



City and Borough of Wrangell  
2020-03-24 Borough Assembly Meeting  
AGENDA

Tuesday, March 24, 2020 at 6:00 PM

Location: TEMPORARILY TELEPHONIC

**This action is the result of Resolution No. 03-20-1520, allowing the temporary suspension of in-person Assembly Meetings and allowing for teleconference meetings, until further notice.**

**CALL-IN Teleconference Information for anyone wishing to call into the meeting and speak under Persons to be Heard (Item no. 3).**

**If you wish to speak under Persons to be Heard, please text the Borough Clerk at 907-617-0415 or email to: [clerk@wrangell.com](mailto:clerk@wrangell.com). You will be called in the order that your request is received.**

**Please note that KSTK is still broadcasting the Borough Assembly meetings. Therefore, if you wish only to listen in, you may do so by tuning into KTSK!**

**Here is the Call-in information for Persons to be Heard:**

**By Computer:**

**<https://zoom.us/j/9076170415>**

**And Enter the Meeting ID: 907 617 0415**

**OR**

**Dial by your location**

**+1 669 900 9128 US (San Jose)**

**+1 346 248 7799 US (Houston)**

**+1 301 715 8592 US**

**+1 312 626 6799 US (Chicago)**

**+1 646 558 8656 US (New York)**

**+1 253 215 8782 US**

**Meeting ID: 907 617 0415 then enter #**

**CALL TO ORDER**

a. PLEDGE OF ALLEGIANCE led by Assembly Member Patty Gilbert

b. CEREMONIAL MATTERS

**i.** Wrangell Public School District FY 2021 Annual Budget

**2. ROLL CALL**

**PERSONS TO BE HEARD**

- [a.](#) Temporary Telephonic Process for Persons to be Heard

#### **4. AMENDMENTS TO THE AGENDA**

#### **5. CONFLICT OF INTEREST**

#### **6. CONSENT AGENDA**

- [a.](#) Consent Agenda - MOTION ONLY
- [b.](#) Minutes from the March 10, 2020 Regular Assembly Mtg.
- [c.](#) Minutes from the March 17, 2020 Special Emergency Meeting

#### **7. BOROUGH MANAGER'S REPORT**

- [a.](#) Capital Facilities Department Report
- [b.](#) Former Institute Property Development Status Report
- [c.](#) Truly360 and Google My Business Status Report
- [d.](#) February Permanent Fund APCM Report
- [e.](#) USFS Monthly Report

#### **8. BOROUGH CLERK'S FILE**

- a. Borough Clerk's Report - None.

#### **9. MAYOR AND ASSEMBLY BUSINESS**

#### **10. MAYOR AND ASSEMBLY APPOINTMENTS**

#### **11. PUBLIC HEARING**

#### **12. UNFINISHED BUSINESS**

#### **13. NEW BUSINESS**

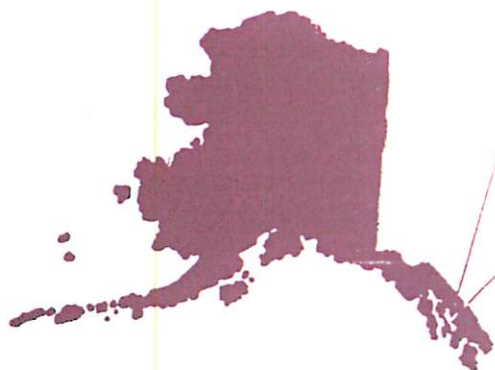
- [a.](#) **RESOLUTION No 03-20-1520** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL ALASKA ESTABLISHING ALTERNATIVE 1: SPILLWAY TRENCH AND SIPHON AS THE PREFERRED ALTERNATIVE FOR THE RESERVOIR BYPASS PROJECT
- [b.](#) **RESOLUTION No 03-20-1521** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA ADOPTING THE WRANGELL MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN
- [c.](#) **RESOLUTION No 03-20-1522** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA AMENDING THE JOB DESCRIPTION OF THE ASSISTANT DIESEL MECHANIC TO INCLUDE METER READING RESPONSIBILITIES
- [d.](#) Approval to Purchase Quantifit Respirator Fit Testing System in the Amount of \$8,373.10

#### **14. ATTORNEY'S FILE** – Available for Assembly review in the Borough Clerk's office

#### **15. EXECUTIVE SESSION**

- [a.](#) Executive Session: Collective Bargaining Strategy

#### **ADJOURNMENT**



**WRANGELL  
PUBLIC SCHOOLS**  
DISTRICT OFFICE

GATEWAY TO THE STIKINE

P.O. BOX 2319  
WRANGELL, ALASKA 99929  
Telephone (907) 874-2347  
Fax # (907) 874-3137

March 17, 2020

Stephen Prysunka, Mayor  
City & Borough of Wrangell, Alaska  
P.O. Box 531  
Wrangell, AK 99929-0531

Dear Mayor Prysunka & Assembly Members:

Please find attached the Fiscal Year 2021 school budget adopted by the School Board during their regular meeting on Monday, March 16, 2020.

Please feel free to contact me if you have questions or need clarification on any parts of the budget.

Sincerely,

A handwritten signature in blue ink that reads "Dr. Debbie Lancaster". The signature is written in a cursive, flowing style.

Dr. Debbie Lancaster  
Superintendent

DL:kjp

## Wrangell Public Schools

General (School Operating) Fund  
 Schedule of Revenues, Expenditures and  
 Changes in Fund Balance - Budget and Actual  
 FY 2021

Period Ended June 30,		FY18 Actual	FY19 Actual	FY20 Budget	FY21 Budget	Difference in Budgets
<b>Revenues</b>						
Local sources:						
100-000-010	Borough appropriation - City and Borough of Wrangell	\$ 667,799	\$ 583,619	\$ 610,329	\$ 583,830	\$ (26,499)
100-000-030	Earnings on investments	715	462	701	701	-
100-000-040	Other local revenues	48,742	129,457	41,114	60,000	18,886
100-000-047	E-Rate	75,952	85,697	76,569	84,454	7,885
Total local sources		793,208	799,235	728,713	728,985	272
State of Alaska:						
100-000-050	Foundation	3,612,769	3,879,785	3,756,369	3,882,367	125,998
100-550-056	TRS on behalf	273,489	273,674	300,844	300,000	(844)
100-000-057	PERS on behalf	32,523	51,022	55,000	55,000	-
Total State of Alaska		3,918,781	4,204,481	4,112,213	4,237,367	125,154
Federal sources:						
100-000-190	Timber receipts passed through City and Borough of Wrangell	848,489	848,488	689,671	716,170	26,499
100-000-100	Direct educational grants - federal impact aid	2,890	2,928	-	-	-
Total federal sources		851,379	851,416	689,671	716,170	26,499
Total Revenues		5,563,368	5,855,132	5,530,597	5,682,522	151,925
<b>Expenditures</b>						
Instruction:						
100-100-310	Certificated salaries	1,345,202	1,499,390	1,575,802	1,616,829	41,027
100-100-320	Noncertificated salaries	71,144	79,139	71,469	125,904	54,435
100-100-350	Employee benefits	702,472	824,027	931,118	1,011,604	80,486
100-100-410	Professional and technical services	80	125	5,000	-	(5,000)
100-100-420	Staff travel	2,153	2,758	5,000	3,000	(2,000)
100-100-425	Student travel	4,475	1,160	6,000	5,000	(1,000)
100-100-440	Other purchased services	5,565	7,171	7,300	7,500	200
100-100-450	Supplies, materials and media	107,699	126,066	126,648	100,000	(26,648)
100-100-490	Other expenditures	17,544	60	739	500	(239)
100-100-510	Equipment	28,604	8,134	13,762	10,000	(3,762)
Total Instruction		2,284,938	2,548,030	2,742,838	2,880,337	137,499
				1,314.22	1,182.80	
				175.00	175.00	
				229,988.50	206,990.00	



## Wrangell Public Schools

## General (School Operating) Fund

## Schedule of Revenues, Expenditures and

## Changes in Fund Balance - Budget and Actual, continued

FY 2021

Period Ended June 30,		FY18 Actual	FY19 Actual	FY20 Budget	FY21 Budget	Difference in Budgets	
<b>Expenditures, continued</b>							
<b>Special education instruction:</b>							
100-200-310	Certificated salaries	\$ 146,178	\$ 125,215	\$ 125,250	\$ 129,244	\$ 3,994	
100-200-320	Noncertificated salaries	188,154	153,477	199,916	217,444	17,528	less \$15K
100-200-350	Employee benefits	142,444	126,070	153,327	180,552	27,225	less \$10K
100-200-410	Professional and technical services	-	30,792	29,953	35,000	5,047	
100-200-420	Staff travel	122	300	10,000	500	(9,500)	
100-200-425	Student travel	-	57	-	-	-	
100-200-450	Supplies, materials and media	5,313	4,152	8,696	6,000	(2,696)	
100-200-490	Other expenditures	83	-	-	-	-	
100-200-510	Equipment	2,028	-	619	-	(619)	
<b>Total special education instruction</b>		<b>484,322</b>	<b>440,063</b>	<b>527,761</b>	<b>568,740</b>	<b>40,979</b>	
<b>Special education support services - students:</b>							
100-220-320	Noncertificated salaries	16,914	15,126	46,089	12,614	(33,475)	
100-220-350	Employee benefits	17,839	11,912	20,704	8,175	(12,529)	
100-220-410	Professional and technical services	32,493	43,835	-	30,000	30,000	
100-220-450	Supplies, materials and media	-	-	870	1,000	130	
100-220-490	Other expenditures	181	-	-	-	-	
100-220-510	Equipment	-	-	500	-	(500)	
<b>Total special education support services - students</b>		<b>67,427</b>	<b>70,873</b>	<b>68,163</b>	<b>51,790</b>	<b>(16,373)</b>	
<b>Support services - students:</b>							
100-300-310	Certificated salaries	81,043	79,207	12,333	16,125	3,792	
100-300-320	Noncertificated salaries	530	-	-	-	-	
100-300-350	Employee benefits	48,656	40,775	3,667	8,530	4,863	
100-300-410	Professional and technical services	8,237	50,000	-	20,000	20,000	
100-300-420	Staff travel	-	-	-	-	-	
100-300-450	Supplies, materials and media	636	559	250	600	350	
100-300-490	Other expenditures	-	1,758	-	1,000	1,000	
<b>Total support services - students</b>		<b>139,102</b>	<b>172,299</b>	<b>16,250</b>	<b>46,255</b>	<b>30,005</b>	

## Wrangell Public Schools

General (School Operating) Fund  
 Schedule of Revenues, Expenditures and  
 Changes in Fund Balance - Budget and Actual, continued  
 FY 2021

		FY18	FY19	FY20	FY21	Difference
	<i>Period Ended June 30,</i>	Actual	Actual	Budget	Budget	In Budgets
<b>Expenditures, continued</b>						
<b>Support services - Instruction:</b>						
100-350-320	Noncertificated salaries	\$ 133,731	\$ 143,559	\$ 134,971	\$ 59,252	\$ (75,719)
100-350-350	Employee benefits	90,858	109,799	112,349	91,505	(20,844)
100-350-410	Professional and technical services	7,546	5,212	19,200	30,000	10,800
100-350-420	Staff travel	1,818	3,001	2,000	3,000	1,000
100-350-430	Utility services	125,038	113,355	116,535	127,000	10,465
100-350-440	Other purchased services	-	-	3,000	-	(3,000)
100-350-450	Supplies, materials and media	12,409	11,250	23,082	20,000	(3,082)
100-350-490	Other expenditures	2,406	410	500	1,000	500
100-350-510	Equipment	3,664	-	5,000	-	(5,000)
<b>Total support services - Instruction</b>		<b>377,470</b>	<b>386,586</b>	<b>416,637</b>	<b>331,757</b>	<b>(84,880)</b>
<b>School administration:</b>						
100-400-310	Certificated salaries	181,405	186,522	127,411	122,470	(4,941)
100-400-320	Noncertificated salaries	9,356	3,940	-	-	-
100-400-350	Employee benefits	84,030	81,674	96,773	68,250	(28,523)
100-400-420	Staff travel	4,398	5,828	8,000	8,000	-
100-400-430	Utility services	3,850	3,345	4,690	5,000	310
100-400-440	Other purchased services	228	72	1,039	500	(539)
100-400-450	Supplies, materials and media	3,045	1,856	1,500	15,000	13,500
100-400-490	Other expenditures	1,214	1,596	1,500	1,000	(500)
100-400-510	Equipment	3,598	-	-	-	-
<b>Total school administration</b>		<b>291,124</b>	<b>284,833</b>	<b>240,913</b>	<b>220,220</b>	<b>(20,693)</b>
<b>School administration support services:</b>						
100-450-320	Noncertificated salaries	117,045	99,428	105,735	87,997	(17,738)
100-450-350	Employee benefits	84,743	64,448	76,308	83,464	7,156
100-450-410	Professional and technical services	-	-	1,000	-	(1,000)
100-450-430	Utility services	5,748	5,308	5,840	6,500	660
100-450-440	Other purchased services	5,565	5,379	8,400	5,000	(3,400)
100-450-450	Supplies, materials and media	2,098	1,580	9,000	1,500	(7,500)
100-450-490	Other expenditures	99	-	100	-	(100)
100-450-510	Equipment	679	-	-	-	-
<b>Total school administration support services</b>		<b>215,977</b>	<b>176,143</b>	<b>206,383</b>	<b>184,461</b>	<b>(21,922)</b>

## Wrangell Public Schools

General (School Operating) Fund  
 Schedule of Revenues, Expenditures and  
 Changes in Fund Balance - Budget and Actual, continued  
 FY 2021

<i>Period Ended June 30,</i>		FY18	FY19	FY20	FY21	Difference
		Actual	Actual	Budget	Budget	In Budgets
<b>Expenditures, continued</b>						
District administration:						
100-510-310	Certificated salaries	\$ 118,397	\$ 107,000	\$ 104,860	\$ 90,950	\$ (13,910)
100-510-350	Employee benefits	54,945	42,247	47,264	37,685	(9,579)
100-510-390	Transportation allowance	5,000	-	-	-	-
100-510-410	Professional and technical services	41,646	7,178	8,600	25,000	16,400
100-510-420	Staff travel	23,740	21,511	32,005	25,000	(7,005)
100-510-430	Utility services	2,467	1,396	2,500	5,000	2,500
100-510-450	Supplies, materials and media	3,798	9,734	7,000	5,000	(2,000)
100-510-490	Other expenditures	10,643	7,773	4,608	7,000	2,392
100-510-510	Equipment	1,249	-	-	-	-
<b>Total district administration</b>		<b>261,885</b>	<b>196,839</b>	<b>206,837</b>	<b>195,635</b>	<b>(11,202)</b>
District administration support services:						
100-550-320	Noncertificated salaries	177,202	179,236	208,372	203,701	(4,671) less \$25K
100-550-350	Employee benefits	108,340	117,023	140,539	163,076	22,537
100-550-410	Professional and technical services	82,865	148,115	106,900	115,000	8,100
100-550-420	Staff travel	5,569	4,904	6,495	5,000	(1,495)
100-550-430	Utility services	4,169	2,503	4,100	2,500	(1,600)
100-550-440	Other purchased services	2,915	4,028	4,300	4,000	(300)
100-550-445	Insurance and bond premiums	10,563	16,213	89,662	89,000	(662)
100-550-450	Supplies, materials and media	3,952	9,140	56,107	25,000	(31,107)
100-550-490	Other expenditures	20,902	15,600	13,224	15,000	1,776
100-550-495	Indirect costs	(34,193)	(26,983)	(35,183)	(35,318)	(135)
100-550-510	Equipment	-	-	2,619	-	(2,619)
<b>Total district administration support services</b>		<b>382,284</b>	<b>469,779</b>	<b>597,135</b>	<b>586,959</b>	<b>(10,176)</b>

## Wrangell Public Schools

General (School Operating) Fund  
 Schedule of Revenues, Expenditures and  
 Changes in Fund Balance - Budget and Actual, continued  
 FY 2021

Period Ended June 30,		FY18	FY19	FY20	FY21	Difference	
		Actual	Actual	Budget	Budget	In Budgets	
<b>Expenditures, continued</b>							
<b>Operations and maintenance of plant:</b>							
100-600-320	Noncertificated salaries	\$ 240,151	\$ 238,404	\$ 190,716	\$ 193,642	\$ 2,926	less \$25K
100-600-350	Employee benefits	144,082	169,091	171,604	225,965	54,361	
100-600-410	Professional and technical services	20,385	12,710	84,847	34,800	(50,047)	
100-600-420	Staff travel	-	1,280	2,000	2,000	-	
100-600-430	Utility services	30,334	31,146	40,970	30,600	(10,370)	
100-600-435	Energy	208,414	247,991	247,168	240,000	(7,168)	
100-600-440	Other purchased services	3,079	4,117	28,000	18,000	(10,000)	
100-600-445	Insurance and bond premiums	38,504	43,065	-	-	-	
100-600-450	Supplies, materials and media	22,059	37,066	54,283	35,000	(19,283)	
100-600-510	Equipment	2,418	6,818	2,000	-	(2,000)	
<b>Total operations and maintenance of plant</b>		<b>709,426</b>	<b>791,688</b>	<b>821,588</b>	<b>780,007</b>	<b>(41,581)</b>	
<b>Student activities:</b>							
100-700-310	Certificated salaries	20,408	21,266	27,951	20,000	(7,951)	plus \$75K
100-700-320	Noncertificated salaries	64,875	53,389	47,694	40,000	(7,694)	
100-700-350	Employee benefits	15,598	11,820	15,443	15,000	(443)	
100-700-410	Professional and technical services	6,671	4,950	500	3,000	2,500	
100-700-420	Staff travel	5,807	3,151	5,000	3,500	(1,500)	
100-700-425	Student travel	105,111	126,607	140,675	125,000	(15,675)	
100-700-440	Other purchased services	-	150	346	300	(46)	
100-700-450	Supplies, materials and media	13,780	54,804	20,000	20,000	-	
100-700-490	Other expenditures	3,799	4,171	6,600	5,000	(1,600)	
<b>Total student activities</b>		<b>236,049</b>	<b>280,308</b>	<b>264,209</b>	<b>231,800</b>	<b>(32,409)</b>	
100-790-350	Food services - employee benefits	657	1,340	-	-	-	
<b>Total Expenditures</b>		<b>5,450,661</b>	<b>5,818,781</b>	<b>6,108,714</b>	<b>6,077,960</b>	<b>(30,754)</b>	
<b>Excess (Deficiency) of Revenues Over Expenditures</b>		<b>112,707</b>	<b>36,351</b>	<b>(578,117)</b>	<b>(395,438)</b>	<b>182,679</b>	
<b>Other Financing Sources (Uses)</b>							
Transfers in		-	-	668,117	-	(668,117)	
Transfers to		(120,000)	-	(90,000)	(61,994)	28,006	
<b>Net Change in Fund Balance</b>		<b>(7,293)</b>	<b>36,351</b>	<b>-</b>	<b>(457,432)</b>	<b>(457,432)</b>	
<b>Fund Balance, beginning of year</b>		<b>549,941</b>	<b>542,648</b>	<b>578,999</b>	<b>578,999</b>	<b>-</b>	
<b>Fund Balance, end of year</b>		<b>\$ 542,648</b>	<b>\$ 578,999</b>	<b>\$ 578,999</b>	<b>\$ 121,567</b>	<b>\$ (457,432)</b>	



## PUBLIC NOTICE

### TEMPORARY TELEPHONIC PROCESS FOR PERSONS TO BE HEARD AT MARCH 24, 2020 WRANGELL BOROUGH ASSEMBLY MEETING

The Wrangell Borough Assembly will hold their Regular Meeting on Tuesday, March 24, 2020 via teleconference. The following alternate methods for Persons To Be Heard have been created:

#### How To Virtually Attend The Meeting:

Call 1-877-378-0449 and enter the code: 5052 7375

#### How To Submit Your Name for Persons To Be Heard:

1. Email your written comments to [clerk@wrangell.com](mailto:clerk@wrangell.com). Emails received by 4:00 p.m. on Tuesday, March 24, 2020 will be read aloud by the Borough Clerk.
2. Sign up to be called on the telephone during the meeting to provide your comments directly via telephone. Call or text the Borough Clerk at (907) 617-0415, or send your contact information to [clerk@wrangell.com](mailto:clerk@wrangell.com), including your full name and the subject you wish to comment on.

Calls and emails received by the Borough Clerk by 4:00 p.m. on Tuesday, March 24, 2020 will be included in the meeting record. Dial into the teleconference via the number above and be prepared to speak when called upon, during that section of the agenda. The meeting will begin at 6:00 p.m.

Comments will be read, and persons will be called upon in the order they were received by the Borough Clerk. All comments will be limited to three minutes, if needed, as usual.

Thank You For Your Cooperation!

The critical need to follow healthcare guidelines cannot be emphasized enough right now. We must do everything we can to protect the health and safety of our community. Receiving input from citizens is very important to everyone at the city, and we appreciate everyone's cooperation in respecting our request to attend the meeting virtually.

**CITY & BOROUGH OF WRANGELL, ALASKA****Consent Agenda MOTION*****Move to approve the Consent Agenda as submitted.*****SUBMITTED BY:**

Kim Lane, Borough Clerk

**INFORMATION:**

***Consent agenda.*** Items listed on the consent agenda or marked with an asterisk (\*) are considered routine and will be passed in one motion; provided, upon the request of any member, the manager, or the clerk, an item on the consent agenda shall be removed from the consent agenda and placed under New Business for assembly action.

## Minutes of Regular Assembly Meeting

**Held on March 10, 2020**

Vice-Mayor Gilbert called the Regular Assembly meeting to order at 7:00 p.m., March 10, 2020, in the Borough Assembly Chambers. The pledge was led by Assembly Member Powell and the roll was called.

PRESENT: POWELL, DECKER, GILBERT, LARRABEE, DELONG

ABSENT: PRYSUNKA, MORRISON

Borough Manager Von Barga and Borough Clerk Lane were also in attendance.

CEREMONIAL MATTERS – None.

PERSONS TO BE HEARD – None.

### AMENDMENTS TO THE AGENDA

Item 15a (Executive Session: Collective Bargaining Strategy) was removed from the Agenda at the request of Manager Von Barga. There were no objections from the Assembly.

CONFLICT OF INTEREST– None.

### CONSENT AGENDA

- a. Assembly Minutes from Regular February 25, 2020
- b. POA-2019-00113 Letter of Permission request by William Rosborough for a dock (Zimovia Straight Waterway)
- c. CORRESPONDENCE: School Board Minutes from December 16, 2019 Meeting
- d. CORRESPONDENCE - School Board Minutes from January 20, 2020 Meeting

***M/S: Decker/Powell to approve the Consent Agenda, as presented. Motion approved unanimously by polled vote.***

### BOROUGH MANAGER'S REPORT

Von Barga provided updates on the following:

- Corona Virus and Oil prices will have tremendous trickle-down effect on municipalities
- State has instituted an out-of-state travel ban
- City of Ketchikan has instituted a 30 day travel ban
- Working diligently with SEARHC on preparedness and will be issuing weekly news releases
- Backup generator for the airport was taken off the priority list; portable light plant is shared around the area; may need to revisit this as a priority
- Experiencing issues with the Nolan Center structure
- Hazard Mitigation Plan has been approved by FEMA; will need to be approved by the Assembly; WCA and Tlingit & Haida Central Council will also review it however, only one of the three entities needs to approve it within the next year



- Budget Work Sessions have begun

#### BOROUGH CLERK'S FILE

Clerk Lane's report was provided.

#### MAYOR AND ASSEMBLY BUSINESS

Powell attended SSRAA meetings; fish returns do not look good.

#### MAYOR AND ASSEMBLY APPOINTMENTS – None.

#### PUBLIC HEARING – None.

#### UNFINISHED BUSINESS

**12a RESOLUTION No 03-20-1514** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA AUTHORIZING THE REFUND OF OVER PAYMENT OF PROPERTY TAXES, INTEREST AND EXPENSES TO ARNOLD AND ALICE BAKKE DUE TO A MANIFEST ERROR IN THE AMOUNT OF \$10,438.96 (*postponed from the December 10, 2019 meeting*)

***M/S: Decker/Powell to approve Resolution No. 03-20-1514.***

Von Bargaen stated that the value of home was artificially inflated from 1994 to 2012 and taxes overpaid; this repays the overpaid tax and six years (statute of limitations) of compounded interest.

***Motion approved unanimously by polled vote.***

#### NEW BUSINESS

**13a RESOLUTION No 03-20-1515** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA AMENDING SECTION 312 (HEALTH INSURANCE BENEFITS) OF THE PERSONNEL POLICY CREATING A NEW TIER OF HEALTH INSURANCE COVERAGE FOR PERMANENT PART-TIME EMPLOYEES HIRED ON OR AFTER MARCH 1, 2020

***M/S: DeLong/Larrabee to approve Resolution No. 03-20-1515.***

Von Bargaen stated that the IRS considers 30 hours full time; any employee working under 40 hours will be on the 70/40 plan and employee

***M/S: Decker/DeLong amended main motion to change the wording: permanent part-time employees to permanent employees working less than 40 hours in the Resolution wherever stated. Amendment approved unanimously by polled vote.***

***Motion, as amended, approved unanimously by polled vote.***

**13b RESOLUTION No 02-20-1516** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA AMENDING SECTION 205 (EMPLOYMENT APPLICATIONS) OF THE PERSONNEL POLICY CREATING A NEW SECTION TITLE (EMPLOYMENT APPLICATIONS AND

PRE-EMPLOYMENT REQUIREMENTS) AND ADDING THE REQUIREMENTS FOR PRE-EMPLOYMENT DRUG SCREENING AND CRIMINAL BACKGROUND CHECKS FOR ALL PERMANENT EMPLOYEES HIRED ON OR AFTER MARCH 1, 2020

***M/S: Larrabee/Powell to approve Resolution No. 03-20-1516.***

Powell questioned if this covered part time employees who operated heavy equipment.

Von Bargen stated that she would look into making that change for part time employees.

Decker questioned how the drug testing for marijuana would be handled.

***Motion approved with Larrabee, DeLong, Powell and Gilbert voting yes; Decker voted no.***

**13c RESOLUTION No 03-20-1517** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA CREATING THE NOLAN CENTER ATTENDANT-MUSEUM COLLECTIONS POSITION AND AMENDING THE NON-UNION WAGE AND GRADE TABLE TO ADD THIS POSITION

***M/S: Powell/DeLong to approve Resolution No. 03-20-1517. Motion approved unanimously by polled vote.***

**13d RESOLUTION No 03-20-1518** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA AMENDING THE JOB DESCRIPTION OF THE HARBORMASTER POSITION AND CHANGING THE JOB TITLE TO PORT AND HARBOR DIRECTOR

***M/S: DeLong/Powell to approve Resolution No. 03-20-1518. Motion approved unanimously by polled vote.***

**13e RESOLUTION No 03-20-1519** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA, AMENDING THE FY 2020 BUDGET IN THE CAPITAL IMPROVEMENTS PROJECT FUND BY ACCEPTING HARBOR FACILITY MATCHING GRANT AMENDMENT NO. 1 FROM THE ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES, HARBOR FACILITY MATCHING GRANT PROGRAM, IN THE AMOUNT OF \$156,042.13 FOR THE SHOEMAKER BAY HARBOR PROJECT AND AUTHORIZING ITS EXPENDITURE

***M/S: Larrabee/DeLong to approve Resolution No. 03-20-1519. Motion approved unanimously by polled vote.***

**13f** Approval of Senior Property Tax Exemption that was received after the March 1<sup>st</sup> Deadline, but before the Late Filing Grace Period End Date

***M/S: Powell/Larrabee to approve Senior Property Tax Exemption received after the March 1st Deadline, but before the Late Filing Grace Period end date. Motion approved unanimously by polled vote.***

ATTORNEY'S FILE

**14** Available for Assembly review in the Borough Clerk's office.

EXECUTIVE SESSION

**15a Executive Session:** Collective Bargaining Strategy (*removed from the Agenda under Amendments to the Agenda*)

**15b Executive Session:** Proposed Purchase of Lots 10D & 10E, Einer Ottesen Resubdivision and Lot 11, Block 83, Wrangell Townsite

**M/S: DeLong/Decker** moved, pursuant to AS 44.62.310 (c)(1), that we recess into executive session to discuss matters in which the immediate knowledge would clearly have an adverse effect upon the finances of the borough, specifically information on the proposed purchase of Lots 10D and 10E, Einer Ottesen Resubdivison and Lot 11, Block 83, Wrangell Townsite and invite

Assembly entered into Executive Session at 7:50 p.m.

Assembly reconvened back into the Regular Session at 8:16 p.m.

Regular Assembly meeting adjourned at 8:17 p.m.

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Stephen Prysunka, Mayor

ATTEST: \_\_\_\_\_  
Kim Lane, MMC, Borough Clerk

**Minutes of Special Emergency Assembly Meeting  
Held on March 17, 2020**

Mayor Stephen Prysunka called the Special Emergency Assembly meeting to order at 1:30 p.m., March 17, 2020, in the Borough Assembly Chambers.

PRESENT: PRYSUNKA (telephonically), GILBERT, DEBORD, DELONG, POWELL, DECKER, MORRISON

ABSENT:

Borough Manager Von Bargaen and Deputy Borough Clerk Mollen were also in attendance.

**CONFLICT OF INTEREST** – None.

**PERSONS TO BE HEARD** – None.

**ITEM(s) OF BUSINESS**

**13a Resolution No 03-20-1520** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA TEMPORARILTY AMENDING WRANGELL MUNICIPAL CODE SECTION 3.05.050 (TELECONFERENCING) RELATED TO ASSEMBLY MEETINGS AND TEMPORARILY SUSPENDING ALL NON-ESSENTIAL BOROUGH COMMISSION, BOARD, AND COMMITTEE MEETINGS

***M/S: Decker/Morrison to approve Resolution No 03-20-1520.***

Von Bargaen explained the reasoning behind the Resolution and the changes that are included.

Larrabee asked about the timeline for the changes. Von Bargaen stated that they are temporary. It will automatically sunset in 6 months unless revoked before that. The Boards and Commissions change will sunset in 8 weeks. Larrabee also asked about the possibility of using Zoom or Google Hangouts instead. Decker supported the idea and has used Zoom while travelling several times.

Decker mentioned that the Wrangell Convention and Visitor's Bureau may want to continue their meetings. Von Bargaen agreed that if it was essential, they could continue.

Gilbert asked about how the public could continue to participate. Via Zoom or Spiderphone, there is the ability for this to happen.

Decker asked for an amendment to state that the federal government had asked for these changes and for gatherings to be to more than 10 people.

***Amended M/S: Decker Powell to amend section (a)1 to read "telephonic or videoconference."***

***Amended Motion approved unanimously by polled vote.***

***Main Motion, as amended, was approved unanimously by polled vote.***

**13b Ordinance No 976** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA DECLARING AN EMERGENCY RELATED OT THE NOVEL CORONAVIRUS (COVID-19) PANDEMIC AND GRANTING AUTHORIZATION TO TAKE ACTIONS NECESSARY TO PROTECT PUBLIC HEATH DURING THE EMERGENCY

***M/S: Powell/Morrison to approve Ordinance No 976***

Von Bargaen explained that there were several more clauses to this as it speaks to the Governor's and President's declarations as well as the complications and local resources. This also authorizes Von Bargaen and Mayor Prysunka to issue emergency orders if necessary. This ordinance will also sunset on October 17, 2020 or sooner if the virus is no longer considered an emergency or if revoked.

Prysunka mentioned that, in essence, this speeds up the Borough's ability to make decisions quickly.

Powell stated that the Assembly should be notified before any Emergency Order is released under Section 3.

***Amended M/S: Powell/Larrabee to Add to Section 3, with notification given to Assembly Members prior to issuance of Emergency Orders.***

***Amended Motion approved unanimously by polled vote.***

***Main Motion, as amended, approved unanimously by polled vote.***

**13c Discussion Item: Emergency Order Mitigation Actions**

Von Bargaen noted that since the ordinance gives the Borough Manager and Mayor the ability to issue Emergency Orders, this discussion item allows those actions to be discussed. Some of the actions nationwide include curfews, limiting restaurants to take-out or delivery only, limiting bars as well.

Von Bargaen stated that there are also other gatherings of 10+ people and the head of the Ministerial Association has passed that along as well.

Morrison asked what recourse there is if people disregard this. Police Chief Radke and Von Bargaen discussed this and stated that it can be broken up and people can be charged with a Class B Misdemeanor if deemed necessary.

Gilbert asked for confirmation that the City is working with the health care providers and Von Bargaen confirmed that. There is a weekly meeting now and the Borough will be diligent about communicating via press releases, NIXLE, the website, and the Facebook page. Von Bargaen also stated that today's press release was reviewed by Leitha and SEARHC.

Decker mentioned about self-quarantine and if it can be a recommendation, if not part of the

order. She also mentioned that in South Korea, the highest rate of cases was among young people in their twenty's.

Decker also asked to begin thinking of economic relief for businesses that would be affected. Von Bargaen stated that in the ordinance, the economic impact is references.

Morrison asked if this qualifies us for emergency relief. Von Bargaen stated that yes, this would open up those avenues. There is not a lot of information on this yet.

Prysunka stated that the Borough needs to take a role in food security and Supply Chain Management in the emergency plan. Von Bargaen said that the Police Chief spoke to both grocery stores today and there may be some slow restocking, but there is enough supply available. Prysunka stated that he is specifically looking at transportation of those goods, should Seattle have more shutdowns.

Gilbert asked about the possibility of deplaning passengers in Wrangell and screening them and if conversations have been had about that. Von Bargaen stated that a conversation was had about Alaska Airlines deplaning people who were suspected and was told that we do not have the authority to mandate testing or quarantine. We have to get confirmation from the Dept of Health or the Governor's Office.

A question was asked about NIXLE and the usage for people without a smart phone or internet. Von Bargaen will work on setting up a hotline.

Powell mentioned that there are bars asking what the plan is so that they can notify employees. Von Bargaen stated that based on the newest information, we have to limit it to take out only and no more than 10 people together at a time.

Prysunka said that the plan is to avoid being out as much as possible. Social Distancing will shorten the overall season of this disease.

Von Bargaen stated that the residual from coughs and sneezes can linger in the air for up to 2 hours, so the 6 foot bubble needs to be in effect when people do have to get out of the house.

Special Assembly meeting adjourned at 2:32 p.m.

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Stephen Prysunka, Mayor

ATTEST: \_\_\_\_\_  
Kim Lane, MMC, Borough Clerk

# City and Borough of Wrangell

## Capital Facilities Department Report

### March 20, 2020

**Facilities Service & Maintenance** - Capital Facilities provides service and maintenance to City and Borough of Wrangell facilities.

- **Building Maintenance.** Since our last report, the department has been working with half of its workforce. A full report on the maintenance work we have achieved over the last few weeks will be provided in a subsequent department report.

**Capital Improvement Projects** - Capital Facilities provides management of capital improvement projects and major maintenance to City and Borough of Wrangell facilities and infrastructure.

#### GENERAL FUND PROJECTS

- **Public Safety Building Siding and Roofing Renovations.** Staff have consulted with AMC Engineers, Anchorage, to perform an engineering assessment of the building and provide a recommendation for a rehabilitation project for the existing building and an option for a building replacement project.

The engineering assessment will include a structural, building envelope and interior finishes survey, a condition assessment of all mechanical and electrical systems, and as well, disciplines that address environmental concerns (i.e. asbestos/lead, soil contamination, etc.) in order to identify all major building deficiencies and provide a recommendation to correct such deficiency with new construction.

The recommendation for a rehabilitation project will include a probable cost opinion, as well as an opinion as to the additional useful life of the building following completion of the rehabilitation work. With a rehabilitation project, consideration would be given to the need to perform work in phases, in order to allow all existing tenants to remain operational.

The option for a replacement project would be based on providing an in-kind replacement of approximately 33,000 square feet of space, with no significant changes to the various tenants' operations.

While we have asked that their proposal be prepared for review and approval for the in-field work to begin as soon as possible, we have since discussed with them that the travel and work may be hindered by the ongoing Corvid-19 concerns; however, this will not negate our need for this survey project and we wish to have their proposal soon.

- **Public Safety Building Heating System Piping Repairs.** The copper pipe for the heating system has shown signs of corrosion for several years, and this FY20-funded project is for a significant

pipe and fitting replacement. As time allows, staff have begun to provide for in-house repairs for some of the worst areas that have started to leak.

- **Swimming Pool Domestic Hot Water Tank Replacement.** This project provides for the replacement of the deteriorated domestic hot water heater at the Swimming Pool. An engineering proposal was received to assist with the plumbing reconfiguration and technical specifications for the project, which staff decided not to pursue due to the high cost (approximately equal to the estimated cost of the construction work).

Plans have begun to develop this project in-house with oversight, as needed by a mechanical engineer, as we are able to manage the majority of the project without a large engineering cost. Fast tracking this project is critical at this time due to a new development with the hot water heater losing its ability to maintain heat temperatures to minimize possible full failure of the unit.

#### WRANGELL MUNICIPAL LIGHT & POWER FUND

- **3MW Transformers Purchase Phase 1.** The procurement for the 3MW Transformer has been made and is expected to be delivered by the end of June 2020.
- **Powerhouse Roof Repairs.** This project has been postponed due to the expected future demolition of the concrete structural portion of the Power Plant.

#### UPPER RESERVOIR BYPASS FUND

- **Upper Reservoir Bypass.** Shannon & Wilson has evaluated five tap/intake options as outlined in their attached March 4, 2020 Upper Dam Bypass Alternative Analysis report. Each option includes a summary of the assumed construction procedures and certain advantages and/or disadvantages of each. The following alternatives were evaluated:
  - Alternative 1 – Spillway Trench & Siphon
  - Alternative 2 – Horizontal Directional Drilling (HDD)
  - Alternative 3 – Sliplining
  - Alternative 4 – Cured in Place Pipe Lining (CIPP Lining)
  - Alternative 5 – Pump Around

Shannon & Wilson's March 4, 2020 report does not offer a recommendation as to which alternative the CBW should consider, but it rather suggests the CBW evaluate the rankings and determine if our assessment aligns with their rankings.

Staff have identified the Spillway Trench & Siphon as the alternative that best meets the project's desired outcome, considering the impacts to the ongoing raw water supply, risks posed to the dam, and limited funding available to complete the selected project. This option has the lowest capital cost of the three viable alternatives.

On March 24, 2020, the Borough Assembly will review for approval Resolution No 3-20-1520 of the Assembly of the City and Borough of Wrangell, Alaska, establishing Alternative 1: Spillway Trench & Siphon as the preferred option for the Reservoir Bypass project.



## WATER MAINS REPLACEMENT FUND

- **Water Mains Replacement.** Development of the Request for Qualifications (RFQ) for competitive selection of engineering survey and design services has begun. We anticipate issuing the solicitation, following DEC's review and approval, before the end of March.

## WATER TREATMENT PLANT IMPROVEMENTS FUND

- **Water Treatment Plant Improvements.** There remains a conflict in the competitive selection of engineering services between our two federal funding agencies, since this week EDA confirmed that the engineering firm who developed our Preliminary Engineering Report for this project cannot participate in the competitive process. Conversely, USDA has indicated that the engineering firm cannot be disallowed to participate. We have called for a joint meeting next week to resolve this issue prior to developing the RFQ.

## SEWER FUND

- **Reroute Node 6 Sewer Pump Station's Overflow Pipe.** EPA has been contacted to review the regulatory oversight and compliance required for this project. They have requested an outline and brief on the scope of work, which will allow them provide an initial review and comments which staff would use to advance the project.

## FUTURE PROJECTS IN FUNDING PHASE / PLANNING PHASE

- **Power Diesel Generation Plant (Power Plant) Rehabilitation.** The CBW will likely be evaluating the current Municipal Light & Power / Public Works campus to develop a Master Plan to provide options for building replacement, material and equipment storage, parking and site circulation, all of which would accommodate the growing needs of both of these departments and possibly other departments. This idea is only in its infancy and requires a variety of departments to begin the discussion.

## ENVIRONMENTAL REMEDIATION PROJECTS

- **Contaminated Sites**

With the three open CBW-owned properties listed in ADEC's contaminated sites system, Shannon & Wilson has prepared the Work Plan for Site Characterization for each of the below sites. We have begun reviewing the work plans prior to submitting to ADEC for their review and approval. With each work plan, the engineers have developed a cost for in-field implementation of the proposed work plan.

1. Former Wilcox Automotive, Hazard ID 26212

We received notice from the DEC Brownfields Assessment and Cleanup (DBAC) services program that they had a total of sixteen requests for DBAC services this year, including Wrangell's application for technical services to cover the work plan for site characterization costs for the Wilcox Automotive property. Out of sixteen project submissions, Wrangell's project ranked 10<sup>th</sup> highest. DEC receives funding for these projects from the Environmental

Protection Agency (EPA), and the number of sites selected depends on the program's actual SFY 21 funding. DEC recommends we not make plans that rely on this Brownfield project work being awarded until funding has been approved specifically for our project. DEC anticipates learning more from the EPA so they can notify successful applicants no later than May 15, 2020.

2. Wrangell City Shop UST #3, Hazard ID # 26199
3. Wrangell Medical Center, UST #2 Hazard ID 26676

## *City and Borough of Wrangell, Alaska*

Date: March 18, 2020

To: Lisa Von Bargen, Borough Manager

From: Carol Rushmore, Economic Development Director

Re: Former Institute Property Development Status

To move forward on the development of the former Institute property, there are several activities that need to take place. A copy of the Institute Master Plan can be found online at:

<https://www.wrangell.com/economicdevelopment/wrangell-institute-master-plan-and-subdivision>

### **Survey**

A survey of a selected portion of the property must be conducted. As part of the Master Planning process, an Alternative development option was requested by staff to address the high cost to build sewer and water extensions to Phase I of the Plan on the southern side of the property, in part due to how the sewer connection to the main differs from the north end to the south end. It was estimated that the initial construction development cost for Phase I would be over \$800,000 (p.62). Alternative Option 1 (also identified as Block 1, p.67) was suggested by the consultants as being more affordable for the City to construct, yet still provide room for ANSEP should that project move forward.

Staff is currently completing a Request for Proposals (RFP) for the survey instructions. This was put on hold until recently because of the issue of the cemetery. Public Works Director Roland Howell recommended that the cemetery expansion is better located at the Institute property due to the development issues and costs associated with other potential site expansions. Two different on site areas were considered for the cemetery including on the north end of the property where Alternative Option 1 is proposed as well as near the center of the property near Phase I (identified as Block 2, p. 67) as identified in the Plan. If that were to occur, Staff was recommending that the cemetery and surrounding area could be established as a green space and park, the Tribe could perhaps use a portion of the area for their memorial or cultural site and the area would be designed appropriately. At this time, staff has been advised that the cemetery expansion will not occur within the proposed Tract 1 of the Master Plan site plan (p.67) and are working to complete the RFP for public notice. The estimate is that the RFP will be issued in early April. Three to four weeks will be required for a notice and to respond to questions by bidders. The contract should be awarded in May in time for the summer season. Staff is working on a survey and subdivision design for all of Tract 1, not just Block 1 (or Alternative Option 1). The survey will include any potentially necessary utility easements, snow removal areas, storm drain requirements, and should be designed with the topography and drainage in mind.

### **Zoning**

The Planning and Zoning Commission has been working on rezoning of the entire Institute Property. There have been some slow downs in their work due to lack of quorums but they are getting closer to a proposed zone. The Master Plan proposed multiple uses on the parcel. In other districts, individuals have requested land uses that are currently not allowed or easily permitted. Some of those same uses are proposed for the Institute property as well... such as tiny homes and accessory dwelling units. The Commission is currently looking at creating a new Zoning District called Residential-Commercial Mixed Use that will be specific to the whole parcel. A proposed Planned Unit Development (PUD) overlay

zone is also being developed that will be applicable to not only the Institute parcel but also to other land areas that meet certain characteristics. A PUD allows more flexibility within the zoning code based on master plans for a larger parcel developments. A few more work sessions will be required prior to going to the public hearing phase. Work sessions via teleconferencing or video conferencing will be new and challenging but the Commission, after their first telephonic meeting on Wednesday, is willing to work through the challenges to keep this moving forward.

### **Utilities**

Both Public Works and Electrical Departments are looking at what will be necessary to extend sewer, water, electrical and storm drains through any subdivision. The Electrical Department is looking at needs and rough cost estimates for overhead and underground. A VERY very rough preliminary electrical installation estimate for only Block 1 (p. 67) for overhead is between \$27,000 and \$28,000. Underground would at least double that to \$60,000. The underground is also assuming easy digging and trenching which costs could go up considerably once engineering is completed. For sewer and water construction, Public Works is roughly estimating \$250 per linear foot and slightly less for storm drainage. Cost estimates for sewer, water and roads are provided in the Master Plan.

### **Engineering Design**

Once the survey is complete, Engineering Design for all or a portion of the subdivision created in Tract 1 could be conducted to arrive at more definitive cost estimates for construction.

### **Partnerships**

The City will continue to work with Wrangell Cooperative Association as we move through this process.

## *City and Borough of Wrangell, Alaska*

Date: March 18, 2020

To: Lisa Von Barga, Borough Manager

From: Carol Rushmore, Economic Development Director

Re: Truly360 Contract for Google My Business representation update

The Wrangell Convention and Visitor Bureau is contracting with Truly360, a Google contractor, to help the CVB and local businesses learn and take advantage of the Google tools to develop an online presence for the community.

In August of last year, a Truly360 representative came to town to film the Google Street View, take a 360 view of one location, and provide training for local businesses and staff on Google My Business and other tools. They came the one week it started to rain so we only had the first evening they arrived and a 2 hour window the next day with no rain for the Street View and 360 videos.

### Claim Your Listing

As part of the Google My Business component, local businesses need to “claim” their business through Google. The CVB needed to claim points of interest or specific facilities. It is then important to provide information relevant to the business within the google listing. The more you can interact regularly on Google, the higher your business will be ranked and thus found during google searches.

The CVB has claimed thus far the following points of interest:

- Petroglyph Beach State Historic Park
- Rainbow Falls Trail
- Volunteer Park Trail
- Mt. Dewey Trail
- Anan Creek Wildlife Observatory
- Visitor Center
- Nolan Center (claimed by the Nolan Center directly)

The Borough has claimed:

- Wrangell Economic Development
- City of Wrangell
- Marine Service Center

There were at least 20 businesses including retail, charters, accommodations that were present for the training. Most of those businesses have been claimed although a follow up with a couple of them indicated they were having issues. I put them in direct contact with Truly360 staff to work through the issues. In the next month, Truly360 will be reaching out to all the businesses that participated in August to make sure their listings are live and if they need any assistances. This has been requested by Staff because with the expected poor summer visitor season, the more businesses that can have a verified and active presence will help the whole community once travel resumes.

Because some of the points of interest are not actually “owned” or managed by the Borough, Truly360 had to work with Google to have them placed into the care of the CVB and this took some time. Should the State or USFS decide they want to manage their listings of their facilities, the ownership can be transferred. However, staff wanted to make sure that our key locations were being represented on Google actively. Additional sites can be added and will be over the next few months. However, like Instagram and Facebook promotions, it can be time consuming to stay on top of your listing and keep it fresh, therefore CVB initially has been selective in claiming points of interest.

Key interactions on the Google listing include business hours of operation, photos, videos, posts, responding to posts. There are other tools as well but making sure these activities happen regularly will help elevate the listing status. Photos and staff time are the primary stumbling blocks we face. The CVB is working with local photographers to acquire different photos and will build that relationship in the coming months.

The Google listings have new photos and posting at least once a month if not twice. We are going to try and up that to 4 times a month. Truly360 provides some of the postings.... A photo and a comment work better than just a comment but it depends on what is available or what they have access to at the time. Responding to comments left on the listing is also important. Not much has happened over the winter but hopefully more comments will be left as weather improves. Photos were uploaded to each listing but those need to be refreshed and staff will be working on that. Individuals also post their own pictures, but some of them are better than others, so by uploading your own, you can start to control which ones will stay at the top. One way is to have your friends and family go to a listing and view and post and like certain photos! This is all a work in progress and learning curve.

### Street View

Staff had hoped that the Street View would be live in January. It was processed by Truly360 but is now in “processing” with Google. They will be checking into this and for our 6 month status report should have a more concrete answer as to when that will go live.

### 360 Street Views

Truly360 took three 360 views for us when here rather than just the one that was part of the contract. And keep in mind it was raining most of the time they were here so the outdoor footage isn't the best but still getting great numbers of views. The primary and detailed 360view was of the Nolan Center inside, so that when viewed online, you can actually walk through the facility. This has been on Google since October. This same footage is what Cyni is able to use and embed into the Museum's website (<https://www.nolancenter.org/museum-virtual-tour.html>). The entire footage can be found at this link: <https://goo.gl/maps/ArBP8dxjBw3jTnMH8> and from Oct to Dec received over 8500 views. The second and more popular 360 view based on viewing stats is from the dock by the Harbor Master's shack which can be found at: <https://goo.gl/maps/3AmWvpdiD7wHzuhEA> and for Oct to Dec 2019 received almost 25,000 views. The last 360 view is on Chief Shakes Island and can be viewed at: <https://goo.gl/maps/3AmWvpdiD7wHzuhEA>

### Stats

In early January, Truly360 provided the first stat report regarding Wrangell's new found Google presence online – see attached. For the most part, our online presence was not really established until October. This first basic stat report provided by Truly360 was July to Dec 2019, with a comparison of the same time period in 2018. In April 2020, a 6 month detailed status report will be available.

### Coronavirus update

The CVB is taking an approach for “armchair” traveling posts, we are here when travel resumes, etc. on FB, Instagram and Google posts. Truly360 staff have some suggestions and ideas for status update postings regarding the virus so staff is working to craft some basic language to post via Google.

### Follow the CVB:

Instagram: VisitWrangell

Facebook: @WrangellCVB

Google – search a location and then leave a positive comment, or photo

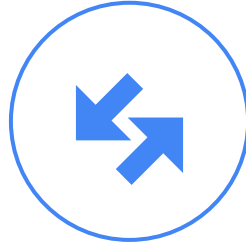




# What objectives do we have? What are we measuring? How can we define success?



Identify how each location is being found on Google



What actions are people taking when they find a location



Compare data year over year to measure success

# How are locations being found right now?

Item c.



## PERFORMANCE

**Views**  
**95,062**

**Searches**  
**51,483**

**Actions**  
**1,143**

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Search views

7,118

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Maps views

87,994

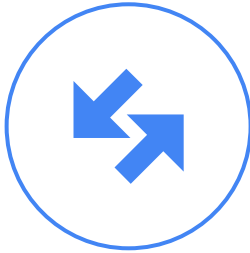
# How are locations being found right now?

Item c.



PERFORMANCE		
Views	Searches	Actions
95,062	51,483	1,143
Direct		25,096
Discovery		26,387

# What actions are users taking when they find a location?

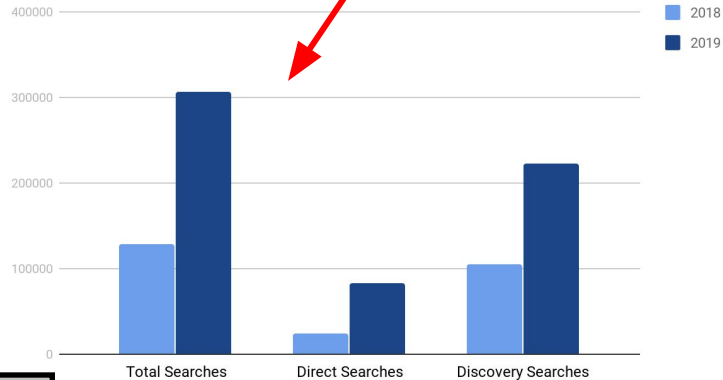


PERFORMANCE		
Views	Searches	Actions
95,062	51,483	1,143
Direction Requests		616
Website Visits		507
Calls		20

# Wrangell Alaska Year-Over-Year

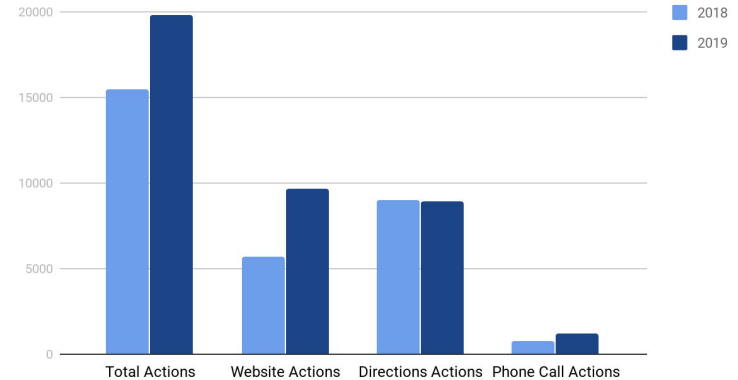
+140.64%

Total Searches Increased

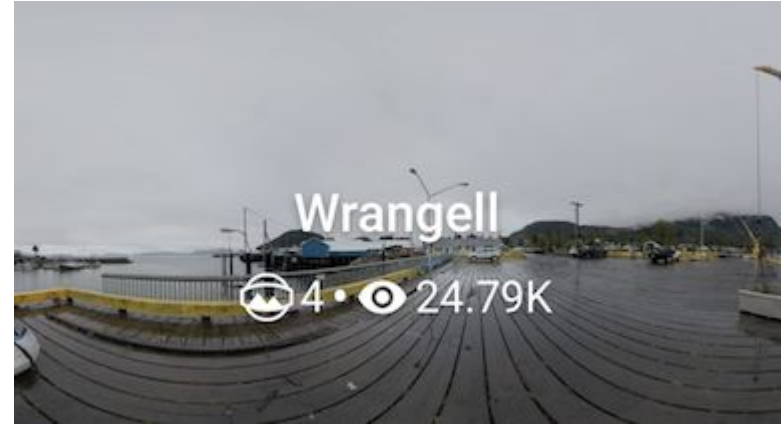
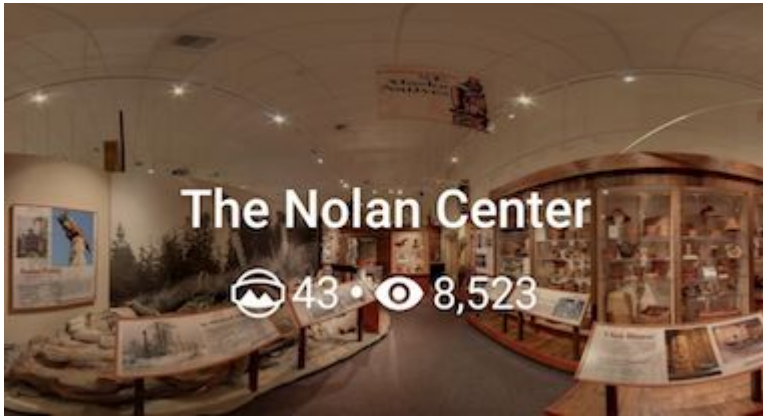


+22.12%

Total Actions Increased



## Wrangell, Alaska Virtual Tours



We value your partnership.  
The best is yet to come...

## CITY & BOROUGH OF WRANGELL, ALASKA BOROUGH ASSEMBLY AGENDA STATEMENT

<u>AGENDA ITEM TITLE:</u>	<u>DATE:</u>	March 24, 2020
	<u>Agenda Section</u>	<b>7</b>

February Permanent Fund APCM Report

SUBMITTED BY:

Joyce Mason, Finance Director

FISCAL NOTE:

**Expenditure Required:** \$XXX Total

FY 20: \$	FY 21: \$	FY22: \$
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**Amount Budgeted:**

	FY20 \$XXX
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**Account Number(s):**

	XXXXXX XXX XXXX
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**Account Name(s):**

	Enter Text Here
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**Unencumbered Balance(s) (prior to expenditure):**

	\$XXX
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Reviews/Approvals/Recommendations

<input type="checkbox"/>	Commission, Board or Committee
Name(s)	
Name(s)	
<input type="checkbox"/>	Attorney
<input type="checkbox"/>	Insurance

ATTACHMENTS: 1. February Permanent Fund APCM Report

**RECOMMENDATION MOTION:**

None. Report only.

**SUMMARY STATEMENT:**

Attached is the February Investment Statement for the Borough's Permanent Fund as provided by Alaska Permanent Capital Management.



