CHUGACH ELECTRIC ASSOCIATION, INC.
ANCHORAGE, ALASKA

OPERATIONS COMMITTEE MEETING

AGENDA

Mark Wiggin, Chair
Jim Nordlund, Vice Chair

Sisi Cooper, Director
Bettina Chastain, Director
Sam Cason, Director

July 12, 2023 | **4:00 p.m.** | **Chugach Board Room**

I. CALL TO ORDER *(4:00 p.m.)*
   - *A. Roll Call*

II. APPROVAL OF THE AGENDA* *(4:05 p.m.)*

III. APPROVAL OF THE MINUTES* *(4:10 p.m.)*
   - A. *June 21, 2023 (Cacy)*

IV. PERSONS TO BE HEARD *(4:15 p.m.)*
   - *A. Member Comments*

V. NEW BUSINESS *(scheduled) (4:20 p.m.)*
   - *A. Review Board Policy 206 – Statement of Functions of the Operations Committee (Committee) (4:20 p.m.)*
   - *B. Recap and Review of 2023 Election Process (Kurka/Hasquet/Miller) (4:25 p.m.)*
   - *C. Renewable Energy Plan (Skaling) (4:40 p.m.)*
   - *D. Eklutna Project (Brodie/S. Owens) (5:00 p.m.)*

VI. EXECUTIVE SESSION* *(scheduled) (5:40 p.m.)*
   - *A. Gas Supply Update (Rudeck/Gerlek/Thompson)*
   - *B. May 1, 2023 – April 30, 2024, CEO Project Specific Initiatives and Priority Areas (Miller/Board)*

VII. DIRECTOR COMMENTS *(6:45 p.m.)*

VIII. ADJOURNMENT* *(7:00 p.m.)*

* ***Denotes Action Items***
** ***Denotes Possible Action Items***
7/7/2023 8:52:29 AM

CHUGACH ELECTRIC ASSOCIATION, INC.
Anchorage, Alaska

June 21, 2023
Wednesday
(Immediately following Governance Committee Meeting)

OPERATIONS COMMITTEE MEETING

Recording Secretary: Sandra Cacy

I. CALL TO ORDER

Chair Wiggin called the Operations Committee meeting to order at 5:11 p.m. in the boardroom of Chugach Electric Association, Inc., 5601 Electron Drive, Anchorage, Alaska.

A. Roll Call

Committee Members Present:
Mark Wiggin, Chair
Jim Nordlund, Vice Chair
Bettina Chastain, Director
Sisi Cooper, Director
Sam Cason, Director

Board Members Present:
Rachel Morse, Director
Susan Fleek-Green, Director

Guests and Staff Attendance Present:

Arthur Miller	Julie Hasquet	Bart Armfield, Consultant
Andrew Laughlin	Hans Thompson	Steve Gerlek, Consultant
Matthew Clarkson	Sherri Highers	

Via Teleconference:

Ashton Doyle	Mitchel Roth, Member	Antony Scott, Member
Sydney Scott, Member	Donovan Russoniello, Member	

II. APPROVAL OF THE AGENDA

Director Chastain moved, and Director Nordlund seconded the motion to approve the agenda. The motion passed unanimously.

III. APPROVAL OF THE MINUTES

Director Cason moved, and Director Cooper seconded the motion to approve the June 7, 2023, Operations Committee Meeting minutes. The motion passed unanimously.

IV. PERSONS TO BE HEARD

A. Member Comments

Chugach Members, Antony Scott, Mitchel Roth, and Donovan Russoniello addressed the Board with comments on the upcoming Rate Case and Rate design as well as Natural Gas pricing.

V. NEW BUSINESS

A. 2023 General Rate Case Update (Kornmuller/Clarkson)

Matthew Clarkson, Chief Legal Officer, provided an update on the 2023 General Rate Case and responded to questions from the Committee.

Director Cooper moved, and Director Cason seconded that the Operations Committee recommend the Board of Directors approve the attached resolution authorizing the Chief Executive Officer to file the 2022 Rate Case with the Regulatory Commission of Alaska. The motion passed with a vote of four yes and one no.

B. 2024 – 2033 Financial Forecast (Sims/Griffin)

Karen Griffin, Vice President of Finance and Accounting and Curtis Sims, Senior Manager of Budget, and Finance discussed the Financial Forecast and responded to questions from the Committee.

Director Cooper moved, and Director Cason seconded that the Operations Committee recommend the Board of Directors approve the 2024-2033 Financial Forecast in all material respects as discussed and summarized on the attached Projected 2024-2033 Financial Forecast Results. The motion passed unanimously.

VI. EXECUTIVE SESSION

A. Gas Supply Update (Armfield/Gerlek/Thompson)

B. May 1, 2023-April 30, 2024, CEO Project Specific Initiatives and Priority Areas (Miller)

At 6:48 p.m., Director Cason moved and Director Cooper seconded the motion that pursuant to Alaska Statute 10.25.175(c)(1), (3) and (4), the Operations Committee go into executive session to: 1) discuss and receive reports regarding matters the immediate knowledge of which would clearly have an adverse effect on the finances of the cooperative; 2) discuss with its attorneys matters the immediate knowledge of which could have an adverse effect on the legal position of the cooperative; and 3) discuss personnel matters. The motion passed unanimously.

The meeting reconvened in open session at 8:03 p.m.

VII. NEW BUSINESS

*A. May 1, 2023-April 30, 2024, CEO Project Specific Initiatives and Priority Areas** (Miller)*

After discussion during Executive Session, the Board made the decision to defer action on item VII.A. until the July 12, 2023, Operations Committee Meeting.

VIII. DIRECTOR COMMENTS

Comments were made at this time.

IX. ADJOURNMENT

At 8:19 p.m., Director Wiggin moved, and Director Nordlund seconded the motion to adjourn. The motion passed unanimously.

CHUGACH ELECTRIC ASSOCIATION, INC.

BOARD POLICY: 206

STATEMENT OF FUNCTIONS OF THE OPERATIONS COMMITTEE

I. OBJECTIVE

To state the functions of the Operations Committee. The purpose of the Operations Committee shall be to study, examine and report on matters assigned to it by the Board of Directors.

II. DUTIES AND RESPONSIBILITIES

A. Annually conduct the performance evaluation for the Chief Executive Officer and provide a written report to the Board of Directors detailing the results of such evaluation on or before the first Board meeting in April as required by Board Policy 103.

B. Reviews such other matters as may be specifically assigned to it by the Board.

III. COMMITTEE ORGANIZATION

A. The Committee shall be comprised of five Board members.

B. A quorum of the Committee shall consist of three members.

C. The Board Chair shall appoint the Committee Chair as well as the Directors to serve on the Committee. The Committee shall elect from its membership a Vice Chair.

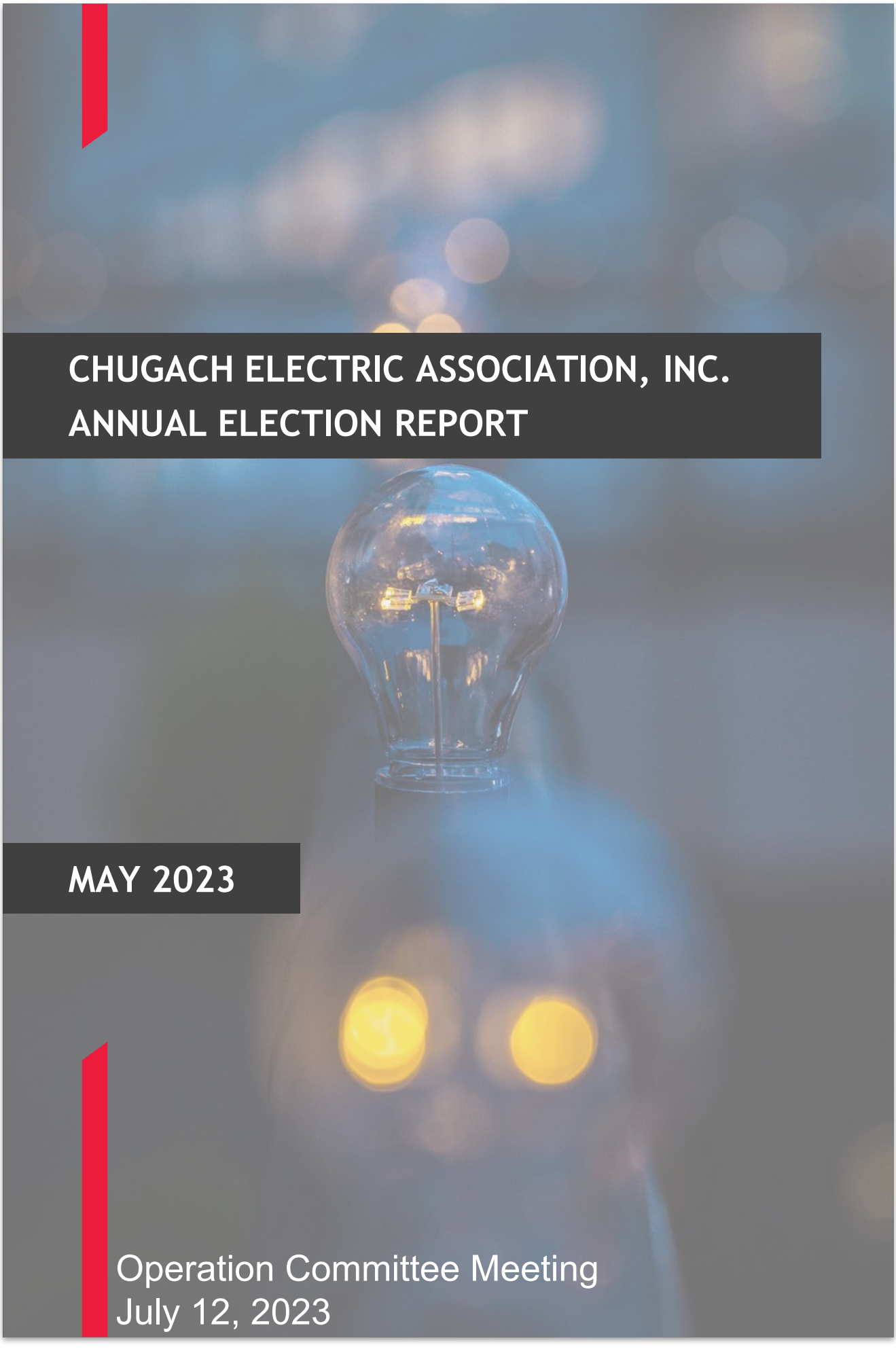
D. The Committee shall meet as needed. The Committee Chair shall convene all meetings of the Committee. In his or her absence, the Committee Vice Chair shall convene meetings. The Committee Chair or a quorum of the Committee may call a special meeting of the Committee.

E. The Committee Chair may appoint sub-committees from the Committee's membership to study specific areas. Written statements of the functions of such sub-committees should be prepared and reviewed periodically.

Date Approved: July 21, 2021

Attested: James Henderson

James Henderson
Secretary of the Board



CHUGACH ELECTRIC ASSOCIATION, INC.
ANNUAL ELECTION REPORT

MAY 2023

Operation Committee Meeting
July 12, 2023

Table of Contents

Executive Summary

OVERVIEW

BDO USA, LLP ("BDO") was contracted by Chugach Electric Association, Inc. ("Chugach") to perform election administration services, as the Election Administrator, for the 2023 Annual Meeting and Election. Election administration services include administration and oversight of the election, as well as subcontracting for electronic voting services. Specific election administrator duties and responsibilities are outlined in the Chugach Election Procedures.

ELIGIBLE MEMBERS

A total of 90,210 members were eligible to vote as of the date of record, March 31, 2023. A total of 86,167 (96%) of the eligible members were natural and 4,043 (4%) were non-natural.

ELECTION RESULTS

In the 2023 election, eligible members voted for three of nine candidates running for the three available seats on the Board of Directors. The two candidates who received the most votes were each elected to a 4-year term and one candidate will serve a 2-year term. Eligible members also voted on one proposed bylaw amendment. Based on the results of the election shown in the tables below, the two candidates elected to 4-year terms were Susanne Fleek-Green and Jim Nordlund, the one candidate elected to a 2-year term was Bettina Chastain, and the proposed bylaw amendment passed.

Board of Directors Candidate	Online	Paper	Total Votes
Brad Authier	3,939	117	4,056
Bettina Chastain	6,088	170	6,258
Susanne Fleek-Green	6,622	103	6,725
Harold Hollis	4,813	131	4,944
Shaina Kilcoyne	5,912	90	6,002
Steve Konkel	2,078	31	2,109
Jim Nordlund	6,295	122	6,417
Scott Von Gemmingen	1,820	51	1,871
James Wileman	1,311	30	1,341

Bylaw Amendments	Total "Yes" Votes	Total "No" Votes	Outcome
Bill Round-Up Program	7,712	6,202	Passed

Mail Inspection

On 04/04/2023, Chugach delivered their printed election material to their third-party mailing service provider, Rapid Action Mailing Service, Inc. ("Rapid Action"), for assembly of paper ballot election packages to be mailed via USPS on 04/19/2023.

Rapid Action assembled the election materials into 10 x 12 master envelopes and placed the envelopes into postal trays in the order they are provided on the printed list, which is by zip code. Each package received 1 ballot (1 of 9 available versions). Each version has a different one of the candidates listed first. Ballots are stamped in sequential order from beginning to end (i.e., 001, 002, 003, etc.). In addition to the ballot, each master envelope also receives 1 ballot return envelope (two-sided #10 envelope with the member's address showing through the plastic window and the Chugach return address on the reverse side) and 1 election pamphlet.

BDO obtained the listing of eligible voting members for the 2023 election from the Chugach file share and noted that a total of 574 of the eligible voters opted to receive paper ballots. On 04/18/2023, BDO met with Jarrod Holloway, General Manager of Rapid Action Mailing Services at Rapid Action Mailing Service, Inc. located at 3620 Jewel Lake Road, Anchorage, AK 99502. BDO manually counted the packages, which were distributed amongst 8 postal trays and noted a total of 574 printed paper ballot packages. BDO randomly selected a sample of 10% of the population for a total of 60 samples by selecting ballots from each of the 8 postal trays. BDO inspected each of the selected packages. No exceptions were noted for the 60 sampled packages.

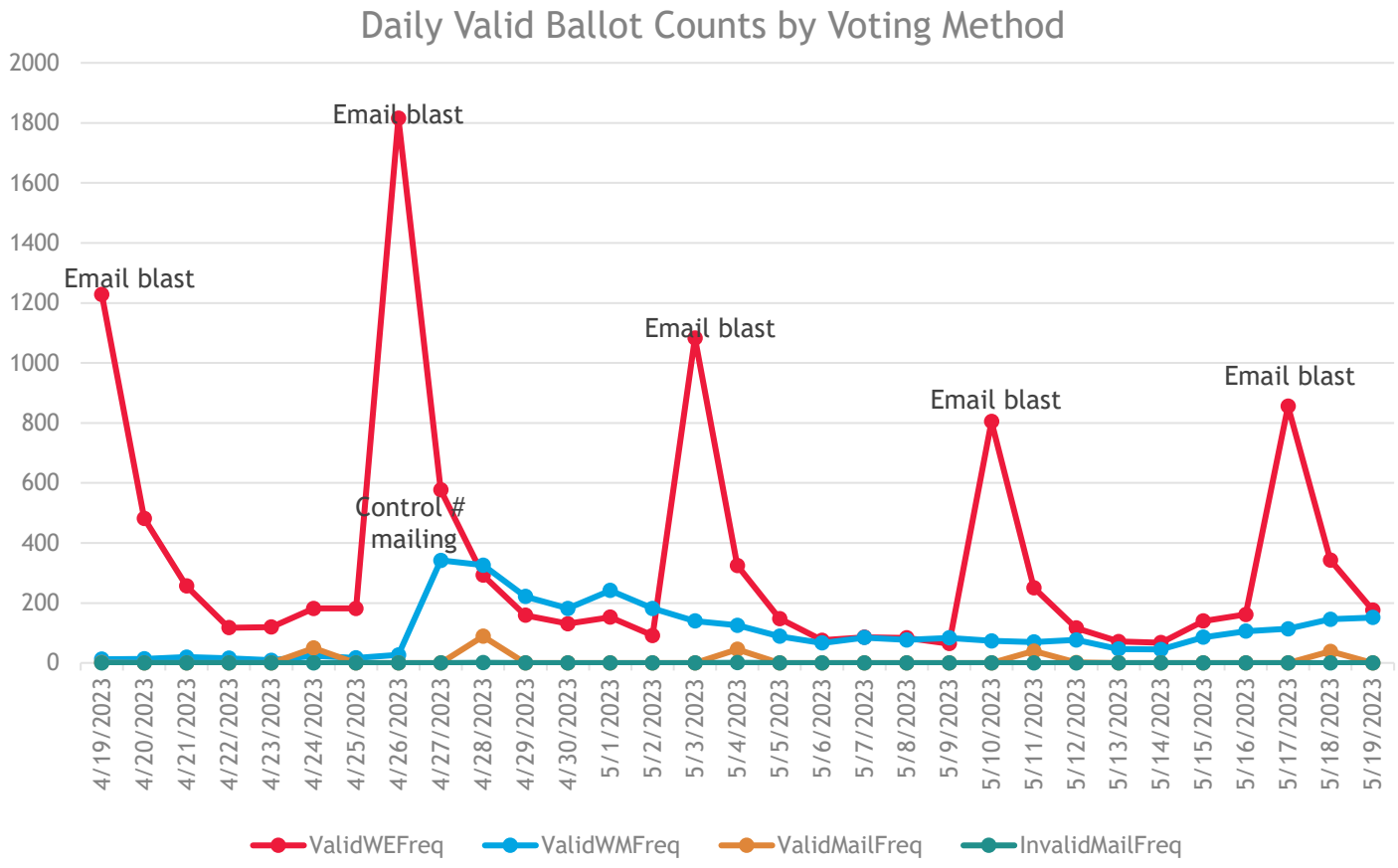
Paper Ballot Envelopes

Paper ballots are picked up from the secure Chugach drop box (5601 Election Drive) and Anchorage airport U.S. Post Office by third-party service provider, Guardian Security Systems, Inc. ("Guardian"), and delivered to BDO (3601 C Street, Suite 600), on the days listed in the table below. No paper ballots were mailed directly to the BDO office. A delivery receipt was provided by Guardian with the count of paper ballots delivered. BDO reviewed each envelope to ensure it was signed by an authorized member. For at least 5% of the received ballot envelopes, BDO compared the member's signature on the envelope to the member's signature on file in Laserfiche. The number of paper ballots received with each Guardian delivery and the number of invalid ballots are shown in the table below.

Batch #	Date Received	Ballot Count	Invalid	Valid
1	4/19/2023	1	0	1
2	4/24/2023	50	0	50
3	4/28/2023	90	1	89
4	5/4/2023	46	0	46
5	5/11/2023	40	0	40
6	5/12/2023	2	0	2
7	5/18/2023	39	0	39
Total		268	1	267

Daily Valid Ballot Counts by Voting Method

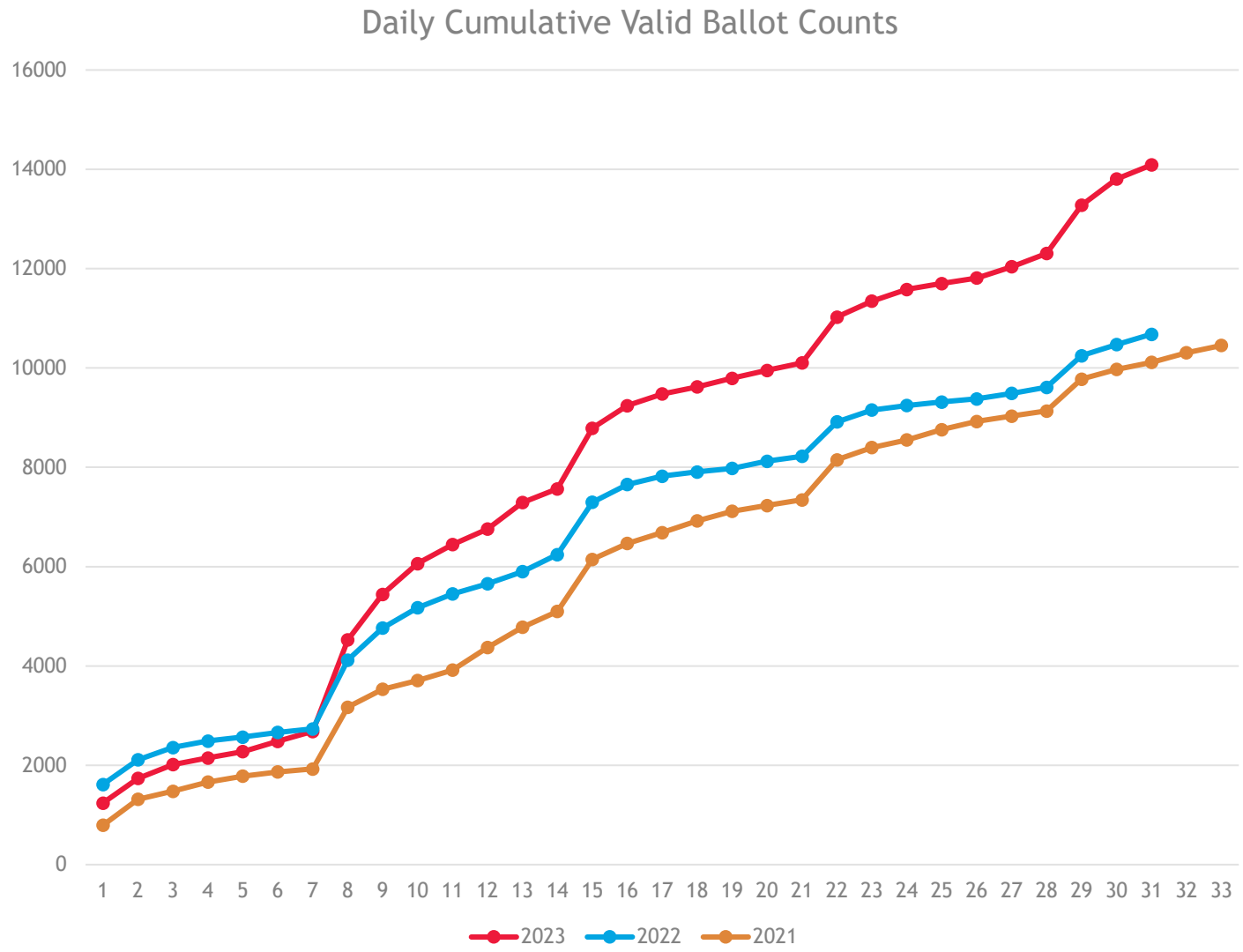
The graph below shows the daily valid ballot counts received per available voting method. A total of 2,420 (18%) of the valid ballots were received by members whose member number starts with “141” meaning they are likely part of the North District.



Day	4/19	4/20	4/21	4/22	4/23	4/24	4/25	4/26	4/27	4/28	4/29	4/30	5/1	5/2	5/3	5/4	5/5	5/6	5/7	5/8	5/9	5/10	5/11	5/12	5/13	5/14	5/15	5/16	5/17	5/18	5/19
Web (Email Link)	1,228	482	257	118	120	182	182	1,815	577	293	159	131	153	92	1,083	325	148	76	86	84	65	805	251	117	72	68	140	162	856	343	176
Web (Manual)	13	14	20	16	9	24	17	27	342	326	222	182	242	182	140	127	89	67	85	77	84	74	70	77	47	45	86	106	114	146	152
Paper (Mail)	1	0	0	0	0	50	0	0	0	89	0	0	0	0	0	46	0	0	0	0	0	0	40	2	0	0	0	0	0	39	0
Paper (In-Person)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Total Valid	1,241	1,737	2,014	2,148	2,277	2,483	2,682	4,524	5,443	6,062	6,443	6,756	7,291	7,565	8,788	9,240	9,477	9,620	9,791	9,952	10,101	11,025	11,346	11,580	11,699	11,812	12,038	12,306	13,276	13,806	14,156

Daily Cumulative Valid Ballot Counts

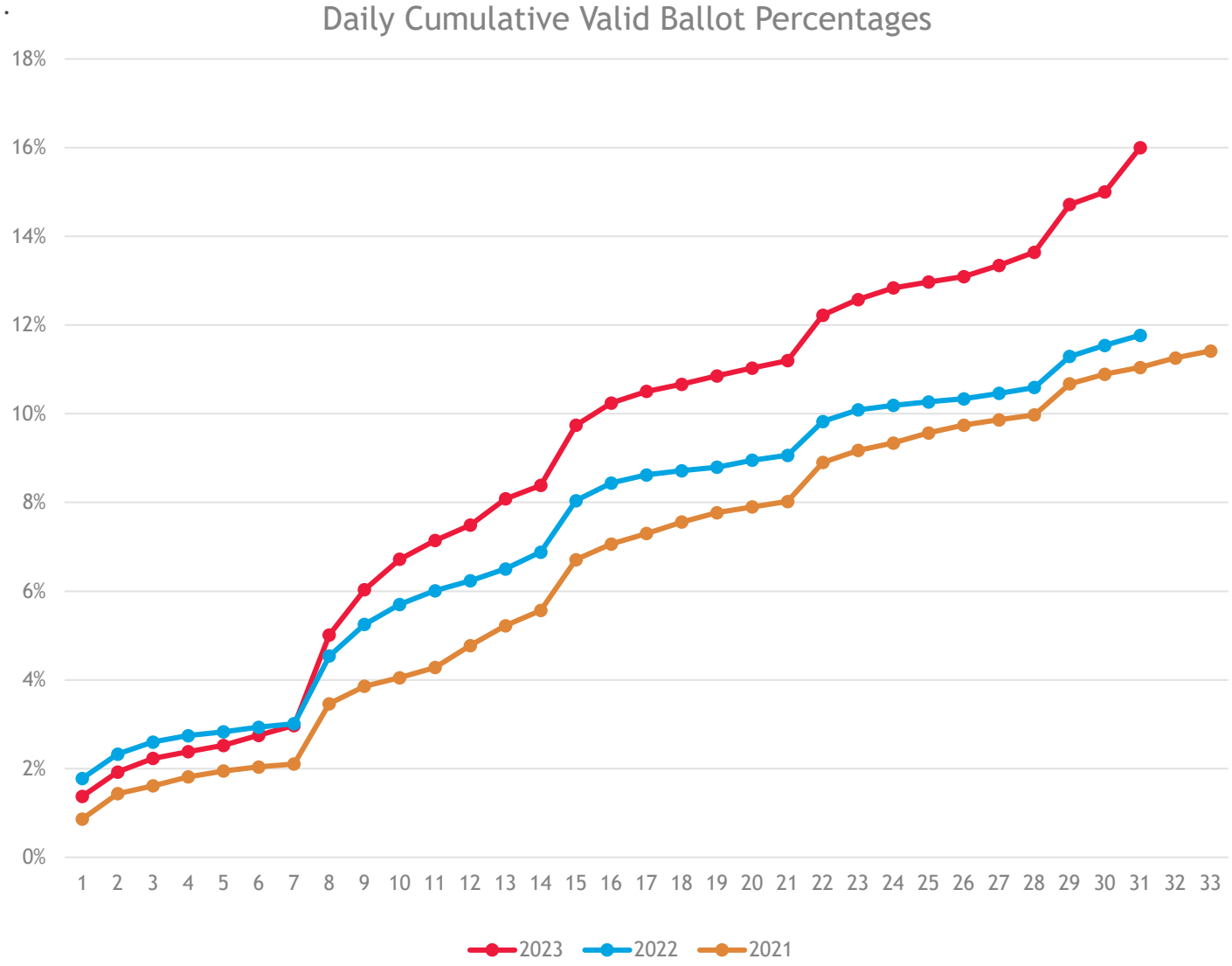
The graph below shows the cumulative valid ballot counts received each day for the current and previous two elections.



Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
2023	1,241	1,737	2,014	2,148	2,277	2,483	2,682	4,524	5,443	6,062	6,443	6,756	7,291	7,565	8,788	9,240	9,477	9,620	9,791	9,952	10,101	11,025	11,346	11,580	11,699	11,812	12,038	12,306	13,276	13,806	14,156		
2022	1,614	2,112	2,359	2,490	2,568	2,662	2,734	4,119	4,764	5,172	5,452	5,656	5,900	6,243	7,295	7,655	7,821	7,907	7,979	8,123	8,221	8,914	9,152	9,243	9,314	9,377	9,489	9,609	10,245	10,471	10,677		
2021	793	1,316	1,478	1,663	1,782	1,866	1,926	3,171	3,531	3,707	3,918	4,371	4,781	5,098	6,145	6,468	6,685	6,920	7,114	7,232	7,345	8,150	8,398	8,552	8,759	8,922	9,031	9,133	9,774	9,972	10,112	10,306	10,453

Daily Cumulative Valid Ballot Percentages

The graph below shows the daily cumulative percentage of valid eligible voter counts received each day for the current and previous two elections.



Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
2023	1%	2%	2%	2%	3%	3%	3%	5%	6%	7%	7%	7%	8%	8%	10%	10%	11%	11%	11%	11%	11%	12%	13%	13%	13%	13%	13%	14%	15%	15%	16%		
2022	2%	2%	3%	3%	3%	3%	3%	5%	5%	6%	6%	6%	7%	7%	8%	8%	9%	9%	9%	9%	9%	10%	10%	10%	10%	10%	10%	11%	11%	12%	12%		
2021	1%	1%	2%	2%	2%	2%	2%	3%	4%	4%	4%	5%	5%	6%	7%	7%	7%	8%	8%	8%	8%	9%	9%	9%	10%	10%	10%	10%	11%	11%	11%	11%	11%

Member Support Activity

BDO managed the Chugach election hotline (907-646-7394; 888-729-4679) and inbox (chugachelection@bdo.com) from 8am – 5pm AKDT, 4/19/2023 through 3pm on 5/19/2023. The reason for each phone call and email was categorized, as shown in the table below.

Support Category	Hotline Count	Inbox Count	2023 TOTAL	2022 TOTAL
Email resend request	174	92	266	69
Control number request	165	65	230	65
Email update and resend request	126	47	173	49
Paper ballot request	47	15	62	18
Chugach Customer Service (CCS) call	38	0	38	17
Assistance logging in to vote	15	9	24	8
Confirming electronic vote received	14	4	18	12
Assistance with finding election info online	12	2	14	7
Address or name change request - forwarded to CCS	7	7	14	6
Other	66	23	89	41
2023 TOTALS	**664**	**264**	**928**	**292**
2022 TOTALS	**283**	**9**		

Prize Drawings

BDO used Chugach election software to randomly generate prize winners for the early bird and grand prize drawings. Only members who voted online and cast their vote before noon AKDT on the day of the drawing were in scope for the early bird drawing. Winners were removed from scope from subsequent early bird drawings. Members in scope for the grand prize drawing included all members who voted before the in-person deadline, regardless of voting method or previous winnings. Below are the 2023 winners.

Drawing	Date of Drawing	Number of Winners	Winners	
Early Bird Drawing #1	4/21	2	Cara Nichole Shangin	Charles W Treinen
Early Bird Drawing #2	4/28	2	Nicholas P Rotherman / Patricia L Whitaker	Peter J Oswald / Lisa Stratford
Early Bird Drawing #3	5/5	2	Louann Backford	Brian Hickey
Early Bird Drawing #4	5/12	2	Penellope Rose Ward'neas	Tracy Ann Prince
Grand Prize Drawing	5/19	2	Eleanor Signey	Rhonda Yvonne Davis

Email Notifications

Email notifications (“email blasts”) were sent to eligible members with an email address on file to remind members to vote. Members who voted were excluded from subsequent email notifications. Email notifications were sent out each Wednesday of the election starting on 4/19 and ending on 5/17.

Date	Count of Email Addresses on File
4/19	77,899
4/26	75,245
5/3	70,817
5/10	68,457
5/17	66,488

Voting Metrics

Below is a summary of election activity for the current year and the previous four years.

Metrics	Year				
	2023	2022	2021	2020	2019
Eligible Members	90,210	90,716	86,734	67,018	69,320
Total Ballots Cast	14,157	10,681	10,462	8,262	6,752
Valid	14,156	10,677	10,453	8,249	6,749
Invalid	1	4	9	13	3
Total Mail Ballots Received	268	199	226	205	170
Valid Mail	267	195	217	192	167
Invalid Mail	1	4	9	13	3
Total Valid Online Ballots Received	13,867	10,396	10,236	8,057	6,508
Paper Ballots Sent After Initial Mailout	62	48	104	48	58
Member Requested	62	44	95	35	55
Not Signed	1	0	3	2	1
Invalid Signature	0	3	2	9	2
No Application on File	0	0	2	2	0
Other	89	1	2	0	0
Resent Email Notifications (manual and bulk upload)	N/A	640	1,129	487	420
Remaining Email Bounces	2,229	2,272	2,066	374	N/A
Total Email Changes	126	575	1,002	791	538
Online Ballots Received After Mail-In Deadline	556	1,096	1,277	697	135
Member Support Activity	928	292	462	334	501
BDO Hotline Calls	664	283	397	244	475
BDO Inbox Email	264	9	65	90	26
Replacements/Corrections Made by Committee	3	0	0	0	4
Cut/Torn Ballot	1	0	0	0	2
Mismarked	0	0	0	0	2
Manual envelope	1	0	0	0	0
Signature verification	1	0	0	0	0
Annual Meeting - Members Registered	264	284	208	140	244
Annual Meeting - In-Person Paper Ballots Issued	22	86	N/A	N/A	77
Annual Meeting - In-Person Paper Ballots Cast	22	86	N/A	N/A	74
Annual Meeting - In-Person Online Ballot Cast	43	13	N/A	N/A	N/A
Percentage of eligible members that voted	15.69%	11.77%	11.43%	11.87%	9.74%
Percentage of eligible members with valid ballot	15.69%	11.77%	11.42%	11.85%	9.74%
% of valid ballots submitted via Internet	97.96%	97.37%	97.92%	97.67%	96.43%
% of valid ballots submitted via paper	1.89%	1.83%	2.08%	2.33%	2.47%
% of valid ballots submitted in person (paper)	0.16%	0.81%	0%	0%	1.10%

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Chugach Renewable Generation

Q2 Update of Renewable Energy Plan Activities

Chugach Operations Committee Meeting
July 12, 2023

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Presentation Take-Away Messages

1. Two big renewable projects will end study phase in September; if feasible, PPA negotiations in Q4
2. Regulating variable sources is critical
3. Community solar economic evaluation in September
4. Many other projects and policies are in development

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Renewable Energy Plan Progression

2020 Goal:

Add 100,000 MWh of renewable generation by March 31, 2025

2021 Renewable Energy Plan

The focus of this update

2023-2027 Strategic Plan Priority 6: Decarbonization

Reduction Goal: at least 35% by 2030
at least 50% by 2040
Using 2012 as baseline, and if no material impact to member rates

Renewable Energy Plan Focus Areas

1. Issue RFP: Issue a Request for Proposal (RFP) for the purchase of renewable energy generation

2. Develop Known Renewable Projects: Continue to pursue potential renewable energy projects

3. Create Policy Changes: Pursue regulation and legislative changes that remove regulatory barriers to the deployment of renewable generation

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1. Issue RFP: Issue a Request for Proposal (RFP) for the purchase of renewable energy generation

Focus Area 1

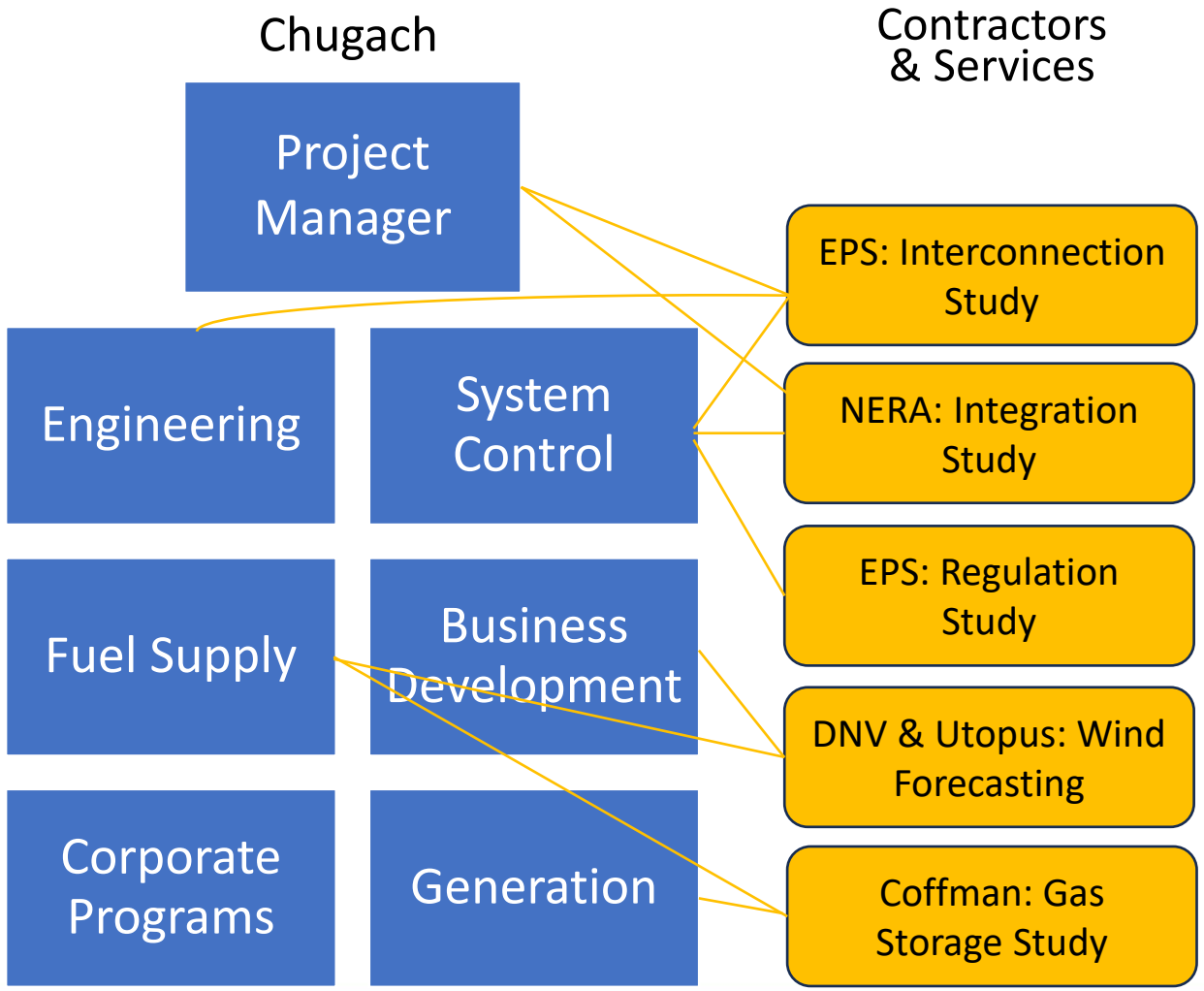
- Issue Request for Proposals
- Goal: Identify renewable projects that can meet or beat Chugach avoided cost. We requested best price, even if higher than avoided cost.

Value and Importance of Multi-Disciplinary Teams

RFP Evaluation Team

- Project Manager
- Transmission Engineering
- Distribution Engineering
- Business Development
- Generation

Studies Team



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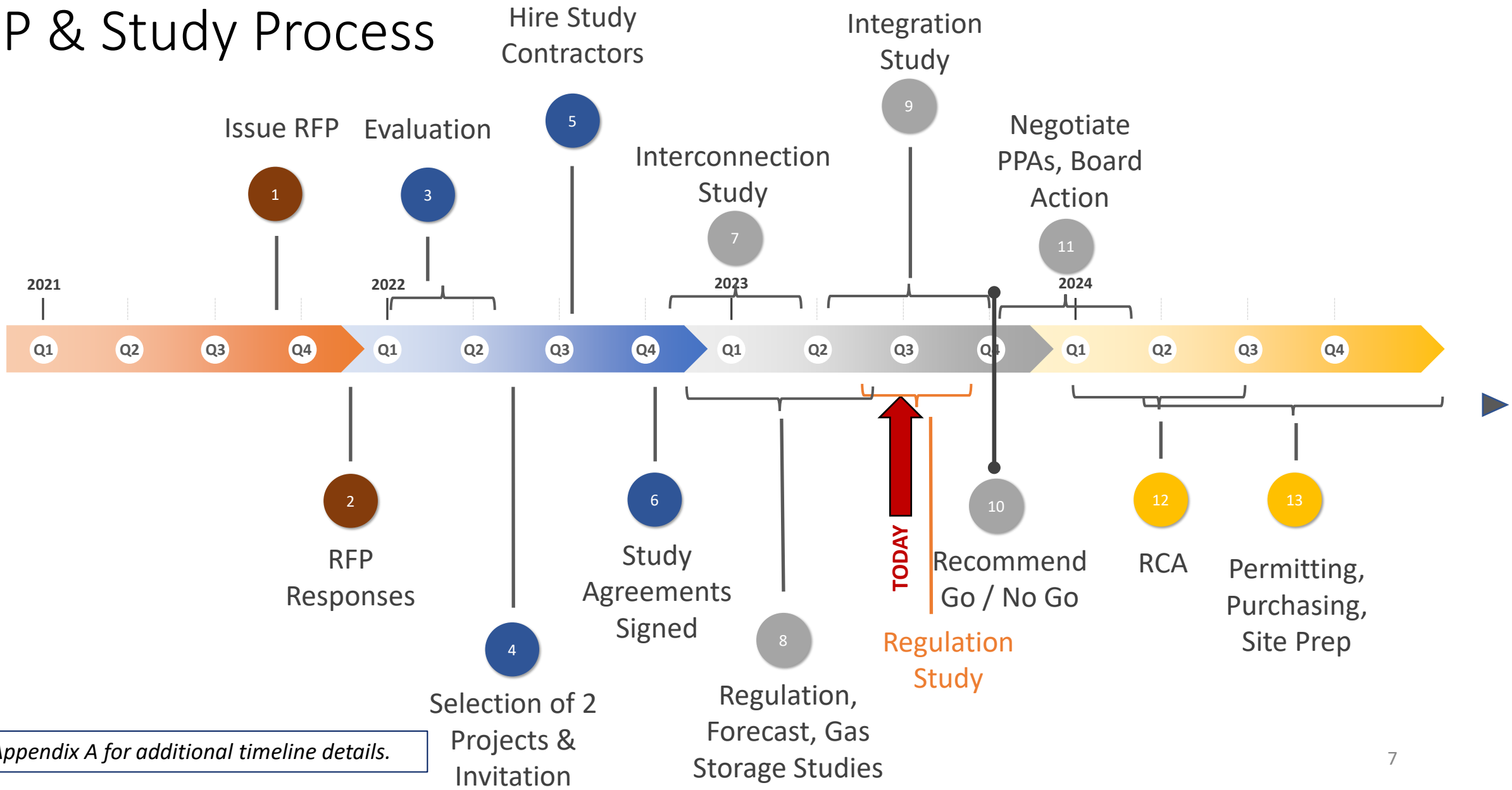
Focus Area 1: RFP for Renewable Energy

RFP & Study Process

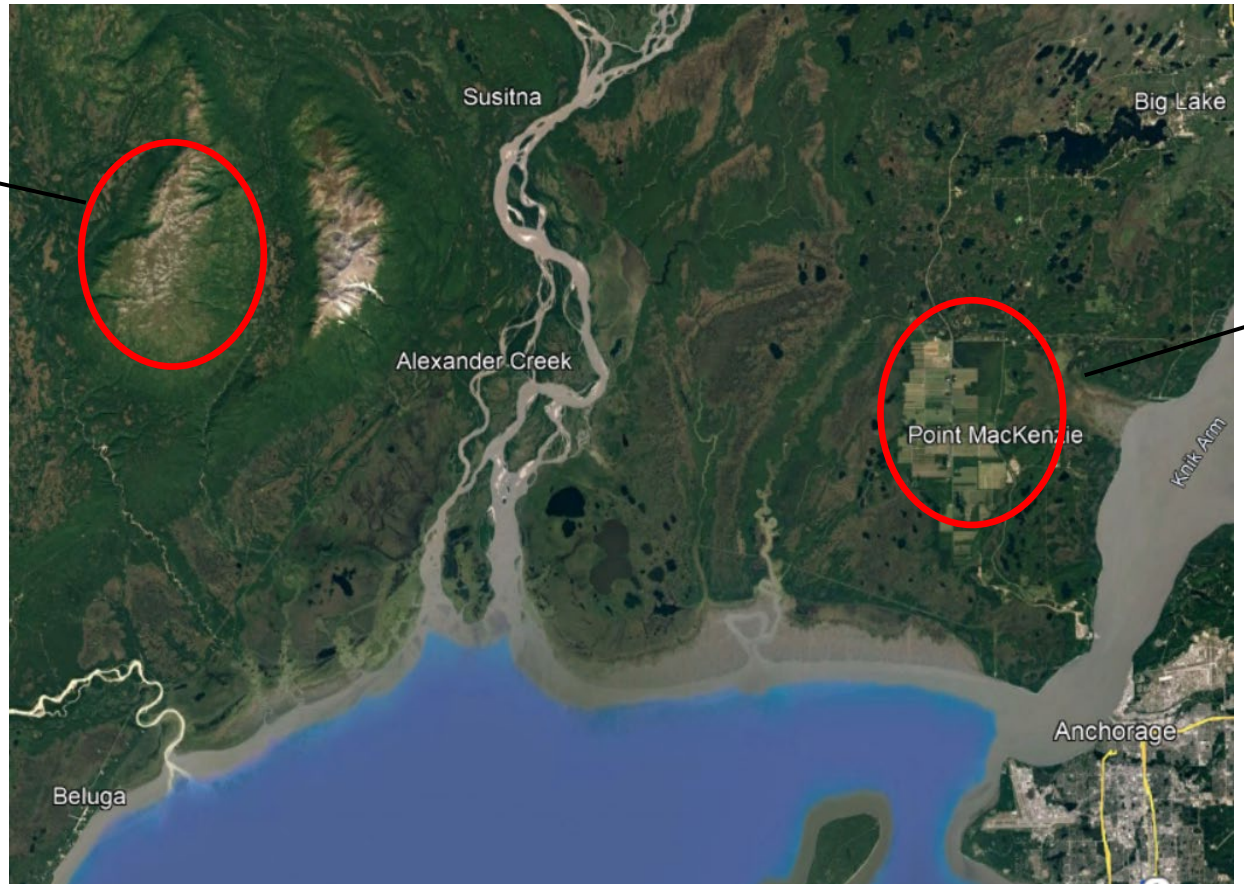


See Appendix A for additional timeline details.

Focus Area 1: RFP for Renewable Energy

A dozen proposals received for a wide variety of technologies.
Two proposals under detailed interconnection and integration studies:

Alaska Renewables
Little Mount Susitna Wind
122 MW
West of Mt. Susitna



Ranger Power
Midnight Solar
120 MW
Near Point MacKenzie

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Progress This Quarter: Studies Performed

- ✓ Interconnection Studies (technical feasibility)
  - ✓ LMS Wind Interconnection: **Completed**
    - ✓ Steady-state and dynamic stability assessed at 122 MW
    - ✓ Two transmission lines needed to avoid largest contingency
    - ✓ Ring bus at LMS substation needed
    - ✓ Beluga to Pt MacKenzie line has sufficient capacity
    - ✓ Transfer limits of south and north intertie are impacted
  - ✓ Midnight Solar Interconnection: **Completed**
    - ✓ Similar detail to LMS
  - Wind + Solar Interconnection: **Expected mid-July**
- ✓ Meteorological Stations
  - ✓ Lidar installed at LMS in June (Tower in Oct. '22)
  - ✓ Solar met station installed in June
- ✓ Natural Gas On-Site Storage FEED Study **Completed**
  - ✓ CNG is selected technology
  - ✓ Gas storage at Sullivan or SPP possible
  - ✓ Capacities studied: Enough to run 50 MW or 100 MW turbines; Storage volume for 6 to 24 hours
- Regulation Study
  - Work in progress, Complete by Aug. 31
- Wind Forecasting
  - ✓ Three forecast services established
  - Ongoing testing
- Integration Study (economic feasibility)
  - ✓ Base model prepared
  - ✓ Initial regulation process provided June 26
  - Scenario modeling by Sep. 29

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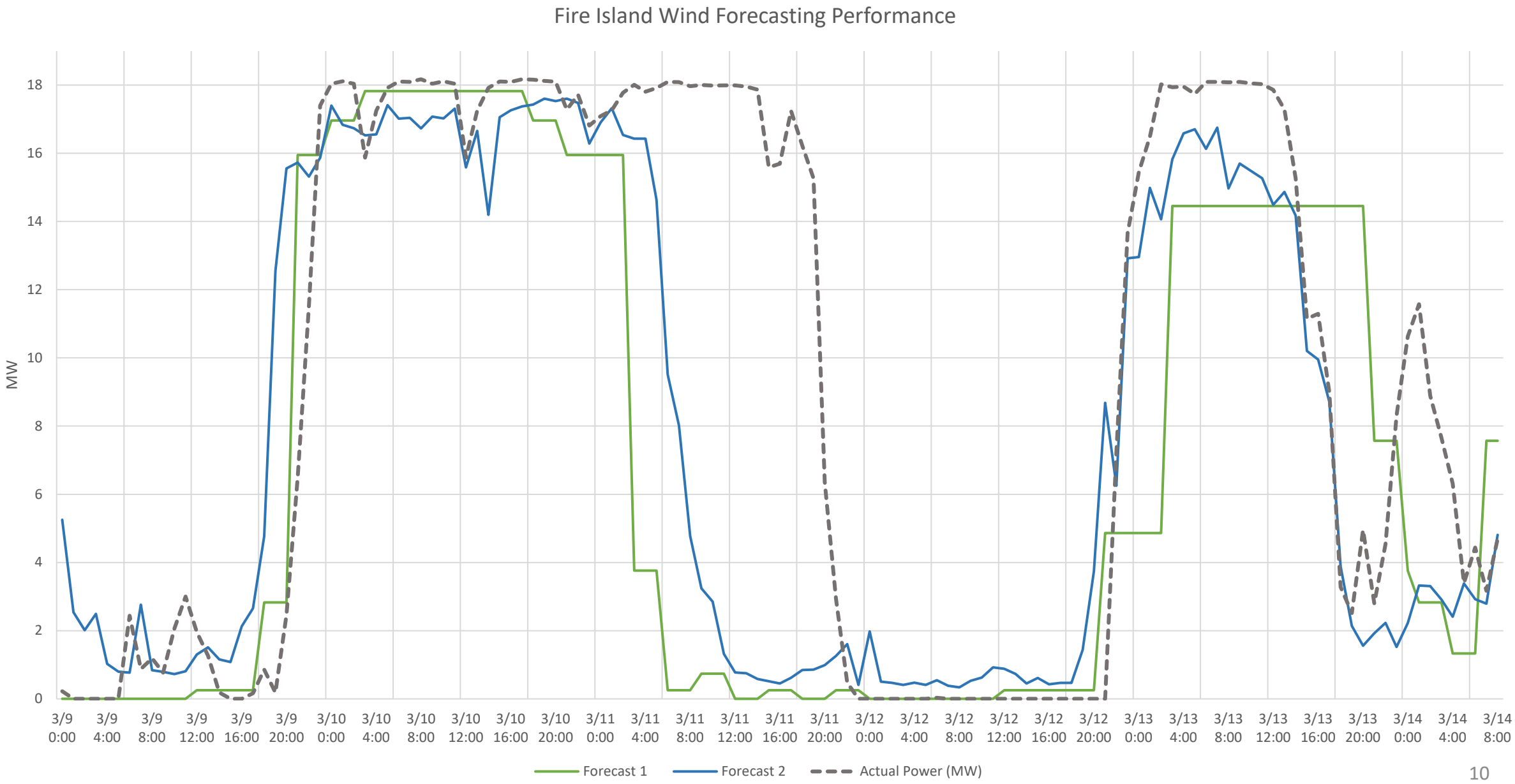
Regulation of Intermittent Resources is Critical - Wind Forecasting Example



Focus Area 1: RFP Next Steps for Renewable Energy

Next Steps

- Complete interconnection studies - July 14, 2023
- Finalize regulation study and ramp rate requirements - August 31, 2023
- Integration studies - September 2023

- If feasible and cost-effective, negotiate power purchase agreements – October - December 2023
- Board action on PPA - January 2024
- Submit agreements to Regulatory Commission of Alaska - February 2024
- Permitting, purchasing, site preparation, construction - 2024 to 2025
- Project commissioning and operation - 2025 to 2026

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2. Develop Known Renewable Projects: Continue to pursue potential renewable energy projects

Focus Area 2

- Develop Known Renewable Projects

Focus Area 2:

DEVELOP KNOWN RENEWABLE PROJECTS

COMPLETED

- Two AWWU PRV to hydro, 28 kW and 45 kW
- Heat Pump Program Initiated Feb. 1, 2023

ACTIVE EVALUATION

- Community solar
- Solar on building C
- Two hydro projects
- CNG storage
- Railbelt wind studies
- Two tidal projects
- MOA waste to energy

CONCEPTS

- PRV to hydro #3
- Community Heat Pump
- Refurbish wind
- H2 or solar at Beluga
- Solar at SPP
- Landfill methane
- Pt. Mac Sub solar
- Others under NDA

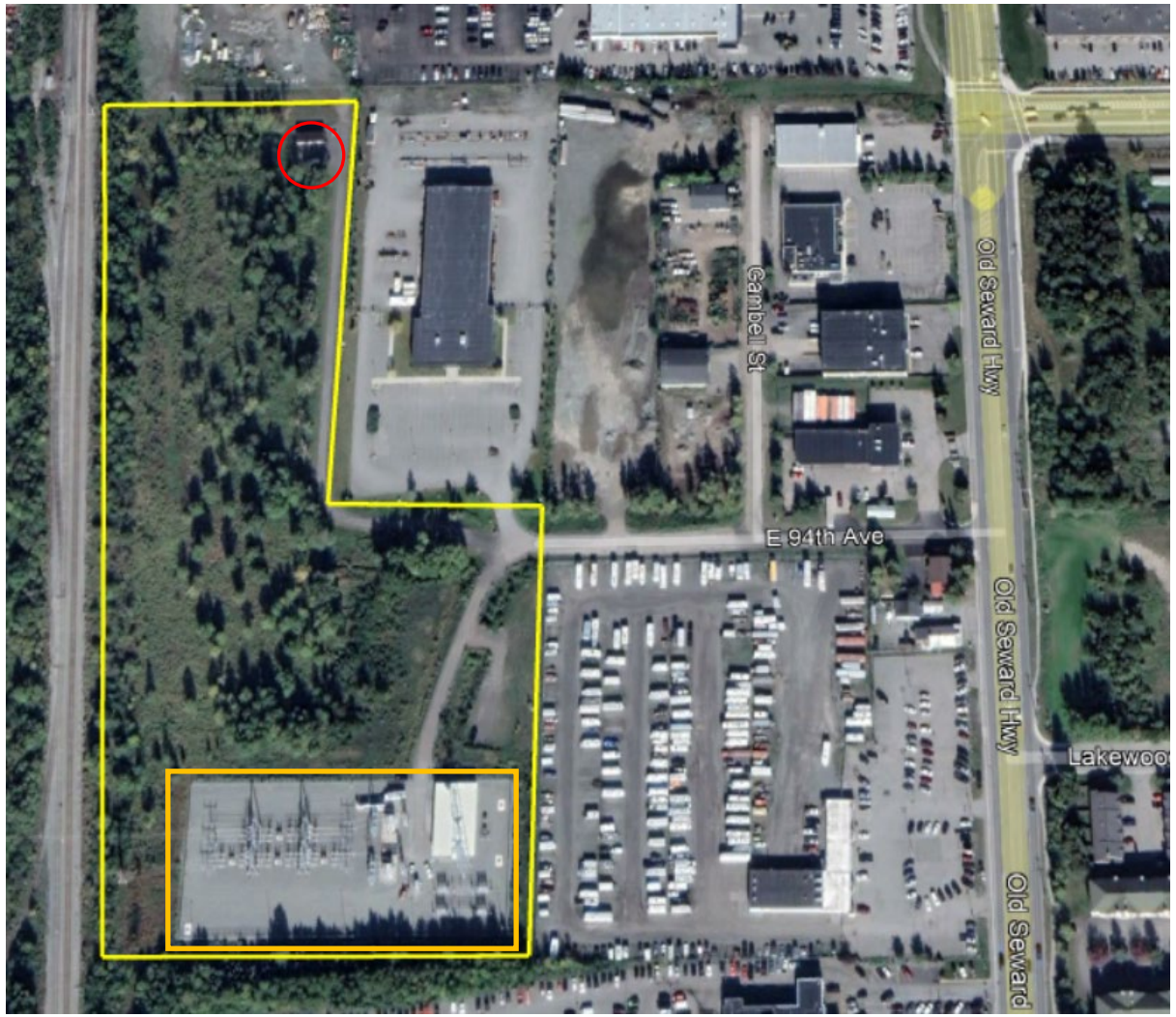
STOPPED

- Five+ solar projects at distribution system scale

See Appendix B for additional detail.

Focus Area 2: Community Solar Location

- Chugach owned Retherford Substation Property
- 800 E 94th near Old Seward Hwy
- 13.6 acres total
- 500 kW solar
- Little shading
- Interconnect to substation (35kV) or feeder on Old Seward (15kV)



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Focus Area 2: Community Solar Update

Coffman Engineering contracted for Front End Engineering and Design

- ✓ Conceptual array design
- ✓ Site design and permitting
  - Geotechnical engineering (Shannon & Wilson)
  - Site survey (Farpoint Land Services)
  - Permitting (Solstice Alaska Consulting)
- Electrical Interconnection Design (7/14)
- Economic Analysis (7/21)
  - Chugach Evaluation of Results
- RFP development for PV Installation (8/11)

Economic evaluation to be completed in September.

