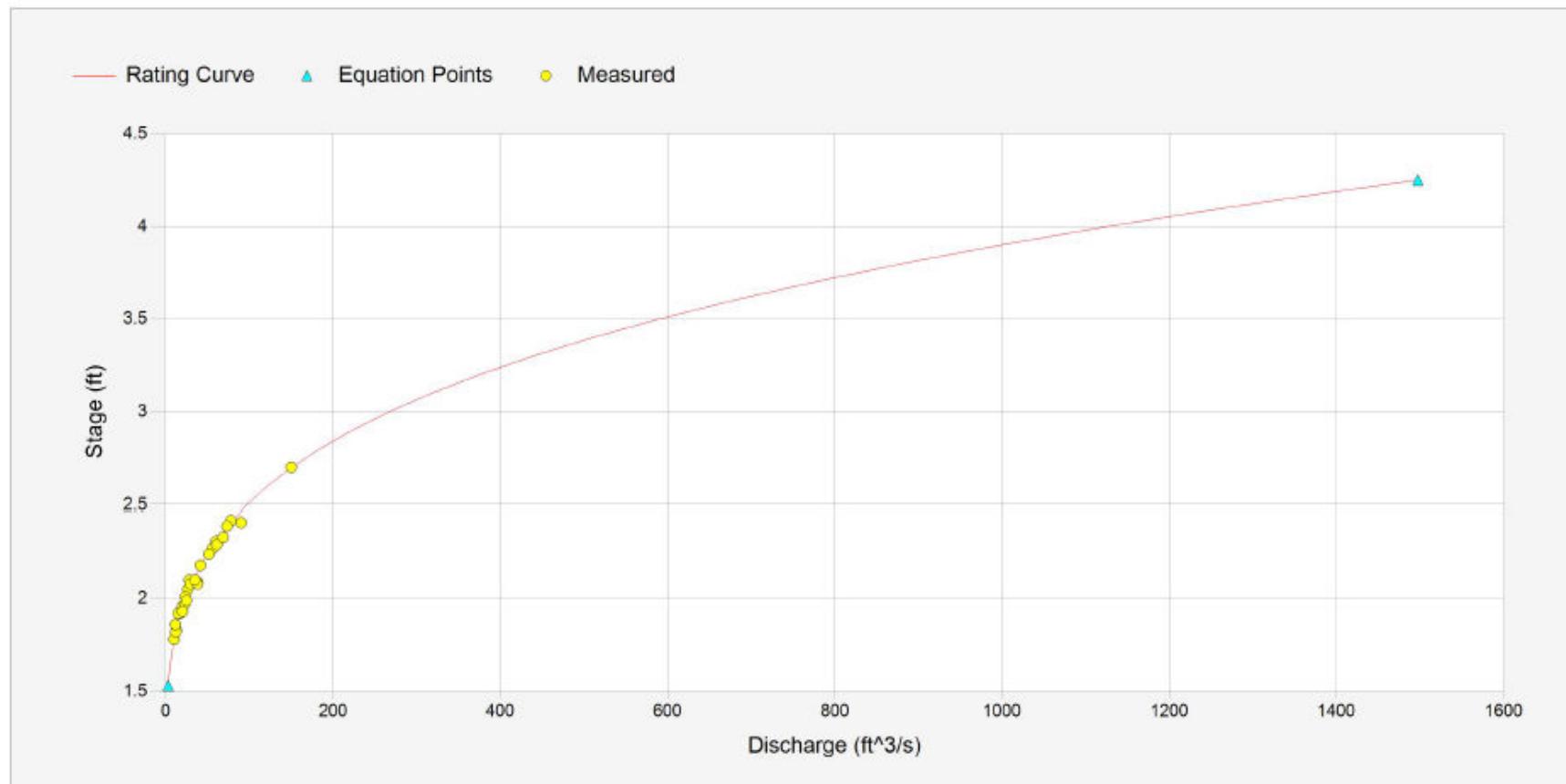
Description: Site ID-Salmon Creek

Curve on: October 25, 2024

Curve Start Date: December 1, 2020

Location:

Salmon Creek Juneau



| STATION NUMBER Salmon Creek Salmon Creek Juneau | | | | | | | | | | | SOURCE AGENCY: | | | |
|--|-------|--------------------------|-------|-------|--------|-------|-------|-------|-------|-------|---|----------|--|--|
| LATITUDE 49.28 LONGITUDE -123.11 | | | | | | | | | | | | | | |
| Date Processed: 2021-10-11 08:18:25 UTC-09:00 By admin | | | | | | | | | | | | | | |
| Rating for Discharge (ft^3/s) | | | | | | | | | | | | | | |
| Created by admin on 2021-10-07 18:23:19 [UTC], | | | | | | | | | | | Updated by admin on 2021-10-09 19:46:22 [UTC] | | | |
| Remarks: | | | | | | | | | | | | | | |
| Offset1: | 0.98 | EXPANDED CAQRating TABLE | | | | | | | | | | | | |
| Stage (m) | | Discharge (ft^3/s) | | | | | | | | | | | | |
| | | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 | .1 UNITS | | |
| 1.50 | | | | | 2.560* | 2.730 | 2.909 | 3.095 | 3.290 | 3.494 | 3.706 | 1.954 | | |
| 1.60 | 3.928 | 4.159 | 4.400 | 4.651 | 4.912 | 5.183 | 5.465 | 5.758 | 6.061 | 6.377 | 6.691 | 2.776 | | |
| 1.70 | 6.704 | 7.042 | 7.393 | 7.757 | 8.133 | 8.522 | 8.924 | 9.340 | 9.769 | 10.21 | 10.67 | 3.966 | | |
| 1.80 | 10.67 | 11.14 | 11.63 | 12.13 | 12.65 | 13.18 | 13.73 | 14.30 | 14.88 | 15.48 | 16.14 | 5.430 | | |
| 1.90 | 16.10 | 16.73 | 17.39 | 18.06 | 18.74 | 19.45 | 20.18 | 20.92 | 21.69 | 22.47 | 23.24 | 7.180 | | |
| 2.00 | 23.28 | 24.10 | 24.95 | 25.82 | 26.71 | 27.62 | 28.56 | 29.51 | 30.49 | 31.49 | 32.48 | 9.240 | | |
| 2.10 | 32.52 | 33.57 | 34.64 | 35.74 | 36.86 | 38.01 | 39.19 | 40.39 | 41.61 | 42.87 | 44.14 | 11.630 | | |
| 2.20 | 44.15 | 45.45 | 46.79 | 48.15 | 49.54 | 50.96 | 52.41 | 53.89 | 55.40 | 56.93 | 58.46 | 14.350 | | |
| 2.30 | 58.50 | 60.10 | 61.73 | 63.40 | 65.09 | 66.82 | 68.58 | 70.37 | 72.19 | 74.06 | 75.93 | 17.450 | | |
| 2.40 | 75.95 | 77.88 | 79.84 | 81.84 | 83.88 | 85.95 | 88.06 | 90.20 | 92.38 | 94.60 | 96.87 | 20.910 | | |
| 2.50 | 96.86 | 99.16 | 101.5 | 103.9 | 106.3 | 108.7 | 111.2 | 113.8 | 116.4 | 119.0 | 121.6 | 24.740 | | |
| 2.60 | 121.6 | 124.3 | 127.1 | 129.9 | 132.7 | 135.6 | 138.5 | 141.5 | 144.5 | 147.6 | 150.7 | 29.100 | | |
| 2.70 | 150.7 | 153.8 | 157.0 | 160.3 | 163.6 | 166.9 | 170.3 | 173.8 | 177.3 | 180.8 | 184.3 | 33.700 | | |
| 2.80 | 184.4 | 188.0 | 191.7 | 195.5 | 199.3 | 203.2 | 207.1 | 211.0 | 215.0 | 219.1 | 223.2 | 38.800 | | |
| 2.90 | 223.2 | 227.4 | 231.7 | 236.0 | 240.3 | 244.7 | 249.2 | 253.7 | 258.3 | 263.0 | 267.7 | 44.500 | | |
| 3.00 | 267.7 | 272.4 | 277.3 | 282.1 | 287.1 | 292.1 | 297.2 | 302.3 | 307.5 | 312.8 | 318.1 | 50.400 | | |
| 3.10 | 318.1 | 323.5 | 329.0 | 334.5 | 340.1 | 345.8 | 351.5 | 357.3 | 363.2 | 369.1 | 375.1 | 57.000 | | |
| 3.20 | 375.1 | 381.2 | 387.3 | 393.5 | 399.8 | 406.2 | 412.6 | 419.1 | 425.7 | 432.3 | 439.1 | 64.000 | | |
| 3.30 | 439.1 | 445.9 | 452.7 | 459.7 | 466.7 | 473.8 | 481.0 | 488.3 | 495.6 | 503.0 | 510.5 | 71.400 | | |
| 3.40 | 510.5 | 518.1 | 525.8 | 533.5 | 541.4 | 549.3 | 557.3 | 565.3 | 573.5 | 581.7 | 589.1 | 79.600 | | |
| 3.50 | 590.1 | 598.5 | 607.0 | 615.5 | 624.2 | 633.0 | 641.8 | 650.8 | 659.8 | 668.9 | 678.1 | 88.000 | | |
| 3.60 | 678.1 | 687.4 | 696.8 | 706.3 | 715.8 | 725.5 | 735.3 | 745.1 | 755.1 | 765.1 | 775.2 | 97.100 | | |
| 3.70 | 775.2 | 785.5 | 795.8 | 806.2 | 816.8 | 827.4 | 838.1 | 848.9 | 859.9 | 870.9 | 882.0 | 106.800 | | |
| 3.80 | 882.0 | 893.3 | 904.6 | 916.0 | 927.6 | 939.2 | 951.0 | 962.8 | 974.8 | 986.8 | 999.0 | 117.000 | | |
| 3.90 | 999.0 | 1011 | 1024 | 1036 | 1049 | 1062 | 1074 | 1087 | 1100 | 1114 | 1127 | 128.000 | | |
| 4.00 | | 1127 | 1140 | 1154 | 1167 | 1181 | 1195 | 1209 | 1223 | 1237 | 1251 | 139.000 | | |
| 4.10 | | 1266 | 1280 | 1295 | 1310 | 1325 | 1340 | 1355 | 1370 | 1386 | 1401 | 151.000 | | |
| 4.20 | | 1417 | 1433 | 1449 | 1465 | 1481 | | | | | | | | |