# CITY AND BOROUGH OF WRANGELL

Account Statement - Period Ending February 29, 2020



ALASKA PERMANENT  
CAPITAL MANAGEMENT

Registered Investment Adviser

## ACCOUNT ACTIVITY

Portfolio Value on 01-31-20 9,243,830

Contributions	118
Withdrawals	-3,184
Change in Market Value	-345,697
Interest	199
Dividends	6,070

Portfolio Value on 02-29-20 8,901,336

## MANAGEMENT TEAM

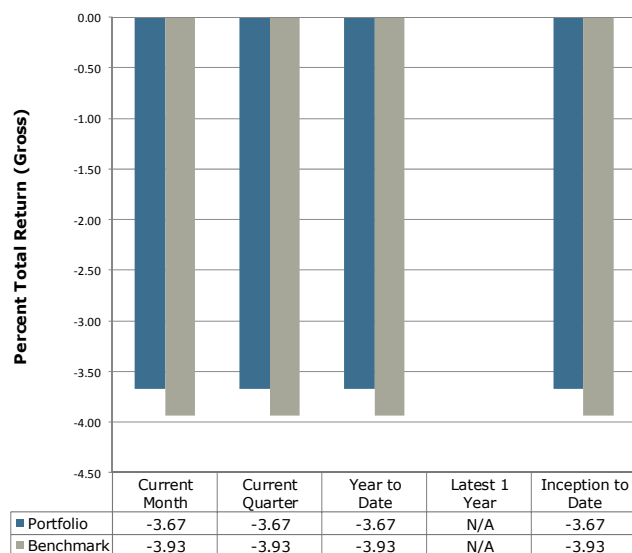
Client Relationship Manager: Amber Frizzell, AIF®  
Amber@apcm.net

Your Portfolio Manager: Brandy Niclai, CFA®

Contact Phone Number: 907/272-7575

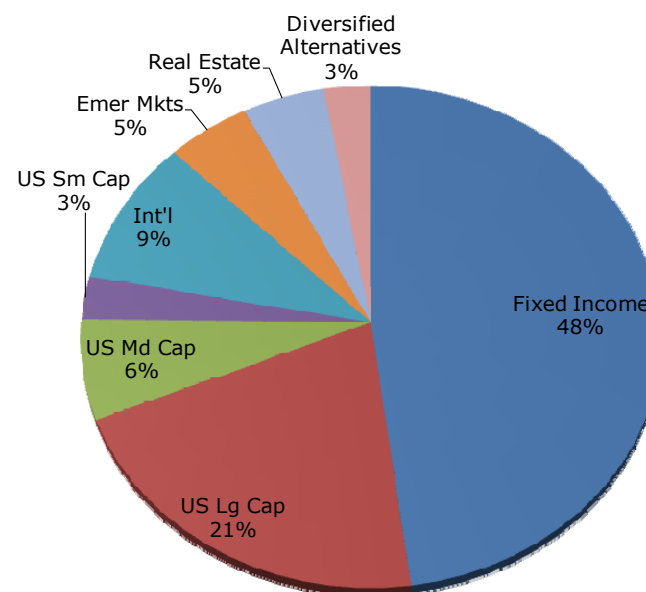
## INVESTMENT PERFORMANCE

Current Account Benchmark:  
Equity Blend



Performance is Annualized for Periods Greater than One Year

## PORTFOLIO COMPOSITION



Alaska Permanent Capital Management Co.  
**PORTFOLIO SUMMARY AND TARGET**  
**CITY AND BOROUGH OF WRANGELL**  
*February 29, 2020*

Asset Class & Target	Market Value	% Assets	Range
<b>FIXED INCOME (45%)</b>			
US Fixed Income (25.0%)	2,371,151	26.6	15% to 35%
TIPS (10.0%)	944,285	10.6	5% to 15%
International Fixed Income (5.0%)	475,518	5.3	0% to 10%
Cash (5.0%)	472,920	5.3	0% to 10%
<b>Subtotal:</b>	<b>4,263,874</b>	<b>47.9</b>	
<b>EQUITY (47%)</b>			
US Large Cap (22.0%)	1,855,525	20.8	12% to 32%
US Mid Cap (7.0%)	575,196	6.5	0% to 15%
US Small Cap (3.0%)	243,483	2.7	0% to 6%
Developed International Equity (10.0%)	843,783	9.5	5% to 15%
Emerging Markets (5.0%)	439,608	4.9	0% to 10%
<b>Subtotal:</b>	<b>3,957,595</b>	<b>44.5</b>	
<b>ALTERNATIVE INVESTMENTS (8%)</b>			
Real Estate (2.0%)	174,560	2.0	0% to 5%
Alternative Beta (0.0%)	0	0.0	0% to 10%
Infrastructure (3.0%)	260,613	2.9	0% to 6%
Commodities (3.0%)	244,695	2.7	0% to 6%
<b>Subtotal:</b>	<b>679,868</b>	<b>7.6</b>	
<b>TOTAL PORTFOLIO</b>	<b>8,901,336</b>	<b>100</b>	

Alaska Permanent Capital Management Co.  
**PORTFOLIO APPRAISAL**  
**CITY AND BOROUGH OF WRANGELL**  
*February 29, 2020*

Quantity	Security	Security Symbol	Avg Cost	Total Cost	Price	Market Value	Pct. Assets
<b>DOMESTIC FIXED INCOME FUNDS/ETF</b>							
4,150	ISHARES SHORT TREASURY BOND ETF	SHV	110.59	458,946	110.71	459,446	5.2
19,015	VANGUARD SHORT-TERM TIPS ETF	VTIP	49.28	937,134	49.66	944,285	10.6
27,330	VANGUARD TOTAL BOND MARKET ETF	BND	85.18	2,327,844	86.76	2,371,151	26.6
				3,723,923		3,774,882	42.4
<b>INTERNATIONAL FIXED INCOME FUNDS/ETF</b>							
8,200	VANGUARD TOTAL INTL BOND ETF	BNDX	57.04	467,746	57.99	475,518	5.3
<b>DOMESTIC LARGE CAP EQUITY FUNDS/ETF</b>							
1,015	FLEXSHARES QUAL DIV ETF	QDF	48.87	49,603	42.69	43,330	0.5
425	ISHARES EDGE MSCI USA QUALITY FACTOR ETF	QUAL	101.38	43,086	91.95	39,079	0.4
5,985	SPDR S&P 500 ETF	SPY	328.31	1,964,964	296.26	1,773,116	19.9
				2,057,654		1,855,525	20.8
<b>DOMESTIC MID CAP EQUITY FUNDS/ETF</b>							
3,170	ISHARES CORE S&P MIDCAP 400 ETF	IJH	207.52	657,850	181.45	575,196	6.5
<b>DOMESTIC SMALL CAP EQUITY FUNDS/ETF</b>							
3,345	ISHARES S&P SMALLCAP 600 INDEX ETF	IJR	84.52	282,725	72.79	243,483	2.7
<b>INTERNATIONAL EQUITY FUNDS/ETF</b>							
5,865	ISHARES ETF CORE MSCI EAFE	IEFA	65.13	381,993	58.44	342,751	3.9
8,050	ISHARES MSCI EAFE INDEX FUND	EFA	69.95	563,097	62.24	501,032	5.6
				945,090		843,783	9.5
<b>EMERGING MARKET FUNDS/ETF</b>							
9,025	ISHARES ETF CORE MSCI EMERGING MKTS	IEMG	54.63	493,048	48.71	439,608	4.9
<b>REAL ESTATE &amp; INFRASTRUCTURE</b>							
5,175	FLEXSHAR STX GLOBAL BROAD INF ETF	NFRA	54.63	282,710	50.36	260,613	2.9
2,110	JPMORGAN BETABUILDERS MSCI US REIT ETF	BBRE	89.45	188,739	82.73	174,560	2.0
				471,450		435,173	4.9
<b>COMMODITIES</b>							
9,460	ETRACS BLOOMBERG CMCI ETN	UCI	14.97	141,616	13.04	123,358	1.4
8,575	INVESCO OPTIMUM YIELD DIVERSIFIED COMMODIT	PDBC	16.36	140,244	14.15	121,336	1.4
				281,860		244,695	2.7
<b>CASH AND EQUIVALENTS</b>							
	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	cash01		13,474		13,474	0.2
<b>TOTAL PORTFOLIO</b>				<b>9,394,820</b>		<b>8,901,336</b>	<b>100.0</b>

Alaska Permanent Capital Management Co.  
**CASH LEDGER**  
**CITY AND BOROUGH OF WRANGELL**  
*From 02-01-20 To 02-29-20*

Trade Date	Settle Date	Tran Code	Activity	Security	Amount
<b>CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT</b>					
02-01-20			Beginning Balance		21,696.29
02-03-20	02-03-20	dp	Transfer from	DIVIDEND ACCRUAL	59.85
02-03-20	02-03-20	dp	Transfer from	DIVIDEND ACCRUAL	737.36
02-03-20	02-03-20	dp	Transfer from	DIVIDEND ACCRUAL	440.34
02-03-20	02-03-20	dp	Transfer from	DIVIDEND ACCRUAL	2.50
02-03-20	02-05-20	wd	Purchase	ISHARES ETF CORE MSCI EAFE	-100,806.00
02-03-20	02-05-20	wd	Purchase	ISHARES EDGE MSCI USA	-43,086.50
				QUALITY FACTOR ETF	
02-03-20	02-05-20	wd	Purchase	ISHARES ETF CORE MSCI	-26,825.77
				EMERGING MKTS	
02-03-20	02-05-20	wd	Purchase	SPDR S&P 500 ETF	-154,066.25
02-03-20	02-05-20	dp	Sale	FLEXSHARES-INTL QUAL DVD	89,647.44
				INDE	
02-03-20	02-05-20	dp	Sale	FLEXSHARES QUAL DIV ETF	202,374.31
02-03-20	02-05-20	dp	Sale	VANGUARD TOTAL BOND	19,614.80
				MARKET ETF	
02-03-20	02-03-20	dp	Addition	to Portfolio	8.36
02-04-20	02-04-20	dp	Addition	to Portfolio	8.16
02-04-20	02-04-20	wd	Withdrawal	from Portfolio	-5.21
02-04-20	02-04-20	wd	Withdrawal	from Portfolio	-33.07
02-04-20	02-04-20	dp	Dividend	MOBILE TELESYSTEMS PJS F	220.49
02-06-20	02-06-20	dp	Dividend	VANGUARD TOTAL BOND	5,029.76
				MARKET ETF	
02-06-20	02-06-20	dp	Dividend	VANGUARD TOTAL INTL	369.00
				BOND ETF	
02-07-20	02-07-20	dp	Transfer from	DIVIDEND ACCRUAL	66.40
02-07-20	02-07-20	dp	Dividend	ISHARES SHORT TREASURY	668.65
				BOND ETF	
02-10-20	02-10-20	dp	Transfer from	DIVIDEND ACCRUAL	7.56

Alaska Permanent Capital Management Co.  
**CASH LEDGER**  
**CITY AND BOROUGH OF WRANGELL**  
*From 02-01-20 To 02-29-20*

Trade Date	Settle Date	Tran Code	Activity	Security	Amount
02-11-20	02-11-20	dp	Transfer from	DIVIDEND ACCRUAL	163.41
02-11-20	02-11-20	dp	Addition	to Portfolio	45.46
02-11-20	02-11-20	dp	Dividend	NUCOR CORP COM	20.94
02-14-20	02-14-20	dp	Transfer from	DIVIDEND ACCRUAL	111.60
02-14-20	02-14-20	dp	Transfer from	DIVIDEND ACCRUAL	132.80
02-14-20	02-14-20	dp	Addition	to Portfolio	56.09
02-14-20	02-14-20	wd	Withdrawal	from Portfolio	-3,144.29
02-14-20	02-14-20	wd	Dividend	ABBOTT LABS COM	-111.60
02-14-20	02-14-20	wd	Dividend	ACCENTURE PLC-CLA	-132.80
02-15-20	02-15-20	dp	Interest	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	172.77
02-15-20	02-15-20	dp	Interest	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	26.53
02-20-20	02-20-20	wd	Withdrawal	from Portfolio	-0.74
02-20-20	02-20-20	wd	Withdrawal	from Portfolio	-0.87
02-20-20	02-20-20	dp	Dividend	CIELO S A F	5.81
<b>02-29-20</b>			<b>Ending Balance</b>		<b>13,473.58</b>
<b>DIVIDEND ACCRUAL</b>					
02-01-20			Beginning Balance		1,721.82
02-03-20	02-03-20	wd	Transfer to	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	-59.85
02-03-20	02-03-20	wd	Transfer to	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	-737.36
02-03-20	02-03-20	wd	Transfer to	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	-440.34
02-03-20	02-03-20	wd	Transfer to	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	-2.50
02-07-20	02-07-20	wd	Transfer to	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	-66.40

Alaska Permanent Capital Management Co.  
**CASH LEDGER**  
***CITY AND BOROUGH OF WRANGELL***  
*From 02-01-20 To 02-29-20*

<b>Trade Date</b>	<b>Settle Date</b>	<b>Tran Code</b>	<b>Activity</b>	<b>Security</b>	<b>Amount</b>
02-10-20	02-10-20	wd	Transfer to	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	-7.56
02-11-20	02-11-20	wd	Transfer to	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	-163.41
02-14-20	02-14-20	wd	Transfer to	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	-111.60
02-14-20	02-14-20	wd	Transfer to	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT	-132.80
<b>02-29-20</b>			<b>Ending Balance</b>		<b>0.00</b>

Alaska Permanent Capital Management Co.  
**REALIZED GAINS AND LOSSES**  
***CITY AND BOROUGH OF WRANGELL***  
*From 02-01-20 Through 02-29-20*

<u>Date</u>	<u>Quantity</u>	<u>Security</u>	<u>Avg. Cost Basis</u>	<u>Proceeds</u>	<u>Gain Or Loss</u>
02-03-20	3,810.0000	FLEXSHARES-INTL QUAL DVD INDE	93,459.30	89,647.44	-3,811.86
02-03-20	4,275.0000	FLEXSHARES QUAL DIV ETF	208,919.25	202,374.31	-6,544.94
02-03-20	230.0000	VANGUARD TOTAL BOND MARKET ETF	19,590.34	19,614.80	24.46
TOTAL GAINS					24.46
TOTAL LOSSES					-10,356.80
			<b>321,968.89</b>	<b>311,636.55</b>	<b>-10,332.34</b>

Alaska Permanent Capital Management Co.  
**TRANSACTION SUMMARY**  
***CITY AND BOROUGH OF WRANGELL***  
*From 02-01-20 To 02-29-20*

Trade Date	Settle Date	Security	Quantity	Trade Amount
<b>PURCHASES</b>				
DOMESTIC LARGE CAP EQUITY FUNDS/ETF				
02-03-20	02-05-20	ISHARES EDGE MSCI USA QUALITY FACTOR ETF	425.0000	43,086.50
02-03-20	02-05-20	SPDR S&P 500 ETF	475.0000	154,066.25
				197,152.75
EMERGING MARKET FUNDS/ETF				
02-03-20	02-05-20	ISHARES ETF CORE MSCI EMERGING MKTS	525.0000	26,825.77
INTERNATIONAL EQUITY FUNDS/ETF				
02-03-20	02-05-20	ISHARES ETF CORE MSCI EAFE	1,585.0000	100,806.00
				<b>324,784.52</b>
<b>DEPOSITS AND EXPENSES</b>				
CASH AND EQUIVALENTS				
02-03-20	02-03-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		8.36
02-04-20	02-04-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		8.16
02-11-20	02-11-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		45.46
02-14-20	02-14-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		56.09
				118.07



Alaska Permanent Capital Management Co.  
**TRANSACTION SUMMARY**  
***CITY AND BOROUGH OF WRANGELL***  
*From 02-01-20 To 02-29-20*

Trade Date	Settle Date	Security	Quantity	Trade Amount
MANAGEMENT FEES				
02-29-20	02-29-20	MANAGEMENT FEES		3,058.67
				<b>3,176.74</b>
<b>DIVIDEND</b>				
AMERICAN DEPOSITORY RECEIPTS				
02-04-20	02-04-20	MOBILE TELESYSTEMS PJS F		220.49
02-20-20	02-20-20	CIELO S A F		5.81
				<u>226.30</u>
COMMON STOCK				
02-11-20	02-11-20	NUCOR CORP COM		20.94
02-14-20	02-14-20	ABBOTT LABS COM		-111.60
02-14-20	02-14-20	ACCENTURE PLC-CLA		-132.80
				<u>-223.46</u>
DOMESTIC FIXED INCOME FUNDS/ETF				
02-06-20	02-06-20	VANGUARD TOTAL BOND MARKET ETF		5,029.76
02-07-20	02-07-20	ISHARES SHORT TREASURY BOND ETF		668.65
				<u>5,698.41</u>
INTERNATIONAL FIXED INCOME FUNDS/ETF				
02-06-20	02-06-20	VANGUARD TOTAL INTL BOND ETF		369.00
				<b>6,070.25</b>
<b>INTEREST</b>				
CASH AND EQUIVALENTS				
02-15-20	02-15-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		172.77

Alaska Permanent Capital Management Co.  
**TRANSACTION SUMMARY**  
**CITY AND BOROUGH OF WRANGELL**  
*From 02-01-20 To 02-29-20*

Trade Date	Settle Date	Security	Quantity	Trade Amount
02-15-20	02-15-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		26.53
				199.30
				<b>199.30</b>

**SALES, MATURITIES, AND CALLS**

DOMESTIC FIXED INCOME FUNDS/ETF

02-03-20	02-05-20	VANGUARD TOTAL BOND MARKET ETF	230.0000	19,614.80
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DOMESTIC LARGE CAP EQUITY FUNDS/ETF

02-03-20	02-05-20	FLEXSHARES QUAL DIV ETF	4,275.0000	202,374.31
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INTERNATIONAL EQUITY FUNDS/ETF

02-03-20	02-05-20	FLEXSHARES-INTL QUAL DVD INDE	3,810.0000	89,647.44
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**311,636.55**

**WITHDRAW**

CASH AND EQUIVALENTS

02-03-20	02-03-20	DIVIDEND ACCRUAL		59.85
02-03-20	02-03-20	DIVIDEND ACCRUAL		737.36
02-03-20	02-03-20	DIVIDEND ACCRUAL		440.34
02-03-20	02-03-20	DIVIDEND ACCRUAL		2.50
02-04-20	02-04-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		5.21
02-04-20	02-04-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		33.07
02-07-20	02-07-20	DIVIDEND ACCRUAL		66.40
02-10-20	02-10-20	DIVIDEND ACCRUAL		7.56
02-11-20	02-11-20	DIVIDEND ACCRUAL		163.41
02-14-20	02-14-20	DIVIDEND ACCRUAL		111.60

Alaska Permanent Capital Management Co.  
**TRANSACTION SUMMARY**  
***CITY AND BOROUGH OF WRANGELL***  
*From 02-01-20 To 02-29-20*

Trade Date	Settle Date	Security	Quantity	Trade Amount
02-14-20	02-14-20	DIVIDEND ACCRUAL		132.80
02-14-20	02-14-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		3,144.29
02-20-20	02-20-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		0.74
02-20-20	02-20-20	CHARLES SCHWAB LIQUID BANK DEPOSIT ACCOUNT		0.87
				4,906.00
				<b>4,906.00</b>

## Wrangell Ranger District & City/Borough of Wrangell Standing Topics of Mutual Interest

**Purpose:** To facilitate open and respectful dialog between the City/Borough of Wrangell and the Wrangell Ranger District on matters of mutual interest on a consistent basis. Topic report-out is intended to be brief and informative and utilized as a collaborative tool for sharing information. Topics identified as needing “additional” consideration will be scheduled for a more appropriate venue (work session).

**Date:** 03/20

**Current Topics:** (updates are in red)

1. **New Topic;** USDA Forest Service Corvid 19 direction and guidance
  - a. Locally, FS employees are being encouraged to consider and adhere to City and Borough guidance in addition to USDA direction for precautions associated with travel, especially when returning to the island from out-of-state travel.
  - b. Employees are continuing to work on mission critical work while utilizing social distancing procedures including holding virtual meetings, teleworking, and limiting public engagement to only mission critical work. To this end:
    - i. Non-critical meetings, trainings, and conferences have been postponed until further notice. This has greatly reduced or eliminated work related travel for WRD personnel.
    - ii. Under USDA direction, the office door is currently locked to the public with instructions for how visitors can self-assess for CV-19 exposure and then proceed to call and make an appointment to visit the office in person (mission critical related work only).
    - iii. We will continue to provide excellent customer service to the degree possible through other electronic and virtual means.
2. Additional information can be found at the supervisors office through this press release:

**Forest Service**

Tongass National Forest  
648 Mission Street  
Ketchikan, AK 99901 907-225-3101  
www.fs.usda.gov/tongass/ Twitter: @TongassNF  
Facebook: @TongassNF

**KETCHIKAN, Alaska** – At the USDA Forest Service, the health and well-being of our employees and the people we serve are our top priority. Continuing our service to you, the public, while doing our part to address the COVID-19 pandemic is also very important. Therefore, we are asking all visitors to self-assess before going to Forest Service offices in their area. Signs have been posted at all southeast Alaska offices with guidance for obtaining entrance to conduct business, which may include setting up an appointment to enhance social distancing and minimize the number of visitors in offices at one time.

Additionally, the Forest Service has decided to postpone our Friday Night Insights at the Southeast Alaska Discovery Center and Fireside Lectures at the Mendenhall Glacier Visitor Center, closing both visitor centers until further notice. The Alaska Hummingbird Festival at the Southeast Alaska Discovery Center, previously scheduled for April, has also been postponed.

We appreciate your patience and understanding as we all work together to minimize the impacts and spread of COVID-19.

For interviews and information to be used for publication, contact the Tongass Public Affairs Officer at 907-228- 6201 or [paul.robbs@usda.gov](mailto:paul.robbs@usda.gov).

3. Central Tongass Large Landscape Analysis: ()
  - a. Comment period closed on September 15<sup>th</sup>
  - b. Interdisciplinary Team is currently analyzing comments for inclusion or adjustments to the Final Environmental Impact Statement (FEIS)
  - c. The FEIS is anticipated to be signed in spring of 2020
  - d. Final adjustments to the FEIS/ROD are currently under consideration prior to release
4. Roadless: (NO UPDATES AT THIS TIME)
  - a. Comment period for the Draft Environmental Impact Statement closed December 17<sup>th</sup>.
5. Recreation: (NO UPDATES AT THIS TIME)
  - a. The District will again be hosting a ten person AmeriCorps NCCC crew that will be working on both community and Forest Service projects
6. Resource Advisory Committee (RAC) ()
  - a. Secure Rural School funding was reauthorized by Congress for another 2 years
  - b. 2020 RAC meetings for WRD/PRD are being scheduled for May but are currently on “pause” due to CV-19
7. Abandoned vehicles on Forest Service administered lands ()
  - a. Clint shared preliminary ideas from the City/FS working group meeting with Forest Supervisor’s Team last month and received an appreciative green light to continue on the path currently being explored. Their gratitude was extended to the City for their collaboration towards a better future state. Next Steps include:
    - i. A shared communication strategy to roll out to the public to prepare vehicles owners for an inventory of operational vehicles vs. non-operational (abandoned); this is currently being developed.
    - ii. FS is continuing to work toward a method to:
      1. Remove abandoned vehicles through a stewardship contract and complete restoration on the administrate site to identify future parking lot perimeter, clean up area/remove environmentally damaging material, and correct poor drainage, etc.
      2. Prepare a Special Use Permit for the City to institute a pilot program to ensure accountable and enforceable rules for vehicle storage at the sight
8. SS Chugach ()

- a. Engineering of site plan is in progress with a goal of moving the ship by September
  - b. Shelter options are still under consideration including a canvas cover not affixed to the ground and resembling other boat yard structures
9. Other:

## CITY & BOROUGH OF WRANGELL, ALASKA BOROUGH ASSEMBLY AGENDA STATEMENT

<u>AGENDA ITEM TITLE:</u>	<u>DATE:</u>	March 24, 2020
	<u>Agenda Section</u>	<b>13</b>

**RESOLUTION NO 3-20-1520** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA, ESTABLISHING ALTERNATIVE 1: SPILLWAY TRENCH & SIPHON AS THE PREFERRED OPTION FOR THE RESERVOIR BYPASS PROJECT

SUBMITTED BY:

Amber Al-Haddad, Capital Facilities Director

FISCAL NOTE: See Summary

**Expenditure Required:**

FY 20: \$	FY 21: \$	FY22: \$
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**Amount Budgeted:**

**Account Number(s):**

**Account Name(s):**

**Unencumbered Balance(s) (prior to expenditure):**

	\$
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Reviews/Approvals/Recommendations

<input type="checkbox"/>	Commission, Board or Committee
<input type="checkbox"/>	Attorney
<input type="checkbox"/>	Insurance

ATTACHMENTS: 1. Resolution No 3-20-1520; 2. Shannon & Wilson, Inc. March 4, 2020 Upper Dam Bypass Alternatives Analysis report; 3. Shannon & Wilson August 4, 2003 Upper Reservoir Water Tap Evaluation report; 4. Upper Reservoir Storage Graph

**RECOMMENDATION MOTION:**

Move to Approve Resolution No 3-20-1520.

**SUMMARY STATEMENT:**

The City and Borough of Wrangell is under contract with Shannon & Wilson Engineers to develop an Upper Reservoir Dam Tap Alternatives Analysis to evaluate alternatives for tapping the reservoir

March 24, 2020

dam. The report includes preparing the associated costs and potential risks for each alternative to determine an appropriate method for the tap. The dam tap would serve to create a direct connection between the reservoir and the water treatment plant. Having this second water intake line will improve raw water intake for the community, in that either reservoir could act as a backup in the event one is offline for maintenance or water levels are low enough to impact flow to the treatment plant.

Shannon & Wilson has inspected Wrangell's dams for many years and are well acquainted with the condition of the dam that affect the water tap. These includes leaking along the two existing drainpipes in the dam, deterioration of the timber crib structure buried within the dam fill, liquefiable foundation soils under the dam, poor quality materials used in the construction of the dam, and the instability of the dam as identified in the 1993 stabilization study.

Shannon & Wilson has evaluated five tap/intake options as outlined in their attached March 4, 2020 Upper Dam Bypass Alternative Analysis report. Each option includes a summary of the assumed construction procedures and certain advantages and/or disadvantages of each. The following alternatives were evaluated:

- Alternative 1 – Spillway Trench & Siphon
- Alternative 2 – Horizontal Directional Drilling (HDD)
- Alternative 3 – Sliplining
- Alternative 4 – Cured in Place Pipe Lining (CIPP Lining)
- Alternative 5 – Pump Around

Each alternative was evaluated relative to a variety of criteria including capital costs, permitting, construction schedule, construction risks, future service flexibility, and impacts to the dam. A selection matrix was then used to numerically rank these criteria.

Shannon & Wilson's March 4, 2020 report does not offer a recommendation as to which alternative the CBW should consider, but it rather suggests the CBW evaluate the rankings and determine if our assessment aligns with their rankings. A 2003 Shannon & Wilson alternative analysis and recommendation for this same project, however, did identify the Spillway Trench & Siphon tap method as the preferred option at that time. The 2003 study also considered the Rehabilitation of the Existing Drainpipes and Directional Drilling alternatives. A copy of the 2003 Shannon & Wilson Upper Reservoir Water Tap Evaluation is attached here.

Since receiving Shannon & Wilson's draft analysis report, staff have continued to work with the engineers to gain additional knowledge of our existing conditions and explore some of our concerns related to some of the alternatives.

A CCTV (closed-circuit television) inspection added valuable information to our evaluation of the two alternatives related to using the existing drain lines through the dam as the water intake/tap. The information gleaned through this effort is explained below.

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- Alternative 3 – Sliplining of the Two Existing Drain Lines. The CCTV inspection performed on the two existing drain pipes through the dam confirmed that the 8" and the 10" pipe are both either deformed and/or collapsed in ways that if pursuing the Sliplining option, there would be significant reduction in the sizes of pipes that would be used in both the 8" and 10" host pipes.

Considering that the 8" existing pipe may only accommodate a new 5" pipe and that the 10" existing pipe may only accommodate a new 2" pipe, the combined flow capacity of the two sliplined pipes would produce a total flow rate from the upper reservoir of 750 gpm. Shannon & Wilson's ranking matrix scored this alternative as the second highest option; however, this reduced rate of flow would not supply water to the treatment plant to meet the community's current demand.

- Alternative 4 – CIPP Lining of the Two Existing Drain Lines. The CCTV inspection performed on the two existing drainpipes through the dam also confirmed that the 8" and the 10" pipes had a significant amount of water flowing through the pipe walls. Following review of the CCTV inspection, Shannon & Wilson removed this option from consideration because the flowing water would complicate the work and potentially wash out the resin from the liner tube prior to completion of curing.

When reviewing both alternatives related to using the two existing drain lines, we considered that unexpected defects would be present in the two pipes that were not identified by the CCTV inspection. Further, the existing pipes in the dam are of a combination of wood stave pipe and ductile iron pipe, are old and fragile, and could be further compromised by the work required under each alternative. Based on these considerations, combined with those listed above for each alternative, considering the Sliplining and CIPP Lining alternatives is not recommended.

The three remaining alternatives for consideration are Alternatives 1, 2 and 5 with the following review synopsis.

- Alternative 5 – Pump Around. The Pump Around option ranked highest in Shannon & Wilson's ranking matrix due to its reduced risk to the dam, limited construction challenges, and the ability to increase flow rates to the water plant by utilizing pumps with variable frequency drives.

Staff's evaluation of this alternative considered the additional infrastructure that this option creates, which includes extending power to the reservoir, extending the roadway, and constructing a catwalk and pump station to house the added equipment.

This option would create additional energy consumption costs and maintenance costs, and it has the highest life cycle costs. This option also requires the highest capital cost, estimated at over \$2,000,000. The Pump Around alternative is not recommended because we cannot afford it.

- Alternative 2 – Horizontal Directional Drilling (HDD). HDD is not recommended through embankment dams such as Wrangell’s due to the risk of hydraulic fracture; *however*, HDD could be performed through the abutment where the rock was previously analyzed as a “hard” category, suitable for the HDD process. The HDD option received the lowest ranking in Shannon & Wilson’s matrix even though they identify it in the report as having minimal impacts to the dam, and they advise that it is a feasible approach for installing a new conduit. The low marks in the matrix are associated with the impacts required for the work, which include a lengthy amount of time for the overall construction of the project and the requirement that the reservoir be lowered, as much as possible, to accomplish the construction tasks.

While the HDD alternative was considered a feasible approach due to its minimal impacts to the dam, staff’s evaluation of this alternative led us to focus primarily on the requirement that the reservoir level would have to be lowered, in addition to the cofferdam that would be constructed. If we eliminate the upper reservoir’s water capacity (47.3 million gallons) from our water supply to accomplish this task, there is overwhelming risk that the smaller-capacity, lower reservoir (21.8 million gallons) would not, on its own, be enough to sustain the water capacity for the community through the lengthy construction period.

This option requires the second highest capital cost, estimated at over \$1,000,000. While the estimated cost of the HDD alternative is also considered second lowest in our review of these last three alternatives, it is also only approximately \$150,000 more than the lowest cost alternative. This option may have been offered as a recommended approach; however, due to the high risk it poses to the community’s water supply, it is not recommended.

- Alternative 1 – Spillway Trench & Siphon. The option of trenching through the existing spillway at a depth of approximately 7’ below the reservoir surface and installing a siphon to provide for the water intake is ranked in Shannon & Wilson’s matrix as the second highest of the last three alternatives considered by staff, and it has the lowest capital cost of these remaining alternatives.

The option would require lowering the reservoir level to below the trenching elevation (approximately 7’). With this level of reservoir water lowering, we could still gain access to the water by way of a separate siphon, similar to what staff is currently using.

This option also requires drill and blast to achieve access through the spillway. The engineer cautions that excavation through the rock could fracture or destabilize the rock, which would require a contingency for repair during the project. The engineer indicates that if the drill and blast method was used, it would be accomplished with trim blasting, taking small controlled shots in several lifts to remove the necessary rock. Both the 2003 and 2020 Shannon & Wilson reports indicate that mechanical trenching is an alternative to drill and blast, to reduce risk to the dam, but may create higher mobilization costs.

Earlier this year, staff narrowed our preferred alternative to the Spillway Trench & Siphon option. Before confirming this as our preferred option, we queried the engineers about limitations of accessing the full depth of the stored water based on limits of siphon uplift (identified as 15'-20'). With a 7' trench depth and a 15' (minimum) siphon lift, the siphon inlet would be at elevation 336', which gains us three additional feet of water beyond our current drain lines' inlet elevation of 339'. At the 339' elevation, there is approximately 2,000,000 gallons of inaccessible water. In referencing the attached upper reservoir storage graph, it suggests that water below the 335' elevation is unusable.

Our query about siphon lift led to a larger concern regarding the connection of a siphon to a closed pipe system, such as ours. Water staff suggested to the engineers that connecting the siphon to the conveyance pipe would not create a closed system, since the draw from the plant would provide constant flow, until such time as the vacuum breaker valve was engaged to stop the siphon. Staff asked the engineers to revisit the engineering of the siphon connected directly to a closed pipe. Toward this effort, staff and the engineers met with Karl Hagerman, Petersburg Utility Director, who had experience with a pipe collapse some years ago with their Cabin Creek Waterline, a siphoned, 6-mile run of 24" HDPE waterline. Karl described the problem causing the pipe collapse as a vacuum from a change in flow resulting from algae growth on the interior of the pipe. Karl described how with proper engineering of the conveyance system, materials used, and putting mechanisms and procedures in place for routine interior pipe cleaning, Petersburg has been able to continue use of this line for the past ten years without further issues. Under this alternative, the engineers would perform a hydraulic model of the system to include identifying the properly pipe material to reduce the risk of pipe collapse.

Staff have identified the Spillway Trench & Siphon as the alternative that best meets the project's desired outcome, considering the impacts to the ongoing raw water supply, risks posed to the dam, and limited funding available to complete the selected project. This option has the lowest capital cost of the three viable alternatives.

- Additional Consideration for Spillway Trench & Siphon

The Spillway Trench & Siphon approach may offer the added benefit of mitigating our deficiency of not having a drawdown pipe for the upper reservoir. Staff have reviewed with the geological engineer the possibility of a deeper trench for the siphon pipe *and* a draw down pipe. This proposed trench would be 20'-22' deeper than the 7' trench depth required for the siphon pipe alone.

The engineer suggests that to consider adding the drawdown pipe and trenching lower in the spillway, they would need to review the dam information they have on file, and depending on this result of their review, they may or may not recommend pursuit of this idea. If a review suggested that deeper trenching could be feasible without impacting the dam, and if the State of Alaska Dam Safety Engineer also approved its feasibility, a seismic test would be performed to further identify risk to the already fragile dam. If the Spillway

Trenching & Siphon option is established as the preferred alternative, staff wish to include the drawdown pipe review and engineering design in the scope of work.

We have confirmed that a portion of the bypass pipe was installed in the early 2000s, using Ductile Iron Pipe (DIP), instead of High Density Polyethylene Pipe (HDPE). Public Works was able to visually inspect only 50'+/- of the interior of this pipe, which appears clean and smooth. Water pressure testing of this pipe provided for positive results; however, due to the fact that our DIP has been failing prematurely throughout our system, staff recommend including the replacement of the DIP with HDPE in the scope of the project as an additive alternative, which will allow us to evaluate the option of making that replacement, if economically feasible.

### **FISCAL NOTE:**

The CBW received a grant in the amount of \$600,000 from the State of Alaska, Department of Commerce, Community and Economic Development (DCCED). After expenditures related to the Alternatives Analysis and the CCTV Inspection, our grant fund balance is approximately \$545,000. The estimated total project cost for Alternative 1: Spillway Trench & Siphon, including design, permitting, construction and construction management is \$874,000. This total includes a projected \$80,000 of CBW Management costs, which could be performed in-kind to the project, reducing the project cost to \$794,000. While a construction cost for the selected alternative would be refined through development of the engineering design, these calculations suggest an additional \$250,000 is needed to provide for the full project cost for this alternative.

A grant extension was received from the DCCED until June 30, 2021. If the construction cost estimate refined through the design phase indicate costs beyond our grant funds, acquiring this additional funding will be necessary before the construction project can be bid. If additional funding cannot be identified prior to the expiration of the grant, we stand to lose the remainder of the grant funds and would have a completed design and a shovel-ready project.

In an effort to begin seeking additional funding which may be needed, staff propose making an application to the ADEC Drinking Water State Revolving Fund Loan program in May.

### **CONCLUSION:**

With the outline of the evaluation of Shannon & Wilson's proposed alternatives, we seek to establish Alternative 1: Spillway Trench & Siphon as the preferred alternative and seek concurrence from the Borough Assembly. If Alternative 1 is established as the preferred alternative, staff would request an engineering fee proposal from Shannon & Wilson, which would require further reviewing and approval by the Assembly at a meeting in April. Shannon & Wilson have suggested it will take two to three weeks to develop the fee proposal.

March 24, 2020

## CITY AND BOROUGH OF WRANGELL, ALASKA

RESOLUTION NO. 03-20-1520

## A RESOLUTION OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA ESTABLISHING ALTERNATIVE 1 – SPILLWAY TRENCHING &amp; SIPHON AS THE PREFERRED ALTERNATIVE FOR THE RESERVOIR BYPASS PROJECT

WHEREAS, the City and Borough of Wrangell, Alaska contracted with Shannon & Wilson, Inc. to provide for a Reservoir Bypass Connection Design, Task 1, Tap Alternatives Analysis to evaluate methods and technologies for tapping the upper dam to create a direct connection between the reservoir and the water treatment plant; and

WHEREAS, Shannon & Wilson, Inc. evaluated five alternatives: Alternative 1: Spillway Trench & Siphon; Alternative 2: Horizontal Directional Drilling; Alternative 3: Sliplining; Alternative 4: Cured in Place Pipe Lining (CIPP); Alternative 5: Pump Around; and

WHEREAS, the City and Borough of Wrangell has evaluated the five alternatives and establishes Alternative 1: Spillway Trench & Siphon as the preferred alternative for the Reservoir Bypass project.

NOW, THEREFORE, BE IT RESOLVED BY THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA, that:

Section 1: Alternative 1: Spillway Trench & Siphon is established as the preferred alternative for the Reservoir Bypass project; and

Section 2: The Borough Manager is authorized to negotiate with Shannon & Wilson, Inc. for a fee proposal for the engineering design of Alternative 1: Spillway Trench & Siphon.

PASSED AND APPROVED BY THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA this 24<sup>th</sup> Day of March 2020.

CITY & BOROUGH OF WRANGELL, ALASKA

\_\_\_\_\_  
Stephen Prysunka, Mayor

ATTEST: \_\_\_\_\_  
Kim Lane, Borough Clerk

March 4, 2020

City and Borough of Wrangell  
PO Box 531  
Wrangell, Alaska 99929

Ms. Amber Al-Haddad, Director of Public Works

**RE: UPPER DAM BYPASS ALTERNATIVES ANALYSIS, WRANGELL, ALASKA;**

This letter presents the results of our alternatives analysis for a reservoir bypass at the Upper Wrangell Reservoir Dam to water utility works below the Lower Wrangell Dam. We understand that the bypass was partially constructed, but was halted prior to constructing the dam tap at the Upper Reservoir Dam. In 2003, Shannon & Wilson conducted an alternatives analysis to assist the City and Borough of Wrangell (CBW) in selecting the most efficient way to design and construct the Upper Dam tap. Since that time, no work has been conducted on the project. At your request, we have conducted a new alternatives analysis to re-evaluate the Upper Dam tap alternatives accounting for potential improvements to construction and trenchless technologies since our original alternatives analysis. The purpose of this study was to evaluate alternatives for the Upper Dam tap so that a preferred approach can be selected and carried through design. The information contained in this report was developed collaboratively with significant support from Ms. Rebecca Venot, P.E. of CRW Engineering Group (CRW) and Mr. Matt Stephl, P.E. of Stephl Engineering (Stephl).

**PROJECT BACKGROUND**

According to the existing safety inspection reports, the Upper Dam was constructed around 1935 as a log crib structure. The structure leaked badly and the reservoir did not retain significant water until it was rehabilitated around 1958. The rehabilitation effort was documented in as-built drawings dated 1965 and 1967. These drawings formed the base for the sections shown in this report. Based on stability/seepage questions raised during dam inspections, Shannon & Wilson completed a subsurface exploration program in the 1990s. Subsequent to our explorations, Wilson Consulting Engineers & Surveyors (WCES) designed a water systems improvement

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project in 1997. This project included a piped connection between the Upper Reservoir and Lower Reservoir and Shannon & Wilson assisted with this design providing various geotechnical services, including evaluating various methods for tapping the upper reservoir. Construction on the project was initiated, but was halted prior to completion due to permitting issues with construction of the pipeline between the Upper and Lower Reservoir. We understand that the pipeline was constructed up to the second air-relief valve at approximate Station 63+40 on the August 12, 1997 plans where it was to cross the Upper Reservoir Access Road and traverse a low-lying boggy area leading up to the Upper Reservoir. We understand that City of Wrangell personnel excavated and exposed the end of the pipe in 2019 near this location, which is approximately 1,750 feet downstream of the dam. The CBW also conducted pressure testing of the existing section of installed pipe during that time and was able to confirm that the pipe was capable of holding pressure as needed.

Shannon & Wilson's most recent alternatives analysis study was conducted in 2003 and consisted of evaluating four options for designing and constructing a pipeline through or around the existing Upper Reservoir dam. The analysis was based on several information sources that were available at the time of the study. Our current alternatives analysis is also based on existing information and no new subsurface data was collected to support our evaluation. The primary sources of information reviewed during our analysis include:

- ***Periodic Dam Safety Inspection Report, Wrangell Upper and Lower Dams***; May 2016; Shannon & Wilson
- ***Upper Reservoir Water Tap Evaluation***; August 4, 2003; Shannon & Wilson
- ***Pipe Inspection Video***; April 2003; City of Wrangell
- ***Phase I Water System Improvements***; Design Drawings; WCES; 1997

### EXISTING CONDUITS

The two conduits that convey water from the dam are approximately 130 feet long and consist of a 10-inch and an 8-inch metal/woodstave pipe. Each pipe has a mid-point valve on it that is buried in the embankment dam.

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The pipes were inspected with a camera in April 2003 and the results were recorded on video. A diver assisted with an inspection of the pipes at the upstream inlets. During the most recent dam safety inspection conducted in May 2016 (by Shannon & Wilson) it was stated that during the 2003 inspection, the pipes were found to be damaged and that the conduits were allowing water to seep into the embankment fill. The report noted that video of the 8-inch pipe showed rocks pushed through in the woodstave pipe. In the 10-inch pipe a rock was seen punched in from above in the woodstave pipe. The Wrangell public works staff stated that the valves in the two pipes have not been operated for a while. The valves are assumed to be closed at this time.

### **2003 and 2018 Pipe Inspections**

A copy of the 2003 pipe inspection video was obtained and reviewed by Stephl staff as part of this study. No written logs or written report of the inspection were provided. It appears that the inspection was completed with a 4-inch diameter push type camera. The footage counter was not operating correctly during the survey. Therefore, the location of the camera in the pipe during the inspection could not be confirmed. The lighting in the images was dim. Usually only about 1/3 of the interior pipe wall could be observed in the camera image. The recorded video did not have any audio in it. An assumption on which pipe was being observed in the inspection was made based on observations of the end of the pipe where the camera was inserted. The camera was able to travel through both pipes entirely by completing a “reverse set-up” inspection from each end and stopping at the valve in the middle.

Because of the relatively poor quality of the prior pipe inspection, we recommended that the inspection be updated. Accordingly, the CBW contracted with Alaska Stormwater Maintenance (ASM) to perform the inspection on November 15, 2018. ASM used a 4-inch wheel mounted camera, and the results were recorded on video. A diver assisted with an inspection of the pipes at the upstream inlets. During the inspection work, opening and closing the valves and plugging was performed to manipulate the water that was flowing in the pipes. Observations from the inspection in 2018 are as follows:

- The gaps in the pipes walls and joints are allowing water to seep into and out of the embankment fill. Water is also flowing from one pipe to the other through the fill. The 2018 inspection found that the water flow in and out of the pipe walls is significant.



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Capping the pipe ends and operating the valves during the inspection work helped to confirm this condition.

- The two valves were confirmed as being operational. They open and close.
- Much of the video image during the 2018 inspection was blocked by water, debris and floating sediment, similar to the 2003 inspection. The use of the camera footage counter and controlling the water flow in the 2018 work provided an improved image of the pipe interior.
- Both pipes had a greater amount of sediment build-up on the interior pipe wall in comparison to the 2003 inspection.
- In the 10-inch pipe, one significant defect is the collapsed or bulged area that is located approximately 10 feet downstream of the valve. The pipe is collapsed at the 3:00 position, when looking upstream. The collapse is estimated to be pushed approximately five to seven inches into the pipe (from the original pipe wall location) and is estimated to be less than two feet long. At this defect the staves in the pipe wall are still in place but they are fractured. It is estimated that this collapse occurred when the woodstave pipe was originally installed.
- In the 8-inch pipe, one significant defect is the partially collapsed joint at approximately 67.6 feet upstream of the outlet. In the 2018 inspection, the camera was able to look closely at this defect. The pipe is oval shaped and appears to in worse condition compared to the inspection from 2003. Based on an interpretation of the video image it is estimated that the pipe has a vertical height of approximately 6-inches at the deformed area. Also, the joint is estimated to have a gap of approximately one inch.
- In the 10-inch pipe downstream of the valve there is a belly in the pipe invert where the camera was submerged. Upstream of the valve, an open joint was observed with a gap estimated at approximately one inch
- In the 8-inch pipe, downstream of the valve, an open joint was observed in the metal bell and spigot pipe. The pipes appeared to still be in line with each other at this location.

### ALTERNATIVES ANALYSIS

In order to conduct our alternatives analysis, we subcontracted with Stephl and CRW to provide support for trenchless and civil/mechanical design services, respectively. We considered the

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alternatives that were included in the 2003 alternatives analysis and determined which of those alternatives were still viable as well as new alternatives that had not been originally considered. Once we had established the alternatives that would be considered in our evaluation, we developed conceptual designs for each and estimated construction and maintenance/life cycle costs as appropriate. It should be noted that the costs and conceptual designs included in this letter are for planning and programming purposes only and should be considered relative. Once a preferred alternative is selected a full design and cost estimate can be developed.

### **Alternatives**

In total, five alternatives were considered for this study. We did not include trenching through the dam to replace the existing pipes as an alternative because it was considered too disruptive to the existing dam, would likely be too difficult to construct, and would be difficult to permit. Brief descriptions of each alternative considered in our analysis are included below.

- **Alternative 1 – Spillway Trench and Siphon.** This alternative includes the preferred option from our prior alternatives analysis. It includes installing a pipe in a trench excavated in the existing spillway and connecting to the existing pipeline extending from the Lower Reservoir. Once out of the spillway, the pipe will be embedded in the existing Upper Reservoir Access Road.
- **Alternative 2 – HDD.** This alternative includes using horizontal directional drilling (HDD) to install a new conduit around the existing dam. Prior versions of this approach assumed the boring would be conducted under the dam.
- **Alternative 3 – Sliplining.** This alternative would include rehabilitation of the existing pipes by inserting a new pipe inside the existing pipes.
- **Alternative 4 – CIPP Lining.** Cured in place pipe (CIPP) lining is a similar approach to slip lining as it is a form of rehabilitating the existing pipes with a new lining that is flexible when first inserted, but is cured using heat or UV light to form a rigid pipe. Note that this alternative has been eliminated from consideration due to the results of the 2018 inspection.
- **Alternative 5 – Pump Around.** This alternative was not considered in prior evaluations and would use a remotely operated pump system to move water from the Upper Reservoir.

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Note that we selected alternatives that appeared to be the most viable approaches considering site conditions, permitting, and constructability. We also assume that the cost of constructing the pipe connection between the dam tap and the end of the existing water line from the Lower Reservoir would be similar for all five options. Water from the Upper Reservoir tap would flow through approximately 2,500 feet of new 12-inch high density polyethylene (HDPE) pipe routed within the existing road bed to the WCES pipeline alignment, where the proposed pipeline leaves the existing road alignment. We understand that an above-ground pipe may be preferred and are prepared to explore this possibility in later design stages, however a below-grade pipe is more advantageous hydraulically. Similar to the WCES proposed pipeline, high point air-vacuum valves and low point drains would be provided along the alignment. More detailed discussions of the evaluated alternatives are included in the text below and conceptual drawings of the alternatives are attached to this letter.

### **Alternative 1 – Spillway Trench & Siphon**

This option consists of constructing one new 12-inch HDPE or steel pipe in a trench excavated along the existing spillway as shown on Figure 1. This pipe would be designed as a siphon inlet for the water supply. Trenching for installation of the pipe would be accomplished using mechanical and/or drill and blast methods. For operation, the siphon inlet would require a priming station located in the spillway where water could be introduced into the pipe to prime the siphon. Priming is accomplished by pumping water to fill both legs of the siphon from above, with closed valves and the inlet and outlet. An air release valve next to the fill connection will let air out as the pipeline fills. Once the pipe is full, the valves are opened to start the flow. In addition to the filling appurtenances, a vacuum breaker valve should be included on the downstream side of the siphon to allow air into the pipeline to stop the siphon and prevent collapse of the pipeline. During design, a hydraulic model of the pipeline should be developed to identify the location of the air/vacuum valves and confirm anticipated system pressures to inform pipe material selection to reduce the risk of pipeline collapse. Alignment details are illustrated in Figure 1. Key assumptions included in our cost evaluation of Alternative 1 are included as follows:

- Reservoir water level would need to be lowered approximately 7 feet to allow the trench excavation to be completed above the reservoir surface.

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- The reservoir will need to be drained further (22 feet) for construction of the siphon inlet to allow it to draw from the lower levels of the Upper Reservoir.
- Excavation of the trench through the right abutment by drill and blast methods or alternatively, by mechanical trenching. The initial trench through the right abutment would be about 40 or 50 feet long.
- Concrete backfill will be used up to existing grade in the trench through the right abutment to form an impermeable barrier at the inlet.
- The siphon inlet will require anchoring to the reservoir side of the dam, a coarse screen to eliminate debris, and an inlet vortex breaker to reduce the entrainment of air during low reservoir level operation.
- Excavation will be required for the remaining trench to the end of the existing water line from the Lower Reservoir.
- Decommissioning of existing two outlet pipes by compaction grouting around the existing outlet pipes.

The advantages for this approach are similar to those discussed in our 2003 alternatives analysis. The excavation process can be conducted using locally available resources and experienced contractors. However, excavation through rock this close to the dam could fracture or destabilize rock that would need to be repaired as part of the project. If drill and blast methods are used, vibration from construction could also negatively impact the dam. Additionally, while siphoning is relatively economical and uses gravity flow, manual priming (using pumped water) is still required to operate the system. Also, the system would be limited by siphon lift that would likely reduce the usable volume of the reservoir. The total useable volume of the reservoir may be reduced compared to other alternatives because siphon lift is limited to approximately 15 feet. The top of the siphon would be trenched in the spillway, but the depth of the trench is limited to reduce the amount of excavation needed and to reduce the risk of destabilizing the adjacent dam structure. The anticipated lowest working level of the reservoir with a siphon is 339 ft. The existing inlet pipe (and what we would use for the other alternatives) is about 337 ft, so there's about 3 ft of volume that wouldn't be accessible with the siphon

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### **Alternative 2 – HDD**

HDD is a steerable drilling system that uses a surface-launched drilling rig for the installation of underground pipes. The HDD installation process is comprised of three basic stages:

- **Stage One** – Drill a guided/steerable pilot bore from the entry location to the exit location
- **Stage Two** – This is the reaming stage and commences with addition of a reamer that is used to enlarge the hole. Cuttings are removed with drilling fluids. A reamed diameter of 18 inches would be used to reduce frictional pullback loads and to maintain circulation of drilling fluids around the product pipe. It could take up to three reaming passes to sufficiently enlarge the hole.
- **Stage Three** – This stage involves pulling the 12-inch diameter product pipe into the completely reamed bore hole.

When completing HDD bores around embankment dams, hydraulic fracture (hydrofracture) of the drilling mud is a significant concern. Hydrofracture occurs when fluid pressures in the bore path exceed the capacity of the soil and the drilling mud exits the bore path boundary. This can result in drilling fluid inadvertently returning to the ground surface. In embankment dams, this can lead to the creation of water seepage paths. The Federal Emergency Management Agency (FEMA) technical manual titled *Conduits through Embankment Dams, Best Practices for Design, Construction, Inspection, Maintenance, Renovation, and Repair*, 2006, recommends the following in regard to using HDD to install conduits near embankment dams:

- HDD should not be used for installing pipes through embankments dams.
- HDD should be restricted to installation of pipes in dam foundations and abutments.
- Entrance and exit points should be located at least 300 feet from the dam when drilling in the dam foundation.
- In controlled tests by the U.S. Army Corps of Engineers (COE), hydrofracture, ground subsidence, surface heave and collapses have all occurred with HDD.
- A collar should be installed near the downstream end of the product pipe to control seepage.

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The U.S. Corps of Engineers (COE) issued Regulation No. 1110-1-1807 on December 31, 2014 titled, *Engineering and Design, Drilling in Earth Embankment Dams and Levees*. The purpose of the regulation was to establish policies for drilling in dam and levee embankments and/or their earth and rock foundations. The COE regulation contains the following significant points:

- A hydrofracture analysis for the HDD bore path should be completed to evaluate the potential for drilling mud to reach the ground surface.
- It is the responsibility of the Dam Safety Officer to ensure compliance with restrictions and procedures outlined in the regulation.
- An approved Drilling Program Plan is required prior to doing the work.
- Consider using conductor casings in some soils to reduce hydrofracture.

HDD is a viable method for installing a new conduit into the Upper Dam. The HDD bore path would travel through rock along the right abutment. The proposed bore path and general alternative layout is shown in Figure 2. The rock at this site is rated in the Class III “hard” category with an estimated compressive strength of 7,000 to 14,000 pounds per square inch (psi) and is very feasible to drill through using the HDD process. Boring under the dam in the foundation zone poses a risk to the dam integrity and is not recommended.

Key assumptions regarding the process to complete an HDD bore to install a new conduit in the Upper Dam are as follows:

- The HDD bore would include approximately 420 feet of 12-inch HDPE pipe along a curved path as shown in Figure 2.
- It is anticipated that the bore would be reamed to 18 inches in diameter.
- A preliminary bend radius of 500 feet is proposed. This bend radius can accommodate the drill stem and product pipe and is a reasonable bend to accomplish during drilling.
- The HDD exit location cannot be under the water. The reservoir would be emptied as much as is practical and a cofferdam would be constructed to keep water from entering the HDD exit location.
- The bore path annular space between the 12-inch HDPE product pipe and the bore wall would be sealed with a cement grout at each end of the bore. This grout is critical to

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prevent water from traveling along the annular space after the reservoir is filled and operational.

- Decommissioning of existing two outlet pipes by compaction grouting around the existing outlet pipes.

The advantages for this approach are mostly associated with minimal impact to the existing dam and that the repair does not rely on the integrity of the existing conduits through the dam. However, the HDD approach will likely be time consuming and relatively costly. Draining and refilling the reservoir will also draw out the duration of the work and add to overall construction cost.

### **Alternative 3 – Sliplining**

Sliplining is described as the insertion of a new pipe into an existing host pipe. On this project, the annular space between the woodstave/metal host pipe and the new pipe would be filled with a flowable cement grout. This proven pipe rehabilitation process provides the benefit of a new pipe, but with the limitation of reducing the pipe capacity. The slipliner pipe is pulled or pushed through the existing host pipe. There are numerous examples of sliplining being used to renovate conduits in embankment dams. HDPE would be used for the slipline pipe on this project. Sliplining can be done by most general contractors. Specialized equipment such as the closed-circuit television (CCTV) camera and the grouting equipment would need to be mobilized to Wrangell.

Generalized project details and layout for this alternative are shown on Figure 3. For the 8-inch conduit it is recommended that the slipliner pipe be a 5-inch HDPE SDR 17 with an inside diameter (I.D.) of 4.88 inches and an outside diameter (O.D.) of 5.56 inches. The limiting factor in selecting a size for the HDPE pipe was the ability to pass through the deformed area located 68 feet from the outlet. The host pipe interior is estimated to be 6-inches in height at the deformation. For the 10-inch conduit pipe it is recommended that the slipliner pipe be a 2-inch HDPE SDR 17 with an I.D. of 2.08 inches and an O.D. of 2.37 inches. This smaller diameter pipe was selected to be able to pass through the narrow, collapsed area that is downstream of the valve. Preliminary calculations show that when both pipes are sliplined as described above they would have a combined flow capacity of approximately 750 gpm.

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Key assumptions regarding the process to complete sliplining in the existing conduits in the Upper Dam are as follows:

- The reservoir would be emptied as much as is practical and a cofferdam would be constructed to allow access to the intake ends and to keep water from entering the existing conduits during the slipline and grouting work.
- The existing valves would be opened.
- The existing pipes would be cleaned and inspected with a camera to confirm that they are ready for sliplining.
- A sizing mandrel or short section of the proposed HDPE slipliner would be pulled through the host pipes to confirm that the proposed liner will fit.
- The butt-fused HDPE slipliner pipes would either be pushed or pulled into place.
- The entire 130-foot-long annular space between the host pipe and the slipliner pipe would be filled with a flowable cement grout. This grout is critical to prevent water from traveling along the annular space after the reservoir is filled and operational.
- A post-construction CCTV inspection would be done after the slipliner is installed.
- New valves would be installed at either the upstream or downstream ends or both.
- An open-bore flush of the pipe to remove any remaining debris would be performed, followed by disinfection.
- A filter diaphragm or collar would be constructed at the downstream end of the conduits to minimize seepage.

Advantages of sliplining are associated with minimal impact to the existing dam and the use of the existing conduits to insert the new pipes. Construction impacts, time, and costs of this option are likely the lowest of the evaluated options. There is some risk to selecting this approach during construction in that because the existing pipes are damaged, the process of inserting the new pipes may be difficult. Because of the amount of water in the existing pipes, there were areas that were not able to be inspected and unexpected defects in the pipe could prevent sliplining.



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#### **Alternative 4 – CIPP Lining**

CIPP liners have been successfully used to repair conduits in embankment dams in the United States. CIPP is a lining system in which a thin flexible tube of fabric is impregnated with resin and expanded by means of internal pressure into position on the inner wall of a defective pipeline before curing the resin. Curing of the resin usually takes place with steam, hot water, or ultraviolet (UV) light. Based on the results of the updated inspection in 2018 and the degree and type of damage to the existing pipes, it is our opinion that this alternative should be removed from consideration.

#### **Alternative 5 – Pump Around**

For this option, a new intake structure and pump station would be constructed in the Upper Reservoir. The intake would be a pile-supported, steel structure with an access catwalk located above the maximum water surface elevation of the reservoir. The pump station would utilize vertical turbine pumps with submersible motors housed in screened pump cylinders, similar to a groundwater well pump. The pump station would include both a duty and standby pump to provide redundancy for operation and maintenance. The pumps would be sized to lift reservoir water over the dam crest at 1,400 GPM maximum flow, and include variable frequency drives (VFD's) to adjust the flow from the pump station to the water treatment plant (WTP), allowing for reduced energy consumption during low flow periods. A drawing showing the conceptual plan is included in Figure 4. Key assumptions regarding the process to construct the pump around facilities at the Upper Dam are as follows:

- It is assumed that the existing flow control valve at the WTP will work. The existing electronic flow control valve would need to be evaluated to determine if it will function with the increased pressure and flow provided by this alternative.
- Includes providing power and controls to the Upper Reservoir for the pumps.
- Includes controls at the Upper Reservoir that would include a local control panel to turn the pumps on and off, which would be located in a weatherproof shelter.

Advantages of the pump around option are such that the project can be completed with no impact to the existing dam with minimal risk for permitting or other delays. Construction challenges

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would be significantly lower for this option as well. In addition, by using a pump, the flow rates from the system can be higher and the influent pressure to the WTP can be customized. Though the initial construction and life cycle costs are higher for this option (through periodic maintenance and ongoing power needs), the City will benefit from having power extended to the Upper Reservoir and the bypass works will be easier to maintain because the major system components will not be buried under or around the dam.

### **Cost Comparison**

The approximate costs associated with each of the above alternative are summarized in the table below. We assumed that connecting the reservoir tap-works to the existing pipeline near the Lower Reservoir would be approximately the same for each alternative (estimated at approximately \$640,000 for a typical buried pipeline under the existing access road). The costs below represent approximate construction costs in 2019 Dollars and include design, construction management, permitting, or other administrative costs. Note that these costs are approximate and should be considered applicable for relative comparisons of the alternatives and should not be used for establishing construction budgets. The line items for contingency, design/permitting, and construction management are based on estimated percentages of total construction cost and are not the same for each alternative. All figures are reported in thousands of dollars in the table below and line item cost assumptions for each alternative are attached to this letter.

Alternative	Construction Cost*	Construction Contingency**	Design and Permitting***	Construction Management $\phi$	CBW Management $\lambda$	Total Cost
1	\$487	\$122	\$92	\$92	\$80	\$874
2	\$571	\$143	\$108	\$108	\$94	\$1,025
3	\$302	\$76	\$57	\$57	\$50	\$542
4	N/A	N/A	N/A	N/A	N/A	N/A
5	\$1,145	\$287	\$215	\$215	\$187	\$2,049

\* Includes mobilization/mobilization, bonds, and insurance

\*\* Estimated at 25 percent of construction cost

\*\*\* Estimated at 15 percent of total construction cost (construction cost plus contingency)

$\phi$  Estimated at 15 percent of total construction cost (construction cost plus contingency)

$\lambda$  City and Borough of Wrangell management costs estimated at 10 percent of total construction cost plus design, permitting, and construction management costs

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### **Overall Alternative Comparison:**

In order to provide a comparison of all five alternatives, we created the matrix below that ranks the options relative to each other based on key considerations for selection. The ranking of each criteria is done so on a scale of 1 to 10 with 10 being the most favorable and 1 being the least favorable. It should be noted that the rankings should be considered relative and, with the exception of the cost component, are based on subjective opinions based on the information available at the time of this letter.

- **Cost** – Ranking each alternative by cost was conducted by assigning the most expensive alternative a value of 1 and the least expensive alternative a value of 10. The remaining alternatives were assigned values relative to the most and least expensive alternatives. These cost rankings do not consider life cycle costs.
- **Permitting** – Some alternatives may experience increased efforts in permitting depending on their footprint and impacts to the environment, the existing dam, etc.
- **Schedule** – This criterion is based on the anticipated time needed to construct the project and/or limitations regarding the season in which the construction will likely need to take place.
- **Construction Risks** – This criterion is intended to reflect the difficulty of construction and/or the need for specialized equipment and contractors to complete. It also reflects the relative risk associated with encountering conditions that will make construction difficult, potentially requiring adjustments in design or approach.
- **Future Service Flexibility** – This criterion reflects the relative ability for adjustments to each alternative to address changes to water supply needs in the future.
- **Existing Dam Impacts** – This criterion indicates the potential impacts to the existing dam structure through the construction process.

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SHANNON & WILSON, INC.

Alternative	Cost	Permitting	Schedule	Construction Risks	Future Service Flexibility	Existing Dam Impacts	Total
1 – Spillway Excavation & Siphon	6	5	5	5	4	5	30
2 – HDD	5	3	3	4	2	7	24
3 – Sliplining	10	7	10	2	4	9	42
4 – CIPP Lining	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5 – Pump Around	1	9	7	8	8	10	43

### ALTERNATIVE SELECTION

Upon review of the information contained in this letter, it will be the responsibility of the City and Borough of Wrangell to select the alternative that best fits their current and future needs. The ranking criteria provided in the matrix above is based on our view of the project and understanding of the conditions, and provides equal weight for all criteria. In reviewing this report, the CBW should determine whether any of the criteria listed should have more importance in the determination process than others and adjust the rankings for themselves accordingly. We are happy to discuss any of the criteria or details of each alternative and assist the CBW in selecting the preferred alternative.

This letter finalizes the draft version of this letter that was originally submitted on December 30, 2018. The CBW has reviewed the draft version of this letter and the alternatives in detail. During the summer of 2019 the community experienced water shortages due to drought. The water supply shortage was mitigated in part by the construction of a temporary siphon over the Upper Reservoir Dam, increasing CBW's confidence and desire to select Spillway Excavation and Siphon as the preferred alternative. Since the submittal of the draft report, CRW has also reviewed siphon operation and design practices. If the siphon alternative moves forward, a hydraulic model of the pipeline will need to be developed that considers transient effects of opening and closing valves or other operations that could cause a sudden increase in vacuum in the pipeline and induce collapse. This model will inform pipe selection and the required location for air release/vacuum breaker valves.

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In addition to the siphon operation, CBW performed an inspection of the existing installed pipe. Contrary to the plans, the installed pipe is Ductile Iron, not HDPE. Based on reports by CBW staff, the pipe is in good condition (and as mentioned above, maintained pressure during a pressure test) at the ends and connection points where it has been exposed.

### CLOSURE AND LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives for evaluating the site as it relates to the engineering and construction aspects discussed herein. The conclusions contained in this report are based on site conditions as they are depicted in the available information for the site. It is assumed that the existing information is representative of the surface and subsurface conditions throughout the site.

Unanticipated conditions are commonly encountered and cannot fully be determined by merely reviewing information. Such unexpected conditions frequently require that additional expenditures be made to attain a properly designed and constructed project. The conclusions and recommendations included in this report are at the conceptual level and should be used for general comparison and preliminary planning purposes only. Additional engineering effort will be required to develop a complete and final design of the project. Shannon & Wilson has prepared the attachment *Important Information About Your Geotechnical/Environmental Report* to assist you and others in understanding the use and limitations of the reports.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information obtained or derived from such electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report please contact the undersigned.

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March 4, 2020  
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SHANNON & WILSON, INC.

We appreciate this opportunity to be of service. Please contact the undersigned at (907) 561-2120 with questions or comments concerning the contents of this report.

Sincerely,

SHANNON & WILSON, INC.

