Environmental Narrative

Please also refer to the Environmental Report prepared by Solstice Alaska Consulting, March 2017 for more details.

A. PROJECT DESCRIPTION:

1. Beneficiaries: Project Beneficiaries include Trident Seafoods, Sea Level Seafoods, Southeast Alaska Regional Health Consortium, and Stikine Inn. In addition, the proposed project greatly benefits all commercial fishermen, Marine Service Center vendors and contractors, Channel Construction, tourism charters, and other commercial businesses that provide support services to the marine industries. A list of key businesses to benefit from the project that were contacted regarding employment and investment status are in Attachment A in a separate uploaded document.

2. Proposed Construction:

The City and Borough of Wrangell (CBW) is proposing to design and construct a new water treatment plant, which would be constructed mostly within the footprint of the existing water treatment plant, which is located along Wood Street in Wrangell, Alaska. The water plant site is located on Borough owned property on Parcel 7 of Plat #86-1, T62S R84E S30. The project would be designed and constructed over a two and a half year period, beginning December 2018. Construction of this project involves expanding the existing roughing filter building to house two, parallel DAF trains. The two-train package plant would integrate a Dissolved Air Flotation (DAF) and Multimedia Filtration with use of a coagulant rapid-mixed with the raw water. An improved disinfection system will be used and the existing slow sand filter basins will be converted to a serpentine clearwell for storing treated water. The DAF's sludge and backwash disposal system will be by way of a new gravity sewer line to the nearby Wastewater Treatment Plant (WWTP). Disposing of the sludge and backwash in this manner differs from the recommended disposal action in the PER, but was an alternative identified within the PER.

This project will address challenges with the quality of drinking water and improve treatment capacity for compliance with Federal and State drinking water regulations and to improve our production capacity to meet the community's growing water demand, as potable water is essential to the health and safety of Wrangell's residents, businesses and visitors and to our continued economic growth. Without the water infrastructure that this project would provide, Wrangell will not have the water production capacity necessary for economic development.

In 2015 and 2016 The City and Borough of Wrangell worked with CRW Engineering Group, LLC to analyze alternative water treatment methods and pilot a water study based on the selected treatment type. Following completion of the pilot study, CRW Engineering Group developed a Preliminary Engineering Report (PER) and Environmental Report (ER) to report their findings, identify issues and options, and develop conceptual design criteria and associated costs based on recommendations for Wrangell's Water Treatment Plant Improvements project. The recommended alternative identified in the PER is to construct a Dissolved Air Filtration (DAF) with Multimedia water treatment plant.

A new treatment building would be constructed to house two parallel DAF plants, which would integrate two of each of the DAF and multimedia filtration assemblies in the same train. The treatment process would involve dissolved air flotation accompanied with chemical coagulation and gravity filtration, and would have a design flowrate of 1.8 mgd. Chemical feed tanks and

associated pumps and control systems would also be located in the new treatment building. The existing slow sand filters would be converted into clearwells to provide CBW with an additional 0.9 million gallons of water storage. With the existing water storage tanks, the total storage capacity would be 1.75 million gallons, which nearly reaches the design flowrate of 1.8 mgd. A portion of the existing control building will be used for chemical storage. A gravity sewer line would be constructed to transport backwash waste from the new water treatment building to the existing Wastewater Treatment Plant. A standby generator and bulk fuel tank would also be installed at the site.

In addition to the Dissolved Air Flotation (DAF) with Multimedia Filtration treatment modular trains, the investment project includes the work necessary to construct, install and integrate the new water treatment system, making use of as much of the existing water treatment plant as possible. The proposed project work includes bedrock blasting and site clearing, building site pad construction, site grading, and renovations to expand the existing roughing filter building in order to house the two DAF trains. Constructing an on-site backwash disposal containment basin with its associated pipe and pumps, as well as all necessary process piping, valving, pumps, chemical mixing and dosing systems, and instrumentation required for the full treatment system. This associated work also includes providing for a temporary water treatment system to perform interim water treatment when the roughing filter building is under renovation and construction.

Components of the Proposed Investment Project:

- Blast and remove bedrock to expand roughing filter building to house new DAF trains and filters.
- Site grading and drainage
- Remodel and expand existing roughing filter's metal building to house new DAF trains and filters.
- Backwash disposal containment system and piping.
- Installation of a pre-packaged DAF treatment system consisting of two DAF trains (flow splitter, mixers, flocculators, DAF cells) and three filters. Includes all associated instrumentation, electrical systems, access walking platforms, stairs and handrails, plumbing, automatic and manual control valving, meters, saturator, compressors, recycle pumps, VFDs, backwash system, air scour blower, filter media, new chemical feed systems with required stands, tanks, plumbing, dosing pumps, loaders/mixers, meters, and controls.
- Process piping (DAF piping connections, influent and effluent piping, rinse and backwash piping, yard piping, drain piping).
- Temporary water treatment system

A Companion Project will enhance the investment project by connecting the newly constructed DAF treatment system and its related components to the existing treatment system piping, electrical systems integration and automated control panels with SCADA integration, extending the sewer service for backwash disposal to the Wastewater Treatment Plant, replacing the existing systems for chlorine generation and caustic feed, replacing booster pumps with the addition of variable frequency drives, reconfiguring the existing ozone system, converting the existing sand filters to clearwells for additional treated water storage, installing a standby generator, remodel the existing control building for chemical storage, commission the final system and train the water treatment operators. The final water treatment process is by disinfection with an on-site chlorine generation system and then the water is pumped to the existing water storage tanks. As part of the companion project work, the existing four sand filter basins would be emptied

and their plumbing reconfigured in order to convert them as additional water storage. This conversion will provide nearly double the existing treated water storage capacity.

A detailed, comprehensive engineering design for construction of the new DAF water treatment facility will be performed according to both Wrangell's and EDA's procurement requirements for professional services. Required deliverables produced by the engineering professionals will include a full engineering design for the construction of the new treatment systems components and will consider value engineering in comparison to the conceptual design identified in the PER for potential construction and treatment component alternatives.

The specific deliverable that will be produced as a result of the EDA investment is the infrastructure-related improvements to the water treatment system.

3. Need and Purpose:

The City and Borough of Wrangell (CBW) is pursuing the design and construction of a new water treatment plant to address challenges with the quality of drinking water and improve treatment capacity for compliance with Federal and State drinking water regulations and to improve our production capacity to meet the community's growing water demand, as potable water is essential to the health and safety of Wrangell's residents, businesses and visitors and to our continued economic growth. With this project, the CBW will be able to provide clean, treated water to a growing population and industry demand for at least a 20-year design life.

4. Alternatives to the Proposed Project:

A feasibility study was performed to evaluate five separate sets of actions in order to determine construction feasibility. Each are addressed in more detail both in the PER and the ER (attached).

The Dissolved Air Flotation (DAF) with Multimedia Filtration was the selected alternative. Regarding site use, the selected project has the least site impacts and utilizes the existing site and facilities to their fullest extent with the proposed new treatment system, and includes an expansion to only one of the existing buildings. Therefore no wetlands or floodplains will be affected through this project. A US Army Corps of Engineer's review provides that the project's area of potential effect, including that required to construct the backwash water's gravity sewer line, does not contain waters of the United States (U.S.) under Corps jurisdiction; therefore, a DA permit is not required. A copy of the approved Jurisdictional Determination form is available at: www.poa.usace.army.mil/Missions/Regulatory/JurisdictionalDeterminations.aspx under the above file number.

Alternative 1 – Improvements Made to the Existing Water Treatment Process

Under this alternative, the existing slow sand filter treatment process would be upgraded; therefore, improvements would be made to all of the existing components: pH adjustment, ozonation, roughing filtration, and slow sand filtration. The disinfection process, which works well currently, would not be upgraded. A backwash clarifying tank (20- foot diameter) and sludge storage area and secondary dewatering system would be installed for backwash water disposal.

This alternative was dismissed from further consideration because it had high capital costs, would have continued issues with a lack of water storage during the summer, and because it

had the potential for continued difficulties with post-treatment high chlorine demands and disinfection by-products, since slow sand filtration has limited organic removal capabilities.

Alternative 2 – MIEX Process with Multimedia Filtration
This alternative would have a MIEX (a proprietary ion exchange process) system installed downstream of the pH adjustment system, using soda ash to increase the raw water's alkalinity (instead of caustic soda). The ozonation system would not be used under this alternative. Alum, rapid-mixed with the raw water, would be used as the coagulant. The use of MIEX would allow a lower dosage of alum to be optimized more for turbidity removal and less for organics removal. Under this alternative, the roughing filter building would be demolished, and a new treatment building would be constructed to house a conventional filtration system comprised of three parallel flocculation/sedimentation/filtration trains with a redundant fourth filter for backwashing purposes. The existing disinfection system would be reused, and the existing slow sand filters would be converted to a serpentine clearwell for storing disinfected water after filtration. A backwash clarifying tank and sludge storage area and secondary dewatering system would be installed for backwash water disposal.

This alternative was dismissed from further consideration because it had the higher annual operation and maintenance (O&M) cost than other alternatives due to chemical and MIEX resin replacement needs. In addition, without substantial amounts of coagulant, Alternative 2 would not remove color as well as other alternatives.

Alternative 3 – Ozonation with MIEX and Biological Filtration
This alternative, a variation of Alternate 2, assumes that a MIEX would be installed between the pH adjustment and the ozone systems. Alum is would be used as the coagulant and rapid- mixed with the raw water. The use of MIEX and ozonation would allow a lower dosage of alum to be optimized more for turbidity removal and less for organics removal. Under this alternative, the roughing filter building would be demolished, and a new treatment building would be constructed to house biological filters in a similar configuration as for Alternative 2. The existing disinfection system would be reused, and the existing slow sand filters would be converted to a serpentine clearwell for storing disinfected water after filtration. A backwash clarifying tank and sludge storage area and secondary dewatering system would be installed for backwash water disposal.

Alternative 3 was dismissed from further consideration because its annual O&M costs would be very high due to considerable power needs for ozone and high costs of chemical and MIEX resin replacements. This alternative would be more complex than other conventional filtration processes, which would require a higher WTP operator certification (Level IV). In addition, the MIEX process would not accommodate major variabilities in raw water characteristics and could lead to variable finished water quality.

Alternative 4—DAF with Multimedia Filtration and Backwash Waste Disposal Alternative A1 is the selected alternatives with modifications.

Under the Proposed Action (Alternative 4—DAF with Multimedia Filtration and Backwash Waste Disposal Alternative D), the project's construction involves expanding the existing roughing filter building to house two, parallel DAF trains. The two-train package plant would integrate a Dissolved Air Flotation (DAF) and Multimedia Filtration with use of a coagulant rapid-mixed with the raw water. An improved disinfection system will be used and the existing slow sand filter basins will be converted to a serpentine clearwell for storing treated water.

This water treatment alternative is the Proposed Action because it has the lowest life cycle cost and the highest treatment efficiency. This alternative provides good organics removal and excellent color removal. In addition, it is a robust process that can accommodate significant variability in raw water quality without substantial adjustments in the treatment process.

The DAF's sludge and backwash disposal system will be by way of a new gravity sewer line to the nearby Wastewater Treatment Plant (WWTP). Disposing of the sludge and backwash in this manner differs from the recommended disposal action in the PER, but was an alternative identified within the PER. The dewatered backwash sludge would be transported to the Solid Waste Facility in Wrangell for further shipping to a landfill in Washington for disposal.

Alternative 5 – Nanofiltration and Multimedia Filtration

Under this alternative, a new treatment building would house a nanofiltration system installed downstream of multimedia filtration. A pH adjustment system using soda ash and potassium permanganate oxidations step would precede the filtration process. The soda ash would provide sufficient alkalinity for the coagulation process, which would employ alum. The existing disinfection system would be reused, and the existing slow sand filters would be converted to a serpentine clearwell for storing disinfected water after filtration. A second pH adjustment step featuring soda ash would be downstream of the clearwell for increasing alkalinity in the water of the distribution system. A backwash clarifying tank and sludge storage area and secondary dewatering system would be installed for backwash water disposal.

This alternative was dismissed from further consideration because it had the highest annual O&M costs and lowest sustainability of any alternative due to chemicals and filter membrane replacement needs. In addition, it was the most complex of the alternatives and required higher WTP operator certification (Level IV)

Backwash Waste Disposal Alternative A1 – Extend Sewer Service from WWTP (Buried Pipeline)

This alternative would include construction of a gravity sewer pipeline to transport backwash water from secondary dewatering area to the Wastewater Treatment Plant (WWTP). The new 1,300 linear feet 20-inch outside diameter (approximately) insulated pipeline would be constructed below ground). Construction of the sewer line would require clearing a 30 feet wide corridor or 39,000 square feet (0.93 acres) through forested areas. In addition, some blasting at the road crossing could be required in order to place the pipeline. The gravity sewer main would connect to the WWTP where clarified backwash wastewater would be treated.

Although this alternative was dismissed from further consideration within the PER due to higher capital cost, it has further been analyzed as the preferred backwash water disposal due to the benefit it offers to minimize additional processes on-site, which add points to the system classification and thus increases the level of water certifications required of our water treatment operators.

Backwash Waste Disposal Alternative A2 – Extend Sewer Service from WWTP (Above Ground Pipeline)

Under this alternative, an aboveground gravity sewer pipeline would be installed to transport backwash water from the new treatment building to the WWTP where clarified backwash wastewater would be treated The pipeline would be supported by timber sleepers and secured with duckbill or drilled epoxy anchors (depending on depth of bedrock). The pipeline would be insulated and have electric heat trace to provide freeze protection.

This alternative was dismissed from further consideration because it had a higher capital cost (about $700,000 higher than the proposed action); had higher annual O&M costs (about $3,100 higher than proposed action); would require heat trace and insulation to maintain the pipeline during the winter; would require forest clearing along the pipeline route; and because construction could be difficult due to the steep terrain between the Water Treatment Plant and the Wastewater Treatment Plant.

Backwash Waste Disposal Alternative B – Wood Street Sewer Extension

Under this alternative, sewer service would be extended from the Zimovia Highway, along Wood Street to the water treatment plant. This alternative would require construction of an above ground clarifier tank and approximately 3,100 linear feet of gravity sewer main. The pipeline alignment would be routed inside the existing road corridor.

This alternative was dismissed from further consideration because it had higher capital costs (about $1.5 million higher than the proposed action) and annual O&M costs (about $1,900 higher than proposed action).

Backwash Waste Disposal Alternative C – Marine Outfall

Under this alternative, backwash waste from the WTP would be piped to an above-ground clarifier tank. The clarifier would allow solids to settle between backwash cycles. Supernatant from the clarifier would then be routed through a 2,000 linear foot gravity sewer main for discharge at a marine outfall.

This alternative was dismissed from further consideration because it had much higher capital costs (about $1 million higher) and annual O&M costs (about $1,000 higher) than the proposed action.

No Action Alternative

As required by guidance, the No Action Alternative was considered for this project. Under this alternative CBW would make no improvements to the WTP, and the facility would continue to operate in its current condition. There would not be sufficient water treatment capacity to meet existing distribution system demands, and the No Action Alternative would likely result in future Disaster Declarations and public water rationing due to the inadequacy of the filtration system to provide sufficient flow to meet community water consumption. Future population growth and increased commercial water usage would not be accommodated.

The No Action Alternative was dismissed from further consideration because it would result in health and safety issues and would limit economic development and because it does not meet Wrangell's need for long term, reliable, safe water treatment facilities.

B. HISTORICAL ARCHAELOGICAL RESOURCES:

A cultural resources literature review was completed on October 17, 2016 by Cultural Resource Consultants, LLC (CRC 2016). According to CRC's literature review preliminary findings, there are no known sites within the project limits listed in the Alaska Heritage Resource Survey (AHRS). West of the general project area, the closest known sites are a reported petroglyph (PET-00033), the Redmen's Cemetery and Native Cemetery (PET-00099), Eli Urho Kanerva Boat Shed and Warehouse (PET-00330), and Fremin Midden (PET-00483). To the east are two

Wrangell water supply dams—PET-00571 and PET-00572. Attached is a copy of the letter from the State Historic Preservation Office.

C. AFFECTED ENVIRONMENT:

1. Affected Area: Wrangell is located on Wrangell Island, approximately 200 miles south of Juneau and 100 miles northwest of Ketchikan. The water treatment plant is located about 1 mile south of downtown Wrangell (Copper River Meridian; Township 62; Range 84; Section 31). The project would involve modification to an existing building and approximately 1 acre of impacts to previously disturbed land adjacent to the Water Treatment Plant. There will be some disturbance to undisturbed forested land and previously disturbed land adjacent to an existing rock quarry and Waste Water Treatment Plant (WWTP) for pipe placement between the Water Plant and WWTP. The land is flat near the Water Treatment Plant and slopes downward between the Water Treatment Plant and the WWTP. According to the CBW Comprehensive Plan, the project is located on land owned by the CBW and zoned light industrial/industrial.

There are no farmlands within the project area, nor are there formally classified lands, such as State of Federal parks, refuges, game preserves or wilderness areas, since the land area is owned by the City and Borough of Wrangell. Historical land use has been designated solely for the community's drinking water system since the original reservoirs and dams construction in the early 1900s, which are fed by a forested watershed formed by an elevated valley between two mountain peaks.

The project area includes dense forest with Sitka spruce and mountain hemlock. There is considerable deadfall in the area which supports various mosses and lichen species. Deciduous trees and shrubs, including alders and devil's club, are found in areas where light penetrates the forest cover. Some of the project area is previously cleared and is non-vegetated. There will be little vegetation removed to construct the project, limited to that required to construct the backwash water's gravity sewer line between the water plant and the wastewater plant.

2. Coastal Zones: The project is not within the boundaries of a coastal zone management area because the Alaska Coastal Management Program sunset on July 1, 2011 per Alaska Statute 44.66.030. There are no shorelines, beaches, dunes or estuaries within or adjacent to the project site. There are no proposed overwater structures that could impact navigable waters.

3. Wetlands: The majority of the project will be constructed within the existing structures. For the Area of Potential Effect, the U.S. Army Corps of Engineers (USACE) found that the project area does not contain waters of the United States, including wetlands, under their jurisdiction. The USACE finding letter as well as maps showing the delineated area is attached.

4. Floodplains: The project is not located in a 100- or 500-year floodplain because the proposed project areas are outside of the Flood Insurance Rate Map (FIRM) established by the Federal Emergency Management Agency (FEMA 1982). The Water Treatment Plant is 200 feet above sea level, and the WWTP is about 90 feet above sea level and under no risk of marine flooding. Attached is a copy of the FIRM Map of the project area Panel 0200980016B, and a marked-up version showing site location and beneficiaries.

5. Endangered Species: According to the USFWS Information for Planning and Conservation (IPaC) website, the proposed project would not impact any endangered species, and there is no

designated critical habitat of any Endangered Species Act (ESA)-listed species under the jurisdiction of the USFWS within the project area (USFWS 2016). According to the National Marine Fisheries Service's Marine Mammal Species Range and Critical Habitat Mapper, endangered Steller sea lion (western distinct population segment [DPS]) and the endangered humpback whale (Western North Pacific DPS) are found in the ocean near the project area (NMFS 2016). Marine areas will be avoided; the Water treatment plant improvements would be located approximately 0.3 miles from the coastline and 200 feet above sea level.

6. Land Use and Zoning: The project is located entirely within the City and Borough of Wrangell (considered City limits) and involves approximately 1 acre of impacts to previously disturbed land adjacent to the Water Treatment Plant (WTP), undisturbed forested land, and previously disturbed land adjacent to an existing rock quarry and Waste Water Treatment Plant (WWTP). The land is flat near the WTP and sloped between the WTP and the WWTP. The project site area is zoned Commercial and the area where the pipe would be installed to the WWTP is zoned Open Space Public, which in Wrangell the zone allows for airports, quarries, public facilities, medical centers etc. (Zoning Districts Attached). According to the CBW's Comprehensive Plan, the project is located on land owned by the CBW and land uses in the area are commercial and light industrial/industrial (Comprehensive Plan Land Use Map attached). There are no designated agricultural land parcels within the City and Borough of Wrangell. Most of the land adjacent to the proposed project area is owned by the CBW and is zoned light industrial/industrial. A portion of the project area is bounded by quarry, which is zoned industrial. The northern area of the quarry is privately owned, and the southern area is owned by the CBW (CBW 2010).

Three of the project beneficiaries, Trident Corporation, Sea Level Seafoods, and the Stikine Inn are located in the Waterfront Development Districts. The Stikine Inn recently received a Conditional Use Permit for their proposed hotel expansion plans (attached). The existing Wrangell Medical Center and the new hospital that will be constructed by Southeast Alaska Regional Health Consortium are located on lands zoned Open Space Public.

7. Solid Waste Management: The Borough provides curbside pickup for residential and commercial solid waste. All solid waste is taken to a materials recovery and handling facility where the waste is containerized and then shipped to eastern Washington to a certified landfill managed by Republic Services. Their Roosevelt Municipal Landfill reported that as of January 2018 their facility had approximately 85 years remaining capacity for the life of the landfill. There is no formal recycling program, however, the Borough and local organizations provide volunteer recycling of aluminum, cardboard, electronics, batteries and other items. Please see attached community recycling information flier prepared by the Wrangell Cooperative Association. Minimal waste is expected from the proposed project facility to include office waste, plastic bags from treatment chemicals and an occasional plastic barrel. Wrangell has shipped to Republic Services landfill 1,640 tons of solid waste during our fiscal year 2016, 1,556 tons of solid waste in our fiscal year 2017, and we estimate 1,500 tons will have been shipped by the end of our fiscal year 2018. The project facility generates approximately 13 cubic yards of solid waste each year, and the primary beneficiaries contribute the following volumes of solid waste, on an annual basis: 1) Trident Seafoods 870 cubic yards; 2) Sea Level Seafoods 453 cubic yards; 3) Stikine Inn 234 cubic yards; and 4) SEARHC 583 cubic yards.

8. Hazardous or Toxic Substances: There are no toxic, hazardous, or radioactive substances that will be produced by the proposed DAF water treatment plant. The proposed project is expected to utilize alum (aluminum sulfate) to aid in the flocculation process. This product is

considered moderately hazardous to human health; however, it will be stored and utilized according to regulations in order to limit workplace exposure.

For hazardous substances used by our primary beneficiaries:

- Trident Seafoods utilizes Anhydrous Ammonia, which is stored in two locations: 1) 3,500 lbs daily maximum stored in the belt Freezer facility and 2) 20,500 lbs daily maximum stored in their refrigeration system. Trident does not produce any hazardous substances.
- Sea Level Seafoods utilizes Anhydrous Ammonia, which is stored in the freezer in quantities of 8,500 lbs. as a daily maximum amount. Sea Level does not produce any hazardous substances. They also store Propane with a 50 lbs. daily maximum stored outside of their structure, Refrigerant with 90 lbs. daily maximum stored in their maintenance building, and Benzalkonium Chloride, used as a disinfectant, with 25 lbs. maximum stored in their laboratory.
- SEARHC's activities within the medical field produce biohazard waste. They dispose of this waste by packing and shipping it from Wrangell to neighboring Petersburg, Alaska where it is then sterilized, added to the solid waste stream, and shipped to Roosevelt Landfill in Washington State for final disposal (an equivalent of approximately 40 gallons of volume each week).
- The Stikine Inn does not utilize any hazardous materials nor do they produce any.

A recent Phase I or Phase II Environmental Site Assessment has not been performed for the project site.

9. Water Resources: CBW's drinking water comes from a surface water source comprised of two dammed mountain lakes— an upper and a lower reservoir. These lakes are located east of and above the Water Treatment Plant. The lower reservoir is about a quarter mile away, via gravel road. The upper reservoir is located about a half mile from the lower reservoir, and is fed by a forested watershed formed by an elevated valley between two mountain peaks. The upper reservoir is contained by an earthen dam and, through a submerged intake, flows into a small creek that feeds the lower reservoir, also contained by an earthen dam (CRW 2016). No other freshwater bodies are near with the project area. There are no wild or scenic rivers near the project area. There is no underground water sources at or near the project. According to the EPA website for Impaired Waters and Alaska DEC's website for the same, there are no impaired water bodies listed in Wrangell. Wrangell is not mapped on EPA's sole source aquifer website. Any changes in surface water runoff created by project activities of the proposed project, anticipated to be related to rainfall only, would be addressed in the civil engineering design through proper site development for storm water collection. A storm water discharge permit is not required. The proposed project will not discharge to surface water; therefore, a NPDES permit will not be required.

10. Water Supply and Distribution System: Wrangell's drinking water system consists of two small reservoirs, totaling approximately 66,000,000 gallons, that each collect surface water behind an earthen dam. Water enters the upper reservoir through a small stream fed by a steep mountainous watershed. Water is transferred from the upper dam to the lower dam through a spillway and then piped to the treatment facility. Wrangell's water distribution system extends through downtown Wrangell, around the Airport Loop Road and south to 6-Mile on the Zimovia Highway. Ductile iron pipe started being used in the 1980's, but after experiencing recent deterioration in the last 15 years in some of these pipes, all new water mains are being installed

with HDPE water lines. Wrangell's water system is a Class 2 Water treatment system and a Class 2 Water distribution system. The existing water treatment plant is designed to produce up to 900 gallons of water per minute, or up to 1.3 million gallons a day.

The volume of water consumed by the identified primary beneficiaries are as follows:

- Trident Seafoods' water use can vary depending on the success of the fishing season and the number of fish brought into their facility during each given year. As their water usage changes based on fish catch, we have seen their usage range from 7 million gallons – 20 million gallons of water when they are in production over the course of approximately three months.

- Sea level Seafoods' water use can vary depending on the success of the fishing season and the number of fish brought into their facility during each given year. As their water usage changes based on fish catch, we have seen their usage range from 17 million gallons – 32 million gallons of water when they are in production over the course of approximately seven months.

- The Hospital – This business is not metered; therefore, there is no historical data to help identify the expected volume of water to be used. It is anticipated that their water use will increase following their planned hospital replacement project.

- Stikine Inn – This business is not metered; therefore, there is no historical data to help identify the expected volume of water to be used. It is expected their water use will increase following their planned hotel expansion.

Currently Wrangell complies with the Safe Drinking Water Act and other EPA safe drinking water regulations. A number of monthly, quarterly, and annual water tests are performed based on EPA's and ADEC's requirements. Wrangell's water generally complies with the standards established for our system; however, we struggle, with existing treatment plant, with the Disinfection Byproduct contaminant standards and have twice exceeded the maximum contaminant levels for HAA5s over the course of the last three years. These occurrences take place because Wrangell's water treatment system cannot effectively remove enough of the organics that are present in our surface water source, which when mixed with the disinfectant, chlorine, produces the disinfection byproducts. That said, we continue to work hard to ensure we are producing the best water quality possible. Every six years the EPA reviews the standards for approximately 75+ contaminants, assessing which of these, or additional contaminants, will be effected by new effluent guidelines that are generally changed to lower the acceptable levels for detection of this contaminants. As some of those contaminants change, it will be difficult for Wrangell to meet some of the requirements with the existing treatment plant.

The National Primary Drinking Water Regulations (NPDWR) are legally enforceable primary standards and treatment techniques that apply to public water systems. Primary standards and treatment techniques protect public health by limiting the levels of contaminants in drinking water, including: Microorganisms, Disinfectants, Disinfection Byproducts, Inorganic Chemicals, Organic Chemicals and Radionuclides. The new DAF plant is projected to minimize these types of contaminant exceedance occurrences and provide faster water treatment, expanded storage capacity, and treatment methodology to meet known future water quality standards efficiently.

11. Wastewater Collection and Treatment Facilities: Wrangell has only one municipal wastewater treatment facility. The Wastewater Treatment Plant (WWTP) is a Class 1 aerated lagoon treatment system and a class 2 collection system. The WWTP operates under an EPA-issued wastewater discharge permit, permit number AK-002146-6, and is in full compliance with the Clean Water Act. The wastewater treatment plant's design supports a monthly average of 0.6 mgd and a daily average of up to 3.6 mgd. The running annual average of flow through the wastewater plant is currently .352 mgd.

The WWTP serves the entire community on the north end of the island, through the downtown area, and south to 6 mile Zimovia Highway. For developments past 6 Mile Zimovia Highway, residents are required to have an approved Alaska Department of Environmental Conservation (ADEC) wastewater disposal system. Most use septic systems and residential developments on the shoreline may receive marine outfall approval from ADEC. Remote settlements may utilize out houses.

As reported in the Preliminary Engineering Report (PER), both average and maximum daily water use are anticipated to increase approximately 16% by the year 2037. Typically, wastewater flows are around 90% of the water distribution system demand flows, however this can be widely variable depending on the amount of infiltration and inflow (I&I) for a given sewer collection system. Based on the Wrangell's data, wastewater treatment plant flows, both the monthly average and daily max flow, are significantly lower from the water distribution system flows, by approximately 50-60%. Leaks in the distribution system and use of water by the local fish processing facilities are two factors which likely account for the comparatively lower than normal wastewater flows.

The proposed water treatment facility project is not expected to utilize on-site pre-treatment prior to discharges to the WWTP. In order to verify that the WWTP has sufficient capacity to accept the backwash flows, current flow data to the WWTP and additional flow from process waste was analyzed. CBW's wastewater samples have consistently been well below permit requirements for monthly average flow, daily max flow, percent removal of BOD-5, and percent removal of suspended solids. The additional backwash flows from the proposed WTP improvements project represents a relatively small increase to the overall flow to the WWTP and it is anticipated that the WWTP will continue to meet permit requirements with the slight increase in flow.

Types of discharges from all of the identified primary beneficiaries to the WWTP are expected to remain as the current domestic class wastewater discharge. Both Trident Seafoods' and Sea Level Seafoods' seafood process wastewater is managed by individual NPDES permits as follows:

- Trident Seafoods NPDES discharge permits that screened process water is discharged by way of their marine outfall. Their seafood waste is disposed of at a designated dump site for fish waste.

- Sea Level Seafoods NPDES discharge permits that process water and a ground seafood waste is discharged by way of their marine outfall.

12. Environmental Justice: Environmental justice populations would not be adversely impacted by the project; rather, the proposed improvements to the Water Treatment Plant would benefit all residents, equally, by providing adequate and sustainable drinking water for all future populations. All residents on the public water system receive water from the same source and

treatment facility. No land or marine areas that provide economic opportunities for the community would be negatively impacted by this project.