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3. Create Policy Changes: Pursue regulation and legislative changes that remove regulatory barriers to the deployment of renewable generation

Focus Area 3

- Create Policy Changes

Focus Area 3: Address from Policy Perspective

Policy Initiatives

- Chugach and Railbelt utilities are working on recommendations for legislation for renewables and clean energy.

- Chugach is prepared to work with a legislative committee or participate in hearings ahead of the 2024 legislative session.

- Chugach is researching legislative bills and industry best practices involving net metering and community solar.

Presentation Take-Away Messages

1. Two big renewable projects will end study phase in September; if feasible, PPA negotiations in Q4
2. Regulating variable sources is critical
3. Community solar economic evaluation in September
4. Many other projects and policies are in development

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Questions?

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Appendix A

RFP and Study Process Details

RFP Key Process Steps

1	RFP written, issued, distributed widely	Sep. 2021
	Pre-proposal videoconference	Nov. 2021
2	Proposal deadline	Dec. 17, 2021
3	Form review team:	Dec. 2021
	Chugach economic & technical 4-stage review	Jan. 2 to Feb. 22, 2022
	Economic screening and notification of proposers	Feb. 22, 2022
	Technical scoring and additional questions for leading proposers	Mar. to Apr. 12, 2022
4	Decision and notification	Mar. 25, 2022
5	Develop interconnection study scope, schedule, budget	Apr. 2022
	Develop integration study scope, schedule, budget	Apr. 2022
	Invitation to enter study agreement, delivery of study agreement	May 18, 2022
6	Acceptance of study agreement & pre-payment	Sep. 16, 2022 & Nov. 7, 2022
	Study kick-off meetings	Oct. 2022 & Nov. 2022
7&8	Data gathering, model inputs, site control	Oct. 2022 to May 2023

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Interconnection Study Timeline Examples

- Proposer providing data, modeling, one-line development, PSS/E model development - Oct. 2022 to May 2023
- Scoping & methodology decisions - Oct. 2022
- Railbelt PSS/E model updating - Oct. 2022
- Base case transfer limits, contingency review - Nov. 2022
- Initial modeling new facilities, begin dynamic modeling - Dec. 2022
- Beluga transfer limit - Jan. 2023
- PSCAD modeling, EMT modeling - Feb. 2023
- Modeling and modeling reviews - Apr. 2023
- Multiple interconnection configurations, report writing - May 2023
- Reporting, Chugach review, finalization - Jun. 2023

PSS/E: Power System Simulator for Engineering
PSCAD: Power Systems Computer Aided Design
EMT: Electromagnetic Transient Modeling

Appendix B

Focus Area 2 Project Updates

Focus Area 2: Projects Completed

Project	Capacity & Type	Status
AWWU Energy Recovery 1	45 kW Hydro	Completed, operational
AWWU Energy Recovery 2	28 kW Hydro	Completed, operational
Heat Pump Program **	N/A Geo/Air	Feasibility study completed; Heat Pump Incentive Program designed in 2022, implemented 2023.

** Chugach-led initiative * Chugach-involved initiative Others are third-party initiatives

Focus Area 2: Projects Under Active Evaluation 1

Project	Capacity & Type	Status
Community Solar **	500 kW Solar	Chugach hired Coffman Engineers to conduct FEED study to examine the feasibility of locating community solar at Retherford substation near 94th and Old Seward.
Solar on Building C Expansion **	170 kW Solar	Preliminary design complete, out to bid.
Dixon Diversion *	~40% more hydro energy from Bradley	Chugach awarded $1M grant from Alaska Renewable Energy Fund on behalf of BPMC; economic feasibility currently under study.
Utility scale hydro **	Hydro	Chugach installed stream gauging to measure water flows. Applied for Renewable Energy Fund Round 15: recommended but not funded.
Natural Gas Storage for regulating renewables **	50-100 MW Storage (for 6-24 hours)	FEED study conducted. Results being considered in economic evaluation of alternatives.
Railbelt wind study *	N/A	Coordinated Railbelt utility study of best possible wind locations and meterological tower installation

Excludes projects from RFP process

** Chugach-led initiative * Chugach-involved initiative Others are third-party initiatives

Focus Area 2: Projects Under Active Evaluation 2

Project	Capacity & Type	Status
Turnagain Arm Tidal	1 MW Tidal	Chugach is supporting all tidal energy development in Cook Inlet and will sign a letter of support for the Turnagain Arm Tidal Electricity Generation project's DOE funding application.
Hilcorp Tidal	TBD Tidal	Hilcorp, Chugach and ACEP examining options; Hilcorp expected to make idle platforms available
Anchorage Waste to Energy Project	20-30 MW Biomass	After project dormancy, a project proponent is actively promoting the project again, met with Chugach in June 2023.

Excludes projects from RFP process

** Chugach-led initiative * Chugach-involved initiative Others are third-party initiatives

Focus Area 2: Concepts Under Consideration

Project	Capacity & Type	Status
AWWU Energy Recovery 3	250 kW Hydro	AWWU awaiting results of prior projects
Seward Ground Source Heat Pump	N/A Geothermal	City seeking other funding sources
AVTEC Wind	100 kW Wind	Recommissioning and commercial arrangement needed
Hydrogen or Solar at Beluga **	TBD	Examined the potential to install solar to replace Unit 7, and the possibility of using unscheduled renewables to produce hydrogen to burn at Beluga
Solar on SPP **	100 kW Solar	Chugach hiring decarbonization contractors then implementing this project in order of priority/availability
Landfill Excess Methane *	Unknown	New concept to consider
Point MacKenzie Substation Solar	5 MW	Adjacent landowner pursuing options to develop solar and interconnect at transmission substation. Very expensive due to high voltage interconnection.
Other options under NDA	>100 MW	

** Chugach-led initiative * Chugach-involved initiative Others are third-party initiatives

Focus Area 2: Projects Stopped or Paused

Project	Capacity & Type	Status
Renewable IPP	6 MW Solar	Multiple locations investigated for distribution-connected solar. IPP ended projects due to poor project economics from high land values and/or citing permitting challenges.
JBER Solar	4.5 MW Solar	JBER paused the project in 2021
3rd Avenue Solar	50 kW Solar	No known activity by organizer
Solar/EV Charging Demo	20 kW Solar	Third-party decided not to pursue the project
Commercial/Industrial Solar	200 kW Solar (est.)	Third-party found the land unsuitable for solar

** Chugach-led initiative * Chugach-involved initiative Others are third-party initiatives

Eklutna Fish & Wildlife Program
Chugach Operations Committee Meeting

July 12, 2023

McMillen

Agenda

- Study Results
- Alternatives Analysis
- Next Steps

Study Results

Phase 1 Engineering

1. Instream Flow Measures
2. Upstream Fish Passage Measures
3. Downstream Fish Passage Measures
4. Peak Flow Measures
5. Instream Flow Improvements
6. Physical Habitat Improvements
7. Infrastructural Improvements
8. Replacement Dam

- Dam Release Modifications
- Siphon Bypass
- AWWU Portal Valve Release
- AWWU Pipeline Release
- Bypass Tunnel Release

- Gravity Flow Fish Ladder
- Variable Exit Fish Ladder
- Pumped Supply and Slide Fish Ladder
- Trap and Haul

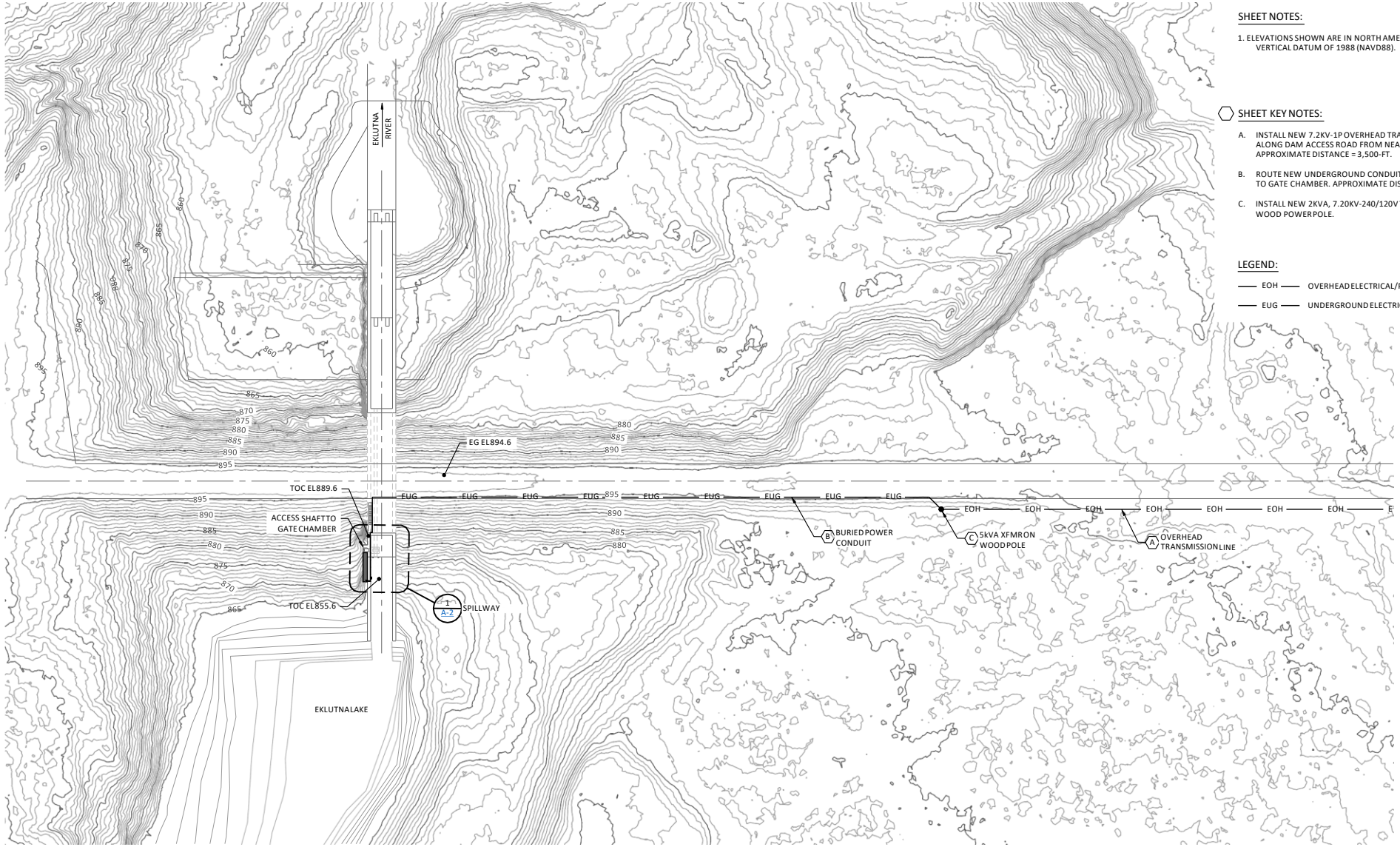
- Dam Spill
- Floating Surface Collector

- Uncontrolled Spill
- Tainter Gate Spill
- Fixed Wheel Gate Spill

Phase 1 Engineering

1. Instream Flow Measures
2. Upstream Fish Passage Measures
3. Downstream Fish Passage Measures
4. Peak Flow Measures
5. Instream Flow Improvements
6. Physical Habitat Improvements
7. Infrastructural Improvements
8. Replacement Dam

- Lach Q'Atnu Re-Route
- Dam Outlet Excavation
- Physical Habitat Manipulation
- AWWU Maintenance Bridges
- Lakeside Trail Improvements



SITE PLAN
SCALE: 1"= 40'

0' 40' 80'

SHEET NOTES:

1. ELEVATIONS SHOWN ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

SHEET KEY NOTES:

A. INSTALL NEW 7.2KV-1P OVERHEAD TRANSMISSION LINE ALONG DAM ACCESS ROAD FROM NEAREST POI. APPROXIMATE DISTANCE = 3,500-FT.

B. ROUTE NEW UNDERGROUND CONDUIT FROM POWER POLE TO GATE CHAMBER. APPROXIMATE DISTANCE = 600-FT.

C. INSTALL NEW 2KVA, 7.20KV-240/120V TRANSFORMER ON WOOD POWER POLE.

LEGEND:

EOH — OVERHEAD ELECTRICAL/POWER

EUG — UNDERGROUND ELECTRICAL

REV				WARNING	McMILLEN JACOBS ASSOCIATES	CHUGACH POWERING ALASKA'S FUTURE	EKLUTNA FISH & WILDLIFE PROJECT ENGINEERING FEASIBILITY STUDY PME ALTERNATIVES ANALYSIS - INSTREAM FLOW DAM RELEASE MODIFICATIONS SITE PLAN	DESIGNED S.ELLENSON DRAWN R.GUERRERO CHECKED J.BOAG PROJECTDATE 12/23/22	DRAWING A-1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

JOB NO 1000000

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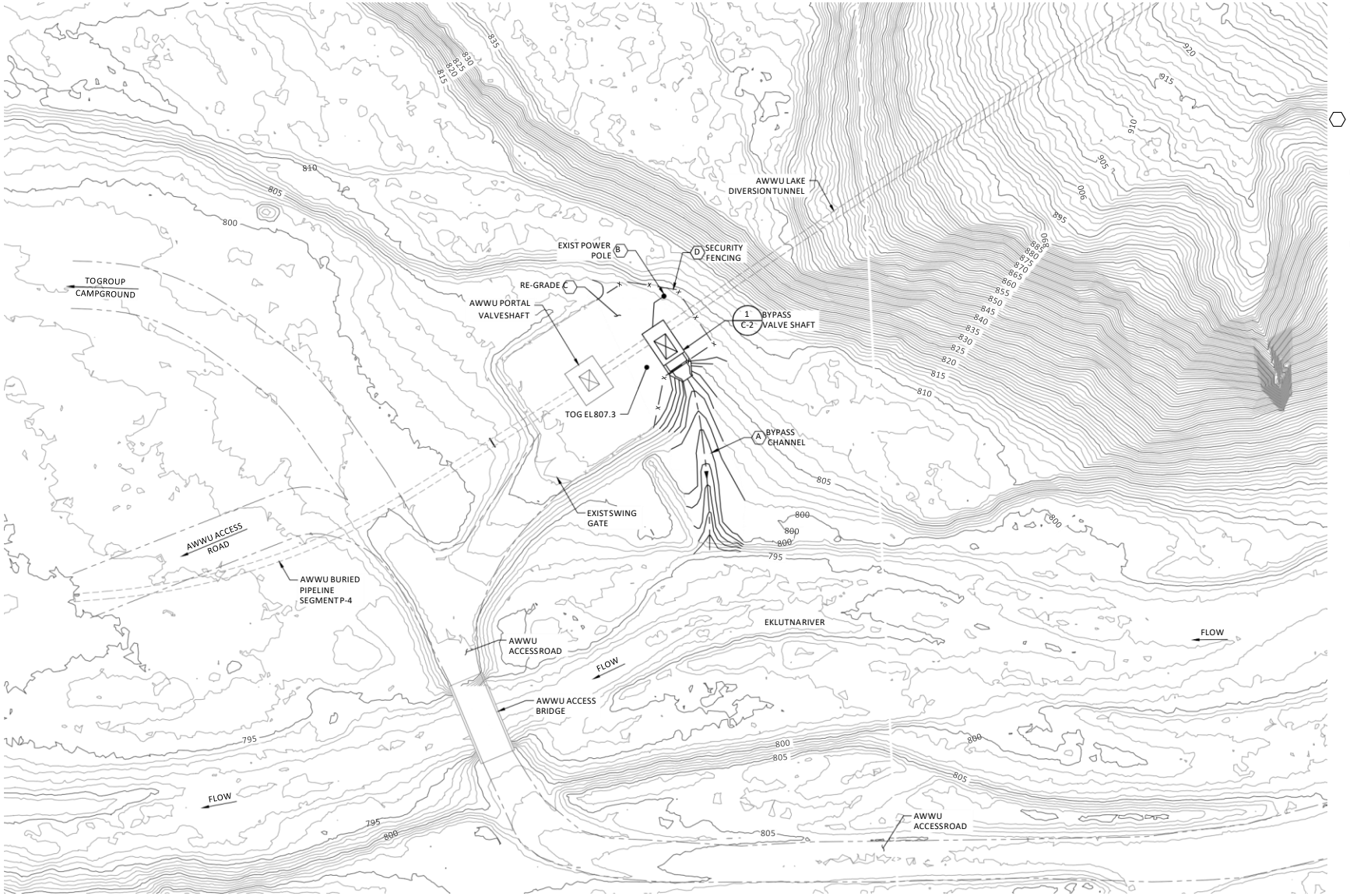

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SCALE: 1"= 30'

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SHEET NOTES:

1. ELEVATIONS SHOWN ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

SHEET KEY NOTES:

A EXCAVATE NEW TRAPEZOIDAL BYPASS CHANNEL FROM BYPASS VALVE WET WELL TO EKLUTNARIVER.

B TAP NEW 240V-3P FEEDER OFF EXISTING 7.2 KV TRANSMISSION LINE.

C FOLLOWING EXCAVATION FOR BYPASS VALVE SHAFT, RE-GRADE PAD TO ELEVATION 807.3 FT IN VICINITY OF BYPASS VALVESTRUCTURE.

D EXTEND SECURITY FENCING AROUND PERIMETER OF NEWSTRUCTURE.

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REV

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

McMILLEN JACOBS ASSOCIATES

CHUGACH POWERING ALASKA'S FUTURE

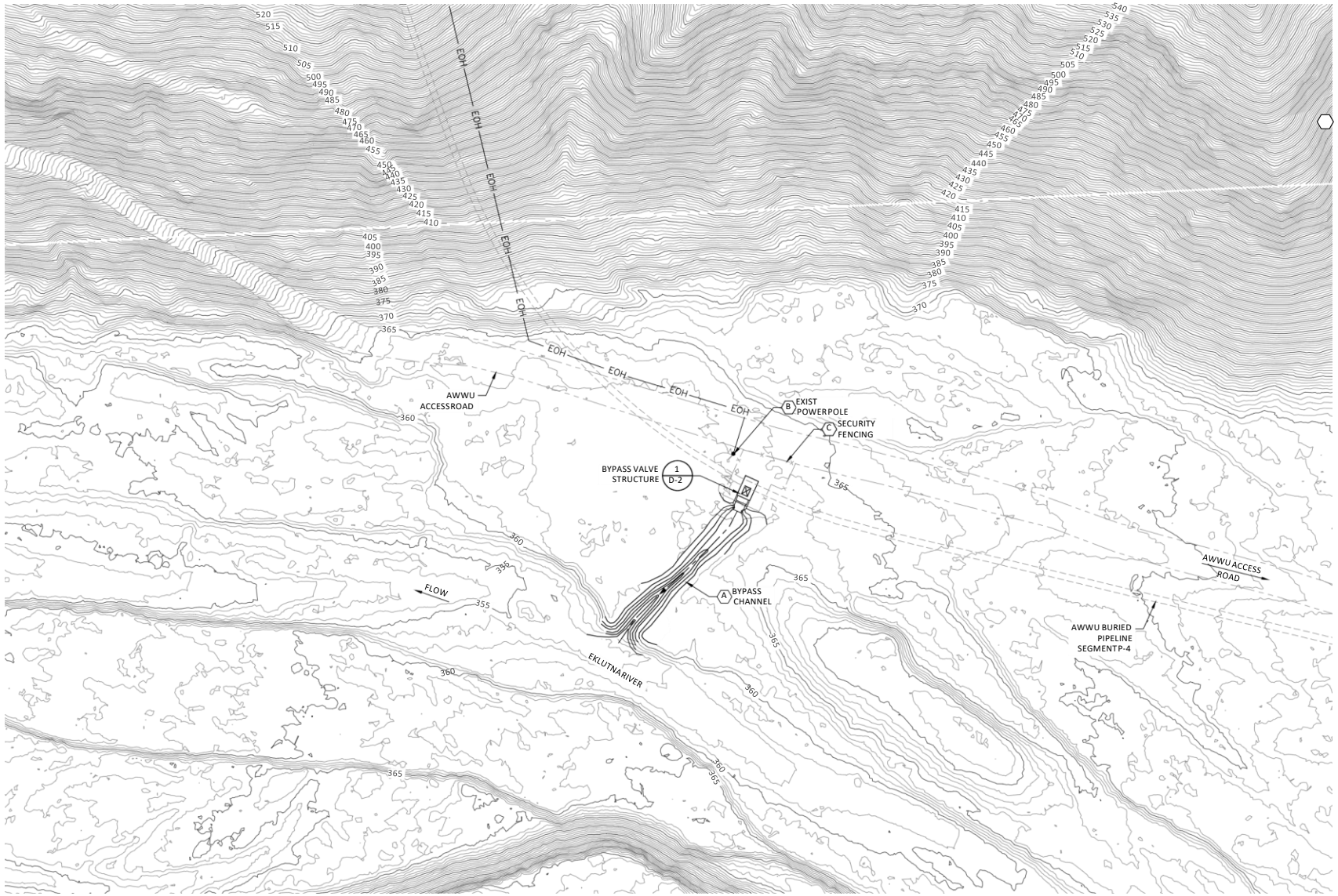
EKLUTNA FISH & WILDLIFE PROJECT
ENGINEERING FEASIBILITY STUDY

PME ALTERNATIVES ANALYSIS - INSTREAM FLOW
AWWU PORTAL VALVE RELEASE
SITE PLAN

DESIGNED S.ELLENSON
DRAWN R.GUERRERO
CHECKED J.BOAG
PROJECTDATE 12/23/22

DRAWING
C-1

JOB NO 000000



SITE PLAN
SCALE: 1"= 40'

0' 40' 80'

N

SHEET NOTES:

1. ELEVATIONS SHOWN ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

SHEET KEY NOTES:

A EXCAVATE NEW TRAPEZOIDAL BYPASS CHANNEL FROM BYPASS VALVE WET WELL TO EKLUTNA RIVER.

B. INSTALL NEW 7.2KV-3P OVERHEAD TRANSMISSION LINE ALONG AWWU ACCESS ROAD FROM NEAREST POI. APPROXIMATE DISTANCE = 2,000-FT.

C. CONSTRUCT SECURITY FENCING AROUND PERIMETER OF NEW STRUCTURE.

REV				WARNING		EKLUTNA FISH & WILDLIFE PROJECT	DESIGNED S.ELLENSON	DRAWING
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				IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	McMILLEN JACOBS ASSOCIATES	PME ALTERNATIVES ANALYSIS - INSTREAM FLOW AWWU PIPELINE RELEASE SITE PLAN	CHECKED J.BOAG PROJECTDATE 12/23/22	

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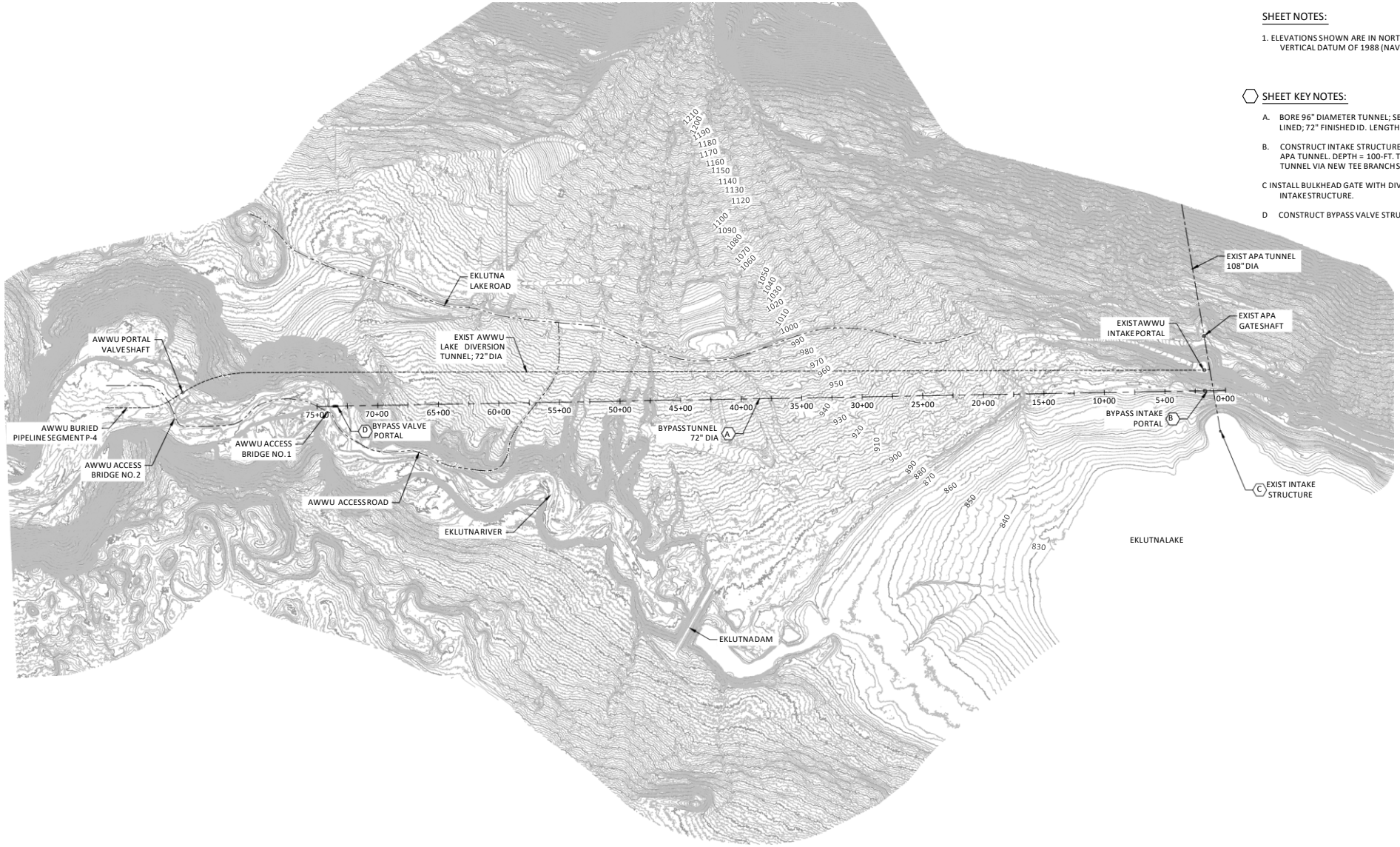

SITE PLAN

SCALE: 1"= 400'

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SHEET NOTES:

1. ELEVATIONS SHOWN ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

SHEET KEY NOTES:

A. BORE 96" DIAMETER TUNNEL; SEGMENTALLY CONCRETE LINED; 72" FINISHED ID. LENGTH = 7,200-FT.

B. CONSTRUCT INTAKE STRUCTURE ADJACENT TO EXISTING APA TUNNEL. DEPTH = 100-FT. TAP INTO EXISTING TUNNEL VIA NEW TEE BRANCH SEGMENT.

C INSTALL BULKHEAD GATE WITH DIVERS IN EXISTING INTAKE STRUCTURE.

D CONSTRUCT BYPASS VALVE STRUCTURE. DEPTH = 30-FT.

