

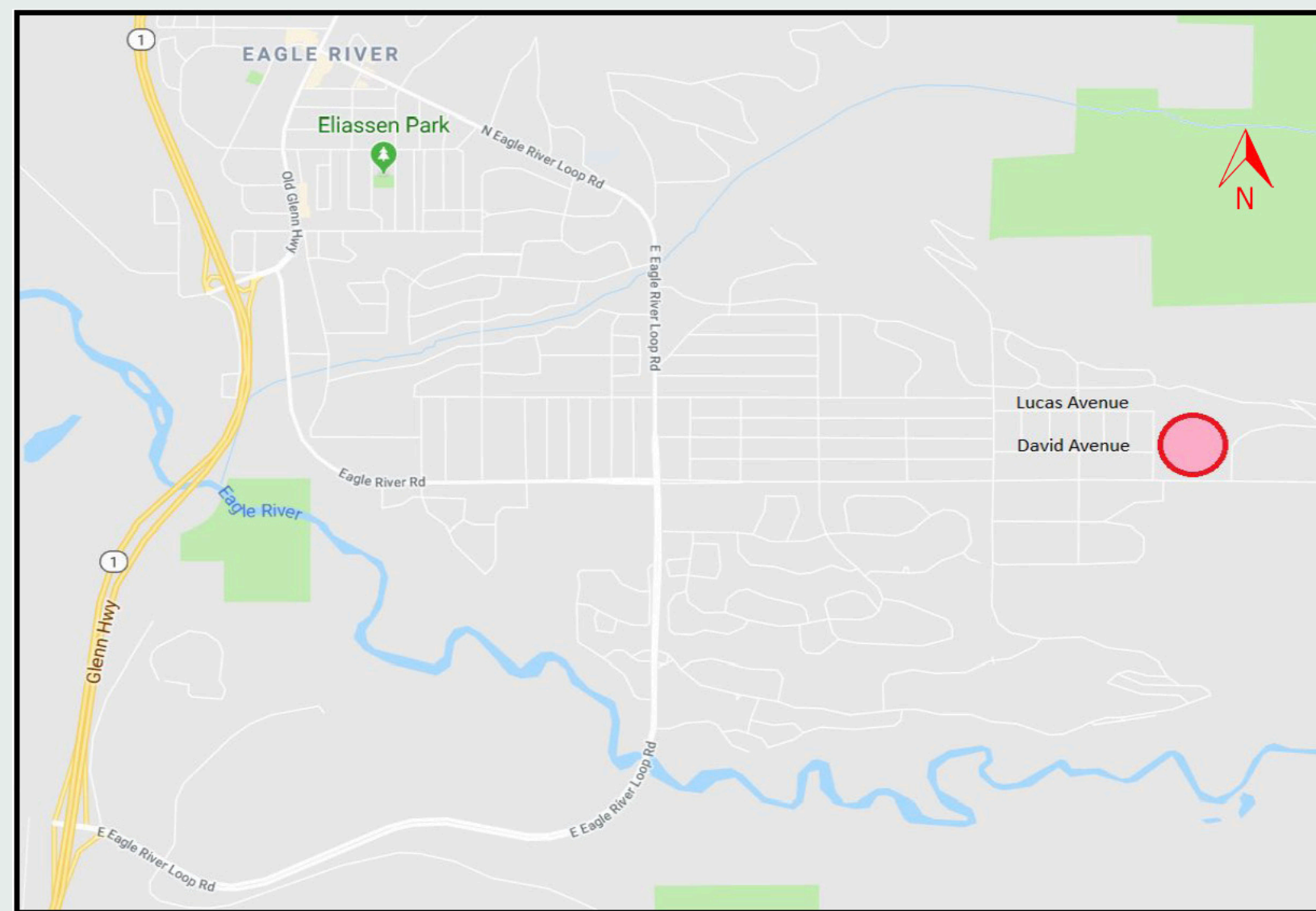
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## ABSTRACT

The Eagle River subdivision was evaluated in 2012. It was found to be lacking in water storage. In order to help Anchorage Water and Wastewater Utility (AWWU) achieve its standard of a three-day emergency water supply, a new 1MG reservoir and transmission main were designed by R&R Consultants to the 35% level. A transmission main was designed out of 12" ductile iron pipe (DIP) which will be supplied by the Eagle River Ln booster station. The route of the transmission main follows Eagle River Ln north, turns east on Lucas Ave, it then continues to the where Lucas Ave ends, and finally to the proposed reservoir site. A glass fused to steel bolted reservoir was selected as the result of evaluating the conditions of the site and life cycle costs of different reservoir materials.