Prepared by:

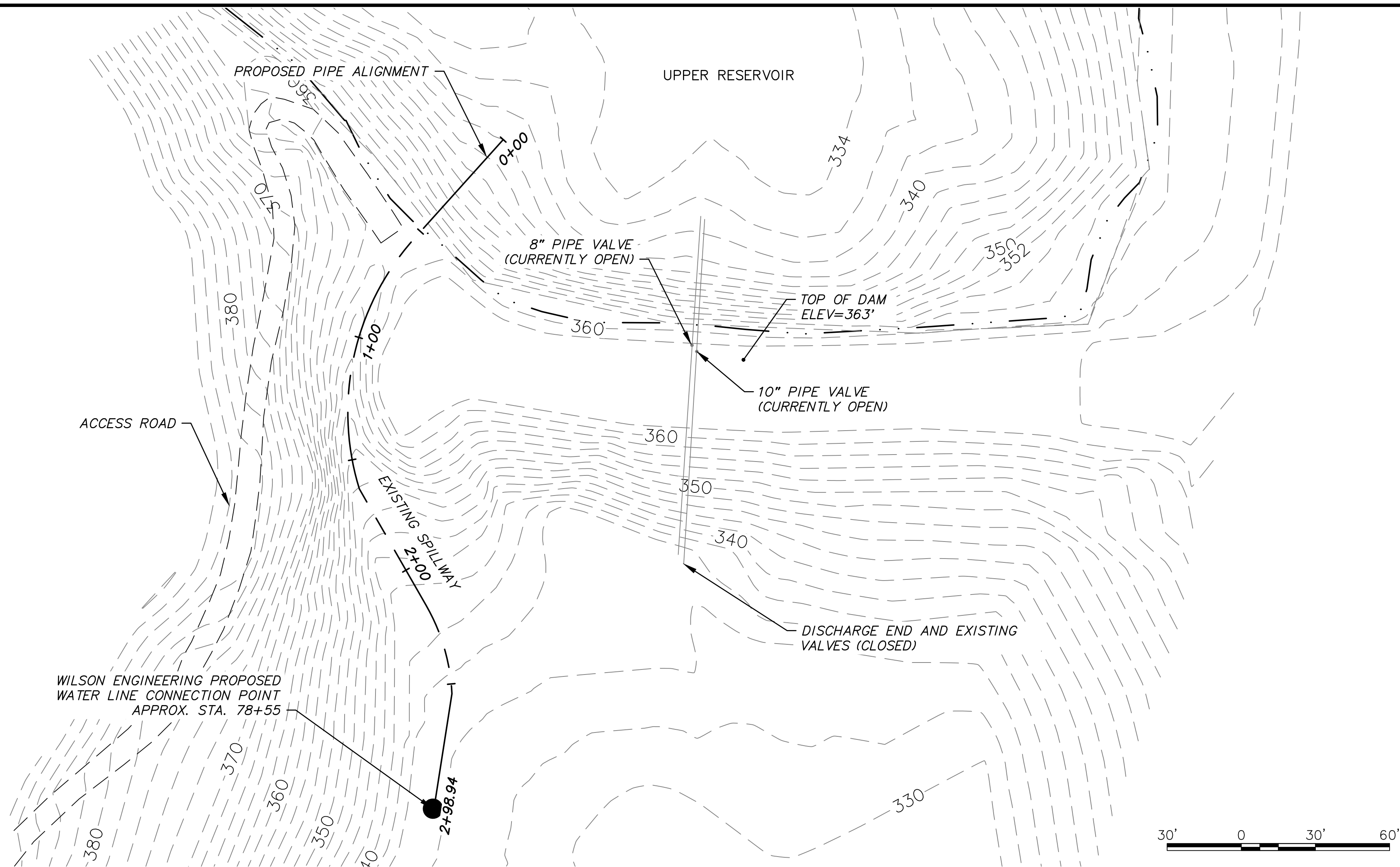


Kyle Brennan, P.E.  
Vice President

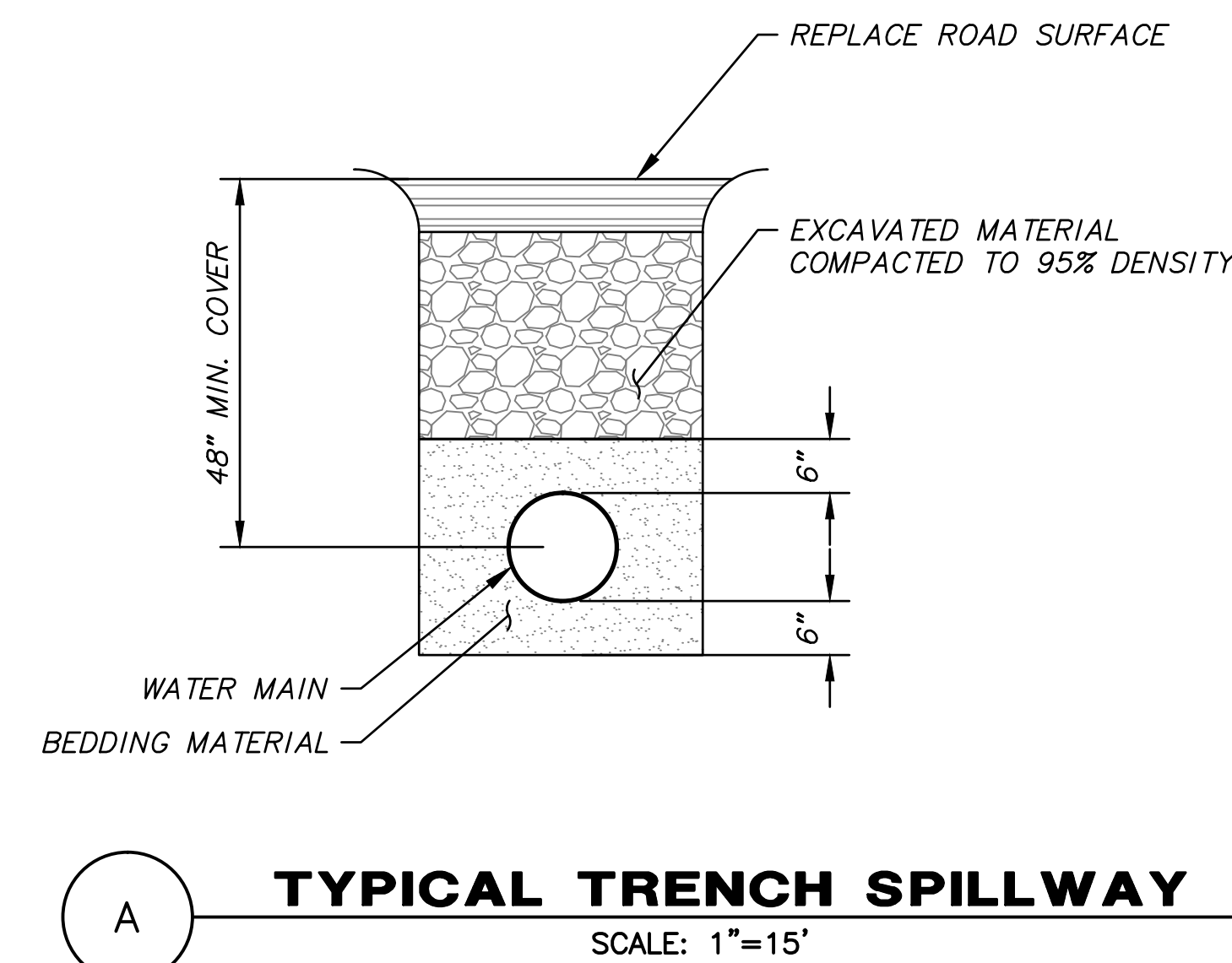
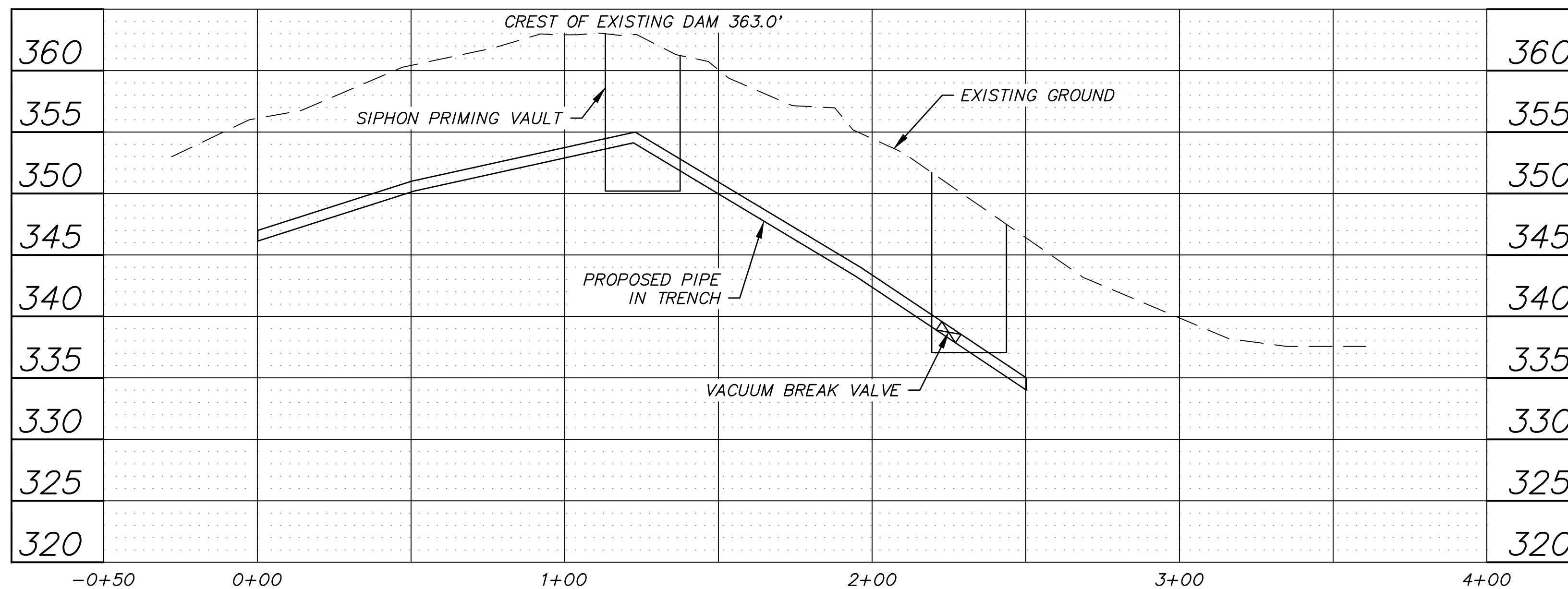
Encl: Figure 1 – Spillway Trench (Alternative 1)  
Figure 2 – HDD (Alternative 2)  
Figure 3 – Sliplining Lining (Alternatives 3)  
Figure 4 – Pump Around (Alternative 5)  
Cost Estimate Details  
Important Information About Your Geotechnical/environmental Report



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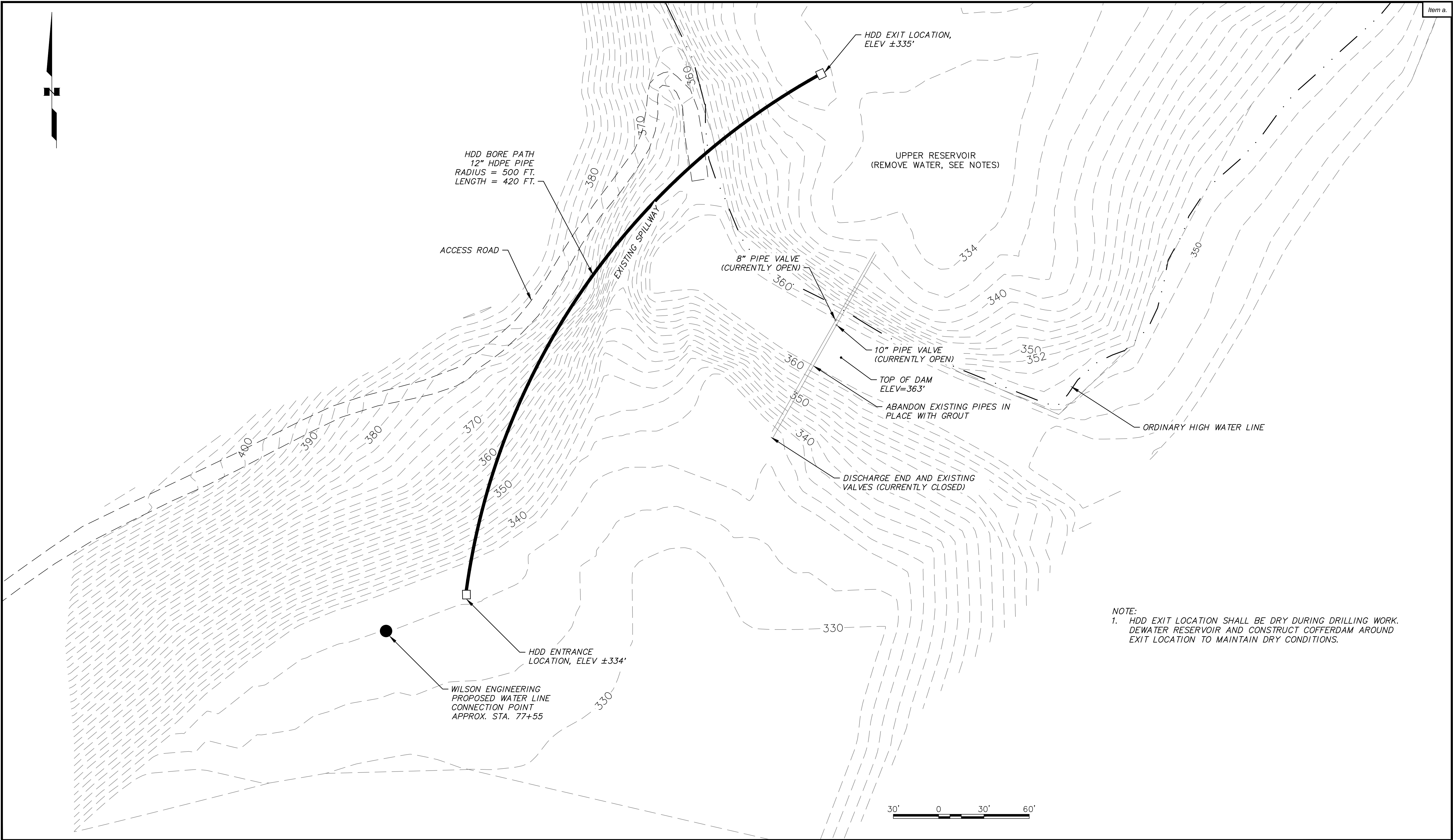


NOTES:  
1. BASE DRAWING "UPPER DAM PLAN AND DETAILS"  
DATED MAY 17, 1968 BY HUBBELL & WALTER  
ENGINEERING CORP. SEATTLE, WASHINGTON FOR THE  
CITY OF WRANGELL PROJECT P-ALASKA-3121.



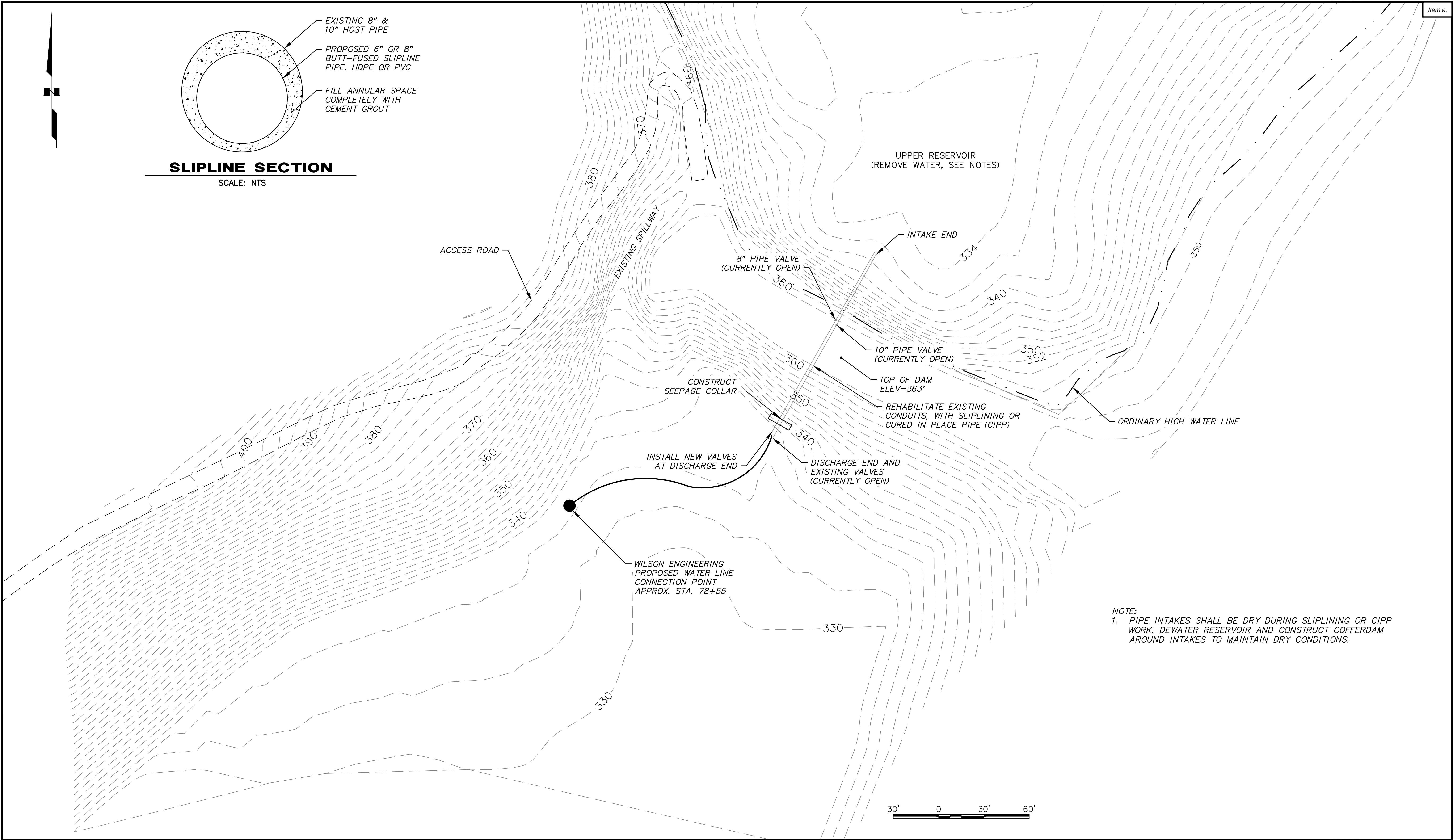


File: \\cwgeng.com\Projects\JobsData\75103.00 Wrangell Upper Reservoir Dam Bypass Alta\00 CADD\02 Figures\05 Report\75103.00 Figure 2.dwg PLOT DATE: 12/8/2017 1:44 PM



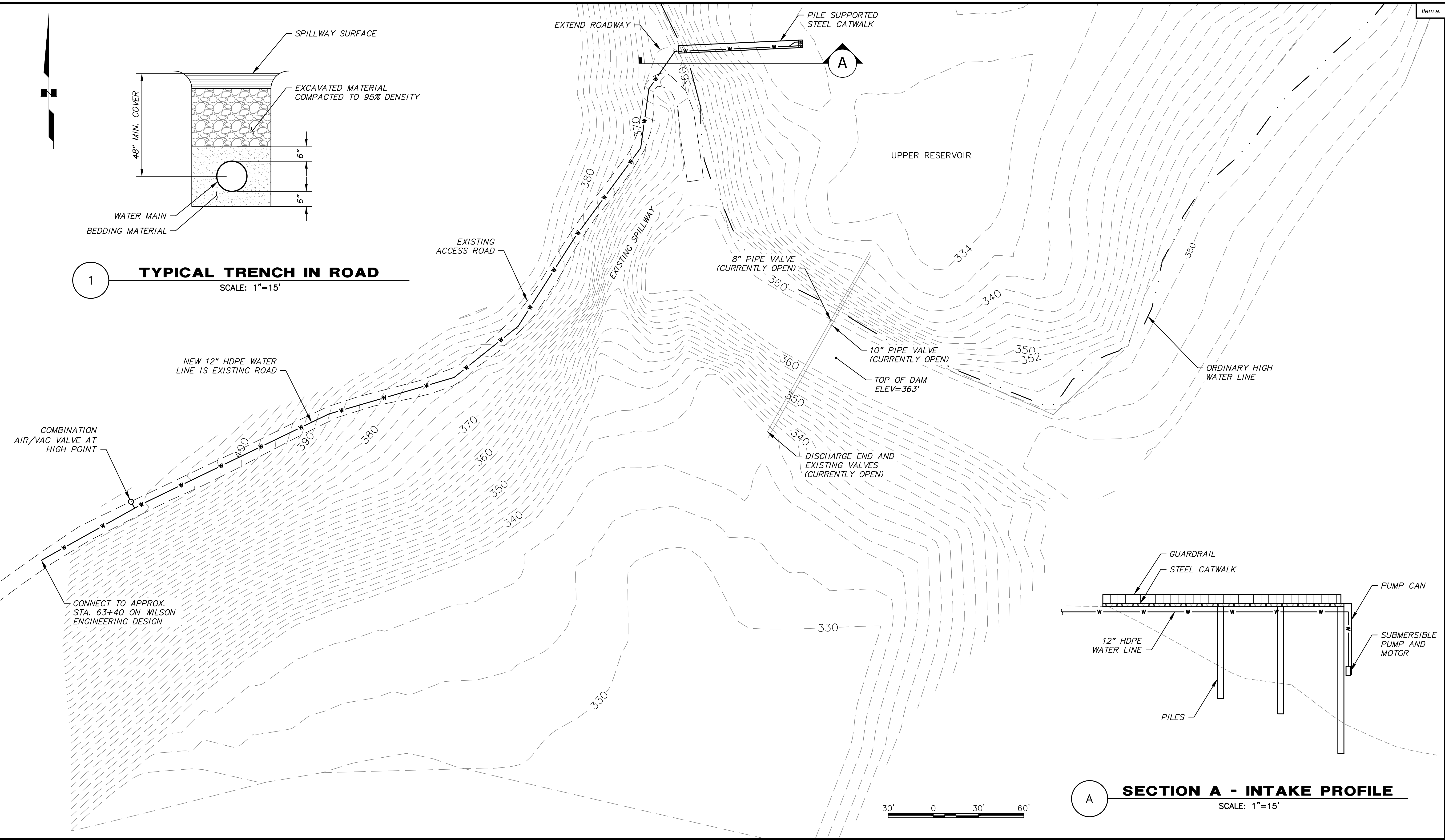


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1 **TYPICAL TRENCH IN ROAD**  
SCALE: 1"=15'

A **SECTION A - INTAKE PROFILE**  
SCALE: 1"=15'



SCALE HOR. 1:30 VER. N/A	PROJECT NO: 32-1-20054-001	WRANGELL UPPER RESERVOIR BYPASS CONNECTION, DAM TAP ASSESSMENT	
DESIGNED BY		FIGURE 4 – PUMP AROUND (ALTERNATIVE 5)	
DRAWN BY			
CHECKED BY			
APPROVED BY	STATUS:	DATE: DECEMBER 2017	SHEET OF 4 4

**Wrangell Upper Reservoir Cost Estimate - Alternative 1 (Spillway Trench)****Rebecca Venot**

3/4/2020 Escalated for 2019 Dollars by Kyle Brennan, January 2020

**Conceptual Estimate**

ITEM NO.	WORK DESCRIPTION	UNIT	TOTAL QUANT.	UNIT PRICE	TOTAL COST
1	Mobilization and Demobilization	LS	1	\$220,507	\$220,507
2	Trench Construction	LF	280	\$763	\$213,640
3	Grout Existing Pipe	LS	1	\$52,974	\$52,974
<b>Construction Cost</b>					\$488,000
Construction Contingency 25%					\$122,000
<b>Total Construction Cost:</b>					\$610,000
Design and Permitting 15%					\$92,000
Construction Management 15%					\$92,000
<b>Subtotal Project Cost:</b>					\$794,000
CBW Project Management 10%					\$80,000
<b>TOTAL PROJECT COST:</b>					\$874,000

**Wrangell Upper Reservoir Cost Estimate - Alternative 2 (HDD)****Matt Steph**

3/4/2020 Escalated for 2019 Dollars by Kyle Brennan, January 2020

**Conceptual Estimate**

ITEM NO.	WORK DESCRIPTION	UNIT	TOTAL QUANT.	UNIT PRICE	TOTAL COST
1	Mobilization and Demobilization	LS	1	\$65,400	\$65,400
2	Dewater Reservoir and Build Cofferdam	LS	1	\$43,600	\$43,600
3	Site Preparation and HDD Drill Pad	LS	1	\$10,900	\$10,900
4	Survey Control	LS	1	\$6,540	\$6,540
5	HDD Drilling 12-inch HDPE	LF	420	\$981	\$412,020
6	Grout Annular Space at Each End	EA	2	\$10,900	\$21,800
7	Abandon Existing Conduits	LS	1	\$10,900	\$10,900
<b>Construction Cost</b>					\$572,000
Construction Contingency 25%					\$143,000
<b>Total Construction Cost:</b>					\$715,000
Design and Permitting 15%					\$108,000
Construction Management 15%					\$108,000
<b>Subtotal Project Cost:</b>					\$931,000
CBW Project Management 10%					\$94,000
<b>TOTAL PROJECT COST:</b>					\$1,025,000

**Wrangell Upper Reservoir Cost Estimate - Alternative 3 (Sliplining)****Matt Steph**

3/4/2020 Escalated for 2019 Dollars by Kyle Brennan, January 2020

**Conceptual Estimate**

ITEM NO.	WORK DESCRIPTION	UNIT	TOTAL QUANT.	UNIT PRICE	TOTAL COST
1	Mobilization and Demobilization	LS	1	\$49,050	\$49,050
2	Dewater Reservoir and Build Cofferdam	LF	1	\$43,600	\$43,600
3	CCTV Inspection and Host Pipe Prep.	LS	1	\$32,700	\$32,700
4	Slipline with 7-inch and 6 or 4-inch pipe	LF	260	\$491	\$127,530
5	Grout Annular Space	LS	1	\$27,250	\$27,250
6	Construct Seepage Collars	LS	1	\$21,800	\$21,800
<b>Construction Cost</b>					\$302,000
Construction Contingency				25%	\$76,000
<b>Total Construction Cost:</b>					\$378,000
Design and Permitting				15%	\$57,000
Construction Management				15%	\$57,000
<b>Subtotal Project Cost:</b>					\$492,000
CBW Project Management				10%	\$50,000
<b>TOTAL PROJECT COST:</b>					\$542,000

**Wrangell Upper Reservoir Cost Estimate - Alternative 5 (Pump Around)****Rebecca Venot**

3/4/2020 Escalated for 2019 Dollars by Kyle Brennan, January 2020

**Conceptual Estimate**

ITEM NO.	WORK DESCRIPTION	UNIT	TOTAL QUANT.	UNIT PRICE	TOTAL COST
1	Mobilization/Demobilization	EA	1	\$190,750	\$190,750
2	Intake Pump	EA	2	\$38,150	\$76,300
3	Intake Pump Structure	SF	800	\$273	\$218,000
4	Intake Structure Piles	EA	10	\$16,350	\$163,500
5	Power/Controls to Upper Reservoir	LF	4000	\$109	\$436,000
6	Control Panel/Programming	EA	1	\$32,700	\$32,700
7	LCP Shelter	LS	1	\$10,900	\$10,900
8	Local Control Panel	LS	1	\$10,900	\$10,900
9	Davit Crane	LS	1	\$5,450	\$5,450
<b>Construction Cost</b>					<b>\$1,145,000</b>
Construction Contingency 25%					\$287,000
<b>Total Construction Cost:</b>					<b>\$1,432,000</b>
Design and Permitting 15%					\$215,000
Construction Management 15%					\$215,000
<b>Subtotal Project Cost:</b>					<b>\$1,862,000</b>
CBW Project Management 10%					\$187,000
<b>TOTAL PROJECT COST:</b>					<b>\$2,049,000</b>



Date: March 2020  
To: City and Borough of Wrangell  
Upper Wrangell Reservoir Dam Bypass  
Alternatives Analysis, Wrangell, Alaska

## **IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT**

### **CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.**

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

### **THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.**

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

### **SUBSURFACE CONDITIONS CAN CHANGE.**

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

### **MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.**

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.



**A REPORT'S CONCLUSIONS ARE PRELIMINARY.**

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

**THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.**

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

**BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.**

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

**READ RESPONSIBILITY CLAUSES CLOSELY.**

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the  
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland



August 4, 2003

Mr. Bob Caldwell  
Box 531  
Wrangell, AK 99929

**Re: Upper Reservoir Water Tap Evaluation  
Wrangell, AK**

Dear Mr. Caldwell:

This letter presents the results of our evaluation of three alternative methods for creating a new water intake line through the existing dam or abutment to the Upper Reservoir. Included is a summary of the assumed construction procedures, estimated construction cost, and both positive and negative issues associated with each method. This evaluation is based on our past work at the site, a survey and historical information provided by the City of Wrangell and Wilson Engineering, Inc., and our site visit between April 15 and April 17, 2003.

As you may recall, Mr. Fred Brown of our office assessed four options and provided you with those results in a letter dated October 2, 1996. In our assessment, these four options are possible solutions to this issue. In reviewing Mr. Brown's assessment, two options were eliminated based on constructability issues; the open cut through the middle of the dam and through the right abutment. This assessment replaced with them an option to rehabilitate the two emergency drainpipes passing through the dam.

Please note that the Wilson Engineers, Inc. water line design routes the new water line along the westerly side of the stream discharge valley. There was a recent landslide on the side of the valley just below the "parking area" located adjacent to the footbridge. The slide extended to the base of the valley. There are other older slides along the sides of the valley. Pipes placed along either of the valley sides should include some form of landslide protection in the design.

**BACKGROUND INFORMATION FOR THIS REVIEW**

According to our 1993 dam inspection report, the Upper Dam was constructed around 1935 as a log crib structure. The structure leaked badly and the reservoir did not retain significant water until it was rehabilitated around 1958. The rehabilitation effort was documented in As-Built drawings dated 1965 and 1967. These drawings formed the base for the sections shown in this report. Based on questions raised during dam inspections, Shannon & Wilson completed a subsurface exploration program. Data from this program have been superimposed onto the As-Built sections to generate the profiles used in this report to assess construction of the three options.

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To standardize cost evaluations between the three options, we assumed that each option would connect to the proposed Wilson Engineering pipeline at approximately Wilson Station 78+55.

Each option has a requirement to grout the zone around the existing two discharge pipes to reduce leakage so that all options have relatively the same final product.

## PROPOSED METHODS

We assessed the following three intake options. Locations of the alignments for each of the three options are indicated on Figure 1 – Site Plan.

### **Option 1 – Rehabilitate the existing emergency drainpipes.**

This option involves rehabilitating the two existing drainpipes for the Upper Dam located as shown on Figure 1. Rehabilitation would consist of inserting new 8-inch and 10-inch steel pipes into the existing 8-inch and 10-inch composite metal and wood stave pipes. Details of this installation and site conditions are outlined and/or illustrated in Figures 2 and 3 and in Photo Figures P1 and P2. Issues associated with this option are presented on Table 1, and a cost estimate is provided on Table 2.

Figure 2 illustrates the As-Built drawing section through the dam in the area of the two existing emergency drains. Superimposed on the drawing are geotechnical data developed by Shannon & Wilson during past exploration programs. Also included on the figure are the actual measurements of the pipes obtained during the Shannon & Wilson site visit. We have not been able to find any details on the valves or the connection of the valves to the wood pipe. According to Mr. Bob Coldwell, the typical connection method was to insert the wood stave pipe into the end of the valve-housing coupling. Noted on the figure is that the dam was rehabilitated and enlarged in 1967. The rehabilitation added length to the two existing wood stave pipes using metal pipe. The type and condition of the valves is not known but they are believed to be 1930's vintage cast iron valves. We are not certain if the pipes are cast iron or steel at this time.

Figure 3 illustrates the 1967 constructed metal pipe extension trench profile detail. The detail indicates that the trench was backfilled with a permeable material. We expect that the permeable material would act as a drain for leakage around the existing pipes to prevent existing seepage from damaging the rehabilitated dam materials.

We have assumed the following construction procedure for preparation of our cost estimate. Final procedures may vary as the contractor develops their methods.

1. Mobilize equipment to the site.
2. Construct a 250-ton reaction frame inline with the two pipes. Photo sheet P1 shows the area of the reaction frame. This size reaction could be developed by drilling two angled anchors to rock on either side of the jacks that would act in tension. These anchors would be drilled angled back under the dam. Alternatively, the resistance could be obtained from two trench boxes set approximately 4 feet into the ground then filled to the top with rock or soil. The trench boxes would be approximately 10 feet wide by 20-feet long by 10-feet high.

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## **Orientation For Site Plans**

The base drawings used to construct the Figures 1, 4, and 6 in this report referenced two different datum. The Wilson Engineer's drawings reference elevation located at the crest of the dam is elevation 363.23 feet. The aerial flyover with the contours for the region references the top of dam elevation of 353.7 feet. The difference is 9.53 feet. For the purpose of this report, elevations cited will reference the Wilson Engineer's elevations. The contours for the bottom of the Upper Reservoir were provided by Wilson Engineer's as a separate file and did not have a defined insert point. The figures in this report merged the bottom of the reservoir contours to the site contour file by matching to existing features. As such, measurements between points are not reliable between the two base plans.

## **Reviewed Site Data**

Shannon & Wilson has conducted periodic safety inspections on this dam for many years and there are several issues with the condition of the dam that may affect the method of the water tap. The concerns include continuing leakage along the two emergency drainpipes and poor quality construction materials used in the dam construction.

Information used for our preliminary assessment for the water taps included review of past Shannon & Wilson, Inc. information from dam inspections and data that you provided based on our discussion on February 4, 2003. Your data included videotape showing the area around the dam, a pipe survey video of the existing 8-inch and 10-inch pipes, and a rock specimen from the area of the existing spillway. We made a site visit in April 2003 to obtain additional data. During the site visit, we videotaped and measured the pipe and videotaped the site access routes and work areas. We also made a dive inspection of the conditions and location of the pipe inlets on April 16, 2003, with the assistance of a diver from the Department of Public Works.

## **Regional Geology**

The rock appears to be arkosic greywacke sandstone called flysch. Flysch is a low metamorphic grade rock formed along the continental margin of a geosyncline trough, which is then uplifted. Deposits may have intrusive mafic rocks and the geologic map of the area indicates that intrusive mafics are present along the spine of Wrangell Island. The intrusive mafic rocks tend to be much stronger than the flysch. Testing the rock with a Schmidt Hammer yielded an unconfined strength of approximately 7,000 psi and a density of approximately 160 pounds per cubic foot (pcf).

## **Design Requirements And Assessment Standardization**

Based on our discussions with Mr. Mark Curtis of Wilson Engineering and yourself, we understand the minimum size pipe needs to be 8-inches in diameter and that a 12 inch diameter pipe would be desirable.

For the purpose of this evaluation, we assumed for the rehabilitation option (Option 1) that each of the existing pipes would be replaced with steel pipes of the same diameter. The other two alternatives assumed installation of a single 10-inch diameter pipe below the dam or through a rock abutment.

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3. Place the pipe burster and new pipe in line with one of the existing pipes at the downstream end. Weld a steel, butt-welded, 1.0-inch grout pipe onto the outside of the product pipe. This pipe will be used to inject grout into the fracture annulus after installation. For our estimate, we assumed using coated perma-loc pipe to eliminate field welding.
4. Drive the pipes through to just short of the inlet end of the existing pipe. Photo P2 shows a typical wood stave pipe that was recovered from another part of the island but has a similar age. The bursting tool will have a seal to the pipe being pushed to prevent water from flowing out the pipe during installation.
5. Construct a special pipe section that includes a valve for the last piece of pipe to be placed and install this pipe last.
6. Use a diver to remove the bursting tool from the product pipe.
7. Grout the annulus with the grout pipe using a polymer or cement grout and retract the 1-inch pipe slowly during the grouting to fill the annulus for the entire length of the pipe burst. Use an experienced grouter to design the grout and monitor the grout injection pressures and volumes to assess the ability of the grout to penetrate into the voids around the wood stave and steel pipes.
8. Assess and repair any damage to the reservoir side of the dam in the area where the bursting tool exited the toe.
9. Construct the "T" for diverting water either to the water supply or to a discharge location in the stream. The "T" would consist of a Tee with two valves; one valve controls the intake water supply and the second valve permits free flow drainage from the dam to the existing creek to provide reservoir drawdown capabilities.
10. Repeat the procedure for the second pipe.
11. Construct the trench connection from the Tee to the end of the proposed water line run from the Lower Dam.
12. Demobilize from the site.

Additional information is recommended for a contractor to develop final construction methods for this option. At this time, we recommend the following additional services to develop the construction documents and final design.

1. Provide a professional video survey of the pipes using a tractor mounted camera that develops an accurate and stable video of the condition of the inside of the pipe, pipe connections, and valve connection and connections. The survey should be capable of providing the inside diameter of the pipes and the nature of the actual pipe connections.
2. Assess the metal in the pipes by hitting the end of the pipe with a hammer. If the pipe breaks then the material is a cast product and if it bends then it is a steel product. Wear safety glasses when hitting the pipe.
3. Accurately measure the pipe dimensions including thickness.

### **Option 2 – Rock cut through dam spillway.**

This option would construct one new 10-inch HDPE or steel pipe a trench excavated along the existing spillway located as shown on Figures 1 and 4. This pipe would be designed as a siphon inlet for the water supply. Alignment and elevation details are illustrated in Figures 4 and 5. Ground surface conditions in the work area are visible and in photographs provided in Figure P3. Pro's and Con's for this option are presented on Table 1 and a cost estimate is provided on Table 2.

We evaluated two methods for making the trench excavation: Method 2A – Mechanical Excavation, and Method 2B – Drill and Blast. The purpose of considering two methods is because the drill and blast method appears to be at a lower cost but the lower cost comes at a risk of causing potentially significant damage to the dam. Therefore, we assessed an alternative method for the rock excavation by using a mechanical trencher. The trenchers are less risky than the drill and blast method and the method has been used in the area on smaller projects. One of the advantages of the mechanical trenching method is that the majority of cost is in getting the equipment to the site. Once on the site, the equipment operates very efficiently. It has often been found that using a trencher is less expensive than using conventional excavators. Therefore, planning to use the trencher for the entire project may result in a total saving for the project over using conventional excavators for the trenching to the pipe termination by the Lower Reservoir.

We have assumed the following construction procedure for preparation of our cost estimate. Final procedures may vary as the contractor develops their methods.

1. Mobilize to the site.
2. Clear the brush from along the route at the toe of the dam.
3. Lower the reservoir approximately 7 feet to allow the trench excavation to be completed above the reservoir surface.
4. Method 2A. Place crushed rock in the existing spillway to provide a pad for the trencher to operate.
5. Excavate the trench through the right abutment by mechanical trenching (Option 2A) or alternatively by drill and blast methods (Option 2B). Based on Figure 4 dimensions, the initial trench through the right abutment would be about 40 or 50 feet long.
6. Place the pipe and inlet structure in the trench and place spacers under the pipe to provide clearance off the bottom of the trench.
7. Place concrete backfill up to existing grade in the 40 to 50 feet of trench through the right abutment to form an impermeable barrier at the inlet.
8. Excavate the remaining trench to the end of the proposed water line from the Lower Reservoir.
9. Place the pipe in the trench and backfill the trench with a compact relatively impermeable material.
10. To remediate the existing leakage around the existing two outlet pipes, place compaction grout around the existing outlet pipes.
11. Demobilize from the site.

### **Option 3 – Directionally drill through the dam.**

This option would construct one new 10-inch HDPE or steel pipe in a horizontal directionally drilled (HDD) hole drilled under the dam in the area of the old spillway, left abutment located as shown on Figure 1. Plan and section details of this installation are illustrated in Figures 6 and 7 and site ground surface is shown in the photographs in Figure P4. Pros and cons for this option are presented on Table 1 and a cost estimate is provided on Table 2.

We have assumed the following construction procedure for preparation of our cost estimate. Final procedures may vary as the contractor develops their methods.

1. Plan the project details with the drilling contractor. Determine if the contractor will push or pull the pipe into the hole and plan all procedures.
2. Mobilize to the site.
3. Prepare the drill site by leveling a drill pad approximately 50 feet square on the top of the old spillway and establishing a water supply.
4. Set a steel casing into the downstream toe of the dam with a dual packer seal on the end of the pipe.
5. Drill the pilot hole through the packer seal using the seal to prevent reservoir water from exiting through the bored hole.
6. Ream the hole to a size necessary to place the 10-inch pipe, expect two ream passes.
7. Assemble the product pipe and attach two or three 1-inch steel pipes to the exterior of the pipe to act as grout pipes. Only one grout pipe is used but the extras are placed and later removed in case of damage to one of the pipes. If the pipe were pushed then it would be assembled during the pushing process. If the pipe would be pulled then it would be assembled on the top of the dam and the end floated onto the reservoir. The drill string would be pulled to the surface using a hook placed by a diver and marked with a work float. The pipe would be attached to the drill string and then would be pulled into the hole as the drill string is withdrawn.
8. Push or pull the pipe through the prepared hole.
9. Grout the annulus with a bentonite grout using tremie methods.
10. To remediate the existing leakage around the existing two outlet pipes, place compaction grout around the existing outlet pipes. Alternatively, an extra hole could be drilled for the placement of a new emergency drain pipe and the existing pipes could then be abandoned by grouting from the inside of the pipes. If the existing pipes are abandoned, then construct a "T" for diverting water either to the water supply or to a discharge location in the stream. The "T" would consist of a Tee with two valves; one valve controls the intake water supply and the second valve permits free flow drainage from the dam to the existing creek to provide reservoir drawdown capabilities.
11. Construct the connection from the bored pipe to the end of the proposed water line from the lower reservoir.
12. Demobilize from the site.

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 Page 7

Additional information is recommended for a contractor to develop final construction methods for this option. At this time, we recommend the following additional services to develop the construction documents and final design.

1. Drill two test borings to approximately 20 feet below the invert of the HDD bore and collect soil samples. Assess groundwater elevations in the borings and perform grain size tests on selected soil samples.

In summary, we evaluated three options for constructing the new intake. Of these three options, Option 2A is the recommended alternative. The reason for recommending Option 2A is to take advantage of the trenchers reduced cost for constructing the balance of the project and the ability of the trencher to handle the site conditions. Additionally, Option 2A provides work for local contractors. Option 1 is practical and economical however, at this time, it is our opinion that the final total project cost may be greater and the pipe bursting has a potential to possibly damage the dam that could require remediation.

We appreciate this opportunity to be of service to you. If you have any questions, please call Mr. Grover Johnson at 907-479-0600 or Mr. Brian Dorwart at 603-487-3363.

Very truly yours,

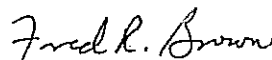
**SHANNON & WILSON, INC.**

Prepared by;



Brian Dorwart, PE, PG  
 Sr. Associate

Reviewed by;



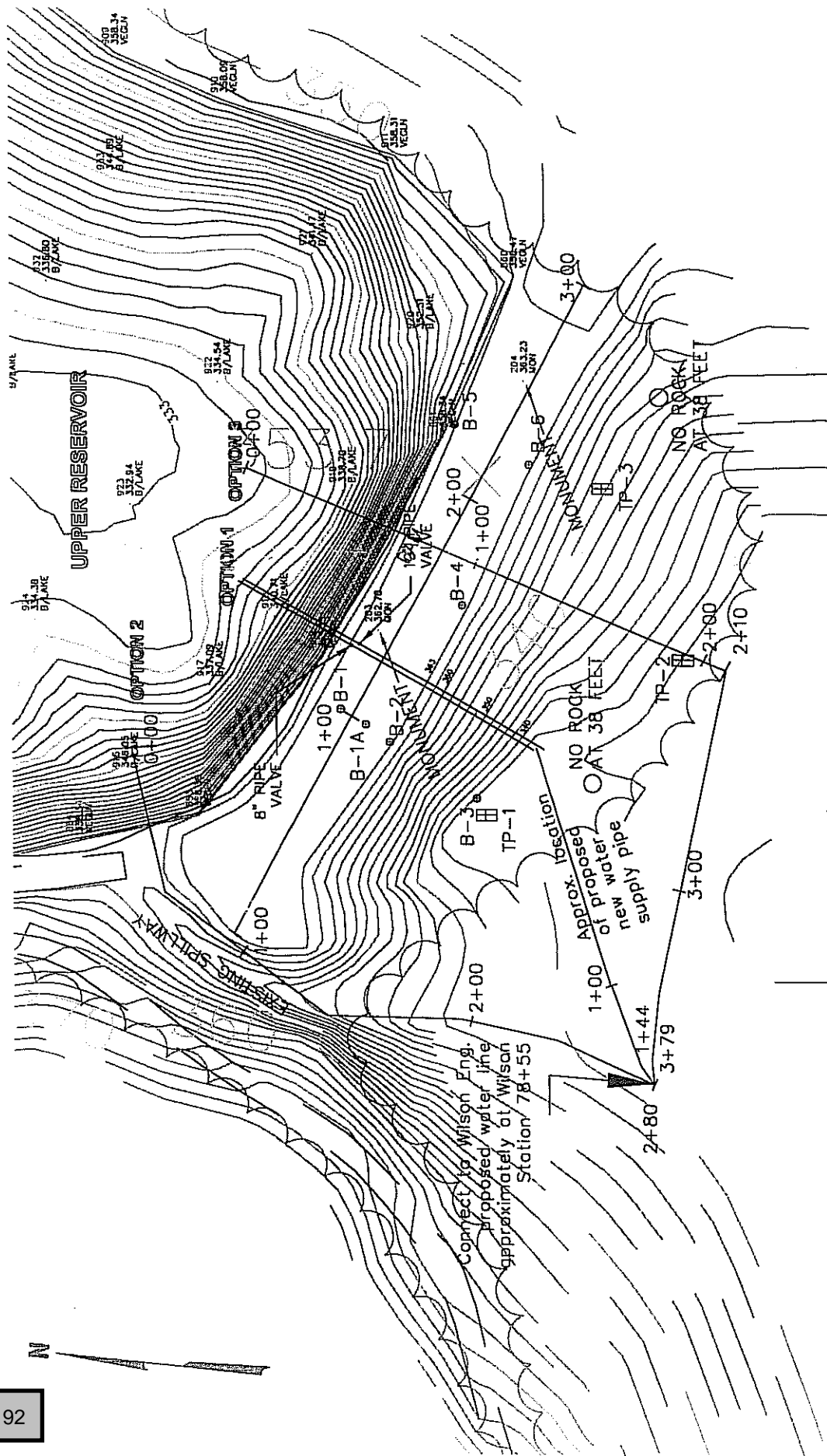
Fred Brown, PE  
 Sr. Vice President

Attachments:

Table 1 Advantages and Disadvantages  
 Table 2 Comparative Cost Estimates  
 Figure 1 Site Plan  
 Figure 2 Option 1 Pipe Bursting Profile  
 Figure 3 Option 1 Pipe Bursting - Detail A  
 Figure 4 Opt 2A & 2B Trench Excav. Plan  
 Figure 5 Opt 2A & 2B Trench Excavation

Figure 6 Option 3 Directional Drilling Plan  
 Figure 7 Option 3 Directional Drilling Profile  
 Figure P1 Option 1 Pipe Bursting Plan Photos  
 Figure P2 Option 1 Pipe Bursting Plan Photos  
 Figure P3 Option 2 Trenching Plan Photos  
 Figure P4 Opt 3 Direct'l Drilling Plan Photos

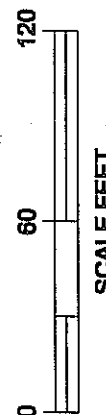
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- NOTES:
1. Base plan provided by City of Wrangell from a photogrammetric survey completed by Walker and Associates based on a flyover on August 4, 2002 with a scale of 1 inch = 200 feet.
  2. Pond bottom contours provided by Wilson Engineering, Inc. titled "Upper and Lower Reservoir Survey Map" dated 8/8/95.
  3. The Base Plan and the Pond Bottom plan were merged based on observed field features and have not been tied to the same coordinate system. Therefore, the two plans are expected to have errors when comparing distances between the two.
  4. The location of the Base Line for the dam and the test pits and test borings and pipes have been approximated from other drawings onto this drawing by rough scaling. Features are only accurate to within several feet at best and may have larger errors because of the rough nature of the transposition method.
  5. The elevations between the pond and surface contours are offset by approximately 9.1 feet. The pond elevations are higher than the surface contours.

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SITE PLAN



Item a.

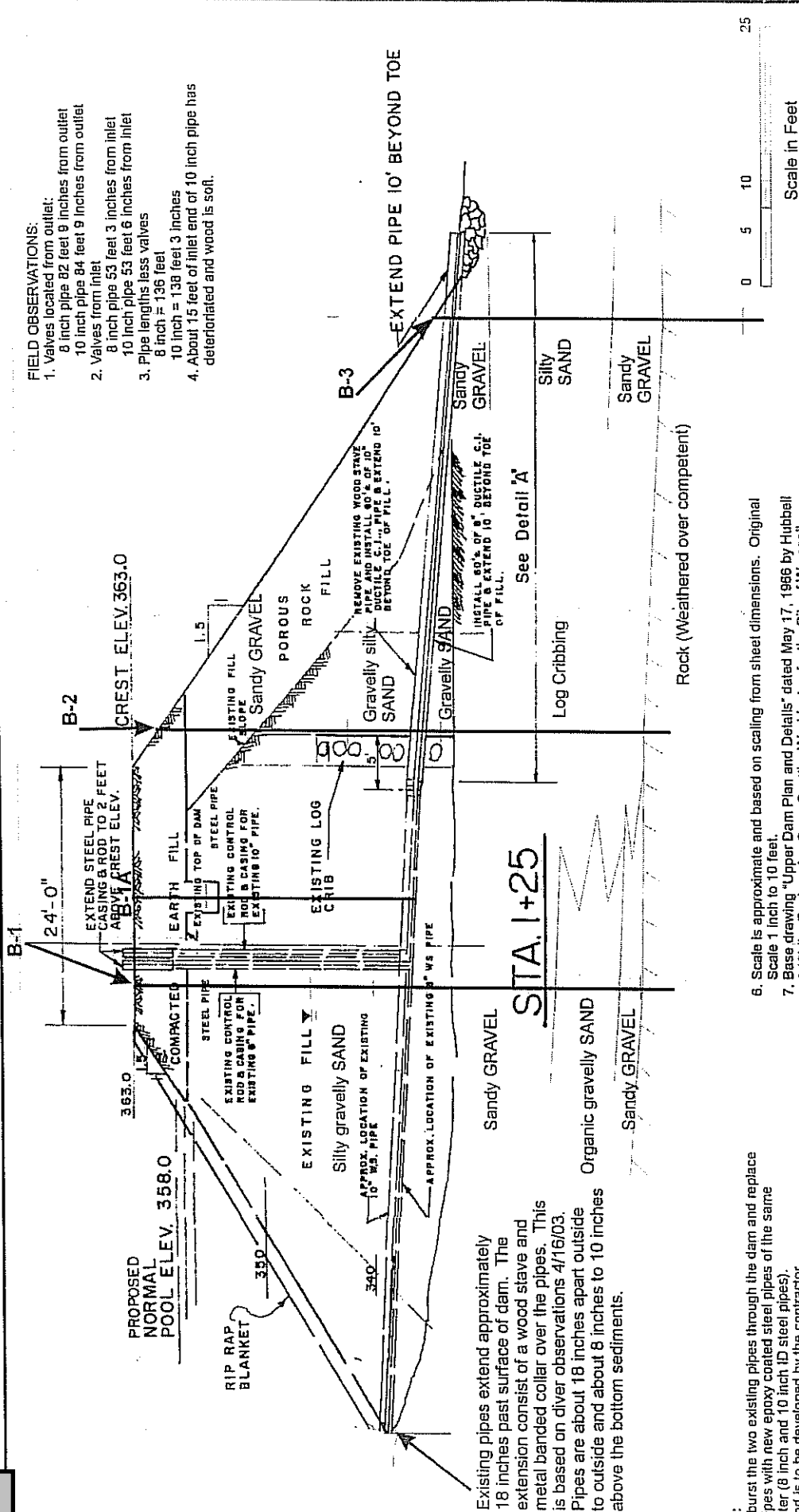
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FIG. 1





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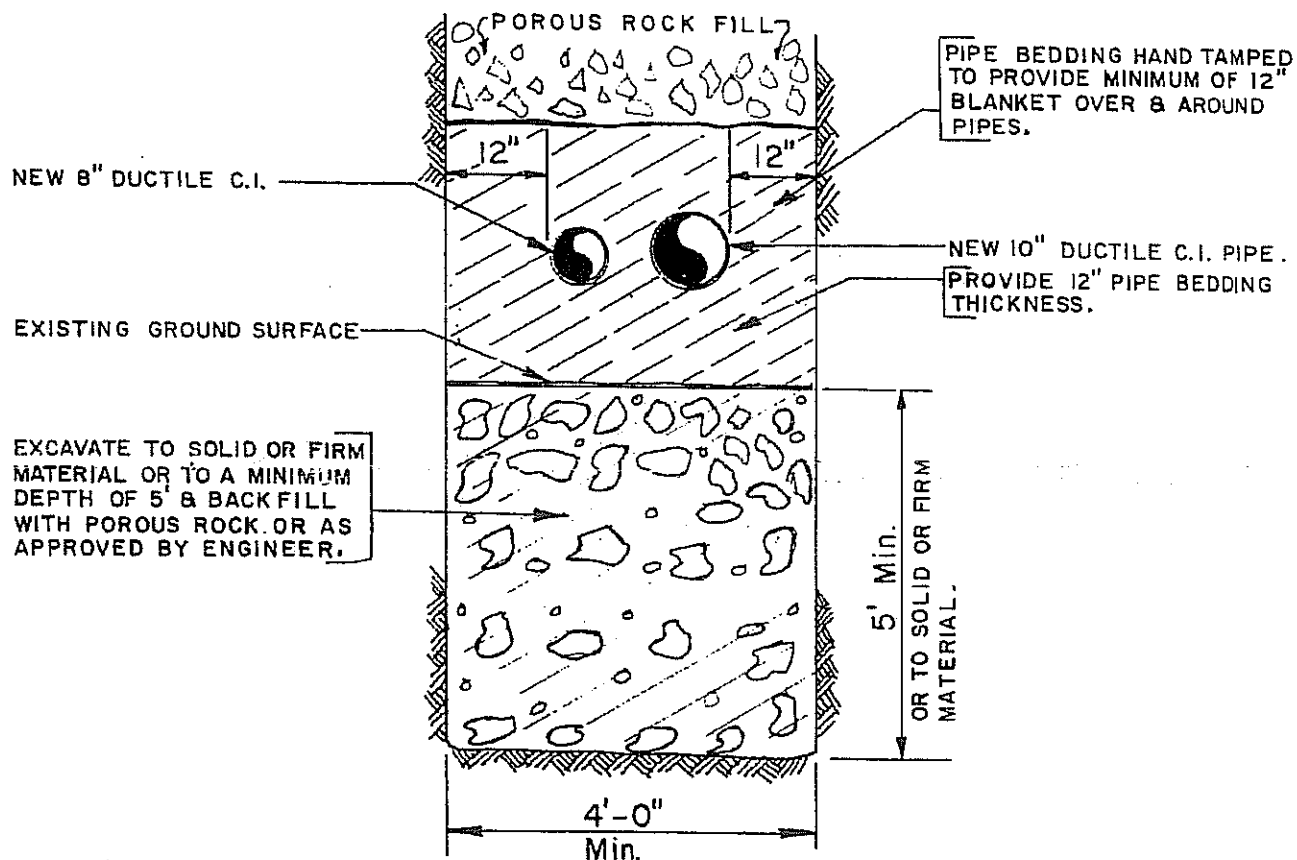
# Option 1 Pipe Bursting Profile

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4-001

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Item a.



**DETAIL "A"**

SCALE: 1/2"=1'-0"

1. Base drawing "Upper Dam Plan and Details" dated May 17, 1966 by Hubbell & Waller Engineering Corp. Seattle, Washington for the City of Wrangell Project P-Alaska-3121.

2. See Figure 2 for length of this section

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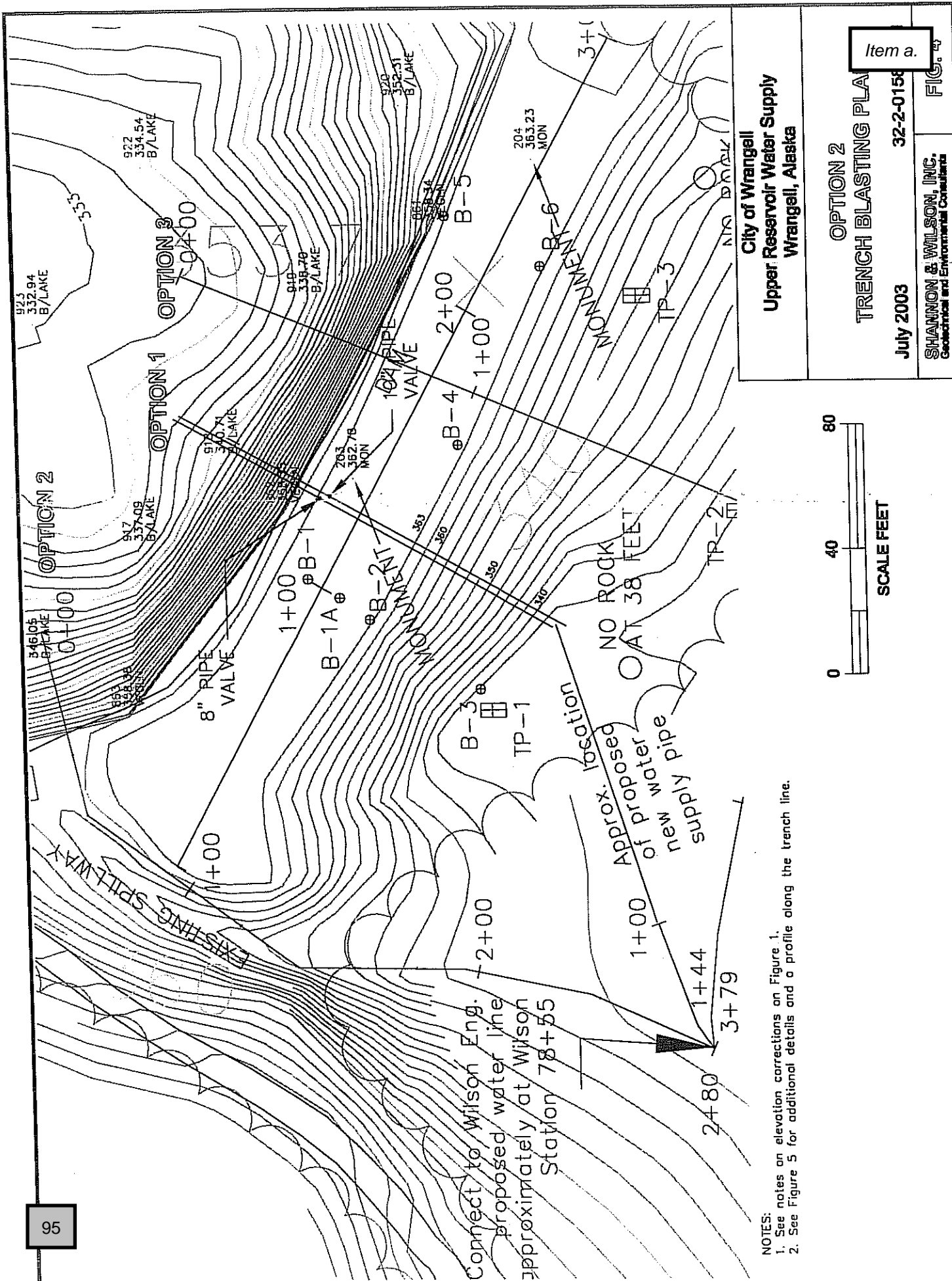
Option 1  
Pipe Bursting Plan  
Detail A

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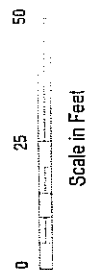
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FIG. 3



## NOTES:

1. See notes on elevation corrections on Figure 1.
2. See Figure 5 for additional details and a profile along the trench line.



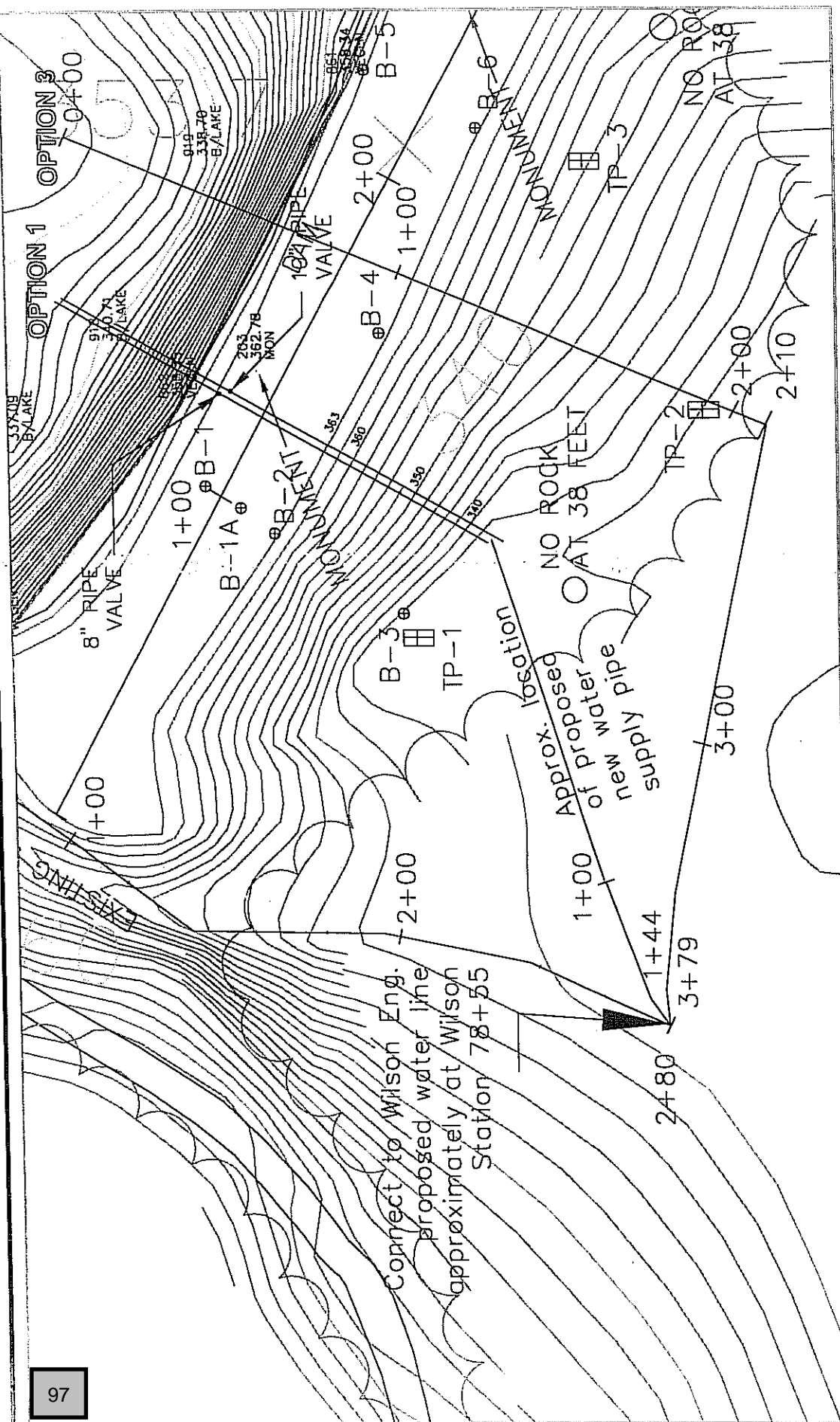
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Upper Reservoir Water Supply  
Wrangell, Alaska

Option 2  
Trench Excavation

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*Item a.*



NOTES:  
1. See notes on elevation corrections on Figure 1.

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OPTION 3  
DIRECTIONAL DRILLING PLAN

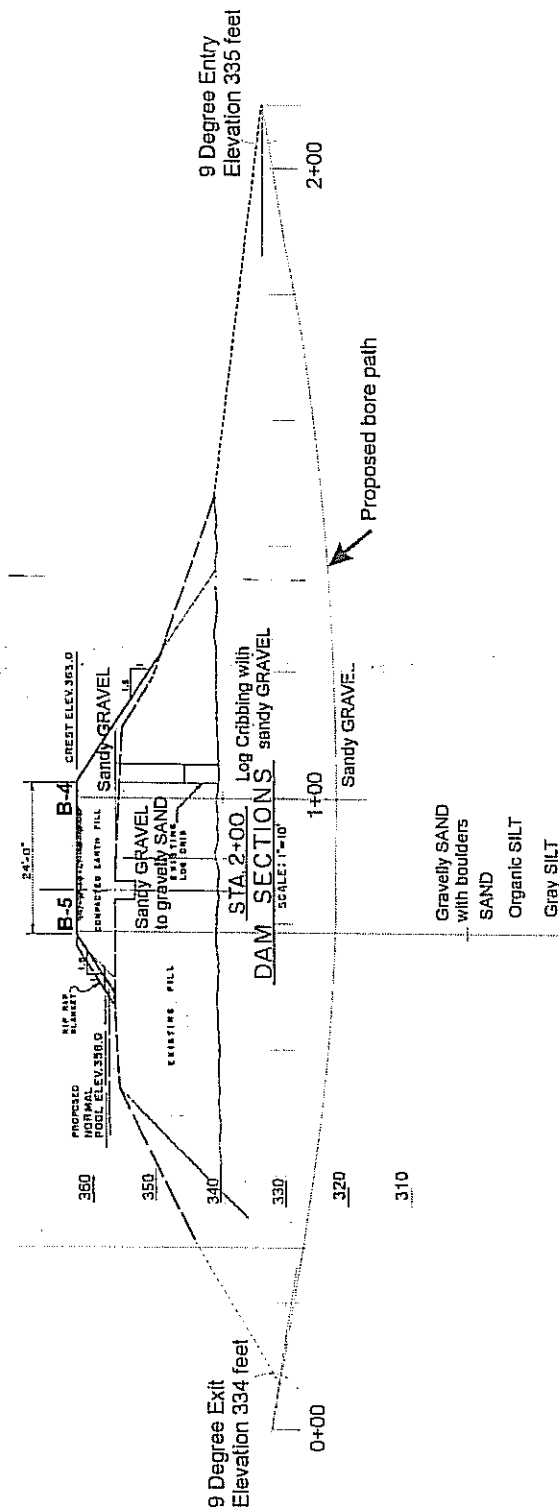
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FIG. 6



1. Base drawing "Upper Dam Plan and Details" dated May 17, 1966 by Hubbell & Waller Engineering Corp. Seattle, Washington for the City of Wrangell Project P-Alaska-3121.
2. See boring logs in Shannon & Wilson's 1994 report for test boring data.

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Wrangell, Alaska

Option 3  
Directional Drilling

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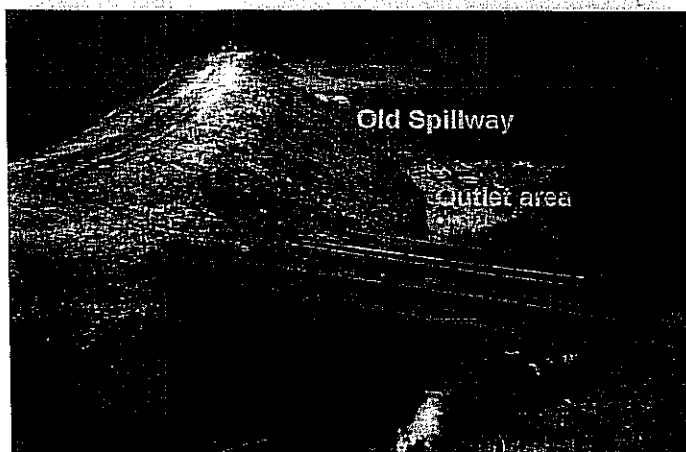


PHOTO 1 Upper Dam view easterly along axis.

View of the dam and the outlet region of the emergency outlets. Access to the top of the dam is over the walking bridge or by driving over the spillway with a truck or 4 wheel drive vehicle. The access to the emergency spillway outlets is across the top of the dam and down the old spillway.

PHOTO 2 Upper Dam view of outlets from emergency outlets.

The 10 inch pipe is on the left. The base of the outlets is a rock lined channel. Access is from the left.

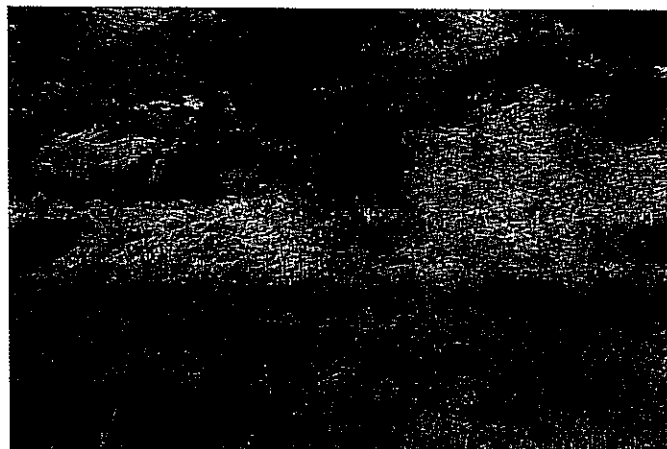


PHOTO 3 Upper Dam view of outlets

View of the video taping of the emergency outlet pipes and of the outlet area. This is the work area for the pipe bursting.



Photos obtained by Shannon & Wilson during our site visit between 4/15/03 and 4/17/03.