REV

WARNING

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

McMILLEN JACOBS ASSOCIATES

CHUGACH POWERING ALASKA'S FUTURE

EKLUTNA FISH & WILDLIFE PROJECT

ENGINEERING FEASIBILITY STUDY

PME ALTERNATIVES ANALYSIS - INSTREAM FLOW
BYPASS TUNNEL RELEASE
SITE PLAN

DESIGNED S.ELLENSON

DRAWN R.GUERRERO

CHECKED J.BOAG

PROJECT DATE 12/23/22

DRAWING

E-1

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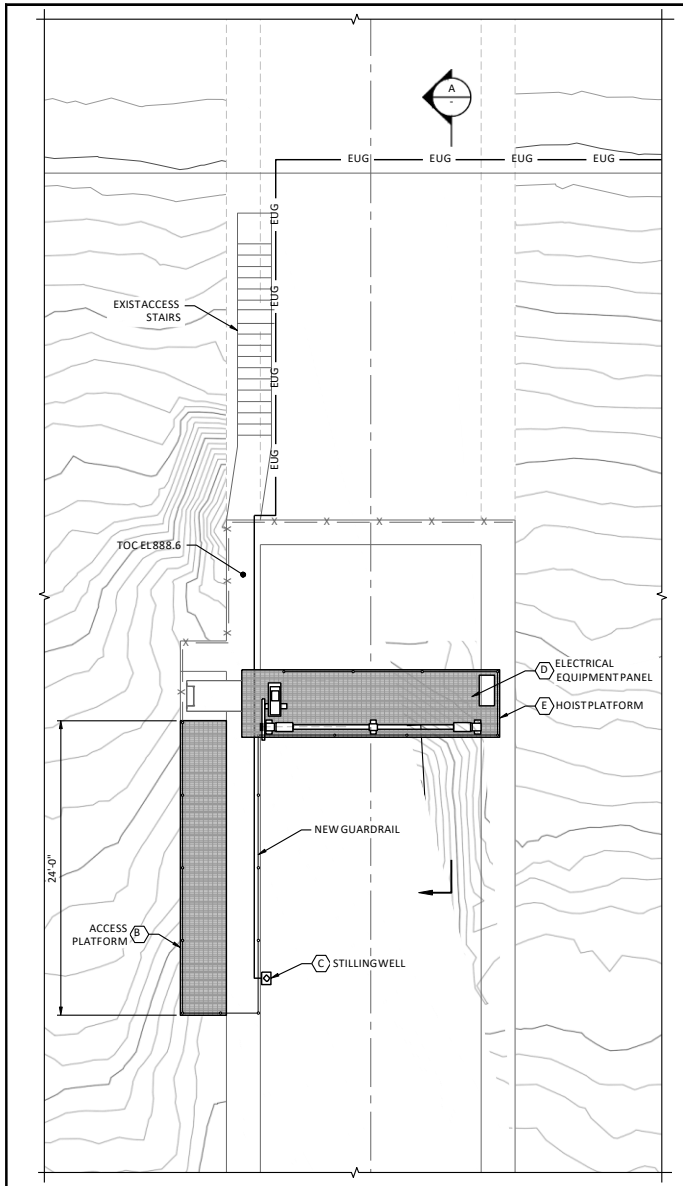

SPILLWAY DETAIL

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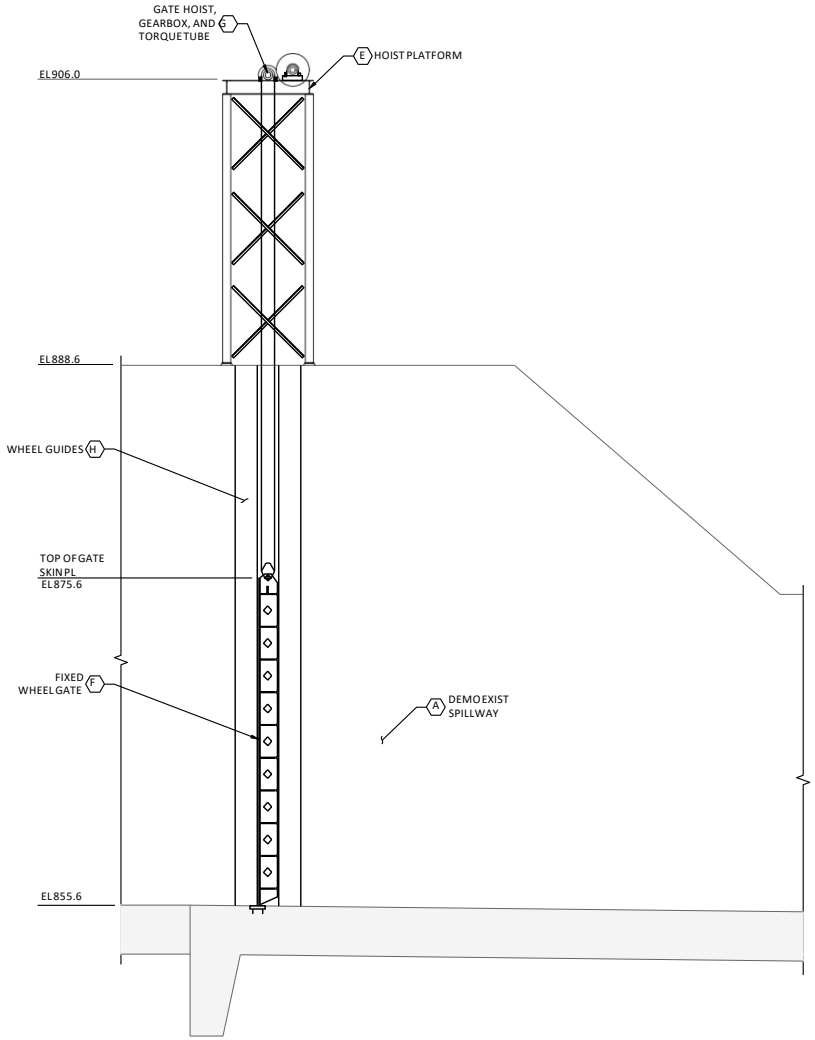
1 / I-1



SECTION

SCALE: 1/4"=1'-0"

A / -

SHEET NOTES:

1. ELEVATIONS SHOWN ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

SHEET KEY NOTES:

A DEMOLISH EXISTING CONCRETE SPILLWAY, GATE CHAMBER, AND OUTLET GATE TO EXISTING SPILLWAY SLAB EL. 855.6.

B. INSTALL O&M ACCESS PLATFORM ON SPILLWAY TRAINING WALL.

C. INSTALL STILLING WELL WITH SUBMERSIBLE PRESSURE TRANSDUCER.

D. INSTALL ELECTRICAL EQUIPMENT AND CONTROLS PANEL.

E INSTALL O&M HOIST PLATFORM ABOVE SPILLWAY.

F INSTALL 16-FT WIDE X 20-FT TALL FIXED WHEEL GATE WITHIN THE EXISTING SPILLWAY STRUCTURE. INSTALL SEALING SURFACE ON LIP OF EXISTING SPILLWAY CREST.

G. INSTALL HOIST, GEAR REDUCER, TORQUE TUBE, AND BEARINGS ON HOIST PLATFORM.

H. MODIFY EXISTING SPILLWAY TRAINING WALLS. INCLUDE NEW WHEEL GUIDE BLOCKOUTS FOR FIXED WHEEL GATE.

REV			
A	12/23/22	SPE	CONCEPTUAL DESIGN

WARNING

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

McMILLEN JACOBS ASSOCIATES

CHUGACH POWERING ALASKA'S FUTURE

EKLUTNA FISH & WILDLIFE PROJECT

ENGINEERING FEASIBILITY STUDY

PME ALTERNATIVES ANALYSIS - PEAK FLOW
SPILLWAY MODIFICATIONS - FIXED WHEEL GATE EL 855.6
SECTIONS AND DETAILS

DESIGNED S. ELLENSON

DRAWN R. GUERRERO

CHECKED J. BOAG

PROJECT DATE 12/23/22

DRAWING

I-2

JOB NO. 000000

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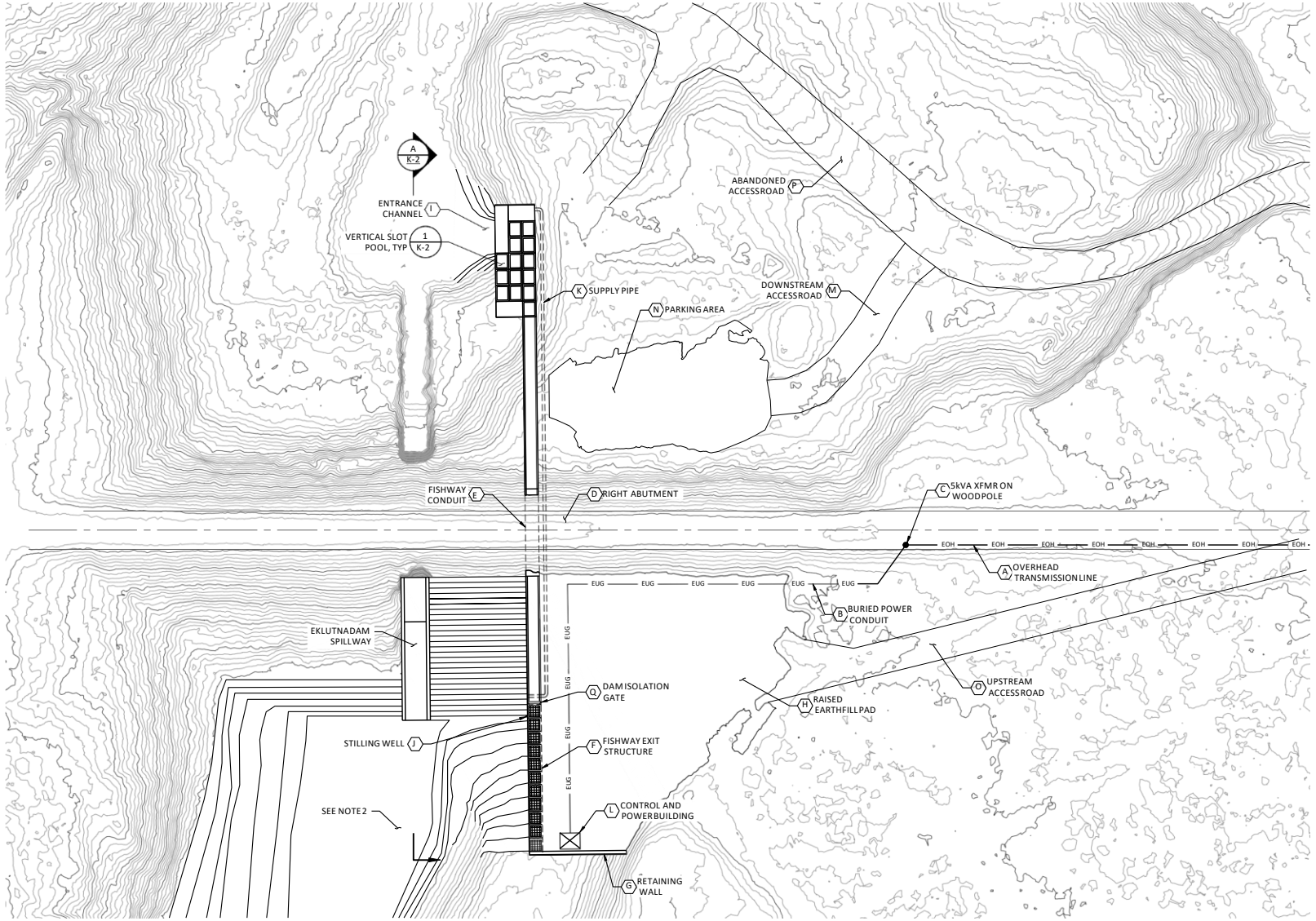

SITE PLAN
SCALE: 1"= 40'

0' 40' 80'

SHEET NOTES:

1. ELEVATIONS SHOWN ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. POND BATHYMETRIC PROFILE IS UNKNOWN, TOPOGRAPHY ESTIMATED BASED ON AS BUILT DRAWINGS OF DAM AND FIELD DATA.

SHEET KEY NOTES:

A INSTALL NEW 7.2KV-3P OVERHEAD TRANSMISSION LINE ALONG DAM ACCESS ROAD FROM NEAREST POI. APPROXIMATE DISTANCE = 3,500-FT.

B ROUTE NEW UNDERGROUND CONDUIT FROM POWER POLE TO CONTROL ENCLOSURE. APPROXIMATE DISTANCE = 500-FT.

C INSTALL NEW 5KVA, 7.20KV-240/120V TRANSFORMER ON WOOD POWER POLE.

D. EXCAVATE RIGHT ABUTMENT OF EXISTING DAM TO ELEVATION 859.0.

E. CONSTRUCT NEW CONCRETE FISHWAY THROUGH DAM SECTION.

D. CONSTRUCT NEW GATED EXIT CHANNEL.

E. CONSTRUCT RETAINING WALL TO ELEVATION 888.6.

F. CONSTRUCT NEW RAISED EARTHFILL PAD TO EL. 888.6 ADJACENT TO NEW FISHWAY.

G. EXCAVATE NEW CHANNEL WITHIN EXISTING PLUNGE POOL TO FISHWAY ENTRANCE POOL.

H. INSTALL NEW STILLING WELL WITH REDUNDANT PRESSURE TRANSDUCERS UPSTREAM OF FISHWAY STRUCTURE..

K INSTALL NEW 24" SUPPLY PIPE TO ENTRANCE POOL. L

CONSTRUCT NEW CONTROL AND POWER BUILDING.

M CONSTRUCT NEW ACCESS ROAD TO DOWNSTREAM TOE OF DAM.

N CONSTRUCT NEW PARKING AND EQUIPMENT PAD AT DOWNSTREAM TOE OF DAM.

O CONSTRUCT NEW ACCESS ROAD TO FISHWAY EXIT STRUCTURE.

P. REGRADE, REPAIR, AND IMPROVE EXISTING ABANDONED ACCESS ROAD DOWNSTREAM OF DAM RIGHT ABUTMENT.

Q. INSTALL DAM ISOLATION BULKHEAD GATE AT DOWNSTREAM EXTENT OF EXIT STRUCTURE.

LEGEND:

EOH — OVERHEAD ELECTRICAL/POWER

EUG — UNDERGROUND ELECTRICAL

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WARNING
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

McMILLEN JACOBS ASSOCIATES

CHUGACH POWERING ALASKA'S FUTURE

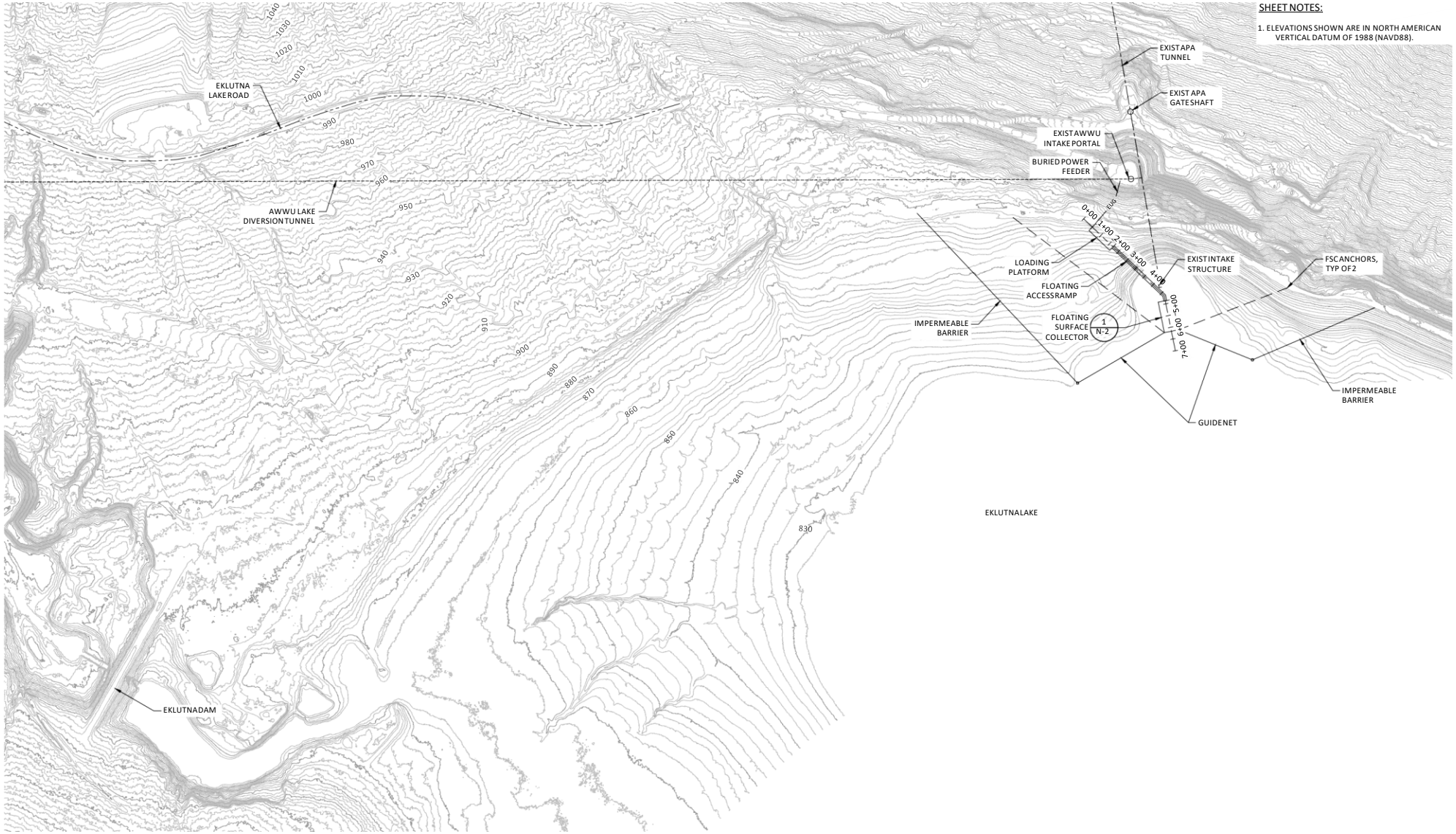
EKLUTNA FISH & WILDLIFE PROJECT
ENGINEERING FEASIBILITY STUDY

PME ALTERNATIVES ANALYSIS - FISH PASSAGE
VARIABLE EXIT FISH LADDER
SITE PLAN

DESIGNED S. ELLENSON
DRAWN R.GUERRERO
CHECKED J.BOAG
PROJECT DATE 12/23/22

DRAWING
K-1

JOB NO 000000



SITE PLAN

SCALE: 1" = 200'

0" 200' 400'

N

REV				WARNING			DRAWING
				0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	McMILLEN JACOBS ASSOCIATES	CHUGACH POWERING ALASKA'S FUTURE	N-1

EKLUTNA FISH & WILDLIFE PROJECT

ENGINEERING FEASIBILITY STUDY

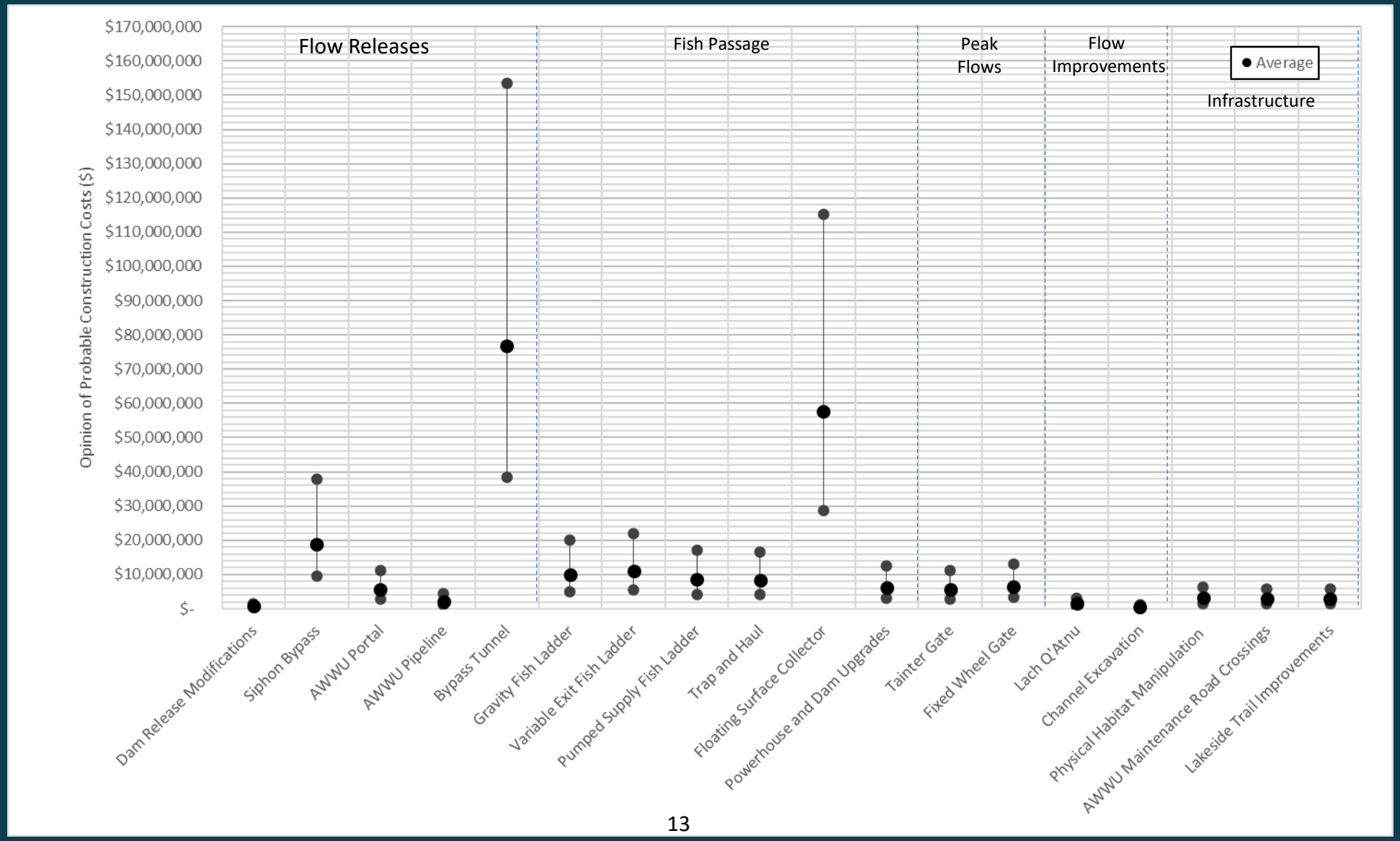
PME ALTERNATIVES ANALYSIS - FISH PASSAGE
FLOATING SURFACE COLLECTOR
SITE PLAN

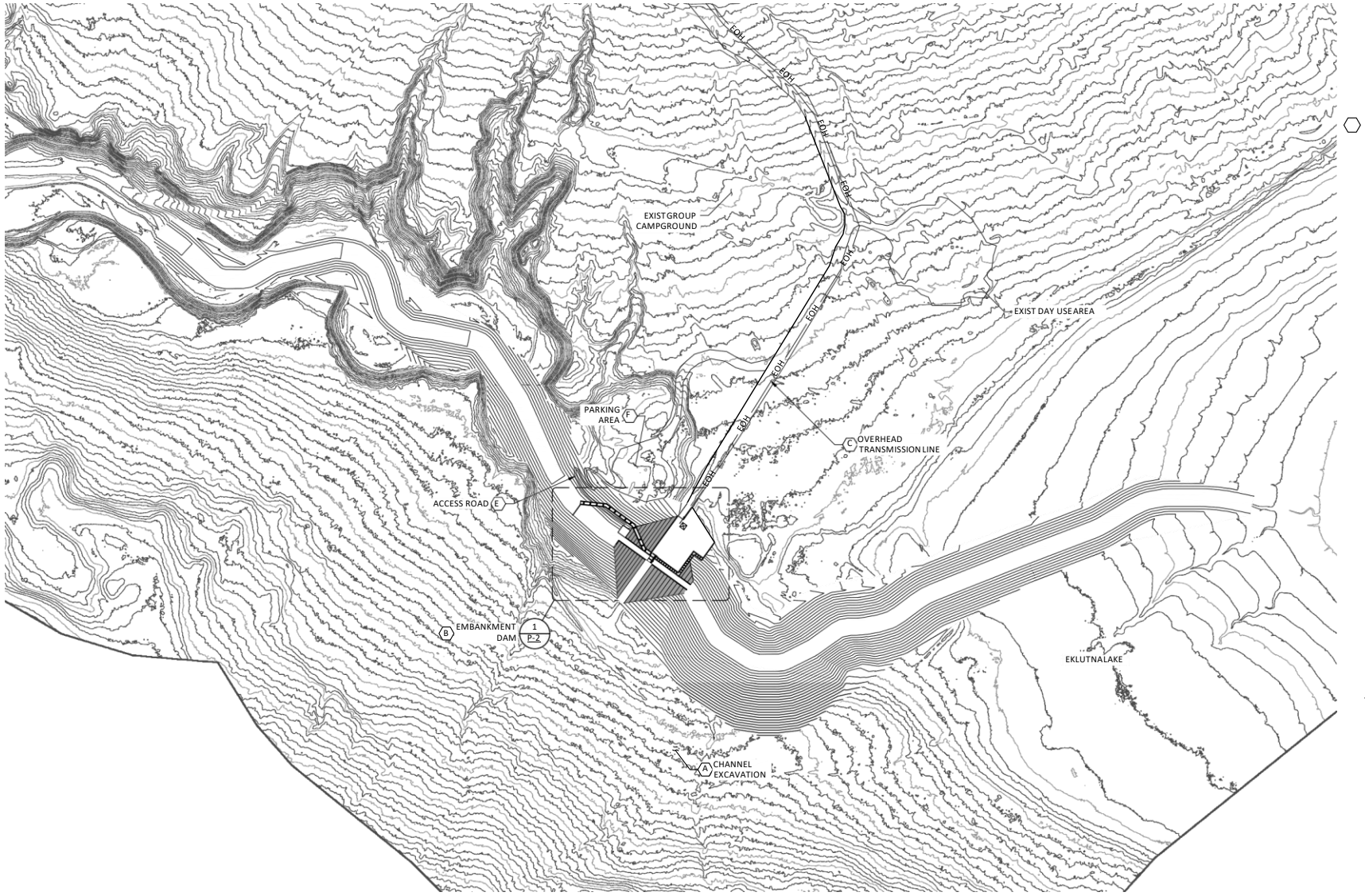
DESIGNED S.ELLENSON
DRAWN R.GUERRERO
CHECKED J.BOAG
PROJECTDATE 12/23/22

JOB NO 000000

Path: C:\Vault20\Chugach Electric\Eklutna Feasibility Study\N-1.dwg Plot date: Dec 15, 2022 03:54pm CAD User: Guerrero\Robert

Class 5 Opinion of Probable Construction Costs





SITE PLAN

SCALE: 1"=200'

0" 200' 400'

N

SHEET NOTES:

1. ELEVATIONS SHOWN ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

SHEET KEY NOTES:

A EXCAVATE CHANNEL THROUGH RESERVOIR OUTLET AND EXISTING EKLUTNA DAM TO EL. 838.6 MSL.
APPROXIMATE LENGTH = 5,200-FT.
APPROXIMATE IN-SITU VOLUME = 550,000 CY.

B CONSTRUCT NEW EARTHFILL EMBANKMENT DAM.
HEIGHT = 56-FT
APPROXIMATE VOLUME = 82,000 CY

C INSTALL NEW 7.2 KV - 3P OVERHEAD TRANSMISSION LINE ALONG DAM ACCESS ROAD FROM NEAREST POI.
APPROXIMATE DISTANCE = 3,500-FT.

D REGRADE, REPAIR AND IMPROVE EXISTING ABANDONED ACCESS ROAD DOWNSTREAM OF DAM RIGHT ABUTMENT.

E CONSTRUCT NEW ACCESS ROAD TO DOWNSTREAM TOE OF DAM.

F CONSTRUCT NEW PARKING AREA DOWNSTREAM OF DAM RIGHT ABUTMENT.

LEGEND:

EOH OVERHEAD ELECTRICAL/POWER

REV	DATE	BY	DESCRIPTION
B	05/12/23	SPE	ADDED FISH PASSAGE ALTERNATIVE
A	05/12/23	SPE	CONCEPTUAL DESIGN

WARNING

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

McMillen

CHUGACH POWERING ALASKA'S FUTURE

EKLUTNA FISH & WILDLIFE PROJECT

ENGINEERING FEASIBILITY STUDY

PME ALTERNATIVES ANALYSIS - FISH PASSAGE
REPLACEMENT DAM ALTERNATIVE
SITE PLAN

DESIGNED S. ELLENSON

DRAWN R.GUERRERO

CHECKED J.BOAG

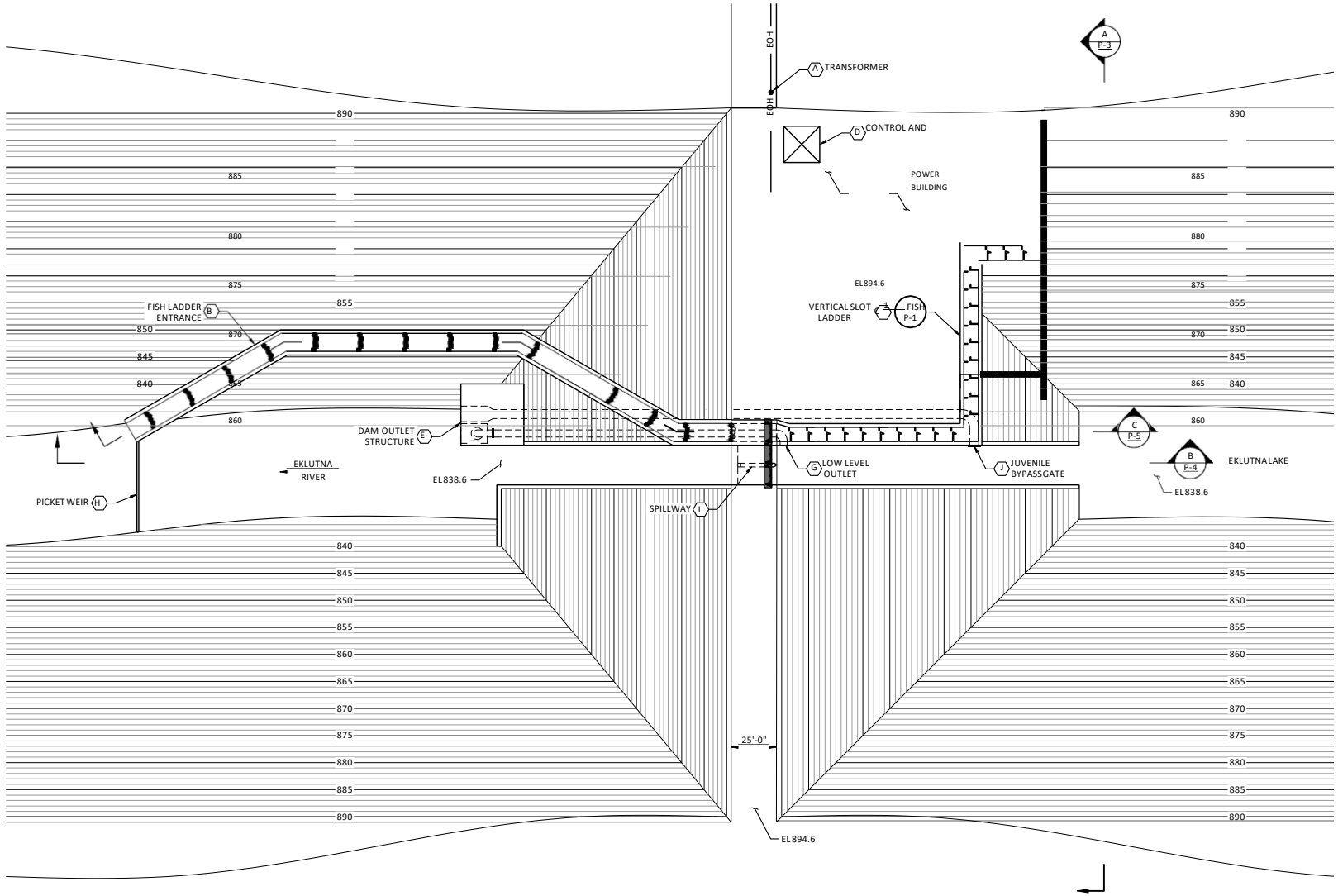
PROJECTDATE 05/12/23

DRAWING

P-1

JOB NO: 000000

Path: C:\Vault\Chugach Electric\Eklutna Feasibility Study\P-1.dwg Plot date: May 08, 2023 05:36pm, CAD User: Guerrero\Robert



EKLUTNA EMBANKMENT DAM

SCALE: 1"=30'

0" 30' 60'

1 P-1

SHEET NOTES:

1. ELEVATIONS SHOWN ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

SHEET KEY NOTES:

A. INSTALL 7.2kV - 240/120V TRANSFORMER ON WOOD POWER POLE

B. CONSTRUCT STEP-POOL ROCK RAMP FISHWAY FOR ENTRANCE TO RESERVOIR.

C. CONSTRUCT VERTICAL SLOT FISH LADDER WITH VARIABLE POOL GATED EXITS ON UPSTREAM FACE OF DAM.

D. CONSTRUCT CONTROL AND POWER BUILDING. 20-FT X 20-FT. E

CONSTRUCT CONTROL AND POWER BUILDING. 20-FT X 20-FT.