"**" indicates a rating descriptor point

| ID | Starting Date | Ending Date | Aging | Comments |
|------|---------------------------------|-------------|-------|----------|
| ah01 | 2020-12-01 16:00:00 [UTC-09:00] | | 0 | |

APPENDIX C: PLOTS OF 15 MINUTE DATA

FOURTH QUARTER 2023 – THIRD QUARTER 2024

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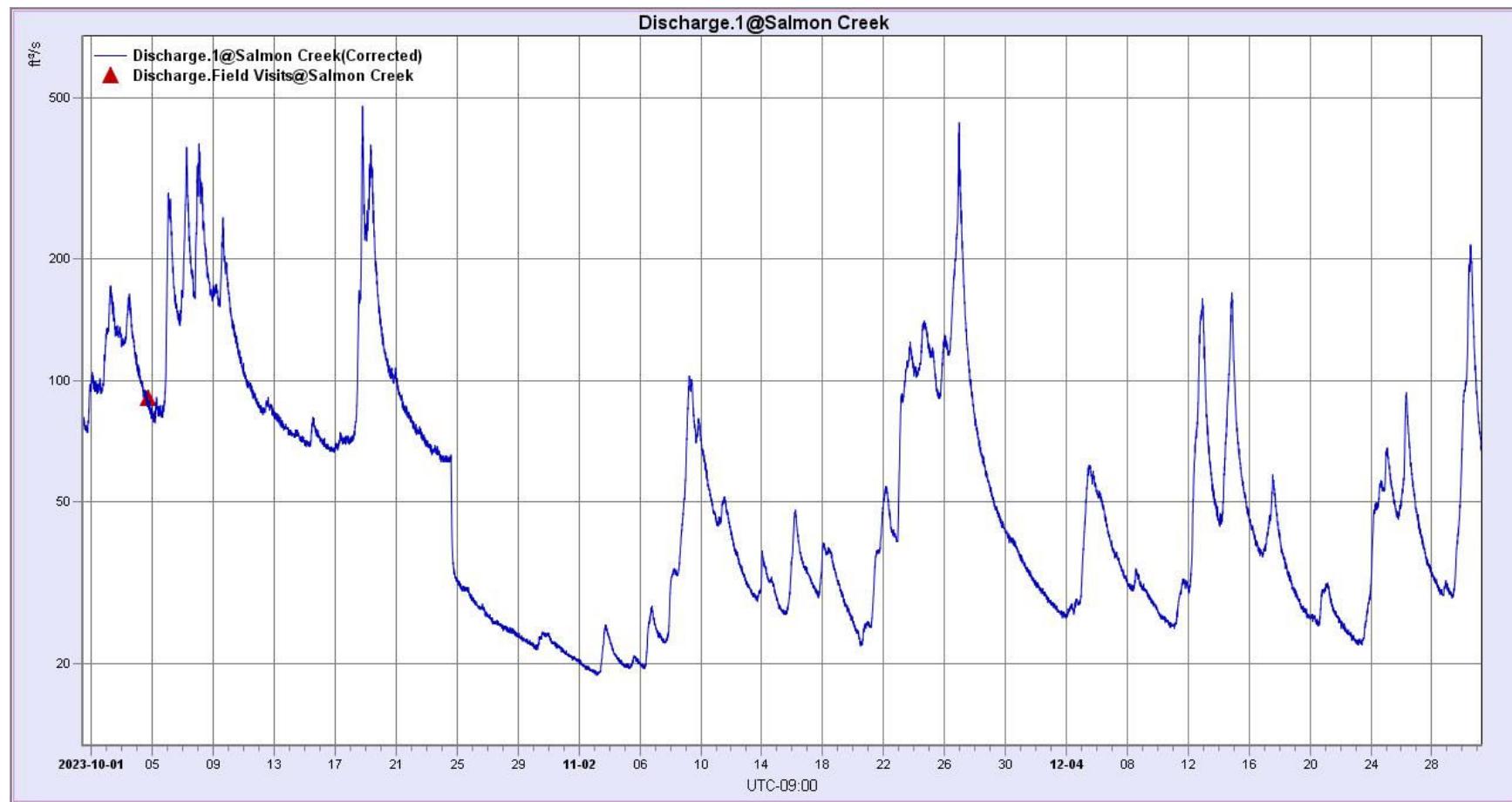