13. Transportation: Wrangell is accessible by air and water. There is a state-owned paved, lighted runway on the north side of the community. A seaplane base is adjacent to the runway, with another airplane float located in the Inner Harbor. Charter air taxi services are also available. The marine facilities include three harbors with 710 slips for recreational and commercial vessels; a deep draft dock which just completed upgrades and renovations; a state ferry terminal; and three boat launches. Freight arrives by barge, ship, ferry, and cargo plane. Front Street was reconstructed as part of a larger downtown revitalization in 2014 (ADCCED 2016a).

A coastal community, Wrangell is located on Zimovia Strait which is a part of the Inside Passage. The Inside Passage is a coastal route for cruise ships, freighters, fishing vessels, and ferries along a network of ocean passages along the Pacific coast from southeastern Alaska to north-western Washington.

None of the capacities of the existing transportation facilities will exceeded as a direct or indirect result of the proposed project.

The Water Treatment Plant is located about 0.5 miles up Wood Street east of the Zimovia Highway. The lower portion of Wood Street from the intersection at Zimovia Highway was recently paved and provides access to the medical clinic and the proposed new hospital. Wood Street is gated just beyond this driveway access, turning into a gravel road and is a non-public road with access only for staff working at the plant or for access to the reservoirs.

The proposed project will affect no traffic patterns nor will any land use in the vicinity of the project be affected by any new traffic patterns.

14. Air Quality: This project is neither located in nor adjacent to a nonattainment or maintenance area according to EPA's website. The community of Wrangell is also not within the Dust Complaint in Rural Alaska area (ADEC 2016b). The Water Treatment Plant improvements will not result in permanent air quality impacts, as it will not result in additional air emissions. Some air emissions could be the result of construction equipment; however, these would be minor and temporary in nature. Further, most disturbed areas will be permanently stabilized after project completion to keep dust from becoming an air quality issue.

Air quality related to the project's primary beneficiaries:

- Trident Seafoods does not emit levels of air or greenhouse emissions that require and are therefore considered to be negligible.
- Sea Level Seafoods does not emit levels of air or greenhouse emissions that require and are therefore considered to be negligible.
- The Hospital does not emit odors, gases or other air emissions.
- The Stikine Inn does contain a restaurant and therefore emits minor food odors when cooking, which are minor and temporary in nature. Mitigation measures for their odors include ventilation hoods which are installed over the cooking appliances.

15. Noise: The noise generated by this project would be minimal during the brief construction phase and negligible post-construction. Further, this project would not take place near any noise-sensitive facilities (Google Earth 2013). The project would take place about 1 mile from the nearest school (1.11 miles to Evergreen Elementary and 1.01 miles to Stikine Middle School and Wrangell High School), 0.78 miles southeast of the nearest church (Bible Baptist Church), and 0.48 miles southeast of the nearest medical clinic (AICS Medical Clinic). The project will not cause the beneficiaries facilities to increase local ambient noise.

16. Permits: No environmental related permits are required for the project.

This project however will require an Alaska Department of Environmental Conservation (ADEC), Drinking Water Division, design and regulatory review and concurrence, with an Approval to Construct issued by their department.

17. Public Notification/Controversy: The subjects of Wrangell's water supply, the treatment plant's inability to provide adequate volume of water during peak periods, and water treatment alternatives have been before the public for at least two years.

During the Summer 2016 water crisis, the Wrangell Assembly held a town hall meeting on July 2nd to discuss the problem and declared a Disaster Emergency. Representatives from both seafood processing companies spoke under persons to be heard and implored the Wrangell Assembly to take the appropriate action to correct the problems with the existing water treatment plant, which is hindering their ability to conduct their regular business activities and has hindered them from expanding their business.

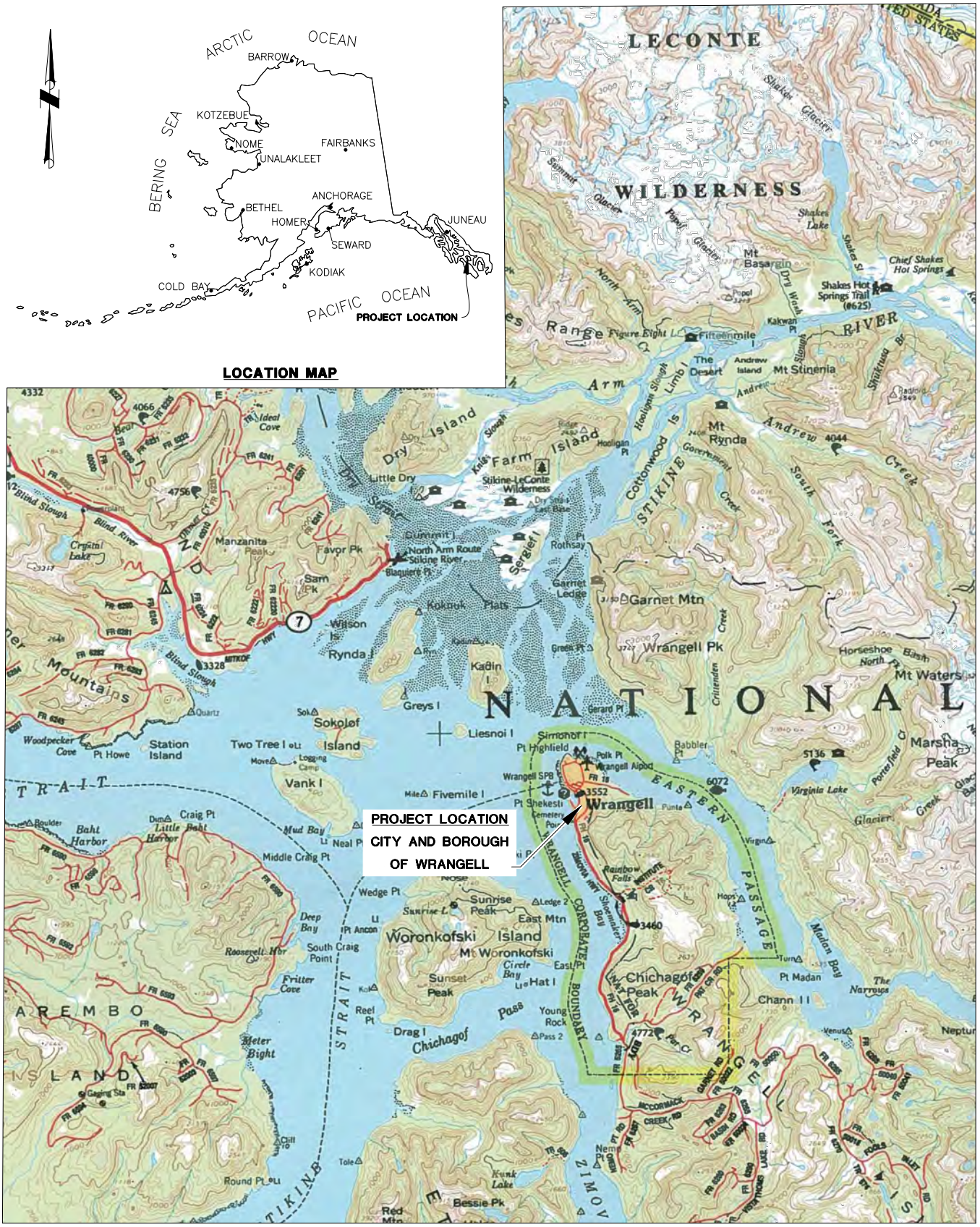
The Borough Assembly receives water and project updates at every Assembly meeting (2 per month) and the Assembly has struggled with determining the best treatment option and project financing regularly. Notifications, public meeting notices, Facebook, website, and bulletin board posts are utilized regularly to inform the public of meetings or water status. The public controversy lies with water restrictions due to the historical, periodic diminished supply of treated water needed to fulfill the demand, not the fact that the community needs a different water treatment process for long term growth and economic opportunity. The concern of the public is that the cost of the treatment plant may increase water rates dramatically. The borough has initiated a 4% annual water rate increase through 2020.

18. Cumulative Effects: Because the location of the project and existing water treatment plant are on a gated road with minimal public access to the lands surrounding the reservoirs and treatment plant there has been little development nearby that could in aggregate cause negative impacts. The closest commercial developments are approximately .5 mile away and include improvements to Wood Street where it intersects with Zimovia Highway (2016); improvements to a building structure at the intersection of Zimovia Highway and Wood Street by Wrangell Cooperative Association (2018); a storage facility with 8 bays located on Zimovia Highway below the plant, approximately .3 miles down hill; construction of the medical clinic accessed via Wood Street, .1 mile from Zimovia Highway in 2012; and a new hospital proposed for construction adjacent to the medical clinic proposed for construction in 2021-2022. The closest two residential developments have been approximately .4 miles downhill on Zimovia Highway and adjacent to the storage facility. Effects on wetlands by the clinic, road improvements and proposed hospital have been mitigated by stream restoration and land set asides. The residential developments and storage unit have met the US Army Corps of Engineers permitting requirements. There are no physical environmental impacts.

D. MITIGATION:

There are no mitigation measures being planned or believed to be necessary as the majority of the project is within an existing structure and the environmental impacts from the above categories are minimal.

LOCATION MAP

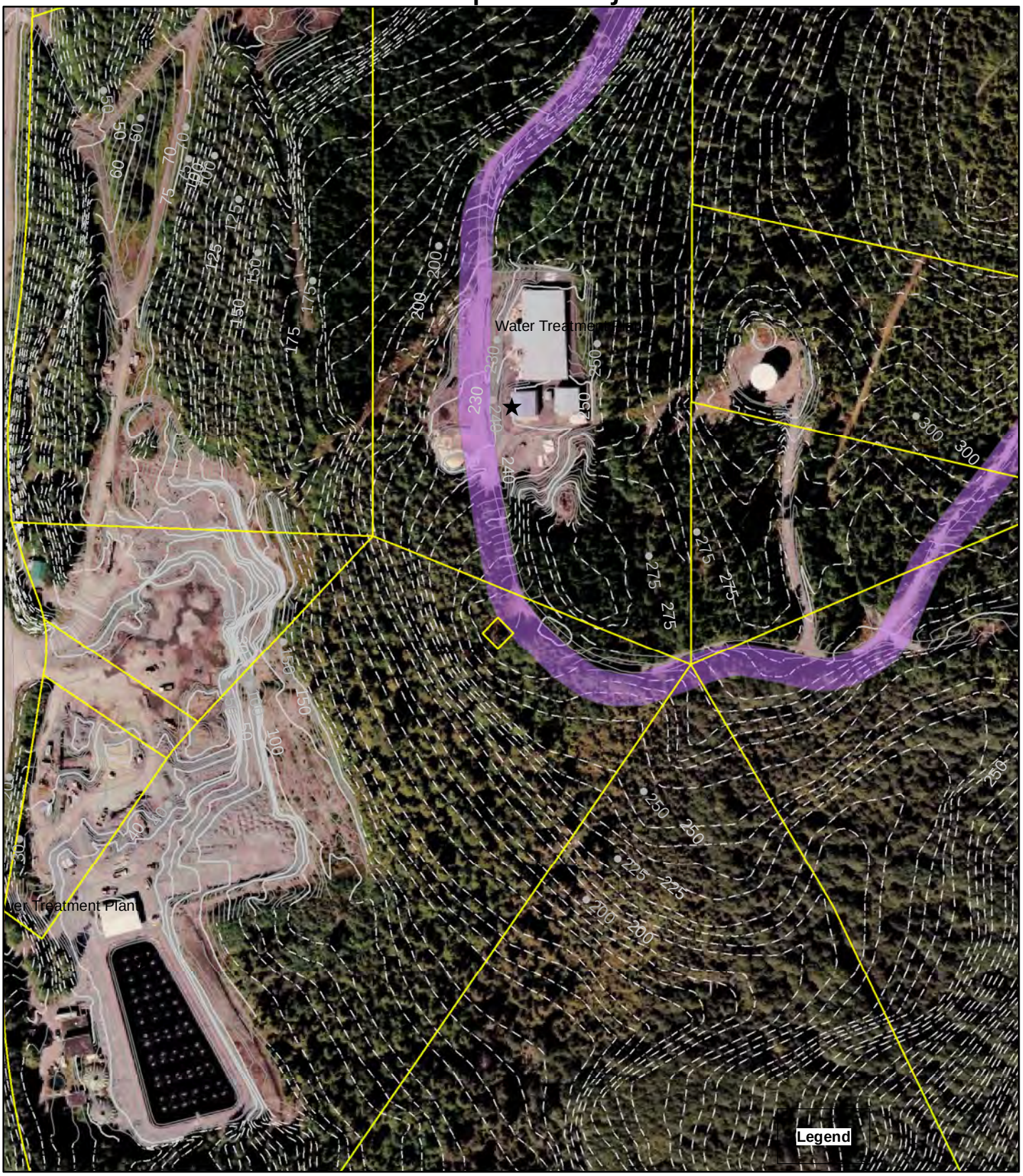


CRW ENGINEERING GROUP, LLC		CITY AND BOROUGH OF WRANGELL PRELIMINARY ENGINEERING REPORT **Figure 1** VICINITY MAP	Project No: 20901.00 Drawn By: WMK Scale: NTS Date: 10/5/2016
Project:			
STATUS: DRAFT			

FILE NAME: J:\Jobsdata\20901.00 Wrangell Water Treatment Pilot Study\00 CADD\01 Working Set\01 Civil\20901.00 Vicinity Map.dwg

CITY AND BOROUGH OF WRANGELL, ALASKA

Contour Map of Project Site



Public Map

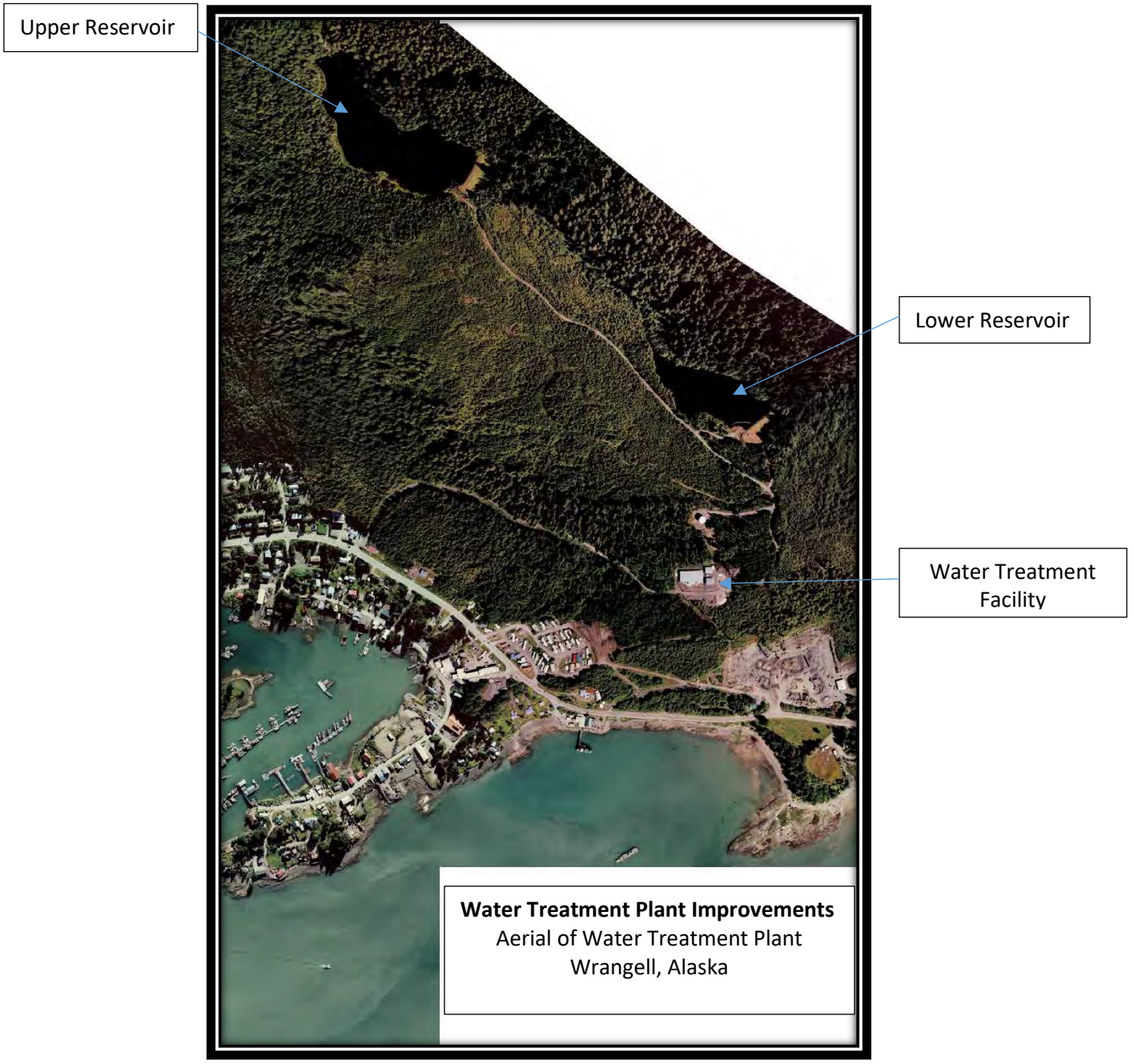
N

DISCLAIMER: THESE MAPS ARE FOR PLANNING PURPOSES ONLY. PROPERTY LINES ARE APPROXIMATE.

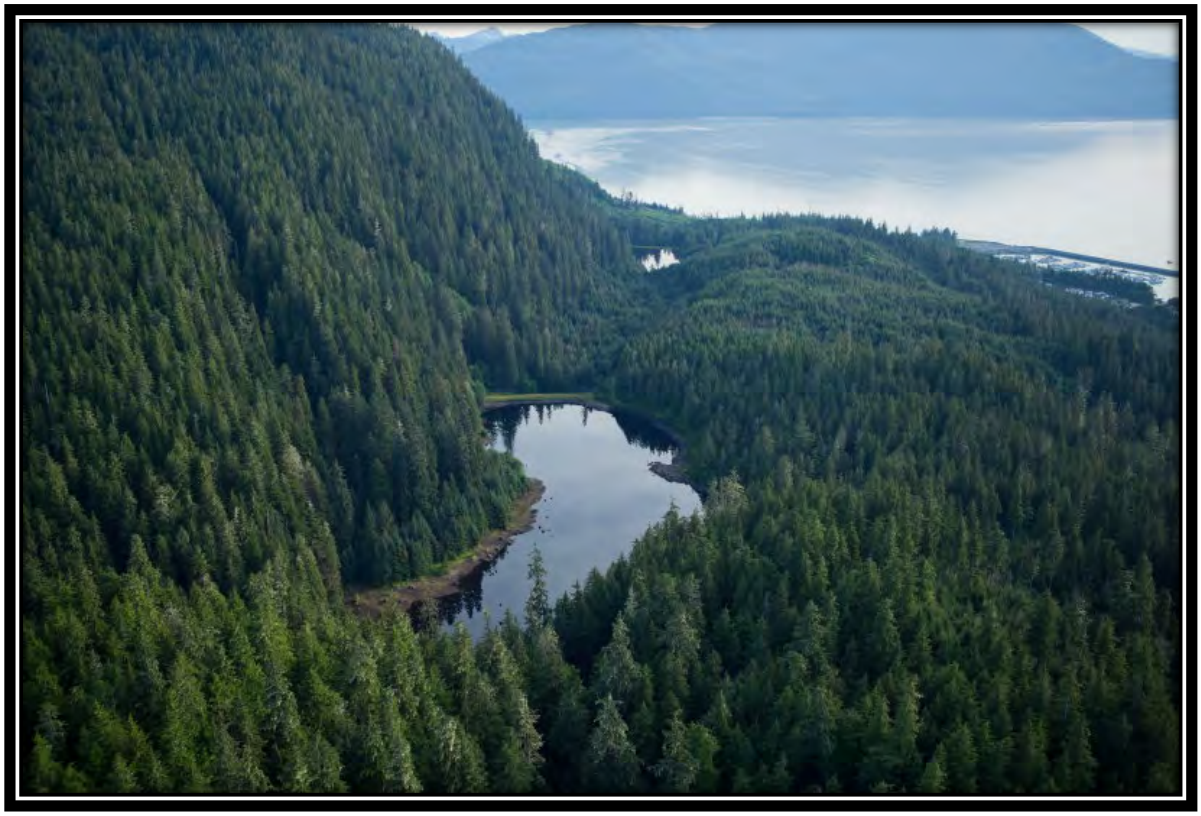
1 inch = 250 feet

Original Aerials from 2002

MAPS / PHOTOGRAPHS OF EXISTING PROJECT SITE
WRANGELL WATER TREATMENT PLANT IMPROVEMENTS

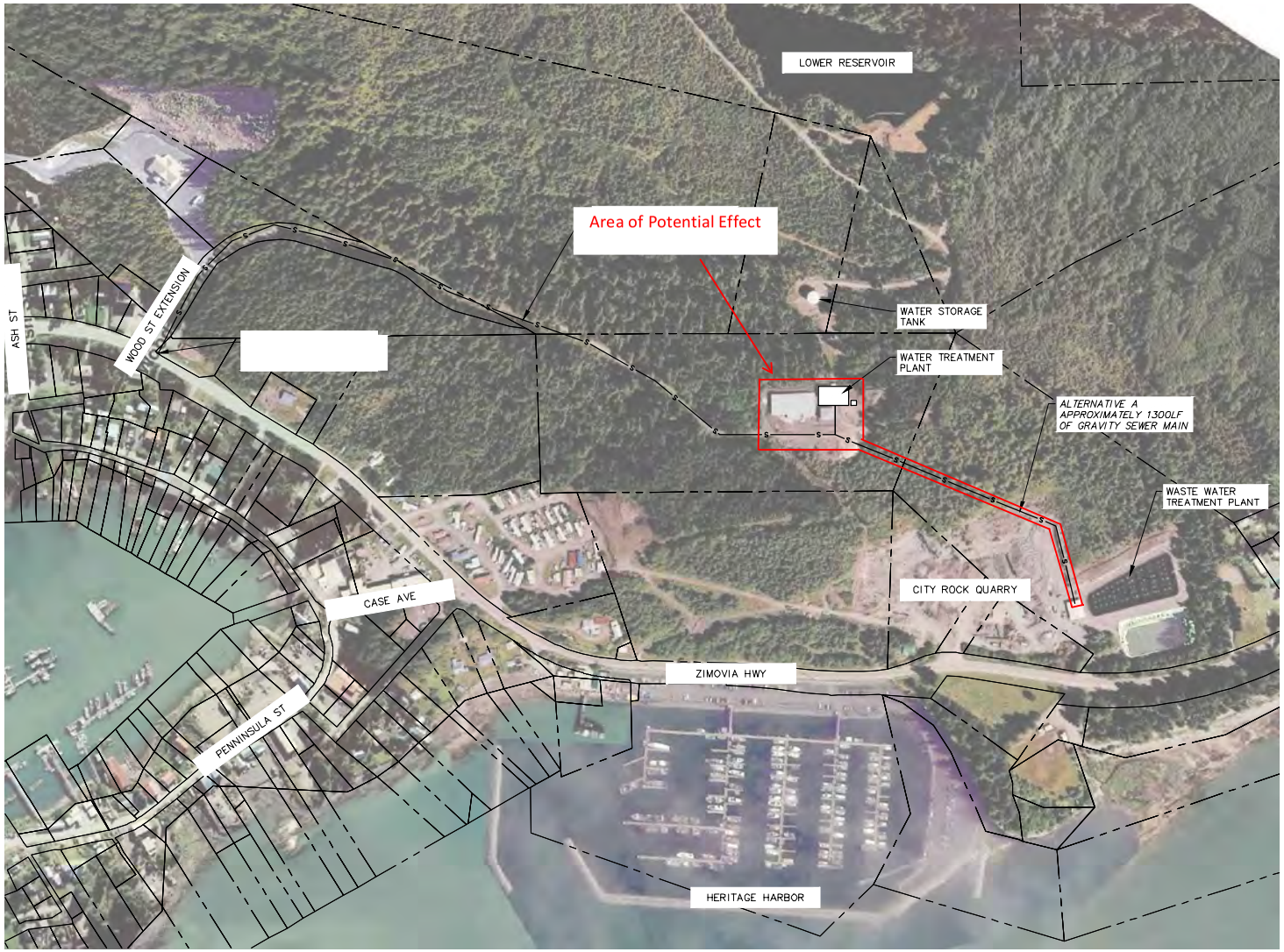


Water Treatment Facility



View from Upper Reservoir

Maps / Photographs of Existing Project Site
Wrangell Water Treatment Plant Improvements



200' 0 200' 400'

PROJECT:

STATUS: DRAFT

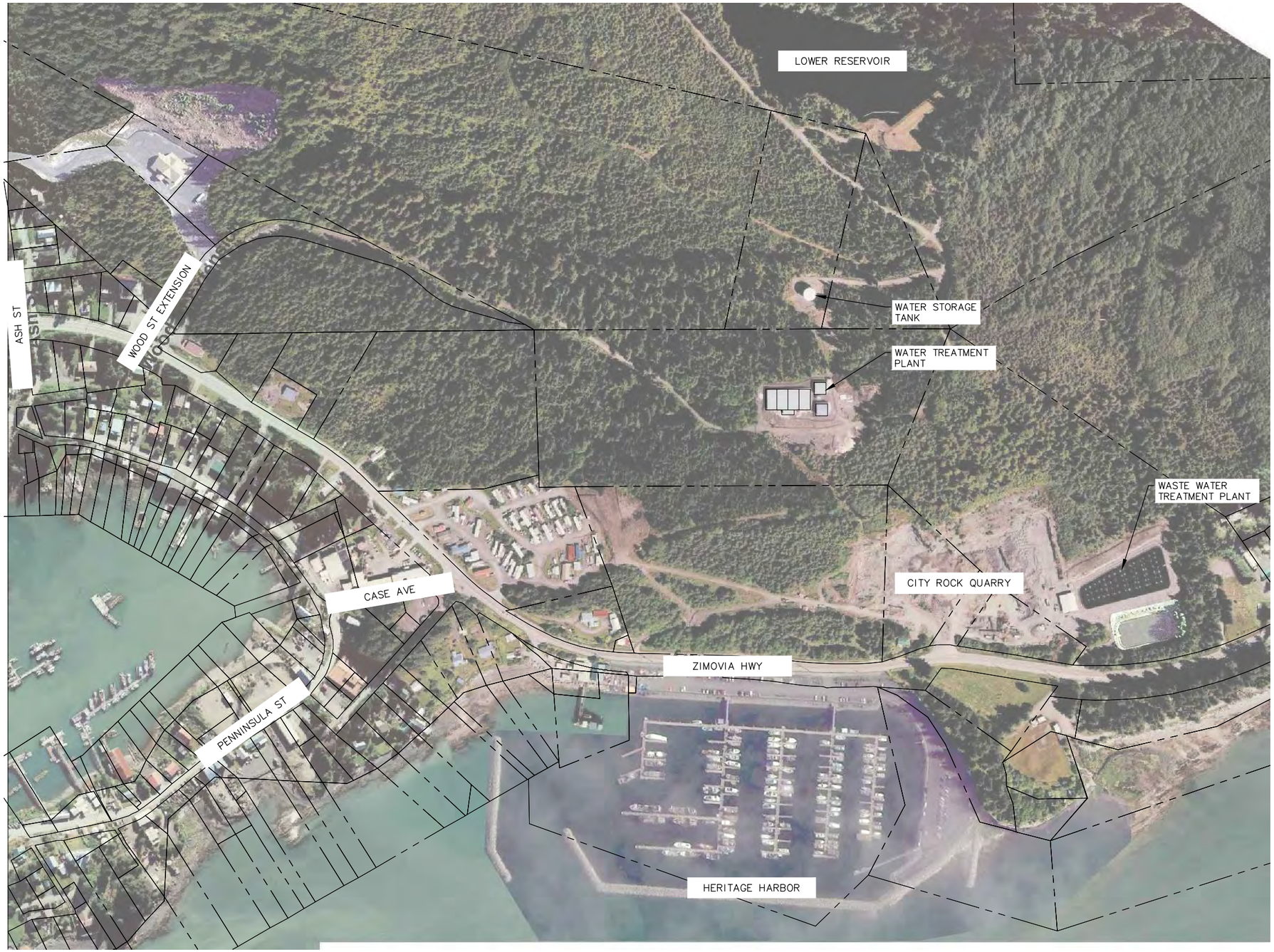
CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
PHONE (907) 562-3252

Wrangell WTP Upgrades Project
Area of Potential Effect

DATE 10/5/16

SCALE GRAPHIC

File: J:\Jobsdata\20901.00 Wrangell Water Treatment Pilot Study\00 CADD\02 Figures\05 PER\20901.00 Sewer Disposal Alternatives.dwg



File: J:\Jobsdata\20901.00 Wrangell Water Treatment Pilot Study\00 CADD\02 Figures\05 PER\20901.00 Site Plan – Existing Conditions.dwg

PROJECT: 20901.00
STATUS: DRAFT

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECL882-AK

Figure 2
EXISTING AREA MAP

DATE 10/4/16
SCALE GRAPHIC

THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Natural Resources
DIVISION OF PARKS & OUTDOOR RECREATION
Office of History & Archaeology
550 West 7th Ave, Suite 1310
Anchorage, Alaska 99501-3565
Main: 907.269.8721
http://dnr.alaska.gov/parks/oha

December 15th, 2016

File No.: 3130-1R USDA-RD
2016-01463

Robert Chambers
USDA – Rural Development
Alaska State Office
800 W. Evergreen, Suite 201
Palmer, AK 99645

SUBJECT: Finding of No Historic Properties Affected, City and Borough of Wrangell Water Treatment Plant Improvements

Dear Mr. Chambers:

The Alaska State Historic Preservation Office (AKSHPO) received your correspondence on December 8th, 2016. Upon review of the documentation provided, we concur that a finding of **no historic properties affected** is appropriate for the subject undertaking.

As a reminder, should previously unidentified archaeological resources be discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the National Register of Historic Places eligibility criteria (36 CFR 60.4) in consultation with our office.

