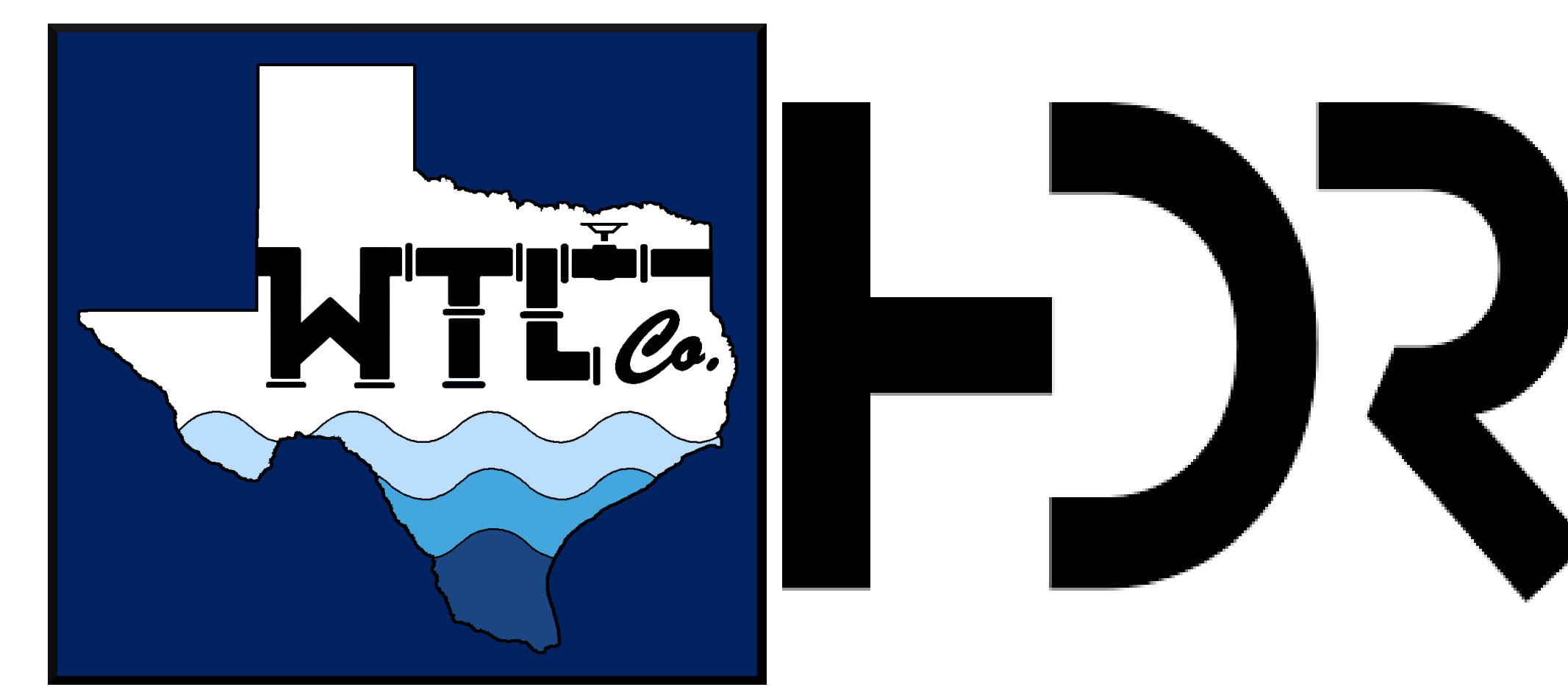
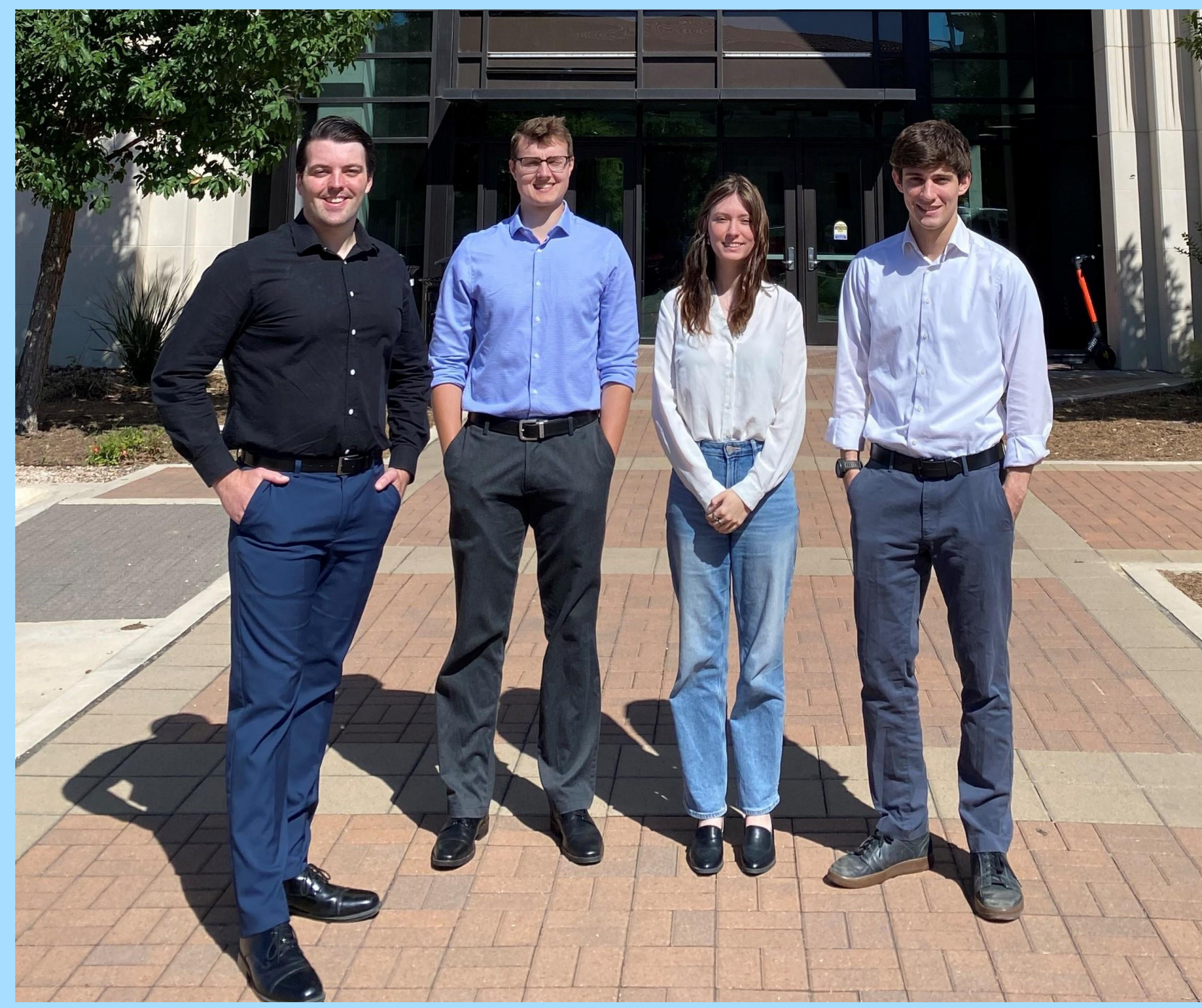