Figure C1 – Fourth Quarter 2023

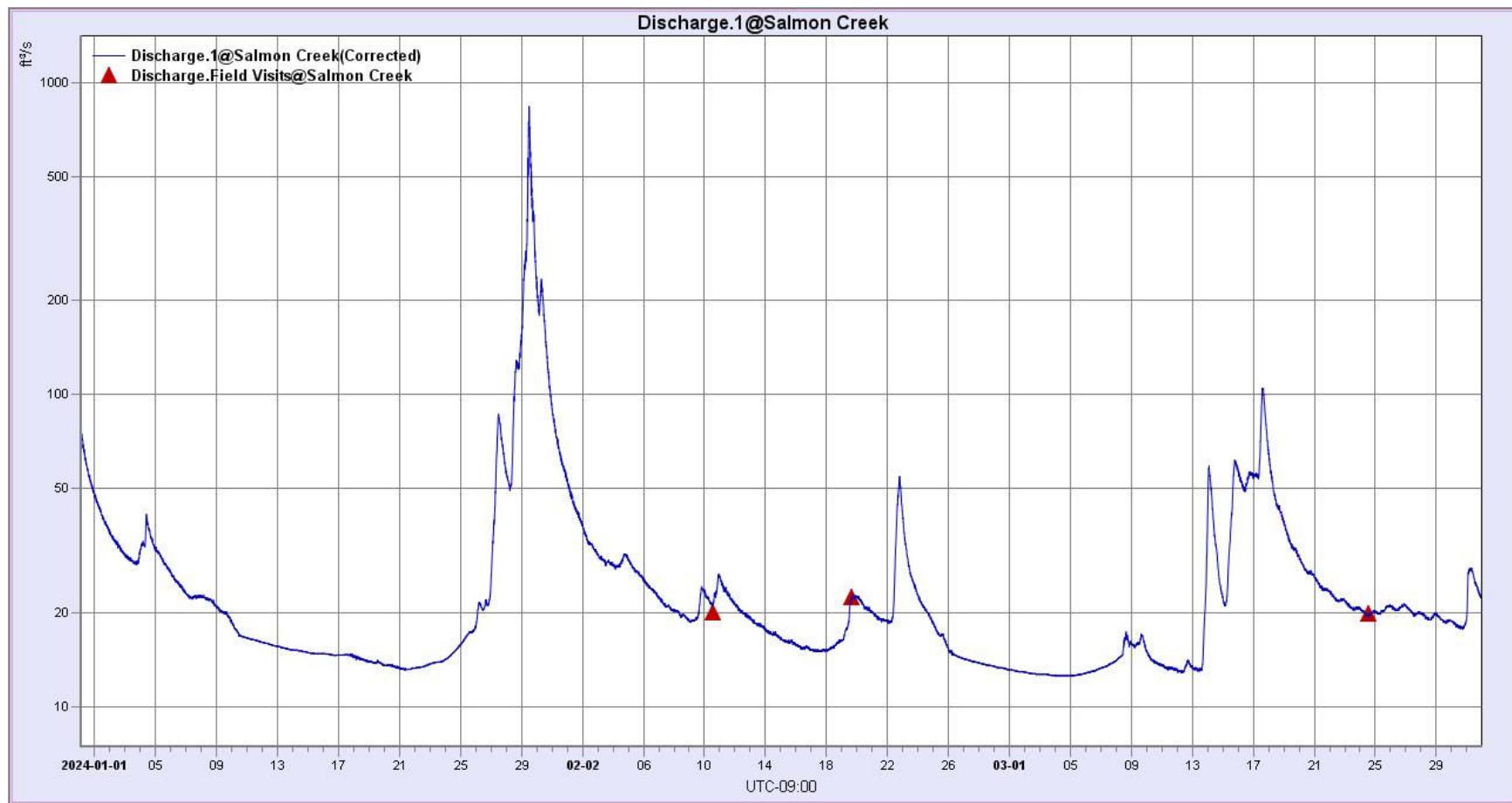


Figure C2 – First Quarter 2024

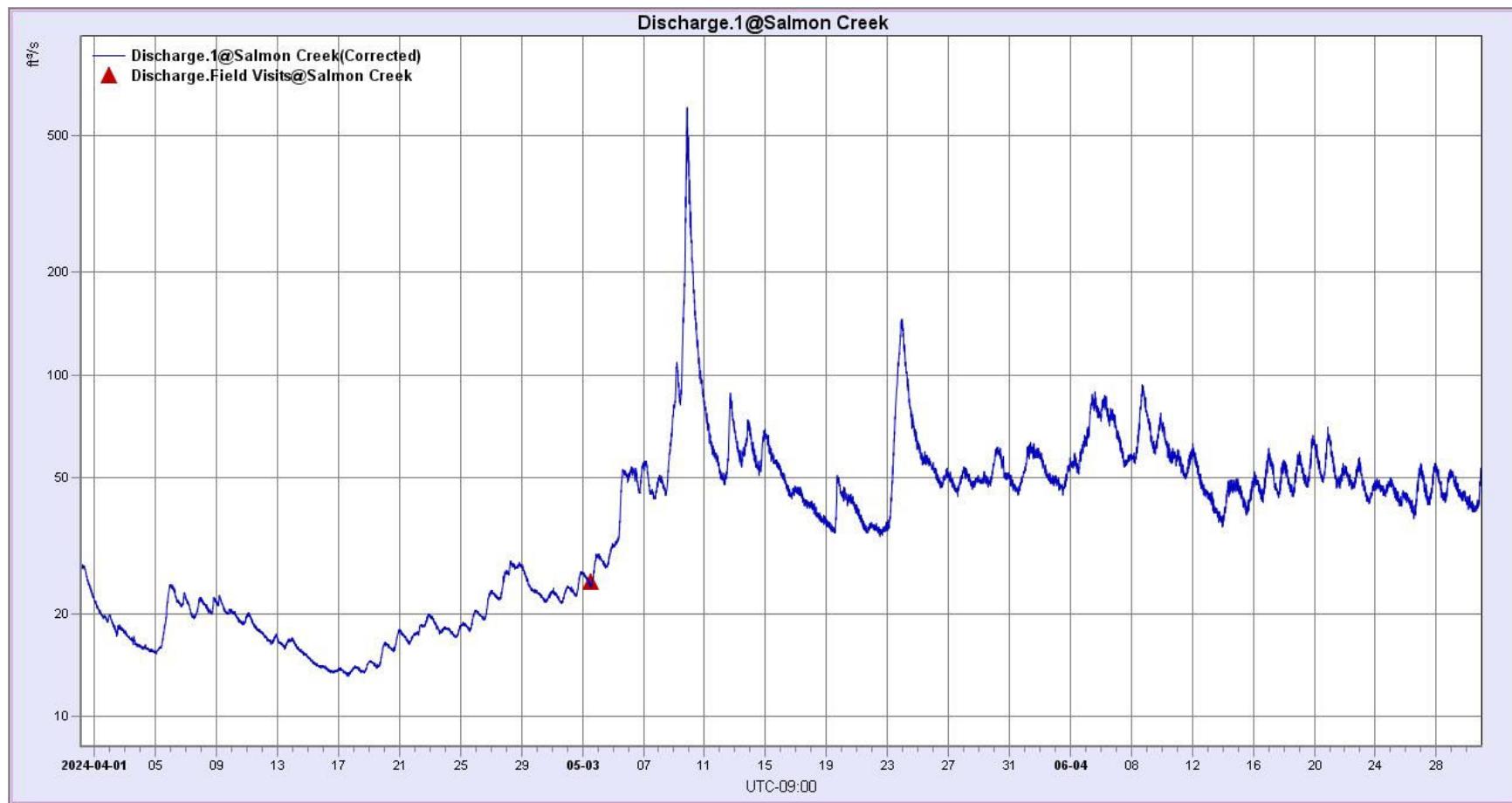


Figure C3 – Second Quarter 2024

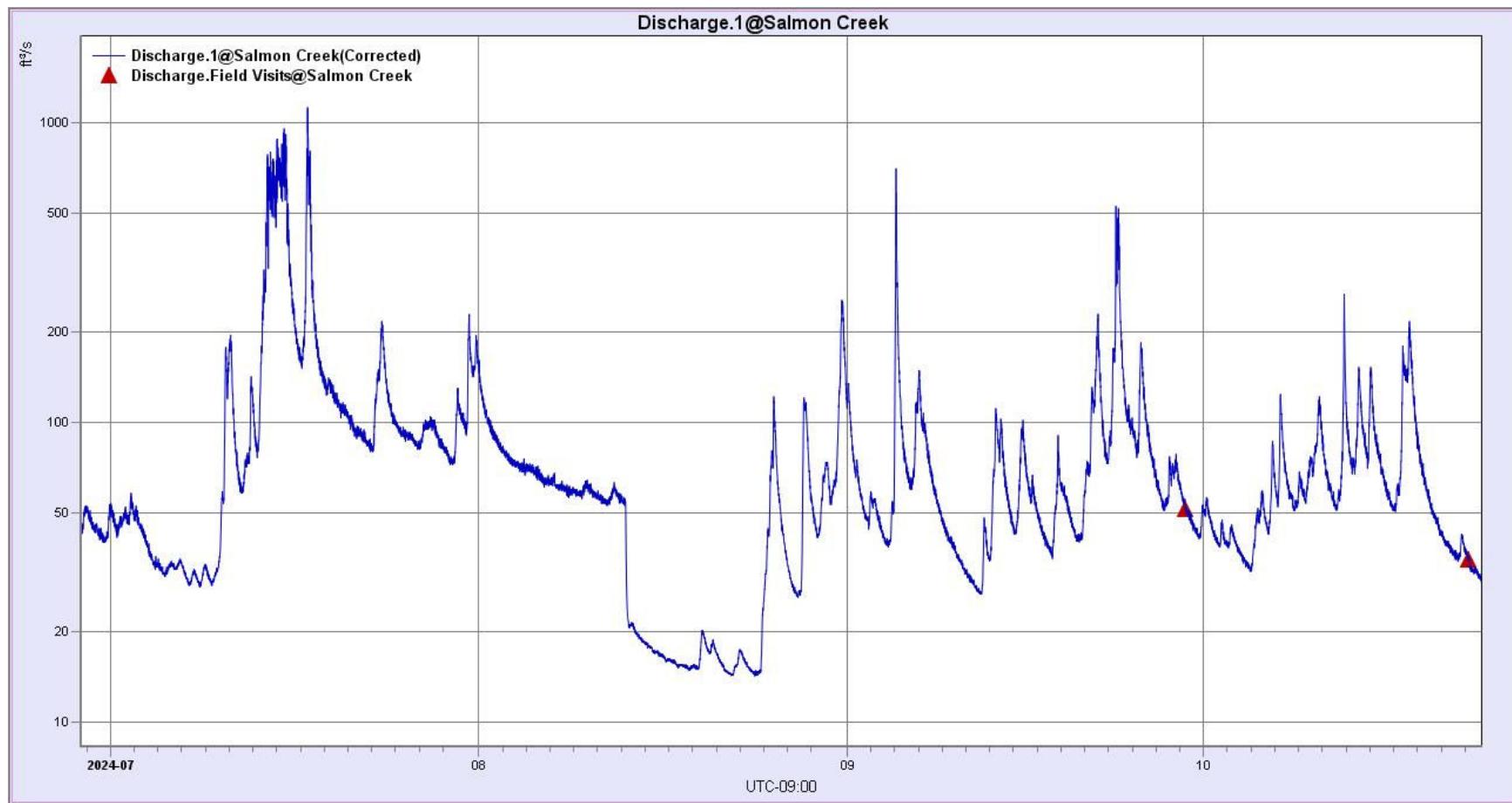


Figure C4 – Third Quarter 2024

**APPENDIX D: SALMON CREEK STATION DESCRIPTION AND ANALYSIS
WATER YEAR 2024 (ALASKA HYDROSCIENCE)**

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Salmon Creek Gaging Station near Juneau, Alaska

Station Description for the 2024 Water Year

LOCATION.—Lat 58°19'57", long 134°27'57" referenced to North American Datum of 1927, and Lat 58°19'56", long 134°28'04" referenced to World Geodetic System 1984. Gage is located on the left bank (when facing downstream), about 0.3 mi upstream from the mouth and 2.5 mi northwest of Juneau.

DRAINAGE AREA.—Drainage area 9.69 mi² (reported by the USGS), discharges are regulated.

ESTABLISHMENT AND HISTORY.—Gage established on April 27, 2016 at the same location and datum of U.S. Geological gaging station number 15051010.

GAGE.—A Campbell Scientific CS450 vented and temperature compensated transducer is coupled to a Campbell Scientific CR6 data logger and records stage data in 15 minute intervals. The transducer is housed in 1 inch galvanized pipe and is set and referenced to vertical datum established by the U.S. Geological Survey (see reference marks). Additional equipment is housed in a gage house on left bank.

CONTROL.—Low flow control is a boulder/cobble/gravel riffle immediately below the orifice and staff gage. The channel is the control at medium and high stages. Shifting from the rating is possible at all stages as the gage reach can be alternately scoured and filled.

DISCHARGE MEASUREMENTS.—Measurements are made by wading in the vicinity of the gage. High flow measurements can be measured from a bridge approximately 0.25 mi downstream.

FLOODS.—U.S. Geological Survey recorded a maximum discharge of 2110 ft³/s, Nov. 22, 2005 and gage height 4.20 ft. Minimum discharge recorded by the U.S. Geological Survey was 3.5 ft³/s, March 17-20, 2006. The maximum gage height of 4.20 ft was also attained on Dec. 1-2, 2020 just prior to the transducer being damaged by the high-flow event.

WINTER FLOW.—The stage-discharge relationship will be periodically affected by ice during cold periods during most winters.