F INSTALL 5-FT SQUARE CONCRETE CONDUIT THROUGH BASE OF DAM WITH FLOW CONTROL GATE AT INTAKE

G INSTALL 48" DIA STEEL PIPE THROUGH BASE OF DAM WITH SCREENED INTAKE.

H CONSTRUCT AUTOMATED PICKET WEIR ACROSS RIVER CHANNEL ADJACENT TO FISH LADDER ENTRANCE.

I CONSTRUCT TWO BAY OVERFLOW SPILLWAY WITH (2X) 10-FT X 16-FT FIXED WHEEL GATES.

LEGEND:

EOH — OVERHEAD ELECTRICAL/POWER

EUG — UNDERGROUND ELECTRICAL

REV	DATE	BY	DESCRIPTION
B	05/12/23	SPE	ADDED FISH PASSAGE ALTERNATIVE
A	05/12/23	SPE	CONCEPTUAL DESIGN

WARNING

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

McMillen

CHUGACH POWERING ALASKA'S FUTURE

EKLUTNA FISH & WILDLIFE PROJECT

ENGINEERING FEASIBILITY STUDY

PME ALTERNATIVES ANALYSIS - FISH PASSAGE REPLACEMENT DAM ALTERNATIVE SECTIONS AND DETAILS 1

DESIGNED S. ELLENSON

DRAWN R.GUERRERO

CHECKED J.BOAG

PROJECTDATE 05/12/23

DRAWING

P-2

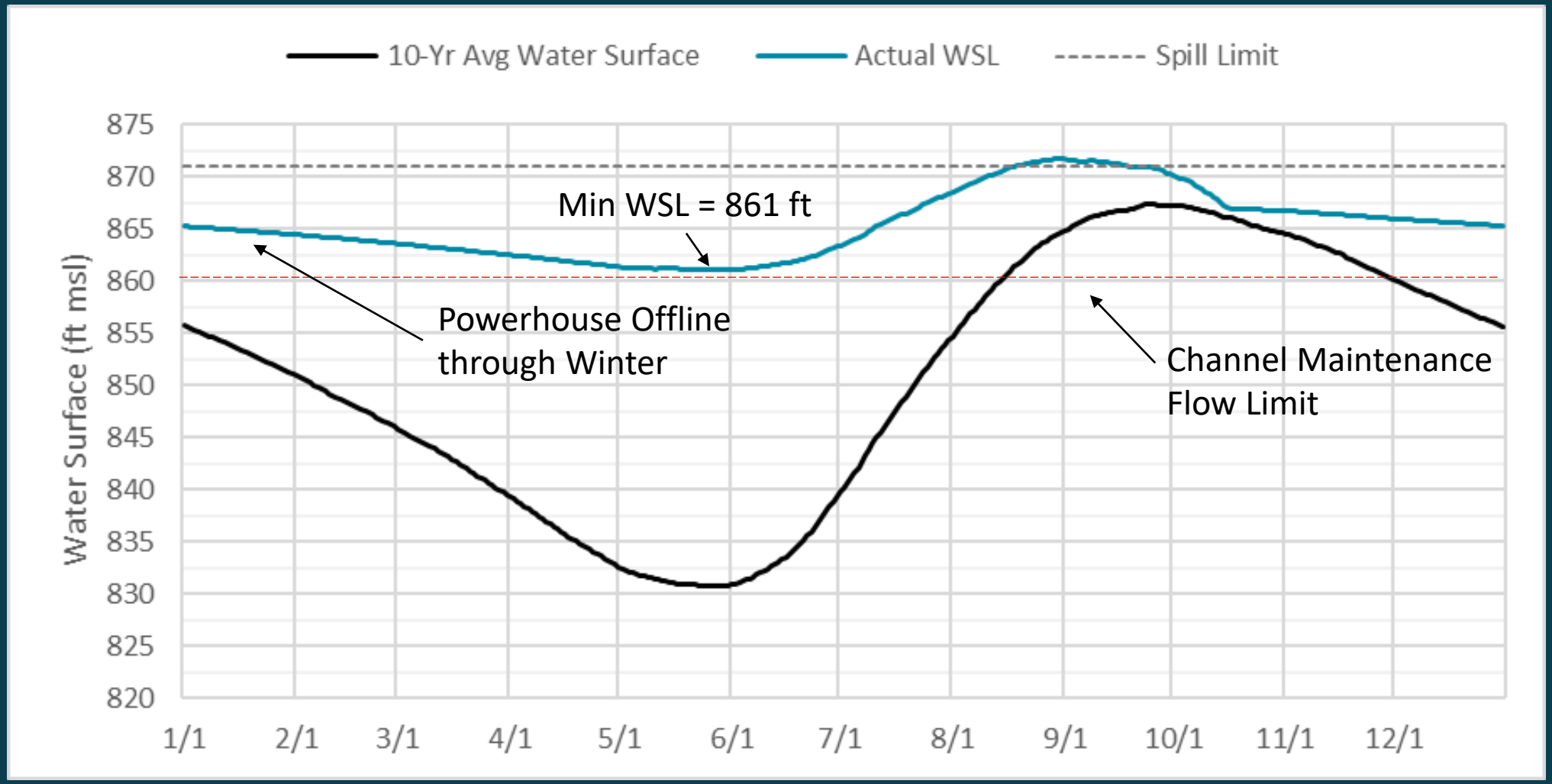
JOB NO: 000000

Path: C:\Vault\Chugach Electric\Eklutna Feasibility Study\P-2.dwg Plot date: May 08, 2023 05:36pm, CAD User: GuerreroRobert

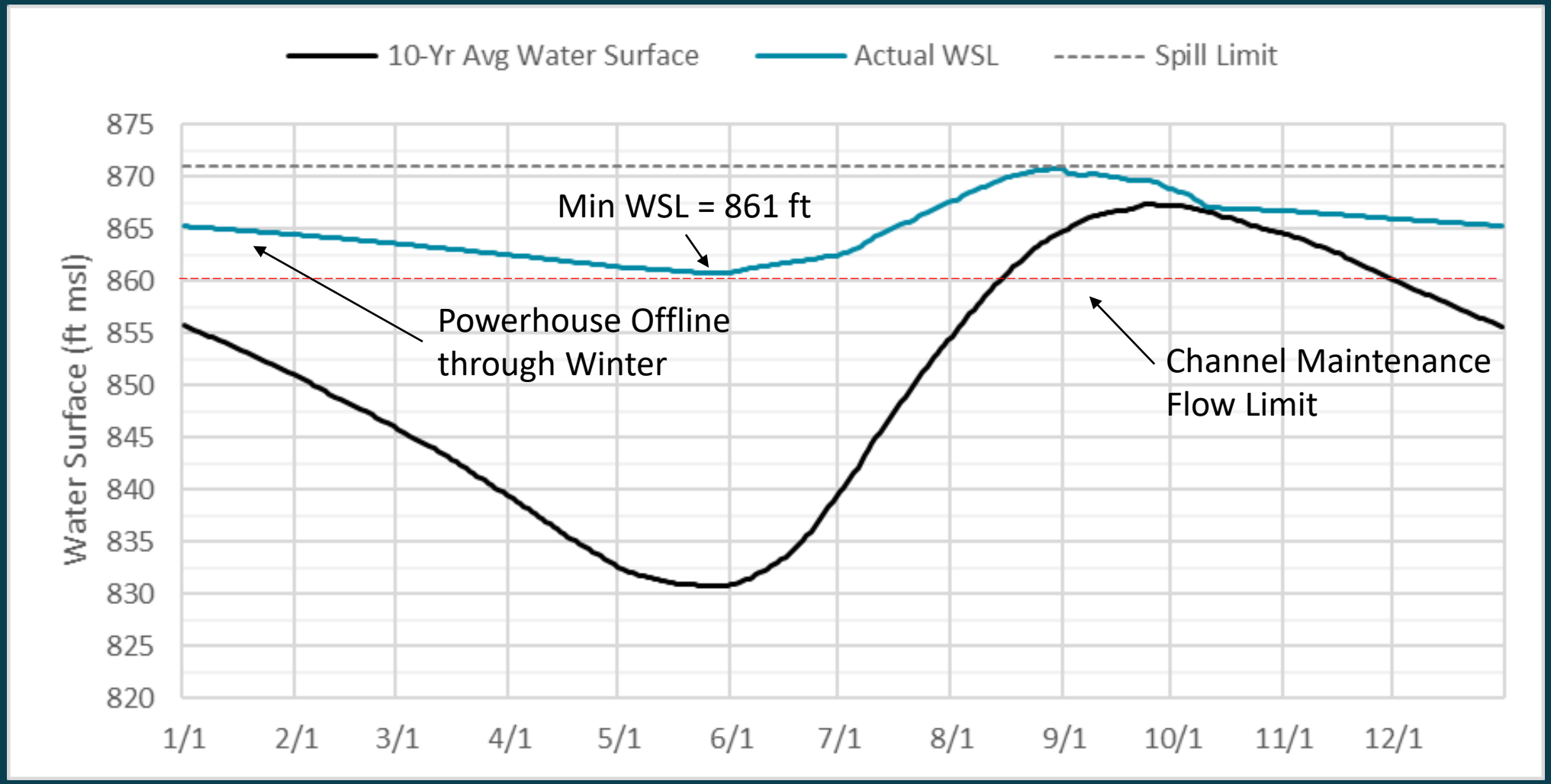
Class 5 OPCC – Replacement Dam

- Indirect Costs (Mobilization / General Requirements)
  - $16M
- Site Construction / Access Roads
  - $1M
- Channel Excavation – Haul
  - $40M
- Dam Construction w/ Fishway
  - $20M
- Electrical/Transmission
  - $3M
- Overhead, Profit, & Bonds
  - $13M
- Contingency
  - $23M
- Construction Price
  - **$115M ($60M - $227M)**

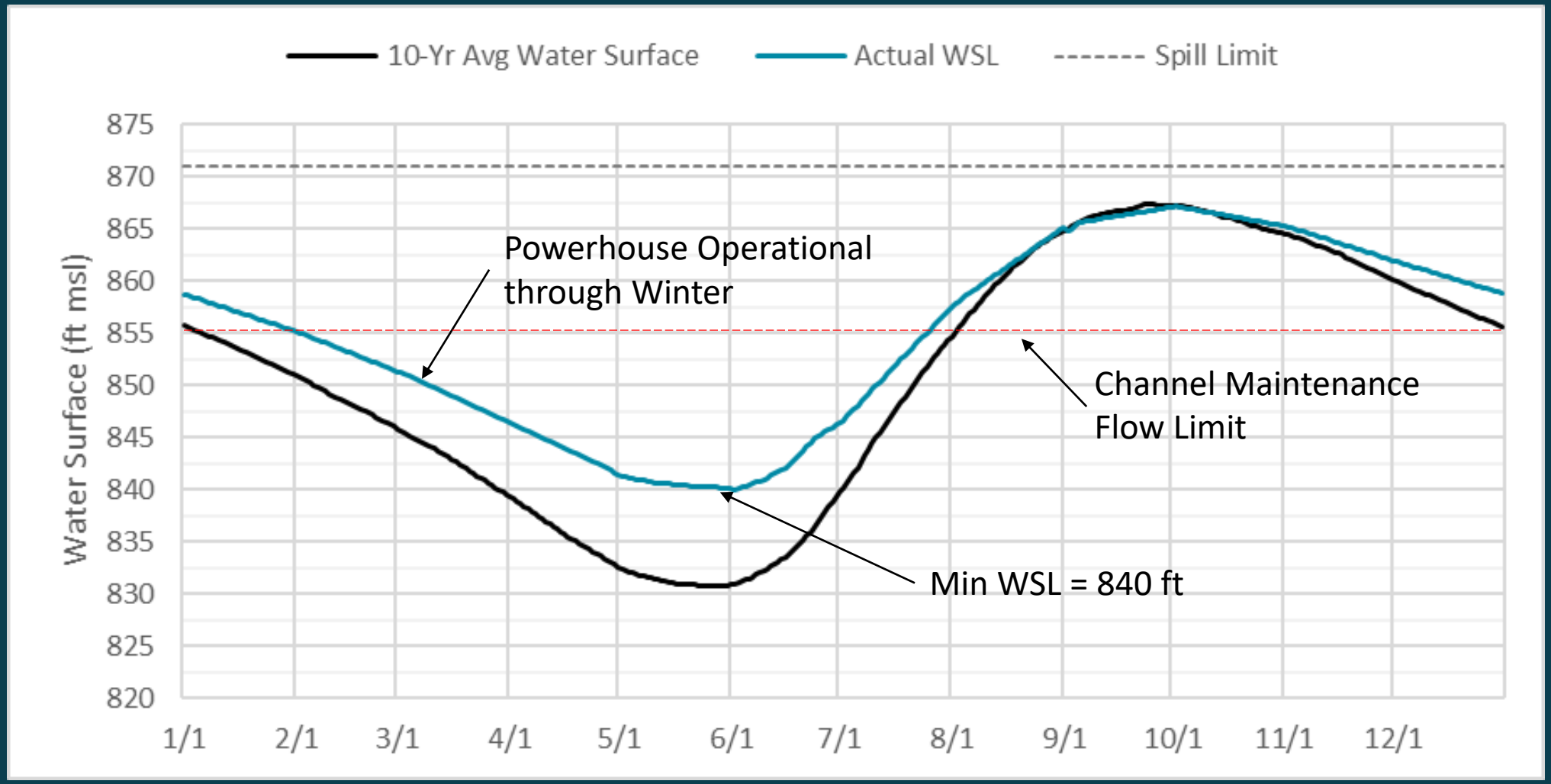
Existing Dam Release w/ No Fish Passage



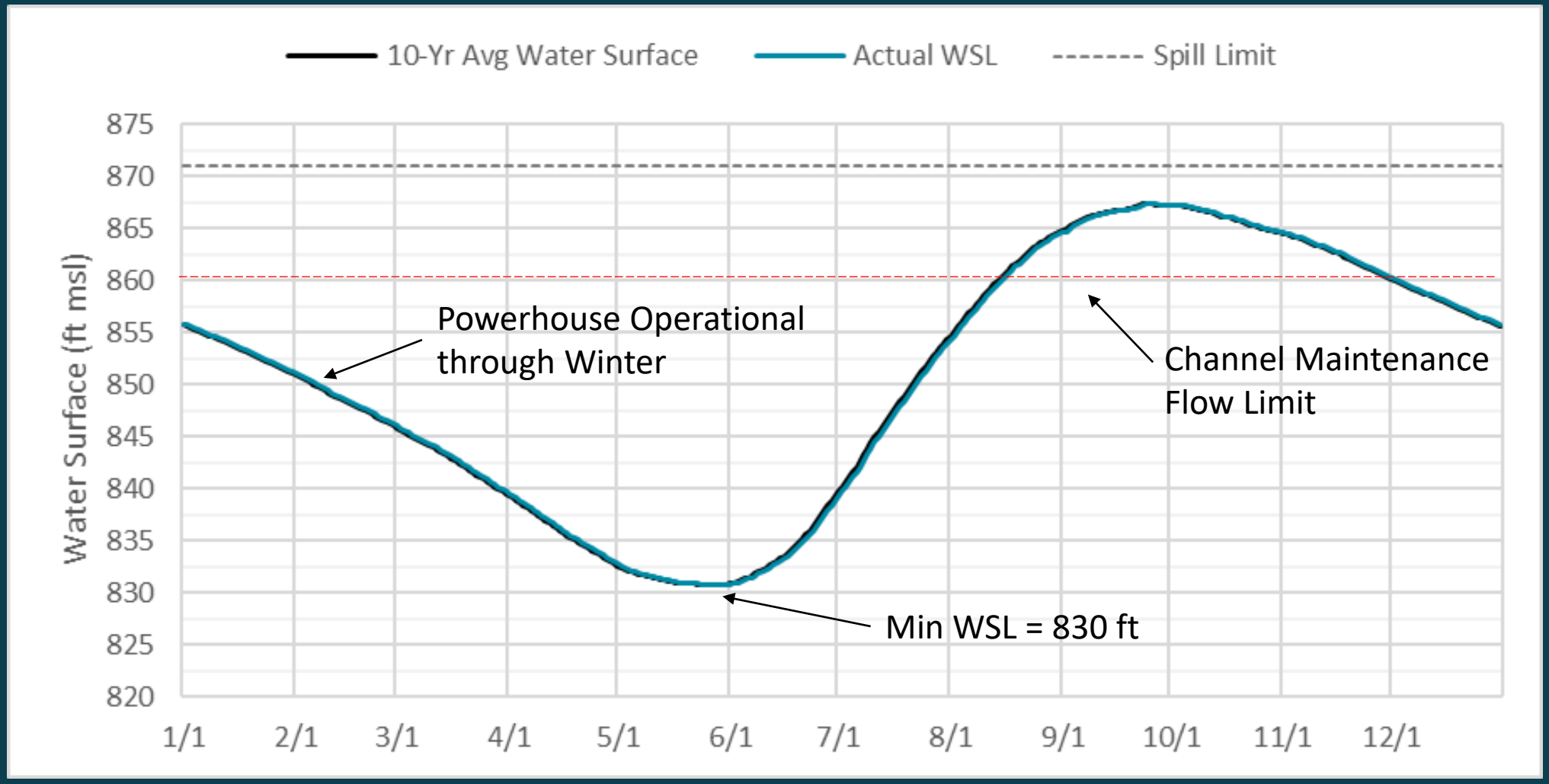
Existing Dam Release w/ Variable Exit Fishway



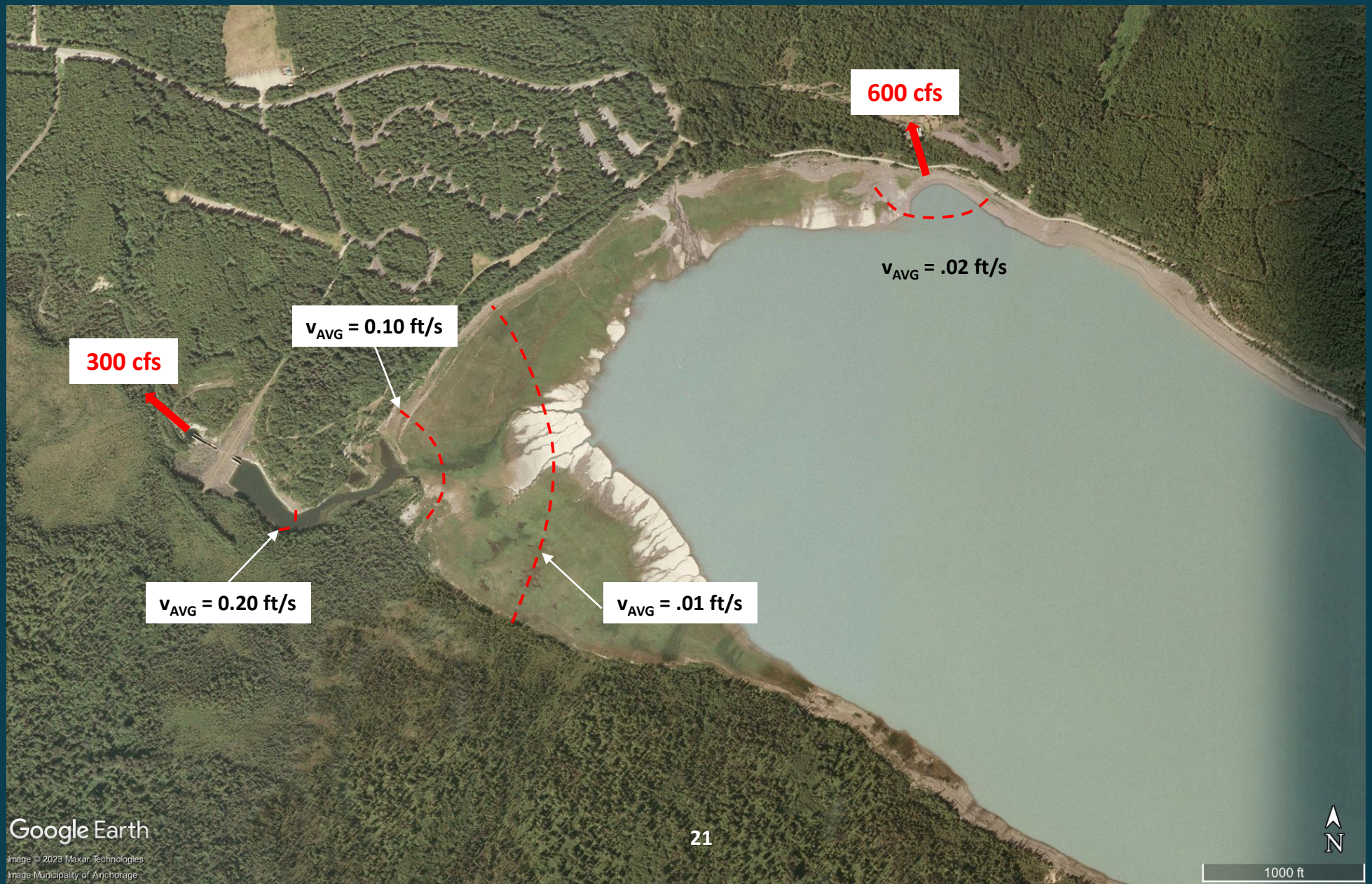
Replacement Dam



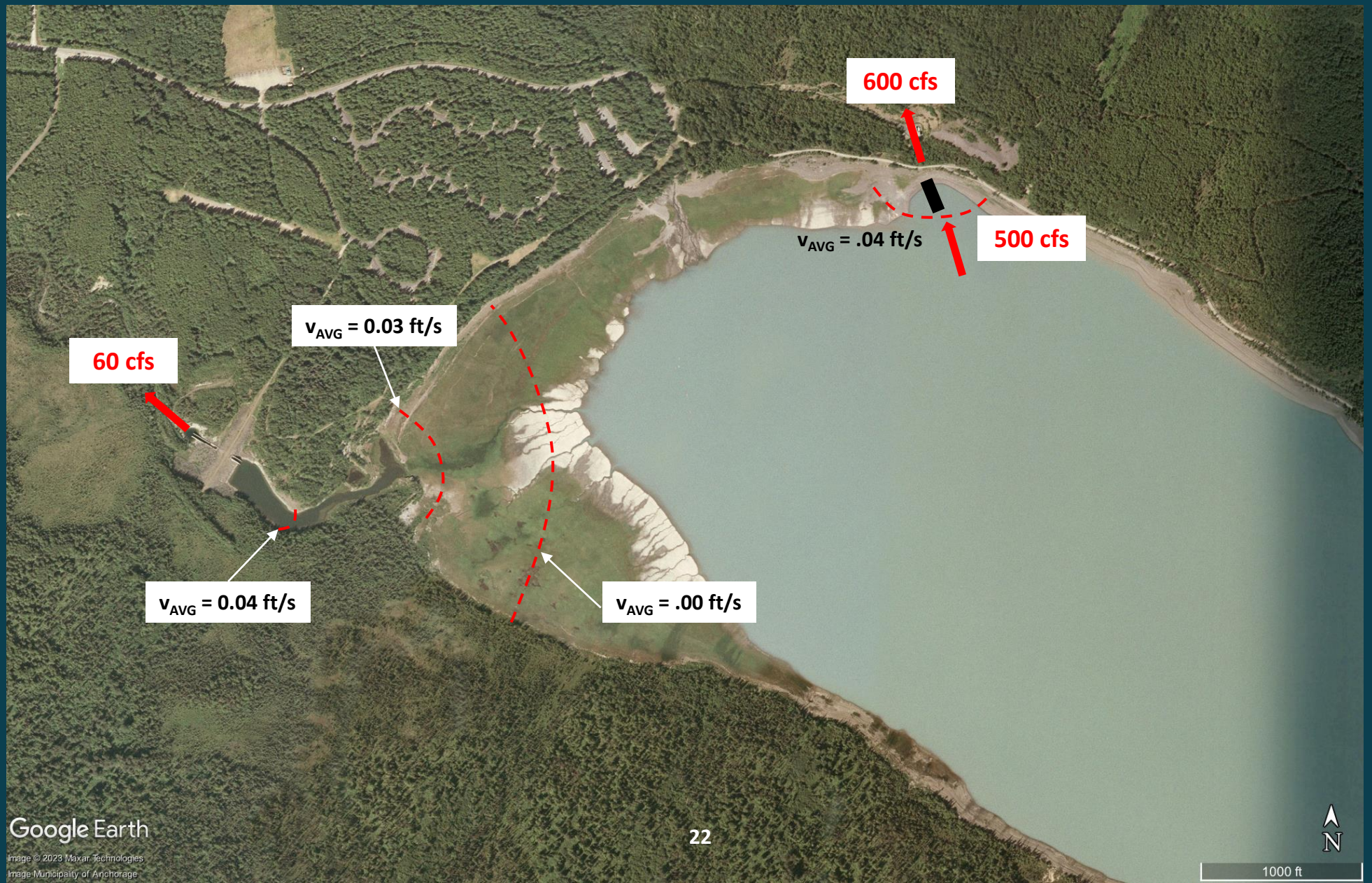
AWWU Portal/Pipeline & Bypass Tunnel



Downstream Fish Passage – Dam Release



Downstream Fish Passage – Floating Surface Collector



Winter Flow Analysis

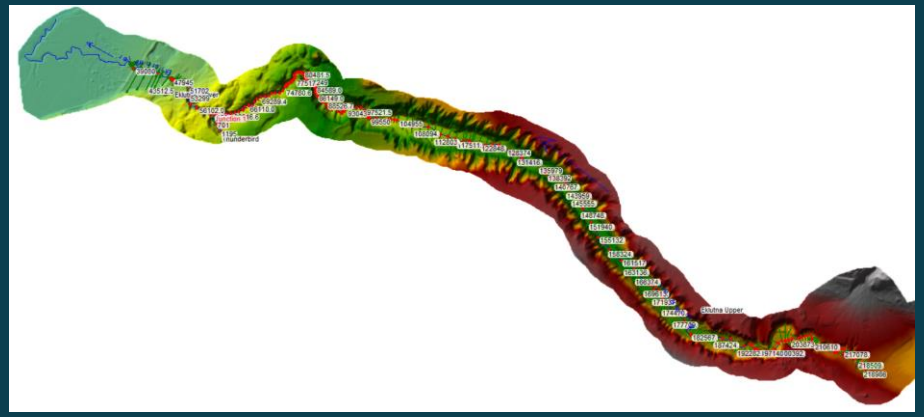
Criteria

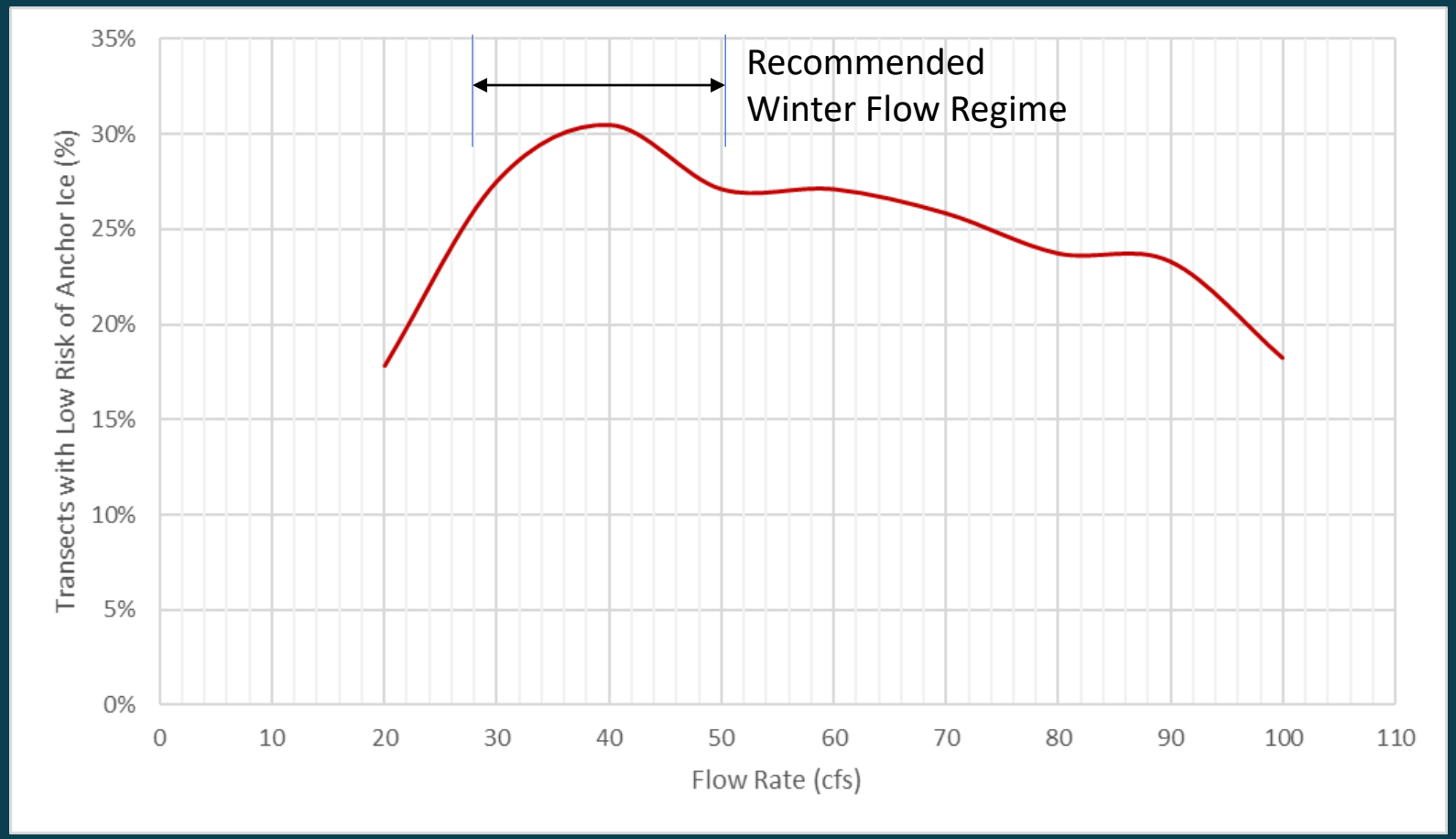
Using 1D River Model (236 Transects):

