

## TEAM MEMBERS



**Project Manager:** Jonathan Hartford  
**Technical Leads:** Monick Estrada, Shawn Eby, Christian Osentoski, Jesse Oakes, Kaytee Villafranca

## INTRODUCTION

The Eagle River Wastewater Treatment Facility (ERWWTF) was constructed in 1971, and is owned and operated by the Anchorage Water and Wastewater Utility (AWWU). The facility is currently configured to be a conventional activated sludge process with tertiary granular media filtration and UV sanitation, where the treated effluent discharges into Eagle River. The facility received upgrades in 1978 and 1991, and the current design peak flow is 2.5 MGD.

In 2013 and 2014 the headworks of the facility experienced overflows as a result of influent flows greater than the capacity of the system. Because of this, AWWU requested an upgrade to the headworks portion of the facility with a 30 year outlook and a budget of \$9 million.

## OBJECTIVE

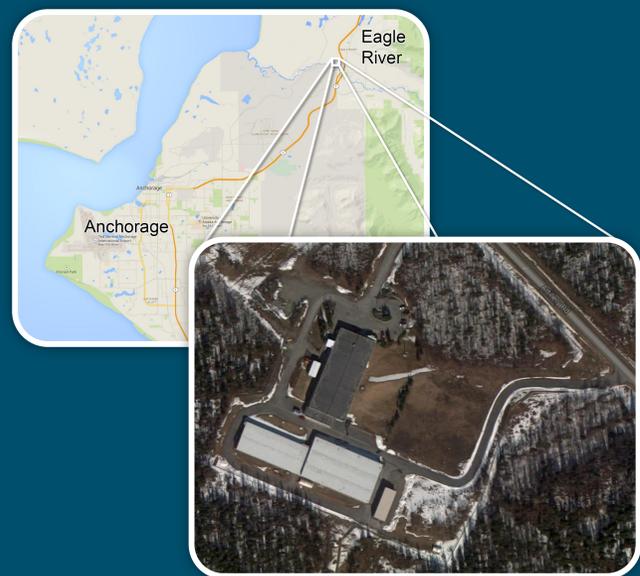
Upgrade the headworks to alleviate the problems associated with the current lack of hydraulic capacity, accommodate an increased flow due to future population growth, and including proper screening and grit removal, all while maintaining facility operations during construction.

## 30 YEAR OUTLOOK

Using historical data and local growth trends, the future service population (FSP) in 2045 for the Eagle River area is projected to be 29,000 people. Also based on historical data, it was found that an individual within the service area has a wastewater output of 75 gallons per day, the peaking factor for the maximum daily flow (MDF) is 1.8, and the peaking factor for the peak hourly flow (PHF) is 3.6. The following are the current and future Average Daily Flows (ADF), MDFs, and PHFs.

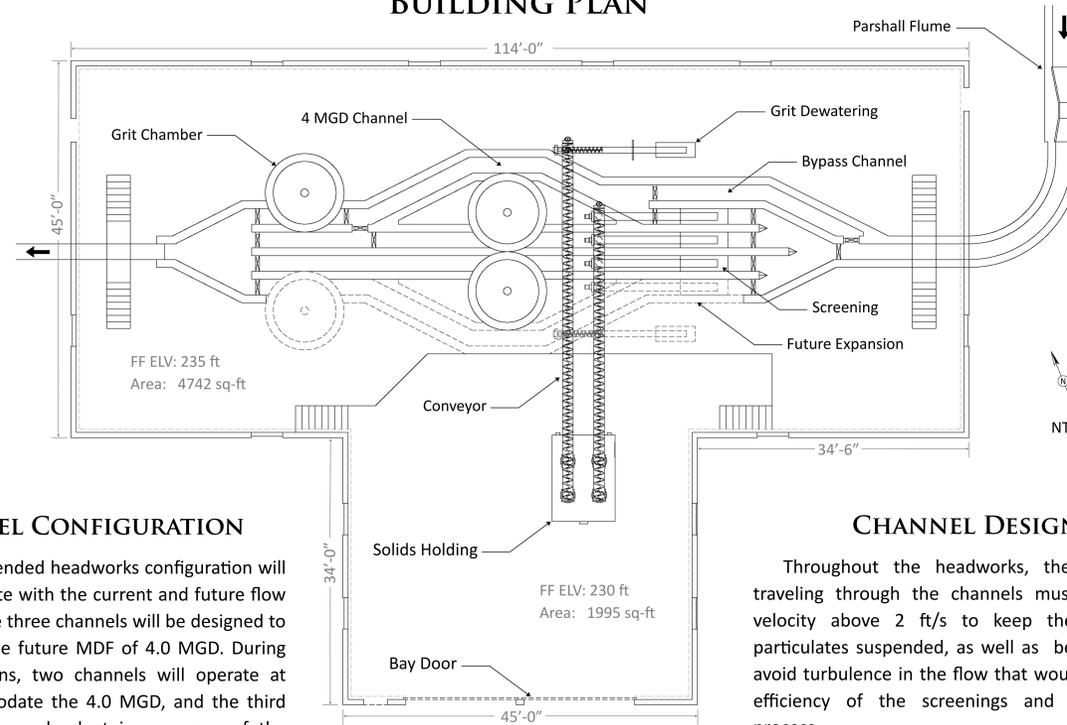
Flow	Equation	2014 Flow Rate	2045 Flow Rate
ADF	FSP x 75 gal/day	1.4 MGD	2.2 MGD
MDF	1.8 x ADF	2.3 MGD	4.0 MGD
PHF	3.6 x ADF	4.4 MGD	8.0 MGD

## PROJECT LOCATION



# EAGLE RIVER WASTEWATER TREATMENT FACILITY HEADWORKS UPGRADE

## BUILDING PLAN



## CHANNEL CONFIGURATION

The recommended headworks configuration will be able to operate with the current and future flow rates. Each of the three channels will be designed to accommodate the future MDF of 4.0 MGD. During normal operations, two channels will operate at 50% to accommodate the 4.0 MGD, and the third channel will be a redundant in case one of the others is inoperable.