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Option 1  
Pipe Bursting Plan  
Photos

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FIG. P1

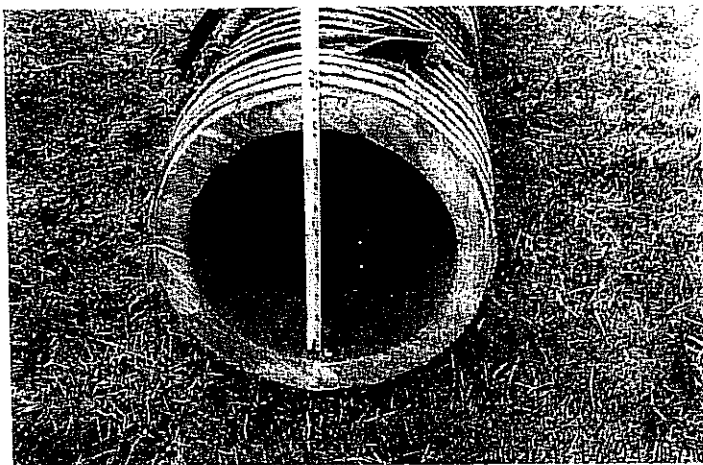


PHOTO 1 Similar wood stave pipe to dam pipe

View of the end of a similar 10" ID wood stave pipe to that used in the dam for the emergency drawdown pipes. The outer coating has been stripped to expose the steel bands.

PHOTO 2 Side view of similar wood stave pipe.

Side view of a similar 10" ID wood stave pipe showing the bands.

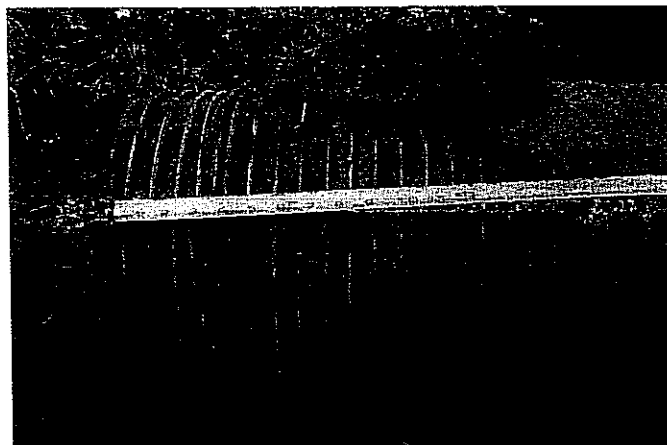


PHOTO 3 Section of similar wood stave pipe.

View of a similar wood stave pipe section.



Photos obtained by Shannon & Wilson during our site visit between 4/15/03 and 4/17/03.

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Upper Reservoir Water Supply  
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Option 1  
Pipe Bursting Plan  
Photos

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FIG. P2





PHOTO 1 Upper Dam view of spillway intake..

Proposed trench extends out to approximately the log boom and runs along the dam side of the spillway.

PHOTO 2 Upper Dam view of spillway downstream

The trench runs diagonally under the bridge and extends to the right. The spillway bed is rock.

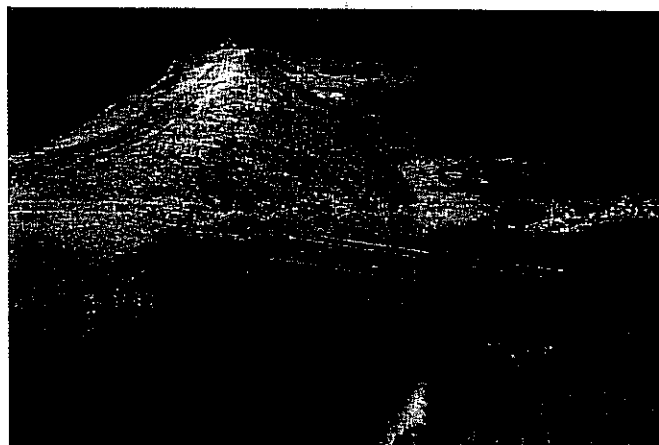


PHOTO 3 Upper Dam view of bottom of spillway.

View of the proposed trench path under the bridge. Trench extends to the left of the spillway just above the falls.

Photos obtained by Shannon & Wilson during our site visit between 4/15/03 and 4/17/03.

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Wrangell, Alaska

Option 2  
Trenching Plan  
Photos

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FIG. P3



## **Important Information About Your Geotechnical/Environmental Report**

### **CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.**

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

### **THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.**

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

### **SUBSURFACE CONDITIONS CAN CHANGE.**

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

### **MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.**

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

**A REPORT'S CONCLUSIONS ARE PRELIMINARY.**

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

**THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.**

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

**BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.**

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

**READ RESPONSIBILITY CLAUSES CLOSELY.**

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the  
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

**TABLE 1**  
**Advantage and Disadvantage of each option**

**Option 1 - Pipe Bursting**

**ADVANTAGE**

Results in repairing the two existing leaking pipes that act as emergency drawdown discharge for the dam.

Specialty equipment is relatively small and can be easily trucked and barged to the site. However, mobilization is still expensive.

Some specialty equipment but the procedure does not require high technical competence though the design of the equipment and procedure should be done by a specialist and a specialty manufacturer.

**DISADVANTAGE**

Valves may not have sufficient soil resistance to remain stable during cracking of the valve resulting in the valve being pushed out of the dam toe and subsequent damage to the dam between the valve and the toe. This disturbed zone would need to be rehabilitated possibly by compaction grouting.

Expect limited damage at the toe of the dam when the burster comes through as the pipe will likely not have sufficient resistance to withstand the bursting thrust and will be pushed whole into the reservoir. This damage will require repairs by adding rip rap or soil to the area.

Must use steel pipes for the new pipes through the dam.

Valves may not fully open resulting in additional thrust necessary to crack the valve.

Reaction frame may be expensive to construct and will likely damage wet areas at the toe of the dam.

Requires additional investigations for data on the existing pipes and connections.

**Option 2A - Trench Excavation - Mechanical Excavation**

**ADVANTAGE**

Allows the shutoff valve to be located on either the inlet or outlet end of the pipe.

Procedure can handle most conditions using locally available equipment and labor supported by one piece of outside specialty equipment.

Sufficient data is available for design though a better survey may be needed. (It may already be available)

Lowest risk of problems of the three options.

**DISADVANTAGE**

Mechanical excavation may loosen rock on the sides of the trench resulting in a potential leakage path. However, this path could be grouted and sealed at a later date and is not expected to impact dam stability.

Requires expensive mobilization of a large heavy piece of specialty equipment to the site with a specialty operator.

Requires separate grouting program to reduce leakage around existing pipes.

Mechanical excavator can be used to rapidly and very economically excavate the remaining pipe trench to the Lower Dam connection. A trencher can excavate more efficiently, less expensively, faster, and can handle the expected shallow rock outcrops than an excavator thus there may be a significant total project savings.

Much of the work could be completed using local forces supporting the trencher. Local forces could do the site preparation, pipe placement, and backfilling/site restoration.

Lowest risk of problems of the three options if rock saw used.

Option to install an HDPE or steel pipe.

### **Option 2B - Trench Excavation - Drill and Blast**

#### **ADVANTAGE**

Allows the shutoff valve to be located on either the inlet or outlet end of the pipe.

Procedure can handle most conditions using locally available equipment and labor.

Sufficient data is available for design though a better survey may be needed. (It may already be available)

Option to install an HDPE or steel pipe.

#### **DISADVANTAGE**

Requires blasting through an abutment that may result in over break requiring slurry grouting to reestablish a seal.

Blasting vibrations may have an impact on the dam stability requiring careful planning and limited pounds per delay in blast rounds thus more powder, blast holes, and time will be required to complete the work and probably line drilling between the blast and the dam to mitigate the vibrations.

Largest disturbed area.

Blasting may damage rock along the trench sides that may be difficult to repair and result in excessive leakage.

Requires separate grouting program to reduce leakage around existing pipes.

### **Option 3 - Horizontal Directional Drilling**

#### **ADVANTAGE**

The bore would likely be in soil that is somewhat favorable to HDD procedures.

Option to install an HDPE or steel pipe.

Pipe can be installed by pushing or pulling through a prepared hole.

#### **DISADVANTAGE**

Requires special equipment and trained operators for construction. The equipment is expensive and delays and breakdowns can be costly as new parts would likely need to be flown to the site.

Will need to grout the bore annulus with a bentonitic grout to seal against leakage.

Risk of leakage along bore path.

Requires careful planning and design up front.

Need additional data in the form of two test borings with soil samples to provide soil properties to the contractor.

Requires experienced and skilled company and driller. This significantly limits the companies capable of doing the work and may result in elevated costs.

Requires separate grouting program to reduce leakage around existing pipes.

**TABLE 2**  
**Comparative Cost Estimates**

Item	Units	Quantity	Unit Rate	Total
<b>Option 1 - Pipe Bursting</b>				
Mobilization and Demobilization	LS	1	\$125,000.00	\$125,000.00
Site Preparation	LS	1	\$30,000.00	\$30,000.00
8" Pipe Installed including pipe	feet	137	\$154.00	\$21,098.00
10" Pipe Installed including pipe	feet	139	\$173.00	\$24,047.00
New connecting pipe	feet	144	\$35.00	\$5,040.00
Grouting annulus	LS	1	\$30,000.00	\$30,000.00
New dam drain pipe bypass	LS	1	\$10,000.00	\$10,000.00
Additional data collection	LS	1	\$25,000.00	\$25,000.00
Subtotal				<u>\$270,185.00</u>
Engineering & Field Services (Percent of Subtotal)		10%		\$27,018.50
Risk Contingency (Percent of Subtotal)		10%		<u>\$27,018.50</u>
<b>TOTAL</b>				<b>\$324,222.00</b>
<b>Option 2A - Trench Excavation by Mechanical Excavation</b>				
Mobilization and Demobilization	LS	1	\$125,000.00	\$125,000.00
Trench construction	feet	280	\$425.00	\$119,000.00
Grout existing pipes	LS	1	\$30,000.00	\$30,000.00
Subtotal				<u>\$274,000.00</u>
Engineering & Field Services (Percent of Subtotal)		10%		\$27,400.00
Risk Contingency (Percent of Subtotal)		5%		<u>\$13,700.00</u>
<b>TOTAL</b>				<b>\$315,100.00</b>
<b>Option 2B - Trench Excavation by Drill and Blast Excavation</b>				
Mobilization and Demobilization	LS	1	\$5,000.00	\$5,000.00
Trench construction	feet	280	\$300.00	\$84,000.00
Grout existing pipes	LS	1	\$30,000.00	\$30,000.00
Subtotal				<u>\$119,000.00</u>
Engineering & Field Services (Percent of Subtotal)		20%		\$23,800.00
Risk Contingency (Percent of Subtotal)		40%		<u>\$47,600.00</u>
<b>TOTAL</b>				<b>\$190,400.00</b>
<b>Option 3 - Horizontal Directional Drilling</b>				
Mobilization and Demobilization	LS	1	\$125,000.00	\$125,000.00
Site Preparation	LS	1	\$20,000.00	\$20,000.00
Drill and Install 10 inch HDPE	feet	235	\$706.38	\$165,999.30
New connecting pipe	feet	169	\$35.00	\$5,915.00
Grout existing pipes	LS	1	\$30,000.00	\$30,000.00
Grout annulus	LS	1	\$5,000.00	\$5,000.00
Additional Explorations	LS	1	\$30,000.00	\$30,000.00
Subtotal				<u>\$381,914.30</u>
Engineering & Field Services (Percent of Subtotal)		12%		\$45,829.72
Risk Contingency (Percent of Subtotal)		15%		<u>\$57,287.15</u>
<b>TOTAL</b>				<b>\$485,031.16</b>

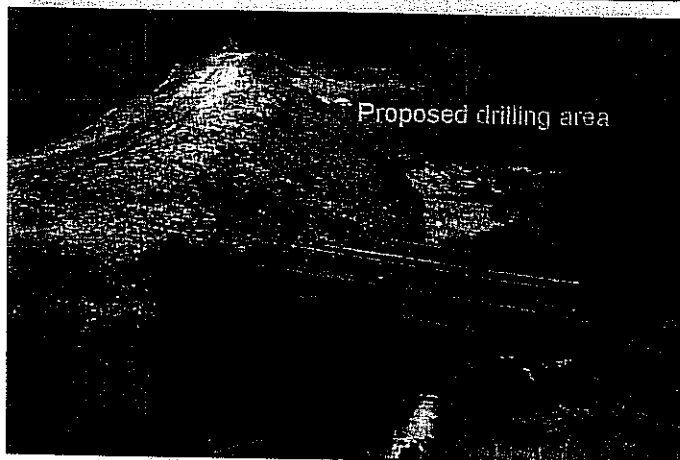


PHOTO 1 Upper Dam view easterly along axis.

View of the dam and the outlet region of the emergency outlets. Access to the top of the dam is over the walking bridge or by driving over the spillway with a truck or 4 wheel drive vehicle. The access to the emergency spillway outlets is across the top of the dam and down the old spillway.

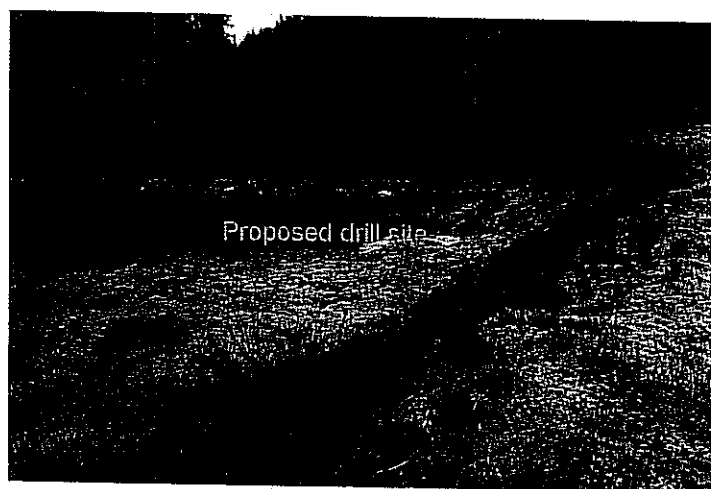
PHOTO 2 Upper Dam view of old spillway..

Proposed drilling area.



PHOTO 3 Upper Dam Old Spillway view westerly

View of the old spillway from the top of the access down to the proposed drill site. Access will probably require tracked equipment and may require some fill.



Photos obtained by Shannon & Wilson during our site visit between 4/15/03 and 4/17/03.

City of Wrangell  
Upper Reservoir Water Supply  
Wrangell, Alaska

Option 3  
Directional Drilling Plan  
Photos

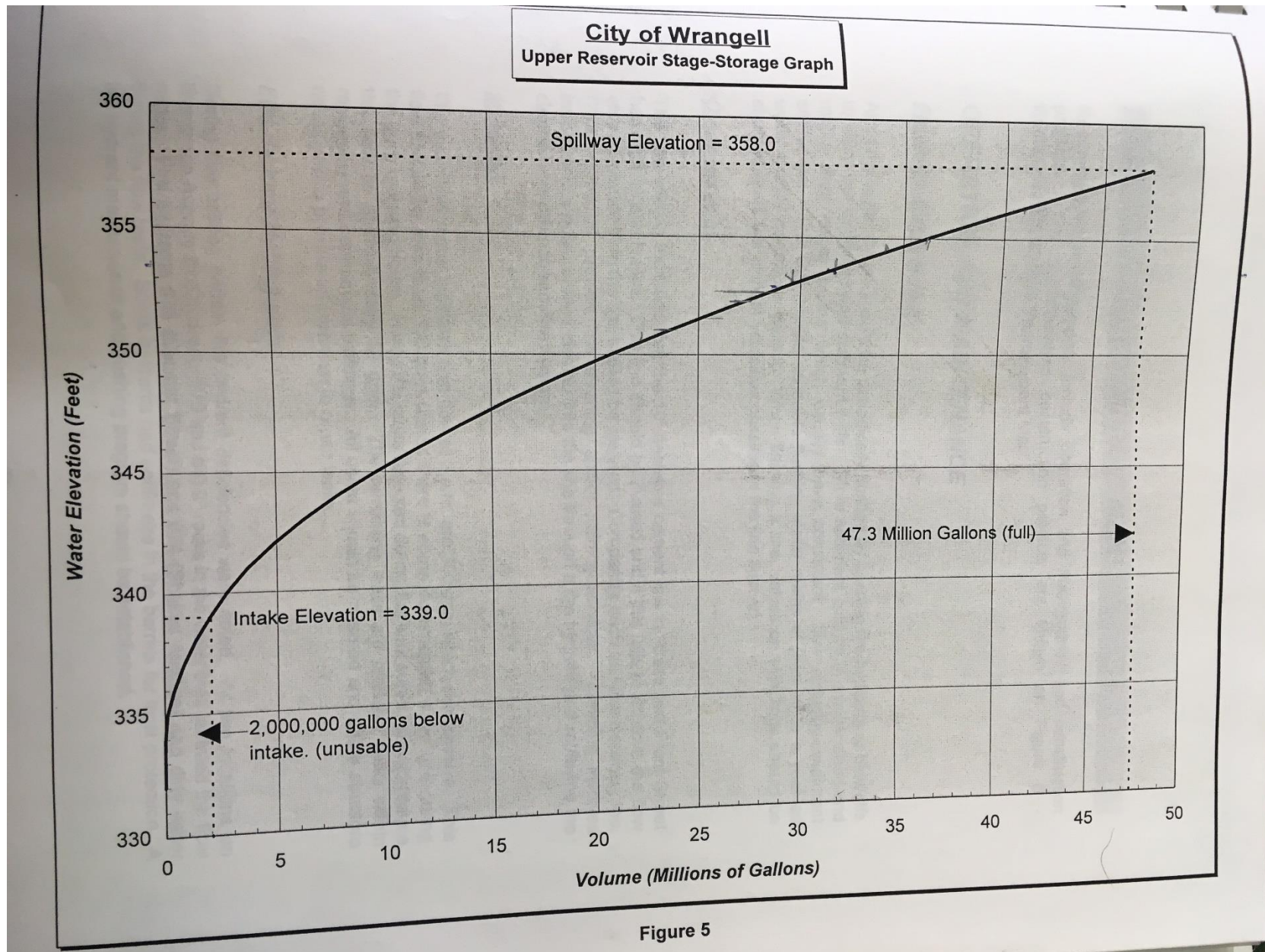
July 2003

32-1-01584-001

SHANNON & WILSON, INC.  
Geotechnical and Environmental Consultants

FIG. P4





## CITY & BOROUGH OF WRANGELL, ALASKA BOROUGH ASSEMBLY AGENDA STATEMENT

<u>AGENDA ITEM TITLE:</u>	<u>DATE:</u>	March 24, 2020
	<u>Agenda Section</u>	<b>13</b>

**RESOLUTION No 03-20-1521** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA ADOPTING THE WRANGELL MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

SUBMITTED BY:

Carol Rushmore, Economic Development  
Director

FISCAL NOTE:

**Expenditure Required:** \$XXX Total

FY 20: \$	FY 21: \$	FY22: \$
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**Amount Budgeted:**

	FY20 \$XXX
--	------------

**Account Number(s):**

	XXXXX XXX XXXX
--	----------------

**Account Name(s):**

	Enter Text Here
--	-----------------

**Unencumbered Balance(s) (prior to expenditure):**

	\$XXX
--	-------

Reviews/Approvals/Recommendations

<input checked="" type="checkbox"/>	Commission, Board or Committee
Name(s)	AK DHS&EM
Name(s)	FEMA
<input type="checkbox"/>	Attorney
<input type="checkbox"/>	Insurance

ATTACHMENTS: 1. Resolution 03-20-1521; 2.State and FEMA Approved Multi-Jurisdictional Hazard Mitigation Plan

**RECOMMENDATION MOTION:**

Move to Approve Resolution 03-20-1521.

**SUMMARY STATEMENT:**

In November 2018 the first Hazard Mitigation Planning meeting occurred with Borough staff and other partners including the School District, WCA, USFS, SEARHC, and Chamber of Commerce. Over the next year, AECOM, the State's contractor hired to work with the Borough on our plan

development, worked with staff to identify critical facilities and develop mitigation projects. AECOM and the State had some contractual issues during the year which trickled down to Wrangell via staff changes, and little attention to details regarding requested changes in the Plan. It was submitted to the State Hazard Mitigation Team for review without a final review by Borough Staff and then was forwarded to FEMA for approval. FEMA sent the draft Plan back to the State for some minor modifications. These were made in Jan/Feb 2020 and the plan was resubmitted to FEMA in March. FEMA approved the Plan pending adoption by at least one jurisdiction involved with our Multi-Jurisdictional Hazard Mitigation Plan. The Wrangell Borough, Wrangell Cooperative Association and the Tlingit-Haida Central Council are the three jurisdictions being requested to adopt the Plan.

Chapters 1-3 of the Plan provide information regarding the process and basic community information. Chapter 4 discusses, in detail, the types of hazards and their likelihood of occurring in our area and the extent of the threat as well as providing references. Chapter 5 identifies the Mitigation Strategies and Action Plan. Chapter 6 are references and Chapter 7 is the Adoption process with blanks still to be filled in. *The critical pieces of the plan are the Critical Facilities list page 4-40 and the Mitigation Action Plan page 5-13.*

Dorianne Sprehe and I attended a Community Resilience meeting in Sitka earlier this month regarding all aspects of emergency planning. One of the sessions discussed the Hazard Mitigation Plan and why it is so important. By having an adopted Plan, funding is available for a variety of mitigation projects. This session and other discussions helped Dorianne and I realize the Plan needed to be amended immediately to include additional mitigation activities. According to the State, amending the plan is very simple and does not require Assembly, State or FEMA approval, although any updates will be sent to the Assembly for review. Plan amendments only require a documented meeting of the Planning team to update and amend. Staff's original intent was to develop those updates in the next month or two and then bring the FEMA adopted Hazard Mitigation Plan to the Assembly and Tribe along with suggested changes and have everything approved at one meeting. The State, however, advised that it would be in our best interest to have the Plan adopted sooner than later to potentially access advanced assistance funding or other funding sources that might be available soon. Also, due to the hourly changes of the COVID-19 situation, it may take Staff longer to develop the proposed changes to the Plan than originally intended.

Therefore, staff is requesting that the Assembly adopt the Multi-Jurisdictional Hazard Mitigation Plan as currently written. Staff will work with Wrangell Cooperative Association and Tlingit-Haida Central Council to also adopt the plan. Staff will also begin working on changes to the Mitigation Action Plan and other recommended changes not incorporated by the contractor.

## CITY AND BOROUGH OF WRANGELL, ALASKA

RESOLUTION No. 03-20-1521

## A RESOLUTION OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA ADOPTING THE WRANGELL MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the City and Borough of Wrangell has participated with Wrangell Cooperative Association and the Tlingit-Haida Central Council in the hazard mitigation planning process established under the Disaster Mitigation Act of 2000 and facilitated by AECOM, the State of Alaska's contractor; and

WHEREAS, the Act establishes a framework for development of a multi-jurisdictional Tribal and Municipal Hazard Mitigation Plan; and

WHEREAS, the Act, as part of the planning process, requires public involvement among community, Tribal, and municipal stakeholders; and

WHEREAS, the Wrangell Multi-Jurisdictional Hazard Mitigation Plan includes all required elements of the Plan; and

WHEREAS, the Wrangell Multi-Jurisdictional Hazard Mitigation Plan has been approved by the State of Alaska Department of Homeland Security and Emergency Management and the Federal Emergency Management Agency (FEMA); and

WHEREAS, the Wrangell Multi-Jurisdictional Hazard Mitigation Plan will make the City and Borough of Wrangell, the Wrangell Cooperative Association and Tlingit-Haida Central Council eligible to receive FEMA hazard mitigation grants for Wrangell projects; and

WHEREAS, the entities participating in the Plan must also formally adopt the plan.

NOW, THEREFORE, BE IT RESOLVED BY THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA, THAT:

The Wrangell Multi-Hazard Mitigation Plan is hereby adopted by the City and Borough of Wrangell, Alaska.

PASSED AND APPROVED BY THE ASSEMBLY OF THE CITY & BOROUGH OF WRANGELL, ALASKA THIS 24<sup>th</sup> DAY OF MARCH, 2020.

CITY & BOROUGH OF WRANGELL

---

Stephen Prysunka, Mayor

ATTEST: \_\_\_\_\_  
Kim Lane, Borough Clerk





# City and Borough of Wrangell

## Multi-Jurisdictional Hazard Mitigation Plan

2020

Prepared by:

**AECOM**



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## LIST OF ACRONYMS AND ABBREVIATIONS

AECOM	AECOM, Consultant, or Contractor
AVO	Alaska Volcano Observatory
CBW	City and Borough of Wrangell
CCTHITA	Central Council of the Tlingit and Haida Indian Tribes of Alaska
CFR	U.S. Code of Federal Regulations
DCCED	Department of Commerce, Community, and Economic Development
DCRA	Division of Community and Regional Affairs
DEC	Alaska Department of Environmental Conservation
DHS&EM	Division of Homeland Security and Emergency Management
DGGS	Alaska Division of Geological and Geophysical Survey
DMA 2000	Disaster Mitigation Act Of 2000
DOT/PF	Department of Transportation and Public Facilities
ENSO	El Niño/La Niña Southern Oscillation
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
ft	Feet
GI	Geophysical Institute
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HUD	Housing and Urban Development
IRA	Indian Reorganization Act
M	Magnitude
MAP	Mitigation Action Plan
MJHMP	Multi-Jurisdictional Hazard Mitigation Plan
mph	Miles Per Hour
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
SNAP	Scenarios Network for Alaska and Arctic Planning
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
UAF	University of Alaska Fairbanks
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geologic Survey
WCA	Wrangell Cooperative Association

# 1 INTRODUCTION

## 1.1 HAZARD MITIGATION PLANNING

As defined in Title 44 of the Code of Federal Regulations (CFR), Subpart M, Section 206.401, hazard mitigation is “any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.” As such, hazard mitigation is any work to minimize the impacts of any type of hazard event before it occurs. Hazard mitigation aims to reduce losses from future disasters. It is a process that identifies and profiles hazards, analyzes the people and facilities at risk, and develops mitigation actions to reduce or eliminate hazard risk. The implementation of the mitigation actions, which include short- and long-term strategies that may involve planning, policy changes, programs, projects, and other activities, is the end result of this process.

In recent years, local hazard mitigation planning has been driven by a federal law, known as the Disaster Mitigation Act of 2000 (DMA 2000). On October 30, 2000, Congress passed the DMA 2000 (Public Law 106-390), which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act) (Title 42 of the United States Code Section 5121 et seq.) by repealing the act’s previous mitigation planning section (409) and replacing it with a new mitigation planning section (322). This new section emphasized the need for state, tribal, and local entities to closely coordinate mitigation planning and implementation efforts. This new section also provided the legal basis for the Federal Emergency Management Agency’s (FEMA’s) mitigation plan requirements for the Hazard Mitigation Assistance grant programs.

In recognition of tribal sovereignty and the government-to-government relationship that FEMA has with Indian Tribal governments, FEMA amended 44 CFR Part 201 at 72 Fed. Reg. 61720, on October 31, 2007, and again at 74 Fed. Reg. 47471, on September 16, 2009, to consolidate and clarify the requirements for Indian Tribal governments, to establish tribal mitigation plans separately from state and local mitigation plans, and finalize the mitigation planning rule.

Indian tribal governments with an approved Tribal Mitigation Plan in accordance with 44 CFR 201.7 may apply for assistance from FEMA as a grantee. If the Indian Tribal government coordinates with the State for review of their Tribal Mitigation Plan, then the Indian Tribal government also has the option to apply as a subgrantee through a state or another tribe. A grantee is an entity such as a state, territory, or Indian Tribal government to which a grant is awarded and that is accountable for the funds provided. A subgrantee is an entity, such as a community, local, or Indian Tribal government; state-recognized tribe; or a private non-profit organization to which a subgrant is awarded and that is accountable to the grantee for use of the funds provided.

If the Indian Tribal government is eligible as a grantee or subgrantee because it has an approved Tribal Mitigation Plan and has coordinated with the State for review, it can decide which option it wants to take on a case-by-case basis with respect to each Presidential Disaster Declaration, and for each grant program under a Declaration, but not on a project-by-project basis within a grant program. For example, an Indian Tribal government can participate as a subgrantee for Public Assistance, but as a grantee for the Hazard Mitigation Grant Program (HMGP) under the same Declaration. However, the Indian Tribal government would not be able to request grantee status under HMGP for one HMGP project, then request subgrantee status for another HMGP project under the same Declaration.

Under the Stafford Act and the National Flood Insurance Act, local, and tribal governments must have an approved, adopted hazard mitigation plan to meet the eligibility requirements for certain assistance types, which may differ depending on whether the local or Indian tribal government intends to apply as a grantee or subgrantee.

## 1.2 2020 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN SYNOPSIS

To meet the requirements of the DMA 2000, the City and Borough of Wrangell (CBW), the Wrangell Cooperative Association (WCA), and the Central Council of the Tlingit and Haida Indian Tribes of Alaska (CCTHITA) have prepared a Multi-Jurisdictional Mitigation Plan (MJHMP) (hereinafter referred to as the 2020 MJHMP) to assess risks posed by natural hazards and to develop a mitigation action plan for reducing the risks on Wrangell Island (Wrangell). This is an updated plan from the legacy 2009 hazard mitigation plan for the community.

The 2020 MJHMP is organized to follow FEMA's Local Mitigation Plan Review Tool, which demonstrates how local HMPs meet the DMA 2000 regulations. As such, specific planning elements of this review tool are in their appropriate plan sections.

The 2020 MJHMP structure has been updated to including the following sections:

- **Section 1 Introduction** defines what a hazard mitigation plan is, delineates federal requirements and authorities, and introduces the Hazard Mitigation Assistance program listing the various grant programs and their historical funding levels.
- **Section 2 Planning Process** provides an overview of the planning process, starting with the plan completion timeline. It identifies planning/advisory committee members and describes their involvement with the plan update process. It also details stakeholder outreach, public involvement and continued public involvement. It provides an overview of the existing plans and reports and how they were incorporated into the 2020 MJHMP, how the legacy plan was reviewed for the update, and lastly lays out a plan update method and schedule. Supporting planning process documentation is listed in Appendix A.
- **Section 3 Community Profile** provides a general history and background of Wrangell including historical trends for population and the demographic and economic conditions that have shaped the area. Finally, this section lists the critical facilities identified by the community that are included in this plan.
- **Section 4 Hazard Identification and Risk Assessment** describes each of the seven hazards addressed in this plan. Additionally, it includes impact (i.e., risk assessment) tables for the planning area, vulnerable populations and critical facilities in each hazard area. An overall summary description is also provided for each hazard.
- **Section 5 Mitigation Strategy** details Wrangell's capabilities (authorities, policies, programs and resources) available for hazard mitigation. Finally, it describes the mitigation strategy, which is the blueprint for how Wrangell will reduce its risks to hazards. The mitigation strategy is made up of three main components: mitigation goal(s); potential mitigation actions and projects; and a mitigation action plan.
- **Section 6 References** contains the sources cited in the document.
- **Section 7 Plan Adoption** contains a scanned copy of the adoption resolutions.

## 2 PLANNING PROCESS

Section 2 – Planning Process addresses Element A of the Local Mitigation Plan Regulation Checklist.

DMA 2000 requirements and implementing local and multi-jurisdictional governance regulations for describing the planning process include:

<b>Regulation Checklist – 44 CFR 201.6 Local Mitigation Plans</b>
<b>Element A: Planning Process</b>
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))

DMA 2000 requirements and implementing Tribal governance regulations for describing the planning process include:

<b>Regulation Checklist – 44 CFR 201.7 Tribal Mitigation Plans</b>
<b>Element A: Planning Process</b>
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process? [44 CFR § 201.7(c)(1)]
A2. Does the plan document an opportunity for public comment during the drafting stage and prior to plan approval, including a description of how the tribal government defined “public”? [44 CFR § 201.7(c)(1)(i)]
A3. Does the plan document, as appropriate, an opportunity for neighboring communities, tribal and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? [44 CFR § 201.7(c)(1)(ii)]
A4. Does the plan describe the review and incorporation of existing plans, studies, and reports? [44 CFR § 201.7(c)(1)(iii)]
A5. Does the plan include a discussion on how the planning process was integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA programs and initiatives? [44 CFR § 201.7(c)(1)(iv)]
A6. Does the plan include a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within the plan update cycle)? [44 CFR § 201.7(c)(4)(i)]
A7. Does the plan include a discussion of how the tribal government will continue public participation in the plan maintenance process? [44 CFR § 201.7(c)(4)(iv)]

### 2.1 OVERVIEW OF 2020 MJHMP PLANNING PROCESS

The planning process began on January 31, 2018 with a teleconference with Ms. Lisa Von Bargen, Borough Manager to explain how their community was selected by the Division of Homeland Security and

Emergency Management (DHS&EM) 2016 Pre-Disaster Mitigation Grant award. The staff of AECOM, the State's contractor, described the MJHMP development requirement to enable the community to qualify for Hazard Mitigation Grant Program grants and the overall MJHMP development process.

Ms. Von Barga explained she desired a major update to their legacy Hazard Mitigation Plan (HMP) stating she was contacting prospective community planning team members to assist the community's efforts to identify available resources and capabilities for the 2020 MJHMP development. The planning team would assist AECOM by acting as an advocate for the planning process, assist with gathering information, and provide support during public participation opportunities.

The first community meeting and planning team work sessions occurred on November 27 to 29, 2018. The Assembly identified applicable resources and capabilities during the November 27 meeting. The planning team met on November 29 to discuss their hazards that create the most concern for the community.

The planning team then discussed the hazard impacts to their residential, critical facilities, and infrastructure various mitigation actions for potential future mitigation project funding.

In summary, the following five-step process took place from November 2018 through July 2019.

1. Organize resources: Members of the planning team identified resources, including staff, agencies, and local community members, who could provide technical expertise and historical information needed in the development of the hazard mitigation plan.
2. Monitor, evaluate, and update the plan: The planning team developed a process to ensure the plan was monitored to ensure it was used as intended while fulfilling community needs. The team then developed a process to evaluate the plan to compare how their decisions affected hazard impacts. They then outlined a method to share their successes with community members to encourage support for mitigation activities and to provide data for incorporating mitigation actions into existing planning mechanisms and to provide data for the plan's five-year update.
3. Assess risks: The planning team identified the hazards specific to the Wrangell area and with AECOM's assistance, developed the risk assessment for their identified hazards. The planning team reviewed the risk assessment, including the vulnerability analysis, prior to and during developing their 2018 mitigation strategy.
4. Assess capabilities: The planning team reviewed current administrative and technical, legal and regulatory, and fiscal capabilities to determine whether existing provisions and requirements adequately address relevant hazards.
5. Develop a mitigation strategy: After reviewing the risks posed by each hazard, the planning team developed a comprehensive range of potential mitigation goals and actions. Subsequently, the planning team identified and prioritized the actions for implementation.

Table 1 provides a timeline of the major planning tasks and milestones over the planning period.

**Table 1. Hazard Mitigation Advisory Committee**

Name	Department / Agency, Title	Contribution
Lisa Von Barga	Borough Manager, CBW	Planning team lead, data input and MJHMP review.
Steve Prysunka	Mayor, CBW	Planning team member, data input and MJHMP review.
Patty Gilbert	Vice Mayor, CBW	Planning team member, data input and MJHMP review.
Carol Rushmore	Economic Development Director, CBW	Planning team member, data input and MJHMP review.

**Table 1. Hazard Mitigation Advisory Committee**

Name	Department / Agency, Title	Contribution
Rolland Howell	Public Works Director, CBW	Planning team member, data input and MJHMP review.
Amber Al-Haddad	Capital Facilities Director, CBW	Planning team member, data input and MJHMP review.
Tim Bunes	Fire Chief, CBW	Planning team member, data input and MJHMP review.
Doug McCloskey	Police Chief, CBW	Planning team member, data input and MJHMP review.
Greg Meissner	Harbor Master, CBW	Planning team member, data input and MJHMP review.
Borough Assembly	Entire Membership, CBW	Planning team members, data input and MJHMP review.
Austin O'Brien	Acting Forest Service District Ranger, US Forest Service District (USFS)	Planning team members, data input and MJHMP review.
Esther Ashton	Tribal Administrator, WCA	Planning team member, Tribal data input and MJHMP review.
Richard Peterson	President, Central Council of the Tlingit and Haida Indian Tribes of Alaska	Planning team member, Tribal data input and MJHMP review.
Raymond Paddock	Environmental Manager/ MJHMP Contact, CCTHITA of Alaska	Planning team member, Tribal data input and MJHMP review.
Michael Sanders	Safety Officer, Southeast Alaska Regional Health Consortium	Agency Planning Participant
Kelly Isham	Emergency Management Planner, AECOM, Alaska	Contract planning team member, data acquisition, MJHMP development
Scott Simmons	Emergency Management Professional, AECOM, Alaska	Contract planning team lead. Responsible for MJHMP development, lead writer, project coordination.

## 2.2 OPPORTUNITIES FOR STAKEHOLDERS

On February 12, 2018, AECOM reached out to stakeholders about the 2020 MJHMP to invite them to participate in the planning process. Stakeholders included:

- US Bureau of Indian Affairs
- US Bureau of Land Management
- US Department of Housing and Urban Development (HUD)
- US Fish & Wildlife Service
- University of Alaska Fairbanks (UAF), Geophysical Institute (GI), Alaska Earthquake Information Center
- Alaska Native Tribal Health Consortium-Community Development
- Alaska Volcano Observatory (AVO)
- Association of Village Council Presidents



- Denali Commission
- Alaska Department of Environmental Conservation (DEC)
  - Division of Spill Prevention and Response
  - Village Safe Water
- Alaska Department of Transportation and Public Facilities (DOT/PF)
  - Central Region
  - North Region
  - Southcoast Region
- Alaska Department of Community, Commerce, and Economic Development (DCCED)
  - Division of Community Advocacy (DCRA)
- Alaska Department of Military and Veterans Affairs
  - Division of Homeland Security and Emergency Management (DHS&EM)
- U.S. Environmental Protection Agency (EPA)
- National Weather Service (NWS)
  - Northern Region
  - Southeast Region
  - Southcentral Region
- Natural Resources Conservation Service (NRCS)
- U.S. Department of Agriculture
- U.S. Department of Agriculture Division of Rural Development
- US Army Corps of Engineers (USACE)

All stakeholder documentation is included in Appendix A.

## 2.3 PUBLIC INVOLVEMENT

The CBW engaged the public in the plan update process through discussions at Borough Assembly and Tribal Council meetings and through distribution of newsletters (Appendix A). The newsletters and draft plan were posted on the community electronic bulletin board for review and comment.

The WCA and the CCTHITA of Alaska recognize any tribal member, Alaska Native, community resident, or employee as a “Public” member of the community. This assures that anyone within the community is eligible to attend and participate in tribal public meetings concerning hazard mitigation plan development and implementation activities. Table 2 provides the community’s public involvement initiative.

**Table 2. Public Involvement Mechanisms**

Plans and Reports	Information to be Incorporated into the 2020 MJHMP
Newsletter #1 Distribution (Oct. 16, 2018)	The jurisdiction distributed their first newsletter introducing the upcoming planning activity. The newsletter encouraged the whole community to provide hazard and critical facility information. It was posted through Wrangell’s offices, stores, and bulletin boards to enable the widest dissemination.

**Table 2. Public Involvement Mechanisms**

Plans and Reports	Information to be Incorporated into the 2020 MJHMP
Newsletter #2 Distribution (January 3, 2019)	The jurisdiction distributed their second newsletter describing the draft MJHMP's availability and presented potential projects for review. The newsletter encouraged the whole community to provide comments or input. It was posted at Wrangell area offices, stores, and bulletin boards, stores to enable the widest dissemination.
Agency Involvement Email (November 12, 2016)	Invited agencies to participate in mitigation planning effort and to review applicable newsletters located on the DHS&EM Local/Tribal All Hazard Mitigation Plan Development website at: <a href="http://ready.alaska.gov/plans/localhazmitplans">http://ready.alaska.gov/plans/localhazmitplans</a>
HMP Reviews Opportunities	The planning team reviewed each section during MJHMP development and final HMP review.
Public HMP Progress Notifications	Team members engaged their public during borough and tribal council meetings to encourage discussion concerning the 2020 MJHMP update's progress and about HMP review opportunities throughout the project.
Public Comments	<p>The CBW planning team reviewed the initial draft MJHMP and posted comments received as of January 13, 2019 on the Planning and Zoning Commission's website for public review. Comments were available at: <a href="http://www.wrangell.com/planning/multi-jurisdictional-hazard-mitigation-plan">http://www.wrangell.com/planning/multi-jurisdictional-hazard-mitigation-plan</a>.</p> <p>Notice for Public comments was posted during development and during the final draft HMP review period. Any comments received were reviewed and vetted by the Planning and Zoning Commission. Valid comments were included within the MJHMP before finalizing the plan.</p>

WCA President worked with the CBW and WCA Tribal Council to review the legacy HMP and provide information throughout the 2020 MJHMP update planning process.

Public meeting notices were posted throughout the community (Offices, businesses, post office, public bulletin boards, etc.) announcing the November 27<sup>th</sup> Assembly Meeting's agenda; encouraging attendance and participate in the plan update process and the introductory newsletter was disseminated.

A planning team meeting was held in February 2019 to review legacy 2009 mitigation actions, determine their current status, and identify new mitigation actions identified based on the results of the risk assessment. A second newsletter was prepared and delivered on January 3, 2019 describing the process to date, presenting the newly identified and prioritized mitigation actions, and announcing the availability of the draft MJHMP for public review and comment.

The planning team held two meetings in February and March 2019 to review the draft MJHMP for accuracy – ensuring it meets borough and tribal needs. The Planning and Zoning Commission further reviewed a draft June 4, 2019 providing additional comments. No public comments were received.

## 2.4 LEGACY 2009 HMP REVIEW AND ANALYSIS

44 CFR requires communities to schedule multi-jurisdictional, local, and tribal HMP planning team meetings and teleconferences to review, discuss, and determine mitigation implementation accomplishments, track data relevance for future HMP update inclusion, and document recommendations for future HMP updates.

Wrangell's Legacy 2009 HMP document was revised to reflect the following format to meet newly identified regulatory requirements.

Section 1: Introduction

- Added entire new section explaining Wrangell's 2020 plan review and update planning processes.

Section 2: Planning Process

- Updated this section to reflect 2009 to 2020 changes to the public process including newsletters, public meetings and planning team composition.

Section 3: Community Profile

- Updated and expanded community information, including new census and state data.

Section 4: Hazard Identification and Risk Assessment

- Reviewed hazard identification and risk assessment for earthquake, flooding, severe weather and wildland fire adding 2009 to 2020 descriptions and data and new hazard impact data. The weather profile now addresses climate change as it pertains to changing patterns and impacts. However, other profiled natural hazards also include noted climate change impacts as appropriate, these modifications better meet Wrangell's needs.

Section 5: Mitigation Strategy

- Reviewed 2009 mitigation goals and actions and added new goals and actions for the 2020 MJHMP Mitigation Strategies' Mitigation Action Plan.

Section 6: References

- Revised to reflect 2020 update resources.

Section 7: Plan Adoption

- Provided new 2020 borough and tribal adoption resolutions.

**Maintenance Requirement Completion Review**

The planning team did not complete their designated annual HMP integration into other planning mechanisms, annual reviews, or other plan maintenance activities. Therefore, it became a primary consideration to update the legacy 2009 HMP to analyze borough and tribal changes as well as all hazards that have, or could potentially have, impacted the Wrangell area during the legacy HMP's five-year lifecycle.

All sections of the MJHMP were updated throughout the 2020 update's planning activity due to intermittent contractor and community staff availability. Table 3 categorizes planning team-identified HMP components that necessitated information update were not lost.

The 2020 MJHMP update process included inviting new and existing stakeholders to review the legacy 2009 HMP to determine what was accomplished versus what was intended to accomplish.

**Table 3. Legacy HMP Review and Update Needs Determinations**

2009 HMP Section	2009 HMP Items to be Updated	Status*	2009 HMP Identified items for Deletion	Newly Identified Items to be Added for HMP Compliance	New Action Commitment
Planning Process	<ul style="list-style-type: none"> <li>Planning process obligations successes</li> <li>Planning team membership</li> <li>Mitigation resource list</li> <li>Continue public outreach initiatives</li> <li>HMP integration initiatives into other planning mechanisms</li> <li>Plan Maintenance Activities</li> </ul>	NF: Complete annual HMP review NF: Integrate any legacy HMP components into other planning mechanisms or initiatives NF: Continue public involvement during five-year life cycle	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Refine plan maintenance processes and responsibilities</li> </ul>	<ul style="list-style-type: none"> <li>Planning team will begin to hold annual review meetings</li> <li>Strive to integrate HMP initiatives into other planning mechanisms</li> </ul>
Hazard Profile Update	<ul style="list-style-type: none"> <li>Update hazard profile and new event history</li> <li>Profile newly identified hazard risks</li> </ul>	NF: Update hazard profile and new event history	<ul style="list-style-type: none"> <li>Mitigation projects that were deleted or combined due to similarity</li> </ul>	<ul style="list-style-type: none"> <li>Identify new hazards</li> <li>Update hazards' impacts</li> <li>Determine mitigation project status as: deleted, deferred, or combined</li> <li>Develop new MAP</li> </ul>	<ul style="list-style-type: none"> <li>Define new actions within the MAP</li> </ul>
Risk Analysis and Vulnerability Assessment	<ul style="list-style-type: none"> <li>Asset inventory</li> <li>Vulnerability analysis &amp; summaries</li> </ul>	NF: Identify development and land use changes	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Develop asset inventory</li> <li>Determine infrastructure vulnerabilities</li> <li>Determine residential structure vulnerabilities</li> <li>Identify repetitive loss properties as appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Fill data gaps</li> <li>Locate scientific information to augment these data.</li> <li>Delineate climate change impacts to infrastructure</li> </ul>

**Table 3. Legacy HMP Review and Update Needs Determinations**

2009 HMP Section	2009 HMP Items to be Updated	Status*	2009 HMP Identified items for Deletion	Newly Identified Items to be Added for HMP Compliance	New Action Commitment
Mitigation Strategy	<ul style="list-style-type: none"> <li>Determine existing mitigation actions progress and current status</li> <li>Define mitigation action implementation successes or barriers</li> </ul>	NF: Did not track project implementation processes or progress	<ul style="list-style-type: none"> <li>Delete completed, combined, or deleted actions</li> <li>Implemented &amp; non-relevant mitigation actions</li> </ul>	<ul style="list-style-type: none"> <li>Legacy (2009) HMP MAP initiatives' status</li> <li>Identify new mitigation actions for newly identified hazard implementation</li> <li>Develop community specific capability assessment(s)</li> </ul>	<ul style="list-style-type: none"> <li>Annually review action's progress, status, and feasibility</li> </ul>

\* F: Fulfilled

NF: Not Fulfilled

## 2.5 REVIEW AND INCORPORATION OF EXISTING PLANS AND REPORTS

The consultant reviewed existing relevant information to include in the 2020 MJHMP. Table 4 lists the plans and reports reviewed as well as information to be incorporated into the 2020 MJHMP.

**Table 4. Existing Plans and Reports**

Plans and Reports	Information to be Incorporated into the 2020 MJHMP
Wrangell Household Opinion Survey, 2009	Identified issues relevant to residents concerning quality of life, economic sustainability, waste accumulation and disposal recycling options, electric power intertie, and deepwater access location to boost industrial development and employment
Wrangell Water Front Economic Overview, 2014	Provided employment and other economic related data for plan inclusion
Waterfront Master Plan, 2015	Provided insight into future and planned development
Wrangell Community Profile, 2016	Provided community specific infrastructure and economic, information
Water Treatment Plant Upgrade Project Environmental Report, 2016 – 2017	Reviewed for pertinent geological information
Wrangell Borough Comprehensive Plan, 2010	Provided priorities for community, land use, historical information on mitigation, development goals
Wrangell Capitol Improvement Project List, 2016 - 2017	Provided critical facility funding information for risk assessment
Wrangell's History, (Wrangell website 2018)	Provided Wrangell area background information

**Table 4. Existing Plans and Reports**

<b>Plans and Reports</b>	<b>Information to be Incorporated into the 2020 MJHMP</b>
FEMA Map Service Center	Provided historic flood hazard area documents and maps
Wrangell Erosion Sediment Control Plan	Describes Wrangell area erosion concern areas
U.S. Army Corps of Engineers, Alaska Baseline Erosion Assessment, 2009	Defined the area's erosion impacts
U.S. Army Corps of Engineers, Floodplain Manager's Reports, Community Specific 2011	Defined the area's historical flood impacts
State of Alaska, Department of Commerce, Community and Economic Development Community Profile	Provided historical and demographic information
State of Alaska Hazard Mitigation Plan, 2013	Defined statewide hazards and their potential locational impacts

## 2.6 INTEGRATING THMP PRECEPTS INTO EXISTING PLANNING MECHANISMS

The Wrangell planning team did not integrate any legacy 2009 HMP components into other planning mechanisms; or initiatives during the legacy 2009 HMP's five-year lifecycle.

Like most Alaska communities there is continuous staff turnover. New leadership is in the process of working with Wrangell department leads to integrate MJHMP components into existing planning documents and procedural mechanisms.

Each planning team member ensures that the MJHMP, and in particular each Mitigation Action Plan's (MAP's) project or initiative, is incorporated into existing city or tribal planning mechanisms whenever possible. Once the MJHMP is community adopted and receives FEMA's final approval, each member of the planning team will undertake the following activities:

- Review community-specific regulatory tools to assess integrating MJHMP components. These regulatory tools are identified in Section 5.
- Work with pertinent community departments to increase MJHMP awareness and provide assistance with integrating the mitigation strategy (including the MAP) into relevant planning mechanisms.
- Responsible authorities will track their respective project or action's status and annually report their progress as well as their mitigation success, or failure.

*Note: Implementing these requirements may require updating or amending specific planning mechanisms*

Wrangell hosts various annual outreach activities annually which gives the Wrangell planning team opportunities to present MJHMP initiatives and philosophies to the public during these meetings. These activities provide platforms to facilitate public discussion and to explain the need to integrate MJHMP precepts into city and tribal planning initiatives. The most effective events include the annual Health Fair, Community Markets, Public School Science presentations or Senior Project presentations. A webpage of Information on Hazard Mitigation concerns will also be established on the City's website. The Borough also regularly uses social media to keep residents informed.

## 2.7 CONTINUED PUBLIC PARTICIPATION

The MJHMP was prepared as a collaborative effort with CBW, WCA, and the CCTHITA. The planning team will build upon previous hazard mitigation planning efforts and successes. CBW, WCA, and the CCTHITA will continue to use their respective planning teams, department staff meetings, and the Planning and Zoning Commission to monitor, review, and evaluate the MJHMP annually and update the plan as required.

A copy of the 2020 MJHMP will be kept at the CWB and the Central Council of the Tlingit and Haida Indian Tribes of Alaska offices and community electronic bulletin board. The Planning team will also notify residents of any changes or updates to the 2020 MJHMP, including mitigation projects identified in the plan as they are implemented on the city website.

The CBW, WCA, and the CCTHITA will strive to continue identifying opportunities to raise community awareness about the MJHMP and the hazards that affect the area. This effort may include attendance and provisions of materials and conducting annual surveys and questionnaires at City and Tribal-sponsored events, periodic presentations on the plan's progress to local officials and other community groups, or posting on social media about the plan and how it is being used in the city. Any public comments received regarding the MJHMP will be collected by the planning team leader who will include the information within the annual report for consideration during future MJHMP updates.

## 2.8 PLAN UPDATE AND MONITORING METHOD AND SCHEDULE

The CBW, WCA, and the CCTHITA commits to organizing their efforts to ensure that future HMP improvements and revisions occur in a well-managed, efficient, and coordinated manner. The planning team will follow these three process steps:

- **Annual Review Worksheets:** Every 12 months from plan adoption, the HMP planning lead will email each member of the planning team an Annual Review Worksheet to complete. As shown in Appendix B, the Annual Review Worksheet reflects the Local Mitigation Plan Review Tool and includes the following: planning process, hazard profile, risk assessment, and mitigation strategy. Each member of the advisory committee will email completed worksheets back to the HMP planning lead to review. The HMP planning lead will summarize these findings and email them out to the committee. If the HMP planning lead believes that the 2020 MJHMP needs to be updated based on the findings, then an invitation will be sent to planning team members to attend a formal HMP update meeting.
- **Mitigation Progress Project Reports:** Mitigation actions will be monitored and updated using the Mitigation Project Progress Report. During each annual review, each department or agency currently administering a mitigation project will submit a progress report to the HMP planning lead. For projects that are being funded by a FEMA mitigation grant, FEMA quarterly reports may be used as the preferred reporting tool. As shown in Appendix B, the progress report will discuss the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them.
- **Planning Team Roundtable:** On the fourth year of the update, the HMP planning lead will lead a tabletop exercise with the advisory committee to: collect the Annual Review Worksheet and any Mitigation Project Progress Reports and FEMA quarterly reports; determine hazards to be included in the 2025 MJHMP; develop a new work plan; and begin the plan update process.

The city and tribal councils will monitor the plan continually, evaluate the plan annually and update the plan every five years, or within 90 days of a presidentially declared disaster (if required), or as necessary to reflect changes in state or federal law.

Each authority identified in the MAP matrix will be responsible for implementing the MAP and determining whether their respective actions were effectively implemented.

The city and tribal councils will work together to appoint the most appropriate planning team leader, who will serve as the primary point-of-contact and will coordinate local efforts to monitor, evaluate, revise, and update MJHMP mitigation strategy actions' progress, status, and closure status.

## **2.9 TRIBAL OR NATIVE VILLAGE MITIGATION GRANT APPLICATION PROCESS CONSIDERATIONS**

The Indian Reorganization Act (IRA) Tribes can potentially qualify to either apply for applicable grant funding as state sub-applicants; or apply directly to FEMA as eligible federally IRA tribal governments with sovereign authority working directly with government agencies.

Therefore, each eligible Tribe can determine which of the two following options will best fit their needs. These options are:

### ***Option 1:***

Each Tribe can submit grant applications through the State with no loss in Tribal governance authorities.

Each Tribe submits their mitigation grant applications to the State Hazard Mitigation Officer for initial State review. This option could potentially enable each Tribe to avoid paying future mitigation project grant funding match.

The State Hazard Mitigation Officer will then coordinate tribal applications within their grant review and prioritization process for potential approval and award. DHS&EM will review, prioritize, and award grants assigning their most current grant recipient cost share requirements to successful grant awardees.

### ***Option 2:***

Each eligible Tribe can submit mitigation grant applications directly to FEMA or other granting agencies as sovereign IRA tribal governments who maintain sovereign authority working directly with government agencies.

As an IRA tribe, the Tribal Councils submits their respective mitigation grant applications directly to FEMA with full knowledge that each Tribe will be responsible for providing any applicable programmatic project matching funds.

FEMA will review, prioritize, and award grants assigning their most current grant recipient cost share requirements to each successful grant awardee.

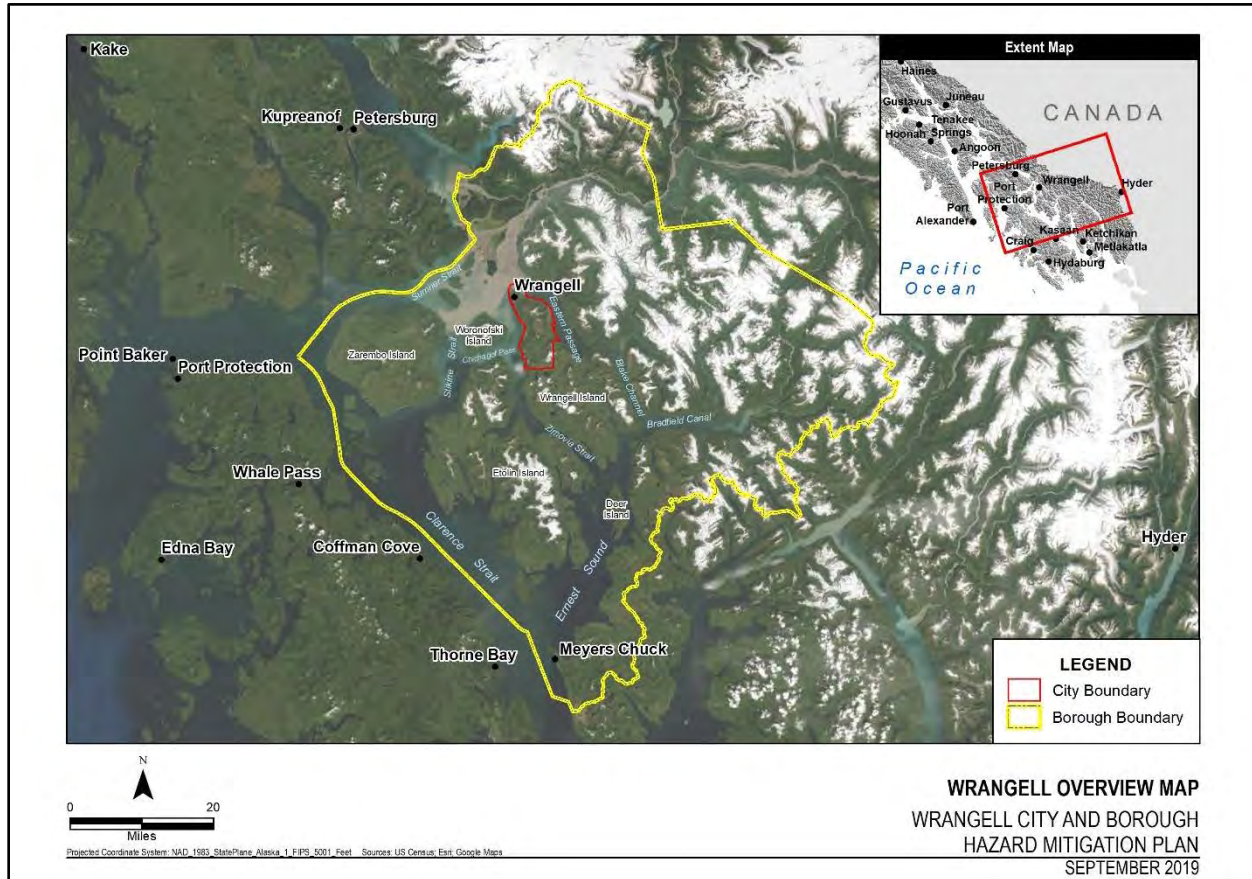


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### 3 COMMUNITY PROFILE

#### 3.1 PLANNING AREA

The City and Borough of Wrangell and the Wrangell Cooperative Association are recognized governmental entities that are both located within and have authority within the same geographic area. For purposes of this Plan, the area includes the borough boundaries of the City and Borough of Wrangell.



**Figure 1. Wrangell Overview Map**

The Wrangell Community Profile defines the city of Wrangell's location on Wrangell Island as being "located 90 miles north of Ketchikan in Southeast Alaska, near the mouth of the Stikine River. By air, Wrangell is approximately 1 hour 30 minutes (155 air miles) south from Juneau, and 3 hours from Anchorage and Seattle (just over 700 air miles each). The city of Wrangell is located on the northern tip of Wrangell Island" (Wrangell 2018). The following information is excerpted from the "History of Wrangell".

*... Wrangell is the third oldest community in Alaska, and the second oldest community in Southeast, and the ONLY city in Alaska to be ruled by four nations and under three flags... Tlingit, Russia, England, and the United States*

***Since the last Ice Age***

*A significant portion of the North American continent was buried under miles of glaciers during the last of the "Ice Age". However, recent archaeological and paleontological evidence indicates that at least a portion of Southeast Alaska, the outer coast, may have been ice-free during the late Pleistocene. Three archaeological sites within the Tongass National Forest have been reliably*

*dated in excess of 9,000 years BP: Hidden Falls at approximately 9860 BP; Groundhog Bay at approximately 10,180 years BP and On-Your-Knees Cave, with rare human remains, at approximately 9730 BP.*

### ***The Tlingits***

*Tlingit influence in Southeast is well documented in the literature. The Tlingit migration stories describe the early migration of the Tlingit through the Canadian interior, the discovery of "the hole in the ice", and the subsequent discovery of the "land of plenty" when a couple was brave enough to explore where the hole led to. Local Wrangell Tlingits believe the hole in the ice was in fact the Stikine River corridor, perhaps a river beneath the glacier that led from the Canadian interior to a series of lush island along the coast of Southeast Alaska during the last of the "Ice Age".*

*Subsequent movement into the area by the Haida and Tsimshian impacted the Tlingits and brought competing interests for the resources. Disputes over resources are commonly described in ethnographic accounts, along with descriptions of the Stikine Tlingits as fierce warriors who were able and willing to fight against their neighbors. Tlingits were equally well known as seasoned negotiators and traders. Trade networks from Southeast extended into the interior of Canada and up the Copper River and beyond. George Vancouver was the first recorded white man to come to the Wrangell area. He came in 1793, while on a survey expedition and just missed discovering the nearby Stikine River. Captain Cleveland visited the "Village of Steeken" on April 16, 1799, where he did some fur trading with the Indians.*

### ***Under the Russian Flag***

*It wasn't until the early 1800's that the Native Alaskans were visited by outside forces. Lt. Dionysius Zarembo, commander of the Russian-American Company ship Chichagof, landed at present day Wrangell in 1833. Wrangell started in 1834 as the Russian Redoubt St. Dionysus. The Russians established the Fort in order to preserve their interests in the region. Both the Spanish and English had also been carefully scouting the extent of Russian settlement with an eye towards occupation themselves*

*Stikine Tlingit Chief Shakes V, recognized some advantages of cooperation with the Russians, and moved the Tlingit village from its former site at "old town" to Shakes Island in the heart of the current city of Wrangell to be near the Russian Redoubt. Aleuts, Eskimos and Interior Athabaskans were brought to Southeast as sea otter hunters for the Russian companies...*

*In June of 1834, shortly after the Russian Redoubt was completed, Peter Sheen Ogden with eight officers, and 80 plus Hudson Bay Company employees, supplies and trading goods, sailed north to establish a post on the Stikine River... the Hudson Bay ship neared Redoubt St. Dionysius, Lt. Zarembo refused to allow them to anchor and ordered the ship to leave at once. Ogden protested to the Chief Russian in Sitka, Baron von Wrangel, saying that the British had as much right as the Russians to trade for fur on the Stikine...*

### ***Under the British Flag***

*Ogden went to Vancouver and talked with Dr. John McLoughlin who was in charge of all Hudson Bay Company posts on the Pacific Coast. The two men agreed that the Russian government should pay the Hudson Bay Company for the furs they had been denied from the Stikine Valley. Dr. McLoughlin prepared a claim for his company of 21,150 pounds, 10 shillings, sterling seeking reimbursement by the Russian government. A settlement was reached and the Hudson Bay Company withdrew its claim in exchange for a lease to the Alaskan mainland from Portland Canal to Cape Spencer. ... On May 30, 1840, the Hudson Bay Company ship Beaver reached Fort Dionysius. The Russian flag was lowered and the British flag raised. The fort was renamed Fort Stikine. John McLoughlin Jr. was made commander of the fort. Eighteen Hudson Bay Company men were left to gather the furs and defend Fort Stikine... Soon after the transfer of Fort Stikine to the British, there were several failed attempts by the Tlingits to capture the fort. The Hudson Bay*

*Company leased the fur lands of the Stikine area for more than 20 years and continued to operate the fort until the purchase of Alaska from Russia in 1867 by the United States.*

### ***Under the American Flag***

*The 1867 purchase of Alaska from Russia was known as "Seward's Folly" after William H. Seward, The Secretary of Interior. Most in the federal government believed Alaska was nothing but ice, snow and glaciers, with little value other than for the exported furs. Gold, however, had been discovered on the Stikine River in 1861. There were three Gold Rushes in and around Wrangell. The first one occurred when a man named Buck Choquette found gold on the Stikine River in 1861 on what is now call Buck's Bar. Buck Choquette was a Hudson Bay company employee. He was the first white man to find gold. Until Skagway came into existence, Wrangell served as the trade center for all the gold rushes, offering access to the Klondike fields through the Stikine River corridor and then on into the interior to the Yukon River. At one point over 10,000 persons were in Wrangell at one time, waiting for supplies and transportation up the Stikine. To put that into perspective, Wrangell has a current population of 2300 people! A number of buildings from this time period still exist in Wrangell.*

*In 1868 a military post was established and a new fort was built in Wrangell at a cost of \$26,000. The American's named the fort after Baron von Wrangel of the Russian-American Company. The fort, located where the present day post office is, was composed of a stockade with narrow gun holes and several block houses. Inside the walls were barracks, officers' quarters, and supply sheds made of logs. South of the fort was the Tlingit village of about 35 houses and 500 inhabitants. The Fort Wrangell Post Office was established in 1869. The fort was abandoned in 1877.*

*Not long after the purchase of Alaska, the fishing industry got its start with the establishment of several canneries throughout Southeast. The canneries were responsible for the eventual development of the large fish traps at stream mouths that dramatically impacted the salmon runs. These traps were later outlawed, but had serious impacts to the local economies, particularly the Tlingit groups who had traditionally procured their subsistence resources from these streams... The second gold rush started in 1872 when two prospectors named Thibert and McCullough came to Wrangell with gold they found at Dease Lake in the Cassiar country in Canada. Then, when gold was discovered in the Klondike, Wrangell became a mining center for the third time. Thousands of people went up the Stikine in 1898 to travel the Teslin Trail to the Klondike. During the 1898 gold rush, famed Marshall Wyatt Earp spent 10 days as Wrangell's marshal. He declined to become a full-time town marshal since he was on his way, with his wife, to strike his fortune in the Klondike. Some locals jokingly claim that "Wrangell was too wild for Wyatt!"*

*An 1898 issue of the Stikine River Journal gives an excellent picture of the rapid growth of Wrangell during the gold rush when it lists the stores in town. Included on the list are two sawmills, one cigar factory, two manufacturing jewelers, one fish cannery, three tin shops, two blacksmith shops, several carpenter and cabinet shops, one ship yard, about ten laundries, one plumbing shop, one copper shop, two breweries, two newspapers, and numerous lodging houses and restaurants. Most of the shops were false front buildings clustered along both sides of Front Street. In 1898, Front Street was constructed of boards placed on pilings over the water. Today, the downtown area is built on gravel fill and still has the false front look of the gold rush days. Unfortunately, two devastating fires, one in 1906 and the other in 1952, destroyed most of the historic buildings...*

*Missionaries came during the early 1870's establishing the first Presbyterian and Catholic churches and schools. Noted naturalist John Muir spent quite a lot of time in Wrangell in the 1880's, staging many of his explorations of southeast Alaska out of Wrangell... Wrangell continued developing as a town and Wrangell incorporated as a city in 1903...*

*In 1902, the creation of the Alexander Archipelago Forest Reserve and its subsequent transformation into the Tongass National Forest five years later, set in motion a series of events which eventually led to Southeast Alaska's and Wrangell's largest, employers during the mid to late*

*1900's - the wood and fiber companies. As with other southeast communities, Wrangell's primary economic base became fishing and timber...*

*...In 1912 the Alaska Native Brotherhood (ANB) was created, thus forming a solid political group whose aim was to achieve political equality for the Native Alaskans. In 1924, successful arguments led to the Natives receiving citizenship and the right to vote. The ANB and Alaska Native Sisterhood further exercised their political power by successfully lobbying the federal Bureau of Indian Affairs to build the first Native boarding school, the Wrangell Institute, in Wrangell in 1932...*

*There were two salmon canneries within the City limits of Wrangell in 1929 as well as two shrimp and crab canneries that employed over 150 people. Fur farming was also very important in the Wrangell area. Wrangell and surrounding islands had fox, mink, beaver, marten and muskrat farms. During the 1920's to present day, Wrangell continues to be a center for mining, serving as a supply area for the gold fields of the Cassiar Country in Canada. On August 14, 1920, the first airplanes ever to come to Wrangell appeared and landed on Sergief Island at the mouth of the Stikine River. The four World War I DeHavilland bi-planes were on a round-trip flight from New York to Nome. Wrangell has survived two fires which destroyed the downtown areas, has survived the boom and bust cycles of the gold rushes, the fishing industry and timber history.... (CBW 2018)*

### 3.2 POPULATION, LAND USE AND DEVELOPMENT TRENDS

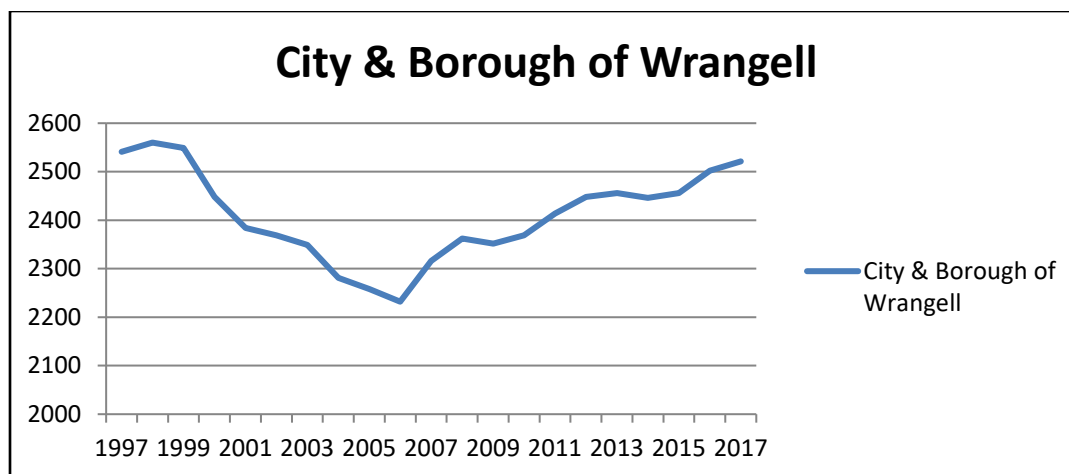
Prior to 2010, the U.S. Census figures were for the City of Wrangell, only. In May of 2008, the City was dissolved, and the City and Borough of Wrangell was incorporated with expanded boundaries, therefore current population data for the expanded Borough boundaries only goes back to 2010. Wrangell's 2015 Waterfront Master Plan provided data that shows the community's population spanning from 1997 through 2017 to fill in the gaps.

