Swan Falls Agreement Flows

- Minimum Streamflow
- Snake River at Murphy Minimum of Record (1981 - 2018)
- Snake River at Murphy Median of Record (1981 - 2018)
- AADF - 3 Day Average
- Snake River at Milner Gage
Swan Falls Settlement

ADJUSTED AVERAGE DAILY FLOW (AADF) CALCULATIONS

- Swan Falls Adjusted Average Daily Flow Calculation
- 3-Day Average AADF
- AADF Graphs — Weekly Update

$$Q_{AADF} = Q_{Murphy} + \Delta S_{SF} + \Delta S_{CJ} + \Delta S_{Bliss} + \Delta S_{LSF}$$

If Idaho Power releases storage past Milner

$$Q_{AADF} = Q_{Murphy} + \Delta S_{SF} + \Delta S_{CJ} + \Delta S_{Bliss} + \Delta S_{LSF} - Q_{\text{Milner}}$$
Swan Falls Dam Lag Time

- Idaho Power analyzed different seasons and flow rates for comparison between Swan Falls Dam Outlet and the old Snake River nr Murphy gage

- Current lag time is 2 hours (based on old analysis)
Swan Falls Dam Outlet to USGS Gage Preliminary Results

No lag time

Discharge (cfs)


Date

Snake_13172454_IPCo  Snake_13172500_USGS
Next Steps

• Lag Time
  – Verify 0 hour lag for Swan Falls Dam
  – Change lag in Excel AADF calculation for this year

• Or next year?
Aquarius Time-series Calculation

- IDWR and Idaho Power both utilize Aquarius (AQ)
- Last meeting: proposed exploring calculation in AQ
- Status:
  - Idaho Power: Developed the calculation in AQ (with 15 minute time series)
    - 15 minute data is necessary
  - IDWR: Import USGS and Idaho Power Data
    - Have the capability to reproduce the calculation in AQ
Current Time-steps

<table>
<thead>
<tr>
<th>Location</th>
<th>Time-step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swan Falls</td>
<td>15 min stage</td>
</tr>
<tr>
<td>CJ Strike</td>
<td>60 min stage</td>
</tr>
<tr>
<td>Bliss Dam</td>
<td>15 min stage</td>
</tr>
<tr>
<td>Lower Salmon Falls</td>
<td>15 min stage</td>
</tr>
</tbody>
</table>

\[ \Delta \text{Storage} \]

\[ \text{Discharge} \]

\[ \text{Hourly to Daily Mean} \]

\[ \text{Reservoir Adjustment} \]

\[ \text{AADF} = \text{Daily Value} - \text{Daily Mean} \]

\[ \text{Snake River nr Murphy} + \text{Reservoir Adjustment} - \text{Snake River at Milner} \]

* If flow is IPCo Storage
Proposed Time-steps

<table>
<thead>
<tr>
<th>Swan Falls 15 min stage</th>
<th>CJ Strike 15 min stage</th>
<th>Bliss Dam 15 min stage</th>
<th>Lower Salmon Falls 15 min stage</th>
</tr>
</thead>
</table>

\[ \Delta \text{Storage} \]

\[ \text{Discharge} \]

\[ \text{15 min to Daily Mean} \]

\[ \text{Reservoir Adjustment} \]

\[ \text{Daily Mean} \]

\[ \text{AADF} \]

\[ \text{Snake River nr Murphy} \]

\[ \text{Reservoir Adjustment} \]

\[ \text{Snake River at Milner} \]

* If flow is IPCo Storage
2019 AADF vs 15 minute calculation

1 Day AADF Comparison Plot - 2019 Calendar Year Data (Preliminary Results)
Discussion

• Official AADF: Excel, Aquarius, R, or other
  – Currently Excel
  – Datasets posted online

• Any concern with 15 minute datasets?
Next Steps

• Lag Time
  – Verify 0 hour lag for Swan Falls Dam
Next Steps

• Lag Time
  – Verify 0 hour lag for Swan Falls Dam

• Aquarius Calculation
  – Refine 15 minute time step calculation in Aquarius and work on 15 minute Excel calculation?
  – Verify 15 minute calculation: QA/QC
  – Analyze reservoir lag times?
Swan Falls Forecast Tool - May 2020 Forecast

Discharge (ft³/s)

SFFT Uncertainty Range
Swan Falls Minimum Streamflow
SFFT Forecast