## PROJECT BACKGROUND

AWWU has acquired 7 acres of land on the upper east side of Eagle River. This not only added more water to the emergency total supply, but provided a reservoir at a higher hydraulic grade line (HGL). This will help alleviate pumps and make the system more efficient. In order to make design conclusions it is necessary to exam geotechnical, and environmental data which were acquired from the Municipality of Anchorage (MOA).



## PROJECT OBJECTIVES

- This project will:
- Implement a 1 MG reservoir at the 900HGL
  - Design a new transmission main
  - Develop a digital terrain model

## PROJECT SIGNIFICANCE

This reservoir will increase the amount of emergency water storage in the Eagle River area.

## GEOTECHNICAL INVESTIGATION

In order to establish the soil profile and different soil layers, it was necessary to examine the boring logs given by the MOA. These boring logs indicated that the ground layers are expected to be granular well-drained soil. No water table was found.

DEPTH	DESCRIPTION	NO. OF SAMPLES	REMARKS
0 - 1'	Brown silty gravel	1	NO FROST
1 - 2'	Brown sandy silt with gravel and occasional cobbles GW (P-1)	2	
2 - 3'			Sample
3 - 4'			
4 - 5'			
5 - 6'			
6 - 7'			
7 - 8'			
8 - 9'			
9 - 10'			
10 - 11'			
11'	Bottom of Hole at 11'		Sample DRY A.T.D.

## ENVIRONMENTAL INVESTIGATION

After investigating potential wetlands and contaminations, it was determined that these considerations do not impact the design recommendations.



Ductile Iron Pipe

Glass Fused to Steel Bolted Reservoir



## R&R Consultants Team

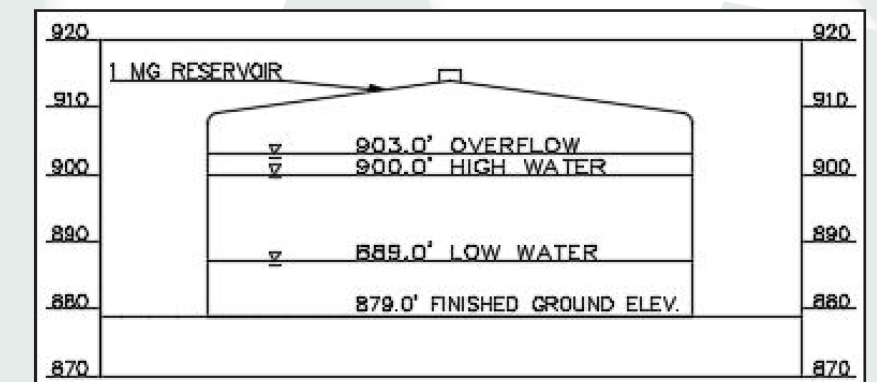
From left to right:  
Brandon Shayan, Alungoo Tumendemberel, Evan Rhodes, Russell Gingras, Trevor Trasky, Ryan Rosario

## PROPOSED SOLUTION

### 1 MG Reservoir

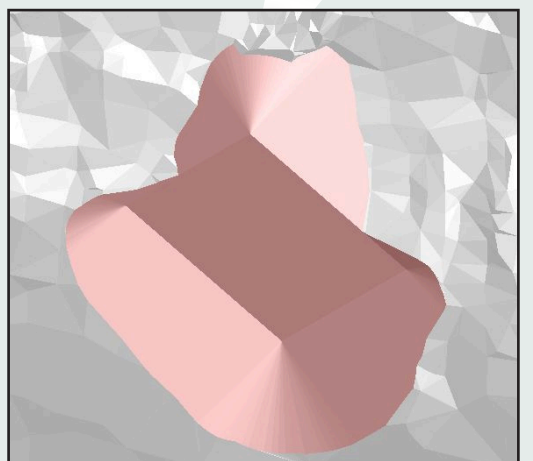
A glass fused to steel bolted tank is the recommended reservoir material. The design will be based on the American Water Works Association D103 classification and adhere to the National Sanitation Foundation 61st standard. The dimensions for the reservoir include:

- Diameter: 90'
- Height: 30'
- Roof slab thickness: 1/8"
- Circumference thickness: 1/4"
- Base plate thickness: 1/4"



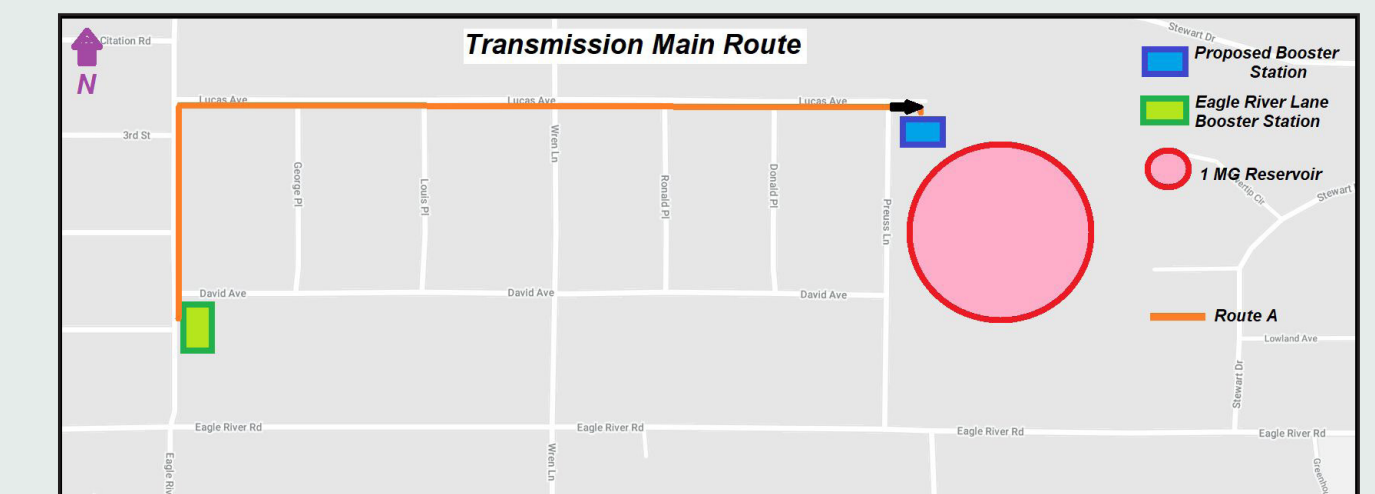
### Finished Grade

The 1 MG reservoir will be installed on a concrete pad that sits on top of asphalt that will have an elevation of 879'. This asphalt has the dimensions of 200' by 130' which will have the a 2.5:1 cut slope and a 3:1 fill slope.



### Transmission Main

Based on the geotechnical investigations, the contaminated soils, and pressure analysis, a final pipe material was able to be recommended. A twelve inch ductile iron pipe main with a polyethylene-zinc coating, cement mortar lining, with Tyton joints would satisfy the conditions safely and economically.



### Booster Station

The Hylan Crest booster station is reaching the end of its service life. In order to renew its service life, a new booster station will be implemented in the proposed ground, which will connect to the existing water main.

## COST ESTIMATE

Construction Costs	\$2,098,593
Engineering, Admin, ROW Costs	\$1,049,725
<b>TOTAL COST</b>	<b>\$3,148,318</b>

## CONCLUSION

R&R Consultant's submitted a Design Study Report to AWWU along with a 35% plan set. This includes the recommendation of the reservoir, transmission main, finished ground, and the relocation of the Hylan Crest booster station.