Thank you for the opportunity to review and comment. Please contact Mckenzie Johnson at 269-8726 or mckenzie.johnson@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner

Judith E. Bittner
State Historic Preservation Officer

JEB: msj

Exhibit B

Wetlands Information and Coordination

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 6898
JBER, AK 99506-0898

November 21, 2016

Regulatory Division
POA-2016-535

City and Borough of Wrangell
Attn: Ms. Amber Al-Haddad
Post Office Box 531
Wrangell, Alaska 99929

Dear Ms. Al-Haddad:

This letter responds to your November 14, 2016, request for a Department of the Army (DA) jurisdictional determination for your proposed upgrade to the water treatment plant. It has been assigned number POA-2016-535, Zimovia Straits, which should be referred to in all correspondence with us. The project site is located within Section 36, T. 62 S., R. 83 E., Seward Meridian; USGS Quad Map AK-Petersburg B-2; Latitude 56.4561º N., Longitude 132.3770º W.; Wrangell-Petersburg Borough; in Wrangell, Alaska.

Based on our review of the information you provided, we have determined the subject property does not contain waters of the United States (U.S.) under Corps jurisdiction. Therefore, a DA permit is not required. A copy of the Approved Jurisdictional Determination form is available at: www.poa.usace.army.mil/Missions/Regulatory/JurisdictionalDeterminations.aspx under the above file number. Please contact us if you decide to alter the method, scope, or location of your proposed activity.

This approved jurisdictional determination is valid for a period of five (5) years from the date of this letter, unless new information supporting a revision is provided to us before the expiration date.

Enclosed is a Notification of Administrative Appeal Options and Process and Request for Appeal form regarding this approved jurisdictional determination (see section labeled “Approved Jurisdictional Determination”).

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

Please contact me via email at michael.r.gala@usace.army.mil, by mail at the address above, by phone at (907) 753-2821, or toll free from within Alaska at (800) 478-2712, if you have questions. For more information about the Regulatory Program, please visit our website at http://www.poa.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,

Michael R. Gala
Regulatory Specialist

Request for a Jurisdictional Determination from the Regulatory Division of the U.S. Army Corps of Engineers

Instructions: Provide the information on this sheet along with a map of the property and send it to one of the Corps offices listed on the back of this form.

City and Borough of Wrangell, Alaska
NAME

(907) 874-3904
PHONE - HOME

Amber Al-Haddad
Director of Public Works and Capital Projects
MAILING ADDRESS 1

(907) 874-3904
PHONE - WORK

P.O. Box 531
MAILING ADDRESS 2

FAX

Wrangell AK 99929
CITY STATE ZIP

aal-haddad@wrangell.com
E-MAIL

Property Location:

Section 31 Township 62S Range 84D Meridian Copper River Nearest City Wrangell

Lot: _____ Block: _____ Tract: _____ Subdivision Name: _____

Parcel Number: _____ Borough: City and Borough of Wrangell

Physical Address (if any): _____

Directions to the property: From the Wrangell Airport, take Airport Loop Road east to Bennett Street to Zimovia Highway. Turn left (east) off Zimovia Highway to Wood Street (the Water Treatment Plant access road). The project area can be accessed from the WTP parking area.

How are the boundaries of the property identified? _____

Do you own the land? (Yes) or No

If "Yes", do we have your permission to visit the property? (Yes) or No

If you do not own the property and in the event a site visit is necessary, provide a written statement from the landowner allowing the Corps of Engineers to enter the site.

To expedite our response to you, you may request a preliminary jurisdictional determination (PJD). If you need to obtain a permit for your project, it may be possible to evaluate your permit application using a PJD, depending on the specific project. Note that a PJD is not definitive and therefore not appealable. More information regarding JDs can be found at http://www.usace.army.mil/Portals/2/docs/civilworks/RGLS/rgl08-02.pdf.

Please indicate if you desire a preliminary jurisdictional determination (PJD). (YES) or NO

Signature Amber Al-Haddad
Public Works Director

Date: November 14, 2016

Submit this form and map to the Corps office responsible for the geographic area that encompasses the Property Location. (See back)

From: Robin Reich <robin@solsticeak.com>
Sent: Friday, November 11, 2016 2:04 PM
To: 'Speerstra, Linda POA'
Cc: ''Olivia Cohn''
Subject: FW: Wrangell Wetlands Water Treatment Plant Project

Hi Linda-
Here is information to follow up on the voicemail message I left you this morning. I will send along a JD request form, if you need it?

The City & Borough of Wrangell is currently proposing improvements to its water treatment processes that consist of constructing a backwash waste disposal pipe and an expansion and remodel of its water treatment plant (WTP). We are assisting the City with environmental permitting for this effort.

The project would be located in Wrangell, Alaska north of Zimovia Highway near Township 62 South, Range 84 East, Section 31 of the Copper River Meridian, USGS quadrangle Petersburg B-2 NE. The WTP is located at approximately latitude 56.4565028112, longitude -132.376624775 (Figure 1). WTP improvements would occur primarily within the footprint of the existing WTP to expand capacity of existing infrastructure. The preferred option for the backwash waste disposal pipe would be a 1,350 linear feet pipe that would be constructed to run downhill from the WTP, that is located near the 400-feet (ft) contour, to connect to the existing wastewater treatment facility (WWTF), that is located just under the 100-ft contour. See the included U.S. Geological Survey topographical map image for a depiction of the elevations (Figure 2). See the included photographs of the proposed project area for the WTP and backwash waste disposal pipe, which were taken on October 19, 2016 traveling downhill from the WTP to the WWTF, for a depiction of the proposed project area (Images 1 through 13).

National Wetlands Inventory (NWI) and Other Information
According to the NWI, wetlands do not exist in the project area (Figure 3). There is little other wetlands data available in the proposed project area. Land appraisals, the 2003 wetlands assessment (which does not include the proposed project area), a City & Borough of Wrangell Land Prospectus, the Wrangell Institute Master Plan, the Tongass National Forest website, the Southeast Alaska Land Trust's Wetland Ecosystem Services Protocol for Southeast Alaska, and additional resources were reviewed.

The grade along the vegetated hillside area along the proposed backwash disposal pipe route from the WTP to the WWTF is approximately 25% (a 25 ft elevation difference per 100 ft). It appears that the area contains forested vegetation (see images). According to the 2003 Wetlands and Watershed Management Plan for the City of Wrangell and Alaska Mental Health Trust Land Office, hydric soils were mapped almost a mile from the proposed project area, (for the Institute Study Area). According to the 2014 City and Borough of Wrangell, Alaska 134 Acre Land Prospectus, which includes the proposed project area, the land is described as mostly forested wetlands (The prospectus states: "Mostly forested wetlands occur throughout the property with several large creeks and smaller drainages.")

Given the information in this email, we are requesting a jurisdictional determination. Please see attached.

Figure 1. Water treatment project general project Area, Wrangell, Alaska

Figure 2. U.S. Geological Survey topographical map of the water treatment improvement proposed project area, Wrangell, Alaska. *The red diamond indicates the location of the WTP at 56.4565028112, -132.376624775.*


topoView
1880
2010
Shoemaker Bay Zimovia Hwy
Wood St
MAP RECORDS: 8

Figure 3. NWI mapping near general project area, Wrangell, Alaska

Site photographs

These photographs were taken on October 19, 2016 and follow the proposed project area traveling downhill from the WTP to the WWTF.

Image 1.

Image 2.

Image 3.

Image 4.

These photographs were taken on October 19, 2016 and follow the proposed project area traveling downhill from the WTP to the WWTF.

Image 5.

Image 6.

Image 7.

Image 8.

These photographs were taken on October 19, 2016 and follow the proposed project area traveling downhill from the WTP to the WWTF.

Image 9.

Image 10.

These photographs were taken on October 19, 2016 and follow the proposed project area traveling downhill from the WTP to the WWTF. The WWTF can be seen in these photographs.

Image 11.

Image 12.

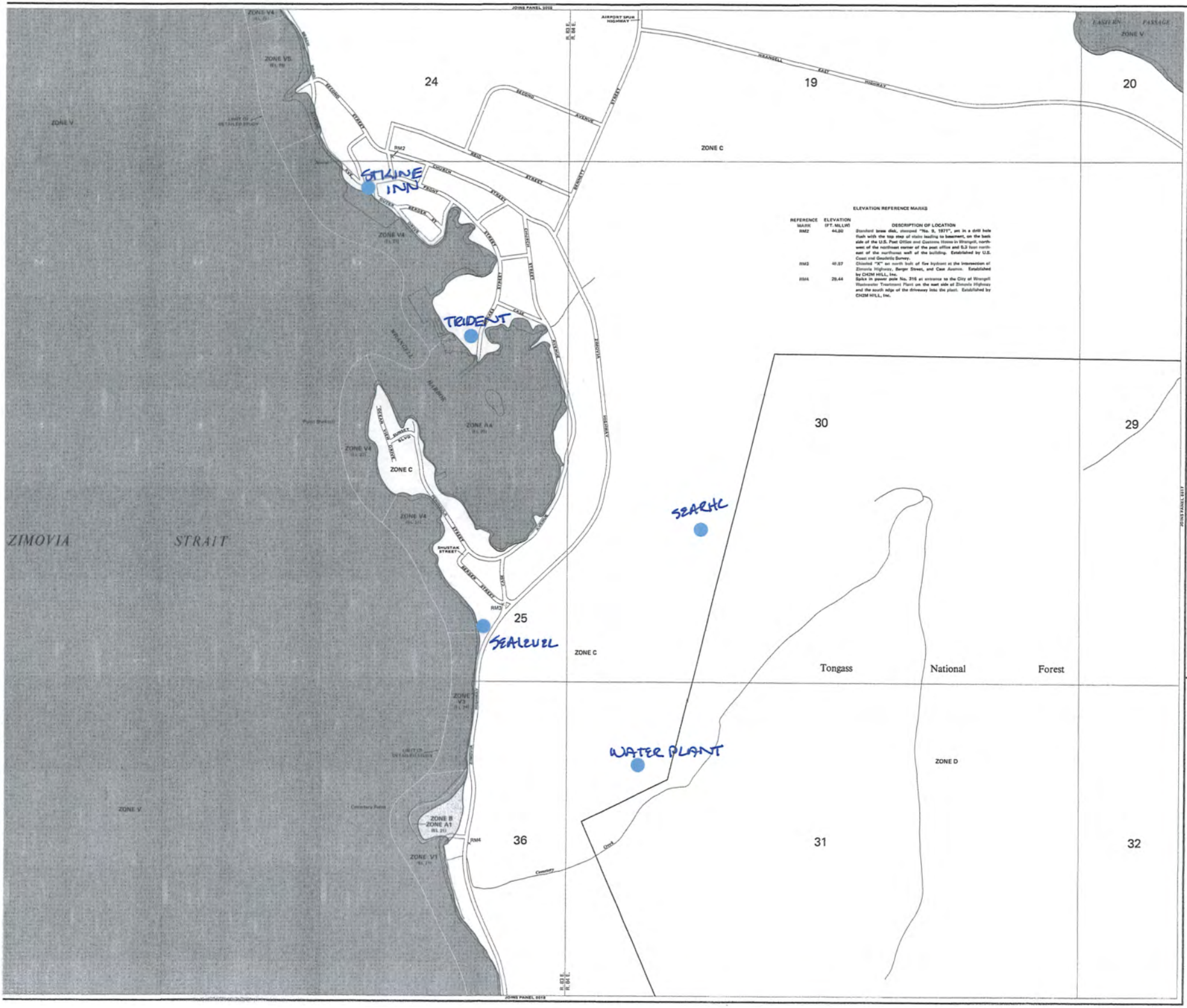
Image 13.

Thank you.

Robin Reich, President
Environmental Planner

Solstice Alaska Consulting, Inc.
2607 Fairbanks St. #B
Anchorage, AK 99503
907.929.5960
Cell: 907.903.0597

www.solsticeak.com



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. MLLW)	DESCRIPTION OF LOCATION
RM2	44.80	Standard brass disk, stamped "No. 8, 1971", set in a drill hole flush with the top step of stairs leading to basement, on the back side of the U.S. Post Office and Customs House in Wrangell, northwest of the northeast corner of the post office and 0.3 foot northeast of the northwest wall of the building. Established by U.S. Coast and Geodetic Survey.
RM3	40.07	Chiseled "X" on north bolt of fire hydrant at the intersection of Zimovia Highway, Berger Street, and Case Avenue. Established by CH2M HILL, Inc.
RM4	28.44	Spike in power pole No. 316 at entrance to the City of Wrangell Wastewater Treatment Plant on the east side of Zimovia Highway and the south edge of the driveway into the plant. Established by CH2M HILL, Inc.

KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	ZONE A1
Zone Designations*	ZONE A9
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	512
Base Flood Elevation In Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7×
Zone D Boundary	
River Mile	•M1.5

**Referenced to Mean Lower Low Water Datum.

***EXPLANATION OF ZONE DESIGNATIONS**

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
JUNE 28, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
FEBRUARY 4, 1977

FLOOD INSURANCE RATE MAP EFFECTIVE:
JUNE 15, 1982

FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
WRANGELL, ALASKA
WRANGELL-PETERSBURG
DIVISION

PANEL 16 OF 45
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
020098 0016 B

EFFECTIVE DATE:
JUNE 15, 1982

Federal Emergency Management Agency

Federal Emergency Management Agency

Washington, D.C. 20472

MAY 10 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Valery McCandless
Mayor, City of Wrangell
P.O. Box 531
Wrangell, AK 99929

IN REPLY REFER TO:
Case No.: 05-10-0329P
Community Name: City of Wrangell, AK
Community No.: 020098
Effective Date of This Revision: MAY 10 2006

Dear Mayor McCandless:

The Flood Insurance Rate Map for your community has been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Bothell, Washington, at (425) 487-4682, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

For: William R. Blanton Jr., CFM, Acting Chief
Engineering Management Section
Mitigation Division

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map

cc: Mr. Robert Prunella
City Manager
City of Wrangell

[redacted]
Principal, Coastal Engineer
Coast & Harbor Engineering, Inc.

 | Issue Date: MAY 10 2006 | Effective Date: MAY 10 2006 | Case No.: 05-10-0329P | LOMR-APP

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Wrangell Wrangell-Petersburg Census Area Alaska	COASTAL STRUCTURE	COASTAL ANALYSIS NEW TOPOGRAPHIC DATA
	COMMUNITY NO.: 020098		
IDENTIFIER	Wrangell Harbor	APPROXIMATE LATITUDE & LONGITUDE: 56.469, -132.385 SOURCE: Precision Mapping Streets DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 020098 0016 B DATE: June 15, 1982	NO REVISION TO THE FLOOD INSURANCE STUDY REPORT

Enclosures reflect changes to flooding sources affected by this revision.
* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES)

Wrangell Harbor – from the southernmost intersection of Front Street and Outer Drive, extending south along Front Street approximately 900 feet and west approximately 700 feet

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Wrangell Harbor	Zone VE	Zone C	NONE	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance stillwater elevations computed in the FIS for your community. A comprehensive restudy of your community's flood hazards could establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Carl L. Cook, Jr.
Director, Federal Insurance and Mitigation Division
Federal Emergency Management Agency, Region X
Federal Regional Center
130 228th Street Southwest
Bothell, WA 98021-9796
(425) 487-4682

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

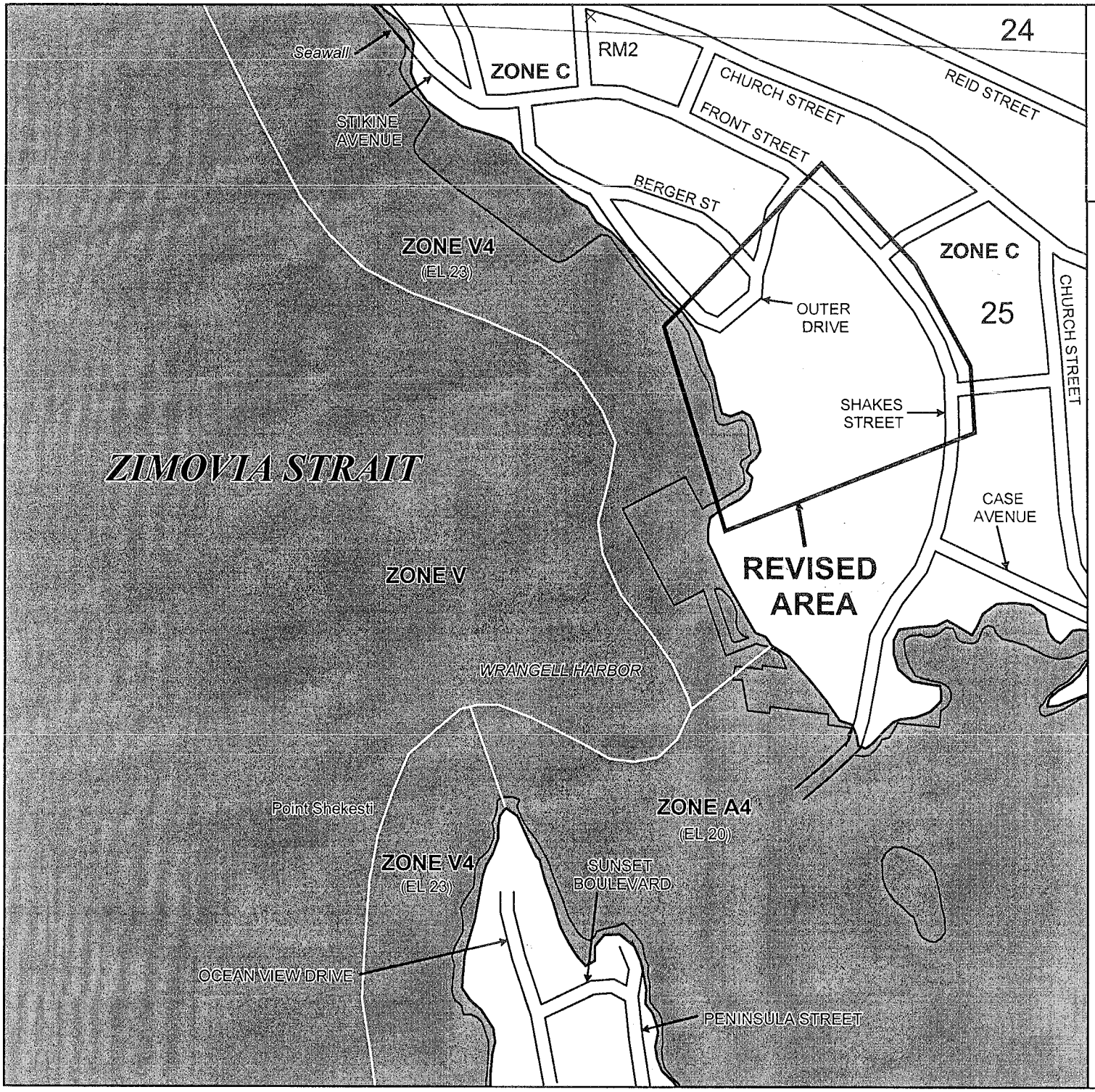
PUBLIC NOTIFICATION OF REVISION

This revision is effective as of the date of this letter. Any requests to review or alter this determination should be made within 30 days and must be based on scientific or technical data.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division



Legend

- 1% annual chance (100-Year) Floodplain
- 1% annual chance (100-Year) Floodway
- 0.2% annual chance (500-Year) Floodplain

APPROXIMATE SCALE IN FEET

400 0 400

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
WRANGELL, ALASKA
WRANGELL-PETERSBURG
DIVISION

PANEL 16 OF 45
(SEE MAP INDEX FOR PANELS NOT PRINTED)

REVISED TO
REFLECT LOMR
DATED MAY 10 2006

COMMUNITY-PANEL NUMBER
020098 0016 B

EFFECTIVE DATE:
JUNE 15, 1982

Federal Emergency Management Agency

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Anchorage Fish And Wildlife Conservation Office
4700 Blm Road
Anchorage, AK 99507
Phone: (907) 271-2888 Fax: (907) 271-2786

In Reply Refer To:
Consultation Code: 07CAAN00-2018-SLI-0239
Event Code: 07CAAN00-2018-E-00751
Project Name: Water Treatment Plant Improvements

June 01, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and some candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Please note that candidate species are not included on this list. We encourage you to visit the following website to learn more about candidate species in your area: http://www.fws.gov/alaska/fisheries/fieldoffice/anchorage/endangered/candidate_conservation.htm

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Anchorage Fish And Wildlife Conservation Office
4700 Blm Road
Anchorage, AK 99507
(907) 271-2888

Project Summary

Consultation Code: 07CAAN00-2018-SLI-0239

Event Code: 07CAAN00-2018-E-00751

Project Name: Water Treatment Plant Improvements

Project Type: Federal Grant / Loan Related

Project Description: This project will modify an existing water treatment plant facility. Backwash from the plant will be discharged via a pipe to the nearby Waste Water treatment plant located downhill from the facility. Construction for the entire project would occur between September 2018 to September 2019.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/56.45614483750006N132.376537983422W

Counties: Wrangell, AK

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

BOOK 16 PAGE 606

State of Alaska

Patent

No. 9598

Know Ye By These Presents that the State of Alaska, pursuant to A.S. 38.05.810 and the regulations promulgated thereunder, in consideration of the sum of TEN AND NO/100 DOLLARS lawful money of the United States, and other good and valuable consideration, now paid, the receipt whereof is hereby acknowledged, does hereby grant to The CITY OF WRANGELL, P.O. Box 531, Wrangell, Alaska 99929, its successors and assigns, all that real property situated in the Wrangell Recording District, State of Alaska, and described as follows:

PARCELS 1, 2, 3A, 3B, 4A, 4B, 5, 6, 7, 8 AND 9 OF ALASKA STATE LAND SURVEY NO. 84-83, CONTAINING 288.728 ACRES, MORE OR LESS, ACCORDING TO THE SURVEY PLAT FILED IN THE WRANGELL RECORDING DISTRICT ON JANUARY 30, 1986 AS PLAT 86-1.

Subject to:

Platted easements and reservations.

The Grantee is granted the authority to manage easements reserved, to limit, restrict, or close easements in order to protect public health, safety, wildlife values, or the environment.

BOOK 16 PAGE 607

88-230

RECORDED - ~~FILED~~ 13
WRANGELL REC. DIST.
DATE 5-16 19 88
TIME 2:40 P.M.
Requested by City of
Address Wrangell

Save and Except, those restrictions appearing in the Federal Patent or other conveyance by which the Grantor acquired title;

And Further, Alaska, as Grantor, hereby expressly saves, excepts and reserves out of the grant hereby made, unto itself, its lessees, successors, and assigns forever, all oils, gases, coal, ores, minerals, fissionable materials, geothermal resources, and fossils of every name, kind or description, and which may be in or upon said lands above described, or any part thereof, and the right to explore the same for such oils, gases, coal, ores, minerals, fissionable materials, geothermal resources, and fossils, and it also hereby expressly saves and reserves out of the grant hereby made, unto itself, its lessees, successors, and assigns forever, the right to enter by itself, its or their agents, attorneys, and servants upon said lands, or any part or parts thereof, at any and all times for the purpose of opening, developing, drilling, and working mines or wells on these or other lands and taking out and removing therefrom all such oils, gases, coal, ores, minerals, fissionable materials, geothermal resources, and fossils, and to that end it further expressly reserves out of the grant hereby made, unto itself, its lessees, successors, and assigns forever, the right by its or their agents, servants and attorneys at any and all times to erect, construct, maintain, and use all such buildings, machinery, roads, pipelines, powerlines, and railroads, sink such shafts, drill such wells, remove such soil, and to remain on said lands or any part thereof for the foregoing purposes and to occupy as much of said lands as may be necessary or convenient for such purposes hereby expressly reserving to itself, its lessees, successors, and assigns, as aforesaid, generally all rights and power in, to, and over said land, whether herein expressed or not, reasonably necessary or convenient to render beneficial and efficient the complete enjoyment of the property and rights hereby expressly reserved.

To Have And To Hold the said land, together with the tenements, hereditaments, and appurtenances thereunto appertaining, unto the said Grantee and ~~heirs and assigns forever~~ its successors and assigns forever.

In Testimony Whereof the State of Alaska has caused these presents to be executed by the Director of the Division of Land and Water Management, Department of Natural Resources, State of Alaska, pursuant to delegated authority, this 6th day of May A.D., 19 88

Carol L. Shobe
For the Director, Division of Land and Water Management

State of Alaska }
THIRD Judicial District } ss.

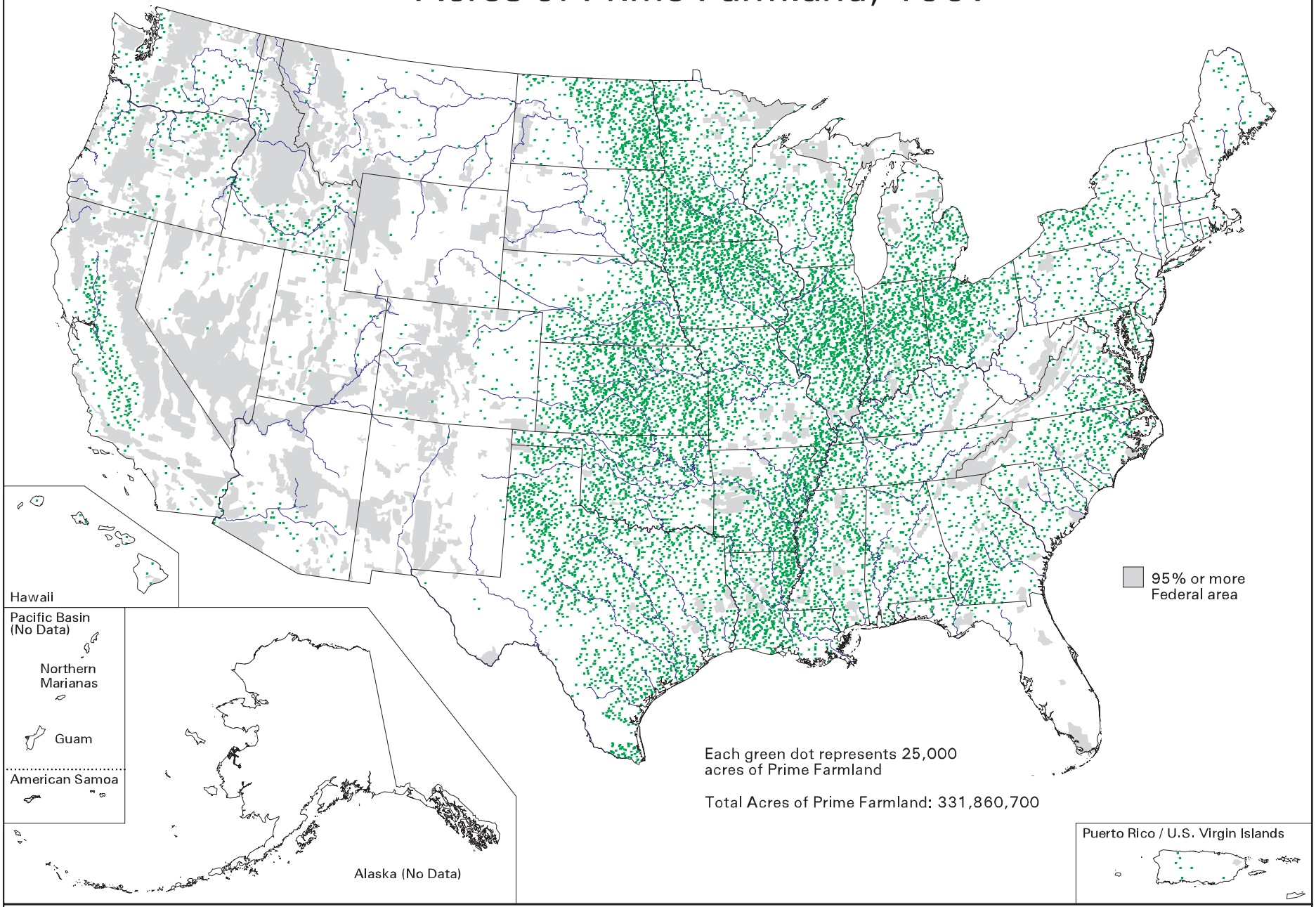
This Is To Certify that on the 6th day May 19 88 appeared before me Carol L. Shobe who is known to me to be the Director of the Division of Land and Water Management, Department of Natural Resources, State of Alaska, or the person who has been lawfully delegated the authority of said Director to execute the foregoing document; that he executed said document under such legal authority and with knowledge of its contents; and that such act was performed freely and voluntarily upon the premises and for the purposes stated therein.

K. L. Kruger
Notary Public in and for Alaska
My Commission expires 4-4-89

ADL No. 100553
Patent No. 9598
Location Index:
T. 62 S., R. 83 E., C.R.M.
Section 24
T. 62 S., R. 84 E., C.R.M.

Return Document to:
City Clerk
City of Wrangell
PO Box 531
[illegible] AK 99929

Acres of Prime Farmland, 1997



U.S. Department of Agriculture
Natural Resources Conservation Service
Resource Assessment Division
Washington DC January 2001

Map ID: m4983
For proper interpretation, see Explanation of Analysis for this map at our web site. Search for "USDASOTL" to locate our map index.

Data Source: 1997 National Resources Inventory
Revised December 2000

M4983.MAP (Color Comp)

2017 Free Disposal/Recycling Guide

Aluminum Cans-Garnet Grit Betties
If possible please crush cans.

- **Boxes at City Market and Bobs'**
  Contact: Jennifer Wiederspohn

Animal Carcasses

- City Dump –inside building with regular household waste

Batteries – Auto and Marine (Must be intact w/caps on and not leaking)

- Napa, Sentry, Bay Company, City Dump

Batteries – Household

- WCA IGAP Office (Eg. Duracell, Energizer, etc.)

Cell Phones

- GCI Office

Commercial Fishing Nets

- Travel Lift Yard – look for the sign
- Please strip nets of all lines!

Compact Fluorescent Light Bulbs

- WCA IGAP Office

Cardboard - Dry, free of plastic and styrofoam

- City Market (back of store by the bailer)
- City Dump

Electronic Waste

- WCA IGAP E-waste Event Spring 2018

Eye Glasses

- First Bank, Hospital (physical therapy area)

Paper

- City Dump - Dry and burnable

Printer Ink Cartridges

- American Legion Auxiliary Contact
- WCA IGAP Office
- Buness Brothers

Rummage, Consignment and Clean Plastic Bags-CLEAN, GENTLY used items

- Moosalaneous Bargains Legion Hall: Thurs-Sun 12-4pm (or if sign is on). For larger items contact Marilyn Mork

Scrap Metals – Copper, Brass, Aluminum, and Stainless – Call for information:

- Garnet Grit Betties: Jennifer Wiederspohn
- Rolland Howell

Used Motor Oil

- Harbor locations – Heritage, Shoemaker, Inner, Harbor Office

Compost!
The community garden collects and uses compost as follows:

- Please follow directions on the bins
- Add only fruits, veggies, coffee grounds, shredded newspaper, egg shells, etc.
- No meat or meat products (bones, etc.)
- No glossy paper nor grass clippings with weed killer

Community Projects!
If you have a community clean-up project, you may contact Public Works to see if your project qualifies for free plastic bags and disposal at the city dump. These are specifically NOT for regular household waste, rather community oriented projects.