REGULATION AND DIVERSIONS.—Flow is regulated by Salmon Creek Reservoir located 2 miles upstream. Diversion upstream for off-stream hydropower plant; outflow from the plant goes into Gastineau Channel and is not included in the discharge records. There is a supplemental water valve tapped off of the penstock at the base of the dam to supply additional water to Salmon Creek during periods of low flow. The valve discharges water directly into the natural channel. Operation of the valve is performed remotely by the AEL&P System Operator who also has real-time indication of the streamflow. When the flow drops to 9 ft³/s, an alarm is generated and the Operator opens the valve and logs the operation.

ACCURACY.— Accuracy of the discharge records should be fair to good with the exception of ice affected record which will be fair to poor.

REFERENCE MARKS.—The gage is referenced to several vertical reference marks (RMs) established by the U.S. Geological Survey to accurately track vertical datum for the gage. The existing gage continues to reference these RMs to maintain accurate vertical datum. In a survey conducted on July 3, 2020 additional reference marks were added to the station to facilitate accurate tracking of station datum.

RM 1—Brass cap anchored in concrete 2 feet shoreward of the orifice on left bank, elevation 2.64 feet. This RM is the base RM from which to begin level surveys.

RM2-- Established July 3, 2020. Head of rock bolt protruding from top of boulder 3 feet upstream from RM1, elevation 4.87 feet.

RM3—Established July 3, 2020. 3/8 in anchor bolt in on top of 5-foot boulder located approximately 15 feet upstream near the left edge of water, elevation 3.77 feet.

RP 1— $\frac{1}{4}$ inch anchor bolt drilled in concrete block 1 foot upstream of orifice, elevation 2.44 feet.

RM 5— $\frac{1}{4}$ inch lag bolt on upstream side of two-foot diameter cottonwood 25 feet from left edge of water and 12 feet downstream of the orifice, elevation 8.59 feet.

RM5.1-- Established July 3, 2020. Lag bolt on upstream side of 26-inch cottonwood tree on left bank 25 feet shoreward and 12 feet downstream of orifice, elevation 8.70 feet. Replacing RM5, which was nearly grown over by bark.

RM 6— $\frac{1}{4}$ inch lag bolt on upstream side of 1-foot diameter spruce tree, 15 feet from the left edge of water and 15 feet upstream of the orifice, elevation 7.77 feet.

RM6.1- Established July 3, 2020. Lag bolt on same tree as RM6, elevation 8.02 feet. Used to replace RM6, which is nearly overgrown.

2024 WATER YEAR STATION ANALYSIS

GAGE HEIGHT RECORD.— Gage height record is complete for the 2024 water year with no periods of missing record. The gage height record was periodically subject to backwater due to ice during which times discharges were estimated. Gage height record was subject to backwater from ice on the following dates:

January 10-16; January 21-25; February 26- March 8, 2024.

GAGE HEIGHT CORRECTIONS.— Pressure transducers used to record stage are often subject to slight drift in recorded values. Gage height corrections to the recorder are used to adjust for differences between the recorded values and readings of the outside reference gage during site visits. Gage height corrections are typically prorated over time between site visits. Corrections less than ± 0.02 feet are typically not applied unless they persist over multiple site visits. Gage height corrections for the 2024 water year ranged from no correction to $+0.03$ ft. A plot of corrected gage height and measured field values of gage height is shown below in figures 1 and 2.

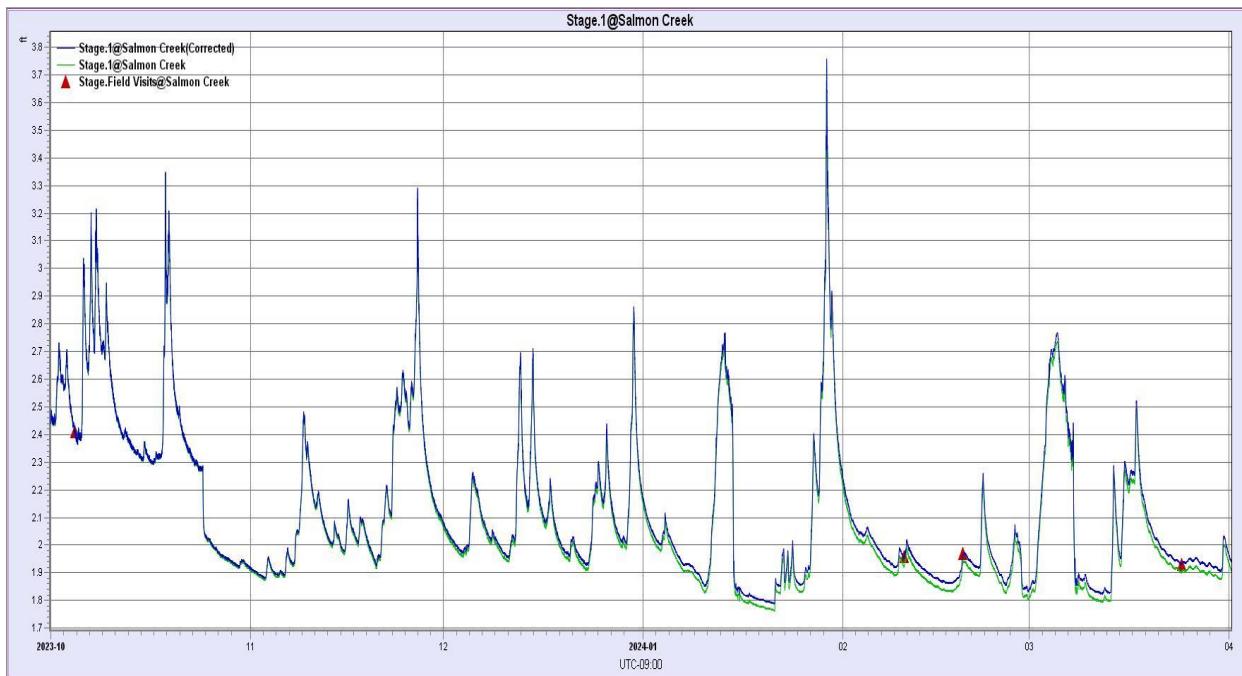


Figure 1. Stage data from Salmon Creek gaging station showing raw and corrected values and field readings from the outside reference gage (Oct. 2023 to April 2024).

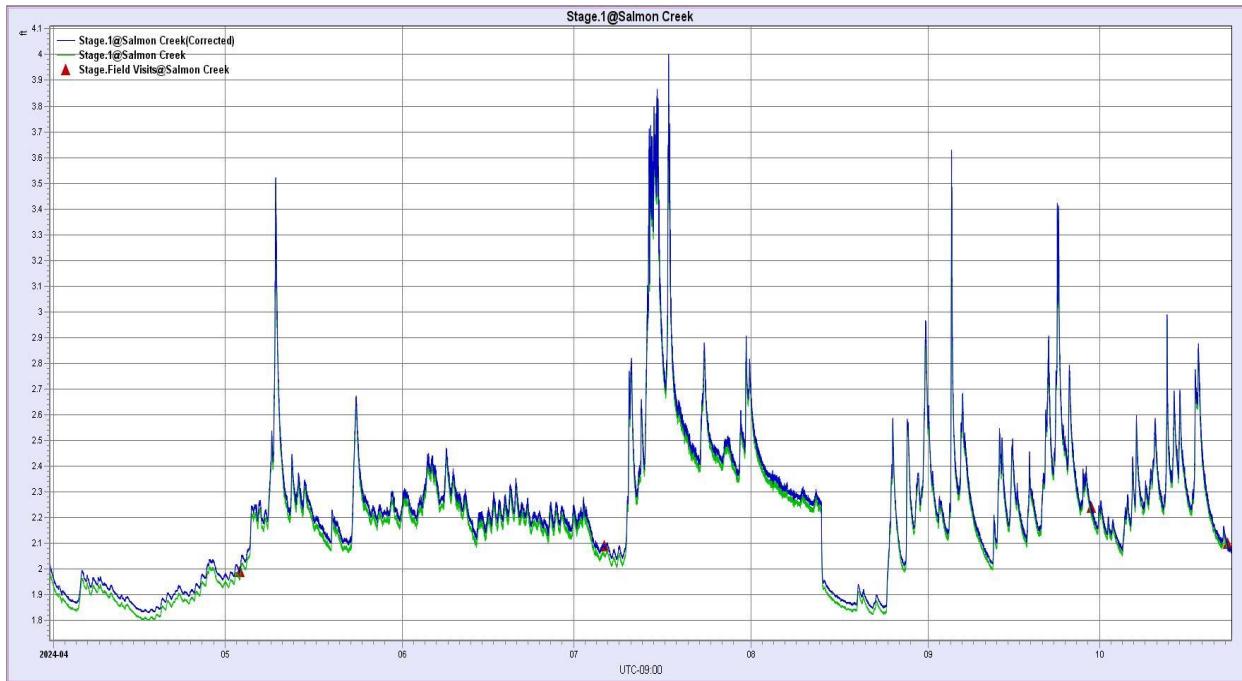


Figure 2. Stage data from Salmon Creek gaging station showing raw and corrected values and field readings from the outside reference gage (April 2024 to October 2024).

DATUM CORRECTIONS.— A complete level survey was conducted on July 3, 2020, and a partial level survey was conducted on November 19, 2022 and again on Oct. 24, 2024. No datum corrections were needed.

RATING.— The gage reach is under section control at low to midrange discharges and channel control at greater discharges. The gage reach is subject to scour and fill during peak flows and during salmon spawning season when salmon spawn throughout the gage reach.