Figure 2 portrays population decreased from a high of 2,560 in 1998 declining steadily to a low of 2,232 in 2006. As described in the Wrangell Waterfront Master Plan, "...the Alaska Pulp Company sawmill closed and salmon prices tumbled in the 1990's, the local economy was devastated. Between 1994 and 2006, the population of the community fell by 18 percent (losing more than 500 residents)."

The population has been growing to 2,456 in 2017 which is only slightly more than Wrangell's 2000 population of 2,448.

2018 U.S. Census estimated 2,503 residents, of which the median age was 48.8 indicating a middle-aged population. The City and Borough's population is expected to continue slow growth with an upward trend for the foreseeable future. Over half of current population is between 25 and 64 years of age.

72.5 percent of the current population is reported as white, with 16.2 percent having an American Indian or Alaska Native heritage. The male and female composition is approximately 52.4 and 47.6 percent respectively. The 2017 Census estimate revealed that there are 1,053 households with the average household having approximately 2.2 individuals. The most recent 2017 DCCED certified population is 2,387.



**Figure 2. City and Borough of Wrangell's Historic Population**

Population data for City and Borough of Wrangell were obtained from the 2017 U.S. Census and the DCCED certified Population. The U.S. Census estimated the City and Borough of Wrangell total population for 2018 as 2,503 and the 2017 DCCED certified population data of 2,426 (Table 5).

**Table 5. Estimated Population and Building Inventory**

Population <sup>1</sup>		Residential Buildings	
2018 Census	DCCED 2017 Data	Total Building Count	Total Value of Buildings
2,503	2,426	1,454	<sup>1</sup> US Census \$282,076,000 <sup>2</sup> Adjusted for CBW: \$399,850,000

<sup>1</sup>U.S. Census 2018 estimated City and Borough of Wrangell population data. US Census listed median housing value at \$940,000

<sup>2</sup>The project team determined that the average single-family residential structural replacement cost is \$275,000

The 2017 U.S. Census estimates the City and Borough of Wrangell's current residential structure value as \$183,300.

However, the planning team stated that residential replacement values are generally understated because replacement costs exceed U.S. Census structure value estimates due to material purchasing, barge or airplane delivery, construction, and labor costs in rural Alaska. The planning team estimates an average 1,200 square foot residential structure costs \$275,000. A total of 1,454 single-family residential buildings were considered in this analysis.

### 3.2.1 Land Use

The 2010 Wrangell Comprehensive Plan defines their land ownership and current land use designations. Since 2010, the Borough has completed its municipal entitlement selection and acquired an additional 9,006 acres from the State of Alaska.

The City and Borough of Wrangell encompasses 2,582 square miles of land and 883 square miles of water. The federal government is by far the largest landowner in the borough, followed by the State of Alaska (including Alaska Mental Health Trust), the City and Borough of Wrangell and a variety of individual and corporate private sector land owners (CBW 2010).

There are just under 41,000 acres of State uplands in the Borough. Approximately 25,000 acres of State land are designated in a manner eligible for municipal selection (CBW 2010).

In 2008, a local election was held to decide whether to dissolve the City of Wrangell and incorporate as the unified City and Borough of Wrangell, that would include the communities of Meyers Chuck, Union Bay, Thoms Place, Olive Cove and Farm Island and stretch from Cleveland Peninsula on the south end to the Stikine River on the north, and Zarembo and Etolin Islands on the west. Two thirds (64 percent) of the area's residents voted in favor of this proposal and on May 30, 2008, the City and Borough of Wrangell was incorporated. The area and extent of the new borough reflects the long standing connection between Wrangell, its Tlingit territory, and the surrounding land and water; minerals and gravel are extracted from the Stikine and brought into Wrangell, fish caught in surrounding waters are processed in local plants, logs harvested from Etolin, Zarembo and Shrubby Islands and other areas supported the Wrangell mills, residents of the remote areas use Wrangell as a transportation and supply hub, and visitors to Wrangell often travel to the rest of Wrangell Island, the Stikine River and Anan Wildlife Observatory (CBW 2010).

Often the co-located tribe and city share the same land boundaries and infrastructure. However, the regional Alaska Native Corporations typically manage the sub-surface rights and sometimes the surface use rights. The regional corporations provide lands to their tribal members for home sites, tribal offices, and other needs. Villages may have historically used lands outside their joint community as seasonal-use land for subsistence hunting/fishing/gathering purposes. These subsistence lands are often traditional use areas, and many times are on public lands. Traditional use lands do not have definitive or set boundaries and are seldom improved. Therefore, undeveloped lands are not eligible for programmatic mitigation funding except what is essential for protecting critically threatened facilities.

### 3.2.2 Development Trends

The City and Borough of Wrangell continually seeks to maintain and upgrade their aging infrastructure.

The CBW, WCA, and the CCTHITA have few known hazard areas because there is no actual hard data about such areas. The community has become aware of a few ground failure - principally landslide sites, and flood hazard areas. Wrangell learned of their potential landslide locations after development occurred in area.

Wrangell has FEMA Flood Insurance Rate Maps developed in 1982. However, Wrangell no longer participates in the National Flood Insurance Program (NFIP). The maps define Wrangell's flood zoned areas. Most of their flood hazard areas are in flood velocity zones near the coastline.

The borough provides developers or those desiring to develop in the floodway flood construction guidance documents, such as flood insurance construction requirements, and construction guidelines before any development occurs. If they are seeking to fill, they are provided all the flood insurance documentation and development guidelines to assure they know what is required. There are only a few homes that were built on fill or in the V zone.

The 10-year Wrangell Comprehensive Plan explains the borough's growth initiatives to guide development away from known hazard impact areas such as requiring building permits.

## 4 HAZARD IDENTIFICATION AND RISK ASSESSMENT

Section 4 – Hazard Identification and Risk Assessment addresses Element B of the Local and Tribal Mitigation Plan Regulation Checklist.

Regulation Checklist – 44 CFR 201.6 Local Mitigation Plans	
Element B: Hazard Identification and Risk Assessment	
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement § 201.6(c)(2)(ii))	
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement § 201.6(c)(2)(i))	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	
Regulation Checklist – 44 CFR 201.7 Tribal Mitigation Plans	
Element B: Hazard Identification and Risk Assessment	
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the tribal planning area? [44 CFR § 201.7(c)(2)(i)]	
B2. Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for the tribal planning area? [44 CFR § 201.7(c)(2)(i)]	
B3. Does the plan include a description of each identified hazard's impact as well as an overall summary of the vulnerability of the tribal planning area? [44 CFR § 201.7(c)(2)(ii)]	

For the 2020 MJHMP, the planning lead worked with the local planning team to review the State of Alaska identified hazards for the geography. The team evaluated and screened these potential hazards based on a range of factors, including prior knowledge or perception of their threat, the relative risk presented by each hazard, the ability to mitigate the hazard, and the known or expected information availability for each hazard. The planning team determined that the following seven hazards: earthquake, flood and erosion, ground failure, tsunami and seiche, volcanic ash, weather, and wildland fire posed the greatest threat to the Wrangell area and are profiled in this plan.

**Table 6. Identification and Screening of Hazards**

Hazard Type	Should It Be Profiled?	Explanation
Earthquake	Yes	Periodic, unpredictable occurrences. The Wrangell area experienced minor shaking from the 1964 Good Friday Earthquake and aftershocks along with earthquakes occurring off the coast of Prince of Wales Island. The Wrangell area has experienced 48 earthquakes M4.2 and below since the legacy 2009 HMP was implemented.
Erosion/Flood (Coastal surge resultant erosive scour damages)	Yes	There is potential for coastal storm surge flooding exacerbated by high wind, high tides, and rising sea level. Wrangell does not have an entire community storm drainage system. Existing location drainage capacity could be insufficient or culverts could clog and back-up. Many drains go directly into sewer systems. Heavy rain



**Table 6. Identification and Screening of Hazards**

Hazard Type	Should It Be Profiled?	Explanation
		could cause pump failure due to stress and too much water cause great concern.
Ground Failure (Landslide/Debris Flow, Permafrost, Subsidence)	Yes	Ground Failure occurs throughout Alaska from avalanches, landslides, melting permafrost, ground subsidence and sink holes. In Wrangell there is a potential for landslides and small avalanches, and subsidence impacts.
Severe Weather (Cold, Drought, Rain, Snow, Wind, etc.)	Yes	Severe weather impacts the community with climate change/global warming and changing El Niño/La Niña Southern Oscillation (ENSO) patterns generating increasingly severe weather events such as winter storms, heavy or freezing rain, thunderstorms and with subsequent secondary hazards such as riverine or coastal storm surge floods, landslides, snow, and wind; and heat and drought more recently from lack of precipitation.
Tsunami (Seiche)	Yes	Wrangell is located at the confluence of three straits, the Stikine, Zimovia, and the Eastern Passage. There have been minor historical tsunami events that caused minor increased (1-foot) tidal run-up.
Volcano	Yes	Distant volcano generated ash has historically extended to beyond the Wrangell area from very distant volcanoes. Such an event could prevent essential goods delivery to Wrangell's remote island location for an extended period.
Wildland Fire	Yes	The community and the surrounding forest area become very dry in summer months when extreme heat, cause very dry drought conditions. These conditions have historically fueled lightening and human carelessness as fire ignition sources throughout the Wrangell area.

Hazard identification consists of describing the nature of the hazard, disaster history, location, extent/severity, and probability of future events. Hazard identification profiles have been developed for each of the five hazards addressed in the MJHMP. Additionally, impact (i.e., risk assessment) tables have been created for each hazard. Overall summary descriptions have been developed as well.

The specific hazards selected by the planning team for profiling have been examined in a methodical manner based on the following factors:

- Nature (Type)
  - Potential climate change impacts are primarily discussed in the Severe Weather hazard profile but are also identified where deemed appropriate within each hazard profile.
- Location
- History (Previous Occurrences)
- Extent (to include magnitude, severity and impact)
- Recurrence Probability

Each hazard is assigned a rating based on the following criteria for magnitude/severity (Table 7) and future recurrence probability (Table 8).

Estimating magnitude and severity are determined based on historic events using the criteria identified in the following tables.

**Table 7. Hazard Magnitude/Severity Criteria**

Magnitude / Severity	Criteria
4 - Catastrophic	<ul style="list-style-type: none"> <li>Multiple deaths.</li> <li>Complete shutdown of facilities for 30 or more days.</li> <li>More than 50 percent (%) of property is severely damaged.</li> </ul>
3 - Critical	<ul style="list-style-type: none"> <li>Injuries and/or illnesses result in permanent disability.</li> <li>Complete shutdown of critical facilities for at least two weeks.</li> <li>More than 25% of property is severely damaged.</li> </ul>
2 - Limited	<ul style="list-style-type: none"> <li>Injuries and/or illnesses do not result in permanent disability.</li> <li>Complete shutdown of critical facilities for more than one week.</li> <li>More than 10% of property is severely damaged.</li> </ul>
1 - Negligible	<ul style="list-style-type: none"> <li>Injuries and/or illnesses are treatable with first aid.</li> <li>Minor quality of life lost.</li> <li>Shutdown of critical facilities and services for 24 hours or less.</li> <li>Less than 10% of property is severely damaged.</li> </ul>

Similar to estimating magnitude and severity, probability is determined based on historic events, using Table 7 identified criteria, to provide estimated future event recurrence likelihood.

**Table 8. Hazard Recurrence Probability Criteria**

Probability	Criteria
4 - Highly Likely	<ul style="list-style-type: none"> <li>Event is probable within the calendar year.</li> <li>Event has up to 1 in 1 year chance of occurring (1/1=100 percent [%]).</li> <li>History of events is greater than 33% likely per year.</li> <li>Event is "Highly Likely" to occur.</li> </ul>
3 - Likely	<ul style="list-style-type: none"> <li>Event is probable within the next three years.</li> <li>Event has up to 1 in 3 years chance of occurring (1/3=33%).</li> <li>History of events is greater than 20% but less than or equal to 33% likely per year.</li> <li>Event is "Likely" to occur.</li> </ul>
2 - Possible	<ul style="list-style-type: none"> <li>Event is probable within the next five years.</li> <li>Event has up to 1 in 5 years chance of occurring (1/5=20%).</li> <li>History of events is greater than 10% but less than or equal to 20% likely per year.</li> <li>Event could "Possibly" occur.</li> </ul>
1 - Unlikely	<ul style="list-style-type: none"> <li>Event is possible within the next ten years.</li> <li>Event has up to 1 in 10 years chance of occurring (1/10=10%).</li> <li>History of events is less than or equal to 10% likely per year.</li> <li>Event is "Unlikely" but is possible to occur.</li> </ul>

The hazards profiled for Wrangell are presented throughout the remainder of this section. The presentation order does not signify their importance or risk level.

The Census Designated Place boundary was used for the geographic area. Percentages for erosion and tsunami were calculated by dividing the acreages of the overlapping tsunami (100 feet from shoreline) or erosion (0.5 mile from shoreline) buffer with the geographic area.

Percent of population was performed similarly, but by selecting the number of critical infrastructure buildings that were given an occupancy count by the community that overlap with the erosion or tsunami buffers.

Building stock was determined by digitizing buildings/structures using map sheets for the community and publicly available imagery. These were then selected by finding those that overlapped with the erosion or tsunami buffers.

Critical infrastructure was selected by finding those that overlapped with the erosion or tsunami buffers.

## 4.1 EARTHQUAKE

### 4.1.1 Nature

An earthquake is a sudden motion or trembling caused by a release of strain accumulated in or along the edge of the earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. Earthquakes usually occur without warning and after only a few seconds can cause massive damage and extensive casualties. The most common effect of earthquakes is ground motion, or the vibration or shaking of the ground during an earthquake.

Ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. An earthquake causes waves in the earth's interior (i.e., seismic waves) and along the earth's surface (i.e., surface waves). Two kinds of seismic waves occur: primary waves are longitudinal or compressional waves similar in character to sound waves that cause back and forth oscillation along the direction of travel (vertical motion), and secondary waves, also known as shear waves, are slower than primary waves and cause structures to vibrate from side to side (horizontal motion). There are also two types of surface waves: Raleigh waves and Love waves. These waves travel more slowly and typically are significantly less damaging than seismic waves.

In addition to ground motion, several secondary natural hazards can occur from earthquakes such as:

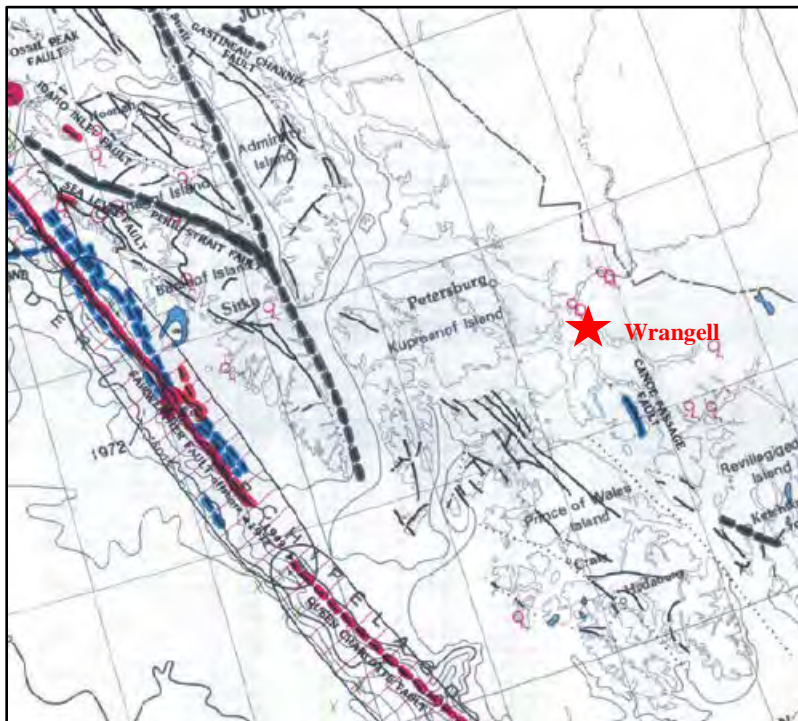
- **Surface Faulting** is the differential movement of two sides of a fault at the earth's surface. Displacement along faults, both in terms of length and width, varies but can be significant (e.g., up to 20 feet [ft]), as can the length of the surface rupture (e.g., up to 200 miles). Surface faulting can cause severe damage to linear structures, including railways, highways, pipelines, and tunnels.
- **Liquefaction** occurs when seismic waves pass through saturated granular soil, distorting its granular structure, and causing some of the empty spaces between granules to collapse. Pore water pressure may also increase sufficiently to cause the soil to behave like a fluid for a brief period and cause deformations. Liquefaction causes lateral spreads (horizontal movements of commonly 10 to 15 ft, but up to 100 ft), flow failures (massive flows of soil, typically hundreds of ft, but up to 12 miles), and loss of bearing strength (soil deformations causing structures to settle or tip). Liquefaction can cause severe damage to property.
- **Landslides/Debris Flows** occur as a result of horizontal seismic inertia forces induced in the slopes by the ground shaking. The most common earthquake-induced landslides include shallow, disrupted landslides such as rock falls, rockslides, and soil slides. Debris flows are created when surface soil on steep slopes becomes totally saturated with water. Once the soil liquefies, it loses the ability to hold together and can flow downhill at very high speeds, taking vegetation and/or structures with it. Slide risks increase after an earthquake during a wet winter.

The severity of an earthquake can be expressed in terms of intensity and magnitude. Intensity is based on the damage and observed effects on people and the natural and built environment. It varies from place to place depending on the location with respect to the earthquake epicenter, which is the point on the earth's surface that is directly above where the earthquake occurred. The severity of intensity generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. The scale most often used in the U.S. to measure intensity is the Modified Mercalli Intensity Scale. The Modified Mercalli Intensity Scale consists of 10 increasing levels of shaking intensity that range from "Not Felt" (imperceptible) to "Extreme" (catastrophic) destruction. Peak ground acceleration is also used to measure earthquake intensity by quantifying how hard the earth shakes in a given location. Peak ground acceleration can be measured as acceleration due to gravity.

#### 4.1.2 Location

The entire geographic area of Alaska is prone to earthquake effects. The USGS earthquake catalog indicates Wrangell earthquakes magnitude (M) averaged M2.9 since 1973. These data should be fairly accurate since state installed a seismometer (equipment that measures the direction, intensity, and duration of earthquakes by measuring actual ground movement in close proximity to Wrangell Shoemaker Bay.

Figure 3 shows an extracted portion of the Neotectonic Map of Alaska depicting Wrangell's relatively close proximity to known earthquake faults (DGGs 1994).



**Figure 3. Neotectonic Map of Alaska, Wrangell Area**

#### 4.1.3 History

Accurate seismology for Alaska is relatively young with historic data beginning in 1973 for most locations. Therefore, data is limited for acquiring long-term earthquake event data. The MJHMP's Alaska earthquake information is based on best available data; obtained from the U.S. Geological Survey (USGS) and the State of Alaska, UAF Geophysical Institute's archives. Research included searching the USGS earthquake database for events since the legacy 2009 HMP was implemented to present; none of which exceeded M4.2 located within 100 miles of Wrangell.

The 1995 “Overview of Environmental and Hydrogeologic Conditions at Wrangell, Alaska,” USGS, Open File Report 95-344 prepared for the Federal Aviation Administration describes the Wrangell area seismically relevant location:

*The bedrock on Wrangell Island consists of sedimentary and intrusive rocks of Cretaceous age. The sedimentary rocks consist of marine gray wacke, mudstone, and minor amounts of limestone. Other rock types on the island include andesitic to basaltic volcanic rocks.*

*Wrangell Island lies within the circum-Pacific seismic belt that rims the north Pacific Ocean. The area is traversed by the Chatham Strait Fault, the Fairweather Fault, and numerous smaller faults. In recent years, several earthquakes with Richter scale magnitudes greater than 7 have been recorded along these fault systems.*

Current Wrangell area earthquake information is based on best available data; obtained from the USGS and the State of Alaska, UAF Geophysical Institute’s archives. Research included searching the USGS earthquake database for events spanning from 1973 to present. Of the 48 events that have occurred since the legacy 2009 HMP was implemented, none exceeded M4.2 located within 109 miles of Wrangell.

The planning team determined that based on available recorded data, Wrangell has a minor to moderate concern for earthquake damages as they have not experienced damaging impacts from their historical earthquake events and only need to be concerned with earthquakes with a magnitude >M5.0 (Table 9).

**Table 9. Wrangell Historic Earthquakes Since 2009**

Date	Latitude	Longitude	Depth	Magnitude	Location
5/22/2017	57.7093	-132.5577	5	2.7	102km NNE of Petersburg, AK
3/24/2017	57.7328	-132.4347	1	2.5	107km NNE of Petersburg, AK
1/26/2017	57.6921	-132.3284	10	2.8	105km NNE of Petersburg, AK
1/26/2017	57.7187	-132.4169	1	3.1	106km NNE of Petersburg, AK
11/14/2016	57.8586	-133.0732	1	2.5	93km ESE of Juneau, AK
10/26/2016	57.4371	-132.936	1	2.5	69km N of Petersburg, AK
9/5/2016	57.882	-133.124	7.98	2.8	89km ESE of Juneau, AK
6/10/2016	57.7006	-132.4483	5	2.9	103km NNE of Petersburg, AK
5/12/2016	56.0847	-130.2367	1	3.1	22km NW of Hyder, AK
11/18/2015	57.2359	-132.908	1	2.8	47km N of Petersburg, AK
9/11/2015	55.8863	-129.9554	10.52	2.8	5km SE of Hyder, AK
7/9/2015	57.8727	-133.0582	1	2.7	93km ESE of Juneau, AK
3/29/2015	57.436	-132.592	1	2.5	72km NNE of Petersburg, AK
3/14/2015	57.479	-132.525	1	2.8	78km NNE of Petersburg, AK
10/20/2014	57.369	-132.7648	1	3.4	63km N of Petersburg, AK
9/13/2014	55.842	-130.0933	1	2.9	9km SSW of Hyder, AK
3/2/2014	57.878	-132.035	1	3.3	130km NNE of Petersburg, AK
11/6/2013	55.715	-134.837	14.9	3.3	109km WNW of Craig, AK
5/27/2013	55.571	-134.486	5	3.2	Southeastern AK
4/29/2013	56.324	-131.232	5	4.2	70km E of Wrangell, AK
4/14/2013	57.333	-132.862	5	2.7	Southeastern AK
1/5/2013	55.775	-134.79	10	2.9	Southeastern AK
1/5/2013	56.169	-134.84	0.1	2.5	Southeastern AK
1/5/2013	55.83	-134.671	10	2.7	Southeastern AK
1/5/2013	55.5	-134.546	10	2.8	Southeastern AK
1/5/2013	56.115	-135.131	4.4	3.8	Southeastern AK
1/5/2013	55.583	-134.677	10	2.7	Southeastern AK
1/5/2013	55.945	-135.047	10	4	Off the Coast of Southeastern AK
1/6/2012	57.19	-131.94	1	3.5	British Columbia, Canada
12/25/2011	57.693	-132.132	20.5	3.1	Southeastern AK
4/27/2011	56.508	-134.999	1	2.9	Southeastern AK
4/6/2011	58.0041	-133.0047	0	2.8	Southeastern AK
12/8/2010	56.5504	-134.4532	8.4	2.8	Southeastern AK
11/9/2010	57.7858	-133.2808	0	2.7	Southeastern AK
9/20/2010	56.8598	-134.6434	16.6	3.4	Southeastern AK
6/16/2010	56.7291	-132.345	13.5	2.6	Southeastern AK
4/9/2010	57.413	-132.823	10	2.6	Southeastern AK
4/6/2010	55.2797	-133.5611	17.8	3.3	Southeastern AK

11/9/2009	57.699	-132.497	1	3.5	Southeastern AK
11/9/2009	54.979	-132.744	15	2.8	Dixon Entrance Region, USA-Canada
11/8/2009	54.93	-132.655	10	2.6	Dixon Entrance Region, USA -Canada
11/8/2009	54.94	-132.662	25	2.6	Dixon Entrance Region, USA -Canada
11/8/2009	54.929	-132.785	10	2.8	Dixon Entrance Region, USA -Canada
11/8/2009	54.97	-132.891	19.2	2.8	Dixon Entrance Region, USA -Canada
11/8/2009	54.95	-132.508	10	2.5	Dixon Entrance Region, USA -Canada
11/8/2009	54.945	-132.789	14.9	4.2	Dixon Entrance Region, USA -Canada
11/8/2009	54.91	-132.651	10	3.2	Dixon Entrance Region, USA -Canada
1/8/2009	56.539	-134.637	18.7	3.1	Southeastern AK

Source: USGS 2018

#### 4.1.4 Extent/Impact

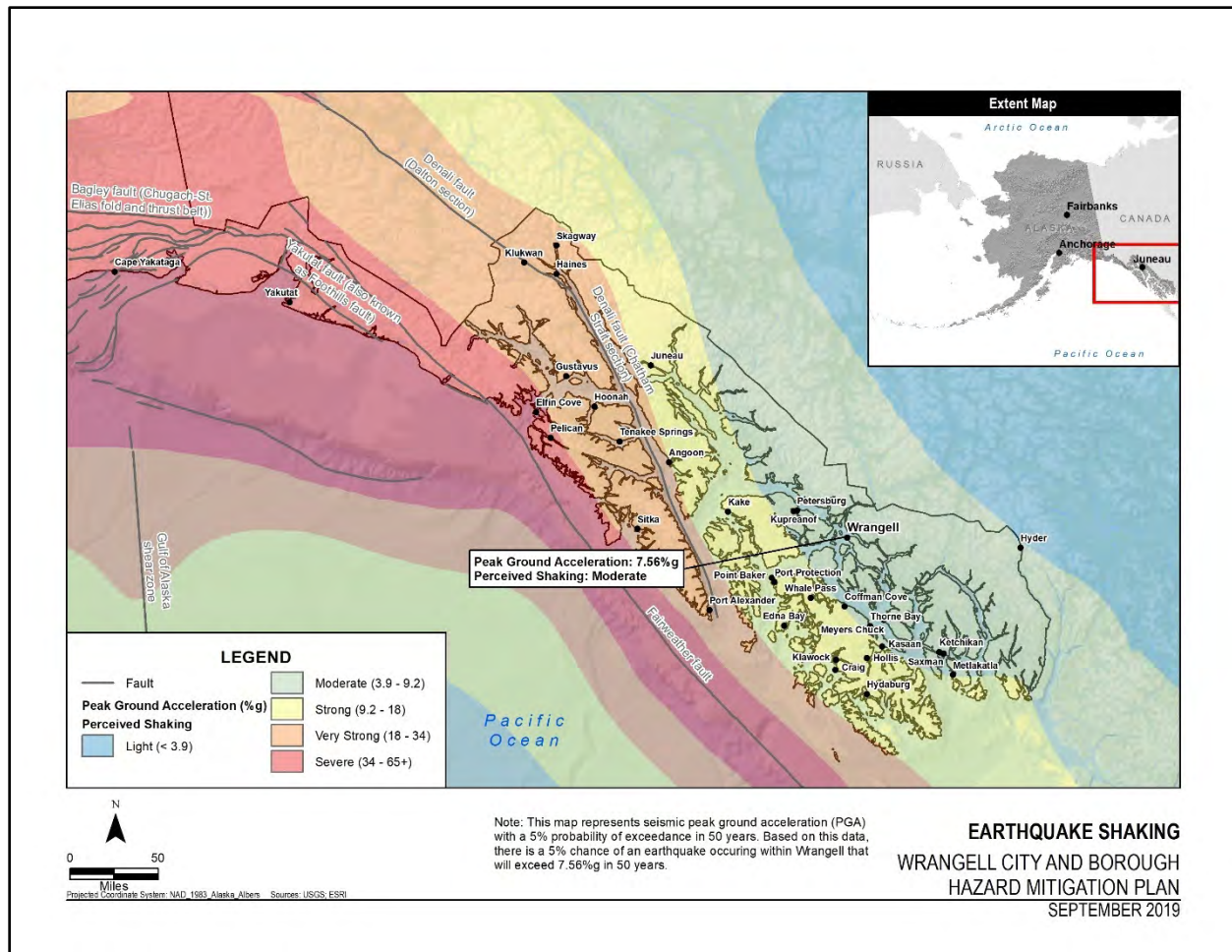
##### Extent

Based on historic earthquake events and the criteria identified in Table 7, the magnitude and severity of earthquake impacts in the Wrangell area are considered “Limited” with potential injuries and/or illnesses that do not result in permanent disability; critical facilities could expect to be shut-down for more than two weeks; and more than 10 percent of property is severely damaged with limited long-term damage to transportation, infrastructure, or the economy.

##### Impact

Impacts to the community such as significant ground movement that may result in infrastructure damage could occur based on the magnitude or intensity. The community’s water supply is supplied by two surface reservoirs behind aging earthen dams. Minor shaking has been felt based during past events. Impacts to future populations, residences, critical facilities, and infrastructure could be severe if a high magnitude earthquake were to occur.

The current USGS seismicity model for Alaska was developed in 2007. Figure 4 shows the peak ground acceleration values for a 7.56 percent probability of exceedance in 50 years. Wrangell falls within the moderate perceived shaking, and moderate range for perceived damages.



#### 4.1.5 Recurrence Probability

Wrangell's historic earthquake history indicates the community could experience a M5.0 or greater earthquake. However, an event of that magnitude could be 250 miles distant from the Wrangell area. While it is not possible to predict when an earthquake will occur, the USGS has conducted Probabilistic Seismic Hazard Analyses for the state. This modeling effort incorporates what is known about Alaska's active faults and current and past seismicity to depict community usable recurrence probability maps.

*The hazard maps depict the peak ground accelerations expected at a point with 10%, 5%, and 2% exceedance probabilities in 50 years. A useful way to think about these exceedance probabilities is that a 10% chance in 50 years means that statistically this earthquake happens on average every 500 years. A 5% chance in 50 years means that statistically this kind of earthquake happens every 1000 years. A 2% chance in 50 years, is the rare, large earthquake, and statistically it happens on average every 2,500 years. For each of these exceedance probabilities, the color on the map at your location corresponds to a shaking intensity in percent of gravitational acceleration. (DHS&EM 2013)*

Wrangell has a low recurrence earthquake probability for an M5.0 event. It is "Unlikely" but possible an event could occur within the next 10 years with a (1/10=10 percent) chance of occurring; due to an event history that is less than or equal to 10 percent likely per year.



## 4.2 FLOOD AND EROSION

### 4.2.1 Nature

Flooding is the accumulation of water where usually none occurs or the overflow of excess water from a stream, river, lake, reservoir, glacier, or coastal body of water onto adjacent floodplains. Floodplains are lowlands adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected.

Flood events not only impact communities with high water levels, or fast flowing waters, but sediment transport also impacts infrastructure and barge and other river vessel access limitations. Dredging may be the only option to maintain an infrastructure's viability and longevity.

Two primary flooding types occur in Wrangell: sheet flow (include rainfall and snowmelt runoff) and storm surge floods.

FEMA defines sheet flooding as:

*Water flows across the surface as either confined or unconfined flow. Unconfined flow moves in broad sheets of water often causing sheet erosion. It can also pick up and adsorb or carry contaminants from the surface. Water that flows along the surface may become trapped in depressions. Here water may either evaporate back into the air, infiltrate into the ground, or spill out of the depression as it fills. If local drainage conditions are inadequate to accommodate rainfall through a combination of evaporation, infiltration into the ground, and surface runoff, accumulation of water in certain areas may cause localized flooding problems. (FEMA nd).*

#### Sheet Flow

*Rainfall-Runoff Flooding* occurs in is spring and early fall. The rainfall intensity, duration, distribution, and geomorphic characteristics of the watershed all play a role in determining the magnitude of the flood. Rainfall runoff flooding is the most common type of flood. This type of flood event generally results from weather systems that have associated prolonged rainfall.

*Snowmelt Floods* typically occur from April through June. The depths of the snowpack and spring weather patterns influence the magnitude of flooding.

*Dam breach floods* are unpredictable. Their longevity is conditional, based on their age, condition, and recurring maintenance consistency, and periodic safety inspection results. These factors combine to determine dam facility current and future stability probabilities.

#### Storm Surge

Also known as coastal floods, occur when the sea is driven inland above the high-tide level onto land that is normally dry. Often, heavy surf conditions driven by high winds accompany a storm surge adding to the destructive-flooding water's force. The conditions that cause coastal floods also can cause significant shoreline erosion as the flood waters undercut roads and other structures. Storm surge is a leading cause of property damage in Alaska.

The meteorological parameters conducive to coastal flooding are low atmospheric pressure, strong winds (blowing directly onshore or along the shore with the shoreline to the right of the direction of the flow), and winds maintained from roughly the same direction over a long distance across the open ocean (fetch).

Communities that are situated on low-lying coastal lands with gradually sloping bathymetry near the shore and exposure to strong winds with a long fetch over the water are particularly susceptible to coastal flooding. Several communities and villages throughout Southeast Alaska's coast have experienced significant damage from coastal floods over the past several decades. Most coastal flooding occurs during

the late summer or early fall season in these locations, however, winter brings changing wind patterns and directional impacts not normally experienced during other times of the year.

**Coastal scour**, sometimes referred to as tidal, bluff, or beach erosion, may encompass different categories altogether. For this profile, tidal, bluff and beach erosion will be nested within this category.

Coastal Scour rarely causes death or injury. However, erosive forces cause property destruction, prohibits development, and impacts community infrastructure. Erosion is typically gradual land loss through wind or water scour. However, erosion can occur rapidly as the result of floods, storms, or other event or slowly as the result of long-term environmental changes such as melting permafrost and other ground failure events. Erosion is a natural process, but its effects can be easily exacerbated by human activity.

**Land scour**, no matter the source results from either natural activity or human influences. Coastal damage occurs throughout the area roughly from the top of the bluff out into the near-shore region to about the 30 feet water depth. It is measured as the rate of change in the position or horizontal displacement of a shoreline over time. Bluff recession is the most visible aspect of coastal erosion because of the dramatic change it causes to the landscape. As a result, this aspect of coastal erosion usually receives the most attention.

Scour damages may also be due to multi-year impacts and long-term climatic change such as sea-level rise, lack of sediment supply, subsidence, or long-term human factors such as aquifer depletion or the construction of shore protection structures and dams. Attempts to control erosion using shoreline protective measures such as groins, jetties, seawalls, or revetments can lead to increased erosion.

High water flow forces are embodied in waves, currents, and winds; surface and ground water flow; freeze-thaw cycles may also play a role. Not all of these forces may be present at any particular location. Coastal scour can occur from rapid, short-term daily, seasonal, or annual natural events such as waves, storm surge, wind, coastal storms, and flooding, or from human activities including boat wakes and dredging. The most dramatic erosion often occurs during storms, particularly because the highest energy waves are generated under storm conditions.

Many flood damages are predictable based on rainfall and seasonal thaw patterns. Most of the annual precipitation is received from April through October with October being the wettest. This rainfall leads to flooding in late spring/early summer and/or fall. Spring snowmelt increases runoff, which can cause excessive surface flooding. It also breaks riverine winter ice cover, exacerbating localized ice-jam flood or coastal ice override damage impacts.

#### 4.2.2 Location

The planning team indicated that Wrangell has a minor flooding impact threat; most of which occur from rainfall and snowmelt run-off sheet flow flooding and wind driven wave storm surge. The USGS Hydrogeologic Conditions at Wrangell, Alaska describes their typical minor flood susceptibility:

*The Stikine River lies north and east of Wrangell Island, the Eastern Passage lies along Wrangell's east side and Zimovia Strait is due west.*

*The city of Wrangell has a low flood hazard rating and has no history of significant waterfront flooding (Federal Emergency Management Agency, 1981; U.S. Army Corps of Engineers, 1993). Although there is a small risk of flooding by storm-surge or tsunami waves, the Thanksgiving Day Storm of 1968, considered to be the largest storm in recent times, produced no unusual flooding in Wrangell. (Federal Emergency Management Agency, 1981; U.S. Army Corps of Engineers, 1993). Winds at that time were generally from the southeast and the effects from high waves and storm surges were negligible. A storm on October 26, 1976, considered to be less severe than the Thanksgiving Day storm, did cause some waterfront damage near Wrangell (Federal Emergency Management Agency, 1981). The winds were predominately from the southwest, an unusual direction. These winds acting over a large area of water*

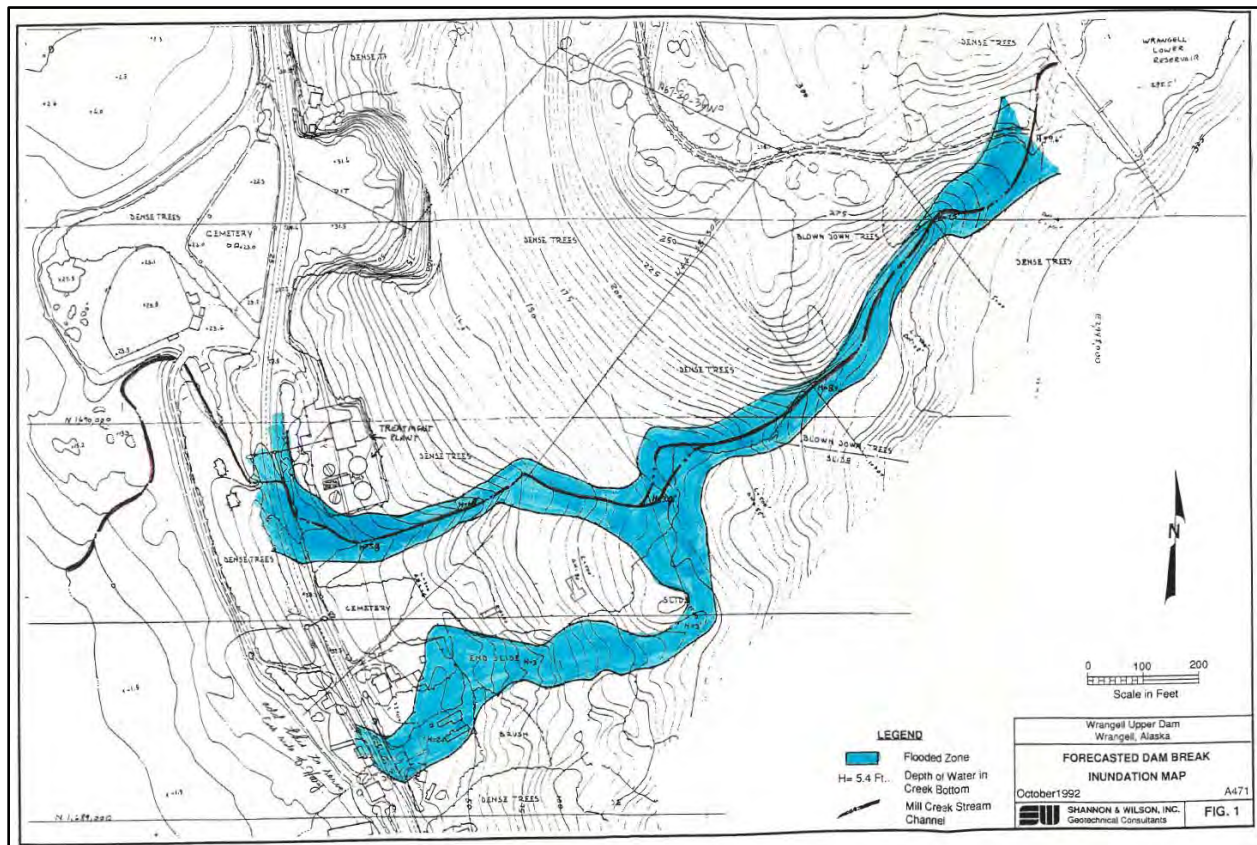
*resulted in a combination of high tide and large waves that eroded fill and exposed some homes to minor wave and log damage. Brower and others (1977) describe return periods for maximum wave heights for coastal areas in Alaska. A 100-year-wave more than 20-m high is estimated for coastal areas near Wrangell Island... A flood of this magnitude may affect the FAA facility which is about 10 m above sea level. (USGS 1995).*

Wrangell's dams are located about 0.5 miles east and above the city of Wrangell, on Wrangell Island, in Alaska. The surrounding land is either owned by the Borough, Alaska Mental Health Trust, or part of the Tongass National Forest. Wrangell's dams are owned and maintained by the City of Wrangell, which uses the water stored in the Lower Reservoir for City water, with the water in the Upper Reservoir replenishing the level of the Lower Reservoir as needed. The two dams are approximately 28 feet high, 315 and 320 feet long, and constructed of earth over log crib dam structures. The dams are about 1,500 feet apart, with an elevation difference of about 64 feet.

The May 2016 Periodic Dam Safety Inspection report stated that both dams are marginally stable under static conditions, but are likely not stable under operating basis earthquake or maximum design earthquake. Outlet works for both dams require remediation.

Therefore, based on the 2016 Periodic Dam Safety Inspection report, if a breach were to occur, the Upper Dam would likely overtop the Lower Dam and potentially wash out and drain the Lower Reservoir then flow downstream to impact Wrangell facilities.

Wrangell's 1992 Emergency Action Plan displays potential dam failure flood inundation areas:



**Figure 5. Wrangell's Potential Failure Dam Inundation Areas**

The planning team stated they experience minor erosion along the island from various seasonal storm sources and directions. High water flow threatens the island's shoreline. Rain and snow melt run-off

removes the road topping material, creates severe pot holes, and contributes to increasing landslide potential.

### 4.2.3 History

The December 15, 1981 City of Wrangell, Alaska, Wrangell-Petersburg Division, FEMA Flood Insurance Study described Wrangell's flood challenges:

*Wrangell has no history of significant waterfront flooding. The Thanksgiving Day storm of 1968, considered to be the major storm of the last decade, produced no unusual flooding hazards, although instances of wind damage were reported. Winds were generally from the southeast, resulting in negligible effects from high waves and storm surge.*

*The storm of October 26, 1976, caused some waterfront damage. The storm was considered less severe by residents than the 1968 Thanksgiving Day storm. However, winds were predominantly from the southwest, and the storm was of unusual duration. The south-westerly winds acting over a relatively long fetch of open water resulted in a combination of high tide and large waves that eroded fill and exposed residences built over the water to wave and log damage. The placed fill, upon which the city dock and barge ramp facilities are built, was severely affected by this storm. From 5 to 6 horizontal feet of fill were lost during the storm. The lost fill has subsequently been replaced; however, armoring was not attempted. The small boat harbor located approximately 5 miles south of the city, in Shoemaker Bay, was also damaged. Fill was lost from the end of the L-shaped levee forming the harbor.*

*Although waterfront flooding has not proved to be a problem in Wrangell, damage from wave action combined with high water can be expected. (FEMA 1981)*

The 1981 Flood Insurance Study included data delineating the following flood recurrence intervals:

*...Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year...*

#### **[Riverine Analysis]**

*Riverine analyses were limited to approximate studies of Cemetery Creek, Rainbow Falls Creek, and Mill Creek...*

#### **[Coastal Analysis]**

*The frequency of occurrence of high water due to coastal flooding consists of three major components: astronomical tide, storm surge, and wave runoff...*

The 1995 "Overview of Environmental and Hydrogeologic Conditions at Wrangell, Alaska," USGS, Open File Report 95-344 prepared for the Federal Aviation Administration describes the Wrangell area flood threat:

*The city of Wrangell has a low flood hazard rating and has no history of significant waterfront flooding (Federal Emergency Management Agency, 1981; U.S. Army Corps of Engineers, 1993). Although there is a small risk of flooding by storm-surge or tsunami waves, the Thanksgiving Day Storm of 1968, considered to be the largest storm in recent times, produced no unusual flooding in Wrangell. (Federal Emergency Management Agency, 1981; U.S. Army Corps of Engineers, 1993). Winds at that time were generally from the southeast and the effects from high waves and storm surges were negligible. A*

*storm on October 26, 1976, considered to be less severe than the Thanksgiving Day storm, did cause some waterfront damage near Wrangell (Federal Emergency Management Agency, 1981). The winds were predominately from the southwest, an unusual direction. These winds acting over a large area of water resulted in a combination of high tide and large waves that eroded fill and exposed some homes to minor wave and log damage. Brower and others (1977) describe return periods for maximum wave heights for coastal areas in Alaska. A 100-year-wave more than 20-m high is estimated for coastal areas near Wrangell Island. A flood of this magnitude may affect the FAA facility which is about 10 m above sea level.*

*Ripraping of exposed land formations has provided flood protection along Zimovia Strait and the Eastern Passage (Federal Emergency Management Agency, 1981). Protection for the small boat harbor is provided by a rubble mound breakwater constructed in 1926. The structure is well armored and shows no signs of damage (Federal Emergency Management Agency, 1981).*

*Over-bank flooding of stream channels in southeast Alaska usually occurs during heavy rainfall; snowmelt rarely causes flooding. Rood crests are typically of short duration, often less than one day, and are characterized by a very sharp rise and decline of flow. On September 11, 1981 rainfall runoff caused a maximum discharge of about 8,500 m<sup>3</sup>/s at U.S. Geological Survey streamgaging station 15024800, on the Stikine River near Wrangell, Alaska (U.S. Geological Survey, 1994). However, no flooding was reported near the city of Wrangell at this time.*

*...Flooding by tsunami and storm-surge waves is a low-rated hazard... (USGS 1995)*

There is potential for coastal flooding in some areas due to storm related wave surge, exacerbated by high winds, high tides, and rising sea levels.

The Wrangell planning team further explained they have insufficient drainage infrastructure in many locations throughout the borough. Some locations have connected storm drains other areas do not. Some of the storm drains direct run-off directly into their sewer system. This creates a potentially very serious sanitation threat to the area; if the sewer pumps quit due to water capacity overload, fatigue, or stress the drains will back up and spread their contents throughout the area. The 2010 Wrangell Comprehensive Plan describes the borough's storm water and wastewater discharge concerns as they could potentially increase sheet flow flooding impacts:

#### **Concerns and Opportunities**

*When there are heavy rains, high volumes of stormwater enter the wastewater system and overwhelm the pumps causing effluent discharge volumes that come close to, and occasionally exceed, permit limits and the treatment capacity of the system. Stormwater enters the wastewater treatment system either through ground water filtration into pipes or through the many commercial and residential storm drains that are directly connected to the wastewater system.*

*Property owners whose downspouts connect to the wastewater system need to be identified and disconnected. Commercial businesses on Front Street will disconnect their buildings downspouts and drainage from the wastewater system and connect to the storm drainage system as part of the 2010 street reconstruction work. Once the Borough's stormwater management system is improved, the wastewater treatment capacity should be sufficient to meet the community's needs for the next 10 to 20 years.*

The 2018 DHS&EM Disaster Cost Index delineates historical flood events that could have directly or indirectly affected the Wrangell area. The index lists the following events:

**3. Wrangell/Craig, November 6, 1978:** During this period an intense storm occurred in the Wrangell/Craig area in Southeastern Alaska generating high winds, torrential rains and heavy sea waves. The storm caused considerable damage to both private and public property in the two communities. Subsequent to the Governor's Proclamation of Disaster Emergency, DHS&EM provided both public assistance and assistance to individuals and families to assist the communities in recovering from the disaster. SBA made disaster loans available to affected businesses and homeowners.

**32. Southeast Alaska, November 26, 1984:** A hurricane force windstorm and wind driven tides caused extensive damage to public and private property in five Southeast Alaskan communities. The State provided public and individual assistance grants and temporary housing in Juneau, Sitka, Kake, Angoon and Tenakee Springs. SBA provided disaster loan assistance and the American Red Cross made grants to meet immediate needs of victims. The Governor's request for a Presidential declaration was denied.

**06-216. 2005 Southeast Storm (AK-06-216) declared December 23, 2005 by Governor Murkowski:** Beginning on November 18, 2005 and continuing through November 26, 2005, a strong winter storm with high winds and record rainfall occurred in the City/Borough of Juneau, the City/Borough of Haines, the City/Borough of Sitka, the City of Pelican, the City of Hoonah, and the City of Skagway, which resulted in widespread coastal flooding, landslides, and severe damage and threat to life and property, with the potential for further damage. The following conditions exist as a result of this disaster: severe damage to personal residences requiring evacuation and relocation of residents; to individuals personal and real property; to businesses; and to a marine highway system dock, the road systems eroded and blocked by heavy debris that prohibited access to communities and residents, and other public infrastructures, necessitating emergency protective measures and temporary and permanent repairs. The total estimated amount of assistance is approximately \$1.87 million. This includes the following: Individual Assistance totaling \$500K for 52 applicants and Public Assistance totaling \$1.1 million for 14 applicants and 31 PW's. There was no hazard mitigation. Nov 21, 08 update—Closeout later to DAS total cost of \$1,684,311 (included \$183,088 for IA, plus IA Admin of \$35,748, PA Grantee admin of \$133,779, and subgrantee admin allowance of \$30,290.) Lapse to DRF was \$183,586. RBS-11/28/08.

**AK-15-254. 2015 August Southeast Raines declared by Governor Walker on August 27, 2015:** Commencing on August 14, 2015, the City and Borough of Sitka received almost three inches of rain in six hours. This intense rainfall was accompanied by heavy wind and came on the heels of an unusually wet summer. Due to ground saturation and the wind, the hillsides within the borough failed resulting in **three deaths**, seven landslides and a sinkhole. The landslides and heavy rain, damaged homes, roads, and other infrastructure. The City and Borough of Sitka, along with state staff and contracted engineers, are monitoring slope stability to ensure safety of search and rescue and assessment efforts. On August 18, the City and Borough of Sitka declared a local disaster and requested state assistance. They have been fully engaged in debris removal operations since August 19<sup>th</sup>. After the failure of the slope on August 18, the Borough activated and staffed an emergency operations center to coordinate the response efforts and provide guidance to first responders, with utility and engineering specialists conducting body recovery as well as evaluating the slopes and affected residential areas.

#### 4.2.4 Extent/Impact

##### Extent

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related recurrence probability.

The following factors contribute to riverine flooding frequency and severity:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including terrain steepness, soil types, amount, vegetation type, and development density
- The attenuating feature existence in the watershed, including natural features such as swamps and lakes and human-built features such as dams
- The flood control feature existence, such as levees and flood control channels
- Flow velocity
- Availability of sediment for transport, and the bed and embankment watercourse erodibility
- Location related to identified-historical flood elevation

Based on limited historical flood damage history and the criteria identified in Table 7, the extent of flooding and resultant damages to infrastructure and their protective embankments in Wrangell are considered “Negligible” where critical facilities would shut-down for 24 hours or less with less than 10 percent of property is severely damaged.

##### Impact

Nationwide, floods result in more deaths than any other natural hazard. Physical damage from floods includes the following:

- Structure flood inundation, causing water damage to structural elements and contents.
- High water flow storm surge floods scour (erode) coastal embankments, coastal protection barriers, and result in infrastructure and residential property losses. Additional impacts can include roadway embankment collapse, foundations exposure, and damaging impacts.
- Damage to structures, roads, bridges, culverts, and other features from high-velocity flow and debris carried by floodwaters. Such debris may also accumulate on bridge piers and in culverts, decreasing water conveyance and increasing loads which may cause feature overtopping or backwater damages.
- Sewage, hazardous or toxic materials release, materials transport from wastewater treatment plant or sewage lagoon inundation, storage tank damages, and/or severed pipeline damages can be catastrophic to rural remote communities.

Floods also result in economic losses through business and government facility closure, communications, utility (such as water and sewer), and transportation services disruptions. Floods result in excessive expenditures for emergency response, and generally disrupt the normal function of a community.

Impacts and problems also related to flooding are deposition as well as embankment, coastal, and/or wind erosion. Deposition is the accumulation of soil, silt, and other particles on a river bottom or delta. Deposition leads to the destruction of fish habitat, presents a challenge for navigational purposes, and prevents access to historical boat and barge landing areas. Deposition also reduces channel capacity, resulting in increased flooding or bank erosion. Embankment erosion involves material removal from the stream or river banks, coastal bluffs, and dune areas. When bank erosion is excessive, it becomes a concern because it results in loss of embankment vegetation, fish habitat, and land, property, and essential infrastructure (BKP 1988).



### 4.2.5 Recurrence Probability

Based on previous occurrences, USACE Floodplain Manager's report, and criteria in Table 8, Wrangell has a low 100-year (1 percent chance of occurring in a given year) flood recurrence probability for high intensity event. It is "Unlikely" but possible an event could occur within the next 10 years with a (1/10=10 percent) chance of occurring; due to an event history that is less than or equal to 10 percent likely per year.

There is no data identifying a 500-year (0.2 percent chance of occurring in a given year) event for this area.

## 4.3 GROUND FAILURE

### 4.3.1 Nature

Ground failure describes avalanche, landslide, subsidence, and unstable soils gravitational or other soil movement mechanisms. Soil movement influences can include rain, snow, and/or water saturation induced avalanches or landslides; as well as from seismic activity, melting permafrost, river or coastal embankment undercutting, or in combination with steep slope conditions.

Landslides are a dislodgment and fall of a mass of soil or rocks along a sloped surface, or for the dislodged mass itself. The term is used for varying phenomena, including mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, and slump-earth flows. The susceptibility of hillside and mountainous areas to landslides depends on variations in geology, topography, vegetation, and weather. Landslides may also be triggered or exacerbated by indiscriminate development of sloping ground, or the creation of cut-and-fill slopes in areas of unstable or inadequately stable geologic conditions.

Additionally, avalanches and landslides often occur secondary to other natural hazard events, thereby exacerbating conditions, such as:

- Earthquake ground movement can trigger events ranging from rock falls and topples to massive slides
- Intense or prolonged precipitation can cause slope over-saturation and subsequent destabilization failures such as avalanches and landslides.
- Climate change related drought conditions may increase wildfire conditions where a wildland fire consumes essential stabilizing vegetation from hillsides significantly increasing runoff and ground failure potential

Development, construction, and other human activities can also provoke ground failure events. Increased runoff, excavation in hillsides, shocks and vibrations from construction, non-engineered fill places excess load to the top of slopes, and changes in vegetation from fire, timber harvesting, and land clearing have all led to landslide events. Broken underground water mains can also saturate soil and destabilize slopes, initiating slides. Something as simple as a blocked culvert can increase and alter water flow, thereby increasing the potential for a landslide event in an area with high natural risk. Weathering and decomposition of geologic material, and alterations in flow of surface or ground water can further increase the potential for landslides.

The USGS identifies six landslide types, distinguished by material type and movement mechanism including:

- **Slides**, the more accurate and restrictive use of the term landslide, refers to a mass movement of material, originating from a discrete weakness area that slides from stable underlying material. A rotational slide occurs when there is movement along a concave surface; a translational slide originates from movement along a flat surface.
- **Debris Flows** arise from saturated material that generally moves rapidly down a slope. A debris flow usually mobilizes from other types of landslide on a steep slope, then flows through confined channels, liquefying and gaining speed. Debris flows can travel at speeds of more than 35 mph for



several miles. Other types of flows include debris avalanches, mudflows, creeps, earth flows, debris flows, and lahars.

- **Lateral Spreads** are a type of landslide generally occurs on gentle slope or flat terrain. Lateral spreads are characterized by liquefaction of fine-grained soils. The event is typically triggered by an earthquake or human-caused rapid ground motion.
- **Falls** are the free-fall movement of rocks and boulders detached from steep slopes or cliffs.
- **Topples** are rocks and boulders that rotate forward and may become falls.
- **Complex** is any combination of landslide types.

In Alaska, earthquakes, seasonally frozen ground, and permafrost are often agents of ground failure. Permafrost is defined as soil, sand, gravel, or bedrock that has remained below 32°F for two or more years. Permafrost can exist as massive ice wedges and lenses in poorly drained soils or as relatively dry matrix in well-drained gravel or bedrock. During the summer, the surficial soil material thaws to a depth of a few feet, but the underlying frozen materials prevent drainage. The surficial material that is subject to annual freezing and thawing is referred to as the “active layer.”

Seasonal freezing can cause frost heaves and frost jacking. Frost heaves occur when ice forms in the ground and separates sediment pores, causing ground displacement. Frost jacking causes unheated structures to move upwards. Permafrost is frozen ground in which a naturally occurring temperature below 32°F has existed for two or more years.

Indicators of a possible ground failure include:

- Springs, seeps, or wet ground that is not typically wet
- New cracks or bulges in the ground or pavement
- Soil subsiding from a foundation
- Secondary structures (decks, patios) tilting or moving away from main structures
- Broken water line or other underground utility
- Leaning structures that were previously straight
- Offset fence lines
- Sunken or dropped-down road beds
- Rapid increase in stream levels, sometimes with increased turbidity
- Rapid decrease in stream levels even though it is raining or has recently stopped and
- Sticking doors and windows, visible spaces indicating frames out of plumb

The State of Alaska 2013 State Hazard Mitigation Plan provides additional ground failure information defining mass movement types, topographic and geologic factors which influence ground failure which may pertain to the Wrangell area.

#### 4.3.2 Location

There are various ground failure locations throughout the Wrangell area. Sources include USACE, NRCS, USGS, as well as other agencies’ developed plans and studies. Land subsidence such as floodwater soil saturation cause the most common ground failure impacts in the Wrangell area.

The June 2018 Borough Assembly meeting minutes provides a little in-sight into Wrangell’s precipitation, ground water, and soil composition challenges:

*Wrangell averages over 80 inches of precipitation per year and the former Byford Junkyard site has slopes up to 17%, which together creates the potential for erosion during site operations from run-on and precipitation. In addition, groundwater in this area is usually shallow with variable depths due to the presence of silt/glacial till that controls*

groundwater flow. There are small drainage channels, and an existing drainage ditch parallel transmitting drainage water to three existing culverts under the Zimovia Highway and into Zimovia Strait approximately 150 feet west of the site.

A Storm Water Pollution Prevention Plan (SWPPP) has been prepared for this project and has been previously submitted. Shane O'Neill, Project Site Superintendent for NRC Alaska is CESCL certified and will perform the weekly SWPPP inspections and event inspections. Additional details pertaining to this issue are available within the Plan.

According to Permafrost Characteristics Map of Alaska (Figure 6) developed for the National Snow and Ice Data Center/World Data Center for Glaciology (Jorgenson et al 2008), shows that Wrangell has no permafrost.

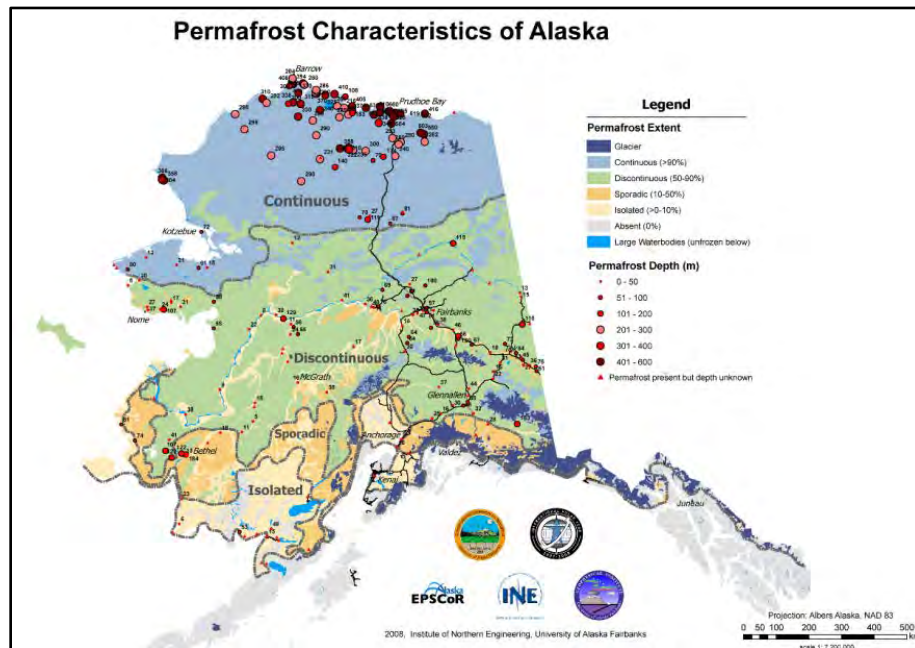


Figure 6. Permafrost Characteristics of Alaska

### 4.3.3 History

There are few written records defining ground failure impacts to the Wrangell area. However, the planning team states they have potential landslide and other ground failure threats in a couple residential areas.