Zaks Restaurant has some containers available for reuse, such as egg cartons, plastic jugs, etc. Selection varies week to week. Help yourself!

City Dump (Material Transfer Facility) Hours:

Tues-Fri	8:30-9:30 am, 12:00-4:00pm
Saturday	9:00-11:30, 12:30-4:30
Sun/Mon	Closed

City Dump fees: $14 for the 1st cubic yard volume $7/cy each additional yard thereafter. **Animal carcasses, burnable**s and **auto** and **marine batteries** are **FREE** to dispose of at the dump.

Contact Info

Harbor Office	874- 3736
Public Works	874- 3904
Jennifer Wiederspohn	305-0164
American Legion	874-3646
Marilyn Mork	874-2189
Rolland Howell	305- 1041

The WCA IGAP Program compiled this list. If you have questions or additions, please don't hesitate to call or stop by our office! (907) 874 4304, 104 Lynch St. Wrangell, AK

June 2017 For large or commercial quantities, please contact the vendor prior to drop off.
Replaces 2016 blue copy

My Map

SoleSourceAquifers - SSA_Labels

SoleSourceAquifers - SSA

Borough Assembly

Work Session - Water Treatment Plant Solutions

Calendar Date:

Monday, February 5, 2018 - 5:30pm

Add to your calendar: Outlook (iCal) - Google

Back to calendar

City & Borough of Wrangell, Alaska

PUBLIC NOTICE

On **Monday, February 5, 2018,** the Borough Assembly will hold a Work Session at 5:30 p.m. and a Special Assembly meeting at 6:30 p.m., at City Hall, regarding the following items:

Work Session (5:30 p.m.): Discussion – Water Treatment Plant Solutions

Special Assembly Mtg. (7:00 p.m.): Executive Session: Borough Manager's 6 Month Evaluation

Meeting Information

Agenda:

Work Session Packet - Water Treatment Improvements Final Evaluation and Recommendation (2 MB)

Special Borough Assembly Meeting Agenda, February 5, 2018 (89 KB)

MEMORANDUM

TO: HONORABLE MAYOR AND MEMBERS OF THE ASSEMBLY
CITY AND BOROUGH OF WRANGELL

FROM: AMBER AL-HADDAD, DIRECTOR OF PUBLIC WORKS

SUBJECT: WATER TREATMENT IMPROVEMENTS, FINAL EVALUATION AND RECOMENDATIONS

DATE: January 29, 2018

INTRODUCTION

Wrangell's slow-sand water treatment facility experiences significant challenges in meeting peak water demand at various times of the year. Significant changes are needed to improve the facility's water treatment process to ensure compliance with water quality standards, to meet current peak demand, and to prepare for growth and the additional demand expected to be placed on the water system.

CBW Staff and Assembly have spent a significant amount of time and expense to assess the needs and identify alternatives for water treatment system improvements and maintenance. CRW Engineering Group joined the CBW to perform an engineering study to carefully evaluate various project delivery models and make a final recommendation to the CBW. This Memorandum summarizes the challenges of our current water treatment process, outlines the operations and maintenance, engineering and project funding work performed to date and provides staff's recommendations based on CRW's final evaluation and recommendations for further improvements to Wrangell's water treatment system.

BACKGROUND

To supply potable water, Wrangell owns and operates a Class 2 Public Water System (PWS ID No. AK2120143), under which the current water treatment plant was constructed in 1999 and features an ozonation process followed by roughing filter, slow-sand filtration and disinfection. Soon after the plant came on-line, the CBW became unable to operate a number of the processes in accordance with the design, which has resulted in less effective water treatment and higher than expected O&M costs. In addition, the facility struggles to meet peak water demand in the summer when seafood processors and cruise ships become active, as well as during the colder months when residents leave their water running to avoid freeze-up. Further, with high organic concentrations in the raw water, we are faced with high disinfection by-product formation when chlorine is injected in the plant's filtered water, prior to storage and distribution.

The current water treatment system is fed by a surface water source. In the process of producing drinking water, Wrangell deals with these primary challenges:

- Poor roughing filter performance.
- Premature head loss development in the slow sand filters, leading to difficulty and an inordinate frequency in filter maintenance.
- Average to below-average removal of organics from the water.
- Relatively high chlorine consumption in the distribution system.
- High levels of haloacetic acids in the distribution system.
- Low slow filtration capacity and water storage volume relative to summer and winter water demands.

The current filtration system is designed to remove organics through ozonation and filtration, prior to chlorination; however, the current design and consistent high flow volumes do not allow enough organics to be removed. Remaining high organics and turbidity cause rapid clogging of the sand filter; therefore, water is not filtered fast enough to meet the increased seasonal demand. The filters must be scraped and cleaned every week, rather than quarterly according to the plant's O&M design. This continual filter cleaning does not allow the necessary development of biofilm on the top layer of sand where the primary biological treatment should occur.

As required by the Safe Drinking Water Act and other State and Federal regulations, the CBW's treated water must meet certain water quality standards established by EPA. Based on stringent water quality regulations, it will become increasingly difficult to meet additional requirements for reducing the risk of health-related incidents in drinking water with our current treatment facility.

Demand within the community has grown and surpassed the design limits of the plant. The plant was designed for a peak flow of 900 gpm. Immediately following construction in 1999, this was found to be lacking in production capability and therefore the max production was increased to its current max production of 1,000 gpm, with little-to-no capability for additional production without modifications which would incur significant capital costs.

The increase in our seafood processing output and marine services industries has placed an increase in water consumption and added strain on the water plant. In July 2011 alone, our storage capacity fell to critical levels eight times, resulting in the potential shut down of seafood processors. As well, during the summers of 2014 and 2016, following the 2011 addition of a second 424,000 gallon treated water storage tank, the storage capacity level continued to reach critical levels. In July 2016 the treated water supply was at such critical low levels for several weeks that the City and Borough of Wrangell declared a Local Disaster and Emergency with a request for State assistance. The community was able to make it through these critical times only after one seafood processor redirected fish to another community, both processors made modifications to their processes, water sales to cruise ships were halted, water service to the

City's harbors and swimming pool was reduced, and mandated water conservation measures were implemented community-wide.

During 2016's critically low water supply period, Wrangell was already well into its first steps in the pursuit of an improved water treatment system. The CBW was engaged in performing a water plant pilot study with CRW Engineering Group, LLC. The purpose of that project was to identify deficiencies in our current water treatment plant, evaluate methods for improving the treatment process, perform on-site pilot testing of the alternative selected from the initial evaluation and provide guidance for the acquisition of recommended water treatment improvements. As the pilot plant testing was concluding, CRW developed a Preliminary Engineering Report to identify the findings of the pilot test and develop preliminary design criteria based on recommendations for Wrangell's Water Treatment Plant Improvements project.

TIMELINE OF WATER DEPARTMENT ACTIVITIES / PROJECT COSTS TO DATE

June 2015 Assembly approves PSA to CRW Engineering with a contract to evaluate methods to improve its water treatment process and perform a pilot study. **(Project Cost $158,112; $150,000 funded from DCCED grant; $8,112 funded from Water Department Reserves)**

Feb 2016 Assembly accepts the CBW staff's and CRW's recommendation to implement the pilot study based on the preferred alternative testing method, using Dissolved Air Flotation (DAF) with Multi-media Filtration. This also allowed us the ability to compare the DAF alternative to the alternative to improve the existing facility based on the combined technical and economical merits toward meeting our community's water needs.

July 2016 Treated water shortages, caused by high consumption, prompts Assembly to issue a Disaster Declaration and Request for State Assistance. Plea issued to community to reduce consumption between 30%-50%.

July-Dec 2016 Staff consults with CRW to address water shortage issues/options, develop sand dredging cleaning methods, tracer study review, and prepare and review with DEC roughing filter improvements design based on media replacement. **(Project Cost: $43,570; funded from Water Department Reserves)**

Sept 2016 Assembly approves PSA amendment to CRW's pilot study contract to develop a Preliminary Engineering Report (PER) and Environmental Assessment (EA), a higher level of engineering report than originally required through the pilot plant project. The PER is required by USDA to qualify applicants for the USDA's WWD loan/grant program. **(Project Cost: $64,098; funded from Water Department Reserves)**

Oct 2016 CBW submits application to USDA's WWD program requesting funding for DAF treatment improvements.

Dec 2016 CRW submits design of roughing milter modification, through media replacement and elevation, for ADEC review and approval.

Jan 2017 CBW staff review CRW-recommended sand dredging plan, experiments with a dredge system and determines the dredge option to be ineffective. Staff begin developing an optional sand cleaning plan.

Feb 2017 CBW and CRW review opportunities for value engineering to reduce overall capital costs of DAF replacement project. This effort resulted in a cost reduction of approximately $3,000,000. The opportunity lost through this project scope and cost reduction is the water treatment capacity for projected community growth and that growth's associated water demands beyond the year 2038. Resulting DAF project cost is approximately $9,000,000.

March 2017 CBW receives ADEC-approval for roughing filter modifications based on media replacement and elevation of the media bed.

March 2017 CBW submits final application to USDA requesting funding for DAF treatment upgrades.

March 2017 Assembly approves expenditures of up to $50,000 to make purchases and temporary hires, as necessary, to prepare for a successful upcoming peak water consumption season.

April 2017 Water Shortage Management Plan adopted by Assembly.

April 2017 Assembly approves contract to CRW to design roughing filter replacement with Forsta Filter's filtration system. ADEC approval received in June 2017. **(Projects Cost $29,984; funded from Water Department Reserves)**

April 26, 2017 Public hearing conducting for public review and comment regarding the Notice of Intent to File an Application to USDA for the purpose of financing improvements to Wrangell's water treatment system.

April 2017 Water Department staff complete fabrication of a water/air scour plunging manifold and performed a trial run of first sand filter "plunging" for cleaning purposes with good success. Four temporary employees hired to assist with sand cleaning, in preparation of the coming peak summer season.

April 2017 Assembly approves, and then reverses the approval, of $250,000 for the replacement of media for one of the four sand filters.

May 2017 At the Assembly's request, CRW provides opinion regarding efficiency of replacing only one sand filter's media in terms of filter flow rate and particulate loading rate. **(Project Cost: $475; funded from Water Department Reserves)**

May 2017 Two, new Ozone Generators installed **(Project Cost: $211,360; funded from Water Department Reserves, with reimbursement expected from DEC loan in FY18. This cost is based on the purchase of one generator. The manufacturer offered to replace the generator unit that we purchased in 2016, with their newest series, at no additional cost to the CBW.)**

June 2017 Ordinance 935 Water Chapter revised to increase water rates (7% in 2017; 5% in 2018 and 5% in 2019) for all customers and restructure the base-rate and bulk-rate water volumes for small and large commercial metered customers.

June 2017 CBW receives ADEC approval to construct roughing filter modifications based on Forsta Filter design by CRW. Construction project cost estimated at $250,000 for design based on two filters (one is for redundancy).

June-July 2017 Staff consults with Case Marine regarding improvements to roughing filters. Suggestions included exploring a down-flow design with possible addition of air scouring system or the Forsta Filters, considering the requirement of a system that includes redundancy for efficient operation.

July 2017 CBW receives notice from USDA of their agency's consideration to loan $3,821,000 and grant $3,161,000 for water treatment improvements based on DAF treatment upgrades and backwash waste disposal, pending receipt from the Borough of Form RD 1942-46, Letter of Intent to Meet Conditions, and Form RD 1940-1, Request for Obligation of Funds, required within thirty days of receipt of this notification.

Aug 2017 Staff receive results of our water's particle count sampling, indicating that greater than 90% of particles would pass through the originally suggested 10-micron screen mesh. Based on this new information, CRW verified with Forsta Filter that six (not two) Forsta Filter units, with 5-micron screen mesh, are needed to adequately replace our existing roughing filters (three of the six, or half of the operational need, are for redundancy). Further design for this larger system has yet to be finalized, including ADEC's further follow-on concurrence.

Sept 2017 Assembly approves PSA to Shannon & Wilson to conduct a Groundwater Desktop Study to investigate the probability of a groundwater source on Wrangell Island. **(Project Cost: $8,055; funded from Water Department CIP)**

Staff plan to include a copy of Shannon & Wilson's the Groundwater Desktop Study findings in the February 6, 2018 Assembly Agenda packet.

Oct 2017 Consideration given to adding backwash options to both a roughing filter redesign similar to the plant's original up-flow design, but with elevated media to optimize the backwash process, as well as to a roughing filter redesign that provides a down-flow with backwash capabilities. These options are being reviewed with Roberts Filters' staff engineers who are reviewing our water characteristics, current design and have offered to make initial recommendations based on the filtration systems they design. The automatic self-cleaning Forsta Filters is also being reexamined based on the need of additional filters that was determined after receiving the particle count analysis information.

CBW issues amendment to CRW's contract to further analyze water treatment improvement alternatives, including additional options for short-term improvements to the roughing filters, and to consider adding a water metering program geared toward water conservation efforts. **(Project Cost: $15,750; funded from Water Department CIP)**

Oct 2017 CBW performs sand media analysis to compare the existing properties of the sand to the specification of the sand as originally designed. The results from the tests were analyzed by CRW in their final evaluation and recommendation **(Project Cost: 1,300; funded from Water Department Facility Maintenance budget FY18)**

Nov 2017 CBW receives USDA notice that the $3,821,000 loan and the $3,161,000 grant were officially approved in Federal Fiscal Year 2017 for the construction and upgrades to the water treatment plant to house two parallel DAF units and backwash waste disposal. This approval assumes the CBW's ability to contribute the remaining project cost through other funding sources. This approval requires a subsequent set of conditions be met to continue project momentum.

Dec 2018 CBW receives CRW Engineer's draft evaluation and recommendation for review and comment. Schedules final submittal in January 2018.

Jan 2018 CBW receives CRW Engineers' final evaluation and recommendation for water treatment improvements.

COST SUMMARY TO DATE

- Engineering-related costs from 2015-Present are $321,344
- Ozone Generator costs in 2017 were $211,360 (advanced from Water Department Reserves; to be reimbursed through receipt of ADEC-approved loan)
- Ozone Generator costs in 2016 were $202,620 (fully funded from Water Department Reserves)

RECOMMENDATION

Given the updated information on the two alternatives, Alternative 1 - Improve Existing Water Treatment Process, and Alternative 2 – Dissolved Air Flotation (DAF) with Multimedia Filtration, staff recommend the following:

A. Adopt Alternative 2 of the CRW Engineering Group, LLC's January 24, 2018 Memorandum entitled Water Treatment Upgrades: Final Evaluation and Recommendation and construct a new water treatment facility based on the DAF treatment process. Reason's supporting this recommendation:

1. The capital cost of the DAF project is substantially less, by approximately $6.5 million, than the capital cost to make improvements to the existing treatment/process facility for providing similar capacities in both water treatment and water storage.

2. Although the DAF alternative is projected to have slightly higher (approximately 5% higher) O&M costs (includes wages, chemicals and supplies, maintenance and operation of the treatment plant) than the alternative to improve the existing plant, the DAF alternative is the more cost effective treatment process based on having a lower life cycle cost and the higher treatment efficiency.

3. The DAF project would result in less volume of water waste associated with backwashing.

4. The DAF project is estimated to require less time for construction.

5. DAF offers the more cost effective technology for meeting water demand for future growth. The modular design of the DAF system better facilitates future expansion as Wrangell continues to grow.

6. DAF provides an almost instantaneous, and "on demand" supply of treated water as demand from the community dictates, versus the lengthy delay of the current, slow-sand system's treatment process.

7. DAF is expected to provide excellent color removal and good organics removal, thus reducing our current level of Disinfection By-Products (DBP) in the distribution system. DAF is a robust process that can accommodate significant variability in raw water quality without substantial adjustments in the treatment process.

8. Wrangell already enjoys quality water. The DAF treatment system will serve to improve the quality of Wrangell's drinking water.

A more detailed timeline for this recommendation will be provided subsequent to this Memorandum.

B. For near-term improvements, move forward with the roughing filters' replacement based on the Forsta Filters' self-cleaning mechanical filters option. Replacing the roughing filters will provide significant improvements to the treatment process until a DAF project is fully implemented. Reason's supporting this recommendation:

1. Replacing the existing roughing filters with the Forsta Filters, prior to DAF implementation, will provide Wrangell with significant gains and improvements to the treatment process, maintenance process, and final water quality during the interim period between now and DAF operation. Further benefits expected through this improvement are increased capacity of treated water, longer run times for the sand filters, and improved water quality.

2. During construction of the DAF treatment system, a roughing filter replacement system would be required based on the fact that the conceptual design of the DAF system proposes to modify the roughing filter building in order to house the DAF units. The Forsta Filter units could be relocated during reconstruction of the roughing filter building to continue serving this pre-treatment process, a cost that would otherwise be incurred in the DAF project, Phase 1 (this interim pre-treatment filtration is currently not included in CRW's DAF project cost estimate, as it is recommended to be an expense incurred ahead of that project, as found in the recommendations).

While we are reasonably confident that the Forsta Filters will meet the needs of our pre-treatment filtration, as a replacement for the existing roughing filters, staff have move forward with short-term pilot testing through the rental of a small Forsta Filter pilot filter, which will be installed for a couple of weeks to collect data.

This recommendation requires additional time for further design of the six-filter system and ADEC's follow-on review, prior to construction. The timeline to complete a Forsta Filter self-cleaning mechanical filters replacement project is not projected until after the summer peak season has begun; however, we would move swiftly to have the final design and agency concurrence completed without delay, with the hope that a

construction start might be possible during the summer. A more detailed timeline for this recommendation will be provided subsequent to this Memorandum.

C. There is industry support that indicates a water metering program can play an important role in reducing water consumption. Such a program can also help to predict flows, determine leaks within the distribution system, set water rate structures for equitable cost allocation, and determine who to target for further conservation measures. While adding a water metering system in Wrangell could play a role in water conservation, due to the significant capital costs, of between $3.4M - $4.6M, for a program of this nature, staff do not recommend pursuing a Borough-wide metering project at this time.

D. Continue pursuit of funding alternatives, including grants and loans, to pay for the water treatment system's improvements projects determined by final Assembly approval.

The Borough's water system must balance four major elements, those being supply, treatment, distribution and rates. In the big picture of balancing these elements, replacing the existing treatment system will improve our number-one, most-significant water challenge of today. While moving forward to construct a new water treatment facility will reduce the amount of funds available for future improvements to the dams and distribution system, Wrangell's ongoing water treatment system problem cannot continue to be pushed aside any longer. As we move forward, we will need to make improvements to other portions of our water system. Given the financial status of the Water Department, these further improvements are expected to cause increases to water rates if those projects are to be addressed.

FINANCIAL PLAN

The total cost of the recommended improvements is $9,640,000 and is recommended to be paid through a combination of loans and grants.

Source of Project Funds	***Amount***	***For***	***Additional Annual Debt Service***
Borough Water Fund Reserves	458,000	Roughing Filters	0.00
USDA Grant Revenue	3,161,000	DAF Plant	0.00
USDA Loan Payable (Proceeds from Loan)	3,821,000	DAF Plant	153,189.78
EDA Grant Revenue	1,750,000	DAF Plant	0.00
DEC Loan Payable	450,000	DAF Plant	26,210.58
Total	**9,640,000**		**179,400.36**

Because it is not yet known, the above project costs do not include the interim financing cost required by USDA.

Staff is drafting projections for future budgets, which will include the additional debt service, as well as projected operations and maintenance (O&M) costs for the DAF system.

It is not currently recommended that the upcoming sequential 5% rate increases effective 7/1/2018 and 7/1/2019 be modified, however it is possible that subsequent rate increases will be recommended or required to cover the operating costs, debt service costs associated with these plant improvements, and other anticipated capital needs. It is recommended that a formal rate study be considered to assist in developing these longer-range rate recommendations, necessary to establish a cash reserve to repay debt. Staff recognize the hardship that increasing rates places on our customers and will continue to make management decisions based on this acute awareness.

FUTURE WATER SYSTEM CAPITAL NEEDS

- Rate Study
- Dams' Rehabilitation
- Water Main Replacement
- Water Metering - Phased
- Other Unplanned Projects

ATTACHMENTS

- MEMORANDUM from CRW Engineering Group LLC entitled Water Treatment Upgrades: Final Evaluation and Recommendation, dated January 24, 2018

The Borough Assembly will review and discuss the water treatment improvements recommendations provided herein during a workshop scheduled for February 5, 2018, 5:30-7:00 p.m. Due to this short time frame available to review this project, the full report will not be reviewed in detail at that meeting, but rather the recommendations will be highlighted during the meeting, to leave time for Q&A and discussion. CRW Engineers, Jon Hermon and Will Kemp, will also attend the workshop, by teleconference, to discuss their evaluation and recommendations.

At their regularly-scheduled meeting on February 27, 2017, it is expected that the Assembly will deliberate and take action for water treatment system improvements.

Memorandum

Date:	January 24, 2018
To:	Amber Al-Haddad, City and Borough of Wrangell
From:	CRW Engineering Group, LLC
Project:	Wrangell Water Treatment Plant
Project No:	CRW #20901.00
Subject:	Water Treatment Upgrades: Final Evaluation and Recommendation

1. Background

The City and Borough of Wrangell (CBW) has retained CRW Engineering Group, LLC (CRW) to provide engineering services related to improving the community's water treatment plant (WTP). The CBW currently operates a Community Public Water System (PWSID # AK2120143) using a surface water source under the requirements of the U.S. Environmental Protection Agency (EPA) surface water treatment rules. CRW prepared a Desktop Analysis in December 2015 and a Preliminary Engineering Report (PER) in April 2017, both of which identified dissolved air flotation (DAF) with multimedia filtration as the recommended alternative. This technology was pilot tested on-site during the fall of 2016.

Since these studies were performed, CBW has explored additional strategies for improving its ability to meet near-term peak summertime water demands. These strategies include the following options:

- Modifying the roughing filter media stratification and gradation to improve cleaning via down-flushing.
- Replacing the roughing filter media altogether with automated self-cleaning screen filters.
- Adding positive means to backwash the roughing filter media.
- Cleaning the slow sand filter media using mechanical and chemical methods.
- Installing flow meters on service lines as a way to encourage community-wide water conservation.

This technical memorandum summarizes the assessments of these additional options in context of improving CBW's capacity to treat and supply water, and in relation to funding being pursued in the present time. Significantly improving its plant throughput would help CBW meet its near-term water demands and possibly delay the need for more substantial improvements, such as reconfiguring the treatment scheme around a DAF process. In light of these considerations, this technical memorandum also further reviews which of the two previously short-listed alternatives that CBW may pursue as a long-term strategy to meet its growth and treatment objectives:

- Improve various processes of the existing WTP facilities.
- Implement DAF and multimedia as the principal water treatment processes.

Another important consideration in the review of these alternatives is the need for additional water storage, which would better buffer the water treatment process from extreme variations in community water demand. The need for additional water storage is evaluated further in this exercise as an option of both alternatives.

2. Funding Overview

The CBW anticipates funding treatment system upgrades through a combination of funding sources.

The CBW has accepted a funding package from the United States Department of Agriculture (USDA) comprised of a $3,821,000 loan and a $3,161,000 grant for a total amount of $6,982,000. The scope of the funding package is based upon the recommendations outlined in the PER prepared by CRW which would upgrade the treatment system to a DAF treatment technology. The USDA funding can only be used for the scope outlined in the PER, and the funding package must be used within five years.

The CBW has also requested $450,000 in funding from the Alaska Department of Environmental Conservation (ADEC) Drinking Water Fund priority list. The CBW plans to apply for $1,500,000 in additional funding from the Alaska Economic Development Administration (EDA). Additionally the CBW has allocated $250,000 in their Water Department Capital Improvements Projects (CIP) budget for improving the water treatment process.

3. Existing Water Treatment Process Concerns

The concerns expressed by CBW as significantly impacting the water treatment process are summarized in both the *Desktop Assessment* and *Preliminary Engineering Report* recently conducted to evaluate CBW's water treatment process. Concerns further addressed in this memorandum are summarized below.

- Roughing Filter Performance: CBW operators report that occasionally the turbidity leaving the roughing filters is greater than that entering the filters. This condition appears to be a symptom of poor cleaning performance by the backwashing system, which would result in the accumulation of contaminants within the media. These accumulations are occasionally discharged to the downstream slow sand filters in relatively high concentrations. These issues may be aggravated by the use of media particles that are larger than specified. Further, as the roughing filters gradually clog with captured solids while operating in an up-flow direction, the water surface upstream of these filters will tend to rise. Because the maximum rise that can be sustained without impacting the process flow through the ozone contactor is less than 2 feet, the length of the roughing filters run times is limited.

- Slow Sand Filter Cleaning: Although the slow sand filtration system design anticipated a cleaning frequency of about four times per year, the actual need to clean filters arises about every 10 to 14 days on average (more frequently with higher summer flows and less frequently with lower winter flows). This condition appears to be due to the slow sand filters being subjected to a higher-than-anticipated solids loading rate, since the roughing filters are not performing effectively. ADEC has also expressed concern that the ATV used in cleaning the filters could contaminate the water.

- Filtration Capacity: During summer months, when fish processors and other commercial users are consuming potable water, the water demand increases to the point where it is difficult to take filters off-line for cleaning. All filters are needed in these conditions to meet the peak water demand. Further, in a 2012 Sanitary Survey performed by ADEC, concern was expressed that the slow sand filters were not allowed to properly "ripen" (i.e., redevelop a sufficient biomat for effective treatment) prior to being placed back on-line. This requirement does not appear to be possible with the frequency currently needed for cleaning, nor for the WTP to function in peak demand conditions.

4. Water Treatment Upgrade Alternatives

a. Alternative 1 – Improve Existing Water Treatment Process

The existing water treatment process features slow sand filtration. Slow sand filtration primarily uses a biological process to remove biodegradable and assimilable substances, which are not readily removed by ordinary granular filtration methods. As water slowly flows through fine-grained sand media, a biological mat ("schmutzdecke") develops on its surface, which provides a medium in which microbes can encounter, break down, and assimilate dissolved compounds.

Under this alternative, the existing slow sand filter treatment process would be upgraded. General flow capacity increases would be made to the existing unit processes including: pH adjustment, ozonation, roughing filtration, and slow sand filtration. A backwash clarifying tank and sludge storage area and secondary dewatering system would be installed for backwash water disposal.

In particular, the roughing filters would also be modified to provide the following upgrades:

- Media gradations revised to provide better filtering performance.
- Improved media cleaning capability.
- Increased upstream hydraulic head to better accommodate solids uptake in the roughing filters.

With these roughing filter improvements, it is believed that slow sand filter performance would be enhanced as well, allowing them to operate longer between cleanings and more readily enable filter cleaning and media ripening. However, because these improvements would be made to an existing, custom-designed filtration system, it is not certain precisely how much these upgrades would improve the performance of the overall filtration process.

b. Alternative 2 – Dissolved Air Flotation (DAF) with Multimedia Filtration

DAF is a pre-filtration process that uses the introduction of minute air bubbles to suspend low-density solids like algae and organic compounds, which facilitate the removal of these contaminants from the water treatment stream. These compounds are typically difficult to remove by sedimentation processes, because they settle very slowly, especially when water temperatures are colder. With sedimentation, coagulants are used to increase the mass of these compounds and increase their ability to settle out of the treatment flow and be disposed of. Further, the sedimentation process needs to operate with slower flow rates when water temperatures are relatively cold.

DAF is an effective alternative to sedimentation, as the targeted compounds are floated instead of settled, and are subsequently skimmed from the water surface. With the use of flotation, smaller coagulant dosages can be used to remove contaminants, because it is generally easier to float suspended particles out of the process flow rather than sinking them. With DAF providing a more efficient removal process, the required treatment time can be made considerably shorter than for the sedimentation process. Consequently, DAF flow rates are typically higher, and the equipment can be made smaller relative to conventional filtration.

Under Alternative 2, the existing roughing filter building would be expanded to house two parallel DAF plants installed downstream of the pH adjustment system. The two package plants would integrate DAF and multimedia filtration. PAX XL-19, an aluminum chlorohydrate, would be used

as the coagulant and rapid-mixed with the raw water. With this alternative, a lower dosage of alum would be used due to the efficiencies of DAF. This alternative would include reusing the existing disinfection system and converting the existing slow sand filters to a serpentine clearwell for storing treated water. A backwash clarifying tank and sludge storage area and secondary dewatering system would be installed onsite to treat backwash wastewater.

5. Near-Term Options for Alternative 1 Improvements

Several near-term options for improving the existing water treatment system were considered and are presented in the following sections, including roughing filter improvements, self-cleaning filters, and slow sand filter improvements.

a. Roughing Filter Cleaning Improvements

Three media cleaning sub-options were reviewed for the CBW roughing filters:

- Sub-option 1: Downflow backwashing with raised media bed.
- Sub-option 2: Provide air scour prior to down-flow backwashing with raised media bed.
- Sub-option 3: Provide simultaneous air scour and up-flow backwashing with media bed supported on basin bottom.

Sub-Option 1:

The media currently rests on the concrete floor of the roughing filter basin and operates in an up-flow configuration. The roughing filters are currently cleaned using a down-flow backwash. Backwashing is accomplished by a rapid drawdown of the water in the basin, which is intended to strip and flush solids from media particles. However, the actual drawdown is slow, due to the inability for water to exit the basin relatively quickly. Water outflow appears to be inhibited by the existing distributor piping at the basin bottom also being used as a backwash collector system.

To improve the down-flow cleaning process under this sub-option, the media would be raised up and supported on grating to provide an open space below. The grating would be supported by steel beams and concrete blocks. With an open space between the bottom layer of media and the concrete basin floor, the media cleaning process could be made more effective by promoting a faster drawdown that would better suspend and flush accumulated solids from the media. Additionally, three new, large drain valves would be installed to facilitate the rapid draining of the basin that is responsible for cleaning. The basin floor will be sloped as well to direct solids to the drains by gravity.

To accommodate the elevated media support grating, the depth of the existing coarse media would be reduced to 2 feet. The existing media would be overlain by a 1-foot layer of finer media with particle sizes ranging between 4 to 8 mm, to enhance solids removal during the filtering process.