Rating 3 was put into use on December 1, 2020, following a large peak that resulted in damage to the gage orifice and transducer and fill conditions throughout the gage reach. Rating 3 was developed following this peak based on discharge measurements 34-40, and further verified by measurements 41-46. Rating 3 utilized historic peak discharge measurements taken by the U.S. Geological Survey to define the high end of the rating. Rating 3 delineates reduced discharge throughout the range of stage when compared to rating 2, resulting from channel aggradation in the gage reach.

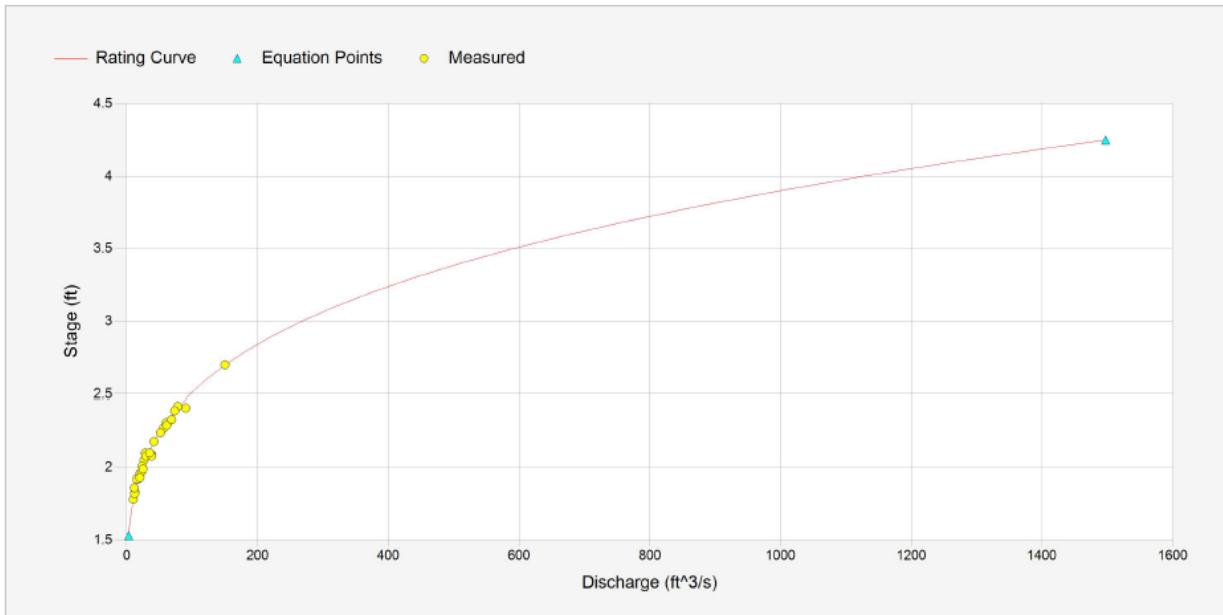
Seven discharge measurements (numbers 55), ranging from 19.8-90 ft³/s, were conducted since the beginning of the 2024 water year. All measurements were used in rating analysis Rating curve and rating equation points for rating number 3 are shown below:

Rating Curve

Rating #3

Label: **Salmon Creek**
Description: **Site ID-Salmon Creek**

Curve on: **October 25, 2024** Curve Start Date: **December 1, 2020** Location: **Salmon Creek Juneau**



| Stage (ft) | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|------------|----------|----------|----------|----------|--------|--------|--------|--------|--------|--------|
| 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.93 | 6.70 | 10.67 | 16.10 |
| 2.00 | 23.28 | 32.52 | 44.15 | 58.50 | 75.95 | 96.86 | 121.64 | 150.67 | 184.40 | 223.25 |
| 3.00 | 267.67 | 318.12 | 375.10 | 439.07 | 510.55 | 590.05 | 678.10 | 775.24 | 882.03 | 999.01 |
| 4.00 | 1,126.78 | 1,265.92 | 1,417.02 | 1,497.25 | | | | | | |

Figure 3. Salmon Creek Rating 3. Used for computing discharge for the 2024 water year, shown in graphic and tabular formats.

DISCHARGE RECORD.— Rating number three was used with two stage variable shift adjustments to compute discharge for the 2024 water year. Shifts adjustments were relatively small but consistent. Shift adjustments ranged from +0.02 to +0.06 ft. Stage variable shift 1 was used to adjust for slight

aggradation scour in the gage reach from Aug. 12, 2023 through Jan. 29, 2024. The shift adjustment was defined by measurements 53-55. Stage variable shifts 2 was used from Jan. 29, 2024 through the remainder of the water year. Stage variable shift 2 defines reduced scour through the gage reach and was defined by measurements 56-61. All shift adjustments to the rating were applied over discharge peaks.

Discharge record was affected by ice and discharges were estimated for numerous days from January through March (see **GAGE HEIGHT RECORD** for exact dates). Discharges were estimated from discharge measurements, examination of the stage record, and comparison with Juneau weather provided by the National Weather Service, and hydrologic records provided by the U.S. Geological Survey.

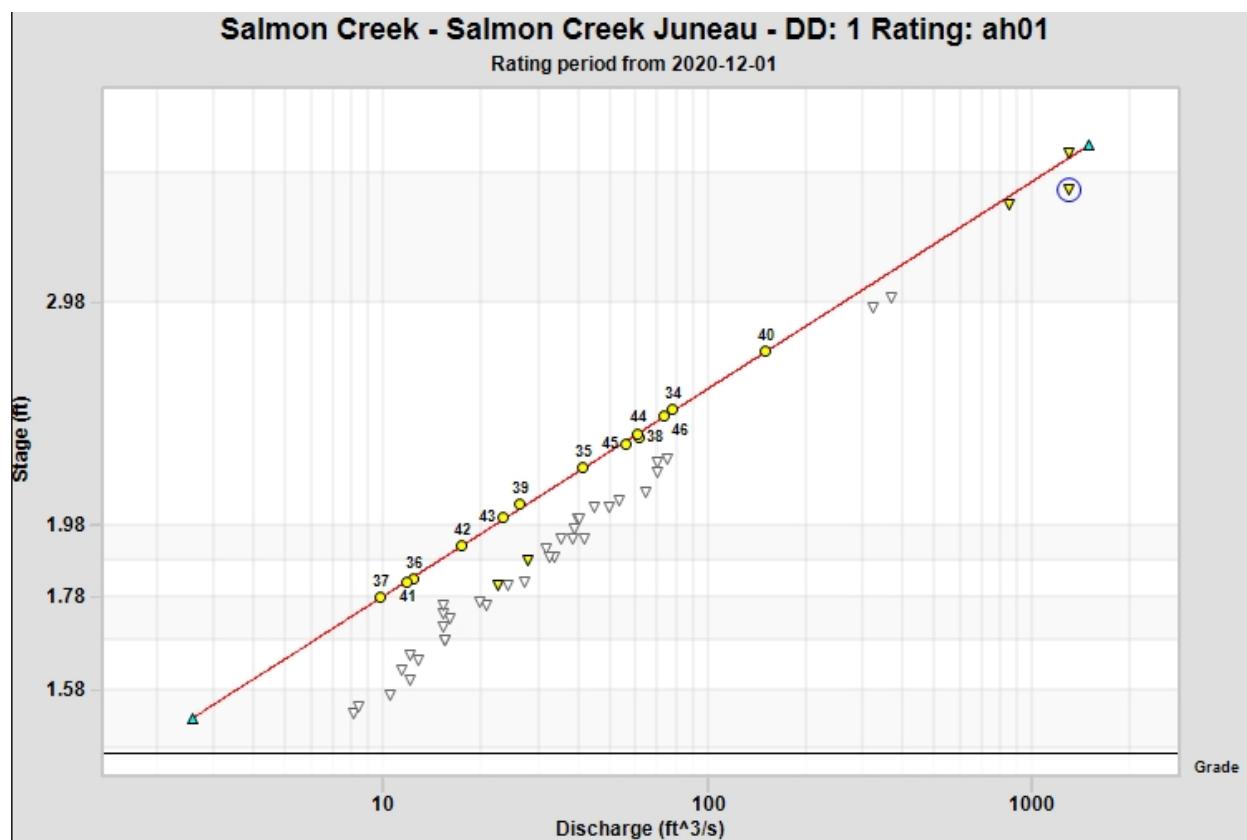


Figure 5. Salmon Creek rating number 3 (log scale) used to compute discharge from December 1, 2020, through the 2024 water year.