Determine Number of Transects with:

$$v < 2.0\ ft/s$$

$$d \geq 15"$$

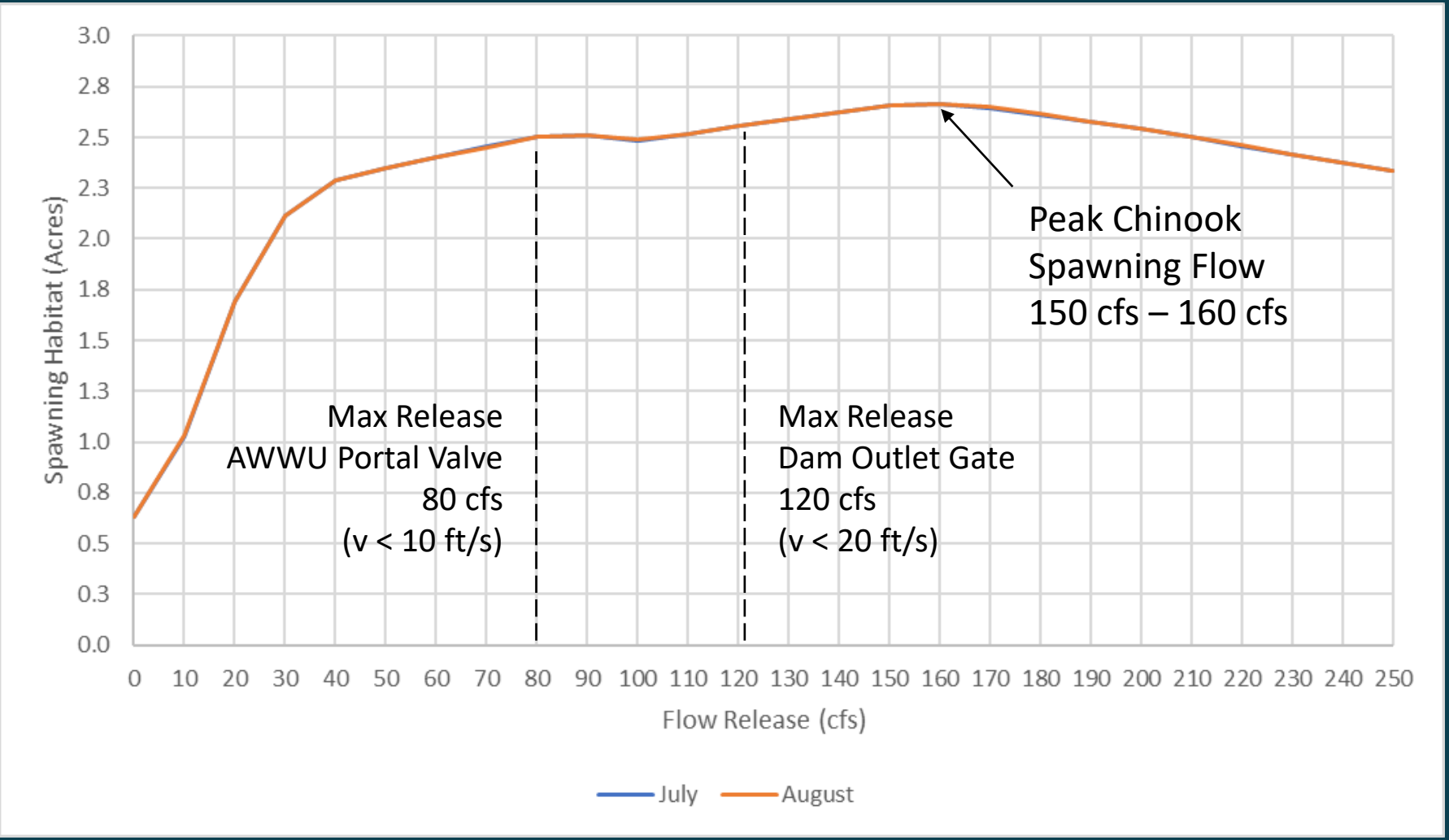




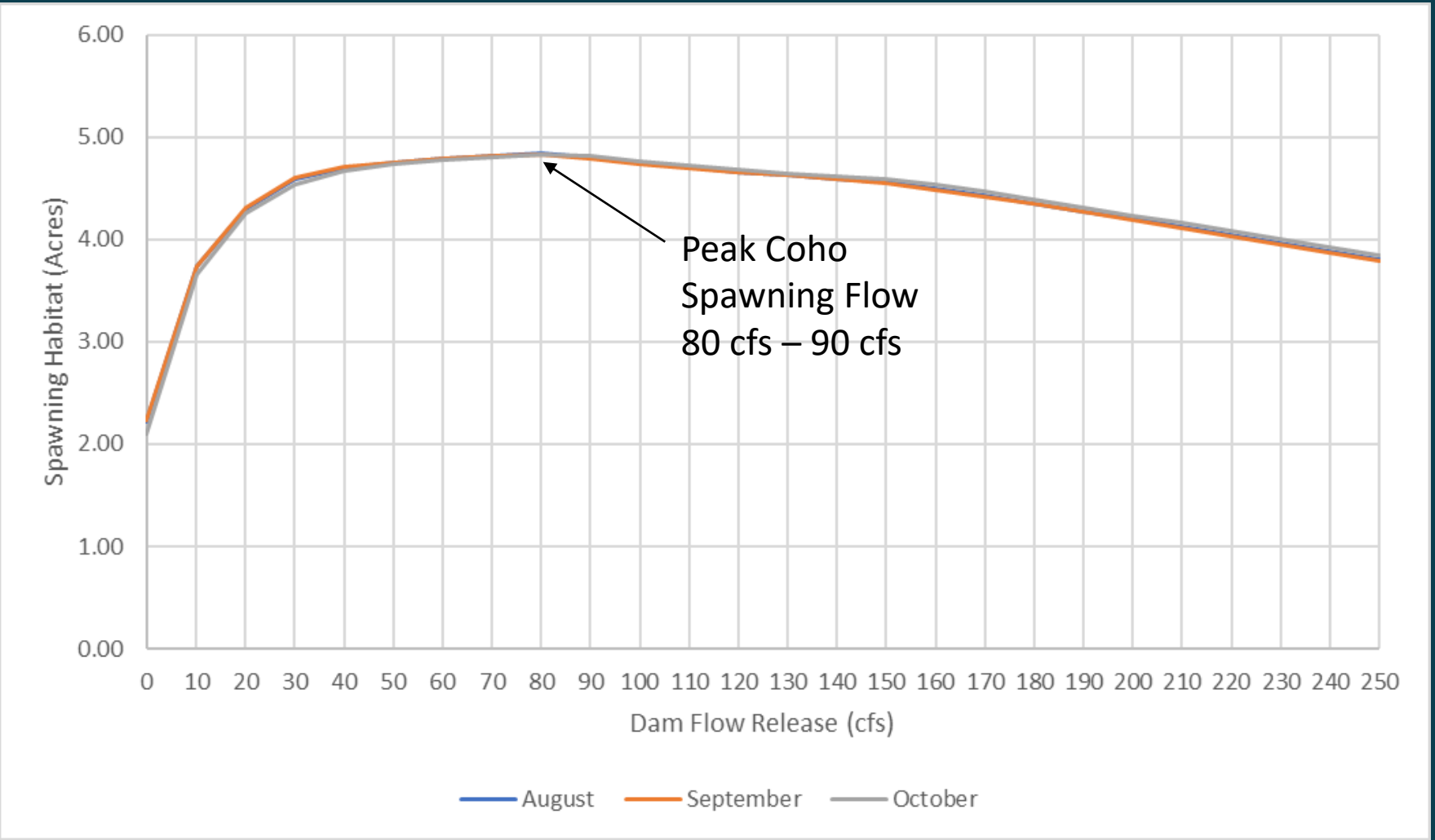
Passage Barrier Analysis

	Site A	Site B	Site C	Site D	Site E
Minimum passage Q (cfs)	40.0	50.0	8.8	40.0	40.0
Velocity at critical transect (ft/s)	8.35	6.25	4.71	4.340	3.76
Depth at critical transect (ft)	0.62	0.57	0.69	0.600	0.43
Froude at critical transect	1.90	1.50	1.00	0.990	1.01
Potential barrier average slope (ft/ft)	0.16	0.14	0.087	0.068	0.12
Passage barrier type	Depth	Depth	Depth	Depth	Depth

Instream Flow Study – Chinook Spawning Habitat



Instream Flow Study – Coho Spawning Habitat

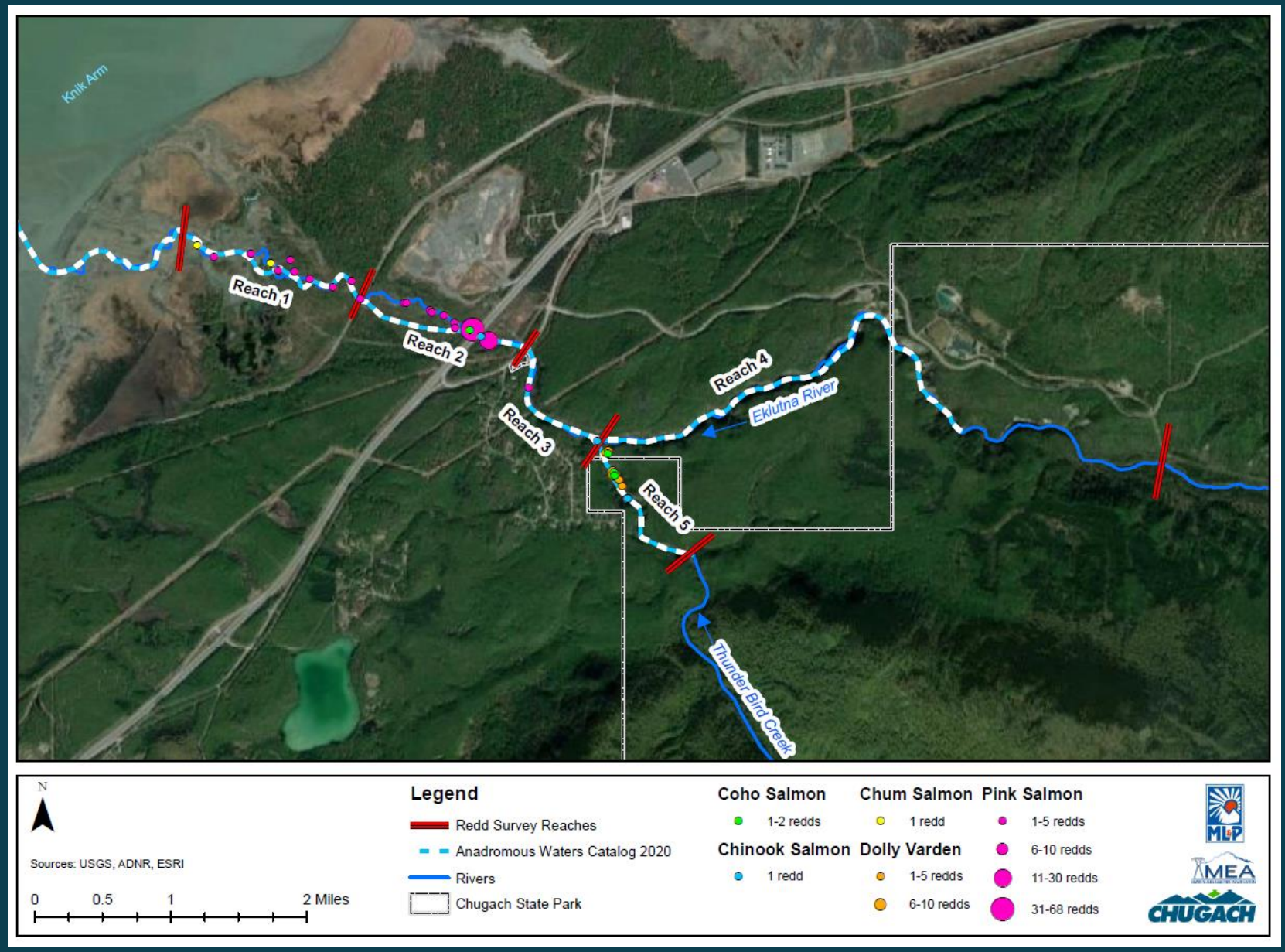


Adult Salmon Counts

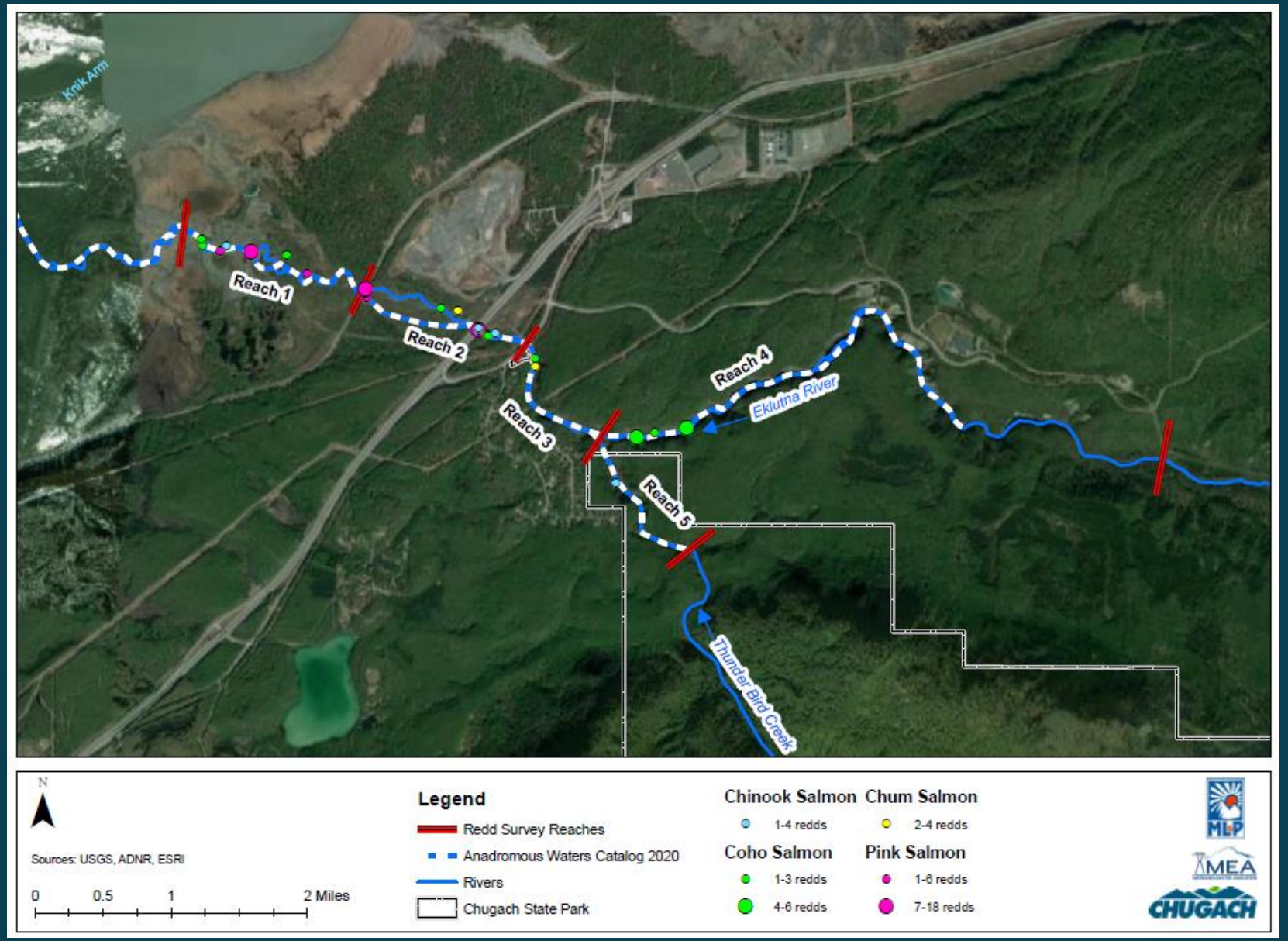
2021					2022				
Date	Chinook	Coho	Chum	Pink	Date	Chinook	Coho	Chum	Pink
7/9/2021	0	0	0	0	7/8/2022	0	0	0	0
7/16/2021	0	0	0	0	7/16/2022	1	0	0	0
7/22/2021	7	0	0	0	7/25/2022	0	0	0	0
7/31/2021	9	0	0	17	8/1/2022	0	0	0	27
8/6/2021	2	0	0	61	8/8/2022	0	0	0	0
8/11/2021	0	0	0	65	8/15/2022	1	0	0	19
8/20/2021	0	0	3	120	8/22/2022	4	2	0	16
8/26/2021	0	0	1	13	8/29/2022[B]		-	-	-
9/3/2021	1	3	1	1	9/6/2022	0	4	4	0
9/11/2021	0	4	0	-	9/13/2022	0	3	2	0
9/18/2021[A]	0	3	0	-	9/19/2022[B]	-	-	-	-
9/23/2021[A]	0	0	0	0	9/26/2022	0	1	0	0
9/29/2021	0	2	0	0	10/3/2022	0	0	0	0
10/5/2021	0	0	0	0	10/11/2022[B]	-	-	-	-
10/14/2021	0	2	0	0	10/17/2022	0	6	0	0
10/22/2028	0	0	0	0	10/24/2022	0	2	0	0
Total Fish	19	14	5	277	Total Fish	6	18	6	62

Notes: A) Only Thunderbird surveyed due to study flow releases; B) Dangerous conditions due to rainfall/ flooding