This sub-option was initially developed by CBW and CRW as a relatively economical way to improve CBW's ability to clean the media consistent with the original design intentions. However, the uncertainty of how well this technique would work made questionable the costs to make the modifications. This sub-option was therefore not given further consideration.

Sub-Option 2:

The media and media supports would be reconfigured as described in the Sub-Option 1 section above, except that the media sizes would be reduced to range between 2.2 and 2.4 mm, and constitute the entire media depth. This depth is also increased from 36 to 42 inches. To more-positively clean the media, an air scour would be applied prior to the fast drawdown. The air scouring would be provided using a piped grid installed below the media. Air would be pumped into the grid using an air blower. As air bubbles are diffused through the media, they rise upward and agitate the media particles for a prescribed time period. To accommodate media expansion during the backwash process, it is assumed that the roughing filter walls would be extended to about 3 feet above the existing finish floor elevation.

Sub-Option 3:

If the direction of backwash flow were reversed to an upward direction, then an air scour could be applied simultaneously, which would agitate and more effectively clean the media. With relatively large media particles used in these filters, effective cleaning is currently impractical without air scour to supplement the backwash flow.

To backwash the filters in this fashion, a pump would be activated to increase the up-flow through the filter media. Air scouring would then be applied similar to the configuration described above for Sub-Option 2. After media agitation and scouring, the backflow up-flow would continue until a targeted clarity was achieved in the water. Then the backwash pump would be deactivated, and the WTP flow redirected to the slow sand filters. By cleaning solids upstream beforehand, the loading rate on the slow sand filters could be reduced, thereby allowing them to run longer.

For this sub-option, the media bed would be supported directly on the basin floor similar to the existing configuration, which would maintain the existing freeboard depth. Steel launder troughs would be installed at an elevation higher than the collector pipe inlets to receive backwash flow and direct it to waste.

Discussion of Roughing Filter Improvement Sub-Options

A number of considerations are needed for all of the roughing improvement sub-options presented above. The first is that the available hydraulic head at the roughing filter basin is limited for operating with a media range size of 4 to 8 mm, as originally designed. When the roughing filters were first put into operation, the media reportedly clogged rapidly, presumably due to the relatively small media size working with a high solids loading rate. Based on discussions with filter manufacturers, this condition was likely made worse by the limited upstream head, about 2 feet, which is the difference in water surface elevations between the ozone contactor and the roughing filters. As a result, the filters would've experienced significant backwater increases as the media progressively clogged with solids. The media has since been replaced with larger diameter pea gravel, but this gradation has marginal capability to filter solids. Further, any retained solids are prone to sloughing off media particles, which produces effluent water quality that is poorer than the influent water.

For any of the sub-options presented, additional hydraulic head would be needed with the design media gradation to provide effective filtration. Two options are apparent for increasing the hydraulic head, presuming that the roughing filter would continue to be operated in an up-flow fashion. The first option would be to add a set of booster pumps just upstream of the roughing filters, with associated piping, valves and controls. The second option would be to modify the ozone contactor and roughing filters to provide this hydraulic head, which would be accomplished

by increasing the height of the contactor and roughing filter concrete walls, and making any necessary adjustments to the WTP's existing automated flow control valve.

The other consideration associated with upgrading the existing roughing filters is the size of backwash pumps and blowers that would be required. Because the roughing filters have a low loading rate (1.15 GPM/SF), the size of the filters is relatively large relative to the process flow rate. As a result, the size of the blowers and backwash pumps required to effectively clean the filters would also be proportionally large in size.

It should be noted that for all of these sub-options and the roughing filter options described in Sections 5b and 5c below, existing valving and infrastructure would allow for bypassing the roughing filters during construction. Because the roughing filters do not significantly improve water quality to the sand filters, and often make it worse, bypassing the roughing filters during construction of either sub-option is not anticipated to be an issue.

b. Pre-Treatment with Self-Cleaning Filters

Another option would be to replace the existing roughing filters with self-cleaning mechanical filters. These mechanical filters would employ a two-stage screening process using a coarse screen followed by a fine screen. Screen sizes are selected based upon raw water characteristics. Correspondence with a self-cleaning filter manufacturer has indicated that a screen size of 10 microns is the appropriate size for CBW's raw water. The self-cleaning filters would use controlled backwash pumps to perform automated filter backwashes. A booster pump would also be required to provide sufficient flow and pressure through the self-cleaning filters. In order to facilitate maintenance and provide redundancy, two sets of self-cleaning filters, backwash pumps and booster pumps would be required. The self-cleaning filters and associated piping, pumps and valves could be installed in the roughing filter basins.

c. Pre-Treatment with Up-flow Clarifiers

Another option would be to replace the existing roughing filters with an up-flow clarifier. The media in the up-flow clarifiers would be designed to provide adequate pre-treatment before the slow sand filters and be washable. The primary advantage of using up-flow clarifiers is that the loading rate can be designed to be much higher than that currently used for the existing roughing filters. Consequently, the footprint of an up-flow clarifier would be a fraction of the roughing filter footprint. The up-flow clarifier would require a pressure pump on the upstream side to provide sufficient flow through the filter. Both the up-flow clarifier and the pressure pump could be located in the existing roughing filter basin, which would require removal of the existing roughing filter components. An air blower and backwash pump would also be required to provide air scour and simultaneous backwash. The blower would likely be located on the floor of the roughing filter building. The backwash pump would be located in the roughing filter basin. A filtration aid (coagulant) would also be used to improve filtration. The coagulant dosing system would be located in the control building.

d. Slow Sand Filter Improvements

To improve filter flow, CBW has been reviewing ways to rejuvenate the slow sand filters either by media replacement or by media cleaning. Since the media was originally installed in the late 1990s, captured solids have gradually accumulated in the deeper media zones. CBW can backwash the slow sand filters by opening a valve that conveys treated water from the WSTs and through the piped effluent collector system at the bottoms of the filter basins. The backwash

flow rate is limited by the fact that the collector system orifices are oriented downward. With this configuration, CBW is concerned that a high flow rate would irreversibly thrust the effluent collector system upward into the media. This piped system is not believed to be sufficiently tied to the filter floor such that it can be held down against the thrusting. Consequently, the backwash flow is throttled to avoid this damage, but the resulting flow rate is ineffective in cleaning the sand media.

Media replacement was reviewed and deemed to be prohibitively expensive, due to the large volume of sand needed and the shipping distances to manufacturers that produce NSF-certified sand. Just the cost of procuring the sand would amount to around $850,000. The labor cost of transporting the media from the docks to the WTP and replacing the media in the four filters would add to the procurement cost.

To mechanically clean the media, the use of a hydraulic eductor was reviewed by CRW with CBW, which was successfully used in another filter improvement project. However, this method was complicated by the fact that CBW's existing slow sand media is layered in two specific particle sizes: 0.5 mm and 1.0 mm. The intent of this layering is understood to keep media from flowing out the effluent collector system, which is comprised of slotted piping. Concern was expressed that the eductor approach, which based its cleaning technique on substantial movement of the sand with water, was impractical without destroying this layering.

Nevertheless, CBW developed and employed a similar approach with the use of jets. The jets were comprised of pipe wands, through which water and air were pumped. By plunging the jets into the media depth, the sand could be agitated and solids materials could be drawn up to the media surface where it could washed away. This method was used on all the filters. Although the sand layering was apparently not destroyed with this method, some localized disturbance has probably occurred at the layer interface. Nevertheless, negligible media loss has been observed, and as a result of these efforts, CBW has achieved significant improvements in filter flow rates. Whereas each filter was conveying a rough average of 150 to 200 GPM (about half the design capacity) prior to cleaning, after cleaning, they each are flowing around 300 to 350 GPM, with about the same freeboard water levels as before.

As part of the evaluation to rejuvenate the existing media in-place, CBW submitted slow sand filter corings to Blue Earth Products to analyze the sand gradation. Testing by Blue Earth confirmed that the media not within design specifications in terms of media size (see Table 1). Industry standards for slow sand filters recommend a media size of 0.15 to 0.3 mm, which is somewhat smaller than that used in rapid rate filtration.

Table 1 – Sand Design Criteria

Criteria	Design Specifications	2017 Testing
Uniformity Coefficient	<1.7 (AWWA)	1.54
Effective Size	0.15 -0.35 mm (AWWA)	0.5 mm

According to the test report by Blue Earth, the media also exhibited deposits of primarily iron, aluminum and calcium on the surface of the media. The report recommended chemically rejuvenating the media with Blue Earth's proprietary cleaning agent, a low-pH acidic solution, to

remove accumulated surficial deposits. CBW expressed interest in pursuing this application as a way to clean the media in-place, without disturbing the stratification of the two sizes of sand.

However, the application of this product on slow sand filters is questionable in a number of ways:

- Most of the treatment in slow sand filters typically occurs within the schmutzdecke and the top few inches of media. It is within this upper media zone that most of the pressure head is developed as solids are accumulated. Chemically cleaning the deeper media zone may not result in a significant improvement in filter flow rate relative to CBW's recent efforts in mechanically washing the media, and therefore may not be cost-effective.
- At the present time, this cleaning technology has not yet been used on slow sand filters, according to a company representative, and therefore no history of successful usage is available to guide its implementation at CBW's facility.
- Although the cleaning agent is NSF 60-listed, proper usage of this product requires a flushing step followed by a pH adjustment step. The pH adjustment chemical needs to be introduced in the filter-to-waste stream and be sufficiently mixed with the flush water for proper neutralization. Safe discharge to the environment would depend on sufficient neutralization. The WTP's inability to effectively backwash the slow sand filters introduces some risk in its ability to effectively flush the low pH cleaning agent and pH adjustment chemical from the filter beds. Further, plant modifications would be needed to introduce and mix the pH adjustment chemical.

Table 2 – Near Term Improvement Capital Costs

Description	Cost
Roughing Filter Improvements	$683,000
Self Cleaning Filters	$458,000
Upflow Clarifiers	$461,000
Slow Sand Cleaning	$203,000

6. Water Storage

CBW's current water storage volume is approximately 0.85 million gallons, as provided by two aboveground tanks of equal size. This volume is about equal to the current average daily water demand (ADD) and roughly half of the maximum daily water demand (MDD), and as such, is insufficient to supply the City's water supply needs. The inability to provide sufficient water volume impacts individual water consumers, medical facilities, seafood processing plants, and the ability to respond to local fires. Further, during periods of high water usage, the treatment process is directly exposed to the variation in water demand. In this condition, unit processes must keep pace with peaking demands, which often require that they operate at maximum capacity for long periods of time. This condition can severely reduce the time needed for CBW to perform maintenance and repairs on the unit processes that are most stressed. Also, an insufficient buffer between the water treatment process and the community water demand might reduce the available contact time for complete disinfection of the treated water.

CBW is prone to experiencing water shortage events, which are most pronounced during the summer season when water demand is highest. In July 2016, CBW passed a Disaster Declaration with Request for State Assistance due to inadequacy of the system to provide sufficient flow to meet community water consumption. CBW also requested that the public ration water use by 30% to 50% in an effort to decrease

overall water use. Much of this rationing was achieved by consumers making more efficient use of supplied water through reduced wasteful practices. With increased conservation, CBW was able to sustain the community's essential water needs in 2016. The peak water demands experienced in 2017 were not as severe as the previous year. The 2017 summer fishing season did not produce a large salmon catch and local canneries closed earlier as a result, thereby lowering the water usage relative to the 2016 season.

To provide at least the volume consumed in one day of MDD (1.8 million gallons per day), the existing water treatment system would need an additional 1 million gallons of water storage. By providing this additional water storage, the increased stored volume (1.8 million gallons) would not only meet the MDD, but also provide nearly 2 days of the ADD. In so doing, this larger storage capacity would:

- Provide more flexibility in achieving sufficient disinfection contact time during peak water system demands.
- Allow CBW additional time to address any system failures that would diminish or otherwise shut down WTP flow.
- Better accommodate system maintenance, such as taking filters off-line for cleaning.

It is important to note that an increase in water storage capacity is considered beneficial only with a corresponding increase in water treatment capacity, as described in either Alternative 1 or 2. Increasing the storage capacity alone will not adequately address CBW's summer water shortage concerns. The treatment capacity of the plant should be great enough that the amount of water storage could be replenished in a reasonable time period, which would vary depending on the patterns of community water usage. To keep pace with peak water consumption, the water treatment plant needs the ability to treat water at a rate that is at least equal to the MDD. If not, the stored water volume, no matter how large, would gradually become depleted if the water consumption continued to exceed the water treatment capacity. However, if the treatment rate could keep pace with maximum demand, the stored volume could be maintained during periods of high water use and be refilled faster thereafter. As CBW experiences prolonged periods of high water usage during the summer, the ability to maintain and replenish the stored water volume is essential to avoiding water shortages.

For the purpose of more directly comparing the costs of Alternative 1 to Alternative 2 with similar project benefits, it is assumed that Alternative 1 would provide an additional 1 million gallons of water storage tank constructed adjacent to the existing water storage tanks. This storage volume could be provided in one tank or two tanks depending on the site topography and which arrangement would provide the most cost effective site development. Under Alternative 2, the existing slow sand filters would be converted into clearwells, taking advantage of reusing existing infrastructure.

7. Alternative Comparison

A matrix of the advantages and disadvantages of the two alternatives is presented below.

	Alternative 1 – Improve Existing Treatment Process	Alternative 2 – Dissolved Air Flotation (DAF) with Multimedia Filtration
Advantages	• CBW is familiar with this water treatment process. • O&M costs would remain relatively low, primarily because a lesser need for chemicals relative to other alternatives. • CBW would continue the use of ozone, having recently invested significant funds to replace its aging ozone generators. • Improved process would require the lowest operator certification level (III).	• DAF is a more cost effective treatment process based on having the lowest life cycle costs and highest treatment efficiency. • The use of DAF is expected to provide good organics removal and excellent color removal • DAF is a robust process that can accommodate significant variability in raw water quality without substantial adjustments in the treatment process. • Existing infrastructure will be reused and repurposed for water storage facilities
Disadvantages	• High capital costs, which will be more difficult to fund relative to other alternatives. • Unlike the other alternatives, which could make use of the slow sand filter basins as additional water storage, Alternative 1 will require construction an additional water storage tank. • Potential for continued difficulties in post-treatment high chlorine demands and in reducing disinfection by-products, as slow sand filtration has limited organic removal capabilities.	• This process will likely require a Level IV certification.

Capital costs for the two alternatives are presented below, with Alternative 2 being substantially lower than Alternative 1, which would require significant site development construction for additional slow sand filters and water storage. For this cost comparison, 2 new slow sand filters are assumed to be added to the existing facility for a total of six filters. With clean sand media, each filter is designed to provide 300 GPM of capacity. At this unit rate, 5 filters would provide up to 1500 GPM or 2.2 MGD of treatment capacity, with a sixth filter offline for cleaning and ripening purposes.

Table 3 – Capital Cost Comparison

	Alt 1 – Improve Existing	Alt 2 – DAF + Filtration
Water Treatment Upgrades	$10,903,000	$8,322,000
Water Storage Upgrades	$3,876,000	Included in Treatment Upgrades
Backwash Disposal	$860,000	$860,000
Total	$15,639,000	$9,182,000

8. Recommendation and Discussion

The capital cost for Alternative 1 is substantially higher than for Alternative 2 for providing similar capacities in treatment and water storage. Even with no water storage improvements included with it, Alternative 1 would still be higher in cost. Because the capital costs of constructing additional sand filters would be more expensive on a unit basis than adding DAF modules, Alternate 2 would offer the more cost effective technology for meeting a growing water demand into the distant future.

The pilot testing for the DAF that was conducted in 2016 confirmed the suitability of DAF as an effective treatment technology for CBW's water supply needs. The use of DAF is expected to provide good organics removal and excellent color removal during treatment. DAF is also a robust process that can accommodate significant variability in raw water quality without substantial adjustments in the treatment process.

Alternative 2 would re-use the existing facilities and repurpose the slow sand filter basins to cost-effectively provide extra water storage. When compared with Alternative 1, Alternative 2 requires a significantly smaller filtration footprint, which is a significant advantage given the steep topography and high capital cost associated with development at the WTP site. Furthermore, the modular design of the DAF system will facilitate future expansion as CBW continues to grow. For the long-term outlook, Alternative 2 – DAF with Multimedia Filtration is therefore recommended as CBW's preferred alternative.

If CBW receives the funding current being pursued, it could implement the design and construction of one of the near-term options to more immediately address the WTP's capacity problems. However, because increased water storage is needed, the near-term improvements to the existing system would be considered a temporary stop-gap measure until the Alternative 2 improvements are completed. If community water conservation efforts were continued, and if design and construction of the Alternative 2 improvements were to be completed by 2021 (assuming one year of design in 2018-2019 and two years of facility construction in 2019-2021), the near-term improvements to the existing system may not be necessary. If Alternative 2 funding cannot be completely executed within the next two to three years (i.e. matching funding and loans secured), implementation of the preferred near-term option should be strongly considered.

Of the various near-term options that could enhance the performance of the roughing filters (and accordingly the slow sand filters), the self-cleaning filter or up-flow clarifier options would be the most cost-effective. Between these two, it is anticipated that the self-cleaning filter option would impose less complexity, as a polymer system would not be used to enhance solids removal. Being the most cost-effective, we believe the self-cleaning filter option would be the preferred option. The construction of this option could be accomplished within a year's time, but not likely before the 2018 peak water demand

season. It is recommended that this option be validated in pilot testing prior to proceeding with full scale construction.

9. Phasing Approach for Alternative 2

In order to facilitate greater flexibility with funding sources and construction scheduling, a phased approach for construction of the water treatment upgrades is presented. The components directly associated with the water treatment process would be installed during phase 1 and the supporting components would be installed in phase 2. Note that a two phase approach will result in a slight increase in overall construction cost as it will require two separate mobilization/demobilization efforts.

Phase 1

- Site work
- Expand roughing filter building
- DAF treatment system
- Connections to existing system
- Chemical feed, transfer and booster pumps
- Control panels

Phase 2

- Conversion of filters to clearwells
- Demolish ozone generation system
- Remodel control building for chemical storage
- Replace onsite chlorine generation system
- Caustic feed system improvements
- Standby generator and fuel system

Capital costs for the recommended alternative - Alternative 2 –DAF with Multimedia Filtration are presented below.

Table 4 – Phased DAF Capital Costs

Description	WTP Upgrades (Phase 1)	Backwash Disposal (Phase 1)	WTP Upgrades (Phase 2)
Construction	$6,104,000	$715,000	$828,000
Design	$550,000	$65,000	$75,000
Construction Administration	$550,000	$65,000	$75,000
Project Administration	$123,000	$15,000	$17,000
Total	$7,327,000	$860,000	$995,000
	Combined Total (Phase 1 + Phase 2)		$9,182,000

10. Additional Considerations - Water Conservation and Water Service Meters

As discussed in the PER, the average per capita water use is approximately 250 gallons per capita-day (GPCD). Compared with other communities in Alaska of similar size, this is a relatively high per capita use rate. As residential service lines are not metered, it is not known how much of this volume is attributable to system water losses (pipeline leaks, water wasting at plant and hydrants, and others). Any efforts by CBW to identify leaks, exercise conservation measures or otherwise reduce water use will result in decreased system O&M costs and increased overall system efficiency.

One approach that municipalities have taken to reduce water consumption and encourage conservation is to install meters on water services. Meters on water services can not only reduce overall consumption, but with meters having sufficient accuracy at low flow rates, utilities can also better identify low-flow leaks in the distribution system. When meters are used, customers are typically billed by the gallon, rather than by a flat rate, and this method tends to inhibit indiscriminate water usage by consumers. Industry experience has shown that, when combined with an effective billing structure, metering can reduce water use by an average of 15% to 20%. This range may appear to be diminished somewhat by unmetered water losses and consumption. Further, these percentages can vary significantly beyond the average, depending on actual water usage and other local conditions.

Currently, services to major water users in the community, such as canneries and harbor users, are provided with flow meters. Further meter-related reductions in water usage would therefore be expected to substantially come from new installations in the remaining community. Assuming that a 20% water use reduction could be realized in 10 years of phased meter installations (approximately 100 per year), this would equate to a reduction in ADD of about 143,000 gallons per day at that time of complete build-out. This calculation also assumes 10 years of water use growth from the year 2014, consistent with the estimate provided in the *Desktop Assessment*. This reduced water usage would equate to about 33% of the capacity of one slow sand filter and therefore would not be expected to significantly reduce the need for additional, future slow sand filter capacity.

Flow Meter Technologies

Generally speaking, water service meters fall into two broad categories: non-automated meters and automated meters (or smart meters).

Non-Automated Meters

As the name implies, non-automated meters do not transmit data. These meters must be manually read on a periodic basis to monitor water use. Where the meter is located (i.e., at the curb stop, or within customers' houses) will impact the amount of labor expended to read the meter. Meters used in cold weather regions are usually located in warm enclosures.

Automated Meters

There are two main categories of automated meter systems: automatic meter reading (AMR) and advanced metering infrastructure (AMI). While the two terms are sometimes used interchangeably, they are in fact very different. AMR uses mobile data collection which, for instance, might employ a utility truck with a data receiver that drives through a neighborhood and collects meter data as it drives by each house. For AMR, data is typically collected on a monthly basis. AMI, on the other hand, uses a network of transmitters to send meter data to a central collection point on a continuous, real-time basis.

Table 6 – Water Meter Technology Comparisons

	Advantages	Disadvantages
Non-automated meters	• Low capital cost • Simplest approach, no receiving or transmitting equipment required	• Meter reading requires technician to visually inspect each meter which can be labor intensive • Limited data, meters are typically read on a monthly basis
Automated meters (AMR)	• Doesn't require technician to visually inspect meter, meter reading can be done remotely.	• Limited data, meters are typically read on a monthly basis
Automated meters (AMI)	• Meters are continuously monitored, provided continuous real-time data • Leaks can be identified on a real-time basis • The utility can actively engage with customers to provide feedback on water use, potential leaks or abnormal water usage patterns • Optimizes revenue by improving meter accuracy and identifying meter tampering or service theft	• Smaller utilities can be challenged with the AMI system which requires IT personnel and equipment • An AMI system generates large volumes of data that must be managed • AMI systems can be tied to a particular vendor • High capital cost

Cost Discussion

The capital cost for installing the three different water meter systems are presented below. The cost estimates assume:

- Installation of 1,016 meters.
- Meter installation will be within residences and businesses either in crawlspaces or mechanical rooms/plumbing areas.
- Existing curb stops will be used to isolate water services.
- Primary service line material is copper.

The meter installation costs are presented as budgetary allowances, with limited on-site data available. In order to present a more accurate cost estimate, detailed information regarding each water service and associated building would be required.

Table 6 – Water Meter Capital Costs

Description	Cost
Water Meters (non-automated)	$3,425,000
Water Meters (AMR)	$3,631,000
Water Meters (AMI)	$4,625,000

According to the *Preliminary Engineering Report*, the average annual treatment O&M cost is $186,000. Assuming a reduction in water use of 15% this could equate to a potential savings in treatment O&M costs of $27,900. Realistically, some of the O&M costs are "fixed" (i.e., would not decrease based on a decrease in water production), so the actual cost reduction may be less than indicated. However, even with a conservative cost savings of $27,900, the simple payback period for the lowest cost non-automated meter option would still be nearly 100 years. Any additional increases or decreases in distribution system O&M costs might somewhat vary the payback return, but the order of magnitude would be still a very long time. Therefore, metering is not considered an economically viable option.

Attachments:

Cost Estimates (12 pages)
Figures (6 sheets)

Conceptual Capital Cost Estimate

Roughing Filter Upgrades

ACTIVITY	NOTES	QUANTITY	UNIT	UNIT COST	TOTAL COST
Rouging filter basin demolition		1	ls	$15,000	$15,000
Roughing filter modifications - material only		1	ls	$270,000	$270,000
Roughing filter modifications - shipping and installation costs		1	ls	$81,000	$81,000
Ozone contactor and roughing filter wall increase (concrete)		30	CY	$1,300	$39,000
Ozone contactor and roughing filter hydraulic modifications		1	ls	$25,000	$25,000
				Subtotal	$430,000
			Estimating Contingency	25.0%	$108,000
			Inflation	3.5%	$16,000
				Construction Subtotal	$554,000
			Design	12.0%	$67,000
			Construction Administration	9.0%	$50,000
			City Administration	2.0%	$12,000
			Estimated Total Cost		**$683,000**

Conceptual Capital Cost Estimate

Forsta Filters

ACTIVITY	NOTES	QUANTITY	UNIT	UNIT COST	TOTAL COST
Demolition		LS	1	$15,000	$15,000
Concrete		CY	13	$1,200	$15,600
Filter Housing		EA	6	$18,000	$108,000
Pressure Pump		EA	2	$10,000	$20,000
Backwash Pump		EA	2	$10,000	$20,000
Piping & Valves		LS	1	$45,000	$45,000
Back Pressure Valve		EA	2	$10,000	$20,000
Ladder		LS	1	$6,000	$6,000
Controls/Electrical		LS	1	$80,000	$80,000
				Subtotal	$330,000
			Estimating Contingency	20.0%	$66,000
			Inflation	3.5%	$12,000
				Construction Subtotal	$408,000
			Construction Administration	10.0%	$41,000
			City Administration	2.0%	$9,000
			Estimated Total Cost		**$458,000**

Conceptual Capital Cost Estimate

Upflow Clarifier

ACTIVITY	NOTES	QUANTITY	UNIT	UNIT COST	TOTAL COST
Rouging filter basin demolition		1	ls	$15,000	$15,000
Upflow clarifier - material only		1	ls	$200,000	$200,000
Upflow clarifier - shipping and installation costs		1	ls	$60,000	$60,000
Roughing filter hydraulic modifications		1	ls	$15,000	$15,000

		Subtotal	$290,000
Estimating Contingency	25.0%		$73,000
Inflation	3.5%		$11,000
		Construction Subtotal	$374,000
Design	12.0%		$45,000
Construction Administration	9.0%		$34,000
City Administration	2.0%		$8,000
Estimated Total Cost			**$461,000**

Conceptual Capital Cost Estimate

Slow Sand Cleaning

ACTIVITY	NOTES	QUANTITY	UNIT	UNIT COST	TOTAL COST
Cleaning Chemicals		1	ls	$65,000	$65,000
Neutralization Chemicals		1	ls	$32,000	$32,000
Chemical Shipping		20	tons	$700	$14,000
Support Equipment (dosing, neutralization, discharge)		1	ls	$30,000	$30,000

		Subtotal	$141,000
Estimating Contingency	25.0%		$36,000
Inflation	3.5%		$5,000
		Construction Subtotal	$182,000
Engineering Support	9.0%		$17,000
City Administration	2.0%		$4,000
Estimated Total Cost			**$203,000**

Water Meters

ACTIVITY	NOTES	QUANTITY	UNIT	UNIT COST	TOTAL COST
Positive Displacement Meters	Budgetary Allowance	1	ls	$2,220,000	$2,220,000

Subtotal		$2,220,000
Estimating Contingency	25.0%	$555,000
Inflation	3.5%	$78,000
Construction Subtotal		$2,853,000
Design	9.0%	$257,000
Construction Administration	9.0%	$257,000
City Administration	2.0%	$58,000
Estimated Total Cost		**$3,425,000**

ACTIVITY	NOTES	QUANTITY	UNIT	UNIT COST	TOTAL COST
Positive Displacement Meters with Automatic Meter Reading (AMR)	Budgetary Allowance	1	ls	$2,340,000	$2,340,000

Subtotal		$2,340,000
Estimating Contingency	25.0%	$555,000
Inflation	3.5%	$78,000
Construction Subtotal		$2,973,000
Design	12.0%	$343,000
Construction Administration	9.0%	$257,000
City Administration	2.0%	$58,000
Estimated Total Cost		**$3,631,000**

ACTIVITY	NOTES	QUANTITY	UNIT	UNIT COST	TOTAL COST
Positive Displacement Meters with Advanced Metering Infrastructure (AMI)	Budgetary Allowance	1	ls	$3,420,000	$3,420,000

Subtotal		$3,420,000
Estimating Contingency	25.0%	$555,000
Inflation	3.5%	$78,000
Construction Subtotal		$4,053,000
Design	9.0%	$257,000
Construction Administration	9.0%	$257,000
City Administration	2.0%	$58,000
Estimated Total Cost		**$4,625,000**

Conceptual Capital Cost Estimate

Alternative 1 - Additional 1 MG Water Storage Tank

Project Duration **4** **weeks**

ACTIVITY	NOTES	QUANTITY	UNIT	UNIT COST	TOTAL COST
General					
Per Diem		224	day	$60	$13,440
Superintendent		4	weeks	$7,200	$28,800
Project Manager	8 hrs/week	4	weeks	$800	$3,200
Expeditor	40 hrs/week	4	weeks	$2,800	$11,200
Roundtrip Air Fare		3	each	$1,000	$3,000
Allowance for Misc Air Freight		1	ls	$25,000	$25,000
Survey		1	ls	$15,000	$15,000
Erosion Control		1	ls	$10,000	$10,000
Equipment Mobilization		1	ls	$50,000	$50,000
Meetings/Coordination					
Project Meetings		8	hours		$800
Project Schedule		1	months	$200	$200
Shop Drawings		16	hours		$1,600
Equipment					
Pickup (2 each)	Rental/Ownership Cost	4	weeks	$300	$1,200
Flatbed Truck	Rental/Ownership Cost	4	weeks	$500	$2,000
Note: Heavy Equipment Cost Included in Unit Costs for WTP Upgrades					
Other					
Project Office	Office + equipment	1	months	$750	$750
Safety Equipment		1	ls	$5,000	$5,000
Temporary Power	Generators for Tools	1	months	$500	$500
Hand tools, consumables, signage, porta cans, etc.		1	ls	$35,000	$35,000
Fuel, oil and gas for equipment		1	months	$1,500	$1,500
Housing					
Housing		1	months	$10,000	$10,000
Utilities		1	months	$1,500	$1,500
Insurance					
Certified Payroll Fee		1	ls	$5,000	$5,000
Water Treatment Plant Modifications					
Clearing and Grubbing		0.4	ACRE	$10,000	$3,587
Fill		1700	CY	$35	$59,500
Site Grading and Drainage		1	LS	$50,000	$50,000
Bedrock Blasting and Removal		2900	CY	$80	$232,000
Water Storage Tank and Insulation Package		1,000,000	gal	$1.75	$1,750,000
System Startup, Operator Training and O&M Manuals		1	ls	$15,000	$15,000
Project Closeout					
Punchlist Items		1	ls	$5,000	$5,000