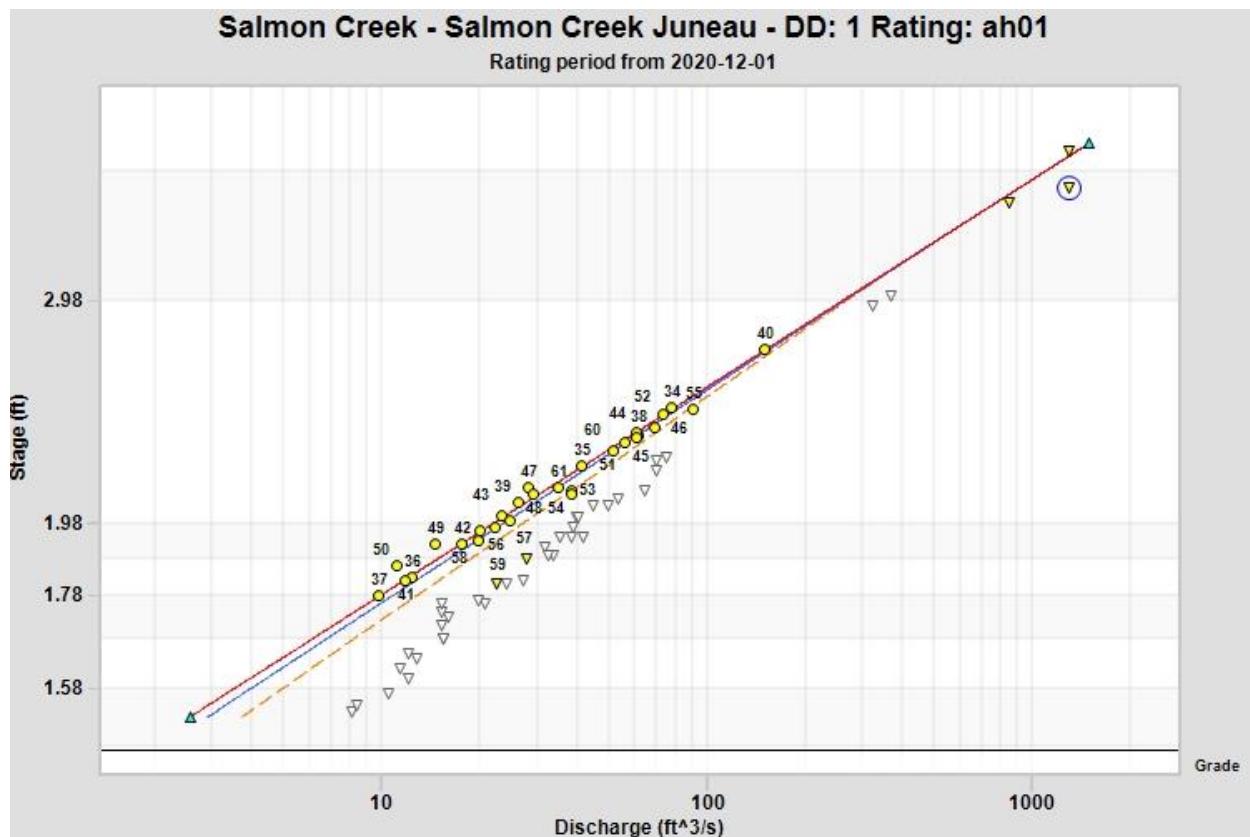


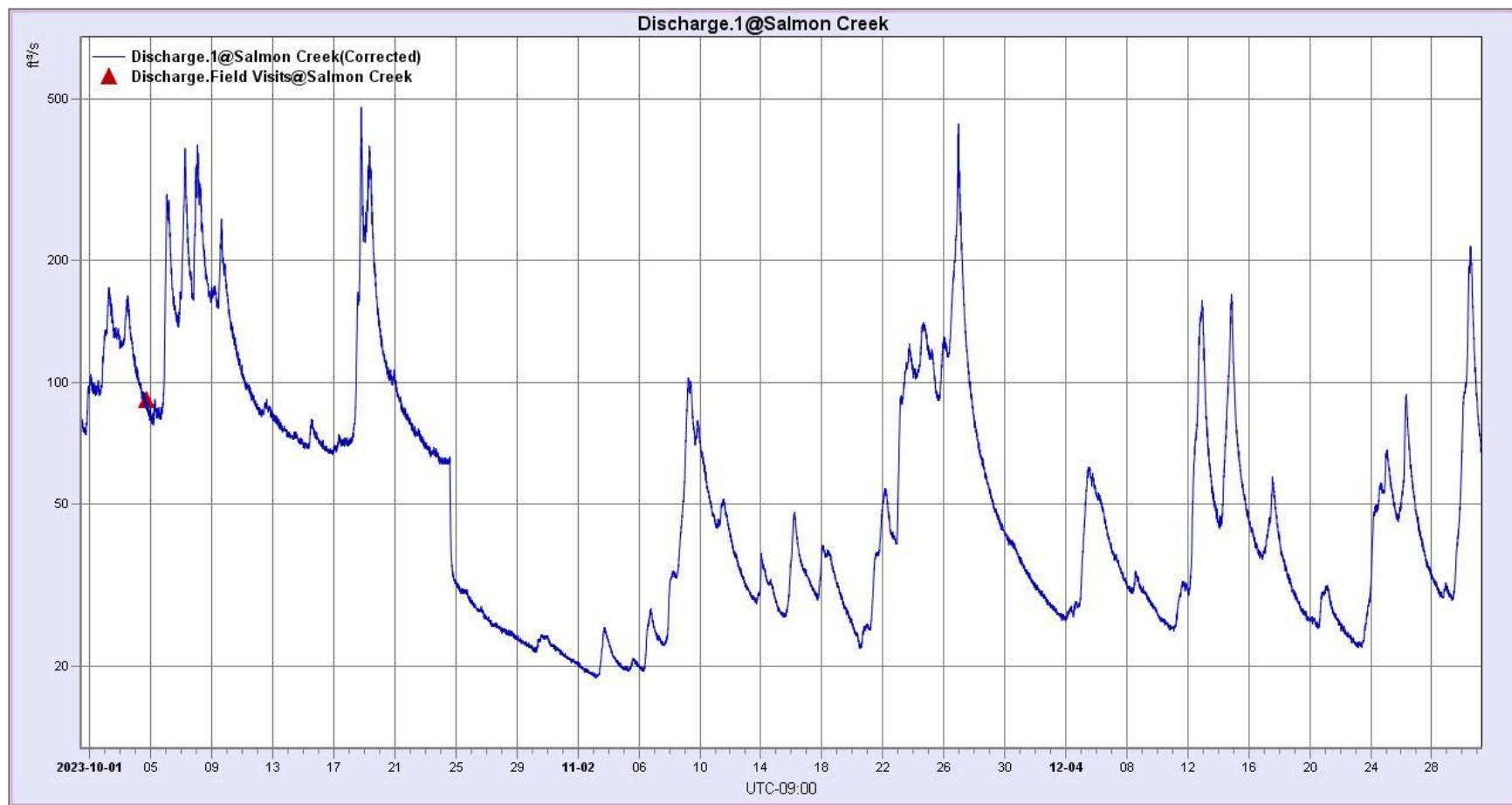
Figure 6. Salmon Creek shifted rating used to compute discharge during the 2024 water year.

REMARKS.— Discharge records are fair to good for discharges below 300 ft³/s and poor for higher discharges due to the relatively poor gage reach and lack of cross sections available to consistently make good discharge measurements. Discharges estimated due to backwater from ice are poor. Hydrographs and tabular discharge data for the 2024 are included in the following pages.

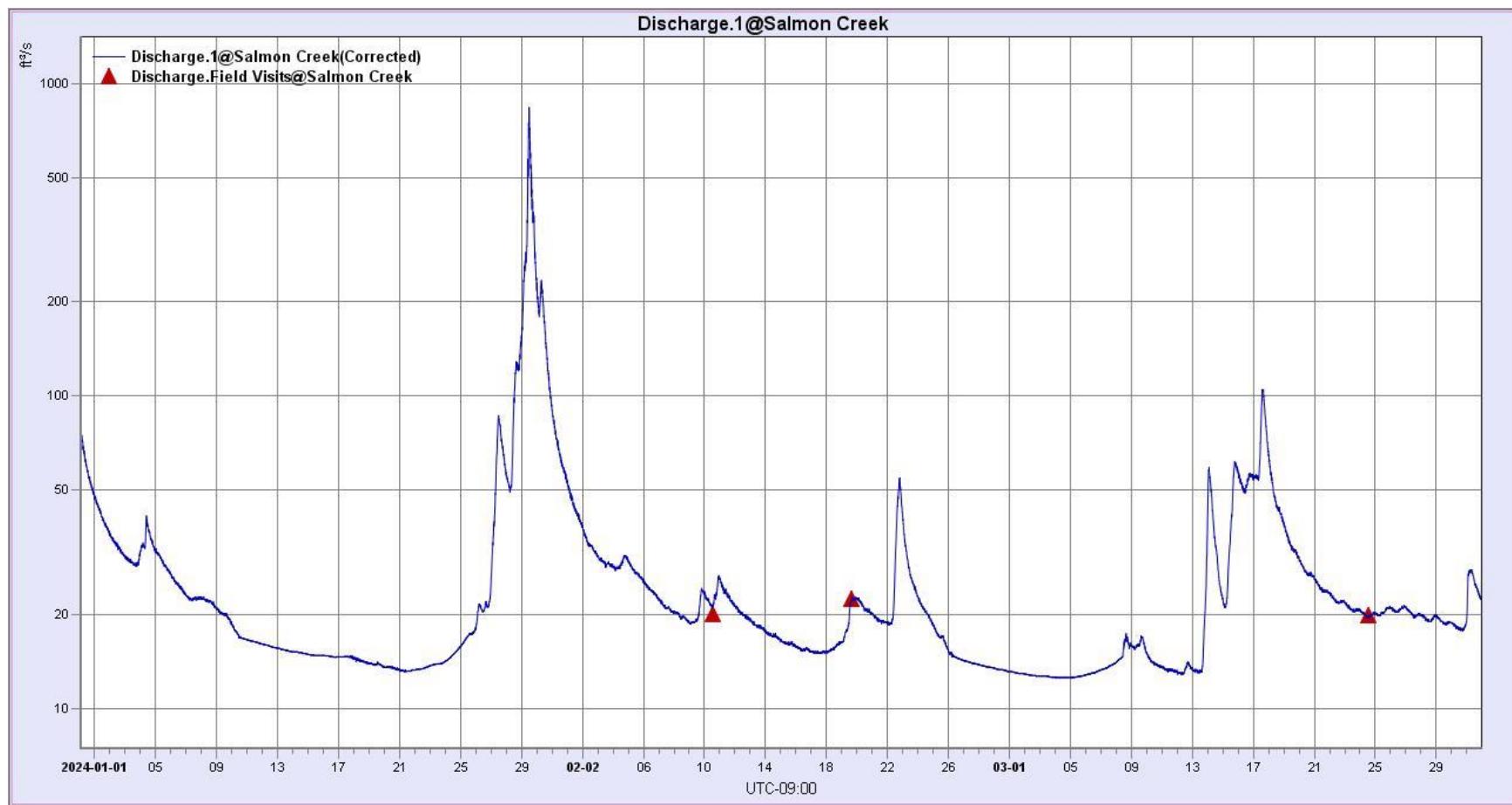
The following .csv files were included as attachments to this document:

Salmon Creek 15 min. 2024 Final.