# C2.03 – Water Transmission Line

**Dylan McConnell, Kallen Rangnow, Rachel Mondy, Benjamin Lehrer**  
 Todd Warrix, PE



## Team Members



Dylan M, Kallen R, Rachel M, Ben L

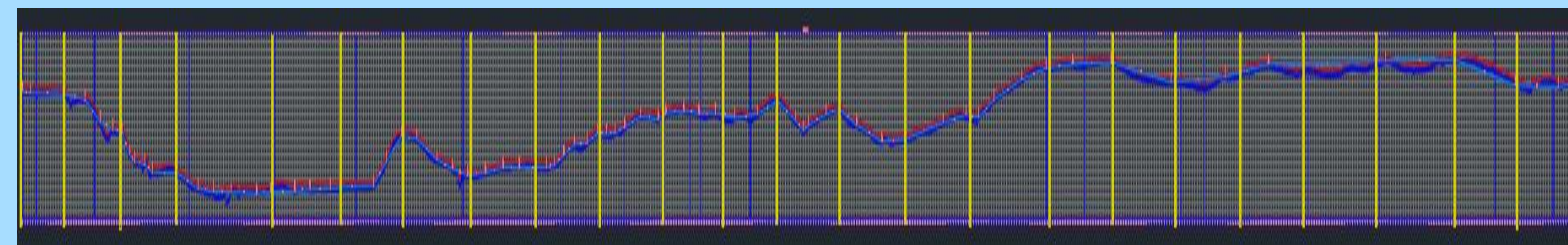
## Project Overview

The population boom experienced throughout Central Texas has prompted the city of Mustang Ridge to expand their municipal water supply capacity. This project will supply the City of Mustang Ridge with 20 MGD of potable water via a 12-mile-long pipeline, as well as provide an elevated storage tank, groundwater storage tank, and disinfection booster station.