Asbuilts of System		1	ls	$5,000	$5,000
Site Cleanup		1	ls	$5,000	$5,000
Demobilization		1	ls	$15,000	$15,000

		Subtotal	$2,365,000
General Contractor Overhead and Profit	15.0%		$355,000
General Contractor Bond & Insurance	3.0%		$71,000
Estimating Contingency	15.0%		$355,000
Inflation	3.5%		$83,000
		Construction Subt	$3,229,000
Design	9.0%		$291,000
Construction Administration	9.0%		$291,000
City Administration	2.0%		$65,000
Estimated Total Cost (Alternative No. 1)			**$3,876,000**

Conceptual Capital Cost Estimate

Alternative No. 1 - Expand Exisitng Slow Sand Filtration System

Project Duration **52 weeks**

ACTIVITY	NOTES	QUANTITY	UNIT	UNIT COST	TOTAL COST
General					
Per Diem		2912	day	$60	$174,720
Superintendent		52	weeks	$7,200	$374,400
Project Manager	8 hrs/week	52	weeks	$800	$41,600
Expeditor	40 hrs/week	52	weeks	$2,800	$145,600
Roundtrip Air Fare		35	each	$1,000	$35,000
Allowance for Misc Air Freight		1	ls	$100,000	$100,000
Survey		1	ls	$25,000	$25,000
Erosion Control		1	ls	$10,000	$10,000
Equipment Mobilization		1	ls	$50,000	$50,000
Meetings/Coordination					
Project Meetings		104	hours		$10,400
Project Schedule		13	months	$200	$2,600
Shop Drawings		208	hours		$20,800
Equipment					
Pickup (2 each)	Rental/Ownership Cost	52	weeks	$300	$15,600
Flatbed Truck	Rental/Ownership Cost	52	weeks	$500	$26,000
Note: Heavy Equipment Cost Included in Unit Costs for WTP Upgrades					
Other					
Project Office	Office + equipment	13	months	$750	$9,750
Safety Equipment		1	ls	$5,000	$5,000
Temporary Power	Generators for Tools	13	months	$500	$6,500
Hand tools, consumables, signage, porta cans, etc.		1	ls	$35,000	$35,000
Fuel, oil and gas for equipment		12	months	$1,500	$18,000
Housing					
Housing		12	months	$10,000	$120,000
Utilities		12	months	$1,500	$18,000
Insurance					
Certified Payroll Fee		1	ls	$5,000	$5,000
Water Treatment Plant Modifications					
Clearing and Grubbing		0.5	ACRE	$10,000	$5,000
Fill		3000	CY	$35	$105,000
Site Grading and Drainage		1	LS	$125,000	$125,000
Cleaning Existing Filter Sand		1	LS	$50	$50
Addition of (2) Slow Sand Filters					
Bedrock Blasting and Removal		1100	CY	$80	$88,000
Concrete Filter Beds		460	CY	$1,300	$598,000
Filter Piping		528	LF	$120	$63,360
Filter Valves, Fittings, Etc.		1	LS	$32,000	$32,000
Connection to Existing System		1	LS	$30,000	$30,000
Media for Filters		8400	CF	$7	$58,800

Freight for Media		535	TONS	$700	$374,220
Metal Building Over Filters		2096	SF	$250	$524,081
Addition of (2) Roughing Filter					
Bedrock Blasting and Removal		1000	CY	$80	$80,000
Concrete Filter Beds		180	CY	$1,300	$234,000
Filter Piping		500	LF	$120	$60,000
Filter Valves, Fittings, Etc.		1	LS	$45,000	$45,000
Connection to Existing System		1	LS	$20,000	$20,000
Media for Filters		4320	CF	$7	$30,240
1 ft GAC Cap		2160	CF	$35	$75,600
20 hp Backwash Pumps		2	EA	$35,000	$70,000
Freight for Media		270	TONS	$700	$189,000
Metal Building Over Filters		1080	SF	$250	$270,000
Chemical Feed System		1	ea	$35,000	$35,000
Replace Onsite Chlorine Generation System		1	LS	$115,000	$115,000
Caustic Feed System Improvements		1	ea	$30,000	$30,000
Air Scour System		1	LS	$150,000	$150,000
Oxygen Generator		1	EA	$210,000	$210,000
Ozone Destructor		1	EA	$50,000	$50,000
Expansion of Ozone Contactor by 50%					
Bedrock Blasting and Removal		300	CY	$80	$24,000
Concrete Contact Filter		20	CY	$1,300	$26,000
Connection to Existing System		1	LS	$15,000	$15,000
60 hp Booster Pumps		2	ea	$20,000	$40,000
150,000-gal Recaptured Water Storage Tank		150000	gal	$2.50	$375,000
150,000-gal Tank Insulation Package		150000	gal	$0.50	$75,000
10 hp Transfer Pumps		2	ea	$10,000	$20,000
Recapture Water Piping		200	LF	$120	$24,000
Sand Removal System		1	LS	$200,000	$200,000
Sand Cleaning System		1	LS	$400,000	$400,000
Standby Generator		1	LS	$150,000	$150,000
Fuel System		1	LS	$24,000	$24,000
Control Panels		1	LS	$200,000	$200,000
System Startup, Operator Training and O&M Manuals		1	ls	$50,000	$50,000
Project Closeout					
Punchlist Items		1	ls	$25,000	$25,000
Asbuilts of System		1	ls	$15,000	$15,000
Site Cleanup		1	ls	$25,000	$25,000
Demobilization		1	ls	$50,000	$50,000

		Subtotal	$6,654,000
General Contractor Overhead and Profit	15.0%		$999,000
General Contractor Bond & Insurance	3.0%		$200,000
Estimating Contingency	15.0%		$999,000
Inflation	3.5%		$233,000
		Construction Subt	$9,085,000
Design	9.0%		$818,000

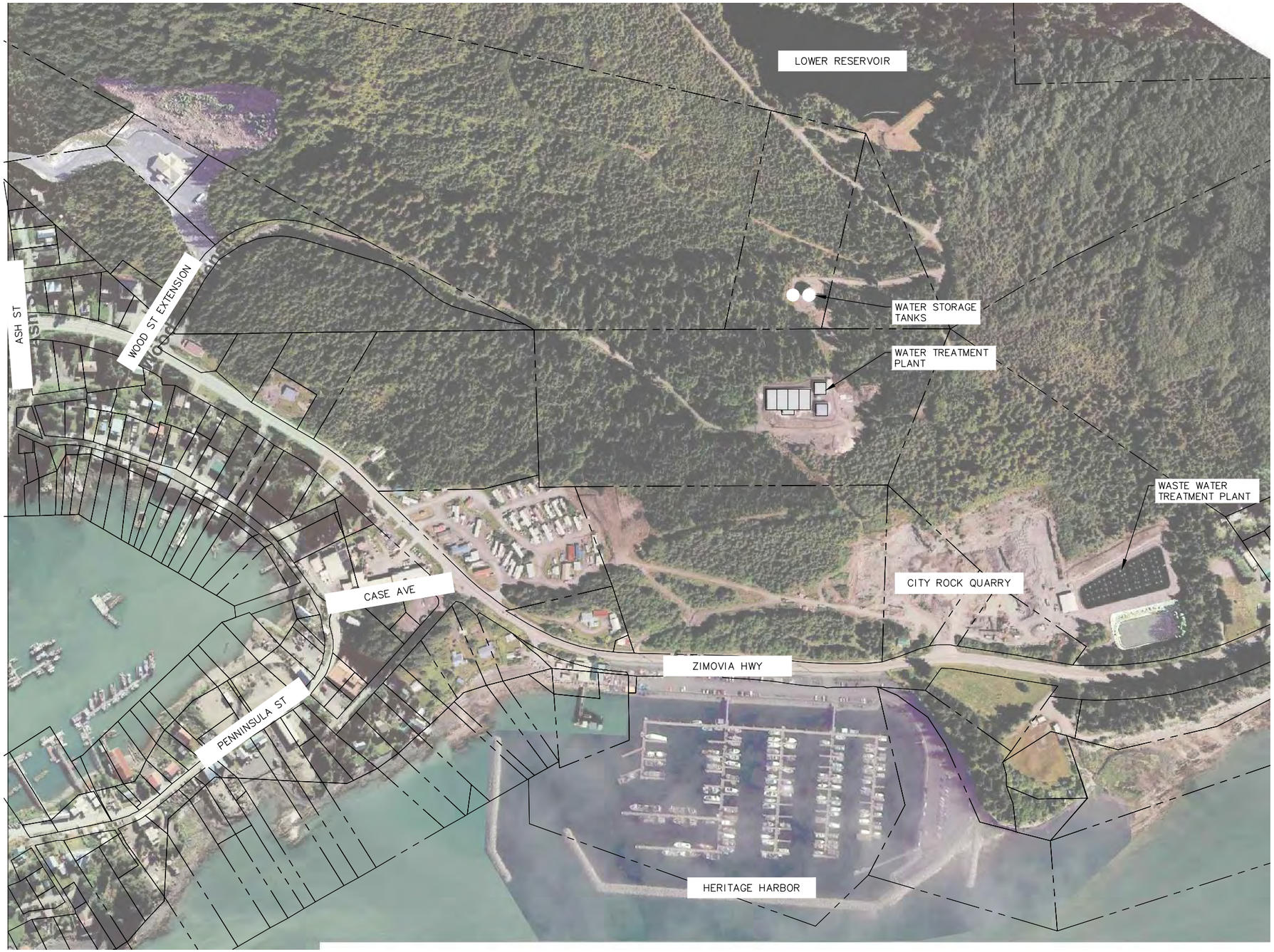
Construction Administration	9.0%	$818,000
City Administration	2.0%	$182,000
Estimated Total Cost (Alternative No. 1)		**$10,903,000**

Alternative No. 2 - Dissolved Air Flotation with Multimedia Filtration

Project Duration **36 weeks (Phase 1)** **4 weeks (Phase 2)**

ACTIVITY	NOTES	QUANTITY	UNIT	UNIT COST	TOTAL COST (PHASE 1)	QUANTITY	UNIT	UNIT COST	TOTAL COST (PHASE 1)
General									
Meals and lodging		2016	day	$60	$120,960	224	day	$60	$13,440
Superintendent		36	weeks	$7,200	$259,200	4	weeks	$7,200	$28,800
Project Manager	8 hrs/week	36	weeks	$800	$28,800	4	weeks	$800	$3,200
Expeditor	40 hrs/week	36	weeks	$2,800	$100,800	4	weeks	$2,800	$11,200
Roundtrip Air Fare		24	each	$1,000	$24,000	3	each	$1,000	$3,000
Allowance for Misc Air Freight		1	ls	$75,000	$75,000	1	ls	$25,000	$25,000
Equipment Mobilization		1	ls	$50,000	$50,000	1	ls	$10,000	$10,000
Meetings/Coordination									
Project Meetings		72	hours	$100	$7,200	8	hours	$100	$800
Project Schedule		9	months	$200	$1,800	1	months	$200	$200
Shop Drawings		144	hours	$100	$14,400	16	hours	$100	$1,600
Equipment									
Pickup (2 each)	Rental/Ownership Cost	36	weeks	$300	$10,800	4	weeks	$300	$1,200
Flatbed Truck	Rental/Ownership Cost	36	weeks	$500	$18,000	4	weeks	$500	$2,000
Other									
Project Office	Office + equipment	9	months	$750	$6,750	1	months	$750	$750
Safety Equipment		1	ls	$5,000	$5,000	1	ls	$5,000	$5,000
Temporary Power	Generators for Tools	9	months	$500	$4,500	1	months	$500	$500
Hand tools, consumables, signage, porta cans, etc.		1	ls	$30,000	$30,000	1	ls	$7,500	$7,500
Fuel, oil and gas for equipment		9	months	$1,500	$13,500	1	months	$1,500	$1,500
Housing									
Housing		9	months	$10,000	$90,000	1	months	$10,000	$10,000
Utilities		9	months	$1,500	$13,500	1	months	$1,500	$1,500
Insurance									
Certified Payroll Fee		1	ls	$5,000	$5,000	1	ls	$1,000	$1,000
Water Treatment Plant Modifications - Phase 1									
Bedrock Blasting and Removal		1400	CY	$80	$112,000				
Site Grading and Drainage		1	LS	$25,000	$25,000				
Remodel Roughing Filter Bldg		1936	SF	$50	$96,800				
Expand Roughing Filter Bldg		2640	SF	$325	$858,000				
DAF Treatment System		1	LS	$1,360,000	$1,360,000				
Streaming Current Detector		1	ea	$25,000	$25,000				
Connection to Existing WTP Piping		1	LS	$50,000	$50,000				
Process Piping and Instrumentation		1	LS	$350,000	$350,000				
Chemical Feed Systems		1	LS	$35,000	$35,000				
10 hp Transfer Pumpst to Treatment System		2	ea	$12,000	$24,000				
60 hp Booster Pumps		2	ea	$20,000	$40,000				
Control Panels		1	LS	$150,000	$150,000				
Water Treatment Plant Modifications - Phase 2									
Conversion of Filters to Clearwells						4	ea	$25,000	$100,000
Demolish Ozone Generation System						1	LS	$10,000	$10,000
Remodel Part of Control Bldg for Chemical Storage						400	SF	$50	$20,000
Replace Onsite Chlorine Generation System						1	LS	$115,000	$115,000
Caustic Feed System Improvements						1	ea	$30,000	$30,000
Standby Generator						1	LS	$150,000	$150,000
Fuel System						1	LS	$24,000	$24,000
Temporary Water Treatment Facilities		1	ls	$300,000	$300,000				
System Startup, Operator Training and O&M Manuals		1	ls	$50,000	$50,000	1	ls	$5,000	$5,000
Project Closeout									
Punchlist Items		1	ls	$25,000	$25,000	1	ls	$5,000	$5,000
Asbuilts of System		1	ls	$15,000	$15,000	1	ls	$2,500	$2,500
Site Cleanup		1	ls	$25,000	$25,000	1	ls	$5,000	$5,000
Demobilization		1	ls	$50,000	$50,000	1	ls	$10,000	$10,000

		Subtotal	$4,470,000	Subtotal	$605,000
General Contractor Overhead and Profit	15.0%		$671,000		$91,000
General Contractor Bond & Insurance	3.0%		$135,000		$19,000
Estimating Contingency	15.0%		$671,000		$91,000
Inflation	3.5%		$157,000		$22,000
Construction Subtotal			$6,104,000		$828,000
Design	9.0%		$550,000		$75,000
Construction Administration	9.0%		$550,000		$75,000
City Administration	2.0%		$123,000		$17,000
Estimated Total Cost (Alternative No. 4)			**$7,327,000**		**$995,000**
Combined Phase 1 + Phase 2 Total			**$8,322,000**		



200' 0 200' 400'

PROJECT: 20901.00	CRW ENGINEERING GROUP, LLC 3940 ARCTIC BLVD, SUITE 300 ANCHORAGE, ALASKA 99503 PHONE: (907) 562-3252 #AECL882-AK	WRANGELL WTP TECH MEMO EXISTING AREA MAP
STATUS: FINAL		

DATE	10/24/17
SCALE	GRAPHIC
FIGURE	1

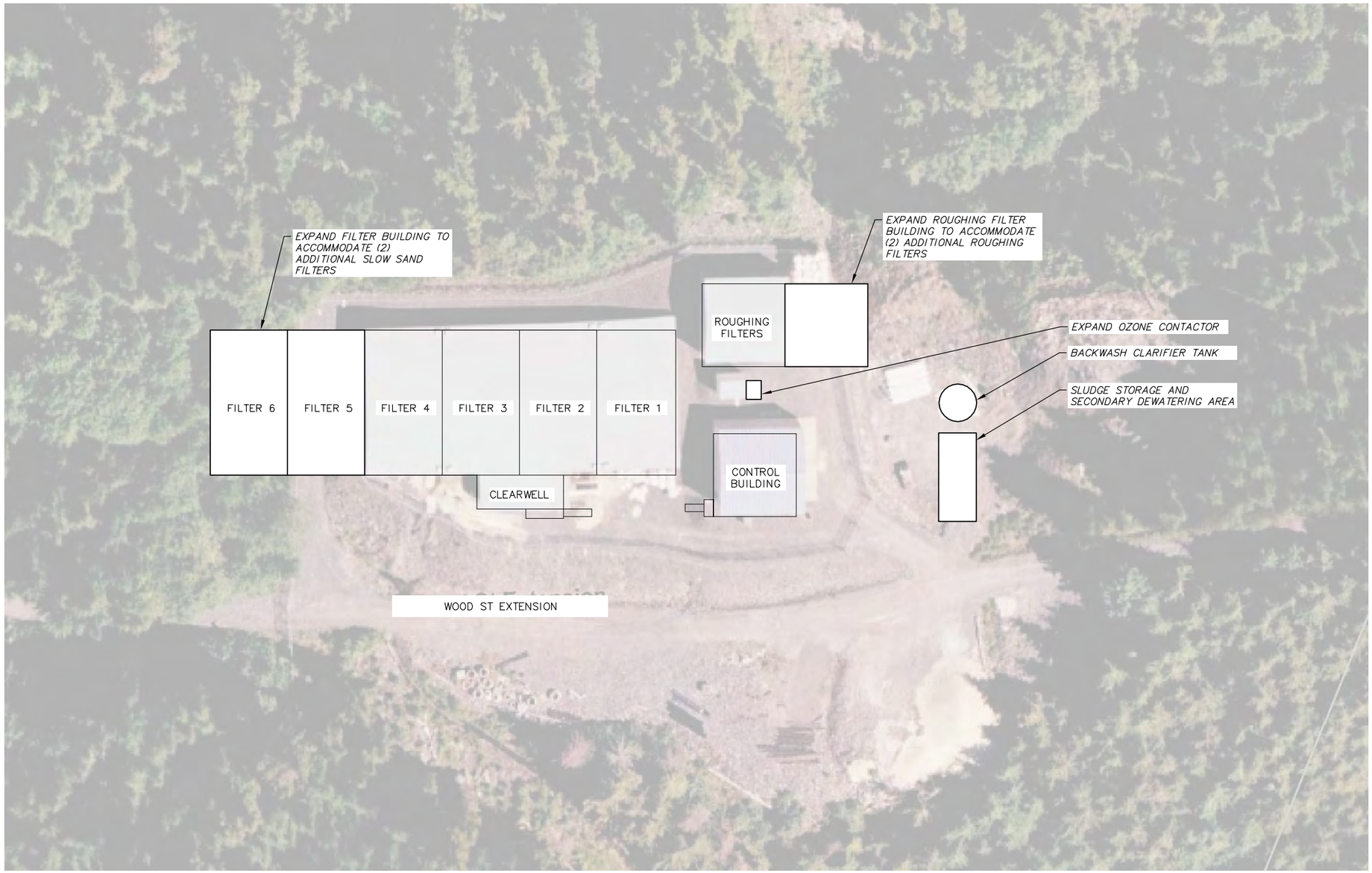
File: J:\JobsData\20901.00 Wrangell Water Treatment Pilot Study\00 CADD\02 Figures\06 Tech Memo\20901.00 Site Plan – Existing Conditions.dwg

50' 0 50' 100'

PROJECT: 20901.00 STATUS: FINAL	CRW ENGINEERING GROUP, LLC 3940 ARCTIC BLVD, SUITE 300 ANCHORAGE, ALASKA 99503 PHONE: (907) 562-3252 #AECL882-AK	WRANGELL WTP TECH MEMO 1 MG WATER STORAGE TANK ALTERNATIVE 1

DATE 1/24/18
SCALE GRAPHIC
FIGURE 2

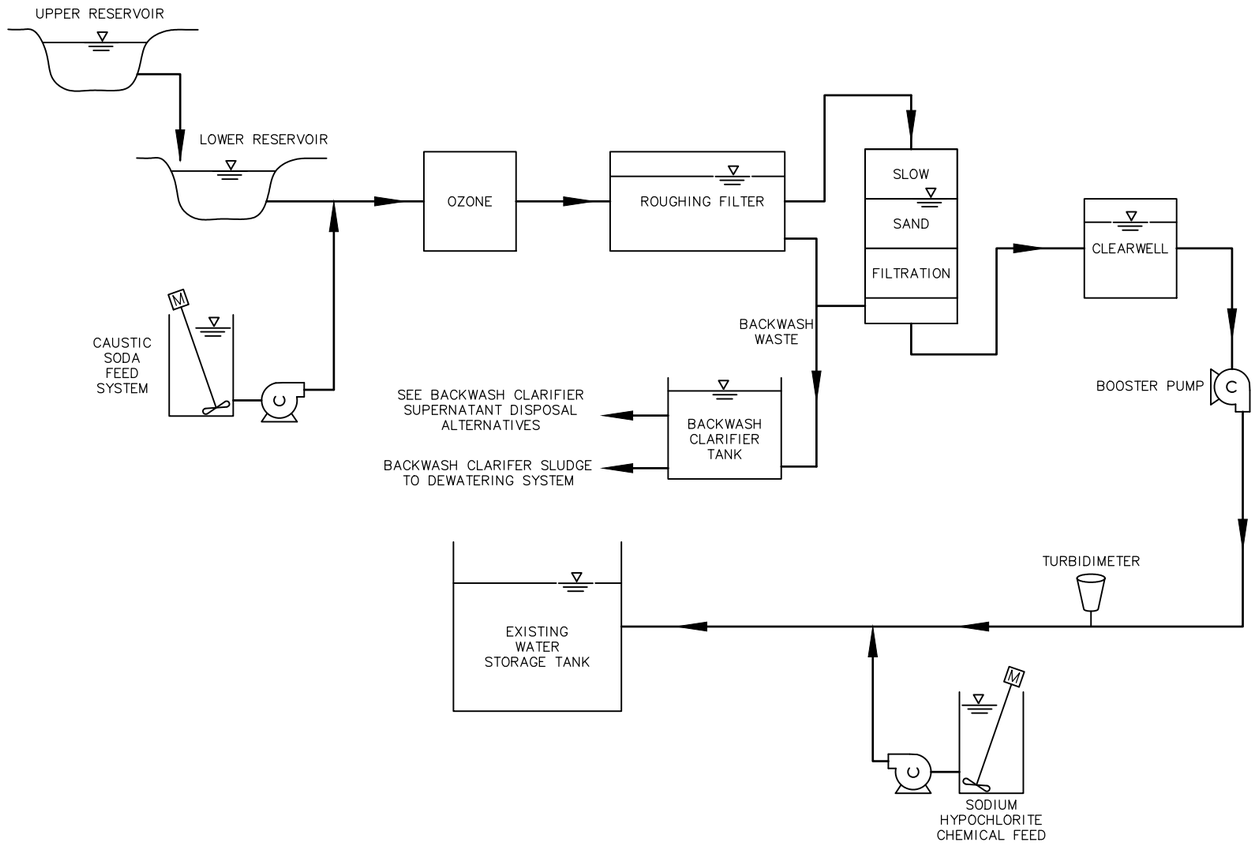
File: J:\JobsData\20901.00 Wrangell Water Treatment Pilot Study\00 CADD\02 Figures\06 Tech Memo\20901.00 Site Plan – Water Storage Tank.dwg



30' 0 30' 60'

PROJECT: 20901.00 STATUS: FINAL	CRW ENGINEERING GROUP, LLC 3940 ARCTIC BLVD. SUITE 300 ANCHORAGE, ALASKA 99503 PHONE: (907) 562-3252 #AECL882-AK	WRANGELL WTP TECH MEMO SITE PLAN – ALTERNATIVE 1 IMPROVE EXISTING WATER TREATMENT PROCESS	DATE 12/19/17 SCALE GRAPHIC FIGURE 3

File: J:\JobsData\20901.00 Wrangell Water Treatment Pilot Study\00 CADD\02 Figures\06 Tech Memo\20901.00 Site Plan – Alt 1.dwg



File: J:\JobsData\20901.00 Wrangell Water Treatment Pilot Study\00 CADD\02 Figures\06 Tech Memo\20901.00 Wrangell Process Schematics.dwg

PROJECT: 20901.00

STATUS: FINAL

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECL882-AK

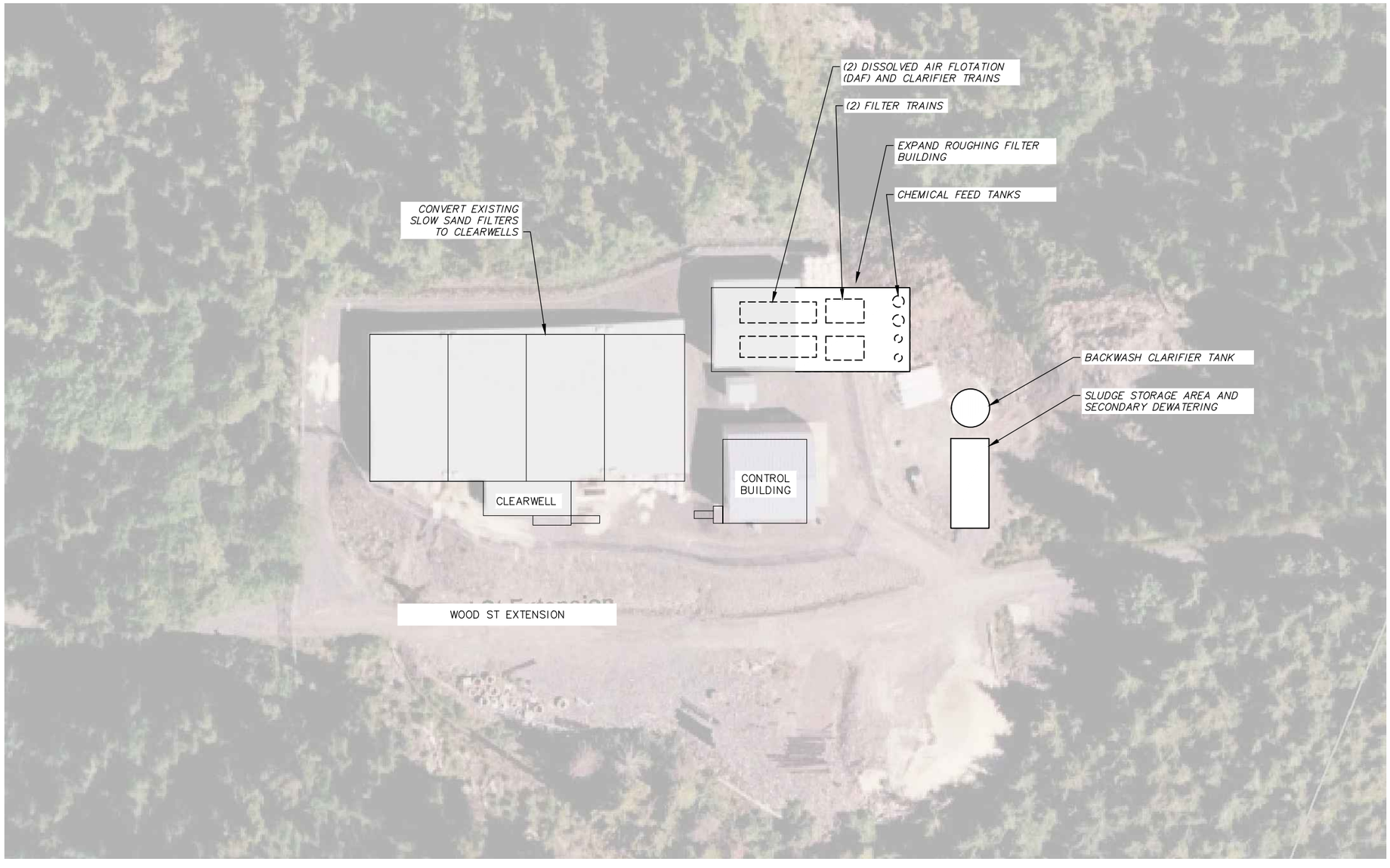
WRANGELL WTP TECH MEMO

PROCESS SCHEMATIC – ALTERNATIVE 1 IMPROVE EXISTING WATER TREATMENT PROCESS

DATE: 10/24/17

SCALE: GRAPHIC

FIGURE: 4



30' 0 30' 60'

PROJECT: 20901.00	
STATUS: FINAL	

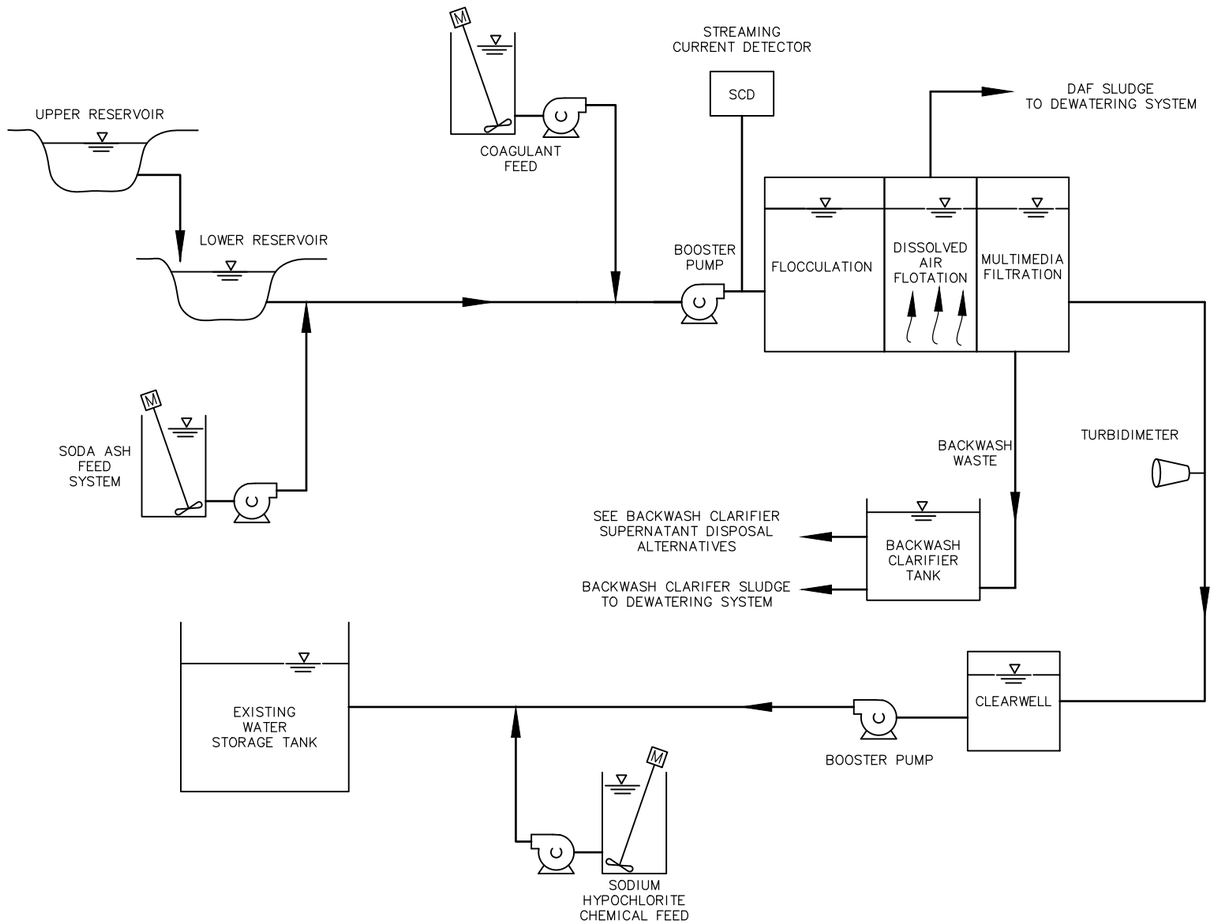
CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECL882-AK

WRANGELL WTP TECH MEMO

SITE PLAN – ALTERNATIVE 2
DISSOLVED AIR FILTRATION WITH
MULTIMEDIA FILTRATION

DATE	10/24/17
SCALE	GRAPHIC
FIGURE	5

File: J:\JobsData\20901.00 Wrangell Water Treatment Pilot Study\00 CADD\02 Figures\06 Tech Memo\20901.00 ALT 2 DAF.dwg



PROJECT: 20901.00	CRW ENGINEERING GROUP LLC 3940 ARCTIC BLVD. SUITE 300 ANCHORAGE, ALASKA 99503 PHONE: (907) 562-3252 #AECL882-AK	WRANGELL WTP TECH MEMO PROCESS SCHEMATIC – ALTERNATIVE 2 DISSOLVED AIR FLOTATION AND MULTIMEDIA FILTRATION	DATE 10/24/17
STATUS: FINAL			SCALE GRAPHIC
			FIGURE 6

File: J:\JobsData\20901.00 Wrangell Water Treatment Pilot Study\00 CADD\02 Figures\06 Tech Memo\20901.00 Wrangell Process Schematics.dwg

Municipal Light and Power.