### 4.3.4 Extent/Impact

#### Extent

The damage magnitude could range from minor with some repairs required and little to no damage to transportation, infrastructure, or the economy to major if a critical facility (such as the airport or water supply dams) were damaged and transportation or drinking water was affected.

Based on research and the planning team's knowledge of past ground failure and various degradation events and the criteria identified in Table 7, the extent of ground failure impacts in Wrangell are considered "Negligible". Impacts would not occur quickly but over time with warning signs. The Planning team described ground failure as:

*...slide impacts usually occur unexpectedly... you think the ground is fine and then it is not there. The [slide events occurred in] areas [that] I am aware of in the community were completely unexpected and happened quickly.*

Therefore, Wrangell's landslides would occur quickly with little to no warning. This hazard may not likely cause injuries or death, neither would it likely shutdown critical facilities and services for extensive time periods. However, less than 10 percent of property could potentially receive severe damage.

### **Impact**

Impacts associated with ground failure include surface subsidence, infrastructure, building, and/or road damage. Ground failure does not typically pose a sudden and catastrophic hazard; however, landslides and avalanches may. Ground failure damage occurs from improperly designed and constructed buildings that settle as the ground subsides, resulting in structure loss or expensive repairs. It may also impact buildings, communities, pipelines, airfields, as well as road and bridge design costs and location. To avoid costly damage to these facilities, careful planning and location and facility construction design is warranted.

### **4.3.5 Recurrence Probability**

Even though there are few written records defining ground failure impacts for the Wrangell area, the planning team notes there are recurring landslide, avalanche, and ground failure damages within the community that could threaten structures, roads, and the airport. The planning team stated the probability for ground failure follows the criteria in Table 8, future damage probability resulting from ground failure is "Possible" in the few known locations in the next five years, with a (1/5=20 percent) percent chance of occurring with a history of events greater than 20 percent but less than 33 percent likely per year.

## **4.4 TSUNAMI AND SEICHE**

### **4.4.1 Nature**

A tsunami is a series of waves generated in a body of water by an impulsive disturbance along the seafloor that vertically displaces the water. A seiche is an oscillating wave occurring in a partially or totally enclosed water body.

Subduction zone earthquakes at plate boundaries often cause tsunamis. However, submarine landslides, submarine volcanic eruptions, and the collapses of volcanic edifices can also generate tsunamis. A single tsunami may involve a series of waves, known as a train, of varying heights. In open water, tsunamis exhibit long wave periods (up to several hours) and wavelengths that can extend up to several hundred miles, unlike typical wind-generated swells on the ocean, which might have a period of about 10 seconds and a wavelength of 300 feet.

The actual height of a tsunami wave in open water is generally only 1 to 3 feet and is often practically unnoticeable to people on ships. The energy of a tsunami passes through the entire water column to the seabed. Tsunami waves may travel across the ocean at speeds up to 700 miles per hour (mph). As the wave approaches land, the sea shallows and the wave no longer travels as quickly, so the wave begins to "pile up" as the wave-front becomes steeper and taller, and less distance occurs between crests. Therefore, the wave can increase to a height of 90 feet or more as it approaches the coastline and compresses.

Tsunamis not only affect beaches that are open to the ocean, but also bay mouths, tidal flats, and the shores of large coastal rivers. Tsunami waves can also diffract around land masses and islands. Since tsunamis are not symmetrical, the waves may be much stronger in one direction than another, depending on the nature of the source and the surrounding geography. However, tsunamis do propagate outward from their source, so coasts in the shadow of affected land masses are usually fairly safe.

Local tsunamis and seiches may be generated from earthquakes, underwater landslides, atmospheric disturbances, or avalanches and last from a few minutes to a few hours. Initial waves typically occur quite soon after onslaught, with very little advance warning. They occur more in Alaska than any other part of the U.S.

Seiches occur in an enclosed water body such as a lake, harbor, cove or bay. They are localized event-generated waves characterized as a “bathtub effect” where successive water waves move back and forth in the enclosed area until the energy is fully spent causing repeated impacts and damages.

#### 4.4.2 Location

The 1995 “Overview of Environmental and Hydrogeologic Conditions at Wrangell, Alaska,” USGS, Open File Report 95-344 prepared for the Federal Aviation Administration describes the Wrangell tsunami threat as: “...*Flooding by tsunami and storm-surge waves is a low-rated hazard...*” due to their fairly protected location away from the open ocean.

The University of Alaska Fairbanks’, Dmitry Nicolski, Geophysical Institute, Research Assistant Professor stated:

*Wrangell is at the top of their “to-be-modeled” list. Research indicates there is a recognition of the submarine landslide potential at the Stikine River. A geologist presumably traced remnants of the previous submarine landslide in the Eastern Channel based on currently available bathymetry. UAF/GI anticipates they will be working with NCEI to develop Digital Elevation Models for Wrangell and other southeast Alaska regions.*

Many believe that Wrangell’s relatively protected location on the northern side of the island – away from the open Pacific tsunami sources would protect them from severe impacts. The planning team described their tsunami threat potential as:

*Yes, we have potential [for future tsunami event impacts]. Even though [we are] behind other islands that could [provide] protect[ion]... depending on where [the] center is, if wave action comes from certain directions... We are [located near a] confluence of two straights ... [we] could [potentially experience] impacts. There was a Tsunami threat years ago, but I think water levels only rose about 1 foot. (Source: 2018 Wrangell planning team comment)*

#### 4.4.3 History

Wrangell has minimal tsunamigenic event history. However, the Wrangell Sentinel reported that on January 10, 2013:

*A 7.5 magnitude earthquake, with an epicenter located 110 kilometers west of Craig and approximately 6 miles under the earth’s surface, struck just minutes before midnight on Friday, shaking houses across the region.*

*A tsunami warning was initially lodged for almost all of Southeast, including Wrangell and Petersburg, though it was cancelled within hours of the initial quake. No substantial elevation in the tide level at Wrangell or Petersburg was reported....*

The West Coast/Alaska Tsunami Warning Center lists the following Alaska earthquake generated tsunamis with observed or measured tsunami waves (Table 10) throughout Alaska.

**Table 10. Alaska's Historic Aleutian Tsunamis Waves**

Date	Location	Magnitude (MW)	Wave Height (Ft/m)	Latitude	Longitude
11/10/1938	Alaska Peninsula	8.2	0.1	54.48	-158.37
4/1/1946	Near Unimak Island, Eastern Aleutian Islands, AK	8.6	Unknown	25.8	-163.5
3/9/1957	South of Andreanof Islands, Central Aleutian Islands, AK	8.3	Unknown	51.5	-175.7
3/27/1964	Prince William Sound	9.2	0.35	61.05	-147.48
2/4/1965	Rat Islands, Western Aleutian Islands, AK	8.7	<0.1	51.29	-178.49
5/7/1986	Central Aleutian Islands, AK	8.0	0.15	51.52	-166.54
2/21/1991	Bering Sea	6.7	0.15	58.43	-175.45
6 10/1996	Central Aleutian Islands, AK	7.9	0.6	51.56	-177.63

#### 4.4.4 Extent/Impact

##### Extent

There is limited anecdotal tsunami impact data available at this time. Based on limited data and the criteria identified in Table 7, the magnitude and severity of tsunami impacts to the Wrangell area are considered "Limited" with injuries and/or illnesses that do not result in permanent disability; critical facility could shut down for more than one week, and more than 10 percent of property could be severely damaged.

##### Impact

Dmitry Nicolski further postulates:

*Some local landslide-generated tsunamis might produce higher run-up values, but there is little known about them in this region.*

#### 4.4.5 Recurrence Probability

The Alaska Division of Geological & Geophysical Surveys (DGGS) Makushin Volcano Assessment, Report of Investigation, 2000-4 states that it is unlikely the volcano will generate a tsunami:

*No tsunamis have been produced at Makushin Volcano during the relatively small eruptions of the last few hundred years, and tsunamis are very unlikely to be produced by typical eruptions of Makushin Volcano in the future. However, if an unusually large eruption, similar to the caldera-forming eruptions of about 8,000 years ago, were to occur again, tsunami waves might be produced. During the prehistoric eruptions, pyroclastic flows and surges traveled from the volcano to the sea, especially on the north flank, where the sea is closest (McConnell and others, 1997). Slightly older debris avalanches also reached the sea on the north flank of Makushin Volcano (Bean, 1999). No geologic deposits of tsunamis produced by eruptions of Makushin were identified during field studies (Bean, 1999) (DGGS 2000).*

The Wrangell has a minor tsunami impact history with no fully documented tsunami impact data. However, the National Oceanic and Atmospheric Administration (NOAA) and UAF/GI state that southeast Alaska is near the top of their tsunami mapping list. Following the criteria delineated in Table 8, a distant source tsunami is "Possible" however, the recurrence interval is unknown. Too many factors determine when an

impact event will occur, and there is limited data for the area to determine bathymetric conditions adjacent to Wrangell Island area and the surrounding area.

## 4.5 VOLCANIC ASH

### 4.5.1 Nature

Alaska is home to 40 historically active volcanoes stretching across the entire southern portion of the state from the Wrangell Mountains to the far western Aleutian Islands. “Historically active” refers to actual eruptions that have occurred during Alaskan historic time, in general the time-period in which written records have been kept; from about 1760. Alaska averages 1-2 eruptions per year. In 1912, the largest eruption of the 20th century occurred at Novarupta and Mount Katmai, located in what is now Katmai National Park and Preserve on the Alaska Peninsula.

A volcano is a vent or opening in the earth’s crust from which molten lava (magma), pyroclastic materials, and volcanic gases are expelled onto the surface. Volcanoes and other volcanic phenomena can unleash cataclysmic destructive power greater than nuclear bombs and can pose serious hazards if they occur in populated and/or cultivated regions.

There are different eruption classifications. Eruption types are a major determinant of the physical impacts an event will create, and the particular hazards it poses. Six main types of volcano hazards exist including:

- Volcanic gases are made up of water vapor (steam), carbon dioxide, ammonia, as well as sulfur, chlorine, fluorine, and boron compounds, and several other compounds. Wind is the primary source of dispersion for volcanic gases. Life, health, and property can be endangered from volcanic gases within about 6 miles of a volcano. Acids, ammonia, and other compounds present in volcanic gases can damage eyes and respiratory systems of people and animals, and heavier-than-air gases, such as carbon dioxide, can accumulate in closed depressions and suffocate people or animals.
- Lahars are usually created by shield volcanoes and stratovolcanoes and can easily grow to more than 10 times their initial size. They are formed when loose masses of unconsolidated, wet debris become mobilized. Eruptions may trigger one or more lahars directly by quickly melting snow and ice on a volcano or ejecting water from a crater lake. More often, lahars are formed by intense rainfall during or after an eruption since rainwater can easily erode loose volcanic rock and soil on hillsides and in river valleys. As a lahar moves farther away from a volcano, it will eventually begin to lose its heavy load of sediment and decrease in size.
- Landslides are common on stratovolcanoes because their massive cones typically rise thousands of feet above the surrounding terrain and are often weakened by the very process that created the mountain – the rise and eruption of molten rock (magma). If the moving rock debris is large enough and contains a large content of water and soil material, the landslide may transform into a lahar and flow down valley more than 50 miles from the volcano.
- Lava flows are streams of molten rock that erupt from a vent and move downslope. Lava flows destroy everything in their path; however, deaths caused directly by lava flows are uncommon because most move slowly enough that people can move out of way easily and flows usually do not travel far from the source vent. Lava flows can bury homes and agricultural land under tens of feet of hardened rock, obscuring landmarks and property lines in a vast, new, hummocky landscape.
- Pyroclastic flows are dense mixtures of hot, dry rock fragments and gases that can reach 50 mph. Most pyroclastic flows include a ground flow composed of coarse fragments and an ash cloud that can travel by wind. Escape from a pyroclastic flow is unlikely because of the speed at which they can move.
- Tephra is a term describing any size of volcanic rock or lava that is expelled from a volcano during an eruption. Large fragments generally fall back close to the erupting vent, while smaller fragment

particles (ash) can be carried hundreds to thousands of miles away from the source by wind. Ash clouds are common adaptations of tephra.

Ash fall poses the most significant volcanic threat to Wrangell because, unlike other secondary eruption effects such as lahars and lava flows, ash fall can travel thousands of miles from the eruption site.

Volcanic ash consists of tiny jagged particles of rock and natural glass blasted into the air by a volcano. Ash can threaten the health of people, livestock, and wildlife. Ash imparts catastrophic damage to flying jet aircraft, operating electronics and machinery, and interrupts power generation and telecommunications. Wind can carry ash thousands of miles, affecting far greater areas and many more people than other volcano hazards. Even after a series of ash-producing eruptions has ended, wind and human activity can stir up fallen ash for months or years, presenting a long-term health and economic risk. Special concern is extended to aircraft because volcanic ash completely destroys aircraft engines.

Ash clouds have caused catastrophic aircraft engine failure, most notably in 1989 when KLM Flight 867, a 747 jetliner, flew into an ash cloud from Mt. Redoubt's eruption and subsequently experienced flameout of all four engines. The jetliner fell 13,000 feet before the flight crew was able to restart the engines and land the plane safely in Anchorage. The significant trans-Pacific and intrastate air traffic traveling directly over or near Alaska's volcanoes, has necessitated developing strong communication and warning links between the AVO, other government agencies with responsibility for aviation management, and the airline and air cargo industry (AVO 2012, USGS 2002).

#### 4.5.2 Location

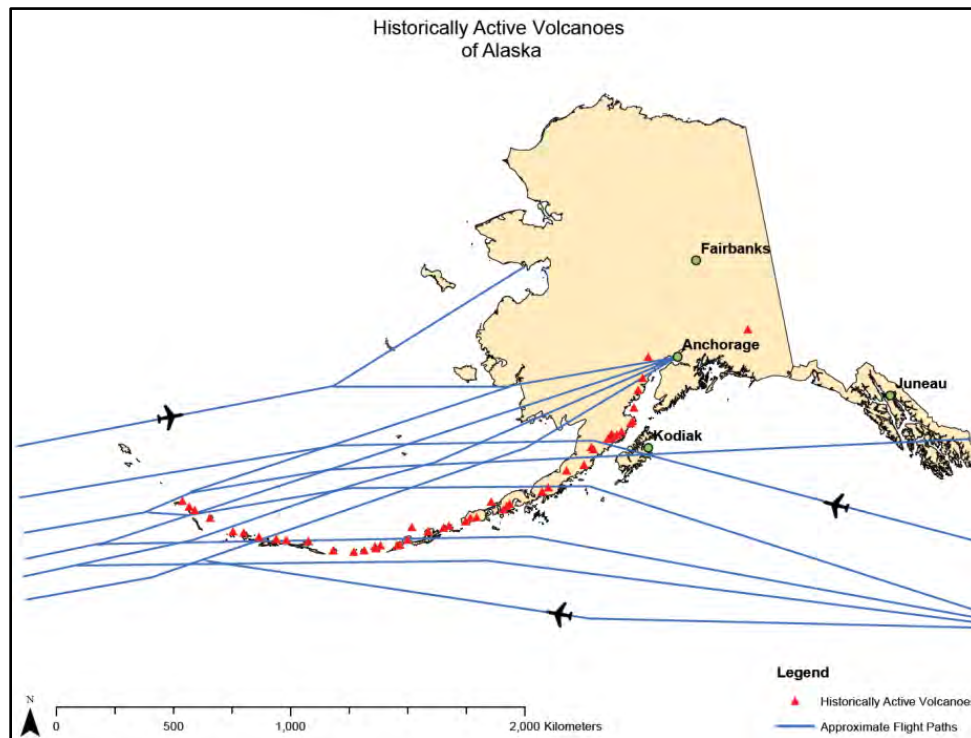
The legacy 2009 HMP states that the closest active volcano to Wrangell at being over 400 miles away. The AVO, which is a cooperative program of the USGS, DGGs, and the UAF/GI, monitors the seismic activity at 23 of Alaska's 41 active volcanoes in real time. In addition, satellite images of all Alaskan and Russian volcanoes are analyzed daily for evidence of ash plumes and elevated surface temperatures. Russian volcanoes are also a concern to Alaska as prevailing winds could carry large ash plumes from Kamchatka into Alaskan air space. AVO also researches the individual history of Alaska's active volcanoes and produces hazard assessment maps for each center. The AVO identifies the closest active volcano to Wrangell as being over 400 miles away.

Each report contains a description of the eruptive history of the volcano, the hazards they pose, and the likely effects of future eruptions to populations, facilities, and ecosystems. Figure 7 lists Wrangell's closest volcanoes. However, there is very little known eruption data for these volcanoes and are not seismically monitored.

Volcanos Nearby								
A total of 6 volcanoes are found in or near Wrangell, AK.								
Distance (miles)	Name	Region	Latitude	Longitude	Elevation (foot)	Type	Status	Last Eruption
43.3	Duncan Canal	Alaska-SE, United States	56.5	-133.1	15	Unknown	Holocene	Undated, but probable Holocene eruption
45.1	Hoodoo Mountain	Canada, Canada	56.78	-131.28	1820	Subglacial volcano	Holocene	Undated, but probable Holocene eruption
60.6	Iskut-Unuk River Cones	Canada, Canada	56.58	-130.55	1880	Cinder cone	Radiocarbon	Last known eruption 1800-1899
76.6	Behm Canal-Rudyard Bay	Alaska-SE, United States	55.32	-131.05	500	Cinder cone	Holocene	Unknown
86.3	Tlevak Strait-Suemez Is.	Alaska-SE, United States	55.25	-133.3	50	Volcanic field	Holocene	Undated, but probable Holocene eruption
94.6	Spectrum Range	Canada, Canada	57.43	-130.68	2430	Shield volcano	Holocene	Undated, but probable Holocene eruption

Figure 7. Wrangell Area Volcanoes

Figure 8 displays a simplified illustration of approximate flight paths traveling over Alaska's historically active volcanoes (AVO 2018). Aircraft flying along these routes, some of the busiest in the world carry more than 50,000 passengers and millions of dollars of cargo each day to and from Asia, North America, and Europe.



**Figure 8. North Pacific Air Travel Routes**

### 4.5.3 History

The AVO, and its constituent organizations (USGS, Alaska Department of Natural Resources, and UAF), have volcano hazard identification and assessment responsibility for Alaska's active volcanic centers. The AVO monitors active volcanoes several times each day using Advanced Very High Resolution Radiometers and satellite imagery.

DHS&EM's Disaster Cost Index records the following volcanic eruption disaster events:

**103. Mt. Redoubt Volcano, December 20, 1989** When Mt. Redoubt erupted in December 1989, posing a threat to the Kenai Peninsula Borough, Mat-Su Borough, and the Municipality of Anchorage, and interrupting air travel, the Governor declared a Disaster Emergency. The Declaration provided funding to upgrade and operate a 24-hr. monitoring and warning capability.

**104. KPB-Mt. Redoubt, January 11, 1990** The Kenai Peninsula Borough, most directly affected by Mt. Redoubt, experienced extraordinary costs in upgrading air quality in schools and other public facilities throughout successive volcanic eruptions. The Borough also sustained costs of maintaining 24-hr. operations during critical periods. The Governor's declaration of Disaster Emergency supported these activities.

**161. Mt. Spurr, September 21, 1992** Frequent eruptions and the possibility of further eruptions has caused health hazards and property damage within the local governments of the Municipality of Anchorage, Kenai Peninsula Borough and Mat-Su Borough. These



*eruptions caused physical damage to observation and warning equipment. Funds to replace equipment for AVO.*

The AVO's Service Review, Mount Redoubt Volcanic Eruptions, March – April 2009 states that the Mount Redoubt volcano was in continuous eruption on March 31, 2009. Plume height was no more than 15,000 feet above sea level. The small amount of ash in the plume created a haze layer downwind of the volcano and dustings of fine ash fell out of the plume.

*On March 22, 2009, Mount Redoubt volcano, 106 miles southwest of Anchorage, Alaska, began a series of eruptions after persisting in Orange or "Watch" status since late January 2009. Plume heights were observed at or above 60,000 feet during two of the six significant eruptions. Ashfall occurred over south central Alaska, including in Anchorage, with amounts ranging from a trace to one-half inch in depth.*

*The Redoubt eruptions also disrupted air traffic in the region. Hundreds of commercial flights were cancelled and cargo companies were significantly impacted. This resulted in employees being placed on unpaid leave during periods when airport operations were shut down. Anchorage is Alaska's major population center; its airport serves as a critical strategic transportation hub as the third busiest cargo airport in the world.*

*The impacts of the unrest at Mount Redoubt volcano continued through spring and into the summer. The threat of continuing eruptions and lahars (volcanic mud flows composed of water, ash, mud, and debris) necessitated the removal of millions of gallons of oil from Chevron's nearby Drift River Terminal. Residents, emergency management, and health officials remained on alert until Mount Redoubt volcano was downgraded to Yellow or "Advisory" status on June 30, 2009, and finally to Green or "Normal" status on September 29, 2009.*

Recent volcano eruption impacts demonstrate modern community vulnerability to volcanic ash dispersal and travel distance statewide.

Alaska's volcanoes have very diverse eruption histories spanning thousands of years. Activity spanning such an extensive timeline is nearly impossible to define. However modern science has enabled the AVO with determining fairly recent historical eruption dates.

#### **4.5.4 Extent/Impact**

##### **Extent**

Volcanic effects include severe blast, turbulent ash and gas clouds, lightning discharge, volcanic mudflows, pyroclastic flows, corrosive rain, flash flood, outburst floods, earthquakes, and tsunamis. Some of these activities include ash fallout in various communities, air traffic, road transportation, and maritime activity disruptions.

Southeast Alaska could receive some ash fall during a massive volcanic eruption from Russian as and Alaska volcanoes. Prolonged traffic disruptions (air, land, or rail) would potentially prevent essential community resupply e.g. food and medicine delivery, and medical evacuation service capabilities to full service hospitals.

A massive eruption anywhere on earth could severely affect the global climate; radically changing Wrangell's (and everyone else's) long-term weather event risks for weeks, months, or years.

Based on historic volcanic activity impacts and the criteria identified in Table 7, the magnitude and severity of impacts in Wrangell are considered "Negligible" with minor injuries, minor quality of life lost, the potential for critical facilities to shut down for 24 hours or less, and less than 10 percent of property or critical infrastructure being severely damaged.

## Impact

As the Preliminary Volcano-Hazard Assessment for Makushin Volcano, Alaska, Summary of Hazards states,

*If eruptions as large as those of 8,000 years ago were to occur, volcanic ash falls would be much thicker and more extensive than any seen in the area in historic time, and highly mobile pyroclastic flows, surges, or lateral blasts might affect areas tens of kilometers from the volcano... Such huge eruptions could also significantly disrupt air travel over the north Pacific area for days and perhaps weeks. However, based on the volcano's pattern of past behavior, eruptions of this magnitude are very rare, and therefore unlikely to recur in the near future (DGGs 2000).*

Such an ash fall event would undoubtedly be devastating to the entire state by straining its resources as well as transportation (air, ocean, land, and rail routes); especially if other hub communities are also significantly affected by a volcanic eruption. Wrangell residents could experience respiratory problems from airborne ash, general property damage (electronics and unprotected machinery), state or regional transportation interruptions, loss of commerce, as well as potential water supply contamination.

These impacts can range from inconvenience – a few days with no transportation capability; to disastrous – heavy, debilitating ash fall throughout the state, forcing Wrangell residents to be completely self-sufficient.

### 4.5.5 Recurrence Probability

Geologists can make long-term general forecasts associated with individual volcanoes by carefully analyzing past activity, but they would be based trends and likelihood, rather than specific events or timelines. Short-range forecasts are often possible with greater accuracy. Several signs of increasing activity can indicate that an eruption will follow within weeks or months. Magma moving upward into a volcano often causes a significant increase in small, localized earthquakes, and measurable carbon dioxide, sulfur, and chlorine compound emission increases. Shifts in magma depth and location can cause ground level elevation changes that can be detected through ground instrumentation or remote sensing.

Based on the criteria identified in Table 8 and information presented in the Alaska State Hazard Mitigation Plan, it is “Possible” a volcanic eruption will occur within the next ten years. Event has up to 1 in 10 years (1/10=10 percent) chance of occurring. History of events is less than or equal to 10 percent likely per year. Vulnerability depends on the type of activity and current weather, especially wind patterns.

## 4.6 SEVERE WEATHER

### 4.6.1 Nature

Severe weather events occur throughout Alaska and vary by location. The Wrangell area continually experience rain, thunderstorms, lightning, hail, high winds, moderate snow, freezing rain/ice storm, and extreme cold.

Climate Change influences the environment, particularly historical weather patterns. Climate change and ENSO determines create increased weather volatility such as hotter summers (drought) and colder winters, intense thunderstorms, lightning, hail, snow storms, freezing rain/ice storms, high winds and even a few tornadoes in and around Alaska.

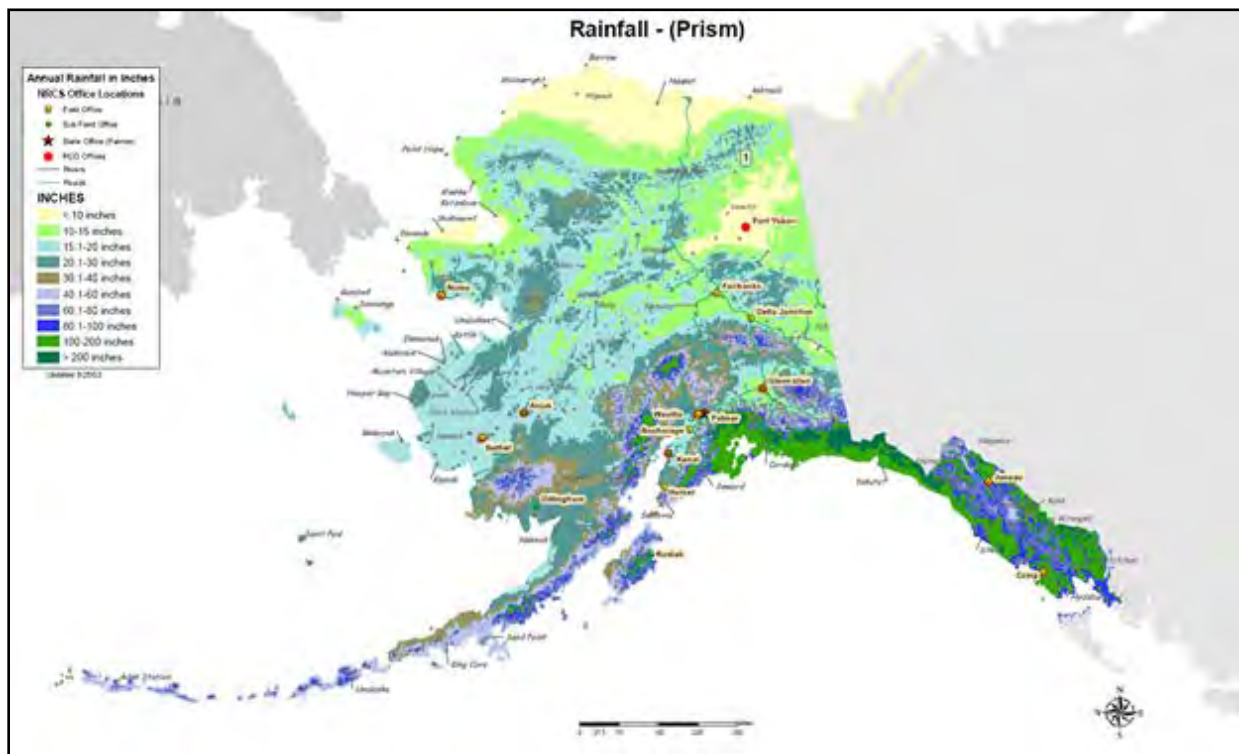
ENSO is comprised of two weather phenomena known as El Niño and La Niña. While ENSO activities are not a hazard, they can lead to severe weather events and large-scale damage throughout Alaska's varied jurisdictions. Direct correlations were found linking ENSO events to severe weather across the Pacific Northwest, particularly increased flooding (riverine and storm surge) and severe winter storms. Therefore,

increased awareness and understanding how ENSO events potentially impact Alaska's vastly differing regional weather.

Climate change is described as a phenomena of water vapor, carbon dioxide, and other gases in the earth's atmosphere acting like a blanket over the earth, absorbing some of the heat of the sunlight-warmed surfaces instead of allowing it to escape into space. The more gasses, the thicker the blanket, the warmer the earth. Trees and other plants cannot absorb carbon dioxide through photosynthesis if foliage growth is inhibited. Therefor carbon dioxide builds up and changes precipitation patterns, increases storms, wildfires, and flooding frequency and intensity; and substantially changes flora, fauna, fish, and wildlife habitats.

Heavy Rain occurs rather frequently over the coastal areas along the Bering Sea and the Gulf of Alaska. Figure 9 displays Alaska's annual rainfall map based on Parameter-elevation Regressions on Independent Slopes Model that combines climate data from the NOAA and the NRCS climate stations with a digital elevation model to generate annual, monthly, and event-based climatic element estimates such as precipitation and temperature.

Wrangell is centrally located in the Tongass National Forest which is a temperate rainforest. The last several years have shown decreased precipitation and higher than average temperatures for longer periods of time. Snow pack has been reduced which in turn reduces the spring melt feeding into lakes and streams. This can impact not only salmon returns but also impacts residents. In 2019, NOAA declared extreme drought conditions for the Wrangell area and south.



**Figure 9. Statewide Rainfall Map**

Freezing Rain and Ice Storms occur when rain or drizzle freezes on surfaces, accumulating 12 inches in less than 24 hours. Ice accumulations can damage trees, utility poles, and communication towers which disrupts transportation, power, and communications.

Extreme Cold varies according to normal regional climate. Near freezing temperatures are considered "extreme" in areas unaccustomed to winter weather. Alaska's extreme cold usually involves temperatures between -20 to -50°F. Excessive cold may accompany winter storms, be left in their wake, or can occur

without storm activity. Extreme cold accompanied by wind exacerbates exposure injuries such as frostbite and hypothermia.

High Winds occur in Alaska when there are winter low-pressure systems in the North Pacific Ocean and the Gulf of Alaska. Alaska's high wind can equal hurricane force but fall under a different classification because they are not cyclonic nor possess other hurricane characteristics. Strong winds occasionally occur over the interior due to strong pressure differences, especially where influenced by mountainous terrain, but the windiest places in Alaska are generally along the coastlines.

Winter Storms include a variety of phenomena described above and as previously stated may include several components; wind, snow, and ice storms. Ice storms, which include freezing rain, sleet, and hail, can be the most devastating of winter weather phenomena and are often the cause of automobile accidents, power outages, and personal injury. Ice storms result in freezing rain accumulation which coats and glazes every surface it falls on. Freezing rain is most commonly found in a narrow band on the cold side of a warm front, where surface temperatures are at, or just below, freezing temperatures. Typically, ice crystals high in the atmosphere grow by collecting water vapor molecules, which are sometimes supplied by evaporating cloud droplets. As the crystals fall, they encounter a layer of warm air where the particles melt and collapse into raindrops. As the raindrops approach the ground, they encounter a layer of cold air and cool to temperatures below freezing. However, since the cold layer is so shallow, the drops themselves do not freeze, but rather, are supercooled, that is, in liquid state at below-freezing temperature. These supercooled raindrops freeze on contact when they strike the ground or other cold surfaces.

#### 4.6.2 Location

The entire Wrangell area experiences periodic severe weather impacts. The most common to the area are high winds and severe winter storms.

#### 4.6.3 History

The Wrangell area is continually impacted by severe weather events. Hurricane force wind, storm surge, and cold typically have disastrous results.

Table 11 lists a representative sample of Wrangell's major storm events the NWS identified for their Weather Zone. Each weather event may not have specifically impacted the area.

These storm events are listed due to their close proximity to Wrangell or by location within the Inner Channels from Kupreanof Island to Etolin Island's Weather zone 026. Listed impacts may not have affected the Wrangell area.

**Table 11. Wrangell Area Severe Weather Events**

Location	Date	Event Type	Magnitude
Inner Channels from Kupreanof Island to Etolin Island. (AK Zone 026)	2/23/2018	Winter Storm	The weather front swept over the central panhandle on 24 February, spreading snow over the... easterly slopes increasing the snowfall. Temperatures began warming in the afternoon leading to a wetter snowfall in the afternoon and snowpack compaction.
AK Zone 026	2/1/2018	Winter Storm	N-NE-E wind... kept temperatures cold enough on the north side of the front to allow snow to get up to southern Admiralty Island. Increasing temps above freezing late Thursday night into Friday morning made the rain/snow line critical and difficult to forecast. Significant snowfall occurred for Port Alexander, Petersburg, Wrangell, Point Baker and Coffman Cove. Ketchikan had wintry mix. No damage was reported and the impact was snow removal. Some places could have had blizzard conditions... Port Alexander had gusts

**Table 11. Wrangell Area Severe Weather Events**

Location	Date	Event Type	Magnitude
			of around 46 mph (40kts)... Highest snow falls extended a little farther south than expected. Petersburg, to Whale Pass to Thorne Bay, and Coffman Cove got buried. Lighter amounts elsewhere. Snow changed to rain early in Ketchikan and overnight at Kasaan limited snow amounts to 1 to 2 inches there...
AK Zone 026	2/12/2018	Heavy Snow	... Juneau and Petersburg got hit with a heavy snow storm that was not well forecasted. By Tuesday morning Juneau got 6 to 15 inches of new snow plus some freezing drizzle, and Petersburg got 7 to 8 inches. This was due to deep WSW flow aloft that was expected to rain, but cold air never changed over.
AK Zone 026	2/22/2018	Winter Storm	... heavy snow for the Central Panhandle. Cold air in place closer to the coast mountains resulted in heavy snow with a high water content. Most snow was 10 to 1 or less which made heavy snow removal the main impact... Petersburg and Wrangell temperatures warmed overnight but more snow was observed before the changeover especially at Petersburg. Wildly varying snow amounts with less than 1 inch at Kake and Wrangell while 5 to 6 inches were observed at 9 mile on the Mitkof highway.
AK Zone 026	4/10/2018	High Wind	A very strong wave developed south of Haida Gwaii and skirted the coast of SE Alaska causing storm force wind and hurricane force gusts. There was some damage reported, and the peak wind was 100 MPH. The strong wave moved off the coast and into the western Gulf on the morning of 4/11.
AK Zone 026	3/12/2017	Winter Storm	An arctic front was over the central Panhandle as another in a series of storms moved northward from off the Pacific Northwest. The storm center had deepened... off Dixon Entrance forcing warm moist air over the arctic air in place resulting in heavy snow for most of the Panhandle... The impact was intense snow removal for storm totals up to 20 inches on top of an already deep snowpack. This was a setup for avalanches later that week.
AK Zone 026	2/11/2017	High Wind, Snow, Blizzard	Strong SSW flow... brought snow, high winds, and even blizzard conditions to the Panhandle. Warm air overrunning very cold air at the surface caused the snow to accumulate rapidly. White Pass was closed, and snow combined with wind gusts over 60 mph (52kts) caused road and marine problems throughout SE Alaska. Some locations measured over a foot of new snowfall.
AK Zone 026	2/27/2017	Winter Storm	Gale force wind just off Ocean Cape. A strong front moved on to the coast dumping snow. The impact was snow removal but no damage was reported.
AK Zone 026	1/25/2016	High Wind	A Hurricane Force wind over the western Gulf... A series of gale force to storm force winds. One of these systems caused extensive damage in the Edna Bay harbor... wrecking boats in the harbor. Max gusts in these systems were 75 to 80 mph (65-69 kts).
AK Zone 026	12/25/2016	Winter Storm	A very strong Bering Sea low... spawned a strong frontal system that raced across the Gulf to slam SE with another heavy snow event. This was a typical case of warm moist air overrunning cold air at the surface. Snowfall ranged from 1 to 2 ft. The only impact was intense snow removal.
AK Zone 026	11/29/2016	High Wind	...a radical pattern shift with a storm off the coast... brought warm moist air over the arctic front while... causing high wind. Trees came down and snow was hard to remove, but no significant damage was reported.
AK Zone 026	2/5/2015	Winter Storm	A second major wind storm hit Southeast Alaska beginning on the evening of Wednesday February 4th... extreme surface pressure gradients in the channels over the entire Panhandle and an arctic front from Cape Spencer to Petersburg. Classical Taku wind conditions persisted for Downtown Juneau and Douglas through Thursday night into Friday. There were many wind speed observations in excess of 100 mph, and damage was reported. Also,

**Table 11. Wrangell Area Severe Weather Events**

Location	Date	Event Type	Magnitude
			<p>heavy snow developed over the arctic front and winter storm watches and warnings were issued well in advance. Brief blizzard conditions occurred over the Klondike Highway, and a number of high wind warnings were issued well in advance of this storm. Extensive decision support services were conducted by the Juneau Forecast Office.</p> <p>All concerned emergency managers across the region were directly contacted either in person or by phone for briefings. The Alaska Department of Transportation was directly contacted about the hazardous white-out conditions at White Pass and the potential for snow removal in the central Panhandle. The Alaska Marine Highway (ferries) were briefed two days in advance of this event and some routes were cancelled due to the hurricane force winds, giant wind waves - one report to 20 ft. on Inside waters - and heavy freezing spray. There was significant damage to windows and windshields and power outages during this storm. As previously stated, ferry service was canceled and also airline schedules were disrupted. Freezing spray iced over some marine observations which were out of service for a few days until there was a thaw. Snow removal was easier than usual due to the snow being fluff.</p>
AK Zone 026	4/28/2015	High Wind	An unseasonable storm hit the Southern Panhandle... SSW of the Queen Charlotte Islands... The center moved over Sitka... then rapidly weakened over the Eastern Gulf of Alaska... Numerous reports of downed trees, power outages, and wind damage were reported particularly in Ketchikan. Gusts over 100 mph (86 kts) were measured.
AK Zone 026	10/9/2015	High Wind	[High wind] caused minor damage for several coastal areas. Power outages were common and there was significant damage to a dock.
AK Zone 026	11/30/2014	Winter Storm	Cold air was trapped over the inner channels... due to blocking high pressure. Heavy snow began as warm moist air moved over the area as the block broke down... A second snow event occurred on Dec 1, but the amounts were not as heavy... No damage or power outages were reported, but snow removal was a challenge due to this being the first measurable snowfall of the 2014-2015 season.
AK Zone 026	11/5/2014	High Wind	...The storm center..., just off Dixon Entrance... weakened over land... near Cape Spencer... Marine storm force winds were common with this system with hurricane force gusts. Land winds gusted as high as 92 mph (80 kts) and caused damage particularly in Ketchikan with one roof blown away with trees down and power outages.
AK Zone 026	4/28/2014	High Wind	A weak low... caused high wind along the coast of Cape Decision measured 50 mph (43 kts) sustained wind... with gusts as high as 85 mph (74 kts)... some areas along Baranof, Kuiu, and Prince of Wales islands were hit.
AK Zone 026	10/19/2014	High Wind	... a strong associated front approached the Panhandle from the SSW. A secondary low developed... This second center made landfall near Cape Decision... Gale force winds with storm force gusts were observed over much of the Southern Panhandle including Kuiu Island ... Winds rapidly diminished... with no damage reported.
AK Zone 026	12/19/2013	Winter Storm	...gale force triple point low moved into the central Gulf of Alaska... forcing warm moist air over cold air at the surface in the Panhandle. This system brought heavy snow to much of SE Alaska including the northern Panhandle, Yakutat, and Hyder.
AK Zone 026	1/29/2013	Winter Storm	...cold northerly flow [occurred] through mountain passes and Lynn Canal... [carrying] moisture-laden frontal system... into the eastern Gulf. This... brought heavy snow to some parts of SE Alaska...

**Table 11. Wrangell Area Severe Weather Events**

Location	Date	Event Type	Magnitude
AK Zone 026	11/21/2013	Winter Storm	Arctic air... over SE Alaska [that] changed to SW and warm moist air... over the Panhandle... snow changed to rain, precipitation became freezing rain in a few locations. Strong winds... with a switch over to rain. Temperatures warmed rapidly causing the snow pack to become very difficult to manage. This storm ... [caused widespread] snowfall, freezing rain, and wind problems.
AK Zone 026	2/2/2012	High Wind	... hurricane force low deepened... off Sand Point... This storm brought hurricane force winds to all of SE Alaska and a few areas of heavy snow.
AK Zone 026	12/1/2012	Winter Storm	Arctic high pressure... Petersburg got around 11.2 inches of snow...
AK Zone 026	12/8/2012	Winter Storm	... [combined moist] ... air masses [brought] heavy snowfall to the northern Panhandle. The heavier snowfall amounts were from 5 to 9 inches... Most areas had rain later that day making snow management difficult.
AK Zone 026	1/20/2012	Winter Storm	... Strong north wind developed for Downtown Juneau, but no damage was reported ... The storm deepened..., cold air, and heavy snow [occurred along] most of the Panhandle... [lasting for 2 days].
AK Zone 026	11/22/2012	High Wind	...hurricane force low... slowed down but deepened... over Prince of Wales Island that evening. The high winds were brief but intense for much of SE Alaska... Strong winds lasted for another day afterward.

Figure 10 delineates the Weather Service Office's weather data. Actual community temperatures and depths may vary due to their relative proximity to the Weather Service Office (WRCC 2018).

<b>WRANGELL AP, ALASKA (509919)</b>													
<b>Period of Record Monthly Climate Summary</b>													
<b>Period of Record : 11/01/1917 to 02/19/2013</b>													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	33.9	37.7	42.0	49.1	56.3	61.7	64.0	63.5	57.7	49.4	41.1	36.4	49.4
Average Min. Temperature (F)	24.7	27.7	30.8	35.3	41.1	46.5	49.8	49.7	45.9	39.2	32.1	27.6	37.5
Average Total Precipitation (in.)	6.71	5.72	5.49	4.65	4.21	3.93	4.88	5.98	9.62	13.32	9.08	7.92	81.51
Average Total SnowFall (in.)	18.4	12.4	7.9	0.8	0.0	0.0	0.0	0.0	0.0	0.1	5.8	12.6	58.0
Average Snow Depth (in.)	4	5	1	0	0	0	0	0	0	0	1	3	1
Percent of possible observations for period of record.													
Max. Temp.: 95.6% Min. Temp.: 95.5% Precipitation: 90.1% Snowfall: 86.9% Snow Depth: 86.9%													
Check <a href="#">Station Metadata</a> or <a href="#">Metadata graphics</a> for more detail about data completeness.													
Western Regional Climate Center, <a href="mailto:wrcc@dri.edu">wrcc@dri.edu</a>													

**Figure 10. Wrangell Airport Climate Summary**

DHS&EM's Disaster Cost Index records the following severe weather disaster events which may have affected the Wrangell area due to their close proximity to declared disaster events:

**3. Wrangell/Craig, November 6, 1978:** During this period an intense storm occurred in the Wrangell/Craig area in Southeastern Alaska generating high winds, torrential rains and heavy sea waves. The storm caused considerable damage to both private and public property in the two communities. Subsequent to the Governor's Proclamation of Disaster Emergency,

*DHS&EM provided both public assistance and assistance to individuals and families to assist the communities in recovering from the disaster. SBA made disaster loans available to affected businesses and homeowners.*

**83. Omega Block Disaster, January 28, 1989 & FEMA declared (DR-00826) on May 10, 1989.** *The Governor declared a statewide disaster to provide emergency relief to communities suffering adverse effects of a record breaking cold spell, with temperatures as low as -85 degrees. The State conducted a wide variety of emergency actions, which included: emergency repairs to maintain & prevent damage to water, sewer & electrical systems, emergency resupply of essential fuels & food, & DOT/PF support in maintaining access to isolated communities.*

**32. Southeast Alaska, November 26, 1984:** *A hurricane force windstorm and wind driven tides caused extensive damage to public and private property in five Southeast Alaskan communities. The State provided public and individual assistance grants and temporary housing in Juneau, Sitka, Kake, Angoon and Tenakee Springs. SBA provided disaster loan assistance and the American Red Cross made grants to meet immediate needs of victims. The Governor's request for a Presidential declaration was denied.*

**111. '89 Spring Floods Hazard Mitigation, April 14, 1990:** *The Major Disaster Declaration by the President in response to statewide flooding in the Spring of 1989 authorized the commitment of federal funds to projects designed to mitigate flood damage in future years. Since the federal funding required a State matching share, the Governor declared a disaster to provide these funds and authorize their expenditure.*

**97-182 '96 Southeast Storm (Pelican/Elfin Cove):** *On Wednesday, September 25, 1996 a severe storm struck Southeast Alaska causing severe damage to some of the communities in the area. The community of Pelican sustained erosion damage to temporary construction (sandbags) placed to curtail erosion on Pelican Creek. The storm also caused additional erosion around the bridge that crosses the creek. In Elfin Cove the landslide damaged electrical distribution lines to homes, disrupted telephone service to 12 homes and caused remaining telephones to operate off battery power. Two homes sustained damage. Also the trail which provided the only means of access between the two sides of town was damaged causing residents to commute from one side of town to the other by boat. The Governor declared the area a disaster on November 1, 1996 due to the threat to life and property. Public Assistance totaled \$486K for 1 applicant with 1 DSR. The total for this disaster is \$528K.*

**06-216 2005 Southeast Storm (AK-06-216) declared December 23, 2005 by Governor Murkowski:** *Beginning on November 18, 2005 and continuing through November 26, 2005, a strong winter storm with high winds and record rainfall occurred in the City/Borough of Juneau, the City/Borough of Haines, the City/Borough of Sitka, the City of Pelican, the City of Hoonah, and the City of Skagway, which resulted in widespread coastal flooding, landslides, and severe damage and threat to life and property, with the potential for further damage. The following conditions exist as a result of this disaster: severe damage to personal residences requiring evacuation and relocation of residents; to individuals personal and real property; to businesses; and to a marine highway system dock, the road systems eroded and blocked by heavy debris that prohibited access to communities and residents, and other public infrastructures, necessitating emergency protective measures and temporary and permanent repairs. The total estimated amount of assistance is approximately \$1.87 million. This includes the following: Individual Assistance totaling \$500K for 52 applicants and Public Assistance totaling \$1.1 million for 14 applicants and 31 PW's. There was no hazard mitigation. Nov 21,08 update—Closeout later to DAS total cost of \$1,684,311 (included \$183,088 for IA, plus IA Admin of \$35,748, PA Grantee admin of \$133,779, and subgrantee*



*admin allowance of \$30,290.) Lapse to DRF was \$183,586. RBS-11/28/08.*

Severe weather events have historically impacted the entire Wrangell Borough area. Rural communities generally lack capacity to track changing climate conditions. It is fortunate the University of Alaska Fairbanks Scenarios Network for Alaska and Arctic Planning (SNAP) is part of the International Arctic Research Center provides this data for planning purposes. The following provides a guideline for using SNAP data:

*Due to variability among climate models and among years in a natural climate system, these graphs are useful for examining trends over time, rather than for precisely predicting monthly or yearly values.*

*How to interpret climate outlooks for your community*

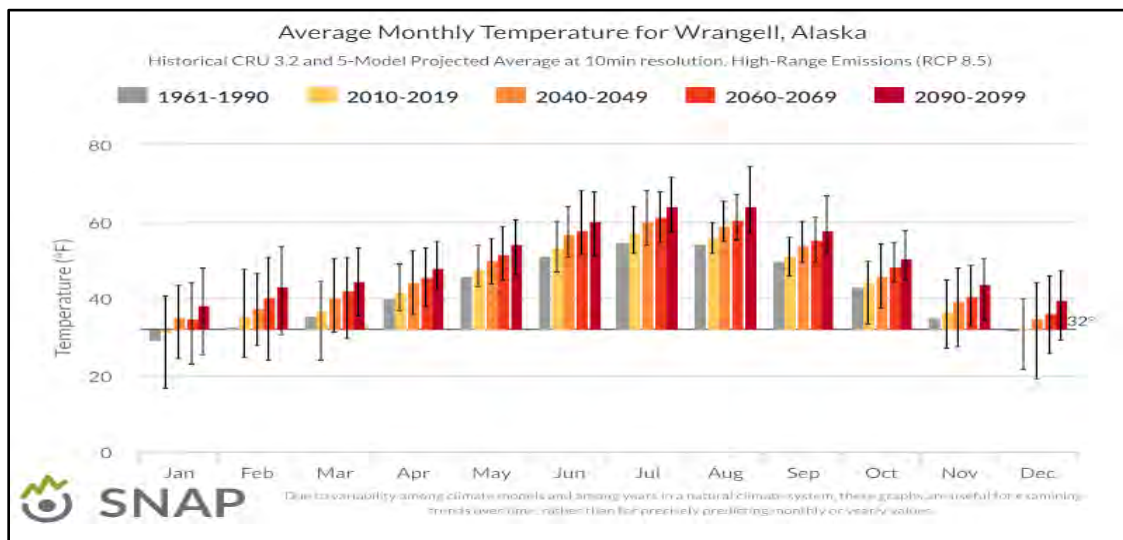
*You can examine SNAP community outlooks for certain key changes and threshold values—for example, higher mean monthly temperatures in the spring and fall may be of particular interest. This could signify any or all of these conditions:*

- *a longer growing season*
- *a loss of ice and/or frozen ground needed for travel or food storage*
- *a shift in precipitation from snow to rain, which impacts water storage capacity and surface water availability*

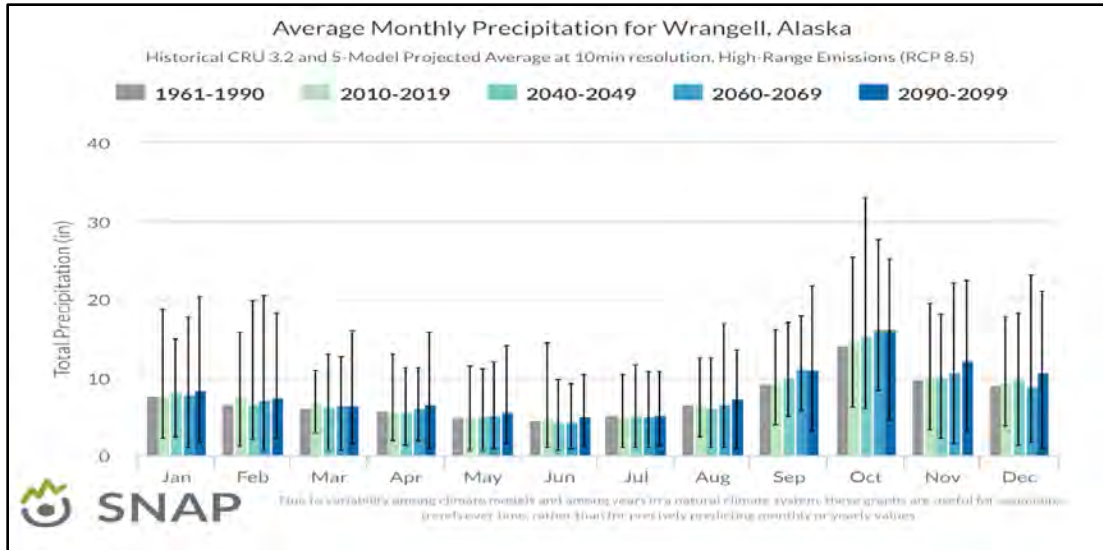
**Note:** *Precipitation may occur as either rain or snow but is reported for all months in terms of rainwater equivalent.*

*Warmer, drier spring weather may also be an indicator for increased fire risk. In many locations, winter temperatures are projected to increase dramatically. Warmer winters may favor growth of species that are less cold-hardy (including desirable crops and invasive species), or it may decrease snowpack and increase the frequency of rain-on-snow events that impact wildlife. Higher temperatures across all seasons will likely impact permafrost and land-fast ice (SNAP 2016)*

SNAP data tools depict Wrangell's historic and future predicted precipitation and temperatures. (Figures 11 and 12) The long bars that look like a capital "T" displays the colored bar's estimated temperature or precipitation range.



**Figure 11. Wrangell's Historic and Predicted Temperature Ranges**



**Figure 12. Wrangell's Historic and Predicted Temperatures**

#### 4.6.4 Extent/Impact

##### Extent

The entire Wrangell area is equally vulnerable to the severe weather effects. The area experiences severe storm conditions with moderate snow depths; wind speeds exceeding 90 mph.

Based on past severe weather events and the criteria identified in Table 7, the extent of severe weather in the Wrangell area are considered "Limited" where injuries do not result in permanent disability, complete shutdown of critical facilities could occur for more than one week, and more than 10 percent of property is severely damaged.

##### Impact

The intensity, location, and the land's topography influence a severe weather event's impact within a community. Hurricane force winds, rain, snow, and storm surge can be expected to impact the entire area.

Heavy snow can immobilize a community by bringing transportation to a halt. Until the snow can be removed, airports and roadways are impacted, even closed completely, stopping the supply flows and disrupting emergency and medical services. Accumulations of snow can cause roofs to collapse and knock down trees and power lines. Heavy snow can also damage light aircraft and sink small boats. A quick thaw after a heavy snow can cause substantial sheet flow flooding throughout Wrangell. Extreme cold can also bring transportation to a halt. Aircraft may be grounded due to extreme cold and ice fog conditions, cutting off access as well as the flow of supplies to communities.

Extreme cold also interferes with the proper functioning of a community's infrastructure by causing fuel to congeal in storage tanks and supply lines, stopping electric generation. Without electricity, heaters and furnaces do not work, causing water and sewer pipes to freeze or rupture. If extreme cold conditions are combined with low or no snow cover, the ground's frost depth can increase, disturbing buried pipes. The greatest danger from extreme cold is its effect on people. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. Infants and elderly people are most susceptible. Casualties also occur due to overexertion while shoveling snow and hypothermia caused by overexposure to the cold weather.

#### 4.6.5 Recurrence Probability

Based on previous occurrences and the criteria identified in Table 8, it is “Likely” a severe storm event will occur in the next three years with a (1/3=33 percent) years chance of occurring as the history of events is greater than 20 percent but less than or equal to 33 percent likely per year.

### 4.7 WILDLAND FIRE

#### 4.7.1 Nature

A wildland fire is a wildfire type that spreads through vegetation consumption. It often begins unnoticed, spreads quickly, and is usually signaled by dense smoke that may be visible from miles around. Wildland fires can be caused by human activities (such as unattended burns or campfires) or by natural events such as lightning. Wildland fires often occur in forests or other areas with ample vegetation. In addition to wildland fires, wildfires can be classified as tundra fires, urban fires, interface or intermix fires, and prescribed burns.

The following three factors contribute significantly to wildland fire behavior and can be used to identify wildland fire hazard areas.

**Topography** describes slope increases, which influences the rate of wildland fire spread increases. South-facing slopes are also subject to more solar radiation, making them drier and thereby intensifying wildland fire behavior. However, ridge tops may mark the end of wildland fire spread since fire spreads more slowly or may even be unable to spread downhill.

**Fuel** is the type and condition of vegetation plays a significant role in the occurrence and spread of wildland fires. Certain types of plants are more susceptible to burning or will burn with greater intensity. Dense or overgrown vegetation increases the amount of combustible material available to fuel the fire (referred to as the “fuel load”). The ratio of living to dead plant matter is also important. Climate change is deemed to increase wildfire risk significantly during periods of prolonged drought as the moisture content of both living and dead plant matter decreases. The fuel load continuity, both horizontally and vertically, is also an important factor.

**Weather** is the most variable factor affecting wildland fire behavior is weather. Temperature, humidity, wind, and lightning can affect chances for ignition and spread of fire. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildland fire activity.

**Climate change** increases the susceptibility of vegetation to fire due to longer dry (drought) seasons. By contrast, cooling and higher humidity often signal reduced wildland fire occurrence and easier containment.

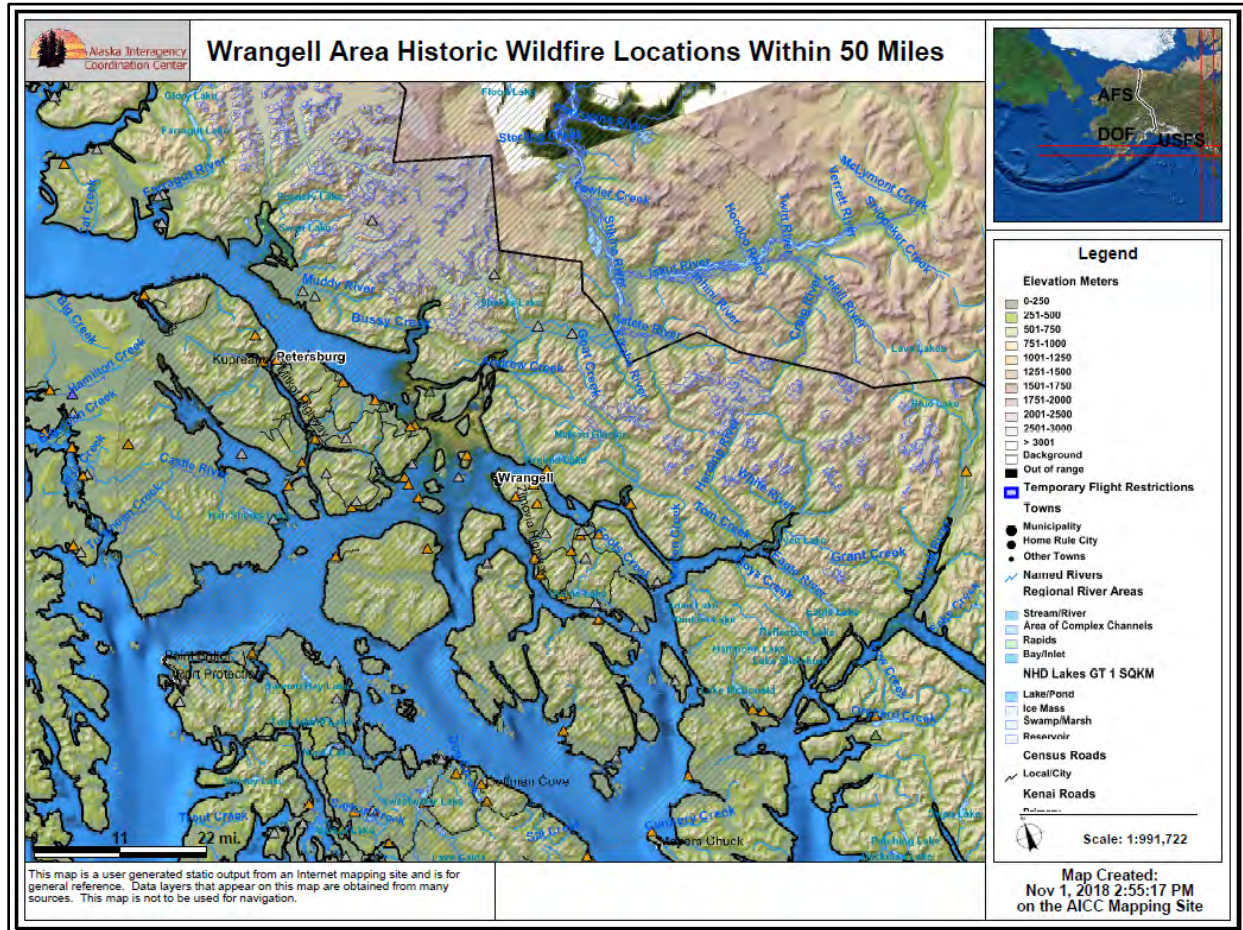
The frequency and severity of wildland fires is also dependent on other hazards, such as lightning and infestations (such as the damage caused by spruce-bark beetle infestations). If not promptly controlled, wildland fires may grow into an emergency or disaster. Even small fires can threaten lives and resources and destroy improved properties. In addition to affecting people, wildland fires may severely affect livestock and pets. Such events may require emergency water/food, evacuation, and shelter.

The indirect effects of wildland fires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance rivers and stream siltation, thereby enhancing flood potential, harming aquatic life, and degrading water quality. Lands stripped of vegetation are also subject to increased debris flow hazards.

The community of Wrangell experienced extreme drought conditions during 2019. It is reported that significant amounts of spruce and cedar required clearing due to lack of water to reduce the interface wildland fire hazard.

#### 4.7.2 Location

Under certain conditions wildland fires may occur near residential areas and other infrastructure when weather, fuel availability, topography, and ignition sources combine. Wrangell area does not have official fuels data. However, the planning team stated that persistent and recurring unseasonably hotter temperatures create drought conditions that are perfect for increasing wildland fire susceptibility. Wrangell's historical wildland fire locations are displayed in Figure 13 (AICC 2018).



**Figure 13. Wrangell's Historical Wildfire Locations**

#### 4.7.3 History

The Alaska Interagency Coordination Center identified 114 historical wildland fires that occurred within 50 miles of Wrangell. The majority of these fires ranged in size from 0.1 to 0.9 acres burned and were human caused from trash burning, camp fires, and children. Table 12 lists 18 of those fires that exceeded 1 acre with the largest one burning 588 acres in 1980, and another burning 26 acres in 1958 (AICC 2018).

**Table 12. Wrangell's Historic Fires within 50 Miles**

Fire Name	Fire Year	Estimated Acres	Cause
Highbush Fire	2009	1	Campfire
Sweetwater	2005	1.3	Human



Rainbow Falls	2004	6	Lightning
Whiskey Cove	2004	1	Human
Kosciusko Bay	2004	3.5	Human
Petersburg Creek	2003	1	Children
Union Bay	2002	4	Human
Ketili	1999	2	Recurrent
Farragut Bay	1998	1	Trash Burning
Snake Ridge	1996	2	Campfire
Sarkar Route	1995	4	Campfire
Clamdigger 2	1994	1	Campfire
Clamdigger	1994	1	Campfire
Canoe	1993	1	Lightning
Unnamed	1990	6	Camping
N Hamilton	1980	588	Undefined
Bay Log	1958	26	Debris Burning
Blind River	1958	5.6	Campfire

#### 4.7.4 Extent/Impact

##### Extent

Wrangell is experiencing greater fire vulnerability because their spring, summer, and early fall temperatures have been increasing. Vegetation dries out from decreasing plant moisture content and increases the ratio of dead fuel to living fuel. The area's humidity, wind speed and direction, fuel load and fuel type, and topography can contribute to the fire intensity and spread rates. Wrangell's most common wildland fire cause is human negligence, followed by increased lightning strikes from changing climate patterns.

The 1980 fire burned approximately 588 acres. Due to poor records, the location is approximate. The cause of the fire was unknown. The Alaska Interagency Coordination Center historical fire report indicates an average number of acres burned amounted to 5.9 acres burned. Subtract the (large, undefined but atypical) 588 acre fire and the average falls to 0.75 acres burned from human carelessness.

Based on the limited number of large historical wildland fire events and the criteria identified in Table 7, the magnitude and severity from wildland fire in Wrangell are considered "Negligible" where minor injuries or illnesses would be treatable with first aid, minor quality of life lost, with potential for critical facilities to be shut down for 24 hours or less with less than 10 percent of property or critical infrastructure being severely damaged.

##### Impact

Wildland fire impacts with the population center of Wrangell could grow into an emergency or disaster if not properly controlled. A small fire can threaten lives and resources and destroy property.

Fire is recognized as a critical feature of the natural history of many ecosystems. It is essential to maintain the biodiversity and long-term ecological health of the land. The role of wildland fire as an essential ecological process and natural change agent has been incorporated into Alaska's fire management planning process its full range of fire management activities to help achieve ecosystem sustainability. This includes

interrelated ecological, economic, and social consequences on firefighters, public safety and welfare; natural and cultural resources threatened.