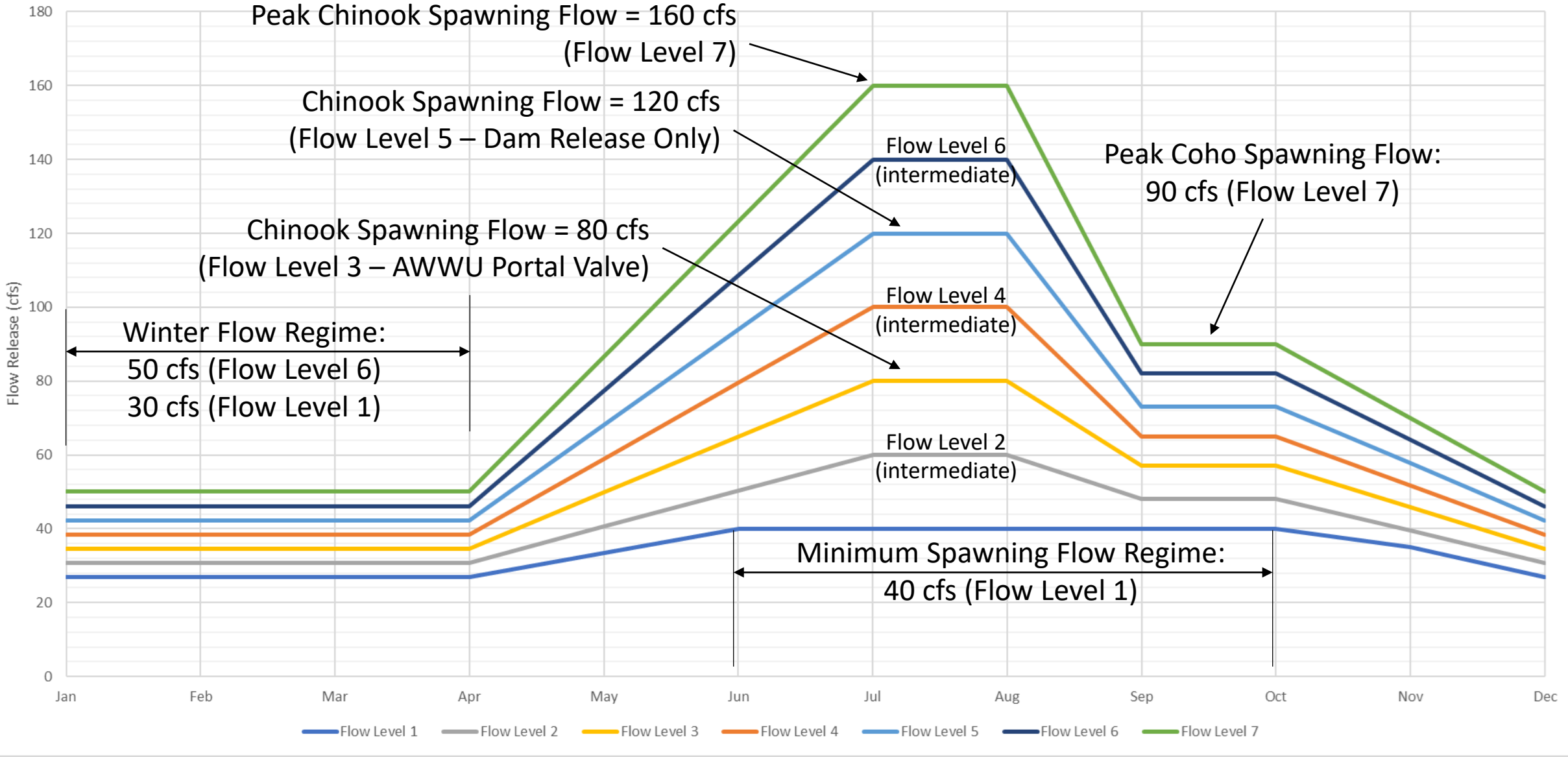
Spawning Distribution in 2021



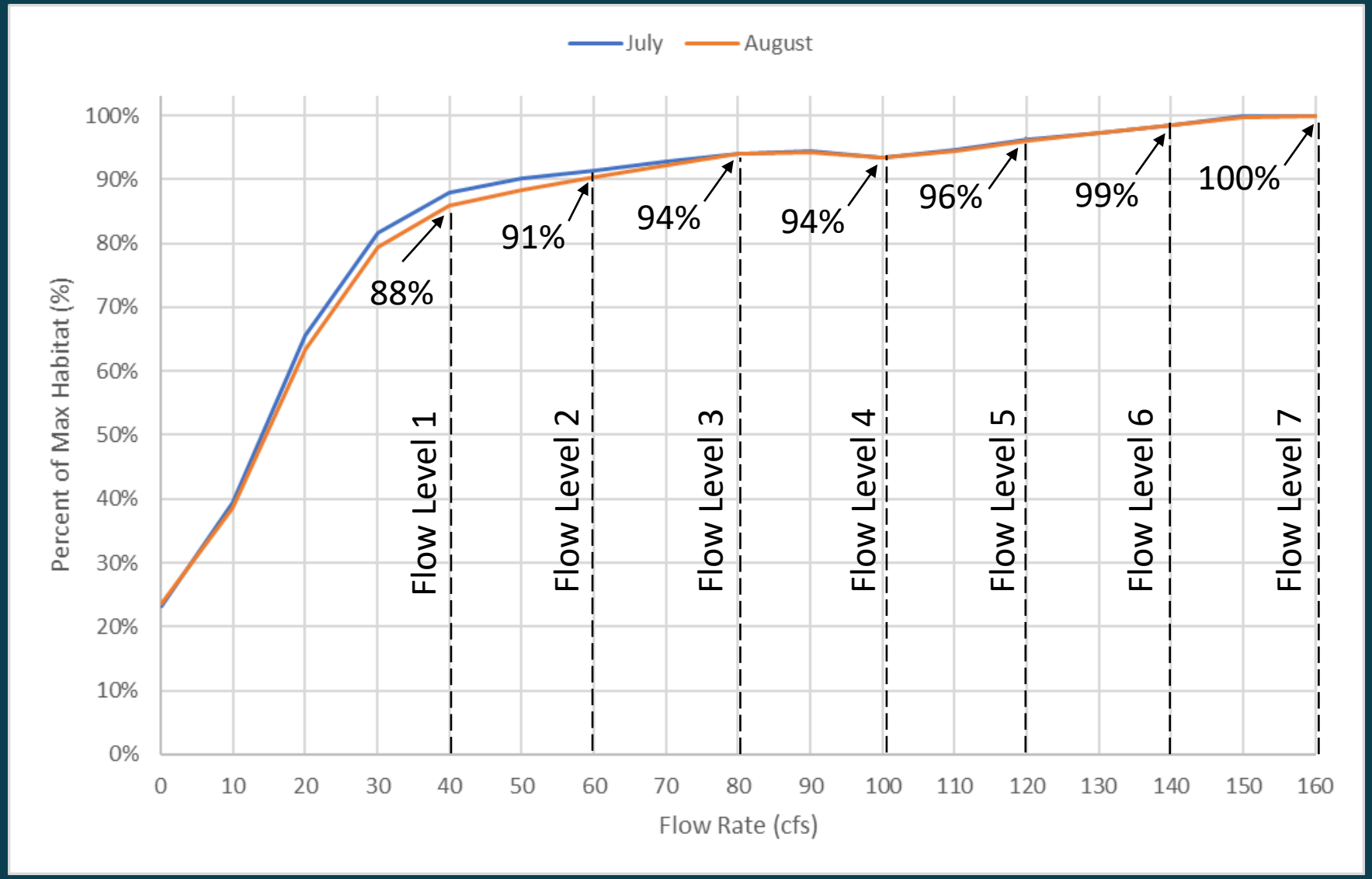
Spawning Distribution in 2022



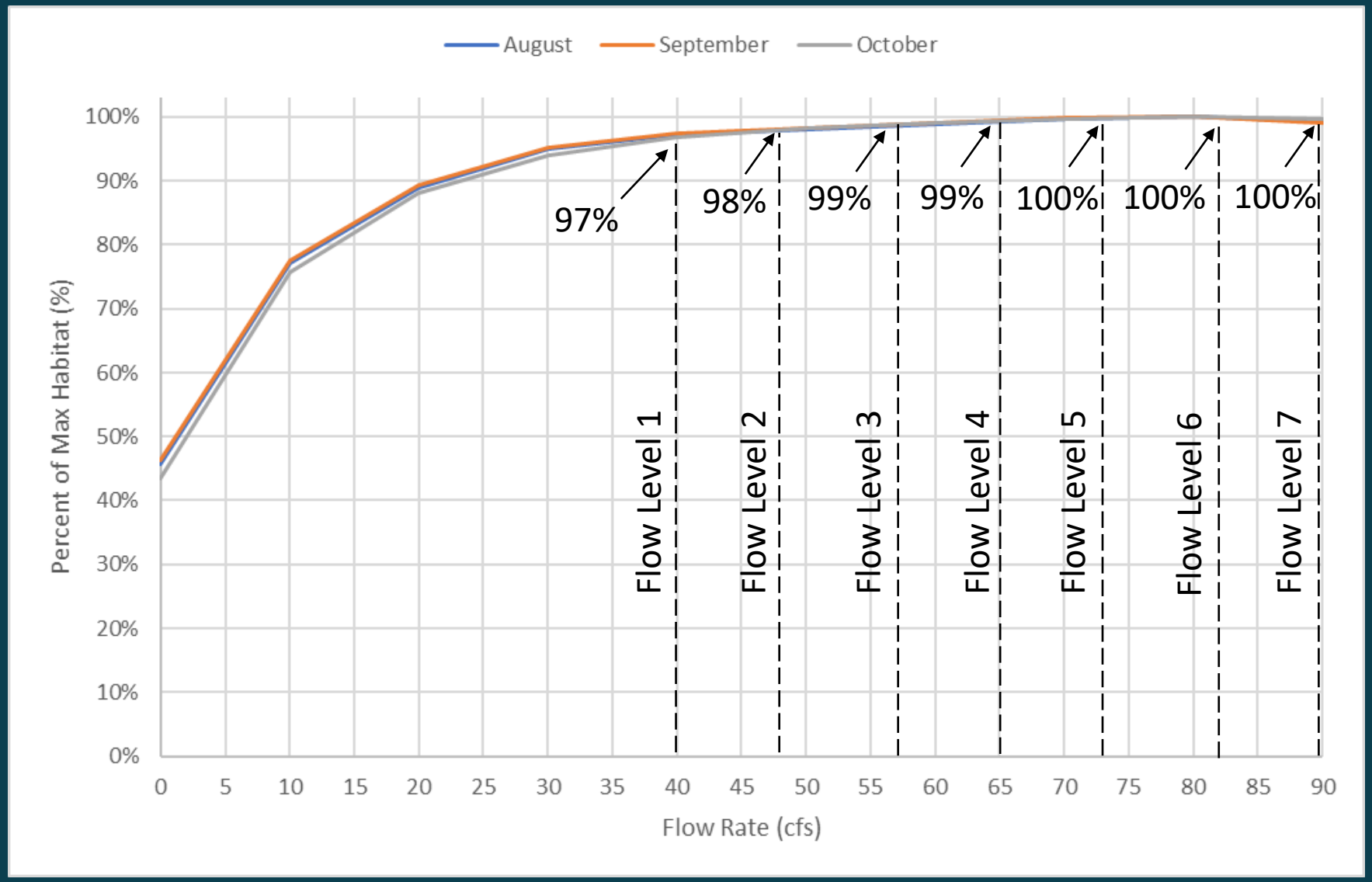
Potential Flow Regimes



Chinook Spawning Flows



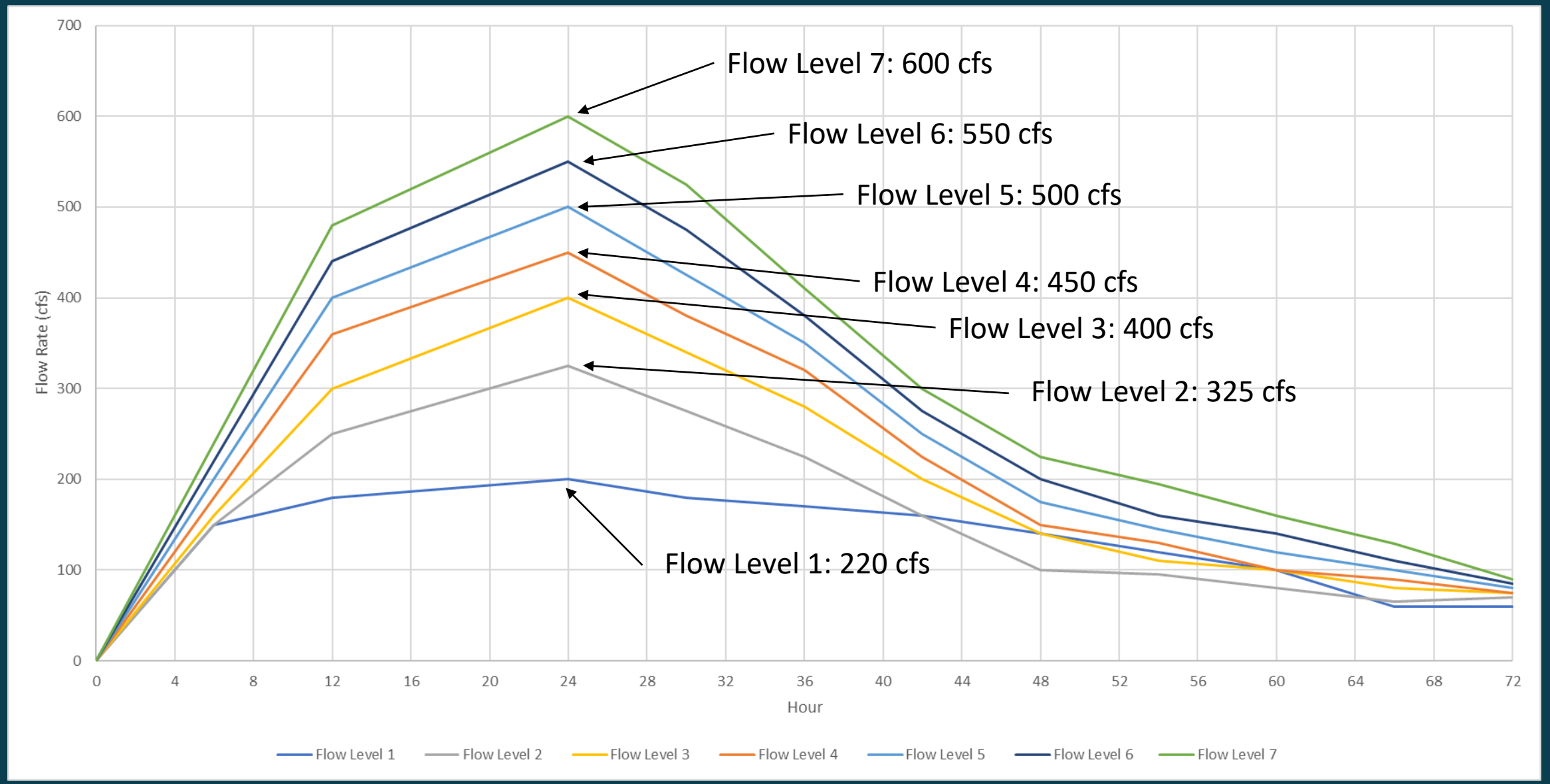
Coho Spawning Flows



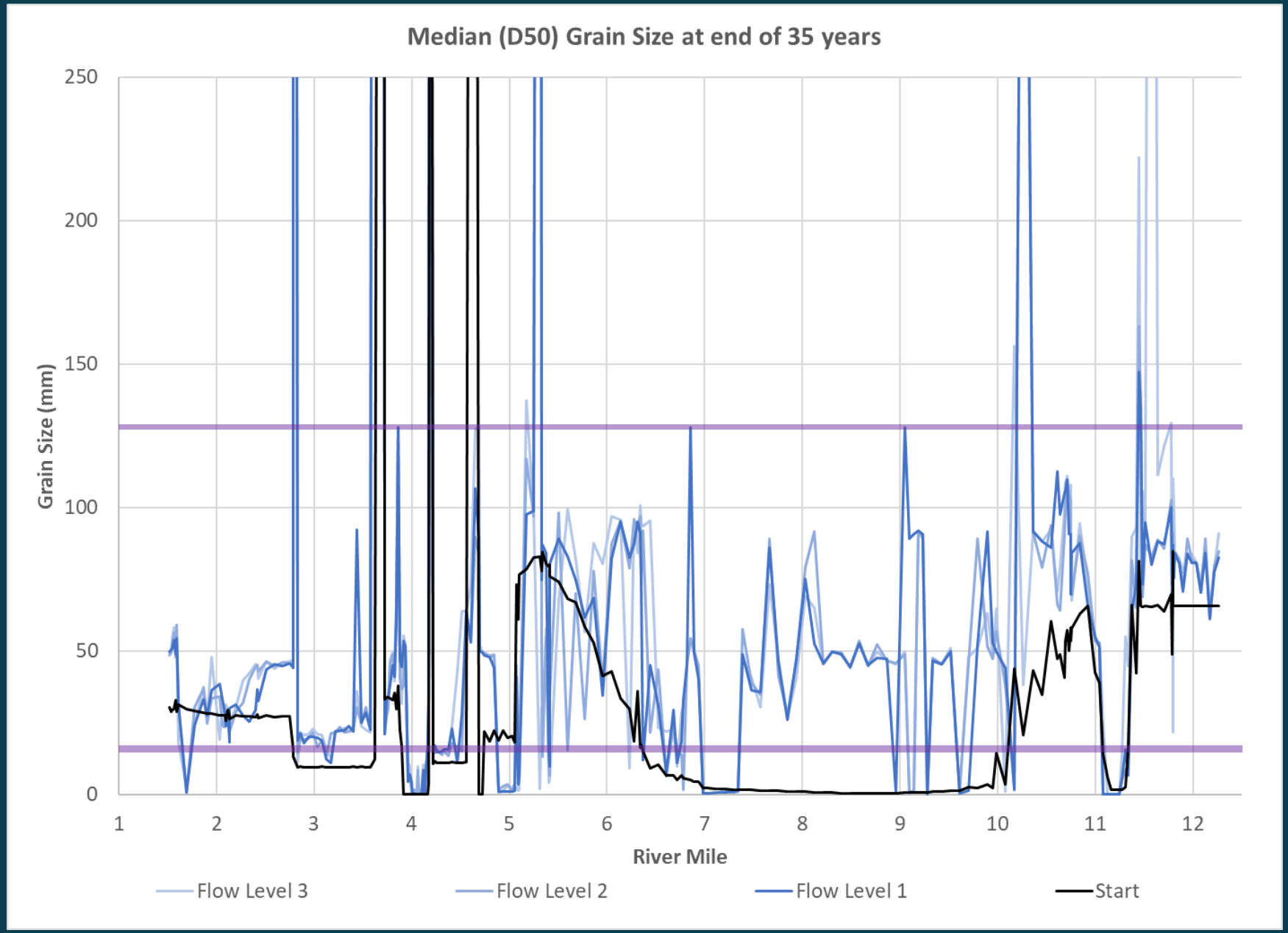
Eklutna River Habitat Gains

Scenario			Time-Averaged Habitat (%)				
			Chinook		Coho		Sockeye
			Spawning	Juvenile Rearing	Spawning	Juvenile Rearing	Spawning
Habitat Improvement (%)	Dam Release	Flow Level 1	227%	75%	89%	90%	75%
		Flow Level 2	240%	84%	92%	99%	78%
		Flow Level 3	254%	92%	94%	108%	77%
		Flow Level 4	254%	99%	94%	115%	74%
		Flow Level 5	265%	104%	93%	122%	71%
		Flow Level 6	274%	110%	93%	128%	67%
		Flow Level 7	280%	116%	91%	136%	62%
	Portal Release	Flow Level 1	209%	53%	65%	67%	58%
		Flow Level 2	215%	61%	65%	75%	57%
		Flow Level 3	221%	69%	65%	83%	54%
	Pipeline Release	Flow Level 1	48%	28%	32%	32%	35%
		Flow Level 2	44%	35%	31%	39%	33%
		Flow Level 3	42%	42%	29%	45%	30%

Channel Maintenance Flows

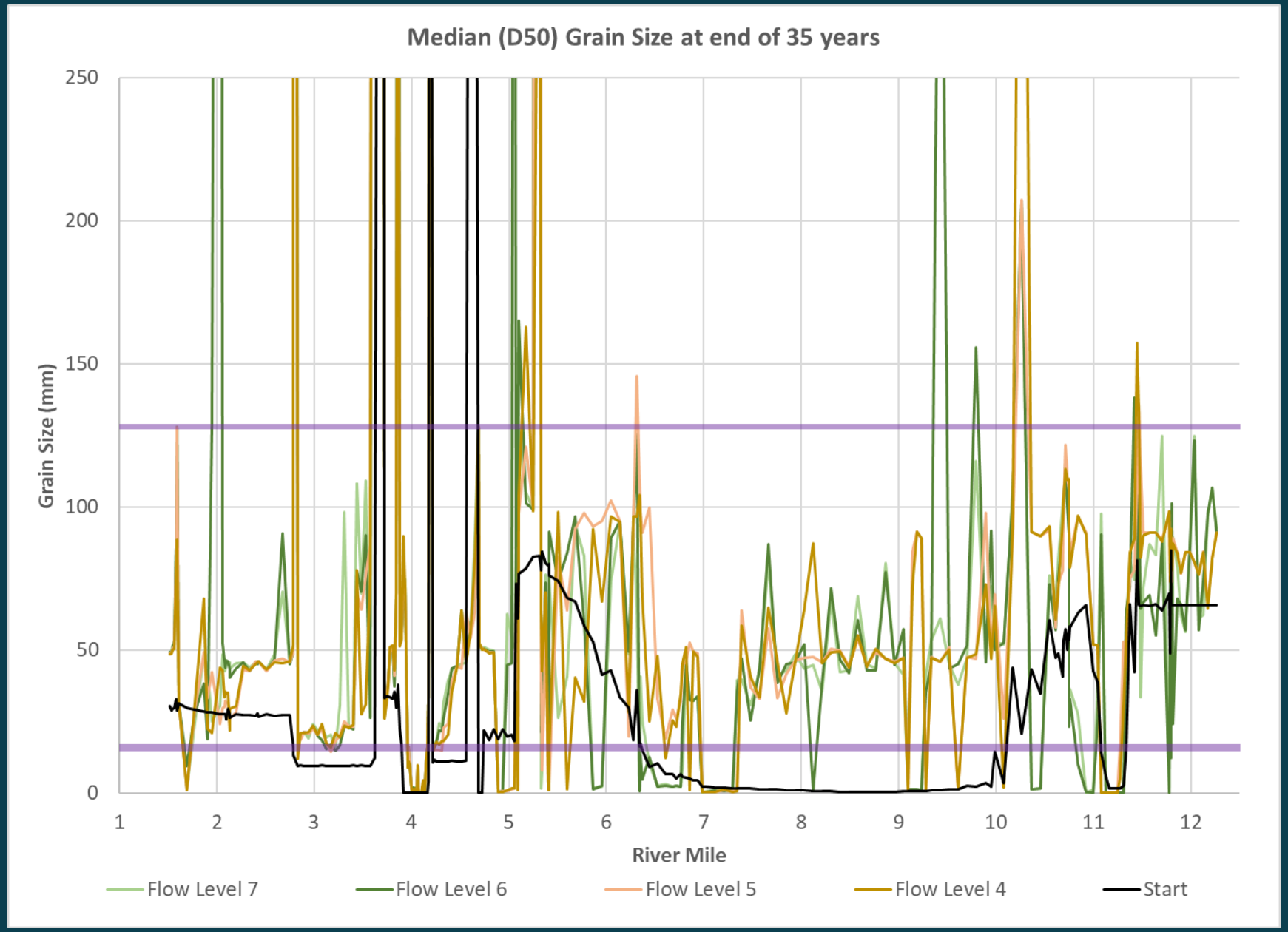


Flow Levels 1-3



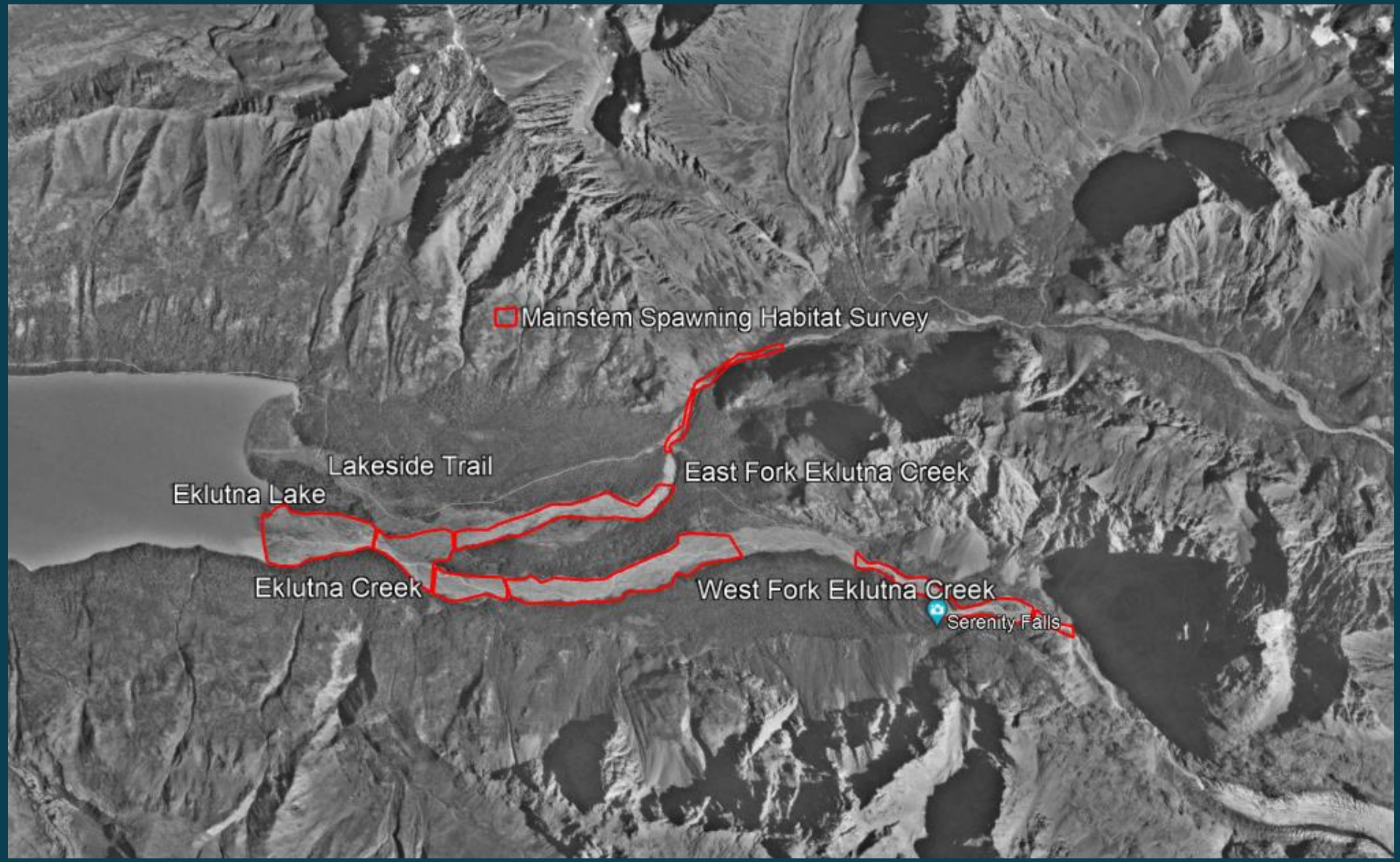
Channel Maintenance Flow = 220/325/400 cfs - 72 Hr Shaped - Every 3 Years

Flow Levels 4-7

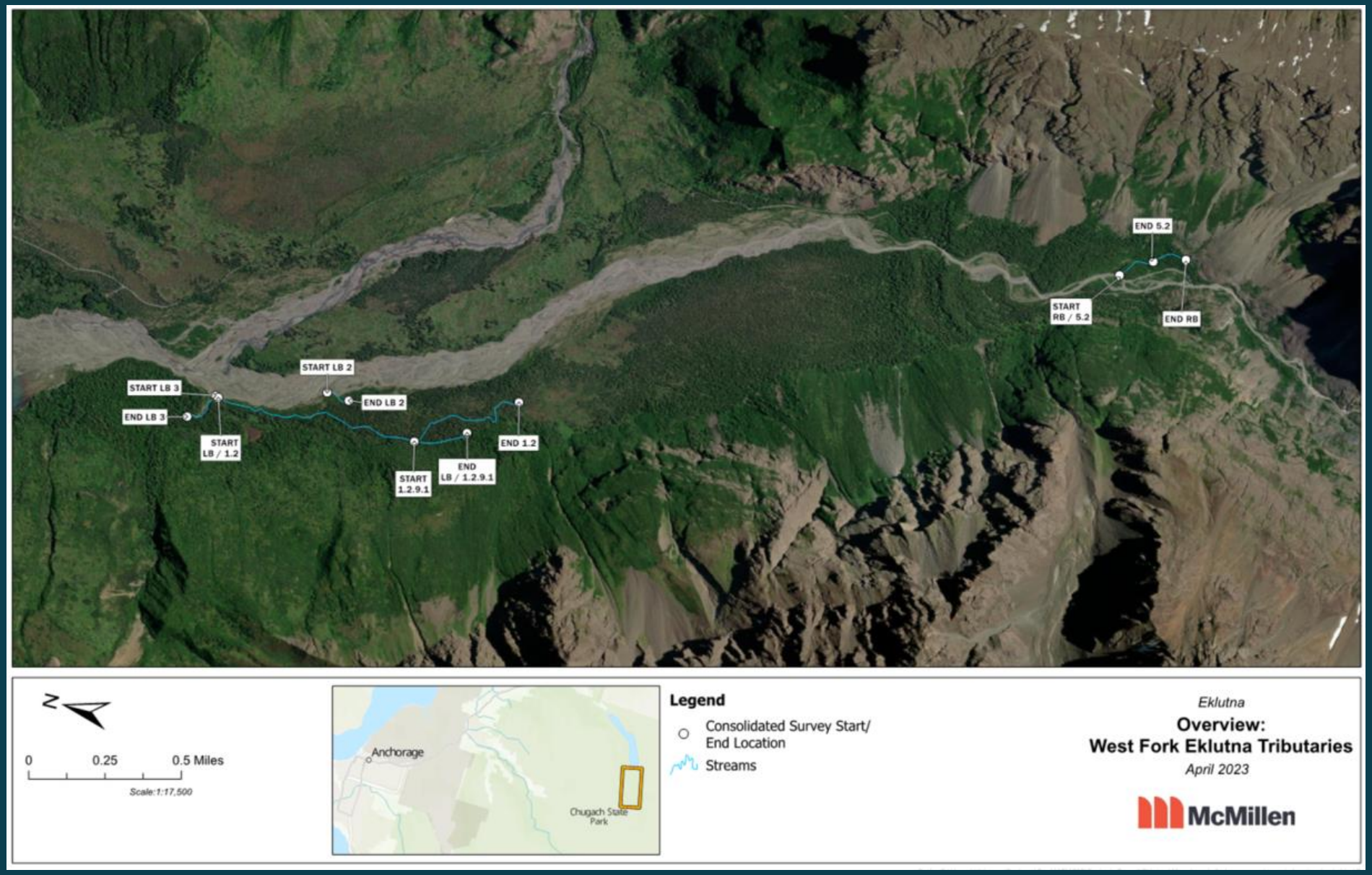


Channel Maintenance Flow = 450/500/550/600 cfs - 72 Hr Shaped - Every 3 Years

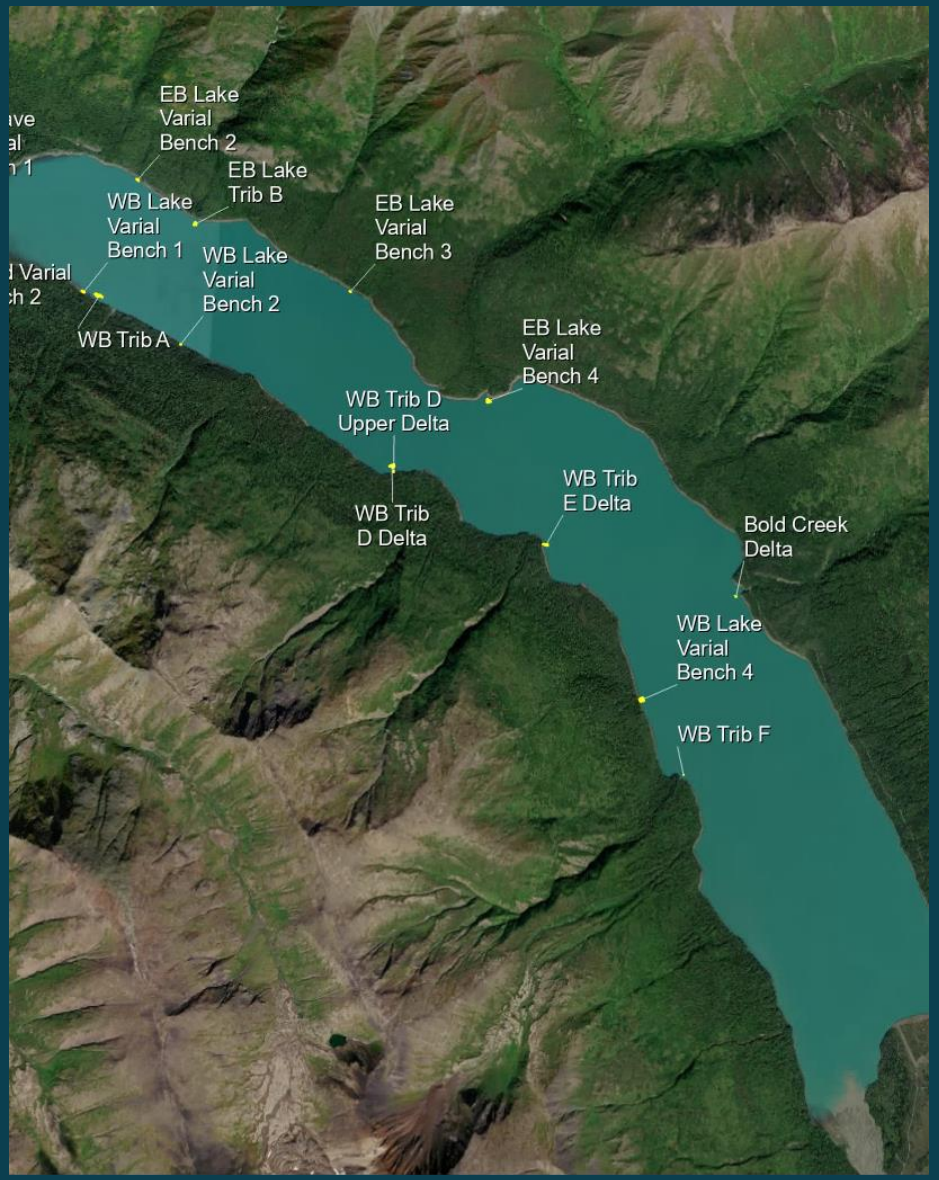
Mainstem Spawning Habitat Survey Area



West Fork Eklutna Creek Survey



Lake Shoreline Habitat



Lake Productivity

Sample Source	Chlorophyll *a* (ug/l)	Total Phosphorus (mg/l)	Secchi Depth (m)	TSI Value*
Eklutna Lake (2021)	0.29	<0.04	0.85	18.5
Eklutna Pond (2021)	0.47	<0.04	2.04	23.2
Eklutna Lake (2022)	0.13	*not collected*	*not collected*	10.6
Eklutna Pond (2022)	0.12	*not collected*	*not collected*	9.8
** Calculation Equation: TSI = 9.81* ln(CHL a) + 30.6*				

- All Trophic Status Index (TSI) values are low (<30) which indicates low primary productivity (oligotrophic status)
- Most likely due to nutrient deficiency and/or turbidity from glacial flour limiting light penetration
- Low primary productivity (phytoplankton) indicates limited secondary production (zooplankton)

Kokanee

A hooked-jawed, 13-inch male kokanee in spawning color.