The ultimate focus would be to improve the maintenance attention given to existing public facilities while keeping within other budgetary and service provision goals.

One restructuring that was suggested was with the electrical utility. Currently the municipal electrical department is run as a separate enterprise fund. Clay Hammer will be stepping down as superintendent of WMLP this spring to take a job with Southeast Alaska Power Agency.

Von Bargen suggested merging it under the purview of a larger Public Works and Utilities department, with a single director in charge of power, water, solid waste, garage and general projects. The line foreman would take on some of the operational responsibilities of the superintendent, while savings could be found in merging the utility's diesel maintenance position with Public Works' garage, and cross-training the other mechanics.

Meanwhile, because of the scope of upcoming and prospective capital projects – ranging from Evergreen Road resurfacing and float replacement at Shoemaker Bay, to new water treatment plant and site development at the former Institute property – Von Bargen also recommended creating a separate position tasked with managing their portfolios. Currently the director of Public Works is responsible for those, along with her other departmental sections.

Von Bargen suggested that a capital projects management position fall under the purview of a concerns. David Powell did not like the idea of directly merging direction of WMLP with Public Works due to the different nature of those various utilities involved. Skills needed to manage one well would not necessarily translate well with another, he suggested.

Prysunka echoed that and pointed out the risks of failure were not just limited to Wrangell, due to its infrastructural ties to Petersburg and Ketchikan through SEAPA. Problems with Wrangell's grid could pull the plug on the others' networks, he cautioned.

Another suggested restructur-

Continued on page 8

PHOTO BY DAN RUDY

Tons of blinking garbage to go

Working at the Wrangell Cooperative Association Cultural Center on Saturday, IGAP techs Kim Wickman (at back) and Chris Hatton (in front) are assisted by high school student Ashton Hayes during WCA's second annual drive to recycle unneeded electronics. The trio collected 11,670 pounds of various gadgets, which will be sent southward for reprocessing.

A dry freeze: City announces wintertime water shortage

By DAN RUDY
Sentinel writer

The City and Borough of Wrangell has issued a conservation advisory to water utility users, as increased wintertime demand outpaces replenishment of the town's reservoirs.

A water watch was declared last Friday, the first of three stages in the emergency response plan the CBW Assembly had adopted last April. During a critical water shortage in the summer of 2016 the city had lacked a clear strategy for responding to such crises across departments.

During a Stage I watch alert such as this, Wrangellites are encouraged to reduce their water use by 10 or 20 percent. Depending on the threat stage, further reductions and bans on certain types of uses are enforced to preserve the water supply.

Last year the Assembly established a three-tiered emergency response plan with a fine schedule for infractions. Demand for water is high during the summer, with increased usage driven by Wrangell's two seafood processors. During 2016 several factors impacted water treatment production at the plant, making it unable to keep up with citywide demand.

There was not a repeat performance in 2017, in part due to a cautious approach by the city going into the summer. The city did enact its first-stage level of conservation through July and August, but a shortened fishing season and extra staffing at the water plant made demand easier to meet. The season wrapped up without incident.

Though the processors are dormant at this time of year, during the winter Wrangell sees another spike in water usage depending on the weather. Without metering on most users' connections it can be difficult to determine with certainty where the extra use is going, but Public Works' assumption is that low temperatures induce people to keep their taps open and running continuously so that water lines do not freeze.

The issue this time around is not with the water plant keeping up with demand, but rather that of the two reservoirs it draws from. Wrangell has not received much rainfall over the course of the past month, with its precipitation largely in the form of snow. Though it will provide runoff when it melts this spring, at the moment it has not provided much hydrological benefit to the raw water supply, meaning the reservoirs are getting tapped dry. Based on the long-range weather forecast the city expects a continuing deterioration of water storage in Wrangell's two basins.

Climate conditions will continue to be monitored, and water restrictions adjusted as necessary. The Stage I watch status will remain in effect until further notice, unless replaced by Stage II warning restrictions.

Residents are encouraged to be mindful of water use. Find and fix leaking faucets, toilets and water lines, avoid washing vehicles and other nonessential uses, and properly plug or winterize outdoor taps when not in use.

For more information or to report a problem, call Public Works at 874-3904.

Wrangell, Alaska
March 15, 2018

WRANGELL SENTINEL

Volume 116, Number 11 Oldest Continuously Published Newspaper in Alaska 12 Pages

PHOTO BY DAN RUDY

Alaska Crossings guides crowd around a crew from Air Station Sitka on March 7, during a demonstration of a Coast Guard MH-60T Jayhawk at Wrangell Airport. The purpose of the exercise was to introduce them to the station's mission in the region, as well as to provide some context for how it can help in an emergency.

Crossings staff gearing up for 2018 programming

By DAN RUDY
Sentinel writer

Alaska Crossings is gearing up for its 2018 season, with guide training formally starting last week.

The youth-oriented behavioral health program has operated out of Wrangell since its inception, back in 2001. Originally a program of Alaska Island Community Services, Crossings is now under the Southeast Alaska Rural Health Consortium umbrella since it acquired AICS last year.

Designed to help people between the ages of 12 and 18 years, Crossings combines therapeutic interventions with outdoor and expeditionary activities, intended to foster a process of change and personal healing.

Those involved in the program tend to have difficulties in school or at home, ranging from self-esteem issues and anxiety to substance abuse and peer group problems. Some are recovering from abuse, while others could use some direction and encouragement.

"Ultimately we're not just out in the woods. We're actually doing a very purposeful activity every moment," said Claire Ramos, Crossings' clinical supervisor.

The Crossings season officially begins on April 11, with the last group's program ending as late as mid-December. Participants in the program come from all over the state, and are often

Continued on page 11

City goes code red as water shortage worsens

By DAN RUDY
Sentinel writer

City Hall jumped a notch on its alert level Tuesday, declaring a Stage III water shortage watch.

The third stage is the most severe in Wrangell's water shortage management plan, adopted last year by the Borough Assembly. The city was previously on a Stage I alert due to dwindling supplies of raw water in the treatment plant's two reservoirs.

In its notice to the public, Public Works explained that Wrangell has received no considerable rainfall over the course of the past month. Precipitation has mainly been in the form of snow, which, to date, has provided no hydrological benefit to the water supply. Looking ahead, the long-range weather forecast suggests this trend to continue.

Meanwhile, the low temperatures experienced this winter are thought to have induced water customers to keep their taps running freely to prevent their lines from freezing. This combination of conditions is thought to be quickly reducing the town's raw water supply, causing in the course of three weeks reservoir levels to drop significantly.

Under Stage III emergency measures now in effect, all outdoor use of water is prohibited. Water service at Wrangell's harbor facilities and the boatyard are to be discontinued, and the public pool shut down until the situation improves. Any water customer found to have a leaky or damaged water line, water system component, or plumbing fixture will have their water service disconnected until such repairs are made.

Observed violations of Stage III restrictions are finable. First offenses receive a written warning under the measures, but for second and all subsequent violations a utility customer will see $500 tacked on to their monthly bill. Each day in violation constitutes a separate offense, meaning the fines can stack up. For repeated observed violations, the borough may disconnect service to the premises.

Individual users are asked to reduce water usage as much as possible while the alert is in effect. Climate conditions will continue to be monitored, with water restrictions adjusted as necessary. For utility questions, Public Works can be reached at 874-3904.

Water, soil and hospital fill Assembly's plate Tuesday

By DAN RUDY
Sentinel writer

Three big issues weighed heavily upon the Wrangell Assembly's agenda Tuesday; impending crises with the city's water supply, its hospital's financial stability, and the state's site selection for a monofill to house treated lead-contaminated soil extracted from the former Byford junkyard.

• Water crisis

The city entered its highest watch level for water conservation Tuesday, after learning that its two reservoirs only have about 30 or so days' worth of raw reserves. (see adjoining story) Reservoir levels have reached a low point after an unusually cold, dry winter, with little meteorological sign of improving in the coming month.

"That leaves us with a very serious concern about our ability to maintain water levels," Wrangell manager Lisa Von Bargen commented.

In its official conservation notices the city has ascribed much of the loss to residents leaving taps on during the winter. However, Von Bargen gave some additional suggestions city staff will be looking into, such as possible leaks within the water main system itself. Ductile iron pipeline that makes up much of the network has historically shown a tendency to burst prematurely.

"We believe there are losses within the water system, but we don't know where it's coming from," said Von Bargen. "We will be bringing in somebody to do leak protection immediately," in an effort to locate and fix potential breakages.

Inefficiencies at the water treatment plant itself are also problematic. Public Works director Amber Al-Haddad reported around 150,000 gallons of water get lost each time its four filters need to get unclogged, which occurs with some frequency.

"We're working on an interim fix right now," Von Bargen said. Currently Public Works is trying to expedite a review by the Department of Environmental Conservation changes to the plant redirecting water to its clearwell, allowing the plant to retain that water during maintenance rather than losing it.

At the Assembly's request, Al-Haddad also sought and received direction on attempting a speedier procurement schedule for replacing the plant's roughing filters. A first stage of filtration at the plant, design and usage problems have rendered it largely ineffective at treatment. Applying a more effective design has thus become a high priority for work at the plant. If normal procurement is waived, Al-Haddad expected a contractor could have the project wrapped up in time for the busy summer processing season.

Bumped from the agenda was a proposal to approve pursuit of a $9.1 million new water plant, one which uses dissolved air flotation to filter sediment from its water during treatment. For the past three years the city has been working with engineers to explore alternatives to its aging slow sand filtration plant. After undertaking a pilot study in 2016, the DAF plant model was found to be well suited to treating Wrangell's sedimented water supply.

However, the cost involved and the useful life of the proposed plant make the topic's pursuit a complex problem to consider, and additional information was still being arranged by staff. Given Tuesday's brimming schedule, a separate special meeting dedicated solely to addressing the city's water woes has been set for this evening at 7 p.m.

"We felt it warranted its own

Continued on page 12

Assembly

Continued from page 1

meeting," Von Bargen explained.

• Discussion with DEC and WCA on Byford monofill

The Assembly had been asked by DEC to clarify its position on a proposed monofill amid continuing delays to the project. Around 850,000 cubic yards of treated but contaminated soil awaits its final resting place after the Alaska department had removed it from the former Byford junkyard, a property the city had acquired through foreclosure in 2009. Engineers identified a rock pit on state land as a suitable place to inter the treated material, but the pit's proximity to the Pats Creek system has caused some concern among residents.

Wrangell Cooperative Association has opposed its placement there due to the creek system's importance to subsistence use. Work set to begin last summer had been put on hold by DEC until April 1 of this year, in an attempt to address those concerns. Theoretically, it would allow time to either identify an alternate site or to come up with the additional funding that would be needed to ship the material off-island.

Commissioner of the DEC Larry Hartig came down for a site visit last week, meeting with WCA officials while here. He also reportedly met with Gov. Bill Walker on Tuesday to discuss the Wrangell project.a

Speaking with DEC project manager Sally Schlichting on the phone at Tuesday's Assembly meeting, Von Bargen wanted to know whether any news from that meeting was available. Schlichting responded that it was not available at this time.

Assembly members and Von Bargen seemed in agreement that a report regarding the outcome of that meeting would be helpful, as well as copies of a report recently prepared for WCA raising design questions of the monofill site, and DEC's response expected in two or three weeks.

Esther Ashton, WCA tribal administrator, explained her staff had secured the assistance of Kendra Zamzow, a biochemist with the Center for Science in Public Participation. She reported that Zamzow had reviewed details for the project and had some questions for the DEC to answer.

These include questions about fractures in the pit's bedrock and its high water table. Lead level thresholds in tests for leaching used on the treated soil were also questioned, as the levels were calibrated to human consumption rather than aquatic lifeforms. The potential for the leaching of phosphates used in the treatment compound itself was also identified as a potential concern, citing studies that found the element could promote algal blooms and reduce oxygen levels in nearby streams.

"The part of the project that the Tribe has been worried about and continues to have issues with is the location of the monofill," Ashton explained. WCA's relationship to the area has been custodial, with one of its previous projects culvert improvement along Pats Creek system roads to improve subsistence access there.

"We are in the process of responding to those recommendations," Schlichting told Ashton and the Assembly.

Assembly members ultimately decided it would be better to collect more information before weighing in on the project, though there were some concerns about the costs of continued delay.

• Future intentions with SEARHC

Assembly members also turned their attention to the state of the Wrangell Medical Center's financial stability. CEO Robert Rang reported that while the hospital was in better stead than it has been in the recent past, its financial reserves remain in a fragile state. Excluding $250,000 borrowed from a city reserve fund and some dedicated capital funding from the WMC Foundation, the hospital has less than half a million dollars in hand, or about enough to pay its bills for 15 or 16 days.

A catastrophe would not necessarily be far off, such as problems stemming from the Alaska Legislature's own financial problems. A stopgap bill to ensure continued Medicaid payments until a budget gets passed moved through the House just Tuesday, heading to the Senate. If it stops there or fails to pass the state could halt those payments by the month's end. Since Medicaid payments account for a significant proportion of WMC's total revenue, such an event could spell disaster for the hospital.

A municipal asset, the city would be liable for any insolvency on the part of the hospital. Given its concerns and the need for a new hospital facility, Wrangell has started exploring other management arrangements for the future. One option would be an alignment of interests in some fashion with Southeast Alaska Rural Health Consortium, which has increased its presence in the island's healthcare sector with its acquisition of Alaska Island Community Services last year.

A steering committee to answer the question of the hospital's future was assembled last week. Meanwhile, as their last act for Tuesday's meeting, Assembly members broke into a closed executive session to discuss a proposed letter of intent outlining such an arrangement. Included in the discussion were consultancy Dorsey & Witney LLP, the city's legal counsel and Von Bargen. Final action on the letter was not available by evening press time.

SUBMITTED PHOTO

Sightseeing on ice

Despite low temperatures of -25 degrees, Wrestlers on Stikine Middle School's team check out a section of the Trans-Alaska Pipeline during last weekend's attendance at the Fairbanks Tanana Invitational. The biggest of the state's middle school wrestling events, six of Wrangell's seven students placed, with Liana Carney taking first place in her bracket for the second time, and Jake Eastaugh beating his weight class' tourney favorite for third place.

BOROUGH DECLARES STAGE III CRITICAL WATER LEVEL

Effective immediately, the City and Borough of Wrangell has declared a ***Stage III - Critical*** water level, and ***we need your help***! It is estimated that there is approximately one months' worth of water supply in the reservoirs at this time.

The City and Borough of Wrangell has moved from a Stage I – Watch to a Stage III – Critical level due to the extreme low drop in our reservoirs' water levels, and all customers are required to initiate Stage III water restrictions.

In discussing climate outlooks with NOAA, predictions are for drier and colder than normal conditions through March 2018. Additionally, their 3-month outlook indicates that below-normal temperatures are more likely for the Alaska panhandle. With continued predictions for drier-than-normal weather conditions, the Stage III water restrictions have been escalated for all of Wrangell beginning March 13, 2018.

The Stage III water restrictions will be aggressively monitored and strictly enforced. It is critical that all water customers suspend all non-essential water use. Water customers are encouraged to review and become familiar with the Stage III restrictions, as outlined in the Water Shortage Management Plan (copies on-line and at City Hall).

A few highlights of the Stage III - Critical water level include:

Wrangell H2O

- All customers shall reduce water consumption to preserve the water supply.
- All outdoor use of water is prohibited.
- Any water customer found to have a leak or a damaged water line, water system component, or plumbing fixture, and not actively remedying the situation, may have water service disconnected until such repairs are made.
- The Borough will work with industrial and commercial water user to determine any necessary reductions.

All customers are encouraged to be vigilant in reducing their indoor water consumption and to check for water leaks. This will reduce the likelihood of a water outage event in the near future. Please talk to your friends and neighbors, and make sure that everyone in your household or place of business is aware of the critical nature of the water shortage and the restrictions that are in place.

City departments will be doing their part in contributing to conserving water by: repairing water main leaks as soon as discovered, accommodating customers who need their water valves shut off to make service lines or in-home plumbing repairs, shutting down non-essential harbor water use, and heavily monitoring water use at the swimming pool. Additionally, we are in pursuit of performing a system-wide leak detection survey. We are also actively working on a project to recapture the discharge of cleaning filter water at the water treatment plant to help eliminate water discharges associated with the maintenance requirements of the system.

Any person who knowingly or intentionally allows the use of water in violation of Wrangell's Water Shortage Management Plan will be issued a citation. Violations will be strictly enforced. Failure to comply with the mandatory restrictions identified under Stage III is subject to a fine; however, because we are moving directly from a Stage I to a Stage III level, we will first be providing a verbal and written warning for a violation and working with the customer to aid in necessary corrective action. A second violation for the same offense would trigger the $500 violation fine. Each day of violation constitutes a separate offense.

Notification will be provided when conditions warrant reductions to the Stage III level. Updates will be noticed in the local newspaper and on the radio, as well as posted on the Borough's website, www.wrangell.com and Facebook pages.

We appreciate the community of Wrangell coming together to address this water shortage in order to maintain water supply for the benefit of everyone as we work through this season of drought.

All questions or concerns should be directed to Public Works at 874-3904.

Published: March 15, 2018

Minutes of Special Assembly Meeting
Held on March 15, 2018

Mayor David L. Jack called the Special Assembly meeting to order at 7:00 p.m., March 15, 2018, in the Borough Assembly Chambers. Assembly Members Larrabee, Gilbert, Howell, and Powell were present. Assembly Members Decker and Prysunka participated by phone. Borough Manager Von Bargen and Clerk Kim Lane were also in attendance.

CONFLICT OF INTEREST – None declared.

PERSONS TO BE HEARD
Jim Debord signed up to speak but stated that he would speak when the action item on the agenda came up.

ITEMS OF BUSINESS

5a Discussion regarding the options of a DAF System as the solution for the Water Treatment Plant

Manager Von Bargen stated that due to some additional information that we have received, Staff would be asking to have the Resolution to approve the DAF System as the Water Treatment Capital Improvement project postponed until Staff could come up with the answers to their questions.

Von Bargen stated that although there was the item on the Agenda for the Assembly to consider the Resolution to approve the DAF Plant as the Water Treatment solution, Staff was not yet ready for them to approve it; we have received some new information as of late that bears more consideration; she presented a PowerPoint presentation to show the chain of events that have led us to where we are now.

Amber Al-Haddad, Public Works Director walked the Assembly through a recap of activities of the steps that we have taken with the Water Treatment crisis that began June 2015, highlighting the key steps that Staff and the Assembly have taken.

Wayne McHolland, Water Treatment Plant Lead and Al-Haddad described how the DAF system would work based on the system plant in Pt. Arde that Al-Haddad had visited last week; Pt. Arde plant operator stated that they have not had any major problems with their DAF plant; only normal wear and tear on the plant in the last 18 or so years.

In response to Prysunka, Al-Haddad stated that in regards to the life expectancy of the Pt. Arde DAF plant, that there have been no major maintenance to the system; just normal wear and tear of the system; Pt. Arde plant operator had stated that with their rigorous maintenance of the plant, they expect to get another 20 years or more out of the plant; the DAF plant does not require the Roughing Filters; the treatment process is contained into one long unit that is a long cylinder basin and has three compartments; about 12' wide by 40' or so long by 12' tall; water comes in and ph is adjusted prior to hitting the DAF unit; then gets injected with a coagulant; water goes into the flocculation basin, then the second; sediment floats to the top and gets scraped off; water then goes into a media filter that has an air scouring backwash

system; goes in and filters through; with the flip of a switch, the air scour comes on and everything floats to the top and is sent into a sludge basin and that is sent to the wastewater plant; this is done every 72 hours.

Prysunka asked if the DAF plants were sized by the amount of water that we go through and what is the capacity of our current reservoir; need to look at the plant as well as the ability to store water in our reservoir. Al-Haddad stated that our engineers had used the State's growth to determine what the amount of water we need is. Prysunka stated that his concern was that if we build a plant that processed twice the amount of water that the current one does, do we have the water volume in the reservoir to allow for that; don't want to run out of water.

In response to Decker, Al-Haddad stated that with regards to the engineers report on the life expectancy of the DAF plant, the engineers are reluctant to give a life expectancy of more than 20 years; our best bet is to look at the systems that are in place right now and get an estimate of the life expectancy.

Von Bargen stated that if we go forward with the DAF plant, the total debt service to the Water Fund would be at least $250,000 per year for the first 20 years; then $175,000 for next 20 years, just for the DAF plant; 1/3 of the annual revenue to the Water Fund right now.

Von Bargen stated that we have issues starting with the reservoirs and going all the way to the entire distribution plant; questioned if our Water Fund and our rate payers can afford what Staff is looking at doing to bring water production up to where it needs to be as well as creating an ongoing maintenance plan.

Al-Haddad stated that we were moving forward with the expedited Roughing Filter project which is close to $500,000.

Von Bargen stated that we need to work on the Hazard Mitigation Plan so that we can look at our Dam Stabilization; we have someone that would do this for us at no cost however we have not had the Staff time to dedicate to this.

McHolland stated that the lower reservoir is half the size of the upper reservoir.

McHolland also stated that an Ozone Injection system (which estimated cost is $30,000) would be an alternative if we did not move forward with the DAF Plant and would improve flow.

Von Bargen stated that if we did not go with the DAF Plant, the suggestion would be to replace the sand in the current plant; cost would be approximately $1 million dollars.

Powell stated that it's possible that if we had been replacing the sand annually instead of cleaning it, it would appear that the annual cost would have been more than $150,000.

Von Bargen stated that we were currently working on a water recapture project so that we are not wasting water in the filter cleaning process; the ADEC Commissioner had reported to her that he was on board with working with CRW in helping to get the recapture project designed and permitted so that we can get this done; will report to the Assembly as this project

progresses; cost will be between $10,000 and $15,000 and will come from the Water Reserve Fund.

McHolland stated that the current plant was designed for normal flow, not peak flow.

Von Bargen explained that there may be hundreds of thousands of gallons of water unaccounted for, per day; working on having a leak detection expert come and explore if we have unknown water leaks.

Von Bargen also provided some information on meter installation quoted by CRW was about $3.5 million; Al-Haddad had researched and found that the cost would probably be closer to about $1.5 million; could be a phased approach; cost of meter and installation could be billed out to the customer over a three year period and equates to about $15-$16 per month.

Jim Debord, 3.2 Mile Zimovia Hwy. reported on what the average consumption of water should be per day; expressed that we are currently producing four times what we should; spoke in opposition of a new plant but spoke in favor of a consumer metering system; would help to determine if there are a leaks and wasted water; metering system can help consumers detect leaks as well; wasted production is creating wear and tear on the existing plant; would suggest an incentive program to consumers who insulate their pipes so that they wouldn't have to run water through the winter to prevent their pipes from freezing.

Mayor Jack called a recess at 8:14 p.m.
Meeting reconvened at 8:20 p.m.

McHolland stated that without distribution meters, there is not a way to determine where leaks are; the problem is locating where the leaks are, not realizing that we have leaks; can tell which side the leak is on; no way to isolate it unless we close each valve down one by one.

Prysunka expressed his lack of confidence with the engineer's since their quote for residential metering was more than double what Ms. Al-Haddad had stated it would be as an estimate.

Von Bargen explained that today, we looked at our outflow vs. our inflow of water and what is estimated to be a loss is roughly 309,595 per day; number one priority is to figure out where the system loss is and come back to the Assembly with that information; if we lose the EDA grant funding, we will lose 2.5 million.

Decker asked if there was a way to draft the EDA application while we look at where the leaks might be; would we be able to submit an application and then alter the capacity of the plant that we need? Decker also stated that she sees the urgency in needing to move forward but realizes that we may need to gather more information.

Decker also walked the public and the any members of the assembly through the water treatment crisis and the steps that were taken along the way.

Von Bargen replied that we cannot submit the application or modify the components of the application to EDA if we are not certain that that project is what we want to do.

Larrabee expressed that we would be spending more money per year to maintain our current plan vs. purchasing a brand new plant.

Prysunka stated that we have to address the production issues but we also have to address all of the other issues, such as the capacity issue; it's a whole package; wants to make sure that we are spending our money wisely so that we are allowing the Water Treatment Plant to do their job effectively.

In response to Powell, McHolland stated that if the leaks were reduced by half, we still cannot keep up with the production; we are producing only 250 to 300 gallons per minute; when each cannery runs at peak they use about 400 gallons per minute; the rest of the city adds to the demand as well; cannot make enough water to keep up with demand.

Prysunka questioned if we do replace the plant and we then have a massive failure to our water distribution infrastructure, the dam, or the reservoir, would we have the capacity to Bond out to repair or replace a massive infrastructure if we go with the DAF plant.

In response to Howell, McHolland stated that the quality of water produced by a DAF plant would be superior to what we have now.

Powell stated that he believed that we would need to have a Special Assembly meeting once we knew the outcome of the leak inspection.

McHolland stated that if there were no leaks, the current system cannot keep up with the production demand.

Gilbert questioned what other information we need to make a decision.

Von Bargen stated that we have roughly $7 million in unrestricted reserves.

Jack stated that he believed that we are in this situation now because we have been told all along that we just don't have the money.

In response to Decker, Al-Haddad stated that the leak inspectors would detect the leaks in the lines as they went; would work about five miles a day; not sure when the final report would be provided.

In response to Prysunka, Al-Haddad stated that we could look at a smaller production system; it's based on what kind of demand we are looking at having; we do need two trains though.

Lee Burgess stated that the way that the grant package is structured, even if we found a smaller production system, it would not allow us to reduce our debt load and that any cost savings would come out of the grant funding; USDA grant is specific to a two train system.

Al-Haddad also stated that the two train system was not the cost driver of the system so reducing the number of trains would not save a significant amount of money; modifying the building to accommodate them was the larger cost to the DAF project.

Decker stated that at Southeast Conference, they had talked about a 19% increase in cruise ship passengers in 2019 throughout Southeast over the 2018 numbers; could see an increase to our community.

5b PROPOSED RESOLUTION NO. 03-18-1394: A RESOLUTION OF THE ASSEMBLY OF THE CITY & BOROUGH OF WRANGELL, ALASKA, APPROVING THE DAF SYSTEM AS THE SOLUTION FOR THE WATER TREATMENT PLANT CAPITAL IMPROVEMENT PROJECT AND ASSOCIATED FUNDING PLAN *(postponed from the February 27th and March 13t Assembly Meetings)*

M/S: Gilbert/Howell, to approve Resolution No. 03-18-1394, approving the Dissolved Air Flotation system as the solution for the water treatment plant capital improvement project and its associated funding plan.

Gilbert stated for the public that the total cost of the project is $9,182,000.

Prysunka stated that he would feel a lot better if the Borough Manager could assure the Assembly that we could wait to hear the report on the leak detection before moving on this; also worried about a catastrophic failure to our system and what we would have to come up with to fix it; still have to get through two plus years and if we cannot repair what we have now, we could really have some serious problem.

Von Bargen stated that Staff could not get an answer from EDA on if they would allow a delay in the application process; don't know if we wait, if we will lose EDA funding; not sure of their grace period; there is a possibility that if the Assembly did not vote on this tonight, we might lose the funding.

In response to Decker, Von Bargen stated that the application to EDA was ready to go; Decker also stated that she believed that the leak detection issue is separate issue; no matter what the leak detection issue was, we still would need to fix the leas issues as well as the capacity issue.

Motion approved unanimously by polled vote.

Special Assembly Meeting adjourned at 10:12 p.m.

David L. Jack, Mayor

ATTEST:
Kim Lane, MMC, Borough Clerk

City & Borough of Wrangell
Incorporated Borough May 30 2008
Incorporated City June 15 1903
Alaska

E. LIST OF ATTACHMENTS

The following checklist is a list of required and optional attachments to the Environmental Narrative as described in the sections above. The items listed in the optional section may be required by EDA at a later date to complete the project review and selection process, so it is recommended that you provide them now if they are currently available. While the documents listed below are the most frequently required for scoping determinations, EDA reserves the right to request additional items that are not listed below when necessary.