#### 4.7.5 Recurrence Probability

An important issue related to the wildland fire probability is the urban interface fire. Increased development along the community's perimeter, accumulation of hazardous wildfire fuels, and the uncertainty of weather patterns that may accompany climate change increases wildland urban-interface fire recurrence probability. These three combined elements are reason for concern and require heightened mitigation management of each community's wildland interface areas, natural areas, and open spaces.

Climate change and flammable vegetation species are prolific throughout Wrangell's forests locations especially since extreme heat days have been increasing and drought conditions are a year recurrence. Fire frequency will likely increase in the future.

Based on the history of wildland fires in the Wrangell area and applying the criteria identified in Table 8, it is "Unlikely" but possible a wildland fire event will occur within Wrangell in the next ten years. The event has 1 in 10 years (1 in 10= 10 percent) chance of occurring and the history of events is less than or equal to 10 percent likely each year.

### 4.8 VULNERABILITY ASSESSMENT

This section describes and summarizes the overall vulnerability of the people and critical facilities to the hazards that occur in Wrangell.

#### 4.8.1 Asset Inventory - Critical Facilities

A critical facility provides services and functions essential to a community, especially during and after a disaster. Common types of critical facilities include: fire stations, police stations, hospitals, schools, water and waste water systems, and utilities. Critical facilities may also include places that can be used for sheltering or staging purposes, such as community centers and libraries. Critical facilities may also include large public gathering spots.

Critical facility information was queried from the Alaska Critical Facilities database and reviewed and updated by the planning team. Due to many of the remote nature of the community – a long distance from their nearest neighboring community, most all facilities are deemed "critical" to their survival. The critical facilities profiled in this plan include the following:

- Government facilities, such as city and tribal administrative offices, departments, or agencies
- Emergency response facilities, including police department and firefighting equipment
- Educational facilities, including K-12
- Care facilities, such as medical clinics, congregate living health, residential and continuing care, and retirement facilities
- Community gathering places, such as community and youth centers
- Utilities, such as electric generation, communications, water and waste water treatment, sewage lagoons, landfills.

Table 13 shows critical facilities and infrastructure identified by the planning team (CBW 2018a; WCA, CCTHITA, and DHS&EM 2009).

Table 13. Wrangell Critical Facilities and Infrastructure

Type	Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Erosion	Ground Failure	Tsunami/Seiche	Volcano	Severe Weather	Wildland Fire
Government	8	City Hall	205 Brueger Street	56.470783	-132.384259	\$1,697,840	GOV1	X	X		X	X	X	X
Government	3	U.S. Post Office	112 Federal Way	56.472538	-132.387132	Undefined	GOV1	X	X		X	X	X	X
Government	5	Alaska Fish & Game	Front Street	56.470505	-132.380631	Undefined	GOV1	X				X	X	X
Government	20	US Forest Service	525 Benett Street	56.478047	-132.376058	Undefined	GOV1	X				X	X	X
Government	3	Public Works Office	Case Avenue	56.469635	-132.377721	Undefined	COM4	X	X			X	X	X
Government	3	Wrangell Municipal Light & Power Office	1064 Case Avenue	56.461768	-132.378815	\$4,664,450	EPPL	X				X	X	X
Government	3	Capital Facilities Office	Bennett Street	56.473652	-132.37529	Undefined	GOV1	X				X	X	X
Government	3	Harbor Office	Shakes Street	56.466554	-132.382074	Undefined	GOV1	X				X	X	X
Government	8	Public Safety Building: Offices for Police, Court System, DMV	Zimovia Highway	56.469635	-132.377721	\$10,674,080	GOV1	X				X	X	X
Government	2	Alaska Legislative Information Office	Front Street	56.470505	-132.380631	Undefined	GOV1	X			X	X	X	X
Government	7	WCA Tribal and Transportation offices	Zimovia Highway	56.462685	-132.375328	Undefined	GOV1	X				X	X	X
Government	1	US Customs office	Airport Loop Road	56.485684	-132.3812	Undefined	GOV1	X				X	X	X
Emergency Response	5	Public Safety Building: Fire and Search & Rescue	Zimovia Hwy and Bennett Street	56.469635	-132.377721	\$5,000,000	EFEO	X				X	X	X
Emergency Response	6	5.5 Mile Substation	Zimovia Hwy	56.362936	-132.356211	\$936,750	GOV2	X				X	X	X
Emergency Response		12 Mile Emergency Van	Undefined	56.324971	-132.3812	Undefined	GOV2	X				X	X	X
Emergency Response	0	Alaska DEC Oil Spill Response Van/Supplies	City Barge Ramp	Undefined	Undefined	Undefined	Undefined	X				X	X	X

Table 13. Wrangell Critical Facilities and Infrastructure

Type	Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Erosion	Ground Failure	Tsunami/Seiche	Volcano	Severe Weather	Wildland Fire
Emergency Response	0	Alaska DOT/PF Airport Fire Pumper Truck 3,000 gal	ARRF Bldg. / Airport Loop Road	56.48452	-132.37778	Undefined	EFEO	X				X	X	X
Emergency Response	0	US Forest Service Fire Pumper Truck	Bennett Street	56.474975	-132.374848	Undefined	Undefined	X				X	X	X
Emergency Response	0	SEARHC 10-person remote medical facility / Decon for HazCom (in Vans)	Bennett Street	Undefined	Undefined	Undefined	Undefined	X				X	X	X
Emergency Response	0	CBW/Fire Dept. MMRS (medical response system)	ARRF Bldg. / Airport Loop Road	Undefined	Undefined	Undefined	Undefined	X				X	X	X
Education	4	Wrangell School District Office	350 Bennett Street	56.472497	-132.37463	Undefined	EDU1	X				X	X	X
Education	182	Wrangell High School (167 students, 15 teachers)	310 Reid Street	56.472159	-132.381524	Undefined	EDU1	X				X	X	X
Education	70	Skitine Middle School (60 students, 10 teachers)	321 Church Street	56.472015	-132.378168	Undefined	EDU1	X				X	X	X
Education	92	Evergreen Elementary School (82 students, 10 teachers)	350 Bennett Street	56.472497	-132.37463	Undefined	EDU1	X				X	X	X
Education	30	T&H Head Start	First Ave	Undefined	Undefined	Undefined	EDU1	X				X	X	X
Medical Care	Undefined	Alaska Island Community Services (AICS) Tideline Health Clinic	232 Wood Street	56.412.952	-132.371778	Undefined	EFMC	X				X	X	X
Medical Care	6	AICS Pharmacy	333 Church Street	56.471185	-132.380348	Undefined	COM1	X				X	X	X
Medical Care	3	Stikine Drug	202 Front Street	56.471778	-132.383977	Undefined	COM1	X	X		X	X	X	X
Medical Care	2	State Public Health Nurse	Front Street	56.471329	-132.383619	Undefined	COM7	X			X	X	X	X
Medical Care	80	Wrangell Medical Center	310 Bennett Street	56.471783	-132.375702	\$20,000,000	COM6	X				X	X	X
Medical Care	60	SEARHC Hospital (under construction -2020)	235 Wood Street	56.463500	-132.372932	\$35,000,000	COM6	X	X	X		X	X	X



Table 13. Wrangell Critical Facilities and Infrastructure

Type	Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Erosion	Ground Failure	Tsunami/Seiche	Volcano	Severe Weather	Wildland Fire
Medical Care	2	Coniffs Critters Vet	Front Street	56.470933	-132.381628	Undefined	Undefined	X				X	X	X
Medical Care	15	AICS Dental Clinic	Front Street	56.471935	-132.385813	Undefined	Undefined	X	X		X	X	X	X
Community	2	Bible Baptist Church	535 Church Street	56.467667	-132.377252	Undefined	REL1	X				X	X	X
Community	2	First Presbyterian Church	220 Church Street	56.471223	-132.379016	Undefined	REL1	X				X	X	X
Community	2	Harbor Light Assembly of God	.5 Mile Zimovia Hwy	56.466379	-132.375998	Undefined	REL1	X		X		X	X	X
Community	2	Hope Community Church of God	212 Bennett Street	56.470829	-132.376445	Undefined	REL1	X				X	X	X
Community	2	Island of Faith Lutheran Church	211 Second Street	56.473544	-132.387981	Undefined	REL1	X				X	X	X
Community	2	Seventh Day Adventist Church	432 Zimovia Hwy	56.470862	-132.37902	Undefined	REL1	X				X	X	X
Community	2	St. Phillip's Episcopal Church	Church Street	56.469777	-132.378456	Undefined	REL1	X				X	X	X
Community	2	St. Rose of Lima Catholic Church	202 Church Street	56.471174	-132.379918	Undefined	REL1	X				X	X	X
Community	5	Salvation Army	Zimovia Hwy	56.467899	-132.375391	Undefined	REL1			X		X	X	X
Community	5	First Bank	224 Brueger Street	56.470823	-132.383292	\$400,000	COM5	X	X		X	X	X	X
Community	5	Tongass Federal Credit Union	215 Front Street	56.47134	-132.383635	\$400,000	COM5	X	X		X	X	X	X
Community	5	Wells Fargo	115 Front Street	56.471.549	-132.384807	\$400,000	COM5	X	X			X	X	X
Community	12	Nolan Center Convention Center, Museum & Wrangell Visitor Ctr	296 Campbell Drive	56.469838	-132.382941	\$9,625,140	GOV1	X	X		X	X	X	X
Community	15	Irene Ingle Public Library	124 2nd Street	56.473242	-132.386377	\$2,198,480	GOV1	X		X		X	X	X
Community	25	Wrangell Community Center	Church Street	56.472138	-132.381927	\$5,378,340	COM8			X		X	X	X
Community	25	Wrangell Parks and Recreation Pool	321 Church Street	56.47195	-132.381386	Undefined	COM8	X		X		X	X	X

Table 13. Wrangell Critical Facilities and Infrastructure

Type	Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Erosion	Ground Failure	Tsunami/Seiche	Volcano	Severe Weather	Wildland Fire
Community	Undefined	Harbor Dept. Warehouses	Front Street	Undefined	Undefined	Undefined	PWH		X			X	X	X
Community	4	Ava's Bed & Breakfast	15 Crest Drive	56.475081	-132.380892	\$325,000	RES4	X				X	X	X
Community	15	Armstrong Rents	522 Front Street	56.46887	-132.380038	\$325,000	RES4	X				X	X	X
Community	Undefined	Airport Hangers	Airport Way	Undefined	Undefined	Undefined	AMF	X				X	X	X
Community	3	Little Bitty Getaway	Church Street	Undefined	Undefined	\$300,000	RES4	X				X	X	X
Community	4	Be Still Bed and Breakfast	318 McKinnon Street	56.473676	-132.38473	\$325,000	RES4	X		X		X	X	X
Community	7	Grand View B&B	1.5 Mile Zimovia Hwy	56.451198	-132.381104	\$325,000	RES4	X			X	X	X	X
Community	2	Heritage Harbor Boathouse	Berger Street	Undefined	Undefined	Undefined	RES4	X	X		X	X	X	X
Community	4	Mt. Dewey Garden Guest House	120 Third Street	56.474283	-132.385587	\$325,000	RES4	X		X		X	X	X
Community	4	Mt. Dewey Sunset Bed & View	111 Mt. Dewey Lane	56.474521	-132.386822	\$300,000	RES4	X		X		X	X	X
Community	2	Northstar Reflections Guest Suite	Zimovia Avenue	Undefined	Undefined	Undefined	RES4	X				X	X	X
Community	3	Off the Hook Extended Stay	Evergreen Ave	Undefined	Undefined	Undefined	RES4	X	X		X	X	X	X
Community	5	Reliance Harbor View	Peninsula Street	Undefined	Undefined	\$300,000	RES4	X				X	X	X
Community	6	Rooney's Roost B&B	206 McKinnon Street	56.472575	-132.384068	\$300,000	RES4	X				X	X	X
Community	4	That Place	928 Zimovia Highway	Undefined	Undefined	Undefined	RES4	X				X	X	X
Community	75	Stikine Inn, Restaurant Café	105 Skitine Avenue	56.471886	-132.38773	\$800,000	RES4	X	X		X	X	X	X
Community	8	Wrangell Extended Stay	312 Stikine Avenue	56.474777	-132.38942	\$400,000	RES5	X			X	X	X	X
Community	4	Wrangell Seawatch House B&B	506 Evergreen Avenue	56.476894	-132.390616	Undefined	RES6	X	X		X	X	X	X
Community	6	Zimovia B&B	319 Webber Street	56.472273	-132.372453	\$400,000	RES7	X				X	X	X

Table 13. Wrangell Critical Facilities and Infrastructure

Type	Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Erosion	Ground Failure	Tsunami/Seiche	Volcano	Severe Weather	Wildland Fire
Community	30	Senior Apartments	351 Bennett Street	56.473022	-132.376046	\$500,000	RES3	X	X		X	X	X	X
Community	35	Wrangell IGA (Grocery)	223 Brueger Street	56.470428	-132.383706	\$400,000	COM1	X	X		X	X	X	X
Community	35	City Market (Grocery)	423 Front Street	56.47004	-132.381145	\$400,000	COM1	X	X		X	X	X	X
Community	5	Twisted Root Market	628 Shakes Street	56.467478	-132.384004	Undefined	COM1	X	X		X	X	X	X
Community	25	Elks Lodge	Front Street	56.471499	-132.385295	\$400,000	RES4	X	X		X	X	X	X
Community	5	J&W's Fast Food	120 Front Street	56.471824	-132.384411	Undefined	COM1	X	X		X	X	X	X
Community	8	Michelle's Taste of Asia	216 Front Street	56.470907	-132.381573	Undefined	COM1	X	X		X	X	X	X
Community	15	Marine Bar and Pizza	640 Shakes Street	56.466746	-132.381181	Undefined	COM1	X	X		X	X	X	X
Community	4	Notsofamous Pizza	325 Front Street	56.470769	-132.381921	Undefined	COM1	X	X		X	X	X	X
Community	2	The Pit Stop	Front Street	56.468585	-132.380078	Undefined	COM1	X	X		X	X	X	X
Community	8	The Cabin Cafe	305 Front Street	56.471368	-132.382645	Undefined	COM1	X	X		X	X	X	X
Community	15	Zak's Café	Front Street	Undefined	Undefined	Undefined	COM1	X	X		X	X	X	X
Community	12	Churchills Apartments and Laundry	Shakes Street	Undefined	Undefined	Undefined	COM1	X	X		X	X	X	X
Community	75	Sea Level Seafoods	2204 Zimovia Hwy	56.458723	-132.381508	Undefined	COM2	X	X		X	X	X	X
Community	75	Trident Seafoods, Inc.	641 Shakes Street	56.467211	-132.381705	\$5,000,000	COM2	X	X		X	X	X	X
Community	0	Cold Storage	Shakes Street	Undefined	Undefined	\$2,633,450	COM2	X	X		X			
Community	2	Wrangell Sentinel	205 Front Street	56.471375	-132.38403	Undefined	COM2	X	X		X	X	X	X
Community	10	Senior Center	Church Street	56.472284	-132.385521	Undefined	COM7	X	X		X	X	X	X
Community	20	Harbor House Assisted Living	Berger Street	56.461192	-132.384531	\$400,000	COM7	X	X	X	X	X	X	X
Community	2	Wrangell Chamber of Commerce	Undefined	56.471385	-132.382618	Undefined	GOV1	X	X	X	X	X	X	X

**Table 13. Wrangell Critical Facilities and Infrastructure**

Type	Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Erosion	Ground Failure	Tsunami/Seiche	Volcano	Severe Weather	Wildland Fire
Community	20	Southeast AK Regional Health Consortium (SEARHC) Offices	Church Street	Undefined	Undefined	Undefined	COM7	X	X	X	X	X	X	X
Community	Undefined	Chief Shakes Tribal House	Shakes Street	56.472284	-132.385521	Undefined	Undefined	X	X	X	X	X	X	X
Community	Undefined	Totem Park	Front Street	Undefined	Undefined	Undefined	COM8	X	X	X	X	X	X	X
Community	2	Tribal Community House and Carving Shed	Front Street	56.470807	-132.382318	Undefined	COM8	X	X	X	X	X	X	X
Roads	0	Total paved road miles: 9.9		Cost per paved mile: \$5M			HRD 2	X	X	X	X	X	X	X
Roads	0	Total gravel road miles: 7.65		Cost per gravel mile: 1.5M			HRD2	X	X	X	X	X	X	X
Bridge	0	Pats Creek Bridge	Pat's Creek Road	56.342059	-132.338188	Undefined	HWB1	X			X	X	X	X
Bridge	0	McCormacks Bridge	Zimovia Highway	56.310421	-132.335998	Undefined	HWB1	X			X	X	X	X
Bridge	0	City Park Bridge	Zimovia Highway	Undefined	Undefined	Undefined	HWB1	X	X		X	X	X	X
Bridge	0	SMB Park Bridge/Institute Creek	Zimovia Highway	Undefined	Undefined	Undefined	HWB1	X	X		X	X	X	X
Bridge	0	SMB near pullout/Zimovia Highway culvert	Zimovia Highway	Undefined	Undefined	Undefined	HWB1	X	X		X	X	X	X
Bridge	0	USFS Bridges on Wrangell Island	Various				HWB1			X		X	X	X
Culvert	0	Wood St/Zimovia Hwy culvert	Zimovia Highway	Undefined	Undefined	Undefined	HWB1	X	X	X	X	X	X	X
Culvert	0	Pine St/Zimovia Hwy Culvert	Zimovia Highway	56.468916,	-132.3764	Undefined	HWB1	X	X		X	X	X	X
Culvert	0	Evergreen/Trailer Park Culvert	Evergreen	56.48118	-132.391572	Undefined	HWB1	X	X		X	X	X	X
Culvert	0	Nugget Trailer Park Culvert	Zimovia Highway	Undefined	Undefined	Undefined	HWB1	X	X		X	X	X	X
Culvert	0	Spur Road Culvert	Spur Road	56.46889	-132.333389	Undefined	HWB1	X				X	X	X
Dam	0	Wrangell Upper Reservoir	Wood Street	56.456118	-132.370065	\$40,000,000	HPDE	X				X	X	X

Table 13. Wrangell Critical Facilities and Infrastructure

Type	Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Erosion	Ground Failure	Tsunami/Seiche	Volcano	Severe Weather	Wildland Fire
Dam	0	Wrangell Lower Reservoir	Wood Street	56.462123	-132.361254	\$25,000,000	HPDE	X				X	X	X
Transportation	2	Wrangell Airport (PAWG)	1 Airport Loop Road	56.4843333	-132.3698333	Undefined	ATB	X				X	X	X
Transportation	0	Wrangell Airport Runway	1 Airport Loop Road	56.4843333	-132.3698333	Undefined	ARW	X				X	X	X
Transportation	0	Wrangell Seaplane Base	Shakes Street	56.466325	-132.3800181	Undefined	AFO	X				X	X	X
Transportation	15	Alaska Airlines Terminal and Hangar	1 Airport Loop Road	56.485	-132.3796	Undefined	AMF	X				X	X	X
Transportation	4	State DOT/PF Highway Maintenance	Airport Loop Road	Undefined	Undefined	Undefined	Undefined	X				X	X	X
Transportation	0	City Bulk Fuel Tanks	Zimovia Highway	Undefined	Undefined	Undefined	OTF	X				X	X	X
Transportation	8	U.S. Transportation Security Administration offices	Front Street	56.485104	-132.37954	Undefined	ATB	X				X	X	X
Transportation	0	Wrangell ports and harbors	Various locations			Undefined	PWS	X	X		X	X	X	X
Transportation	5	Wrangell Ferry Terminal	Stikine Avenue at Evergreen	56.474024	-132.390154	Undefined	FPT	X	X		X	X	X	X
Transportation	4	Samson Tug & Barge	102 Outer Drive	56.471417	-132.386619	Undefined	FMF	X	X		X	X	X	X
Transportation	1	6-mile Industrial Yard / Dock	Zimovia Highway	Undefined	Undefined	Undefined	PEQ/FMF	X	X		X	X	X	X
Transportation	5	Alaska Marine Lines Lynden Transport	520 Front Street	56.469	-132.378956	Undefined	Undefined	X				X	X	X
Transportation	2	Etolin Bus Company Inc.	Howell Avenue	56.470846	-132.37662	Undefined	BMFW	X				X	X	X
Transportation	0	Arrowhead Transfer and Arrowhead L.P. Gas	520 Front Street	56.469249	-132.379751	Undefined	Undefined	X		X	X	X	X	X
Transportation	3	Alpine Fuel Expediting	930 Zimovia Highway	56.463081	-132.374911	Undefined	Undefined	X		X		X	X	X
Transportation	3	LN'M Services and Gas Station	Front Street	Undefined	Undefined	Undefined	Undefined	X		X		X	X	X
Transportation	4	Petro Marine Services	1427 Peninsula Street	56.462595	-132.383143	Undefined	Undefined	X		X		X	X	X

Table 13. Wrangell Critical Facilities and Infrastructure

Type	Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Erosion	Ground Failure	Tsunami/Seiche	Volcano	Severe Weather	Wildland Fire
Transportation	4	Alaska Charters and Adventures	5 Front Street	56.471477	-132.386964	Undefined	COM3	X	X		X	X	X	X
Transportation	4	Alaska Vistas	103 Front Street	56.471431	-132.387147	Undefined	COM3	X	X		X	X	X	X
Transportation	4	Alaska Waters	107 Skitine Avenue	56.471688	-132.387512	Undefined	COM3	X	X		X	X	X	X
Transportation	3	Breakaway Adventures	104 Front Street	56.471688	-132.384136	Undefined	COM3	X	X		X	X	X	X
Transportation	Undefined	Muddy Water Adventures	Undefined	Undefined	Undefined	Undefined	COM4	X				X	X	X
Transportation	3	Practical Car Rental	Airport Way	Undefined	Undefined	Undefined	COM5	X				X	X	X
Transportation	Undefined	Summit Charters	318 McKinnon Street	56.473676	-132.38473	Undefined	COM3	X				X	X	X
Transportation	2	Sunrise Aviation	Airport Loop Road	56.484624	-132.378116	Undefined	AMF	X				X	X	X
Utility	12	Public Works Maintenance Barn	Case Avenue	56.469635	-132.377721	Undefined	COM4	X				X	X	X
Utility	5	Wrangell Municipal Light & Power Generator Warehouse (Large)	1064 Case Avenue	56.461768	-132.378815	\$7,392,770	EPPL	X	X		X	X	X	X
Utility	2	SE Alaska Power Agency Substation	4.5 Zimovia Highway	Undefined	Undefined	Undefined	ESSM	X				X	X	X
Utility	0	SE Alaska Power Agency / Tyee Intertie Distribution Lines	Undefined	Undefined	Undefined	Undefined	EDC	X		X		X	X	X
Utility	2	Potable Water Plant	Wood Street	56.456512	-132.376483	\$1,199,610	PWTM	X		X		X	X	X
Utility	0	Potable Water Distribution Lines	Community-wide	N/A	N/A	Undefined	PWP	X	X	X	X	X	X	X
Utility	0	Potable Water Storage Tanks	Wood Street	56.456512	-132.376483	Undefined		X		X		X	X	X
Utility	2	Wastewater Plant (medium)	Zimovia Hwy	56.453653	-132.380397	Undefined	WWTM	X	X	X	X	X	X	X
Utility	0	Sewer Collection Lines	Community-wide	N/A	N/A	Undefined	PWP	X	X	X	X	X	X	X

**Table 13. Wrangell Critical Facilities and Infrastructure**

Type	Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Erosion	Ground Failure	Tsunami/Seiche	Volcano	Severe Weather	Wildland Fire
Utility	2	Solid Waste Transfer Facility	3 Evergreen Avenue	56.485591	-132.388848	\$1,799,510	Undefined	X		X	X	X	X	X
Utility	3	AP&T Power & Telephone	20 Front Street	56.471933	-132.386013	Undefined	DBO	X	X	X	X	X	X	X
Utility	3	GCI Communication	325 Front Street	56.470777	-132.38195	Undefined	CBO	X	X	X	X	X	X	X
Utility	4	KSTK Public Radio - 101.7, 94.7 FM	202 St. Michael Street	56.471174	-132.379918	Undefined	DBR	X		X		X	X	X
Utility	0	Cell Tower Repeater System	Undefined	Undefined	Undefined	Undefined	CBO	X		X		X	X	X

## 4.8.2 Vulnerability

Table 14 lists CBW, WCA, and the CCTHITA's infrastructures' hazard vulnerability synopsis.

**Table 14. Wrangell Vulnerability Overview**

Hazard	Hazard Vulnerability			
	Percent of Jurisdiction's Geographic Area	Percent of Population	Percent of Building Stock	Percent of Critical Facilities and Utilities
Earthquake	100%	100%	100%	100%
Flood and Erosion	30%	30%	25%	42%
Ground Failure	10%	20%	10%	19%
Tsunami and Seiche	10%	30%	35%	41%
Volcanic Ash	100%	100%	100%	100%
Severe Weather	100%	100%	100%	100%
Wildland Fire	100%	100%	100%	100%

Table 15 lists the key issues or overall summary of vulnerability for each hazard profiled in the 2020 MJHMP.

**Table 15. Overall Summary of Vulnerability**

Hazard	Vulnerability
Earthquake	<p>Although all structures are exposed to earthquakes, buildings within the Wrangell area constructed with wood have less vulnerability to the effects of earthquakes than those constructed with other materials.</p> <p>The Wrangell area has a "Low" recurrence probability for a significant event that will generate "severe" ground movement resulting in infrastructure damage and personal injury. The following summarizes potential impacts from a worse-case scenario event:</p> <ul style="list-style-type: none"> <li>• 1,408 people in 2,387 residences (approximate value \$457,600,000)</li> <li>• 66 people in 12 government facilities (approximate value \$34,361,370)</li> <li>• 11 people in 8 emergency response facilities (approximate value \$5,971,750)</li> <li>• 378 people in 5 educational facilities (approximate value \$30,150,000)</li> <li>• 318 people in 7 medical facilities (approximate value \$48,700,000)</li> <li>• 679 people in 59 community facilities (approximate value \$132,760,410)</li> <li>• 9.9 paved road system miles (approximate value \$49,500,000)</li> <li>• 7.65 gravel road system miles (approximate value \$11,475,000)</li> <li>• 11 bridges/culverts (approximate value is undefined)</li> <li>• 2 earthen dams (approximate value \$65,000,000)</li> <li>• 82 people in 25 transportation facilities (approximate value &gt;\$475,000)</li> <li>• 35 people in 14 utility facilities (approximate value \$10,391,890)</li> </ul>



**Table 15. Overall Summary of Vulnerability**

Hazard	Vulnerability
Erosion/Flood	<p>Typical flood impacts associated include structures and contents water damage, roadbed, embankment, and coastal erosion, boat stranding, standing water in roadways and other areas. Flood events may also damage or displace fuel tanks, power lines, or other infrastructure. Buildings on slab foundations, not located on raised foundations, and/or not constructed with materials designed to withstand flooding events (e.g., cross vents to allow water pass-through an open area under the main floor of a building) are more vulnerable to flood impacts.</p> <p>Wrangell has a minor flooding impact threats; most of which occur from rainfall and snowmelt run-off sheet flow flooding and wind driven wave storm surge.</p> <p>Wrangell has grown since their initial flood insurance rate maps were created in 1982. They can only be used to estimate where they can potentially expand or create new developments away from their historical floodplain. Therefore, the Wrangell planning team estimated potential impacts from a worse-case scenario event could include:</p> <ul style="list-style-type: none"> <li>• 525 people in 175 residences (approximate value \$56,875,000)</li> <li>• 14 people in 3 government facilities (approximate value \$6,697,840)</li> <li>• 18 people in 2 medical facility (approximate value \$800,000)</li> <li>• 384 people in 31 community facilities (approximate value \$37,133,450)</li> <li>• Undefined paved road system miles (approximate value is undefined)</li> <li>• Undefined gravel road system miles (approximate value is undefined)</li> <li>• 7 bridges/culverts (approximate value is undefined)</li> <li>• 2 earthen dams (approximate value \$65,000,000)</li> <li>• 28 people in 9 transportation facilities (approximate value is undefined)</li> <li>• 6 people in 13 utility facilities (approximate value \$8,592,380)</li> </ul>
Ground Failure	<p>Impacts associated with ground failure include surface subsidence, infrastructure, structure, and/or road damage. Buildings that are built on slab foundations and/or not constructed with materials designed to accommodate the ground movement associated with building on permafrost and other land subsidence and impacts, are more vulnerable to damage.</p> <p>Wrangell's ground failure events periodically cause structure and infrastructure displacement due to ground shifting, sliding, sinking, and/or upheaval. There have been periodic landslides and other ground failure incidents on the island. The following summarizes potential impacts from a worse-case scenario event:</p> <ul style="list-style-type: none"> <li>• 375 people in 125 residences (approximate value \$40,325,000)</li> <li>• 82 people in 7 community facilities (approximate value \$38,901,820)</li> <li>• Undefined paved road system miles (approximate value is undefined)</li> <li>• Undefined gravel road system miles (approximate value is undefined)</li> <li>• 2 bridge/culvert (approximate value is undefined)</li> <li>• 2 earthen dams (approximate value is undefined)</li> <li>• 14 people in 4 transportation facilities (approximate value is undefined)</li> <li>• 4 people in 5 utility facilities (approximate value \$2,999,380)</li> </ul>

**Table 15. Overall Summary of Vulnerability**

Hazard	Vulnerability
Tsunami and Seiche	<p>The UAF/GI, DGGs, and the National Tsunami Warning Center indicate that Wrangell has experienced minimal distant and local source tsunami threats for population and infrastructure located within the identified tsunami impact area.</p> <p>Wrangell's residential, commercial, and public structures and infrastructure located adjacent to the identified tsunami impact area have a "Possible" risk from tsunamigenic impacts. Potentially threatened population and infrastructure includes:</p> <ul style="list-style-type: none"> <li>• 1,050 people in 350 residences (approximate value \$113,750,000)</li> <li>• 11 people in 2 government facilities (approximate value \$1,697,840)</li> <li>• 18 people in 2 medical facility (approximate value \$800,000)</li> <li>• 472 people in 30 community facilities (approximate value \$37,133,450)</li> <li>• Undefined paved road system miles (approximate value is undefined)</li> <li>• Undefined gravel road system miles (approximate value is undefined)</li> <li>• 9 bridges/culverts (approximate value is undefined)</li> <li>• 32 people in 10 transportation facilities (approximate value is undefined)</li> <li>• 13 people in 7 utility facilities (approximate value \$9,192,280)</li> </ul>
Volcanic Ash	<p>Impacts associated with a volcanic eruption include strain on resources should other hub communities be significantly affected by volcanic eruption. An eruption of significant size in southcentral Alaska will certainly affect air routes, which in turn affects the entire state. Other impacts include respiratory problems from airborne ash, displaced persons, lack of shelter, and personal injury. Other potential impacts include general property damage (electronics and unprotected machinery), structural damage from ash loading, state/regional transportation interruption, loss of commerce, and contamination of water supply.</p> <p>Using information provided by the planning team, the USGS, and the Alaska Volcano Observatory, Wrangell has a "Possible" risk from volcanic eruptions dispersing volcanic ash into the atmosphere. This could hamper air, land, and ocean resupply capability to Wrangell's isolated island location. The following summaries potential impacts from a worse-case scenario event:</p> <ul style="list-style-type: none"> <li>• 1,408 people in 2,387 residences (approximate value \$457,600,000)</li> <li>• 66 people in 12 government facilities (approximate value \$34,361,370)</li> <li>• 11 people in 8 emergency response facilities (approximate value \$5,971,750)</li> <li>• 378 people in 5 educational facilities (approximate value \$30,150,000)</li> <li>• 318 people in 7 medical facilities (approximate value \$48,700,000)</li> <li>• 679 people in 59 community facilities (approximate value \$132,760,410)</li> <li>• 9.9 paved road system miles (approximate value \$49,500,000)</li> <li>• 7.65 gravel road system miles (approximate value \$11,475,000)</li> <li>• 11 bridges/culverts (approximate value is undefined)</li> <li>• 2 earthen dams (approximate value \$65,000,000)</li> <li>• 82 people in 25 transportation facilities (approximate value &gt;\$475,000)</li> <li>• 35 people in 14 utility facilities (approximate value \$10,391,890)</li> </ul>

**Table 15. Overall Summary of Vulnerability**

Hazard	Vulnerability
Severe Weather	<p>Impacts associated with severe weather events include roof collapse, trees and power lines falling, damage to light aircraft and sinking small boats, injury and death resulting from snow machine or vehicle accidents, overexertion while shoveling all due to heavy snow. A quick thaw after a heavy snow can also cause substantial flooding. Impacts from extreme cold include hypothermia, halting transportation from fog and ice, congealed fuel, frozen pipes, utility disruptions, frozen pipes, and carbon monoxide poisoning. Additional impacts may occur from secondary weather hazards or complex storms such as extreme high winds combined with freezing rain, high seas, and storm surge. Buildings that are older and/or not constructed with materials designed to withstand heavy snow and wind (e.g., hurricane ties on crossbeams) are more vulnerable to the severe weather damage.</p> <p>Wrangell is centrally located in the Tongass National Forest which is a temperate rainforest. The last several years have shown decreased precipitation and higher than average temperatures for longer periods of time. Snow pack has been reduced which in turn reduces the spring melt feeding into lakes and streams. This can impact not only salmon returns but also impacts residents. In 2019, NOAA declared extreme drought conditions for the Wrangell area and south.</p> <p>Based on information provided by the planning team and the National Weather Service; the entire area experiences severe storm conditions with moderate snow depths; and wind speeds exceeding 90 mph. The following summarizes potential impacts from a worse-case scenario event:</p> <ul style="list-style-type: none"> <li>• 1,408 people in 2,387 residences (approximate value \$457,600,000)</li> <li>• 66 people in 12 government facilities (approximate value \$34,361,370)</li> <li>• 11 people in 8 emergency response facilities (approximate value \$5,971,750)</li> <li>• 378 people in 5 educational facilities (approximate value \$30,150,000)</li> <li>• 318 people in 7 medical facilities (approximate value \$48,700,000)</li> <li>• 679 people in 59 community facilities (approximate value \$132,760,410)</li> <li>• 9.9 paved road system miles (approximate value \$49,500,000)</li> <li>• 7.65 gravel road system miles (approximate value \$11,475,000)</li> <li>• 11 bridges/culverts (approximate value is undefined)</li> <li>• 2 earthen dams (approximate value \$65,000,000)</li> <li>• 82 people in 25 transportation facilities (approximate value &gt;\$475,000)</li> <li>• 35 people in 14 utility facilities (approximate value \$10,391,890)</li> </ul>

**Table 15. Overall Summary of Vulnerability**

Hazard	Vulnerability
Wildfire	<p>The planning team stated that persistent and recurring unseasonably hotter temperatures create drought conditions that are perfect for increasing wildland fire susceptibility. Climate change and flammable vegetation species are prolific throughout Wrangell's forests locations; especially since extreme heat days have been increasing and drought conditions are an annual recurrence. Fire frequency will likely increase in the future. The following summarizes potential impacts from a worse-case scenario event:</p> <ul style="list-style-type: none"> <li>• 1,408 people in 2,387 residences (approximate value \$457,600,000)</li> <li>• 66 people in 12 government facilities (approximate value \$34,361,370)</li> <li>• 11 people in 8 emergency response facilities (approximate value \$5,971,750)</li> <li>• 378 people in 5 educational facilities (approximate value \$30,150,000)</li> <li>• 318 people in 7 medical facilities (approximate value \$48,700,000)</li> <li>• 679 people in 59 community facilities (approximate value \$132,760,410)</li> <li>• 9.9 paved road system miles (approximate value \$49,500,000)</li> <li>• 7.65 gravel road system miles (approximate value \$11,475,000)</li> <li>• 11 bridges/culverts (approximate value is undefined)</li> <li>• 2 earthen dams (approximate value \$65,000,000)</li> <li>• 82 people in 25 transportation facilities (approximate value &gt;\$475,000)</li> <li>• 35 people in 14 utility facilities (approximate value \$10,391,890)</li> </ul>

### 4.8.3 Cultural Resources

The 2010 Wrangell Comprehensive Plan describes the areas historic location and describes the Wrangell Cooperative Associations bond to the land.

*People have lived in the Wrangell area for a long, long time (Figure 6-1). According to clan history, the Tlingit people migrated down the Stikine River during a time when the river still flowed underneath glaciers. The population slowly moved down the river with later settlements on the coast including Anita Bay, Mill Creek, the site of the Wrangell Institute at Shoemaker Bay, Anan and many others. The petroglyphs found at Petroglyph Beach near Wrangell and throughout the Borough and the shell middens found on Etolin Island are evidence of the long settlement in the area. (Source 2010 WCP)*

*The community has always been a major home to the Tlingit Kiks.ádi and Naanyaa.aayí clans, as well as the only home of the Kayaashkiditaan, S'iknax.ádi, Xook'eidí, Kaasx'agweidí, and Taalkweidí clans. Today the Wrangell Cooperative Association, a Tlingit IRA council and the federally recognized tribe for the area, maintains Shakes Island in Wrangell's Inner Harbor, Chief Shakes House and the totem park. Chief Shakes House is a replica of traditional Tlingit houses and was constructed in the 1930's using traditional knowledge and methods.*

Neither the WCA nor the CCTHITA identified sacred or culturally sensitive locations within the Wrangell area.

**NOTE:** Anyone desiring information concerning their respective culturally sensitive information must contact the appropriate WCA or CCTHITA tribal office for assistance.

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## 5 MITIGATION STRATEGY

Section 5 – Mitigation Strategy addresses Element C of the Local and Tribal Mitigation Plan Regulation Checklists.

<b>Regulation Checklist – 44 CFR 201.6 Local Mitigation Plans</b>	
<b>Element C: Mitigation Strategy</b>	
C1. Does the Plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement § 201.6(c)(3))	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement § 201.6(c)(3)(i))	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	
<b>Regulation Checklist – 44 CFR 201.7 Tribal Mitigation Plans</b>	
<b>Element C: Mitigation Strategy</b>	
C1. Does the plan include a discussion of the tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including an evaluation of tribal laws and regulations related to hazard mitigation as well as to development in hazard-prone areas? [44 CFR §§ 201.7(c)(3) and 201.7(c)(3)(iv)]	

### 5.1 AUTHORITIES, POLICIES, PROGRAMS, AND RESOURCES

The City and Borough of Wrangell existing authorities, policies, programs and resources available for hazard mitigation are listed in Table 16 through Table 18.

**Table 16. Human and Technical Resources for Hazard Mitigation**

<b>Staff/Personnel</b>	<b>Principal Activities Related to Hazard Mitigation</b>
<b>City and Borough of Wrangell</b>	
Planner or engineer with knowledge of land development and land management practices	The CBW has staff with this knowledge or works with planning and engineering consultants or contractors as needed
Engineer or professional trained in construction practices related to buildings and/or infrastructure	The CBW Director of Public Works and staff have this knowledge
Planner or engineer with an understanding of natural and/or human-caused hazards	The CBW Director of Public Works and staff have this knowledge

**Table 16. Human and Technical Resources for Hazard Mitigation**

Staff/Personnel	Principal Activities Related to Hazard Mitigation
CBW	
Floodplain Manager	The CBW does not have a Floodplain Manager
Surveyors	The CBW works with planning and engineering staff, consultants, or contractors as needed
Staff with education or expertise to assess the jurisdiction’s vulnerability to hazards	The CBW h has staff with this knowledge or works with planning and engineering staff and consultants or contractors as needed
Personnel skilled in Geospatial Information System (GIS) and/or Hazards Us-Multi Hazard (Hazus-MH) software	The CBW has a GIS professional on staff with this knowledge and work with a contractor as necessary.
Scientists familiar with the hazards of the jurisdiction	The CBW works with consultants or contractors as needed
Emergency Manager	The CBW’s Fire Chief and Police Chief and their staff have this knowledge
Finance (Grant writers)	CBW’s Economic Development Director fulfills this capacity
Public Information Officer	The Borough Manager
WCA and CCTHITA	
Planner or engineer with knowledge of land development and land management practices	The WCA works with planning and engineering consultants or contractors as needed.  The CCTHITA has staff with this knowledge and works with planning and engineering consultants or contractors as needed.
Engineer or professional trained in construction practices related to buildings and/or infrastructure	The WCA works with planning and engineering consultants or contractors as needed.  The CCTHITA has staff with this knowledge and works with planning and engineering consultants or contractors as needed.
Planner or engineer with an understanding of natural and/or human-caused hazards	The WCA works with planning and engineering consultants or contractors as needed.  The CCTHITA has staff with this knowledge and works with planning and engineering consultants or contractors as needed.
Floodplain Manager	Neither tribe has this capability.
Surveyors	The WCA works with planning and engineering consultants or contractors as needed.  The CCTHITA works with planning and engineering consultants or contractors as needed.
Staff with education or expertise to assess the jurisdiction’s vulnerability to hazards	The WCA works with planning and engineering consultants or contractors as needed.  The CCTHITA works with planning and engineering consultants or contractors as needed.

**Table 16. Human and Technical Resources for Hazard Mitigation**

Staff/Personnel	Principal Activities Related to Hazard Mitigation
Personnel skilled in Geospatial Information System (GIS) and/or Hazards Us-Multi Hazard (Hazus-MH) software	<p>The WCA works with planning and engineering consultants or contractors as needed.</p> <p>The CCTHITA has staff with this knowledge and works with planning and engineering consultants or contractors as needed.</p>
Scientists familiar with the hazards of the jurisdiction	<p>The WCA has staff with this knowledge or works with planning and engineering consultants or contractors as needed.</p> <p>The CCTHITA has staff with this knowledge or works with planning and engineering consultants or contractors as needed.</p>
Emergency Manager	<p>The WCA Executive Director fulfills this position as needed.</p> <p>The CCTHITA President fulfills this position as needed.</p>
Finance (Grant writers)	Tribal Bookkeeper as applicable.
Public Information Officer	The Borough Manager and Tribal Executive Director as jurisdictionally applicable.



**Table 17. Financial Resources for Hazard Mitigation**

Type	Administrator	Purpose	Amount
General Fund	Borough Assembly and Tribal Council	Program operations and specific projects.	Variable.
General Obligation Bonds	Borough Assembly and Tribal Council	Used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include but are not limited to: libraries, hospitals, parks, public safety facilities, and cultural and educational facilities.	Variable.
Special Tax and Revenue Bonds	Borough Assembly and Tribal Council	Used finance capital projects that: 1) have an identified budgetary stream for repayment (e.g., specified fees, tax receipts); 2) generate project revenue but rely on a broader pledge of general fund revenues to reduce borrowing costs; or 3) finance the acquisition and installation of equipment for the local jurisdiction's general governmental purposes.	Variable.
Indian Community Development Block Grants	HUD	Provides operational funds for tribal management activities	Project-specific.
Indian Environmental General Assistance Program	U.S. Environmental Protection Agency (EPA)	Provides funding for tribal environmental improvement activities	Project-specific.
Indian Housing Block Grant	HUD	Assists IRA Tribes with obtaining adequate housing	Variable.
Employment and Training Administration, Disaster Unemployment Assistance	Department of Labor	Provides disaster related unemployment by supporting employment and training activities	Variable.
Hazard Mitigation Grant Program (HMPG)	FEMA	Supports pre- and post-disaster mitigation plans and projects. Available to Alaska communities after a presidentially declared disaster has occurred in Alaska, administered by Alaska DHS&EM.	Project-specific.
Homeland Security Preparedness Technical Assistance Program	FEMA/DHS	Supports preparedness technical assistance activities in support of the four homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.	Project-specific.
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.	Project-specific.

**Table 17. Financial Resources for Hazard Mitigation**

Type	Administrator	Purpose	Amount
Land and Water Conservation Funds	U.S. Department of the Interior	Supports the protection of federal public lands and waters and voluntary conservation on private land.	Project-specific.
Community Action for a Renewed Environment	U.S. EPA	Offers financial and technical assistance offers an innovative way for a community to organize and take action to reduce toxic pollution (e.g., stormwater) in its local environment. Through this program, a community creates a partnership that implements solutions to reduce releases of toxic pollutants and minimize people's exposure to them.	Project-specific.
Clean Water State Revolving Fund	U.S. EPA	Provides low-cost financing to eligible entities on state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects.	Variable.
Flood Control and Coastal Emergencies	USACE	Authorizes the USACE under PL 84-99, Flood Control and Coastal Emergencies for emergency management activities. Under PL 84-99, the Chief of Engineers, acting for the Secretary of the Army, to undertake activities including disaster preparedness, advance measures, emergency operations (flood response and post flood response), rehabilitation of flood control works threatened or destroyed by flood, protection or repair of federally authorized shore protective works threatened or damaged by coastal storm, and provisions of emergency water due to drought or contaminated sources.	Project-specific.
The Cooperative Watershed Management Program	U.S. Department of the Interior Bureau of Reclamation	Supports WaterSMART strategy by providing funding to watershed groups to encourage diverse stakeholders to form local solutions to address their water management needs. Funding is provided on a competitive basis for watershed group development and watershed restoration planning and implementation of watershed management projects.	Project-specific.
Weatherization Assistance Program	U.S. Department of Energy (DOE)	Reduces energy costs for low-income households by increasing the energy efficiency of their homes. It is the nation's single largest residential whole-house energy efficiency program. The program works through local weatherization agency. Once DOE awards the grants, states contract with more than 700 local agencies nationwide to deliver services. All work is energy-related, and does not include new roofing, siding, or similar structural improvements. The average expenditure is \$6,500 per home.	\$6,500 per project

**Table 17. Financial Resources for Hazard Mitigation**

Type	Administrator	Purpose	Amount
Renewable Energy Fund (REF)	Alaska Energy Authority	Provides funding for the development of qualifying and competitively selected renewable energy projects in Alaska. The program is designed to produce cost-effective renewable energy for both heat and power. For Fiscal Year (FY) 2019, \$11 million has been allocated by the governor to fund the REF. This program runs through 2023.	Project-specific.
Wood Innovation Program	U.S. Department of Agriculture	Created to substantially expand and accelerate wood energy and wood products markets throughout the United States to support forest management needs. A minimum of a 50% of the total eligible costs must come from a non-federal source. In FY 2018, \$8 million in federal funding was awarded to fund 34 projects.	Project-specific.

**Table 18. Legal and Regulatory Resources for Hazard Mitigation**

Name	Description	Hazards Addressed
Comprehensive Plan	Road map for community change	Physical environment and community history include: severe weather, erosion/coastal storm surge, wildfire
Land Use Plan	Guides local permitting process	All
Emergency Response Plan	Guides emergency response	All
Building Code	Defines safe building practices ensuring long-term community goals are not threatened	All
Zoning Ordinances	The CBW can exercise this authority	
Subdivision and special purpose ordinances	The CBW can exercise this authority	

## 5.2 NFIP PARTICIPATION

The City and Borough of Wrangell no longer participates in the National Flood Insurance Program. The City and Borough of Wrangell does not have a repetitive flood property inventory that meets NFIP criteria as the loss thresholds are substantially below FEMA values.

## 5.3 MITIGATION GOALS

Mitigation goals are defined as general guidelines that explain what a community wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide vision. For the 2020 MJHMP, the overarching goal is for Wrangell to be a disaster resilient community. A disaster resilient community is able to prepare for, respond to, and recover from adverse hazards and disasters. According to laresilience.org, “in the resilience framework, less emphasis is placed on traditional, individually focused preparedness efforts... building community resilience is really about making communities stronger.”

## 5.4 POTENTIAL MITIGATION ACTIONS AND PROJECTS

Mitigation actions and projects help achieve the goals of the Mitigation Plan. Potential mitigation actions to be considered are listed below in Table 19. This list addresses every hazard profiled in this plan and is based on the plan’s risk assessment as well as lessons learned from recent disasters. It was developed using: FEMA success stories and best management practices; FEMA job aids; local and regional plans and reports; and input from subject matter experts and guided by the Wrangell planning team.

The committee determined that high priority activities are essential to remedy or prevent a major health/safety hazard. They meet FEMA HMA grant criteria, including project eligibility, benefit-cost, and performance period. Medium activities are important in building a culture and practice of disaster resilience that will prevent new risks. They do not necessarily require and/or meet FEMA HMA grant criteria (but may qualify for other state and federal funds). Low priority projects still require further investigation toward developing a more comprehensive project idea. There are notes about project status from the legacy plan.

**Table 19. Potential Mitigation Actions and Projects**

Hazard	Description	Pros	Cons	Priority	Legacy HMP Status
Multiple	Develop a public outreach and education programs regarding potential hazard impacts and personal planning preparations (annual health fair, educational fliers, school visits, high school senior project, hazard awareness week).	Life/Safety issue Risk reduction Benefit to entire community Inexpensive	Staff time	High	Not completed: Staff acquiring funding and resources.
Multiple	Develop a list of internal and external suppliers of equipment, supplies (batteries, shovels etc.), medical supplies (i.e. voluntary registry of equipment such as earthmoving, generators, etc.).	Life/Safety issue Risk reduction Benefit to entire community Inexpensive	Staff time	Medium	
Multiple	Develop or refine local emergency announcement procedures and back up plans.	Life/Safety issue Risk reduction Benefit to entire community Inexpensive	Staff time	Medium	
Multiple	Obtain and install a Siren Warning system to alert for various emergencies or disasters	Life/Safety issue/Risk reduction Benefit to entire community Federal and State assistance available	Staff time, >\$50,000	High	Not completed: Staff acquiring funding and resources.
Multiple	Develop and install a signage program for hazards posted at key facilities or locations.	Life/Safety issue Risk reduction Benefit to entire community	Staff time, >\$5,000	Medium	
Multiple	Develop alternative water sources: Investigate further feasibility of Sunrise Lake; Consider Desalination; Investigate SMB water supply and hooking into existing system; Explore water opportunities from Institute Creek, the 6.5 mile mill creek for emergency use and hooking into existing system	Risk and damage reduction. Benefit to entire community.	Staff time. Research into feasibility necessary. Potentially expensive	Medium	

**Table 19. Potential Mitigation Actions and Projects**

Hazard	Description	Pros	Cons	Priority	Legacy HMP Status
Earthquake	Complete Dam stabilization and replacement	Life/Safety Issue Benefit to entire community Federal funding may be available	Expensive, at least \$500,000	Medium	
Earthquake	Integrate hazard construction methodologies into newly constructed infrastructure and public buildings.	Benefit to entire community Risk reduction	Staff time	High	
Earthquake	Identify buildings and facilities that must be able to remain operable during and following an earthquake event.	Life/Safety issue/Risk reduction Benefit to entire community Inexpensive State assistance available	Staff time	High	Not completed: Staff acquiring funding and resources.
Earthquake	Contract a structural engineering firm to assess the identified buildings and facilities to determine their structural integrity and devise a strategy to improve their earthquake resistance.	Benefit to entire community Risk reduction	Feasibility and need analysis needed. 1 – 5 years	Medium	Not completed: Staff acquiring funding and resources.
Flood and Erosion	Provide public awareness and response education for residents within the potential flood impact zone of the reservoir dams	Benefit to entire community Risk reduction	Staff time	Medium	
Flood and Erosion	Develop a storm Water management plan for sheet flood prone areas of town	Life/Safety issue/Risk reduction Benefit to entire community Federal and State assistance available	Staff time, >\$50,000	Low	
Ground Failure	Continued public education.	Life/Safety issue/Risk reduction Benefit to entire community	Mapped landslide zones do not exist at this time.	High	Not completed: Staff acquiring funding and resources.

**Table 19. Potential Mitigation Actions and Projects**

Hazard	Description	Pros	Cons	Priority	Legacy HMP Status
		Federal and State assistance available			
Ground Failure	Conduct studies of unstable soils	Life/Safety issue/Risk reduction Benefit to entire community Federal and State assistance available	Mapped landslide zones do not exist at this time. 5+ years to implement	High	Not completed: Staff acquiring funding and resources.
Tsunami	Siren and lights at both ends of town for Tsunami and other hazardous warnings	Life/Safety Project	Staff time, >\$50,000	High	
Tsunami	Inundation Mapping	Life/Safety Issue Benefit to entire community Federal funding may be available	Expensive, at least \$100,000	Medium	Not completed: Staff acquiring funding and resources.
Tsunami	Update Wrangell's Emergency Operations Plan, as needed	Life/Safety issue/Risk reduction Benefit to entire community Inexpensive State assistance available 1 – 5 years, or as needed.	Staff time	Medium	Not completed: Staff acquiring funding and resources.
Volcanic Ash	Provide adequate supplies of breathing apparatus for vulnerable populations, first responders, and critical facility crews.	Life/Safety issue/Risk reduction Inexpensive	Staff time, >\$50,000	Medium	
Volcanic Ash	Determine needs of equipment that may be needed during an event to assure its continued and safe operation	Life/Safety issue/Risk reduction Inexpensive	Staff time	Medium	
Severe Weather	Research and consider instituting the National Weather Service program of "Storm Ready".	Life/Safety issue Risk reduction Benefit to entire community	Staff time	High	Not completed: Staff acquiring funding and resources.

**Table 19. Potential Mitigation Actions and Projects**

Hazard	Description	Pros	Cons	Priority	Legacy HMP Status
		Inexpensive State assistance available			
Severe Weather	Increase water storage capacity: Dredge existing reservoirs and perform stump removal; Install a bypass line to the upper reservoir	Life/Safety Issue Benefit to entire community Federal funding may be available	Expensive, at least \$100,000	Medium	
Severe Weather	Increase back up power generation: Purchase Generators to provide enough back up power to provide essential services and sustain community; Purchase portable generating units for needs for vulnerable populations (elders, medical); Purchase portable generating units for essential services; Explore alternative power sources such as wind and solar for emergency services; Work with Alaska Dept. of Transportation to purchase back-up generator for the airport	Life/Safety Issue Benefit to entire community Federal funding may be available	Expensive, at least \$100,000	Medium	
Severe Weather	Encourage weather resistant building construction materials and practices.	Risk and damage reduction. Benefit to entire community.	May require ordinance change. Potential for increased staff time. Research into feasibility necessary. Political and public support not determined. 1 – 5 year implementation	Medium	Not completed: Staff acquiring funding and resources.
Wildland Fire	Develop a local coordinated response and communication channel with the USFS.	Life/Safety issue/Risk reduction Inexpensive	Staff time	Low	



**Table 19. Potential Mitigation Actions and Projects**

Hazard	Description	Pros	Cons	Priority	Legacy HMP Status
Wildland Fire	Develop a local Smokey Bear awareness campaign with the USFS to educate against fires and mitigate fire threats	Life/Safety issue/Risk reduction Inexpensive Benefit to entire community	Staff time	Medium	
Wildland Fire	Develop, adopt, and enforce burn ordinances that control outdoor burning, require burn permits and restricts open campfires during identified weather periods (wind, dry etc.)	Life/Safety issue Risk reduction Benefit to entire community Inexpensive	Staff time	High	

## 5.5 MITIGATION ACTION PLANS

A mitigation action plan is a prioritized list of proposed mitigation projects and actions that a community hopes to implement to reduce its' risks and vulnerabilities. The 2020 mitigation action plan is shown in Table 20. Based on the prioritization criteria developed for Table 19, medium and high priority projects were selected for the mitigation action plan. These prioritized projects are to be pursued by CBW, WCA, and the CCTHITA over the next five years.

**Table 20. Mitigation Action Plan**

Description	Jurisdiction	Potential Funding	Timeframe	Priority
Develop a public outreach and education programs regarding potential hazard impacts and personal planning preparations (annual health fair, educational fliers, school visits, high school senior project, hazard awareness week).	Borough, Tribes DCRA DHS&EM	Borough DCRA DHS&EM	<1 year	High
Develop a list of internal and external suppliers of equipment, supplies (batteries, shovels etc.), medical supplies (i.e. voluntary registry of equipment such as earthmoving, generators, etc.).	Borough, Tribes	Borough and Tribal Budget	Ongoing	Medium
Develop or refine local emergency announcement procedures and back up plans.	Borough, Tribes DCRA DHS&EM	Borough and Tribal Budget	Ongoing	Medium
Obtain and install a Siren Warning system to alert for various emergencies or disasters	Borough DCRA DHS&EM	HMGP grant	2-3 years	High
Develop and install a signage program for hazards posted at key facilities or locations.	Borough	Borough and Tribal Budget	>1 year	Medium
Develop alternative water sources: Investigate further feasibility of Sunrise Lake; Consider Desalination; Investigate SMB water supply and hooking into existing system; Explore water opportunities from Institute Creek, the 6.5 mile mill creek for emergency use and hooking into existing system	Borough DCRA DHS&EM	HMGP grant	3-5 years	Medium
Complete Dam stabilization and replacement	Borough	Flood Control and Coastal Emergencies funding	3-5 years	Medium
Integrate hazard construction methodologies into newly constructed infrastructure and public buildings.	Borough	Borough and Tribal Budget	>1 year	High
Identify buildings and facilities that must be able to remain operable during and following an earthquake event.	Borough DHS&EM FEMA	State Grants	>1 year	High

**Table 20. Mitigation Action Plan**

Description	Jurisdiction	Potential Funding	Timeframe	Priority
Contract a structural engineering firm to assess the identified buildings and facilities to determine their structural integrity and devise a strategy to improve their earthquake resistance.	Borough DHS&EM	State Grants PDM	1-2 years	Medium
Provide public awareness and response education for residents within the potential flood impact zone of the reservoir dams	Borough	Borough and Tribal Budget	>1 year	Medium
Continued public education.	Borough, Tribes	Borough and Tribal Budget	Ongoing	High
Conduct studies of unstable soils	Borough DHS&EM	State Grants PDM	>1 year	High
Siren and lights at both ends of town for Tsunami and other hazardous warnings	Borough DHS&EM	PDM or HMGP State DHS&EM/ NOAA (NTHMP), State DHS&EM / Homeland Security Grants	>1 year	High
Inundation Mapping	State DHS&EM NOAA/NTHMP	NOAA/NTHMP	>5 years	Medium
Update Wrangell's Emergency Operations Plan, as needed	Borough	DHS&EM/local funds	As needed	Medium
Provide adequate supplies of breathing apparatus for vulnerable populations, first responders, and critical facility crews.	Borough	Borough and Tribal Budget	>1 year	Medium
Determine needs of equipment that may be needed during an event to assure its continued and safe operation	Borough	Borough and Tribal Budget	>1 year	Medium
Research and consider instituting the National Weather Service program of "Storm Ready".	Borough NWS	Borough and Tribal Budget	<1 year	High
Increase water storage capacity: Dredge existing reservoirs and perform stump removal; Install a bypass line to the upper reservoir	Borough DHS&EM	Flood Control and Coastal Emergencies funding	2-3 years	Medium
Increase back up power generation: Purchase Generators to provide enough back up power to provide essential services and sustain community; Purchase portable generating units for needs for vulnerable populations (elders, medical); Purchase portable generating units for essential services; Explore alternative power sources such as wind and solar for emergency services; Work with Alaska Dept. of Transportation to purchase back-up generator for the airport	Borough DHS&EM	HMGP grant/Assistance to Firefighters Grant Program grants	2-3 years	Medium
Encourage weather resistant building construction materials and practices.	Borough	Borough and Tribal Budget	<1 year	Medium

**Table 20. Mitigation Action Plan**

Description	Jurisdiction	Potential Funding	Timeframe	Priority
Develop a local Smokey Bear awareness campaign with the USFS to educate against fires and mitigate fire threats	Borough USFS	Borough and Tribal Budget	<1 year	Medium
Develop, adopt, and enforce burn ordinances that control outdoor burning, require burn permits and restricts open campfires during identified weather periods (wind, dry etc.)	Borough	Borough and Tribal Budget	Ongoing	High

## 5.6 PLAN INTEGRATION

After MJHMP adoption, each planning team member will strive to that the MJHMP, in particular each mitigation action project, is incorporated into existing planning mechanisms such as their Comprehensive Plan, Economic Development or Business Plan, and Bureau of Indian Affairs Indian Reservation Roads Plan, as well as seeking other integration opportunities where appropriate. The MJHMP planning team will achieve this by undertaking the following activities.

- Review city and tribal regulatory tools to determine where to integrate the mitigation philosophy and implementable initiatives within current and future planning mechanisms.
- Work with pertinent community entities to implement MJHMP philosophies and mitigation strategy initiatives (including the MAP) into relevant current and future planning mechanisms (i.e. Comprehensive Plan, Economic Development Plan, Capital Improvement Project List, Transportation Improvement Plan, etc.).

## 5.7 PROGRESS IN LOCAL MITIGATION EFFORTS

The City and Borough of Wrangell's Capital Improvement Projects list (Table 21) contains data for Fiscal Year 2017 – 2018 data. The Tribes did not participate in the legacy HMP.

**Table 21. Proposed Wrangell Capital Budget Requests**

Project Description	State Request Amt.	Total Project Amt.	State or Federal	Status
Shoemaker Bay Float - Construction	5,000,000	10,000,000	State	Priority #1 in Governor's capital budget for State Harbor funding for FY 2018
Water Treatment Plant Improvements	13,000,000	13,000,000	State/ Federal	Undefined
Water Main Distribution System Replacement, Phase 1 - updated costs based on existing funding in place vs. shortfall	500,000	1,000,000	State/ Federal	DEC Loan paperwork underway; DEC MMG received.
Fire Engine/Pumper	275,000	275,000	--	Undefined
Pool Facility Improvements (Pool Roof, Mechanical, Remodel) Phase I	--	2,000,000	State/ Federal	Assessment completed

**Table 21. Proposed Wrangell Capital Budget Requests**

Project Description	State Request Amt.	Total Project Amt.	State or Federal	Status
Wrangell Medical Center Design and Construction	--	35,000,000	State	Undefined
Wrangell Boat Yard Improvements - Final Improvements	4,200,000	4,200,000	State/ Fed	Undefined
Public Safety Building Renovations	950,000	950,000	State/ Federal	Undefined
Ozone Generator Replacement - DELETE Pursuing purchase now	300,000	300,000	State/ Federal	DEC Loan paperwork underway
Water Main Distribution System Replacement, Phase 2 (Zimovia Highway)	1,583,560	2,262,229	State	Undefined
Back-up Diesel Generation	2,700, 000	2,700, 000	--	Undefined
Ash Street/Lemiux Watermain Replacement	1,000,000	1,000,000	--	AK Rural Water Utilities completed assessment; DEC loan application 1/17
Community Center Life & Safety Improvements (phase II) Fire System upgrades	250,000	2,715,000	State/ Federal	Phase I design is complete. Condition Assessment is complete.
SCBA's for personal Protective Equipment	60,000	83,700	--	Undefined

## 6 REFERENCES

This section provides a comprehensive reference list used to develop the MJHMP.

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## 7 PLAN ADOPTION

Section 7 – Plan Adoption addresses Element E of the Local and Tribal Mitigation Plan Regulation Checklist.

Regulation Checklist – 44 CFR 201.6 Local Mitigation Plans
<b>Element E: Plan Adoption</b>
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5)) E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))
Regulation Checklist – 44 CFR 201.7 Tribal Mitigation Plans
<b>Element E: Plan Adoption</b>
E1. Does the plan include assurances that the tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, including 2 CFR Parts 200 and 3002, and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes? [44 CFR § 201.7(c)(6)] E2. Does the plan include documentation that it has been formally adopted by the governing body of the tribal government requesting approval? [44 CFR § 201.7(c)(5)]

### 7.1 JURISDICTIONAL ADOPTION

The 2020 City and Borough of Wrangell Multi-Jurisdictional Hazard Mitigation Plan was formally adopted by the City and Borough of Wrangell Assembly via resolution on [To be completed]. A scanned copy of the resolution follows this page. It will also be kept on file with City and Borough of Wrangell and additional copy will be sent to DHS&EM and FEMA.

### 7.2 TRIBAL GOVERNMENT ADOPTION

All tribal governments will comply with applicable federal statutes and regulations in effect, with regard to any grants or funding awarded to the Tribe for mitigation actions.

The 2020 City and Borough of Wrangell Multi-Jurisdictional Hazard Mitigation Plan was formally adopted by the Wrangell Cooperative Association Tribal Council via resolution on [To be completed]. A scanned copy of the resolution follows this page. It will also be kept on file with Wrangell Cooperative Association Tribal Council and additional copy will be sent to DHS&EM and FEMA.

The 2020 City and Borough of Wrangell Multi-Jurisdictional Hazard Mitigation Plan was formally adopted by the Central Council of the Tlingit and Haida Indian Tribes of Alaska via resolution on [To be completed]. A scanned copy of the resolution follows this page. It will also be kept on file with Central Council of the Tlingit and Haida Indian Tribes of Alaska and additional copy will be sent to DHS&EM and FEMA.