Typical 5-inch kokanee from Eklutna Lake

Eklutna Lake Habitat Gains

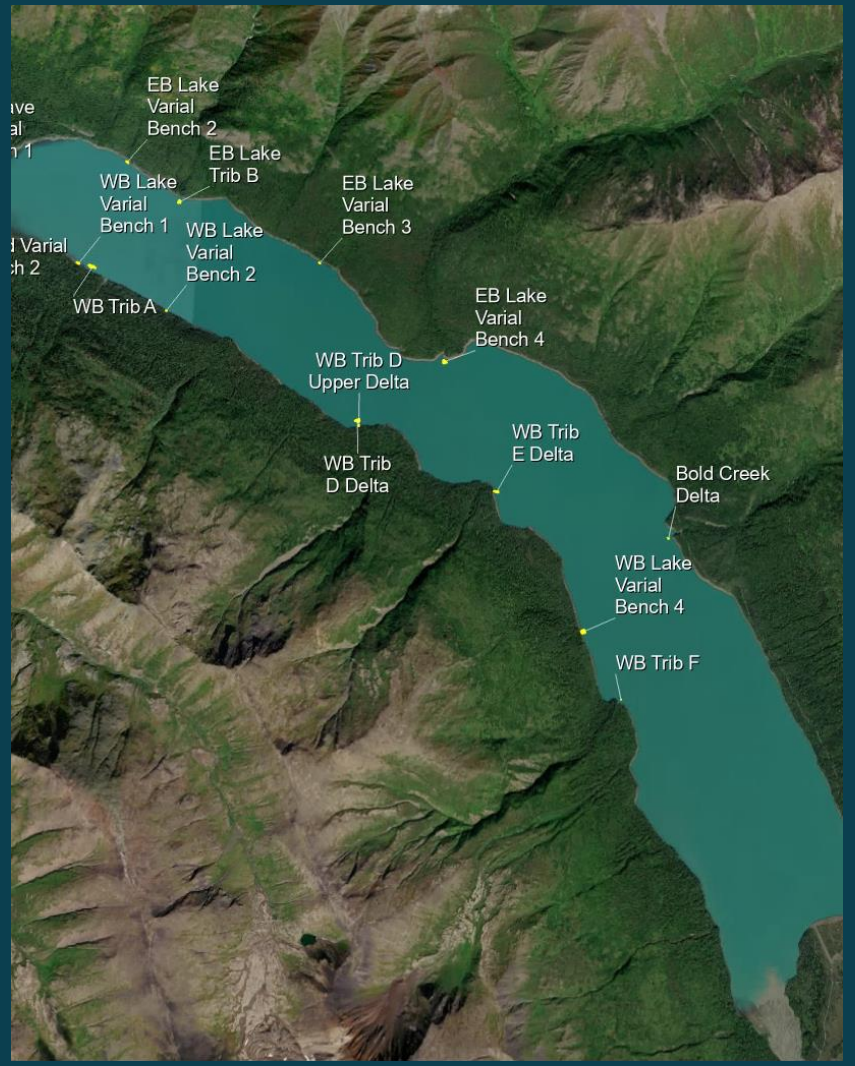
Fish Passage:

(E. & W. Forks Eklutna Creek)

Spawning Habitat:	1.145 Acres (50% Suitability)
Rearing Habitat:	Unknown

(Eklutna Lake Shoreline)

Spawning Habitat:	2.6 Acres (w/o Fluctuation)
Spawning Habitat:	0.03 Acres (w Existing Fluctuation)
Rearing Habitat:	Low Productivity



Alternatives Analysis

Stakeholder Engagement

Received ~36 total comprehensive alternatives from the following entities:

- Native Village of Eklutna (NVE)
- Alaska Department of Fish and Game (ADFG)
- Chugach State Park (ADNR)
- National Marine Fisheries Service (NMFS)
- U.S. Fish & Wildlife Service (USFWS)
- Trout Unlimited (TU)
- The Conservation Fund (TCF)
- Hydro Project Owners (CEA/MEA/MOA)

Note: ADNR Dam Safety has no comments on flow regime but will have input on any modifications to the dam and appurtenant structures.

Stakeholder Preferred Alternatives

Native Village of Eklutna

- Replacement Dam / US Passage / DS Passage Spill 3 Months / Infrastructure Improvements

USFWS

- Plan A – Replacement Dam / US Passage / DS Passage FSC / Infrastructure Improvements
- Plan B – Existing Dam / FWG / US Passage / DS Passage FSC / Infrastructure Improvements
- Plan C – Existing Dam / FWG / No Passage / Infrastructure Improvements
- Plan D – AWWU Portal / FWG / No Passage / Infrastructure Improvements

The Conservation Fund

- Plan A – Replacement Dam / US Passage / DS Passage Spill 3 Months / Infrastructure Improvements
- Plan B – Existing Dam / FWG / US Passage / DS Passage FSC / Infrastructure Improvements

NMFS

- Plan A – Replacement Dam / US Passage / DS Passage FSC / Infrastructure Improvements
- Plan B – AWWU Portal / FWG / No Passage / Infrastructure Improvements

ADFG

- AWWU Portal / No Passage / Infrastructure Improvements

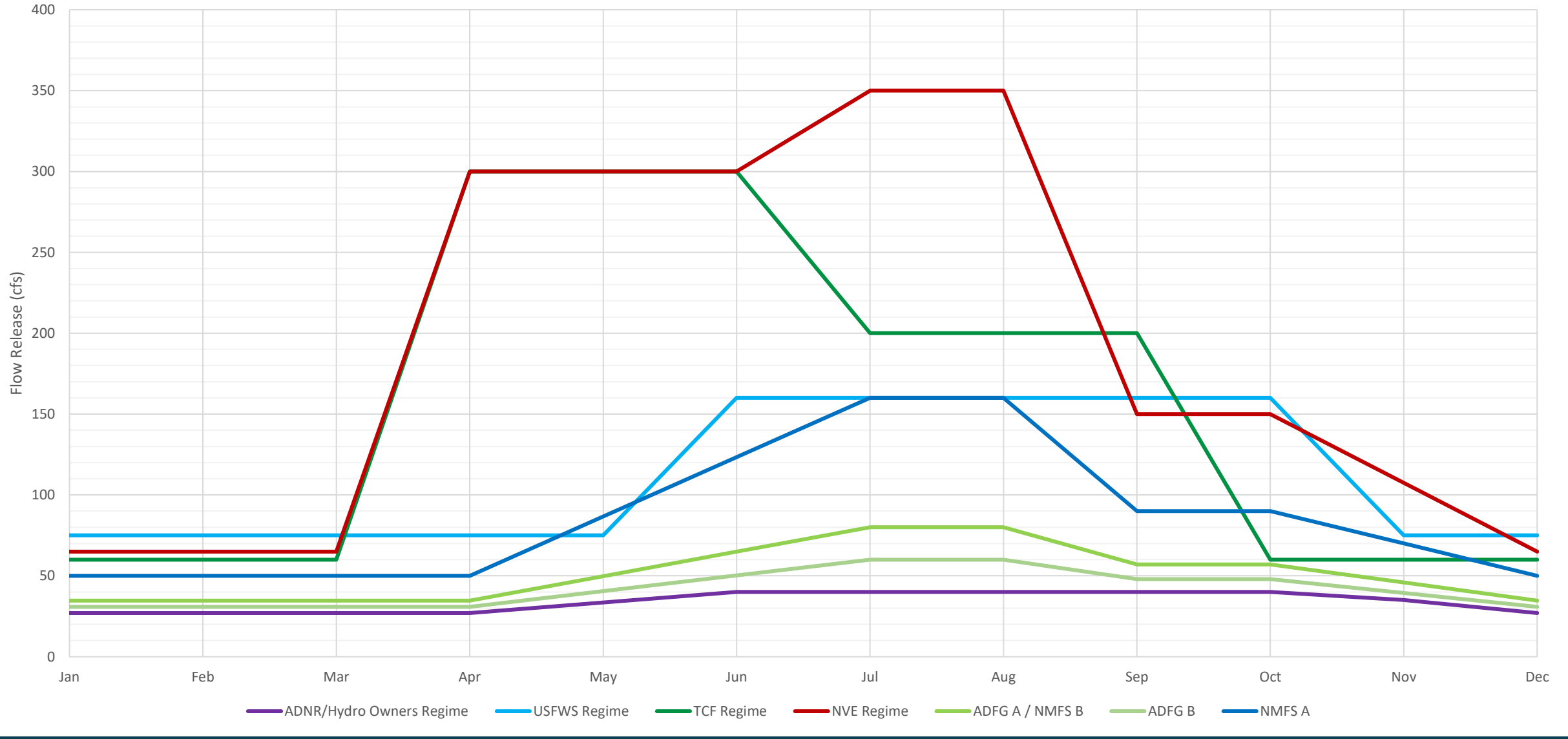
Hydro Project Owners

- AWWU Portal / No Passage / Infrastructure Improvements

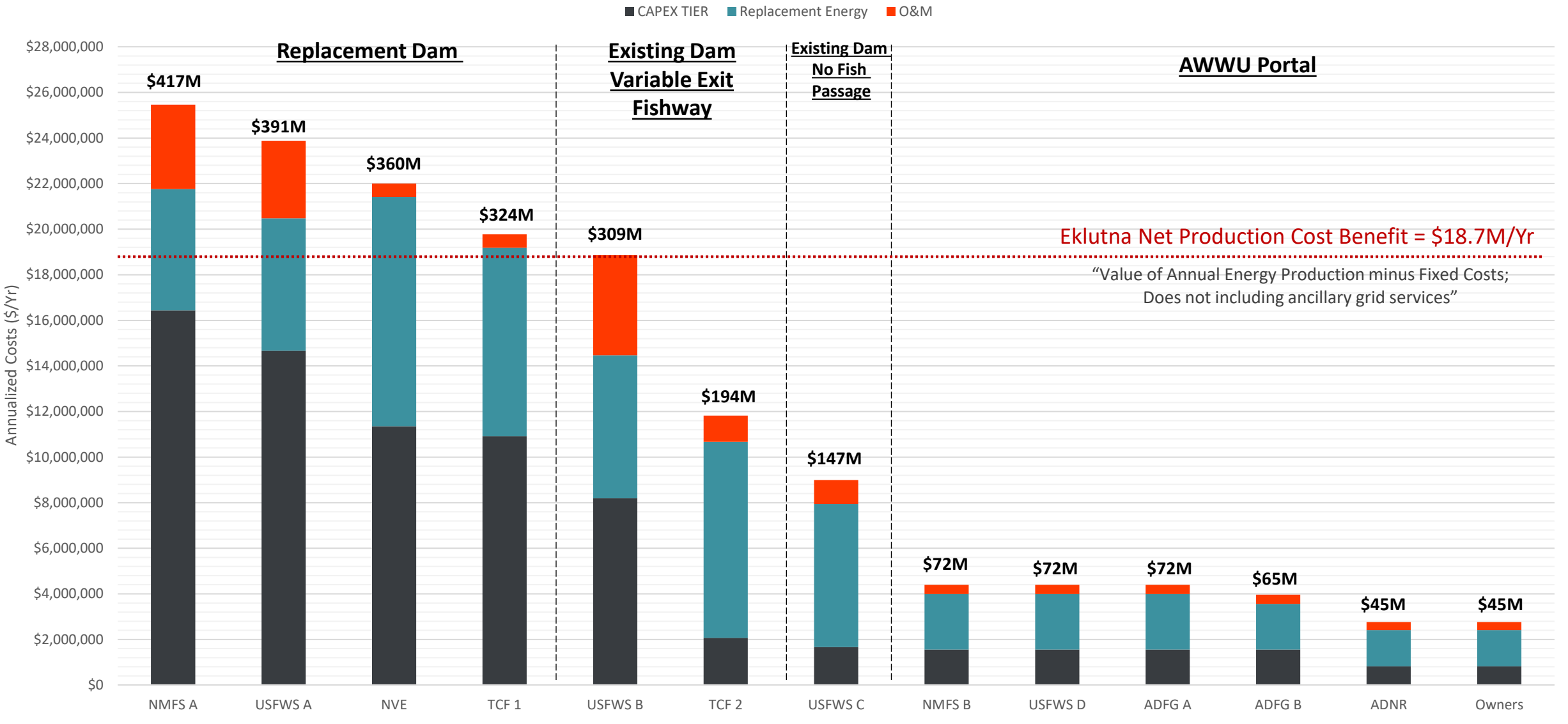
ADNR – State Parks

- AWWU Portal / No Passage / Infrastructure Improvements

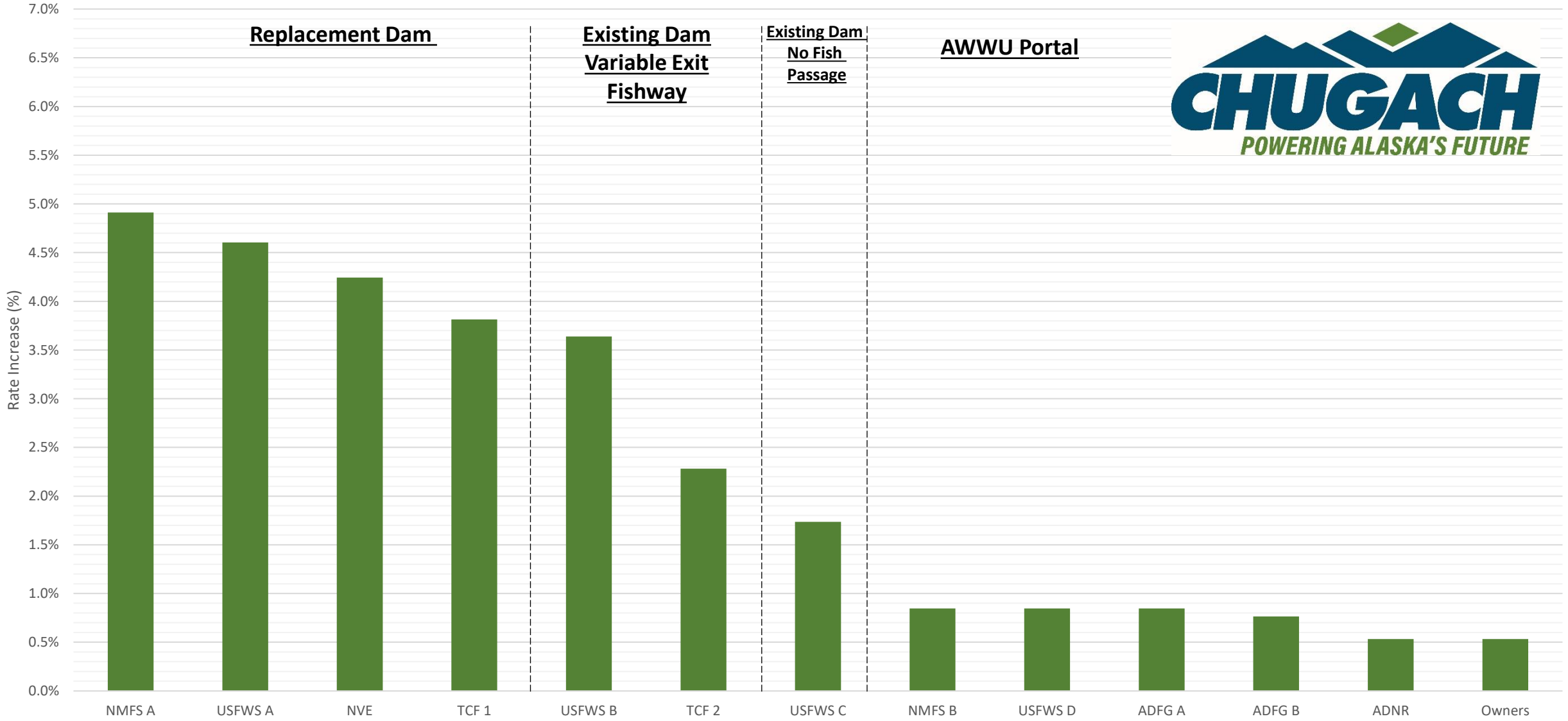
Preferred Flow Regimes



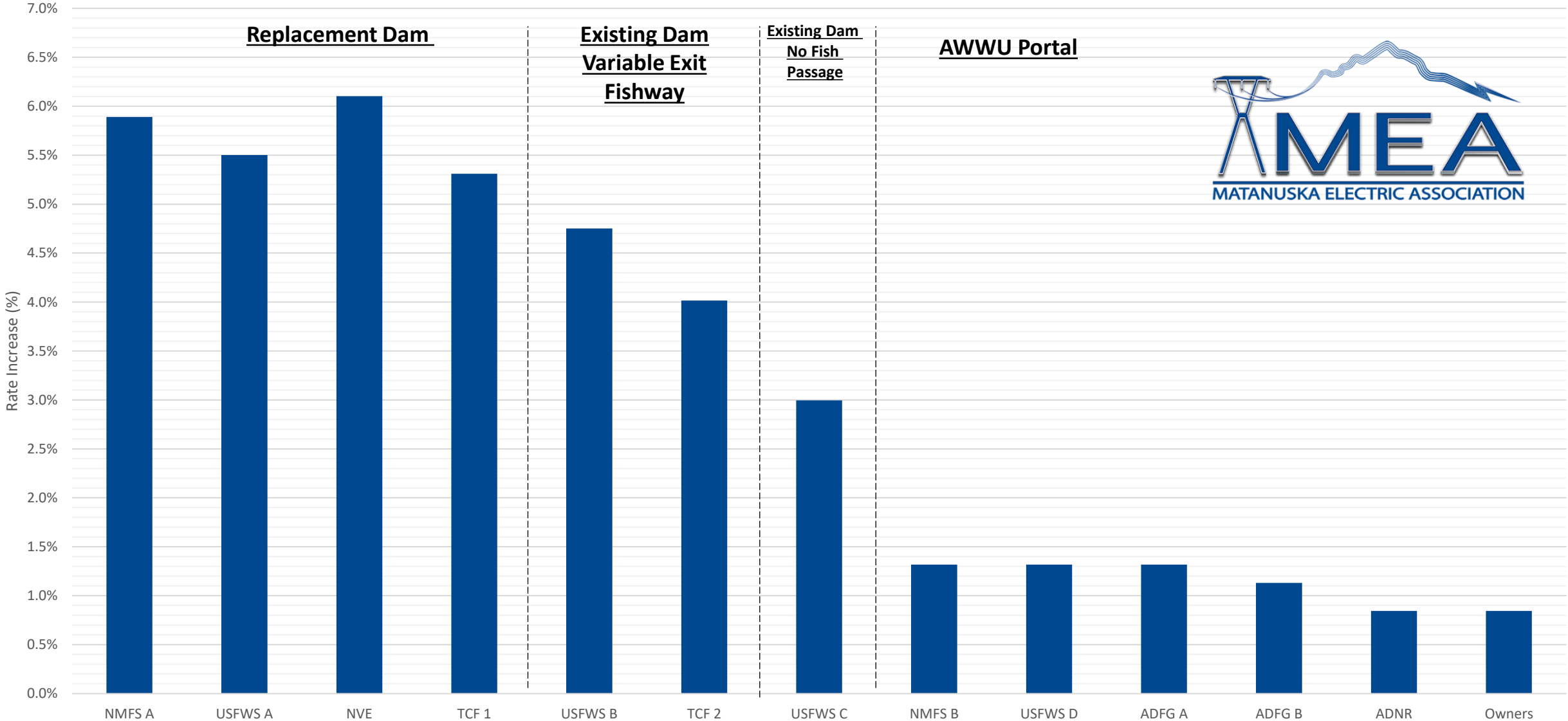
Annualized Costs / Present Value



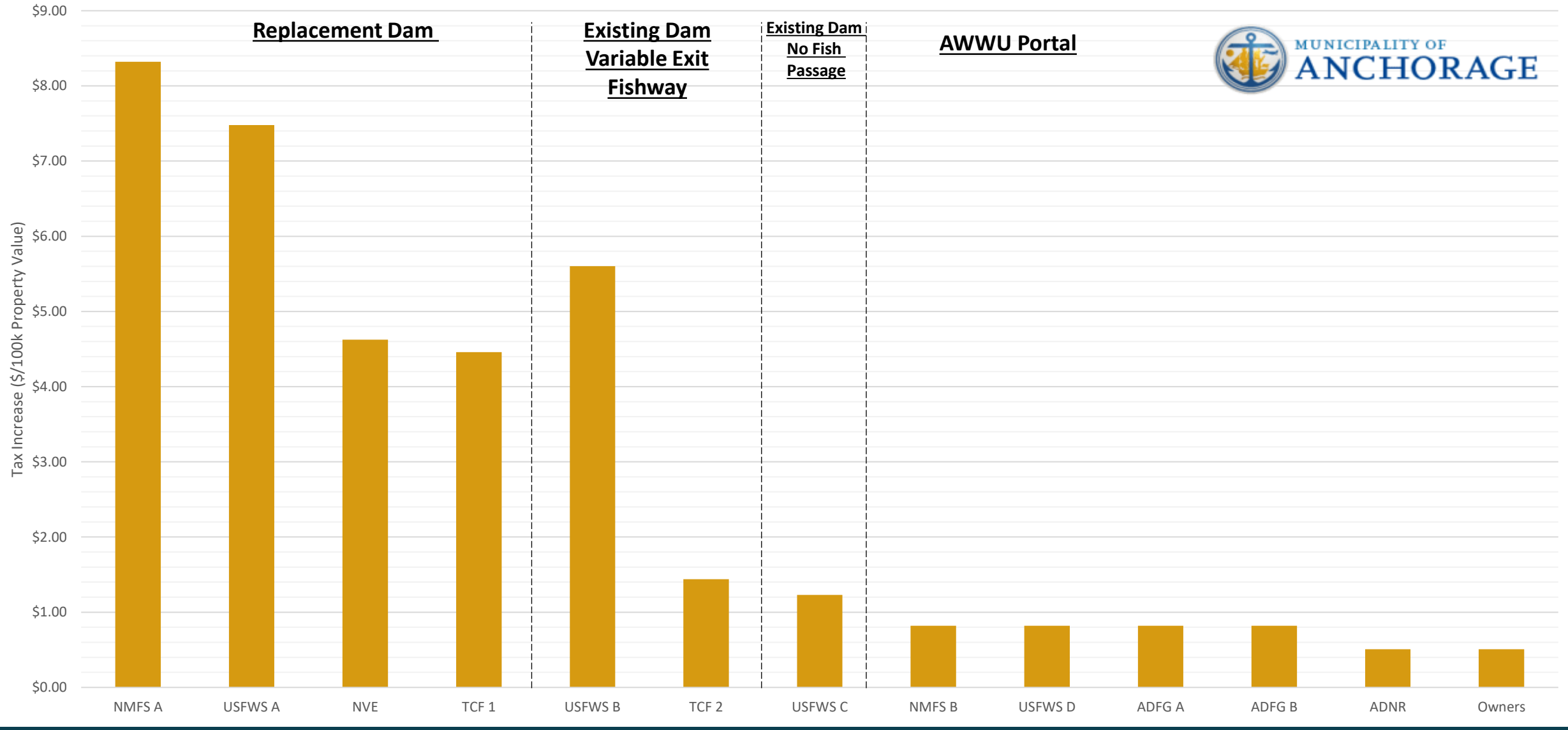
Chugach Electric Ratepayer Impacts



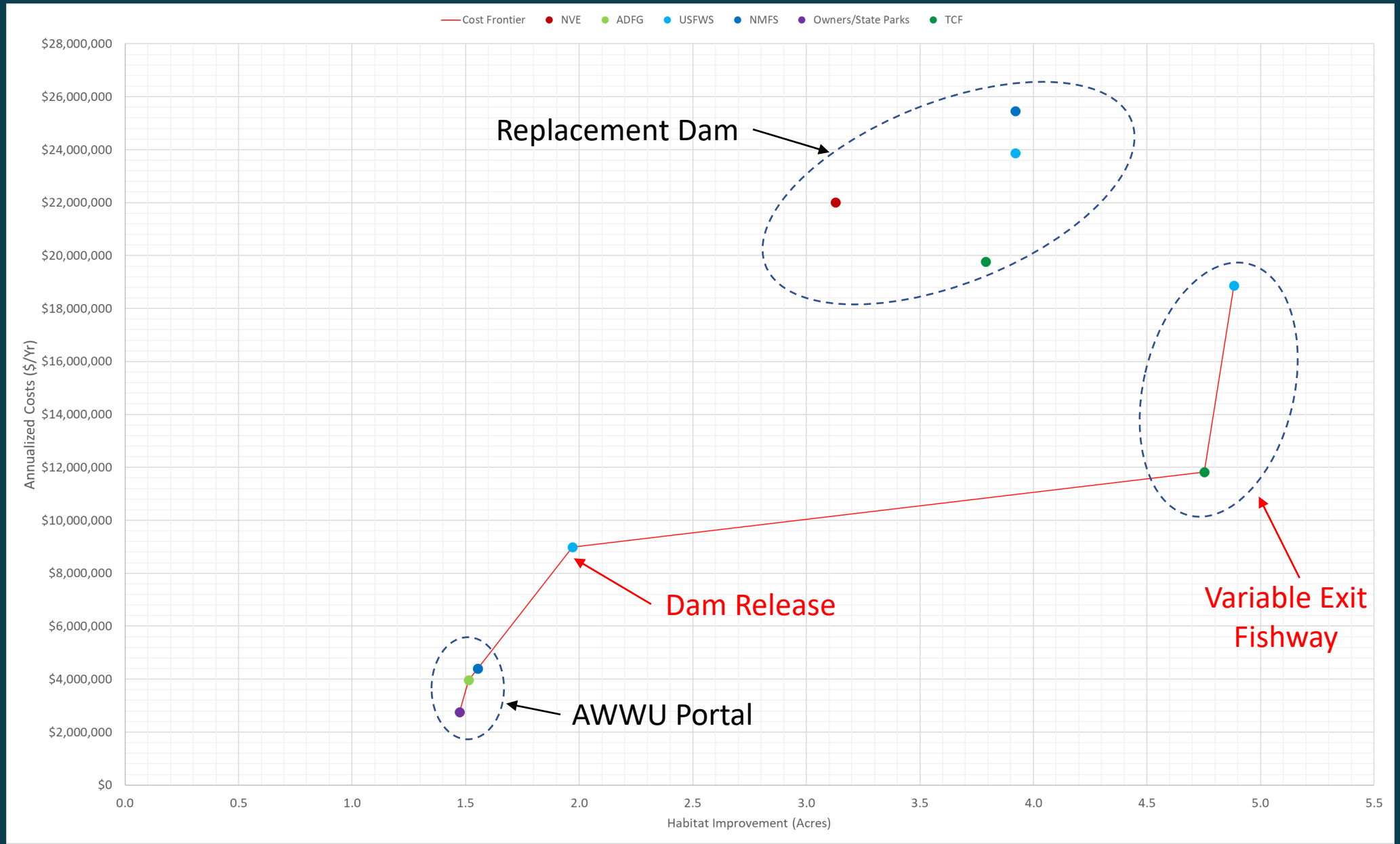
Matanuska Electric Ratepayer Impacts



MOA Property Tax Impacts



Cost Effectiveness – Chinook Spawning Habitat



Cost Effectiveness – Chinook Spawning Habitat

Cost Effective Alternatives for Habitat Gains

- AWWU Portal – Flow Level 1
  - Owner/ADNR Alternative
  - Annual Costs - $2.8M
  - Habitat Gains – 1.5 Acres
  - **$1.9M/Acre**
- AWWU Portal – Flow Level 2
  - ADFG Alternative
  - Annual Costs - $4.0M
  - Habitat Gains – 1.5 Acres
  - **$2.6M/Acre**
- AWWU Portal – Flow Level 3
  - ADFG/NMFS Alternative
  - Annual Costs - $4.4M
  - Habitat Gains – 1.6 Acres
  - **$2.8M/Acre**
- Dam Release – USFWS Alt 1 Regime
  - USFWS Alternative
  - Annual Costs - $9.0M
  - Habitat Gains – 2.0 Acres
  - **$4.6M/Acre**
- Variable Exit Fishway – TCF Regime
  - TCF Alternative
  - Annual Costs - $11.8M
  - Habitat Gains – 4.8 Acres
  - **$2.5M/Acre**
- Variable Exit Fishway – USFWS Alt 1 Regime
  - USFWS Alternative
  - Annual Costs - $18.9M
  - Habitat Gains – 4.9 Acres
  - **$3.8M/Acre**

Alternatives Analysis Meeting 4

- Presented everyone's preferred alternative(s)
- Presented results for potential velocity barriers in the canyon reach
- Discussed potential positive and negative impacts to:
  - Wetlands and Wildlife Habitat
  - Public Water Supply
  - Recreational Facilities and Uses
  - Historic Resources

Next Steps

Next Steps

- **August 2023** – Alternatives Analysis Meeting 5
  - Discuss an appropriate monitoring program and adaptive management approach
- **October 2023** – Distribute Draft Fish and Wildlife Program
  - 30 days for review and comment
  - Attempt to resolve differences
- **January 2024** – Public Meetings (Anchorage and Mat-Su Valley)
- **April 2024** – Submit Proposed Final Fish and Wildlife Program
  - 60 days for parties to review and comment
  - 30 days for project owners to respond
  - Allows 2 months for Governor to consider
- **October 2024** – Governor issues Final Fish and Wildlife Program


McMillen

Chugach Electric Association, Inc.
Anchorage, Alaska

Summary of Executive Session Topics for
Operations Committee Meeting on July 12, 2023
Agenda Item VI.

A. Discussion of confidential and commercially sensitive information concerning natural gas supply, public disclosure of which could have an adverse effect on the finances and legal position of the Association. (AS 10.25.175(c)(1) and (3))

B. Discussion regarding personnel matters concerning the Chief Executive Officer's Project Specific Initiatives and Priority Areas of the Association. (AS 10.25.175(c)(4))