Applicants are not required to contact other governmental agencies for environmental or historical resources consultation until directed by EDA, though any interagency coordination letters that may be currently available should be provided. **EDA expects that all Applicants whose projects are selected for further evaluation will proceed with consultations in an expeditious manner. As such, Applicants should have the required information prepared for submission immediately upon notification of selection by EDA.** If you determine prior to application that your project may affect environmental or historical resources, you may contact the appropriate Regional Environmental Officer to determine if early interagency consultation is appropriate.

Please refer to the applicable Federal Funding Opportunity for unique requirements for each individual grant competition and a list of documents required for submittal with the application.

Checklist of Optional Environmental Documents that should be submitted with Application **if available** (will expedite review and selection process):

- ✓ SHPO/THPO and Tribal leader comments and copy of submittals (see Section B)
- ✓ Site photographs (see Section C1)

NA Coastal Zone consistency determination (see C2)

- ✓ Wetland delineation and/or Jurisdictional Determination (see C3)
- ✓ Preliminary wetland info (see C3)
- ✓ U.S. Army Corps of Engineers comments, Section 404 Permit, Section 10 Permit, and/or Water Quality Certification (401 approval) (see C3)

NA Biological Assessment and/or survey for federally protected species (see C5)

- ✓ Correspondence with US Fish and Wildlife Service and/or National Marine Fisheries Service (see C5)
- ✓ Natural Resources Conservation Service determination of Prime Farmland, Form AD-1006, if applicable (see C6)

NA Phase I and II Environmental Site Assessment (seeC8)

- ✓ Sole Source Aquifer review by US Environmental Protection Agency, if applicable (see C9)
- ✓ Other federal, state and local environmental permits (see C16)
- ✓ Copies of public notices, public hearing minutes, etc. (see C17)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

Reply to
Attn Of: OWW-130

MAY 2 2 2006

Mr. Robert B. Caldwell
Public Works Superintendent
City of Wrangell
Box 531
Wrangell, Alaska 99929

Re: Renewal of National Pollutant Discharge Elimination System (NPDES) Permit For the City of Wrangell WWTP; NPDES Permit No. AK-002146-6

Dear Mr. Caldwell:

The Environmental Protection Agency (EPA) received the above referenced NPDES application materials on May 1, 2006. We have determined your application to be timely and complete. According to federal regulation 40 CFR 122.6(a), when a timely and complete application is received by EPA, and, through no fault of the permittee, EPA does not reissue a new permit prior to the expiration date of the existing permit, then the permit remains fully effective and enforceable. Accordingly, the NPDES permit for the Wrangell Wastewater Treatment Plant will be administratively extended if the permit is not re-issued by January 8, 2007.

Please note that EPA may request additional information during the development of the draft permit to clarify, modify, or supplement previously submitted material. If you have any questions, please contact Lisa Olson at (206) 553-0176.

Sincerely,

Michael J. Lidgard, Manager
NPDES Permits Unit

DISCLAIMER

The full text of certain NPDES permits and the associated fact sheets has been made available to provide online access to this public information. EPA is making permits and fact sheets available electronically to provide convenient access for interested public parties and as a reference for permit writers. The ownership of these documents lies with the permitting authority, typically a State with an authorized NPDES program.

While EPA makes every effort to ensure that this web site remains current and contains the final version of the active permit, we cannot guarantee it is so. For example, there may be some delay in posting modifications made after a permit is issued. Also note that not all active permits are currently available electronically. Only permits and fact sheets for which the full text has been provided to Headquarters by the permitting authority may be made available. Headquarters has requested the full text only for permits as they are issued or reissued, beginning November 1, 2002.

Please contact the appropriate permitting authority (either a State or EPA Regional office) prior to acting on this information to ensure you have the most up-to-date permit and/or fact sheet. EPA recognizes the official version of a permit or fact sheet to be the version designated as such and appropriately stored by the respective permitting authority.

The documents are gathered from all permitting authorities, and all documents thus obtained are made available electronically, with no screening for completeness or quality. Thus, availability on the website does not constitute endorsement by EPA.

Permit No.: AK-002146-6

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, Washington 98101

AUTHORIZATION TO DISCHARGE
UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et seq., as amended by the Water Quality Act of 1987, P.L. 100-4, the "Act", the

The City of Wrangell
Wastewater Treatment Plant

is authorized to discharge from a facility located at **Wrangell, Alaska** (latitude: 56º 27' 10"; longitude: 132º 22' 40")

to receiving waters named **Zimovia Strait**,

in accordance with the discharge point, specific limitations, monitoring requirements, management practices and other conditions set forth herein.

This permit shall become effective January 7th 2002.

This permit and the authorization to discharge shall expire at midnight, January 8th 2007.

Signed this 4th day of December 2001.

/s/ Mike Bussell
Randall R. Smith, Director
Office of Water, Region 10
U.S. Enviornmental Protectection Agency

TABLE OF CONTENTS

I. SPECIFIC LIMITATIONS AND REQUIREMENTS 3
A. Effluent Limitations 3
B. Monitoring Requirements 3
C. Non-industrial Source Control Program 7
D. Operation and Maintenance Plan 8
E. Design Criteria Requirement 9

II. MONITORING, RECORDING, AND REPORTING REQUIREMENTS 9
A. Representative Sampling 9
B. Monitoring Procedures 9
C. Reporting of Monitoring Results 9
D. Additional Monitoring by the Permittee. 10
E. Records Contents 10
F. Retention of Records 10
G. Twenty-four Hour Notice of Noncompliance Reporting 11
H. Other Noncompliance Reporting 12
I. Inspection and Entry 12

III. COMPLIANCE RESPONSIBILITIES 12
A. Duty to Comply 12
B. Penalties for Violations of Permit Conditions 12
C. Need to Halt or Reduce Activity not a Defense 13
D. Duty to Mitigate 13
E. Proper Operation and Maintenance 13
F. Removed Substances 14
G. Bypass of Treatment Facilities 14
H. Upset Conditions 15

IV. GENERAL REQUIREMENTS 15
A. Notice of New Introduction of Pollutants 15
B. Control of Undesirable Pollutants 16
C. Planned Changes 16
D. Anticipated Noncompliance 16
E. Permit Actions 16
F. Duty to Reapply 17
G. Duty to Provide Information 17
H. Other Information 17
I. Signatory Requirement 17
J. Certification 18
K. Availability or Reports 18
L. Property Rights 18
M. Severability 18
N. Transfers 18
O. State Laws 19
P. Reopener Provision 19

V. DEFINITIONS 19

APPENDIX A 21

I. SPECIFIC LIMITATIONS AND REQUIREMENTS

A. Effluent Limitations

1. During the effective period of this permit, the permittee is authorized to discharge from outfall 001, subject to the restrictions set forth herein. This permit does not authorize the discharge of any waste streams, including spills and other unintentional or non-routine discharges of pollutants, that are not part of the normal operation of the facility as disclosed in the permit application, or any pollutants that are not ordinarily present in such waste streams.

2. There shall be no discharge of floating solids, visible foam, or oily wastes which produce a sheen on the surface of the receiving water.

3. The pH shall not be less than 6.5 standard units nor greater than 8.5 standard units.

4. Dissolved Oxygen shall not be less than 2.0 mg/L nor greater than 17.0 mg/L.

5. The following effluent limits shall apply at all times:

Table 1. EFFLUENT LIMITATIONS

Effluent Parameter	Unit of Measurement	Monthly Average	Maximum Daily
Flow	million gallons/day	0.6	3.6
Five day Biochemical Oxygen Demand (BOD_5)	mg/L	120*	200
	lbs/day	601	1001
Total Suspended Solids (TSS)	mg/L	140*	200
	lbs/day	701	1001
Fecal Coliform Bacteria	colonies/100 mL	1.0×10^6	1.5×10^6
Total Residual Chlorine**	mg/L	---	0.1

* The average monthly percent removal shall be greater than or equal to 30%
** This limit will only apply if chlorination is used for disinfection.

B. Monitoring Requirements

1. Annual Reporting

In addition to the monthly Discharge Monitoring Report (DMR) required under Part II.C. of this permit, an annual written report, covering the previous calendar year, shall be submitted to Environmental Protection Agency (EPA) by **January 15** of each year. The annual report shall

contain summaries of the receiving water quality monitoring data, and any sediment analyses or bioaccumulation results if required in the previous year. In addition to summarizing the data, the permittee shall also evaluate and interpret data in relation to the magnitude and ecological significance of observed changes in the parameters measured. Potential changes in water quality, sediment chemistry, and biological parameters over time and with distance from the outfall, shall be addressed. All reports will address compliance with water quality standards by using appropriate descriptive and statistical methods to test for and to describe any impacts of the effluent on water quality.

2. Influent and Effluent Monitoring Requirements

During the effective period of this permit, the following monitoring requirements shall apply:

Table 2. INFLUENT/EFFLUENT MONITORING REQUIREMENTS

Effluent Parameter[1]	**Sample Location**	**Sample Frequency**	**Sample Type**
Flow, mgd	effluent	continuous	recorder
Five day Biochemical Oxygen Demand (BOD_5), mg/L	influent & effluent[2]	1/week[3]	24-hour composite
Total Suspended Solids (TSS), mg/L	influent & effluent[2]	1/week[4]	24-hour composite
pH, s.u.[5]	effluent	1/week	grab
Fecal Coliform Bacteria, colonies/100ml	effluent	1/month	grab
Total Ammonia as N, mg/L	effluent	1/quarter	24-hour composite
Temperature, °C	effluent	1/week	grab
Dissolved Oxygen (DO), mg/L	effluent	1/week	grab
Total Residual Chlorine[6]	effluent	1/month	grab

Table 2. INFLUENT/EFFLUENT MONITORING REQUIREMENTS			
Effluent Parameter[1]	**Sample Location**	**Sample Frequency**	**Sample Type**

Notes:

1 If the discharge concentration falls below the method detection limit (MDL), the permittee shall report the effluent concentration as "less than {numerical MDL}" on the DMR. Actual analytical results shall be reported on the DMR when the results are greater than the MDL. For averaging, samples below the MDL shall be assumed equal to zero. The permittee shall report the number of non-detects for the month in the "comments section" of the DMR.

2 Influent and effluent sampling is required. Samples shall be collected during the same 24-hour period. The percent removal for BOD_5 and TSS shall be reported on each monthly DMR.

3 Sampling for BOD reverts to monthly after the new treatment plant achieves 12 consecutive months at full compliance with BOD effluent limitations and percent removals.

4 Sampling for TSS reverts to monthly after the new treatment plant achieves 12 consecutive months at full compliance with TSS effluent limitations and percent removals.

5 The permittee shall report the number of pH excursions during the month with the DMR for that month.

6 Monitoring is required only if chlorination is used for disinfection.

Influent and effluent monitoring results shall be reported monthly as specified in Part II.C. (Reporting of Monitoring Results). Quarterly reporting of ammonia shall be included in the DMRs for April, July, October and January (none due in January 2002).

3. Receiving Water Quality Monitoring Requirements

The permittee shall implement the receiving water quality monitoring program as described below. The primary objectives of this program are: a) to assess compliance with the water quality standards and the criteria in Section 301(h) of the Act; b) to assess whether changes in permit conditions are warranted; and c) to provide data for evaluating the reissuance of this permit.

Sampling stations shall be established using an electronic navigational aid to ensure that the same sampling stations are occupied during subsequent sampling events. In addition, efforts shall be made to prevent the sampling vessel from drifting off the sampling site.

Table 3 Ambient Monitoring Requirements			
Parameter	**Station Location**[1]	**Depth**	**Monitoring Frequency**
Turbidity, nephelometric turbidity units (NTU)	1000 feet NW of ZID 1000 feet SE of ZID <5m NW of ZID boundary <5m SE of ZID boundary	surface, mid-depth, and bottom	Annually in August or September

Parameter	Station Location[1]	Depth	Monitoring Frequency
Secchi Disk Depth	1000 feet NW of ZID 1000 feet SE of ZID <5m NW of ZID boundary <5m SE of ZID boundary	surface waters only	Annually in August or September
Dissolved oxygen, mg/L	1000 feet NW of ZID 1000 feet SE of ZID <5m NW of ZID boundary <5m SE of ZID boundary	surface, mid-depth, and bottom	Annually in August or September
pH, s.u.	1000 feet NW of ZID 1000 feet SE of ZID <5m NW of ZID boundary <5m SE of ZID boundary	surface, mid-depth, and bottom	Annually in August or September
Salinity, ppt	1000 feet NW of ZID 1000 feet SE of ZID <5m NW of ZID boundary <5m SE of ZID boundary	every 3 m (w/one station at outfall depth)	Annually in August or September
Temperature, °C	1000 feet NW of ZID 1000 feet SE of ZID <5m NW of ZID boundary <5m SE of ZID boundary	every 3 m (w/one station at outfall depth)	Annually in August or September
Total Ammonia as N, mg/L	1000 feet NW of ZID 1000 feet SE of ZID <5m NW of ZID boundary <5m SE of ZID boundary	surface waters only (above 1.0 m)	Annually in August or September
Fecal coliform, #/100ml	NW of outfall at MZ boundary SE of outfall at MZ boundary <5m NW of ZID boundary <5m SE of ZID boundary	surface waters only (above 15-30 cm)	April, June , August, November[2]
Fecal coliform, #/100ml	At low tide or when a minus tide coincides with peak daily flow: Station 1: 1.5 m from shore along length of outfall Stations 2 & 3: 91 m to either side of station 1. Stations 4 & 5: where 1600m MZ touches the shoreline Area A: 1.5 m from shore (See map in Appendix A)	surface waters only (above 15-30 cm)	Monthly May through August for the life of the permit

Notes:
[1] Reference stations should be located at sites where water depth is equivalent to the outfall depth.
[2] Monitoring may be decreased after two years to once per year (in August or September) if the results indicate that discharge has not caused Water Quality Standards (WQS) to be exceeded outside the mixing zone.

Sampling shall be done according to the above schedule and submitted in the Annual Report.

4. Biological Monitoring for Benthic Infauna and Sediment Analyses

   Sediment analyses for total volatile solids (TVS) and a benthic survey shall be conducted at least once during the life of this permit. The sampling shall be coordinated, to the extent practicable, with the sampling times for the water quality monitoring program and may be conducted during maintenance dives. Samples shall be collected from the following five stations:

   - the southeastern and northwestern boundary of the ZID,
   - inside the ZID near the middle of the diffuser,
   - and two reference stations at least 1000 feet northwest and southeast of the outfall.

   One benthic sample and two TVS samples shall be collected at each station.

   If sediment samples are collected from gravel or cobble substrates, analyses for TVS shall be done on the finer size fractions (silt and clay fractions, combined).

   Benthic samples shall be stored. Analyses may be required if the EPA determines that substantial changes have occurred in TVS content of the sediments around the outfall. The stored samples for benthic community analysis shall be inspected every two to three months and any alcohol which has evaporated from the jars shall be replaced.

   Data analyses for TVS shall be presented in the annual written report as mean values and standard deviations by stations.

5. Monitoring Program Plan including Quality Assurance Requirements

   a. Within **120 days of the effective date of this permit**, the permittee shall complete and implement a Monitoring Program Plan that includes a Quality Assurance/Quality Control (QA/QC) program.

      This plan shall address the details of:

      - all monitoring procedures (e.g., methods to insure adequate preservation of composite samples, methods of station location and relocation, identification of sampling equipment),
      - monitoring objectives,
      - specific QA/QC procedures including the method detection limits and precision requirements that will insure that program objectives are met,
      - how data will be used to evaluate the monitoring objectives,

- name(s), address(es), and telephone number(s) of the laboratories, used by or proposed to be used by the permittee, and
- other activities designed to achieve data quality goals for the monitoring programs.

b. The document, *Guidance for Preparation of Quality Assurance Project Plans*, EPA, Region 10, Quality and Data Management Program, QA/G-5, may be used as a reference guide in preparing the QA/QC program. This document is available at www.epa.gov/r10earth/offices/oea/qaindex.htm.

c. The permittee shall amend the Monitoring Program Plan whenever there is a modification in the sample collection, sample analysis, or other conditions or requirements of the plan.

d. Copies of the Monitoring Program Plan shall be kept on site and shall be made available to EPA and ADEC upon request.

C. Non-industrial Source Control Program

Section 301(h) regulations require that the permittee implement a public education program designed to minimize the entrance of nonindustrial toxic pollutants and pesticides into its POTW. Elements of the public education program shall include:

- development and dispersement of information containing non-hazardous alternatives to hazardous household products and pesticides;

- proper and free disposal of hazardous wastes in local newspapers including disposal guidelines specifying what toxic pollutants can and cannot be discharged to the sewer system; and

- Signs shall be placed on the shoreline near the fecal coliform mixing zone and the outfall line. The signs shall state that primary treated domestic wastewater is being discharged, that mixing zones exist, and certain activities, such as the harvesting of shellfish for raw consumption and bathing, should not take place within the mixing zone. The sign shall also have the name and owner of the facility, approximate location and size of the mixing zone and give a facility contact phone number for additional information a sign placed on the shoreline, near the mixing zone and outfall line that states that primary treated domestic wastewater is being discharged, that mixing zones do exist and that certain activities should not take place within the mixing zones. The signs shall also include the approximate location and size of the mixing zones and give a facility. An outfall sign must also be placed at the beach designated as a shellfish collection area. The sign shall state that the consumption of raw shellfish

is not advised along with the advice of steaming shellfish for 4 - 9 minutes, discarding shellfish that do not open after steaming.

An annual report on the nonindustrial source control program shall be submitted by **January 15th** of the following year. This report shall summarize the actions taken, and their effectiveness, to control nonindustrial sources of toxic pollutants and pesticides.

D. Operation and Maintenance Plan

1. Within **180 days after the effective date** of this permit, the permittee shall review/develop and implement its operation and maintenance (O&M) plan and ensure that it includes appropriate best management practices (BMPs); the plan must be reviewed annually thereafter. BMPs include measures that prevent or minimize the potential for the release of pollutants to the Zimovia Strait. The O&M Plan shall be retained on site and made available to EPA and ADEC upon request.

2. The permittee shall develop a description of pollution prevention measures and controls appropriate for the facility. The appropriateness and priorities of controls in the O&M Plan shall reflect identified potential sources of pollutants at the facility. The description of BMPs shall address, to the extent practicable, the following minimum components:

- Spill prevention and control;
- Optimization of chemical usage;
- Preventive maintenance program;
- Minimization of pollutant inputs from industrial users;
- Research, develop and implement a public information and education program to control the introduction of household hazardous materials to the sewer system; and
- Water conservation.

E. Design Criteria Requirement

The design flow criteria for the permitted facility is 0.6 mgd. Each month, the permittee shall compute an annual average value for flow entering or exiting the facility based on the previous twelve months data. If the average annual value exceeds 85% of the design criteria value, the permittee shall notify EPA and develop a facility plan and schedule within **one year from the date of first reaching the annual average flow of 0.51 mgd**. The plan must include the permittee's strategy for continuing to maintain compliance with effluent limits and will be made available to the Director, ADEC or an authorized representative upon request.

II. MONITORING, RECORDING, AND REPORTING REQUIREMENTS

A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under Part I shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. In order to ensure that the effluent limits set forth in this permit are not violated at times other than when routine samples are taken, the permittee shall collect additional samples whenever any discharge occurs that may reasonably be expected to cause or contribute to a violation that is unlikely to be detected by a routine sample. The permittee shall analyze the additional samples for those parameters limited in Part I.A. of this permit that are likely to be affected by the discharge.

The permittee shall collect such additional samples as soon as the spill, discharge, or bypassed effluent reaches the outfall. The samples shall be analyzed in accordance with paragraph II.B ("Monitoring Procedures"). The permittee shall report all additional monitoring in accordance with paragraph II.D ("Additional Monitoring by the Permittee").

B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under 40 CFR 136, unless other test procedures have been specified in this permit or alternate methods have been approved by the EPA Water Office Director.

C. Reporting of Monitoring Results. Monitoring results shall be summarized each month on the DMR form. The reports shall be submitted monthly and are to be postmarked by the 15th day of the following month. Legible copies of these, and all other reports, shall be signed and certified in accordance with the requirements of Part IV.I. Signatory Requirements, and submitted to the Director, Office of Water and the State agency at the following addresses:

original to: United States Environmental Protection Agency
Region 10
NPDES Compliance Unit
1200 Sixth Avenue, OW-133
Seattle, Washington 98101
(206) 553-1280 fax

copy to: Alaska Department of Environmental Conservation
Division of Air and Water Quality
410 Willoughby Avenue, Suite 303
Juneau, Alaska 99709
(907) 465-5300
fax: 465-5274
May be submitted via scanned (.pdf, .bmp or .tif) document to:
wq_permit@envircon.state.ak.us

D. Additional Monitoring by the Permittee. If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR 136 or as specified in this permit, the permittee must include the results of this monitoring in the calculation and reporting of the data submitted in the DMR.

Upon request by the Director, the permittee must submit results of any other sampling, regardless of the test method used.

E. Records Contents. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements,

2. The individual(s) who performed the sampling or measurements,

3. The date(s) analyses were performed,

4. The individual(s) who performed the analyses,

5. The analytical techniques or methods used, and

6. The results of such analyses.

F. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least **three years** from the date of the sample, measurement, report, or application. This period may be extended by request of the Director at any time. Data collected on-site, copies of DMRs, and a copy of this NPDES permit must be maintained on-site during the duration of activity at the permitted location.

G. Twenty-four Hour Notice of Noncompliance Reporting

1. The permittee must report the following occurrences of noncompliance by telephone within 24 hours from the time the permittee becomes aware of the circumstances:

   a. any noncompliance that may endanger health or the environment;

   b. any unanticipated bypass that exceeds any effluent limitation in the permit (See Permit Part III.G., “Bypass of Treatment Facilities”);

   c. any upset that exceeds any effluent limitation in the permit (See Permit Part III.H., “Upset Conditions”);

d. any violation of a maximum daily discharge limitation for any of the pollutants in Table 2 of Permit Part I.A. requiring 24-hour reporting; or

e. any sanitary sewer overflow prior to the treatment works, whether or not such overflow endangers health or the environment or exceeds any effluent limitation in the permit.

2. The permittee must also provide a written submission within five days of the time that the permittee becomes aware of any event required to be reported under Permit Part II.G.1., above. The written submission must contain:

a. a description of the noncompliance (including location) and its cause;

b. the period of noncompliance, including exact dates and times;

c. the estimated time noncompliance is expected to continue if it has not been corrected;

d. steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance; and

e. if the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated flow.

3. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the NPDES Compliance Hotline in Seattle, Washington, by telephone, (206) 553-1846.

4. Reports must be submitted to the addresses in Permit Part II.C. (“Reporting of Monitoring Results”).

H. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for Part II.C. are submitted. The reports shall contain the information listed in Part II.E.

I. Inspection and Entry. The permittee shall allow the Director or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee’s premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit,

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit,

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

III. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for: enforcement action; permit termination, revocation and re-issuance, or modification; or denial of a permit renewal application. The permittee shall give advance notice to the Director and ADEC of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions

1. Civil and Administrative Penalties. Any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act shall be subject to a civil or administrative penalty, not to exceed the maximum amounts authorized by Sections 309(d) and 309(g) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note).

2. Criminal Penalties

a. Negligent Violations. Any person who negligently violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act shall, upon conviction, be punished by a fine and/or imprisonment as specified in Section 309(c)(1) of the Act.

b. Knowing Violations. Any person who knowingly violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act shall, upon conviction, be punished by a fine and/or imprisonment as specified in Section 309(c)(2) of the Act.

c. Knowing Endangerment. Any person who knowingly violates a permit condition implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily

injury, shall, upon conviction, be subject to a fine and/or imprisonment as specified in Section 309(c)(3) of the Act .

d. False Statements. Any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under this Act or who knowingly falsifies, tampers with, or renders inaccurate any monitoring device or method required to be maintained under this Act, shall, upon conviction, be punished by a fine and/or imprisonment as specified in Section 309(c)(4) of the Act.

C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize, or prevent, any discharge, or sludge use or disposal, in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed, or used, by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

F. Removed Substances. Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of waste waters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

G. Bypass of Treatment Facilities

1. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2 and 3 of this section.

2. Notice

a. Anticipated Bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible, at least **10 days** before the date of the bypass.

b. Unanticipated Bypass. The permittee shall submit notice of an unanticipated bypass as required under Part II.G. Twenty-four Hour Notice of Noncompliance Reporting.

3. Prohibition of Bypass

a. Bypass is prohibited and the Director may take enforcement action against a permittee for a bypass, unless:

(1) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The permittee submitted notices as required under paragraph 2 of this section.

b. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determined that it will meet the three conditions listed above in paragraph 3.a. of this section.

H. Upset Conditions

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph 2 of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

2. Necessary upset demonstration conditions. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An upset occurred and that the permittee can identify the cause(s) of the upset,

b. The permitted facility was at the time being properly operated,

c. The permittee submitted notice of the upset as required under Part II.G. Twenty-four Hour Notice of Noncompliance Reporting, and

d. The permittee complied with any remedial measures required under Part III.D. Duty to Mitigate.

3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

IV. GENERAL REQUIREMENTS

A. Notice of New Introduction of Pollutants

1. The permittee shall provide adequate notice to the Director, Office of Water, and ADEC of:

   a. Any new introduction of pollutants into the treatment works from an indirect discharger which would be subject to Sections 301 or 306 of the Act if it were directly discharging those pollutants, and

   b. Any substantial change in the volume or character of pollutants being introduced into the treatment works by a source introducing pollutants into the treatment works at the time of issuance of the permit.

2. For the purposes of this section, adequate notice shall include information on:

   a. The quality and quantity of effluent to be introduced into such treatment works, and

   b. Any anticipated impact of the change on the quantity or quality of effluent to be discharged from such publicly owned treatment works.

B. Control of Undesirable Pollutants.

Under no circumstances shall the permittee allow introduction of the following wastes into the waste treatment system:

1. Wastes which will create a fire or explosion hazard in the treatment works;

2. Wastes which will cause corrosive structural damage to the treatment works, but in no case, wastes with a pH lower than 5.0, unless the treatment works is designed to accommodate such wastes;

3. Solid or viscous substances in amounts which cause obstructions to the flow in sewers, or interference with the proper operation of the treatment works;

4. Waste waters at a flow rate and/or pollutant discharge rate which is excessive over relatively short time periods so that there is a treatment process upset and subsequent loss of treatment efficiency; and

5. Any pollutant, including oxygen demanding pollutants (e.g., BOD, etc.) released in a discharge of such volume or strength as to cause interference in the treatment works.

C. Planned Changes. The permittee shall give notice to the Director and ADEC as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are not subject to effluent limitations in the permit. Notice is also required when the alteration or addition results in a significant change in the permittee's sludge use or disposal practices, including notification of additional use or disposal sites not reported during the permit application process.

D. Anticipated Noncompliance. The permittee shall give advance notice to the Director and ADEC of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

E. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

F. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application should be submitted at least **180 days before the expiration date** of this permit. The application shall include an updated industrial user survey and priority pollutant scan.

G. Duty to Provide Information. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

H. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in

a permit application or any report to the Director or ADEC, it shall promptly submit such facts or information.

I. Signatory Requirement. All applications, reports or information submitted to the Director and ADEC shall be signed and certified.

1. All permit applications shall be signed as follows:

   a. For a corporation: by a responsible corporate officer.

   b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.

   c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Director or ADEC shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described above and submitted to the Director and ADEC, and

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the organization.

3. Changes to authorization. If an authorization under Part IV.I.2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV.I.2. must be submitted to the Regional Administrator and ADEC prior to or together with any reports, information, or applications to be signed by an authorized representative.

J. Certification. Any person signing a document under this section shall make the following certification:

"*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted*

is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

K. Availability or Reports. Except for data determined to be confidential under 40 CFR 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Director. As required by the Act, permit applications, permits, and effluent data shall not be considered confidential.

L. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private infringement of federal, state, or local laws or regulations.

M. Severability. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

N. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Director at least **30 days** in advance of the proposed transfer date,

2. The notice includes a written agreement between the existing and new permittee's containing a specific date for transfer of permit responsibility, coverage, and liability between them, and

3. The Director does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.

O. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Act.

P. Reopener Provision. This permit is subject to modification, revocation and reissuance, or termination at the request of any interested person (including the permittee) or upon EPA initiative. However, permits may only be modified, revoked or reissued, or terminated for the reasons specified in 40 CFR Parts 122.62, 122.63 or 122.64, and 40 CFR Part 124.5. This includes new information which was not available at the time of permit issuance and would have justified the application of different permit conditions at the time of issuance and includes, but is not limited to, future monitoring results. All

requests for permit modification must be addressed to the EPA in writing and shall contain facts or reasons supporting the request.

V. DEFINITIONS

"*Average monthly discharge limitation*" means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

"*Average weekly discharge limitation*" means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

"*Biosolids*" means any sludge or material derived from sludge that can be beneficially used. Beneficial use includes, but is not limited to, land application to agricultural land, forest land, a reclamation site or sale or give away to the public for home lawn and garden use.

"*Daily discharge*" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

A "*Grab*" sample is a single sample or measurement taken at a specific time or over as short a period of time as is feasible.

"*Maximum daily discharge limitation*" means the highest allowable "daily discharge".
"*Method detection limit (MDL)*" is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero as determined by a specific laboratory method (40 CFR 136).

"*Mixing Zone"* is the volume contained within a 1,600 meter radial distance from the outfall.

"*Pathogen*" means an organism that is capable of producing an infection or disease in a susceptible host.

"*Pollutant*," for the purposes of this permit, is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or pathogenic organisms that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food-chain, could, on the basis of information available to the Administrator of the EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in

reproduction), or physical deformations in either organisms or offspring of the organisms.

"*Sewage sludge*" means solid, semi-solid, or liquid residue generated during the treatment of domestic sewage and/or a combination of domestic sewage and industrial waste of a liquid nature in a Treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the incineration of sewage sludge or grit and screenings generated during preliminary treatment of domestic sewage in a Treatment Works. These must be disposed of in accordance with 40 CFR 258.

A "*24-hour composite*" sample shall mean a flow-proportioned mixture of not less than eight discrete aliquots. Each aliquot shall be a grab sample of not less than 100 mL and shall be collected and stored in accordance with procedures prescribed in the most recent edition of *Standard Methods for the Examination of Water and Wastewater*.

"*Toxic pollutants*" are those substances listed in 40 CFR 401.15.

"*Upset*" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

The "*ZID*" is the Zone of Initial Dilution. The ZID is defined by the volume of water centered over the outfall diffuser with a radius of 100 feet.

APPENDIX A