## Adoption Resolutions

## **APPENDIX A – PUBLIC PARTICIPATION AND PLANNING PROCESS DOCUMENTATION**

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Item b.

[Contact Us](#)

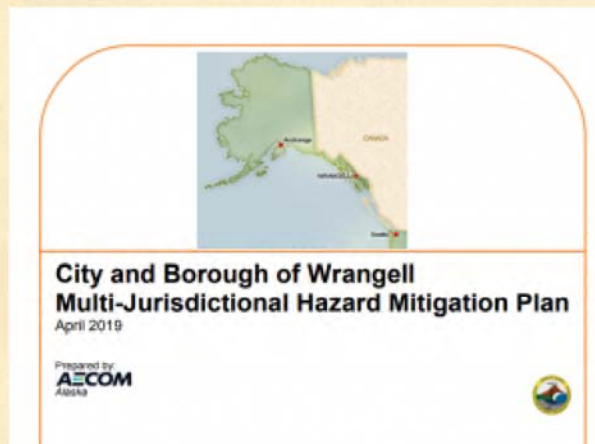
The City and Borough of  
**Wrangell** Alaska



## Planning and Zoning

[Home](#)

# Multi Jurisdictional Hazard Mitigation Plan








In January, 2019, an initial draft of the proposed Hazard Mitigation Plan was made available for review and comments. The Borough's initial comments are listed below, but at the time, staff were still working on the Critical Facility Hazard spreadsheet which provides much of the data for Chapter 6 Vulnerability Assessment and Chapter 7 Mitigation Impacts.

The Planning and Zoning Commission is holding a Special Meeting for public input on the plan and to discuss any changes or additions. The public is encouraged to attend.

Please review the report and if you have questions or comments, please contact Carol Rushmore at 907-874-2381 or [ecodev@wrangell.com](mailto:ecodev@wrangell.com). Comments should be submitted by June 10.

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## Supporting Documents

-  [Draft comments submitted for review to AECOM 7-3-19 \(17 MB\)](#)
-  [DRAFT Hazard Mitigation Plan April 2019 \(10 MB\)](#)
-  [Critical Facility Spreadsheet 3-27-19 \(47 KB\)](#)
-  [Recommended Hazard Mitigation Actions 3-12-19 \(19 KB\)](#)
-  [Draft comments submitted for review to AECOM 1-14-19 \(17 MB\)](#)

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Item b.

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Public Works

**P.O. Box 531 | Wrangell, AK 99929 | 907-874-2381**

**City Hall Hours: 9:00am to 4:00pm**

From: [Simmons, Scott](#)  
 To: ["sally.cox@alaska.gov"](#); ["jimmy.smith@alaska.gov"](#); ["twolf@denali.gov"](#); ["callard@denali.gov"](#); ["rick.dembroski@alaska.gov"](#); ["mike.johnson@alaska.gov"](#); ["scott.nelsen@alaska.gov"](#); ["eli.ward@alaska.gov"](#); ["deanne.stevens@alaska.gov"](#); ["kathryn.pyne@alaska.gov"](#); ["sheri.gray@alaska.gov"](#); ["paul.khera@alaska.gov"](#); ["dan.monteleeone@alaska.gov"](#); ["john.clendenin@alaska.gov"](#); ["michael.angove@noaa.gov"](#); ["louise.fode@noaa.gov"](#); ["aimée.fish@noaa.gov"](#); ["amy.holman@noaa.gov"](#); ["kyle.wright@tanachiefs.org"](#); ["djnicolsky@alaska.edu"](#); ["naruppert@alaska.edu"](#); ["Kenneth.J.Eisses@usace.army.mil"](#); ["scott.crockett@ak.usda.gov"](#); ["brett.nelson@ak.usda.gov"](#); ["ann.Y.gravier@hud.gov"](#); ["jconaway@usgs.gov"](#); ["adevaris@usgs.gov"](#); ["janet.schaefer@alaska.gov"](#); ["robin.bronen@akijp.org"](#); ["denise.pollock@akijp.org"](#); ["essmith@anthc.org"](#); ["kwallace@usgs.gov"](#); ["swhite@avcp.org"](#); ["steve.heppner.bia.ak@gmail.com"](#); ["terri.lomax@alaska.gov"](#); ["Soderlund.Dianne@epamail.epa.gov"](#); ["joel.curtis@noaa.gov"](#); ["sam.albanese@noaa.gov"](#); ["meg.mueller@ak.usda.gov"](#); ["merlaine.kruse@ak.usda.gov"](#); ["patty.burns@alaska.gov"](#); ["margie.goatley1@alaska.gov"](#); ["khoward@blm.gov"](#); ["nicole.kinsman@noaa.gov"](#); ["bruce.r.sexaur@usace.army.mil"](#); ["mtavelton@usace.army.mil"](#); ["steve.mcgroarty@alaska.gov"](#); ["megan.kohler@alaska.gov"](#); ["jade.gamble@alaska.gov"](#); ["essmith@anthc.org"](#); ["kwallace@usgs.gov"](#); ["swhite@avcp.org"](#); ["steve.heppner.bia.ak@gmail.com"](#); ["jimmy.smith@alaska.gov"](#); ["terri.lomax@alaska.gov"](#); ["Soderlund.Dianne@epamail.epa.gov"](#); ["joel.curtis@noaa.gov"](#); ["sam.albanese@noaa.gov"](#); ["meg.mueller@ak.usda.gov"](#); ["merlaine.kruse@ak.usda.gov"](#); ["ak\\_le@fws.gov"](#); ["eddie.zingone@noaa.gov"](#); ["patty.burns@alaska.gov"](#); ["margie.goatley1@alaska.gov"](#); ["khoward@blm.gov"](#); ["nicole.kinsman@noaa.gov"](#); ["bruce.r.sexaur@usace.army.mil"](#); ["mtavelton@usace.army.mil"](#); ["steve.mcgroarty@alaska.gov"](#); ["megan.kohler@alaska.gov"](#); ["jade.gamble@alaska.gov"](#)  
 Cc: [Evans, Jessica \(jessica.evans@aecom.com\)](#); [Rabon, Angel](#); [Cogger, Corinne](#); [Volper, Kaley](#)  
 Subject: Hazard Mitigation Project Agency Involvement Participant Invitation Letter  
 Date: Friday, February 02, 2018 11:38:00 AM  
 Attachments: [image003.png](#)

Dear Potential HMP Development Participants,  
 AECOM (formerly URS) has received a 2014 contract from the State Division of Homeland Security and Emergency Management (DHS&EM) to develop Local/Tribal Multi-Jurisdictional Hazard Mitigation Plans (MJHMPs) for the following communities: Each group defines the HMP type and targeted communities.

The following communities' do not currently have an HMP. These communities will develop plans that meet FEMA's current MJHMP requirements:

#### **New MJHMP and Tribal HMP Development**

- ***Organized Cities with Co-Located Villages***

- Gustavus (2nd Class City)
- Manokotak (2nd Class City with Tribal Village)
- Tenakee Springs (2nd Class City)

The following communities' currently have expired HMPs. These communities will have their plans updated from HMP to MJHMPs to meet current FEMA city and tribal requirements:

#### **MJHMP/Tribal HMP Updates Required**

- ***Organized Cities with Co-Located Native Villages***

- Anvik (2<sup>nd</sup> Class City with Native Village)
- Seward (2<sup>nd</sup> Class City with Native Village)

#### **Borough HMPs converted to MJHMP Update Required**

- The City and Borough of Wrangell's (CBW) legacy HMP includes two-collocated villages. CBW's HMP is currently expired. CBW's HMP will be

converted to meet FEMA's Multi-Jurisdictional Plan requirements with each Tribe receiving separate Tribal HMPs within CWB's MJHMP to meet current FEMA city and tribal requirements.

- The Aleutians East Borough's (AEB) legacy HMP includes six organized cities and their collocated villages. AEB's HMP is currently expired. AEB's HMP will be converted to meet FEMA's Multi-Jurisdictional Plan requirements with each constituent community and native village receiving separate HMPs within AEB's MJHMP to meet current FEMA requirements:

- ***AEB Organized Cities with Co-Located Villages***

- Akutan (2nd Class City with Tribal Village)
- Cold Bay (2nd Class City only)
- False Pass (2nd Class City with Tribal Village)
- King Cove (2nd Class City with 2-Tribal Villages)
- Nelson Lagoon (2nd Class City with Tribal Village)
- Sand Point (2nd Class City with 2-Tribal Villages)

We invite you to participate in this important community planning effort during the development process. Community newsletters will be located on the DHS&EM Local/Tribal All Hazard Mitigation Plan Development website at:

<https://ready.alaska.gov/plans/localhazmitplans> as the communities finalize them.

Please feel free to contact me and to forward this email to the most appropriate person within your agency involved with hazard assessments, hazard mitigation plan development or community specific hazard information or planning suggestions. (Please cc me so I may update the contact list)

I encourage you to acknowledge receiving this invitation at your earliest convenience to allow me to include your participation (with appropriate acknowledgments) within the Draft and Final HMPs prior to State and FEMA review and subsequent approvals.

Kind Regards  
-Scott-



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Senior Emergency Management Planner

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# CITY AND BOROUGH OF WRANGELL

## LEGACY 2009 HAZARD MITIGATION PLAN UPDATE

Newsletter #1

December 2018

*This newsletter describes the City and Borough of Wrangell's Hazard Mitigation Plan Update project development processes to all interested agencies, stakeholders, and the public; and to solicit plan update comments.*

The State of Alaska, Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management (DHS&EM) was awarded a Pre-Disaster Mitigation Program grant from the Federal Emergency Management Agency (FEMA) to update your legacy 2009 Hazard Mitigation Plan (HMP) and convert it into a Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) that includes both collocated City and Tribal governments.

AECOM was contracted to assist the City and Borough of Wrangell with converting your 2009 HMP into a 2018 FEMA approvable Multi-Jurisdictional HMP (MJHMP).

The MJHMP will identify all natural hazards, such as earthquake, flood, ground failure, severe weather, drought, and wildland fire hazards, etc. The plan will also identify the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts. The public participation and planning process is documented as part of these projects.

### What is Hazard Mitigation?

Hazard mitigation projects eliminate the risk or reduce the hazard impact severity to people and property. Projects may include short- or long-term activities to reduce exposure to or the effects of known hazards. Hazard mitigation activities include relocating or elevating buildings, replacing insufficiently sized culverts, using alternative construction techniques, or developing, implementing, or enforcing building codes, and education.

### Why Do We Need to Update the HMP?

Communities must have a current State, FEMA approved, and community adopted updated mitigation plan to receive a project grant from FEMA's pre- and post-disaster grants identified in their Hazard Mitigation Assistance Guides as well as for other agency's mitigation grant programs.

A FEMA approved and community adopted MJHMP enables the Local, collocated Tribal governments and other participating jurisdictions to apply for the Hazard Mitigation Grant Program (HMGP), a disaster related assistance program; the Pre-Disaster Mitigation (PDM), and the National Flood Insurance Program (NFIP) Flood Insurance Assistance (FIA) grant programs.

### The Planning Process

There are very specific federal requirements that must be met when preparing a FEMA approvable MJHMP. These requirements are commonly referred to as the Disaster Mitigation Act of 2000, or DMA2000 criteria. Information about the criteria and other applicable laws and regulations may be found at: <http://www.fema.gov/mitigation-planning-laws-regulations-guidance>.

The DMA2000 requires the updated HMP to include and document the following topics:

- ❑ New Planning Team membership and processes
- ❑ HMP update participation and plan reviewers,
- ❑ Identify new hazards not formerly addressed,
- ❑ Explain how your hazard impacted you since adoption and implementation,
- ❑ Identify new, existing, and future critical facilities were or may be impacted by known hazards,
- ❑ Determine their "estimated" replacement costs,
- ❑ Define the community's population risk and critical facility vulnerabilities,
- ❑ Review current, and update existing hazard mitigation goals as needed to better meet needs,
- ❑ Determine each project's current status within the Mitigation Strategy. Were they completed, deleted, delayed, combined/changed, or still viable and ongoing? Also provide a brief explanation for any changes.
- ❑ Update the MJHMP Maintenance section to reflect how the (City, Village, or Borough) completed legacy HMP annual review commitments, integrated HMP components into community planning mechanisms, and identify whether it was effective or not. Then update the process to make it more effective for future use.
- ❑ Provide a copy of the community's new MJHMP Adoption Resolution

FEMA has prepared Local and Tribal Planning Guidance (respectively available at: <https://www.fema.gov/hazard-mitigation-planning-resources>); that explains how the legacy MJHMP Update meets DMA2000 requirements.

We are currently in the very beginning stages of preparing the MJHMP update. We will be conducting a Planning

Team Meeting to introduce the project and planning team, to gather comments from community residents update hazards lists, and collect data to refine the vulnerability assessment.

### We Need Your Help

Please use the following table to confirm the hazards AND identify new hazards not formerly addressed.

**2018 CBW Hazard Identification Worksheet**

Hazard	2009 HMP	Still Valid
<b>Previously Identified and Profiled</b>		
Earthquake (EQ)	Yes (L)	Yes
Flood (Erosion) (FL)	Yes (L)	Yes
Ground Failure (GF) Avalanche, Landslide, Melting Permafrost, and/or Subsidence	Yes (M)	Yes
Weather (WX), Severe Winter storms, rain, snow, drought, etc.	Yes (M)	Yes
Tsunami & Seiche (TS)	Yes (L)	Yes
Volcanic Ash (VO)	No	Yes
Wildland Fire (WF)	Yes (M)	Yes

### Critical Facilities Hazard Location Determination Item b.

The legacy 2009 HMP identified critical facilities within the Wrangell area, but the list needs to be reviewed and updated and the estimated value and location (latitude/longitude) determined.

In addition, the number and value of structures, and the number of people living in each structure will need to be documented. Once this information is collected we will determine which critical facilities, residences, and populations are vulnerable to specific hazards in Wrangell. Please review and update the facilities list to assist us with better defining your vulnerabilities and potential losses. Please add additional facilities not included on the critical facilities spreadsheet we have included with this newsletter.

Please email or fax updated hazard and critical facility information directly to AECOM or provide it to Ms. Lisa Von Barga, your community Planning Team Leader.

### The Planning Team

The planning team is being led by Borough Manager Lisa Von Barga with assistance from Borough Mayor Steve Prysunka, Vice Mayor Patty Gilbert, Economic Development Director Carol Rushmore, Facility Maintenance Director Amber Al-Haddad, the Wrangell Coop Association's Ester Ashton, and the Tlingit and Haida Indian Tribes President Richard Peterson, and AECOM (contracted by DHS&EM) providing assistance and guidance to the planning team throughout the planning process.

### Public Participation

Public involvement will continue throughout the project. The goal is to receive comments, identify key issues or concerns, and improve mitigation ideas and to guide the community.

*We encourage you to take an active part in preparing the City and Borough of Wrangell Hazard Mitigation Plan development effort. The purpose of this newsletter is to keep you informed and to allow you every opportunity to voice your opinion regarding these important projects. Please contact your community HMP Team Leader or Scott Simmons, AECOM directly if you have any questions, comments, or requests for more information:*

#### City and Borough of Wrangell Planning Team Leader

Lisa Von Barga  
PO Box 531  
Wrangell, AK 99929  
Phone: 874.2381  
eMail: [lvonbarga@wrangell.com](mailto:lvonbarga@wrangell.com)

#### AECOM

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Emergency Management Planner  
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Anchorage, Alaska 99501  
907.261.9706 or 800.909.6787  
eMail: [scott.simmons@aecom.com](mailto:scott.simmons@aecom.com)

#### DHS&EM

Mike Johnson  
State Hazard Mitigation Planner  
PO Box 5750  
Anchorage, AK 99505-5750  
428.7055 or 800.478.2337  
[mike.johnson@alaska.gov](mailto:mike.johnson@alaska.gov)

**From:** [ecodev@wrangell.com](mailto:ecodev@wrangell.com)  
**To:** [Simmons, Scott](#)  
**Cc:** [Lisa Von Borgen](#); [Dorianne Sprehe](#); [WORK](#); [Amber Al-Haddad](#)  
**Subject:** CBW Hazard Mitigation Plan initial plan comments.  
**Date:** Monday, January 14, 2019 8:04:13 PM  
**Attachments:** [image004.png](#)  
[image003.png](#)  
[City SE Map Location GEN- a.jpg](#)

---

Scott,

I am providing a link to the document with comments we have thus far on the Hazard Mitigation Plan. The last version you had emailed was frm (it was too large to email)

Chapters 2, 3, 5 and 6 have been reviewed with comments, and Ch. 7 only minimally. It should be in Track Changes format. Until the planning team can meet together sometime in February to discuss some of these tables and how we want to prioritize and define issues, this is all I can provide right now. Also attached is the updated Spreadsheet, but pretty similar to the 12-8-18 version i had sent previously. There is some information that is being worked on and we are trying to get the valuation information but could not get it put together prior to mid January. Please let me know if you have any issues downloading. There are still some questions I have of some individuals, but to meet your deadline of mid January, here are our initial comments. I have also not been able to talk to the Esther at the Tribe regarding some of their resource capabilities as in Ch. 7 so will work with them in the near future as well.

<http://www.wrangell.com/planning/multi-jurisdictional-hazard-mitigation-plan>

Attached is also a locational map (figure 2.1) if you would like to use it.

Carol Rushmore

-----Original Message-----

**From:** "Simmons, Scott" <[scott.simmons@aecom.com](mailto:scott.simmons@aecom.com)>  
**Sent:** Monday, January 14, 2019 3:15pm  
**To:** "ecodev@wrangell.com" <[ecodev@wrangell.com](mailto:ecodev@wrangell.com)>  
**Subject:** RE: CBW Community Workgroup Meetings' Minutes

Thank you Carol

Kind Regards

-Scott-



R. Scott Simmons, CFM, CPM  
 Senior Emergency Management Professional

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**From:** ecodev@wrangell.com [mailto:ecodev@wrangell.com]  
**Sent:** Monday, January 14, 2019 3:14 PM  
**To:** Simmons, Scott  
**Subject:** RE: CBW Community Workgroup Meetings' Minutes

Scott,

I am trying to compile all the changes to get to you tomorrow, but as an FYI.. I was looking over the notes from our 11/27 and 11/28 meetings.

For 11/27 you say borough assembly members.. then list them as well as staff all underneath. the bold should be assembly members and staff

On the 11/28 notes... you have Borough Assembly members in bold then list the planning team, but there were no Assembly members present, so the bold should say City and Borough of Wrangell Planning Team members. and then the attached sign in sheet you attached for the 11/28 meeting was for 11/27 not the 11/28 meeting.

Carol

-----Original Message-----

**From:** "Simmons, Scott" <scott.simmons@aecom.com>  
**Sent:** Wednesday, January 9, 2019 3:25pm  
**To:** "Carol Rushmore" <ecodev@wrangell.com>  
**Subject:** RE: CBW Community Workgroup Meetings' Minutes

Thank you Carol,

I think is joint priority is the critical facility (GIS) data so we can begin the vulnerability assessment that you expressed as one your greatest needs.

Kind Regards  
-Scott-



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Senior Emergency Management Professional

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---

**From:** Carol Rushmore [mailto:ecodev@wrangell.com]  
**Sent:** Wednesday, January 09, 2019 3:19 PM  
**To:** Simmons, Scott  
**Cc:** 'Lisa Von Bargen'  
**Subject:** RE: CBW Community Workgroup Meetings' Minutes

Hi Scott,

We are trying to get you some comments by early next week on at minimum chapter 7, but will look at whatever we can. Bulk of our comments will likely be on the public draft. Trying to get some of the reviews consolidated to send to you. If you have an updated version from what we last have from November.. could you please forward that to me? Thank you.

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Economic Development Director  
City and Borough of Wrangell  
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[ecodev@wrangell.com](mailto:ecodev@wrangell.com)

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Follow us on Twitter: WrangellCVB  
Like "WrangellCVB" or "City and Borough of Wrangell" on Facebook

---

**From:** Simmons, Scott [mailto:scott.simmons@aecom.com]  
**Sent:** Friday, December 07, 2018 1:06 PM  
**To:** Carol Rushmore <ecodev@wrangell.com>  
**Subject:** RE: CBW Community Workgroup Meetings' Minutes

Hi Carol,

Yes, I remember all that we discussed. We had discussed a few times the contract ends in March. We have accomplished a lot and I believe I have made the few changes we discussed during our meetings.

Please keep in mind I have provided a good working draft; mark it up and send it back to me via postal or fax on the pages with mark-ups.

I will edit until Mid-January. I think you and I discussed how to simplify the critical facilities spreadsheet:

we will delete the GPS coordinates from the spreadsheet;

the "X's" will identify each facilities hazard threats;  
 structure replacement costs can be estimated (most of your planning team could easily help estimate their facilities replacement costs)  
 We will make narrative statements drafted in the Vulnerability Analysis section with the tables and the yellow highlighted text

There are only a few legacy 2009 HMP projects to determine their status (most would likely be deleted); we can make action statements from those you select as ongoing. CBW could select a few more realistic projects to implement that Wrangell has already identify within your CIP and community plans.

Is it accurate to state that CBW did not integrate any legacy 2009 HMP components within other community plans or processes?

The January plan will not be a final draft. Wrangell will have two to three weeks to review. I will then finalize the plan with your comments by Mid-February. It should take a short time to accept and approve the plan for FEMA submittal.

Please understand that State/FEMA reviews will also take time; e.g., State (30-day review) and FEMA (45-day review) minimum.

Kind Regards  
 -Scott-



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 Senior Emergency Management Professional

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---

**From:** Carol Rushmore [<mailto:ecodev@wrangell.com>]  
**Sent:** Friday, December 07, 2018 11:41 AM  
**To:** Simmons, Scott  
**Cc:** 'Lisa Von Borgen'; [rhowell@wrangell.com](mailto:rhowell@wrangell.com)  
**Subject:** RE: CBW Community Workgroup Meetings' Minutes

Hey Scott... you have in me in a panic as you never said anything before about needing to complete the draft by January. I had told you when you were here that the spreadsheet might not be completed until after the new year. Mid January is awfully soon based on the amount of work we need to do and the reviews required of not only the spreadsheet but also the draft plan itself. And is this the FINAL draft? Or just a draft update. With the holidays here and lots of folks traveling, myself included, I need to know to what extent/detail our review must be by then, because frankly, I can't guarantee we can give it the serious review it needs by end of month for you to have a final draft by mid January.

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Please check out our website at [www.wrangell.com](http://www.wrangell.com)  
Follow us on Twitter: WrangellCVB  
Like "WrangellCVB" or "City and Borough of Wrangell" on Facebook

---

**From:** Simmons, Scott [<mailto:scott.simmons@aecom.com>]  
**Sent:** Friday, December 07, 2018 11:06 AM  
**To:** Carol Rushmore <[ecodev@wrangell.com](mailto:ecodev@wrangell.com)>; 'Lisa Von Bargen' <[lvonbargen@wrangell.com](mailto:lvonbargen@wrangell.com)>; Amber Al-Haddad, work <[aal-haddad@wrangell.com](mailto:aal-haddad@wrangell.com)>; [rhowell@wrangell.com](mailto:rhowell@wrangell.com)  
**Cc:** [wcatrube@gmail.com](mailto:wcatrube@gmail.com); [rpaddock@ccthita-nsn.gov](mailto:rpaddock@ccthita-nsn.gov); [deptfob@ccthita.org](mailto:deptfob@ccthita.org)  
**Subject:** CBW Community Workgroup Meetings' Minutes

Good Morning,

My return home was smooth until I was awakened in the morning with the M7.0 shaker... our home had no structural damage, just a lot of things out of a few cabinets. Thankfully nothing broken.

I have attached copies of our meeting minutes for your review and a new newsletter for community distribution. Have you posted any public notices or discussed the HMP update activity within Wrangell Public meetings. If yes, please provide PDF copies for inclusion within the HMP's Public Outreach activities appendix.

Thank you for orchestrating the meetings, I pray they were useful.

Please return the critical facilities spreadsheet when completed. We don't need a lot of detail. Although street address can be sufficient, GPS coordinates will improve hazard identification if there are available GIS data to run against facility locations during future mitigation plan updates.



Please review the Section 7 Mitigation Strategy. We need to determine how to address the legacy 2009 HMP's action items listed within Table 7-9. They didn't really seem like projects, just items that need to be addressed. Those you desire to improve will need to be converted to action statements. I can easily edit those you desire to bring forward into the 2018 Mitigation Action Plan, Table 7-12.

Please also coordinate with WCA and CCTHITA concerning HMP contents, planning processes, identified hazards, critical facilities, and project review striving to confirm any culturally significant sites and potential projects they may desire to include within the HMP.

I must complete the draft plan by mid-January to fulfill contract deadlines, budget, and deliverables. Those are the last two sections I need to complete before I can send you a draft plan for community review.

Kind Regards

-Scott-



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Senior Emergency Management Professional

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**From:** [Carol Rushmore](#)  
**To:** ["Lisa Von Bargaen"; Amber Al-Haddad, work; rhowell@wrangell.com; "Dorianne Sprehe"; firechief@wrangell.com; Simmons, Scott; WCA; Doug McCloskey](#)  
**Subject:** Hazard Mitigation Spreadsheet  
**Date:** Monday, December 10, 2018 11:32:37 AM  
**Attachments:** [Wrangell CritFacil-HzrdSprdst 12-8-18.xlsx](#)  
[112618 CBW MJHMPMitStrtgySec-7.pdf](#)

---

Hey folks,

Attached is the updated DRAFT Hazard Mitigation Spreadsheet based on our discussion two weeks ago. I had a lot of notes after the meeting so very well could have missed something..... please track changes and save with date/your initials and send back to me when you get a chance. There is still much to do on this.... The x's are not filled in except for those hazards that we know will impact everything. We will also need evaluations and other data. Thanks so much for participating in that meeting because it made a huge difference. I also found out from Scott the end of last week that our deadline is now fast approaching. He has to complete the Draft Plan by mid January. I know we need to have another group session to discuss the draft plan itself - -especially the mitigation portion in chapter 7... but that will likely not be until just after the New Year due to everyone's travel schedules over Christmas. But I have attached it here if you can go through it and make any suggestions at all it would be helpful. Same thing... use track changes and save date/initials.

Call if you have any questions. Thanks everyone!

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Please check out our website at [www.wrangell.com](http://www.wrangell.com)  
 Follow us on Twitter: WrangellCVB  
 Like "WrangellCVB" or "City and Borough of Wrangell" on Facebook

**From:** [Carol Rushmore](#)  
**To:** [Simmons, Scott](#)  
**Cc:** [Amber Al-Haddad, work](#); ["Dorianne Sprehe"](#); ["Rolland Howell"](#); [Doug McCloskey](#); ["Lisa Von Bargaen"](#); [Greg Meissner](#)  
**Subject:** RE: updated hazard mitigation plan spreadsheet  
**Date:** Wednesday, February 20, 2019 8:48:56 AM  
**Attachments:** [image001.png](#)  
[0202019 CBW-WCA CritFacil-HzrdSprdst.xlsx](#)

---

Scott,

Attached is the most updated critical facilities spreadsheet. I have added it to the webpage also. We will continue to fill in the blanks. There could still be some additional facility tweaks, but this is the listing for now.

Per an earlier email regarding timeline, this is planned to go before Assembly at their 3/12 meeting. I am hoping there might be a workshop prior to the meeting but that has not yet been finalized.

Carol Rushmore  
 Economic Development Director  
 City and Borough of Wrangell  
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 Wrangell, AK 99929  
 907-874-2381

---

**From:** Simmons, Scott <[scott.simmons@aecom.com](mailto:scott.simmons@aecom.com)>  
**Sent:** Wednesday, February 20, 2019 8:09 AM  
**To:** Carol Rushmore <[ecodev@wrangell.com](mailto:ecodev@wrangell.com)>  
**Subject:** RE: updated plan

Thanks Carol,  
 I received both documents. You're a life saver!!!

Yes. I sent it only because you are so proficient and desire to edit the plan to assure it conveys Wrangell's hazard threats, vulnerabilities, and needs. I can count on one hand how many of the 200 plans had such skilled participants.

Yes...*it was indeed a major burp.*

I'm still awaiting our company's IT to assist with providing me file back-ups so I can meld what was missed with the work we have completed since. We no longer have an in-house IT person because they centralized and out-sourced it.

-Scott-



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Senior Emergency Management Professional

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---

**From:** Carol Rushmore [<mailto:ecodev@wrangell.com>]  
**Sent:** Tuesday, February 19, 2019 4:28 PM  
**To:** Simmons, Scott  
**Subject:** updated plan

The updated word version of the plan you sent me can be found at:

<http://www.wrangell.com/planning/multi-jurisdictional-hazard-mitigation-plan>

I will email you the updated spreadsheet in the morning with a few minor adjustments. We were not trying to duplicate pub works, Public safety building and wmlp.. but separate out the facilities for each. For example, there is a public works office. And then the utility barn where the rest of the crew work. The Public safety building has offices for DMV, court, police and then we were listing the fire Department under emergency response. Same type of thing for WMLight and power. Valuation for each except the public safety building are separate as well.. and will list the value under the offices. Will that work?

Carol Rushmore  
Economic Development Director  
City and Borough of Wrangell  
P.O. Box 531  
Wrangell, AK 99929  
907-874-2381

**From:** [Dmitry Nicolsky](#)  
**To:** [Simmons, Scott](#)  
**Subject:** Re: Wrangell Alaska Tsunami threat and info inquiry  
**Date:** Friday, November 02, 2018 11:32:59 AM  
**Attachments:** [ATT00001.png](#)  
[ATT00002.png](#)  
[ATT00003.png](#)

---

Hi Scott,

Please find my edits (in red) to your text below.

Thanks,

Dmitry

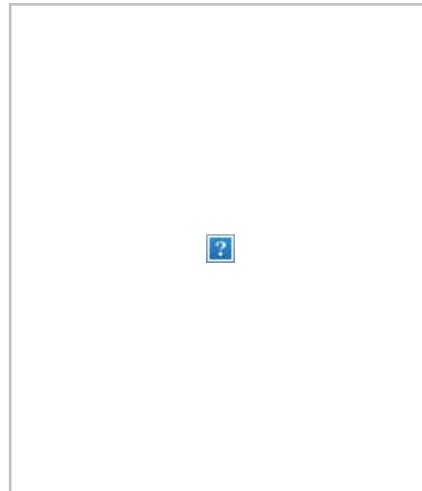
On 11/2/2018 11:26 AM, Simmons, Scott wrote:

Hi Dmitry,

That is good news for them. Could you please edit this short description that I can place based on what you wrote.

*NOAA is striving to develop Digital Elevation Model for Southeast Alaska, Integrating Bathymetric and Topographic Datasets* (<!--[if !vml]--><!--[endif]-->Metadata Updated: February 8, 2018).

NOAA's **National Centers for Environmental Information (NCEI)** is building high-resolution digital elevation models (DEMs) to support individual coastal States as part of the National Tsunami Hazard Mitigation Program's (NTHMP) efforts to improve community preparedness and hazard mitigation. These integrated bathymetric-topographic DEMs are used to support tsunami and coastal inundation mapping. Bathymetric, topographic, and shoreline data used in DEM compilation are obtained from various sources, including **NCEI**, the U.S. National Ocean Service (NOS), the U.S. Geological Survey (USGS), the U.S. Army Corps of Engineers (USACE), the Federal Emergency Management Agency (FEMA), and other federal, state, and local government agencies, academic institutions, and private companies. DEMs are referenced to various vertical and horizontal datums depending on the specific modeling requirements of each State. For specific datum information on each DEM, refer to the appropriate DEM documentation. Cell sizes also vary depending on the specification required by modelers in each State, but typically range from 8/15 arc-second (~15 meters or 50 feet) to 8 arc-seconds (~240 meters or 800 feet). (Source: <https://catalog.data.gov/dataset/digital-elevation-model-of-southeast-alaska-integrating-bathymetric-and-topographic-datasets#sec-dates>)



Dmitry Nicolsky, UAF/GI (**Research Assistant Professor**) stated that Wrangell is at the top of their "to-be-modeled" list. Research indicates there is a recognition of the submarine landslide potential at the Stikine River. A geologist presumably traced remnants of the previous submarine landslide in the Eastern Channel based on currently available bathymetry.

UAF/GI anticipates they will be working **with NCEI** to develop Digital Elevation Models (DEMs) for Wrangell and other southeast Alaska regions.

Thank you Dmitry!

Kind Regards  
-Scott-



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Personal Cell: 907.841.1832

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---

**From:** Dmitry Nicolsky [<mailto:djnicolsky@alaska.edu>]  
**Sent:** Friday, November 02, 2018 10:27 AM  
**To:** Simmons, Scott  
**Subject:** Re: Wrangell Alaska Tsunami threat and info inquiry

Good morning, Scott.

Wrangell is at the top of our to-be-modeled list. There is a recognition of the submarine landslide potential at the Stikine River. Looking at the available bathymetry, a geologist presumably traced remnants of the previous submarine landslide in the Eastern Channel.

This year, we are developing the DEM for the area. Unfortunately, we cannot current give any estimates for the maximum wave height in Wrangell. This is pretty much a similar picture for the most of Southeast communities. Hopefully in the couple of years we can say more about the landslide potential in this area.

Thank you,  
Dmitry

On 11/1/2018 11:23 AM, Simmons, Scott wrote:  
Good Morning Dmitry,  
I'm writing the Wrangell, Alaska hazard mitigation plan update.

Tsunamis Affecting Alaska, 1737-1996 only describes possible tsunami or tectonic caused cable breaks.

Can you provide any pertinent tsunami threat, hazard, or event data, preliminary SIFT type map etc. for this area?

Any assistance is greatly appreciated.

Thank you for all you do for us.

-Scott-



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Senior Emergency Management Professional

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**From:** [Isham, Kelly](#)  
**To:** [Simmons, Scott](#)  
**Subject:** WCA Contact info  
**Date:** Tuesday, October 16, 2018 11:58:29 AM  
**Attachments:** [image001.png](#)

---

Esther Ashton- Tribal Administrator  
Ph: 907-874-4304  
Email: [wcatribes@gmail.com](mailto:wcatribes@gmail.com)

Also, Raymond Paddock is the Environmental Manager for CCTHITA  
His email is [rpaddock@ccthita-nstn.gov](mailto:rpaddock@ccthita-nstn.gov)

Believe his ph is: 907-463-7013

Even though they aren't the tribe, as a stakeholder, they might be good to involve in planning process. Spoke to him in July, 2018, he is interested in assisting.

**V/R**

- Mr. Kelly D.S. Isham  
Emergency Management Planner



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## **APPENDIX B – PLAN MAINTENANCE TOOLS**

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2020 MJHMP - Annual Review Worksheet				
MJHMP Section	Questions	Yes	No	Comments
<b>PLANNING PROCESS</b>	Has Wrangell done any public outreach activities regarding the MJHMP or a mitigation project? If yes, please describe.			
	Has Wrangell integrated any of the MJHMP's elements into other plans or policies? If yes, please describe.			
<b>HAZARD IDENTIFICATION</b>	Has a disaster occurred in this reporting period that affected Wrangell?			
	Do you know of new hazard studies, reports and/or mapping available for Wrangell? If so, what are they?			
<b>RISK ASSESSMENT</b>	Does Wrangell have any new critical assets that should be included in the 2025 MJHMP risk assessment?			
	Have there been changes in development trends that could create additional risks?			
<b>MITIGATION STRATEGY</b>	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?			
	Should new mitigation actions be added?			

2020 MJHMP - Mitigation Project Progress Report			
Progress Report Period From (date):		To (date):	
Project Title:			
Project ID:			
Description of Project:			
Implementing Department/Agency:			
Supporting Department/Agencies:			
Contact Name:			
Contact E-mail:			
Contact Number:			
Grant/Finance Administrator:			
Total Project Cost:			
Anticipated Cost Overrun/Underrun:			
Date of Project Approval:			
Project Start Date:			
Anticipated Completion Date:			
<b>Summary of Progress of Project for this Reporting Period</b>			
1. What was accomplished during this reporting period?			
2. What obstacles, problems, or delays did the project encounter, if any?			
3. How were the problems resolved?			

## CITY & BOROUGH OF WRANGELL, ALASKA BOROUGH ASSEMBLY AGENDA STATEMENT

<u>AGENDA ITEM TITLE:</u>	<u>DATE:</u>	March 24, 2020
	<u>Agenda Section</u>	<b>13</b>

**RESOLUTION No 03-20-1522** OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA AMENDING THE JOB DESCRIPTION OF THE ASSISTANT DIESEL MECHANIC TO INCLUDE METER READING RESPONSIBILITIES

**SUBMITTED BY:**

Rod Rhoades, Electrical Superintendent  
Lisa Von Barga, Borough Manager

**FISCAL NOTE:**

**Expenditure Required:** \$XXX Total

FY 19: \$	FY 20: \$	FY21: \$
-----------	-----------	----------

**Amount Budgeted:**

	FY19 \$XXX
--	------------

**Account Number(s):**

	XXXXXX XXX XXXX
--	-----------------

**Account Name(s):**

	Enter Text Here
--	-----------------

**Unencumbered Balance(s) (prior to expenditure):**

	\$XXX
--	-------

**Reviews/Approvals/Recommendations**

<input type="checkbox"/>	Commission, Board or Committee
Name(s)	
Name(s)	
<input type="checkbox"/>	Attorney
<input type="checkbox"/>	Insurance

**ATTACHMENTS:** 1. Resolution 03-20-1522; 2. Position Description.

**RECOMMENDATION MOTION:**

Move to Approve Resolution No. 03-20-1522.

**SUMMARY STATEMENT:**

In September the Assembly approved Resolution 09-19-1484 authorizing the creation of the Diesel Electric Mechanic Apprentice position. The Collective Bargaining Agreement contains specialized language and pay-scales for true apprentice positions. The position should have been

submitted to the Assembly as Diesel Electric Mechanic Assistant and Groundman. In October the Assembly approved Resolution 10-19-1492 changing the position title from Apprentice Diesel Electric Mechanic to Diesel Electric Mechanic Assistant and Groundman.

During this same timeframe it was the intent of Administration to make the Meter Reader position temporary and on call. The reason for this is that the position will become obsolete once the new “self-reporting” AMI meters are installed. There have been several delays associated with that. Following all of the work and research regarding the Library and Nolan Center positions it became apparent the CBW would not be in compliance with our PERS Agreement moving forward with the plan for the temporary meter reader position. For that reason, it is being added into the position of Assistant Diesel Mechanic.

The Assistant Diesel Mechanic position is planned for re-posting shortly. Administration would like to amend the job description before it goes back out. The accompanying resolution and updated job description provide for the name change to Diesel Mechanic Assistant and add the duties associated with meter reading. The pay scale and other job duties remain the same.

## CITY AND BOROUGH OF WRANGELL, ALASKA

RESOLUTION No. 03-20-1522

## A RESOLUTION OF THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA AMENDING THE ASSISTANT DIESEL ELECTRIC MECHANIC TO INCLUDE METER READING RESPONSIBILITIES

WHEREAS, the previous approved Resolution No. 10-19-1492 authorized the position of Diesel Electric Mechanic Assistant and Groundman; and

WHEREAS, the Electric Department has been without a Meter Reader for nearly a year; and

WHEREAS, it was the intent to make the Meter Reader position temporary and on-call until the time that AMI meters are installed; and

WHEREAS, there were several delays in implementing this plan, most recently realizing the hours of the position would still require coverage under the Borough's PERS Agreement; and

WHEREAS, the Diesel Electric Mechanic Assistant & Groundman position is still vacant and can be amended; and

WHEREAS, the position will be amended to include meter reading responsibilities through the time of AMI meter installation.

NOW, THEREFORE, BE IT RESOLVED BY THE ASSEMBLY OF THE CITY AND BOROUGH OF WRANGELL, ALASKA, THAT:

Section 1. The new job title for the position is Diesel Electric Mechanic Assistant will be effective as of March 25, 2020.

Section 2. The position of Diesel Electric Mechanic Assistant is amended to include meter reading responsibilities.

Section 3. All other sections of Resolution No. 10-19-1492 and the position description and pay scale remain unchanged.

PASSED AND APPROVED BY THE ASSEMBLY OF THE CITY & BOROUGH OF WRANGELL, ALASKA THIS 24<sup>th</sup> DAY OF MARCH, 2020.

CITY & BOROUGH OF WRANGELL

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Stephen Prysunka, Mayor



ATTEST: \_\_\_\_\_  
Kim Lane, Borough Clerk

## City &amp; Borough of Wrangell

## Position Description

Position: Diesel Electric Mechanic Assistant and Groundman	Position Number:
Department/Site: Light Department	FLSA: Non-exempt
Evaluated by: Superintendent Electrical Utility	Salary Grade: 19

**Summary**

Assists the Diesel Electric Mechanic Lead with maintaining and operating standby electrical generation facility. Regularly (monthly) perform the duties of a meter reader. When regular duties permit or circumstances require, assist the Line Department as a ground person or equipment operator. Occasionally works with other City departments, assisting in special projects.

**Distinguishing Career Features**

The Diesel Electric Mechanic has one of the most technical demanding roles in the electric department, and as such, the Diesel Electric Mechanic Assistant must be able to prioritize tasks, follow directions, work well with others, and be comfortable switching between tasks and situations.

Advancement to Diesel Electric Mechanic is based on department needs and compliance with the requirements and certifications of the position.

**Essential Duties and Responsibilities****MAINTAIN AND OPERATE STANDBY GENERATION FACILITY**

- Performs scheduled or routine maintenance on diesel engines, generators, electrical switchboards, compressors, control systems, pumps and other related equipment as directed by the Diesel Electric Mechanic Lead.
- Assists Powerhouse Lead with Operating Generators during scheduled and emergency outages.
- Starts and brings diesel generators up to speed, synchronize, and parallel.
- Closes in units and switch units to base load or isoc.

**METER READING DUTIES**

- Performs scheduled or assigned meter reading duties to record customer power usage. Observes and reports meter abnormalities or malfunctions.

**RECORDKEEPING**

- Maintains detailed records on diesel electrical generation system, which include maintenance, lubrication, part inventories, and costs. Maintains and updates all parts and service manuals.

**REPAIRS AND INSTALLATIONS**

- Inspects diesel preheat systems, cooling systems, air systems and lubricating systems.

**TEAMWORK AND COOPERATION**

- When necessary, or as determined by the Electrical Superintendent, assists the Line Department as a ground worker or an equipment operator. Performs other related

tasks and duties as required or assigned. Works cooperatively with other employees, internal agencies, and the public.

- As needed this position will assist with callouts at any time due to staff shortages or emergencies to facilitate and sustain departmental operations. Must be willing to work odd hours as required by the work environment.

## **Qualifications**

### **Knowledge and Skills**

- Requires knowledge of safety standards and expertise necessary to ensure conformance to them.
- Requires knowledge of diesel mechanics and operation.
- Requires knowledge of voltage regulators, AC generation control, and protection systems.
- Requires knowledge of generator operation, and utility switching operations.
- Requires demonstrated skill in organizing and prioritizing work.
- Requires knowledge of recordkeeping procedures and the ability to keep an accurate account of inventories.
- Requires knowledge of parts and supplies purchasing procedures.
- Requires ability to work with vendors, place orders and make adjustments.
- Requires writing and computer skills to prepare reports.
- Requires sufficient mathematics skill to read, record, and compute precise measurements.
- Requires sufficient human relation skills to train others and exchange technical information.
- Requires the ability to obtain various job-related certifications and training.

### **Abilities**

- Requires the ability to perform diesel generator maintenance projects and tasks.
- Requires the successful candidate be able to function at a fully skilled, journeyman level within four years.
- Requires the ability to diagnose a full range of problems associated with diesel generator operation and safety.
- Ability to read and interpret blueprints at a basic level.
- Must have basic computer skills, including use of Microsoft's Word, Excel, and Outlook programs.
- Requires the ability to plan, prioritize, and assign work to meet schedules and timelines.
- Requires the ability to use common mechanics tools to operate equipment to perform maintenance and repair tasks.
- Requires the ability to read technical manuals and schematics and write such sufficiently to perform the duties of this classification.
- Requires the ability to estimate the scope of work assignments in terms of labor and materials and secure necessary tools and materials to complete assignments.
- Requires the ability to assign and perform a variety of maintenance and repair activities simultaneously.
- Must be able to observe general safety procedures.
- Requires the ability to obtain and maintain applicable certifications.

- Requires the ability to communicate effectively and work as a contributing team member and work productively and cooperatively external customers, contractors, and other employees of the organization.
- Requires knowledge of electrical power generation and the ability learn to manage power loads across multiple diesel generators.
- Requires ability to troubleshoot and maintain the diesel engine of the generator.
- Requires ability to troubleshoot and maintain the generator end of generator.
- Ability to work cooperatively with the Line Crew.
- Ability to accurately read and record meter readings.
- Willingness to perform various job-related duties as required or assigned.
- Must have a strong sense of teamwork and the ability to work cooperatively with others.
- Requires good verbal interpersonal skills and interaction skills

### Physical Abilities

- Ability to operate hand-held equipment and to perform active, physically demanding duties.
- Requires ambulatory ability and strength to maintain cardiovascular fitness to engage in strenuous physical labor such as lifting and carrying materials up to 75 pounds on a frequent basis, to reach from awkward positions using hand-eye coordination to insert parts, and to climb and balance.
- Requires near and far visual acuity to drive, to read and write, to read detailed schematics, and to perform repair work.
- Requires enough hearing and speech ability to hear sound prompts and vehicle sounds, and to carry on conversations in person and over the phone.
- Frequently required to stand, walk, use hands to handle, or feel objects, tools, or controls, climb or balance, talk or hear, sit, stoop, kneel, crouch or crawl.
- \_\_\_\_\_

### Education and Experience

- High school diploma or GED plus two (2) years technical training in diesel generator maintenance and mechanical repair.
- Two (2) years of progressively responsible experience in the maintenance, repair, and overhaul of diesel generators. Knowledge of EMD diesel engines is preferred.
- The ability to clearly read, write, and speak English.
- Sufficient skills necessary to operate related equipment effectively, safely, and responsibly.
- A combination of training, education, and experience, which demonstrates an ability to perform the duties of the position, will be considered.

### Licenses and Certificates

- Must have a valid Alaska Driver's License, or the ability to obtain one within 6 months.
- Must have a valid First Aid/CPR card or be able to obtain one within 6 months of initial employment.
- Must have a valid State of Alaska CDL, or the ability to obtain one within 6 months which must be maintained by the employee through employment.

**Working Conditions**

- Will sometimes be required to work irregular hours.
- Work is performed indoors and outdoors where significant safety considerations exist from physical labor, moving equipment, and temperature and noise extremes. Will frequently work in outside weather conditions and will regularly be exposed to extreme cold. The employee is occasionally exposed to wet and/or humid conditions, fumes, airborne particles, toxic or caustic chemicals, extreme heat and the risk of electrical shock.
- The noise level in the work environment is moderated noisy.

*This job/class description describes the general nature of the work performed, representative duties as well as the typical qualifications needed for acceptable performance. It is not intended to be a complete list of all responsibilities, duties, work steps, and skills required of the job.*

## CITY & BOROUGH OF WRANGELL, ALASKA BOROUGH ASSEMBLY AGENDA STATEMENT

<u>AGENDA ITEM TITLE:</u>	<u>DATE:</u>	March 24, 2020
	<u>Agenda Section</u>	<b>13</b>

Approval to Purchase Quantifit Respirator Fit Testing System in the Amount of \$8,373.10

SUBMITTED BY:

Dorianne Sprehe, Fire/EMS Captain

FISCAL NOTE:

**Expenditure Required:** \$8373.10 Total

FY 19: \$	FY 20: \$8,373.10	FY21: \$
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**Amount Budgeted:**

FY20 \$XXX

**Account Number(s):**

11000 012 7009

**Account Name(s):**

Equipment repair and Maintenance

**Unencumbered Balance(s) (prior to expenditure):**

\$XXX

Reviews/Approvals/Recommendations

<input type="checkbox"/>	Commission, Board or Committee
Name(s)	
Name(s)	
<input type="checkbox"/>	Attorney
<input type="checkbox"/>	Insurance

ATTACHMENTS: 1. Quote

**RECOMMENDATION MOTION:**

Move to Approve Purchase of Quantifit Respirator Fit Testing System in the Amountt of \$8,373.10.

**SUMMARY STATEMENT:**

With annual requirements from NFPA and OSHA to have all employees and volunteers who have the potential to work in IDLH (immediately dangerous to life or health) environments properly fit tested for respiratory protection, the fit test equipment is essential to the City and Borough of Wrangell. The current fit test equipment is used by the Fire Department and Public Works (street,

wastewater and water treatment employees) as well as a recent request by the Capital Facilities department. Due to the age of our existing equipment and many technology upgrades, the fit test equipment is no longer operational. We have the opportunity trade-in our equipment for a value of \$1,500.00. It is our request to take action on the trade-in option as well as purchase a new fit test package.

Note from the Borough Manager:

The cost of the equipment is within the Borough Manager's spending authority. However, the code is very clear that a competitive quote/bid process must be used unless the equipment is under \$10,000 and the purchase was budgeted or approved previously by the Assembly. The piece of equipment was not included in the budget and the Assembly has not previously approved the purchase.

The FIT tester is an essential piece of equipment. Unspent funds in the Fire Department budget are being used to make this purchase. No draw from reserves is necessary.



YOUR PROTECTION OUR PRIORITY

## Quote for Dorianne Sprehe

Date: 2/26/2020 12:16 PM

Quote Number: QUO-05865-G4H0D4

Quote valid until 3/27/2020

Account Number:

Item	Description	Unit Price	Unit Discount	Qty.	Amount
FTK 9519-4000	Quantifit Respirator Fit Testing System	\$9,295.00	<b>\$1,500.00</b> Trade-In Discount	1.00000	\$7,795.00
960150	Survivair/ Honeywell 2020 adapter	\$234.00	<b>\$23.40</b> 10% discount	1.00000	\$210.60
FTK 9513-0130	OHD Kit1 40 MM adapter	\$325.00	<b>\$32.50</b> 10% discount	1.00000	\$292.50
SUBTOTAL					<b>\$8,298.10</b>
SHIPPING/HANDLING					<b>\$75.00</b>
TOTAL					<b>\$8,373.10</b>

*Except as otherwise provided in the quotation or order acknowledgement, as the case may be, the price does not include any Federal, State, or local taxes or duties.*

**If you have any questions concerning this quotation call (888) 464-3872 or email  
sales@ohdusa.com**

**THANK YOU FOR YOUR BUSINESS!**

**PLEASE REVIEW OUR TERMS AND CONDITIONS ON THE FINAL PAGE OF THIS QUOTE**



# GENERAL TERMS AND CONDITIONS OF SALE – OHD, LLLP

## I. ACCEPTANCE TERMS AND CONDITIONS

The term "Order" as used herein shall mean the total agreement between the parties arising out of the Purchaser's agreement to buy and the Seller's (OHD, LLLP) agreement to sell the Goods described on the face of this quotation or acknowledgement. The Purchaser's order is accepted expressly conditioned upon the following terms and conditions which may not be varied or added to, except by written agreement signed by an authorized representative of OHD, LLLP (hereafter referred to as OHD). Inconsistent or additional terms or conditions stated by Purchaser will not be binding on OHD, whether or not such terms or conditions "materially alter" this Order. Failure of Purchaser to specifically object to any of these terms or conditions prior to OHD shipping the Order shall constitute acceptance of these terms and conditions by Purchaser.

## II. WARRANTY

- A. OHD warrants that, at the time of delivery, the Goods delivered under this Order shall be free of all defects in workmanship and material. OHD will repair or replace, at its sole option, any Goods found to be defective by OHD, if notified by Purchaser within the Warranty time period. This remedy is Purchaser's exclusive remedy for breach of warranty.
- B. Warranty Time Periods
  - a. New Products manufactured by OHD: The warranty time period shall be two (2) years from date of shipment by OHD, except as noted below.
    - i. Extended for fifteen (15) days when shipped to a USA domestic Distributor; or
    - ii. Extended for forty-five (45) days when shipped to an international Distributor.
  - b. New Products not manufactured by OHD: The warranty time period shall be the time period provided by the manufacturer of that product. This includes commercial off the shelf products that are accessories for OHD manufactured products.
  - c. Refurbished products warranty: The warranty time period shall be 180 days from date of shipment by OHD.
  - d. Exceptions to the above Warranty time periods: Purchased extended warranty options.
- C. This Warranty does not cover components that are expendable in normal use, and thus have an unpredictable service life, such as but not limited to batteries, fuses, filters, and diaphragms.
- D. This Warranty shall be null and void on any product which:
  - a. Is operated or used in excess of the product's operating specifications; or
  - b. Is not properly maintained in accordance with its maintenance manual or specifications; or
  - c. Has been repaired or modified by persons other than authorized OHD personnel, unless such work is authorized in advance in writing by OHD; or
  - d. Has been damaged, abused, or misused.
- E. Warranty on Service and Repairs:
  - a. Goods, which have been repaired or replaced during the Warranty period, are warranted only for the remainder of the unexpired portion of the original Warranty period.
  - b. Repairs or service provided not pursuant to Warranty: 90 days from date of shipment by OHD.
  - c. Round Trip Shipping Warranty. OHD will repair or replace, at its sole option, items damaged or lost by its carrier when this service option is used. The warranty is only valid for OHD supplied items that have been listed on the OHD Service Return Form. Non OHD supplied items, such as but not limited to laptops, respirators, etc., that are included in the shipment are expressly excluded from this warranty.
- F. Representations and warranties made by any person, including distributors and representatives of OHD, which are inconsistent or in conflict with the terms of this Warranty, shall not be binding upon OHD unless presented in writing and signed by a Vice President or the President of OHD.
- G. **OHD SHALL NOT BE LIABLE FOR DIRECT, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR OTHER DAMAGES RESULTING FROM THE SALE AND USE OF ANY GOODS AND SELLER'S LIABILITY HEREUNDER SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF ANY GOODS FOUND DEFECTIVE.**
- H. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT BEING LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE OR FOR A PARTICULAR PURPOSE, WHICH ARE EXPRESSLY DISCLAIMED, AND CONSTITUTES THE ONLY WARRANTY OF OHD WITH RESPECT TO GOODS SOLD OR DELIVERED UNDER THIS ORDER.**
- I. **PURCHASER IS SOLELY RESPONSIBLE FOR DETERMINING THE SUITABILITY OF OHD PRODUCT(S) FOR THE PURCHASER'S USE OR RESALE, OR FOR INCORPORATING OHD'S PRODUCT(S) INTO SYSTEMS, PRODUCTS, OR FOR APPLICATIONS WHICH PURCHASER DESIGNS, CONSTRUCTS OR MANUFACTURES. PURCHASER SHOULD TEST ALL PRODUCTS UNDER ACTUAL SERVICE CONDITIONS TO DETERMINE SUITABILITY FOR A PARTICULAR PURPOSE.**

## III. RETURNED GOODS POLICY

No Goods may be returned unless and until OHD has authorized such return and given shipping instructions. The failure to obtain such authorization prior to returning the Goods shall render the Purchaser liable for any direct, indirect, consequential, incidental and all other costs incurred by OHD in the handling of the returned Goods. Current stock products in unbroken, unmarked packages, in saleable condition, may be eligible for return, subject to approval of Sales Management and a restocking charge of typically no less than 20%.

## IV. EXPORT ORDERS

Prepayment via wire transfer in US Dollar is required prior to shipment. Shipments will be F.O.B collect from origin on Purchaser's carrier account. Purchaser shall be responsible for obtaining any license to import the Goods into the country of destination and shall pay all taxes, duties, and tariffs. Purchaser shall ensure that all Goods exported from the United States are exported in accordance with the U.S. Export Administration regulations and any other applicable U.S. rules, regulations or statutes.

## V. DOMESTIC PAYMENT

OHD shall invoice the Purchaser at the time the Goods are shipped from OHD with payment to be made by the Purchaser according to the terms of the invoice. Net 30 days for approved accounts only. Visa, MasterCard, American Express, Discover, pre-pay, and COD orders are accepted. All prices are payable in US Dollar. Prices are subject to change without notice.

## VI. DOMESTIC SHIPMENT

Shipment shall be F.O.B. origin, carrier selected by OHD unless other instructions and special handling fees have been provided by Purchaser. Title to the Goods and risk of loss shall pass to the Purchaser at the F.O.B. point. Shipping dates provided by OHD are approximate and OHD shall use its best commercially reasonable efforts to meet such dates.

## VII. TAXES

Except as otherwise provided in the quotation or order acknowledgment, as the case may be, the price does not include any Federal, State or local taxes or duties.

## VIII. CANCELLATION

Except as otherwise provided herein, this Order may not be cancelled by Purchaser without the express consent of OHD in writing and upon payment to OHD of cancellation charges as determined by OHD.

## IX. INSPECTION

The Purchaser shall inspect and accept any Goods delivered pursuant to this Order within thirty (30) days after receipt of such Goods. In the event the Goods do not conform to any drawings, designs or specifications which are expressly applicable to this Order, the Purchaser shall promptly notify OHD of such non-conformity in writing. OHD shall have a reasonable opportunity to repair or replace the nonconforming Goods at its sole option. The Purchaser shall be deemed to have accepted any Goods delivered hereunder and to have waived any such nonconformity in the event such a written communication is not received by OHD within sixty (60) days after Purchaser's receipt of the Goods.

## X. ASSIGNMENT

Purchaser shall not assign rights under this Order without the written permission of OHD.

## XI. FORCE MAJEURE

Neither party shall be liable for its failure to perform hereunder due to any contingency beyond its reasonable control, including without limitation acts of God, fires, floods, wars, sabotage, accidents, labor disputes or shortages, governmental laws, ordinances, rules and regulations, any delay in or inability to obtain labor, machinery, material, products or services through its usual and regular sources or any other similar condition or cause (hereinafter "Force Majeure"). Notwithstanding the foregoing, a Force Majeure event will not excuse the obligation of payment of money.

## XII. GENERAL

The construction, interpretation, and performance of this order and all transactions hereunder shall be governed by the laws of the State of Alabama; U.S.A. Purchaser expressly consents to the jurisdiction of the courts of the State of Alabama in the event litigation arises out of this transaction. If any provision of this order is in violation of any Federal, State or local law or regulation, or is illegal for any reason, such provision shall be deemed self-deleting without affecting the validity of the remaining provisions.

## XIII. BLANKET ORDERS

Blanket order pricing is based upon the sale and delivery of the total quantities of Goods specified within the Order within twelve (12) months from the date of OHD's acceptance of the Order. In the event that Purchaser does not accept delivery of the full quantity of Goods stated on the Order within the twelve (12) month performance period, Purchaser shall compensate OHD the difference between the normal pricing for the quantity of Goods actually accepted and the pricing included on this Order times the number of units actually accepted. In addition, Purchaser shall pay OHD a reasonable cancellation charge as determined by OHD based on the unshipped balance of the Order. These additional charges shall be payable on a net thirty (30) day basis.

## XIV. LIMITATION OF LIABILITY

OHD's liability to Purchaser under this Order or arising out of possession or use of the Goods supplied hereunder or any technical advice relating thereto is limited to the warranty obligations set forth in the Warranty Article. In no event shall OHD's liability to Purchaser, whether based in contract, warranty, OHD's negligence or other tort, strict liability or otherwise, exceed the purchase price of the Goods in question. The foregoing shall constitute the sole and exclusive remedy of Purchaser and the sole and exclusive liability of OHD. **IN NO EVENT SHALL OHD BE LIABLE FOR INDIRECT, CONSEQUENTIAL, INCIDENTAL, EXEMPLARY, OR OTHER DAMAGES RESULTING FROM THE SALE OR USE OF GOODS INCLUDING BUT NOT LIMITED TO LOSS OF PROFIT OR REVENUES, DAMAGE FOR LOSS OF USE OF THE PRODUCTS, DAMAGE TO PROPERTY, CLAIMS OF THIRD PARTIES, INCLUDING PERSONAL INJURY OR DEATH ON ACCOUNT OF USE OF THE PRODUCTS OR FAILURE TO WARN AGAINST OR INSTRUCT ON, OR ADEQUATELY WARN AGAINST OR INSTRUCT ON, THE DANGERS OF THE PRODUCTS OR THE SAFE AND PROPER USE OF THE PRODUCTS, WHETHER OR NOT OHD HAS BEEN ADVISED OF THE POTENTIAL FOR SUCH DAMAGES.**

**XV. COMPLIANCE WITH LAWS.** Purchaser acknowledges that the products purchased by it from OHD are products of the United States of America and that the export, use, transmission or other transfer of such products are governed by the laws and regulations of the United States of America. Purchaser agrees that it shall not take, export, or transmit any product to any other country or entity without OHD's prior written consent, which consent OHD may grant or withhold in its sole discretion. Purchaser hereby covenants and agrees to comply with all applicable laws, rules and regulations governing the handling, shipment, labeling, packaging, notification and use of the product by Purchaser and by Purchaser's customer, including without limitation any and all laws, rules and regulations of the jurisdiction where the customer of such product is located and that govern or affect the ordering, shipment, sale, delivery and redelivery of such product in such jurisdiction. Purchaser acknowledges and agrees that OHD has no responsibility or liability for complying or failing to comply with such laws, rules and regulations of the jurisdiction of Purchaser's customers, regardless of whether OHD has reason to know, has been advised or is otherwise in fact aware of such jurisdiction's applicable laws, rules and regulations.

**XVI. INTELLECTUAL PROPERTY; PROPRIETARY INFORMATION.** Purchaser and its customers and end users shall have no rights in or title to, and OHD shall retain all rights in and title to, any patents, inventions, designs, discoveries, technical data, copyrights, trademarks, trade names, service marks, trade secrets, or other intellectual property rights arising out of the products delivered or provided hereunder (the "**Intellectual Property**"). Purchaser hereby acknowledges and agrees that OHD is granting to Purchaser a non-exclusive limited license to any software contained in the product sold hereunder. All rights not expressly granted to Purchaser herein are reserved by OHD. Purchaser will not, and agrees not to cause or permit an end user of the product to, modify, re-create, reverse engineer, disassemble or decompile the product or any software contained in the product. Notwithstanding the foregoing, any modifications, developments, inventions, discoveries, updates or other improvements (each an "**Improvement**") to the products sold to Purchaser shall be the sole property of OHD and Purchaser agrees to assign to OHD all right, title and interest in and to such Improvements and shall execute any and all documents and instruments as OHD may reasonably determine are necessary or desirable in order to give effect to this section or to preserve, protect or enforce OHD's rights with respect to such Improvements. Purchaser agrees to hold all proprietary information in confidence and not to, directly or indirectly, copy, publish, summarize, or disclose to any person or entity such information without OHD's prior written consent. Purchaser agrees that it will take all steps (including nondisclosure agreements with Purchaser's employees and consultants, and such other steps as Purchaser takes to protect its own proprietary information) necessary to protect and prevent disclosure to and/or use by third parties of any proprietary information of OHD obtained by Purchaser. For the purpose of this section, "proprietary information" includes, but is not limited to, (i) information furnished by OHD, relating to the sale, use, or service of the products sold hereunder; and (ii) information provided by OHD to Purchaser and specifically marked "Confidential."

Item d.

# CITY & BOROUGH OF WRANGELL, ALASKA BOROUGH ASSEMBLY AGENDA STATEMENT

<u>AGENDA ITEM TITLE:</u>	<u>DATE:</u>	March 24, 2020
	<u>Agenda NO.</u>	<b>15a</b>

Executive Session: Collective Bargaining Strategy

**SUBMITTED BY:**

Lisa Von Bargen, Borough Manager

**FISCAL NOTE:**

**Expenditure Required:** \$XXX Total

FY 19: \$	FY 20: \$	FY21: \$
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**Amount Budgeted:**

FY19 \$XXX
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**Account Number(s):**

XXXXXX XXX XXXX
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**Account Name(s):**

Enter Text Here
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**Unencumbered Balance(s) (prior to expenditure):**

\$XXX
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**Reviews/Approvals/Recommendations**

<input type="checkbox"/>	Commission, Board or Committee
Name(s)	
Name(s)	
<input checked="" type="checkbox"/>	Attorney
<input type="checkbox"/>	Insurance

**ATTACHMENTS:** 1) Ground Rules Document

**RECOMMENDATION MOTION:**

Move to go into Executive Session to discuss upcoming collective bargaining strategy with the Borough Attorney, Finance Director and the Borough Manager.

**SUMMARY STATEMENT:**

Discussion will be held in executive session. Please see the attached ground rules document.