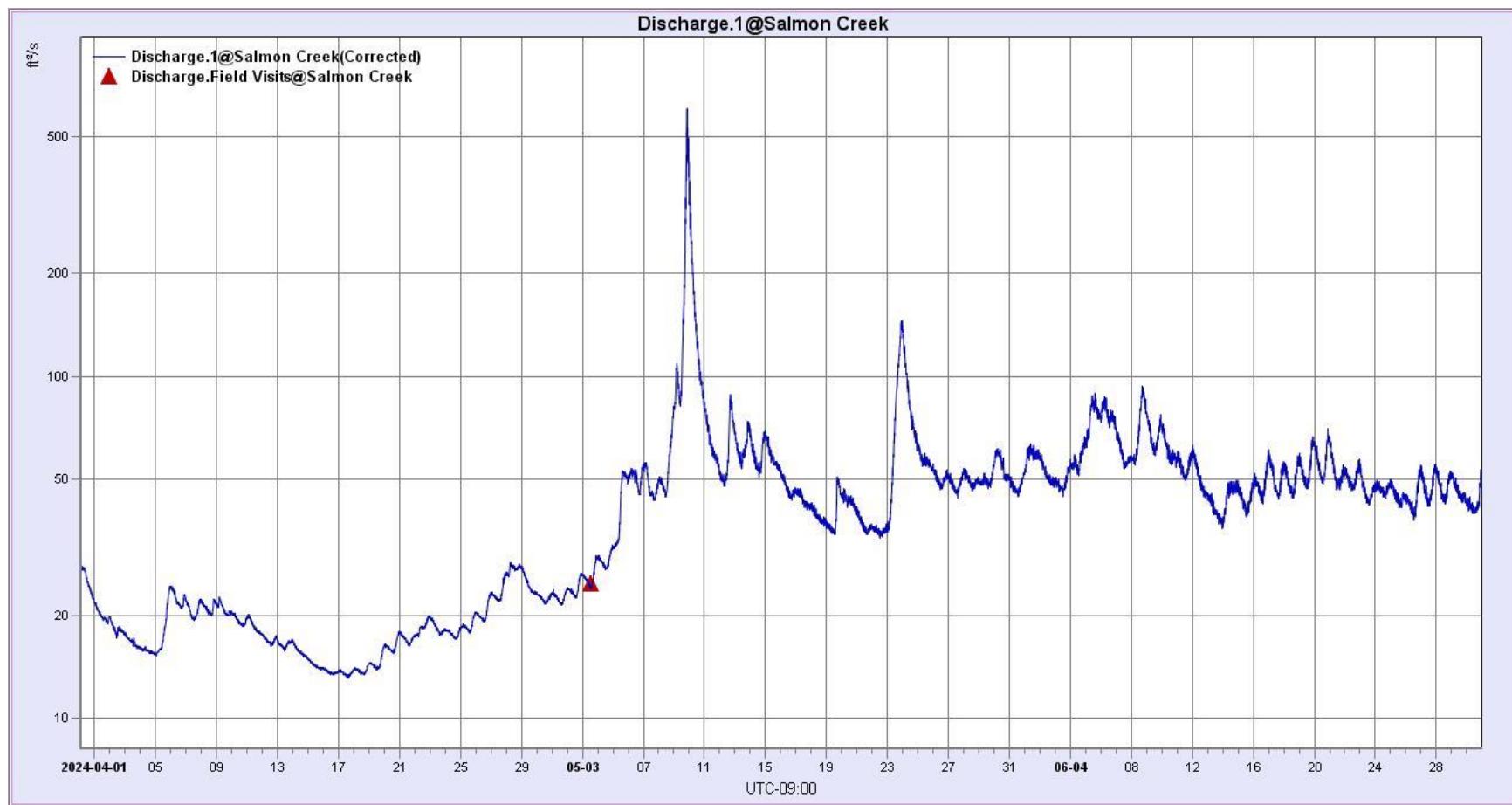
Salmon Creek Daily Mean 2024 WY Final.



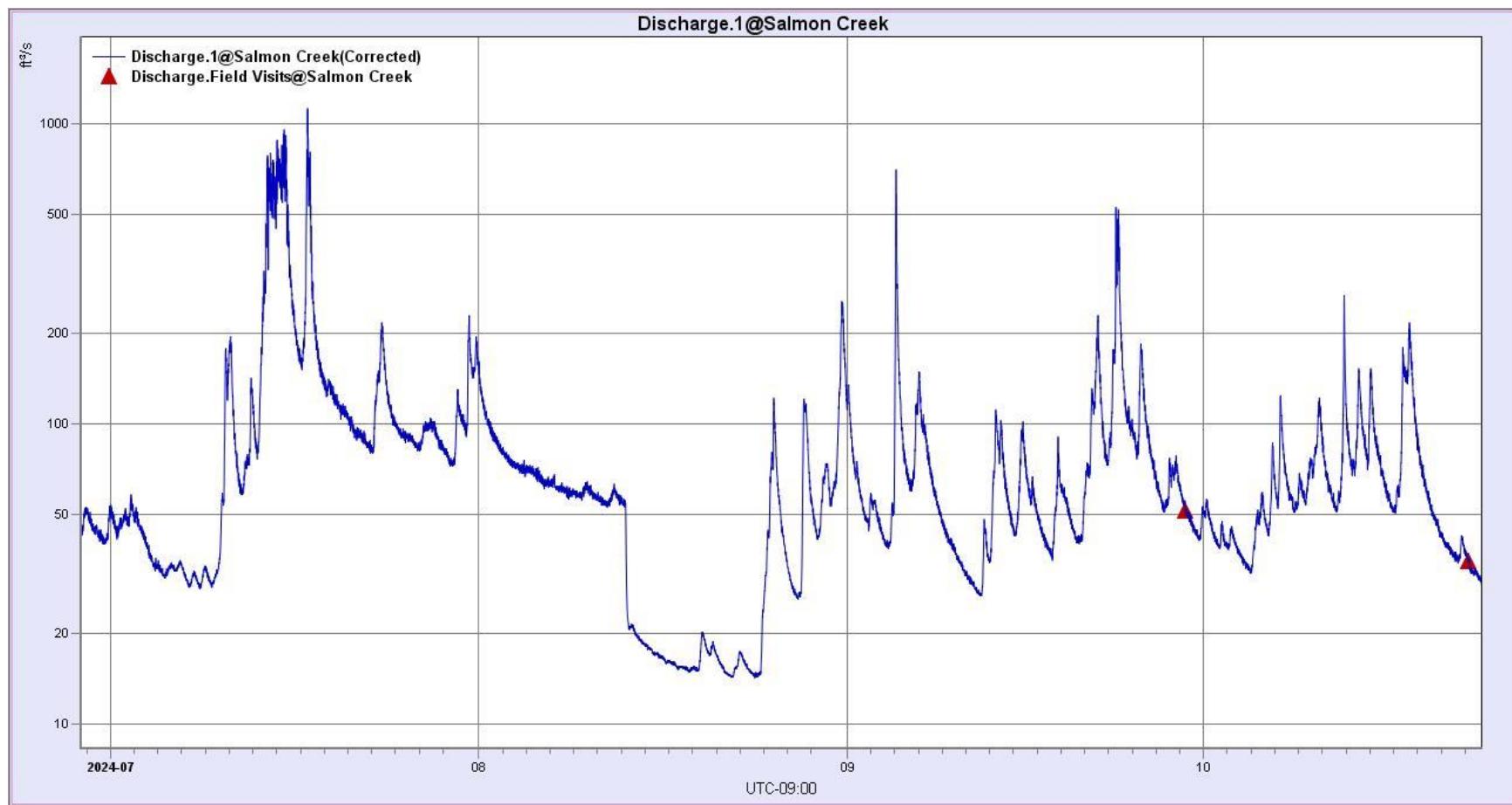
Computed discharge and field measurements for Salmon Creek near Juneau, Alaska from October 2023 to January 2024.



Computed discharge and field measurements for Salmon Creek near Juneau, Alaska from January to April 2024.



Computed discharge and field measurements for Salmon Creek near Juneau, Alaska from April to July 2024.



Computed discharge and field measurements for Salmon Creek near Juneau, Alaska from July to October 25, 2024.