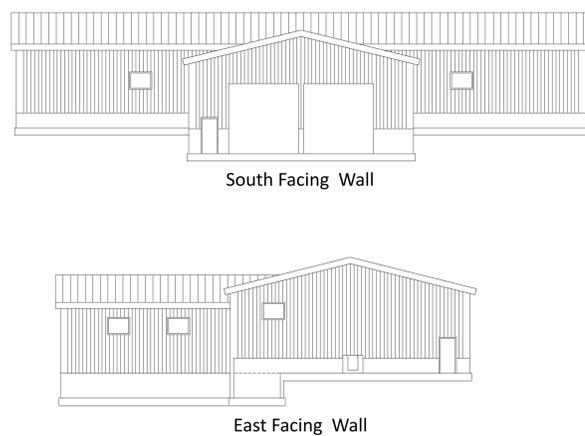
There is room for a fourth channel to allow for future expansion. A bypass channel, along with a series of weir gates in the far North channel will allow for wastewater to bypass the system during an overflow event or by facility operators.

## CHANNEL DESIGN

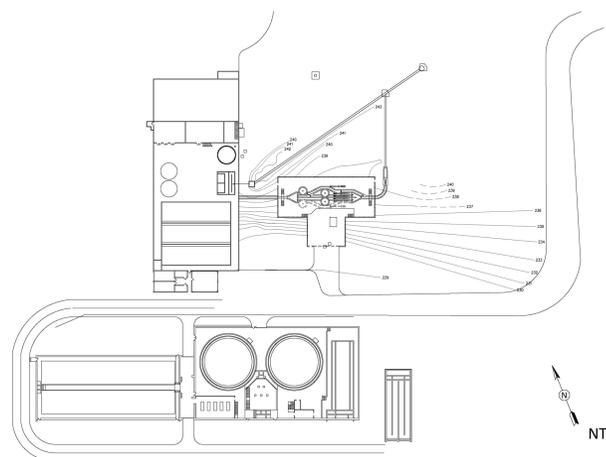
Throughout the headworks, the wastewater traveling through the channels must maintain a velocity above 2 ft/s to keep the solids and particulates suspended, as well as below 4 ft/s to avoid turbulence in the flow that would reduce the efficiency of the screenings and grit removal process.

The recommended channel is rectangular with a width of 2 ft., a slope of 1%, and a depth of 3 ft. to handle the current and projected flow rates. The depth of the channel is twice that of the maximum projected flow depth to reduce the risk of wastewater spilling over the channel walls.

## ELEVATION VIEWS



## SITE PLAN



## THANKS TO



## RECOMMENDED EQUIPMENT

### FLOW MEASUREMENT

- Plasti-Fab Parshall Flume
- Pre-fabricated
- Minimal head loss
- Self cleaning
- 12" throat to handle current and future flow rates



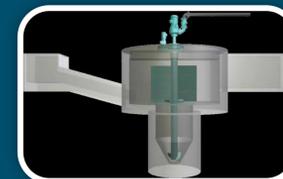
### FINE SCREENINGS

- Parkson Helisieve
- 2 in 1 system with screenings and dewatering
- Cost and space efficient design
- Low maintenance
- Passes Paint filter test for solids disposal



### GRIT CHAMBERS

- Smith & Loveless Pista 360 with V-Force Baffle
- 95% grit removal
- 8' diameter tank
- Small footprint
- Adequate for current and future flow rates



### GRIT DEWATERING

- Smith & Loveless Pista Turbo Grit Washer 250
- Compact design
- Large Capacity
- Passes Paint filter test for solids disposal



### CONVEYORS

- Parkson Helicon
- Shaftless for clear and unrestricted throughput
- Enclosed to reduce spills and odor
- Simple design



### SOLIDS HOLDING

- Waste Service
- 15 cu-yrd commercial dumpster
- Taken to the Anchorage Regional Landfill once per week



## BUILDING DESIGN

### ROOF

- Gable with 3:12 Pitch
- Clearance for maintenance equipment to reach process equipment
- R40 insulation



### MATERIALS

- Steel construction with metal siding
- 4" thick insulated panel walls
- Exposed steel will be galvanized to reduce corrosion
- 14' x 14' insulated bay doors



### LOCATION

- 45' East of building 1 (Northwest building)
- Current influent pipe will remain operational during construction
- Current influent pipe can be used to bypass headworks in the future
- Grass lined swales and culverts will be used for stormwater drainage

## COST ESTIMATE

Equipment	\$750,000.00
Construction and Materials	\$3,900,000.00
Engineering Design	\$1,500,000.00
15% Contingency	\$920,000.00
<b>TOTAL</b>	<b>\$7,070,000.00</b>