Daily Mean Discharge 2024 WY - Salmon Creek

Identifier: Discharge.1@Salmon Creek

Location: Salmon Creek Juneau

Units: ft^3/s

Filter: None

Year: 2024 Water Year

| Day | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|
| 1 | 100 | 21 | 34 | 41 | 44 | 13 | 20 | 23 | 59 | 47 | 120 | 88 |
| 2 | 140 | 20 | 30 | 33 | 34 | 13 | 18 | 24 | 52 | 50 | 88 | 52 |
| 3 | 130 | 21 | 27 | 30 | 29 | 13 | 17 | 26 | 49 | 45 | 76 | 50 |
| 4 | 93 | 21 | 28 | 35 | 29 | 13 | 16 | 29 | 57 | 36 | 71 | 44 |
| 5 | 94 | 20 | 52 | 29 | 27 | 13 | 18 | 42 | 77 | 32 | 69 | 160 |
| 6 | 190 | 23 | 47 | 25 | 24 | 13 | 22 | 51 | 78 | 33 | 65 | 78 |
| 7 | 230 | 24 | 35 | 23 | 21 | 14 | 21 | 48 | 60 | 31 | 62 | 98 |
| 8 | 230 | 38 | 32 | 22 | 20 | 15 | 21 | 55 | 71 | 31 | 60 | 57 |
| 9 | 180 | 82 | 29 | 20 | 20 | 16 | 21 | 190 | 68 | 31 | 59 | 42 |
| 10 | 130 | 56 | 26 | 17 | 23 | 14 | 19 | 160 | 61 | 84 | 59 | 35 |
| 11 | 95 | 46 | 29 | 16 | 23 | 13 | 19 | 64 | 55 | 110 | 55 | 30 |
| 12 | 85 | 36 | 80 | 16 | 20 | 13 | 17 | 62 | 51 | 82 | 57 | 34 |
| 13 | 78 | 30 | 68 | 15 | 18 | 16 | 16 | 62 | 41 | 140 | 35 | 74 |
| 14 | 73 | 33 | 85 | 15 | 17 | 37 | 16 | 59 | 45 | 570 | 19 | 60 |
| 15 | 73 | 28 | 64 | 15 | 16 | 39 | 14 | 58 | 44 | 680 | 18 | 65 |
| 16 | 69 | 39 | 40 | 15 | 15 | 53 | 14 | 47 | 49 | 230 | 17 | 60 |
| 17 | 71 | 32 | 46 | 15 | 15 | 72 | 14 | 44 | 51 | 410 | 16 | 43 |
| 18 | 160 | 36 | 34 | 14 | 16 | 48 | 14 | 39 | 50 | 180 | 15 | 52 |
| 19 | 230 | 28 | 28 | 14 | 20 | 34 | 15 | 40 | 54 | 130 | 17 | 54 |
| 20 | 110 | 24 | 27 | 13 | 21 | 28 | 16 | 43 | 57 | 110 | 18 | 44 |
| 21 | 88 | 34 | 28 | 13 | 19 | 24 | 17 | 37 | 53 | 96 | 16 | 97 |
| 22 | 74 | 46 | 24 | 13 | 32 | 22 | 18 | 35 | 51 | 87 | 15 | 120 |
| 23 | 67 | 100 | 25 | 14 | 28 | 21 | 18 | 79 | 46 | 140 | 16 | 220 |
| 24 | 53 | 120 | 50 | 15 | 20 | 20 | 18 | 87 | 47 | 120 | 16 | 130 |
| 25 | 30 | 110 | 54 | 17 | 17 | 20 | 19 | 57 | 45 | 93 | 61 | 110 |
| 26 | 28 | 180 | 64 | 21 | 15 | 21 | 20 | 50 | 44 | 87 | 49 | 86 |
| 27 | 25 | 150 | 39 | 60 | 14 | 20 | 23 | 48 | 48 | 94 | 29 | 57 |
| 28 | 24 | 65 | 31 | 91 | 14 | 19 | 27 | 50 | 48 | 92 | 73 | 68 |
| 29 | 23 | 47 | 38 | 370 | 13 | 19 | 25 | 50 | 46 | 77 | 48 | 53 |
| 30 | 23 | 40 | 130 | 160 | | 18 | 22 | 55 | 43 | 100 | 64 | 45 |
| 31 | 22 | | 61 | 67 | | 25 | | 48 | | 160 | 150 | |
| Aggr | 97 | 51 | 45 | 41 | 22 | 23 | 19 | 57 | 53 | 140 | 49 | 73 |
| Min | 21 | 19 | 22 | 13 | 13 | 13 | 13 | 22 | 36 | 28 | 14 | 27 |
| Max | 470 | 430 | 220 | 840 | 55 | 110 | 28 | 610 | 93 | 1100 | 250 | 710 |

APPENDIX E: AGENCY COMMENTS

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Bryan Farrell

From: Larquier, Ann M (DFG) <ann.larquier@alaska.gov>
Sent: Tuesday, November 26, 2024 3:16 PM
To: Bryan Farrell
Cc: Cooper, Douglass; Sowa, Jarrod J (DFG); Mahara, Carol J; julianne.rosset; Klein, Joseph P (DFG)
Subject: Re: ** EXTERNAL ** RE: [EXTERNAL] Re: AELP WY24 Salmon Creek streamflow DRAFT report for comment

Hello Brian,

The Alaska Department of Fish and Game has reviewed the WY24 DRAFT Salmon Creek Streamflow Report and has no comments.

Please note, Leah Ellis' last day with ADF&G was November 4th. I am now responsible for hydropower coordination activities for Fish and Game with the assistance of Jarrod Sowa.

Thank you,

Ann Marie Larquier
Instream Flow Program
Alaska Department of Fish & Game

907-267-2311
ann.larquier@alaska.gov

From: Bryan Farrell <Bryan.Farrell@aelp.com>
Sent: Tuesday, November 26, 2024 11:04 AM
To: Mahara, Carol J <carol_mahara@fws.gov>; julianne.rosset <julianne.rosset@noaa.gov>
Cc: Cooper, Douglass <douglass_cooper@fws.gov>; Sowa, Jarrod J (DFG) <jarrod.sowa@alaska.gov>; Larquier, Ann M (DFG) <ann.larquier@alaska.gov>
Subject: RE: ** EXTERNAL ** RE: [EXTERNAL] Re: AELP WY24 Salmon Creek streamflow DRAFT report for comment

Some people who received this message don't often get email from bryan.farrell@aelp.com. [Learn why this is important](#)

CAUTION: This email originated from outside the State of Alaska mail system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Thank you.

Bryan

From: Mahara, Carol J <carol_mahara@fws.gov>
Sent: Tuesday, November 26, 2024 9:54 AM
To: julianne.rosset <julianne.rosset@noaa.gov>; Bryan Farrell <Bryan.Farrell@aelp.com>

Cc: Cooper, Douglass <douglass_cooper@fws.gov>; Sowa, Jarrod J (DFG) <jarrod.sowa@alaska.gov>; Larquier, Ann M (DFG) <ann.larquier@alaska.gov>

Subject: ** EXTERNAL ** RE: [EXTERNAL] Re: AELP WY24 Salmon Creek streamflow DRAFT report for comment

Hi Bryan,

Similarly, the U.S. Fish and Wildlife Service has no comments regarding the Draft Salmon Creek Stream Flow Monitoring Report for water year 2024.

Thanks,

Carol

Carol Mahara

Fish and Wildlife Biologist
Ecological Services
US Fish and Wildlife Service
4700 BLM Road
Anchorage, AK 99507
carol_mahara@fws.gov
Cell: 907-280-9751

From: Julianne Rosset - NOAA Federal <julianne.rosset@noaa.gov>

Sent: Tuesday, November 26, 2024 9:41 AM

To: Bryan Farrell <Bryan.Farrell@aelp.com>

Cc: Cooper, Douglass <douglass_cooper@fws.gov>; Sowa, Jarrod J (DFG) <jarrod.sowa@alaska.gov>; Mahara, Carol J <carol_mahara@fws.gov>; Larquier, Ann M (DFG) <ann.larquier@alaska.gov>

Subject: [EXTERNAL] Re: AELP WY24 Salmon Creek streamflow DRAFT report for comment

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Hi Bryan,

The National Marine Fisheries Service is in receipt of the WY24 Draft Salmon Creek (FERC No. 2307) Streamflow Report, which was emailed to us on October 25, 2024. At this time, we have no comments.

Thank you!

Kind regards,
Julianne

Julianne Rosset (she/her)
Hydropower Program Coordinator | Alaska Region
NOAA Fisheries | U.S. Department of Commerce
Office: 907-271-3654 *please note this is a new number*
Alaska Region Hydropower Projects



On Mon, Nov 25, 2024 at 3:18 PM Bryan Farrell <Bryan.Farrell@aelp.com> wrote:

Hi all,

This is a reminder that any comments on the draft streamflow report are due tomorrow. If you don't have any comments, please reply to this email to indicate that.

Thanks and happy holidays!

Bryan

From: Bryan Farrell

Sent: Friday, October 25, 2024 4:31 PM

To: douglass_cooper@fws.gov; benjamin.johnson@noaa.gov; Ellis, Leah M (DFG) <leah.ellis@alaska.gov>; evangeline.houston@noaa.gov; barb.lake@noaa.gov

Subject: AELP WY24 Salmon Creek streamflow DRAFT report for comment

Hello,

The WY24 DRAFT Salmon Creek Streamflow Report is attached for your review. Please respond with any comments, or "no comment", by November 26th.

Thank you for taking the time to look it over.

Bryan Farrell, PE

VP, Power Generation

Alaska Electric Light & Power Company | 5601 Tongard Court, Juneau, AK 99801

907.759.5939 direct | 907.209.3701 mobile

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