## Design Considerations

- Maintain a reasonable hydraulic grade across the pipeline
- Minimize impact of construction on surrounding community
- Avoid environmentally and historically sensitive areas
- Ensure most efficient pipeline design and material choice
- Maintain a flow velocity between 3 and 7 feet per second
- Minimize parcel crossings

## Route Selection

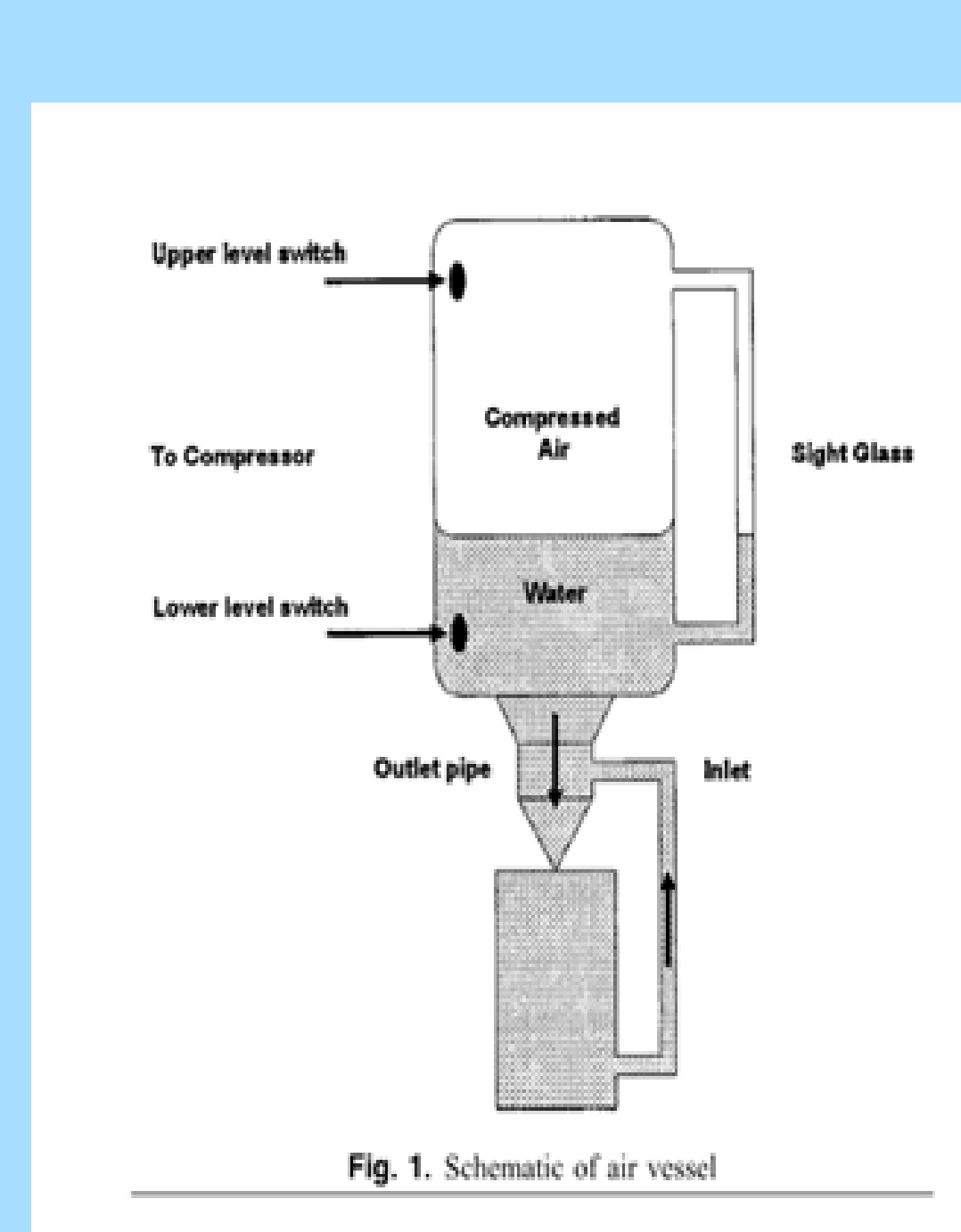


Route Profile View

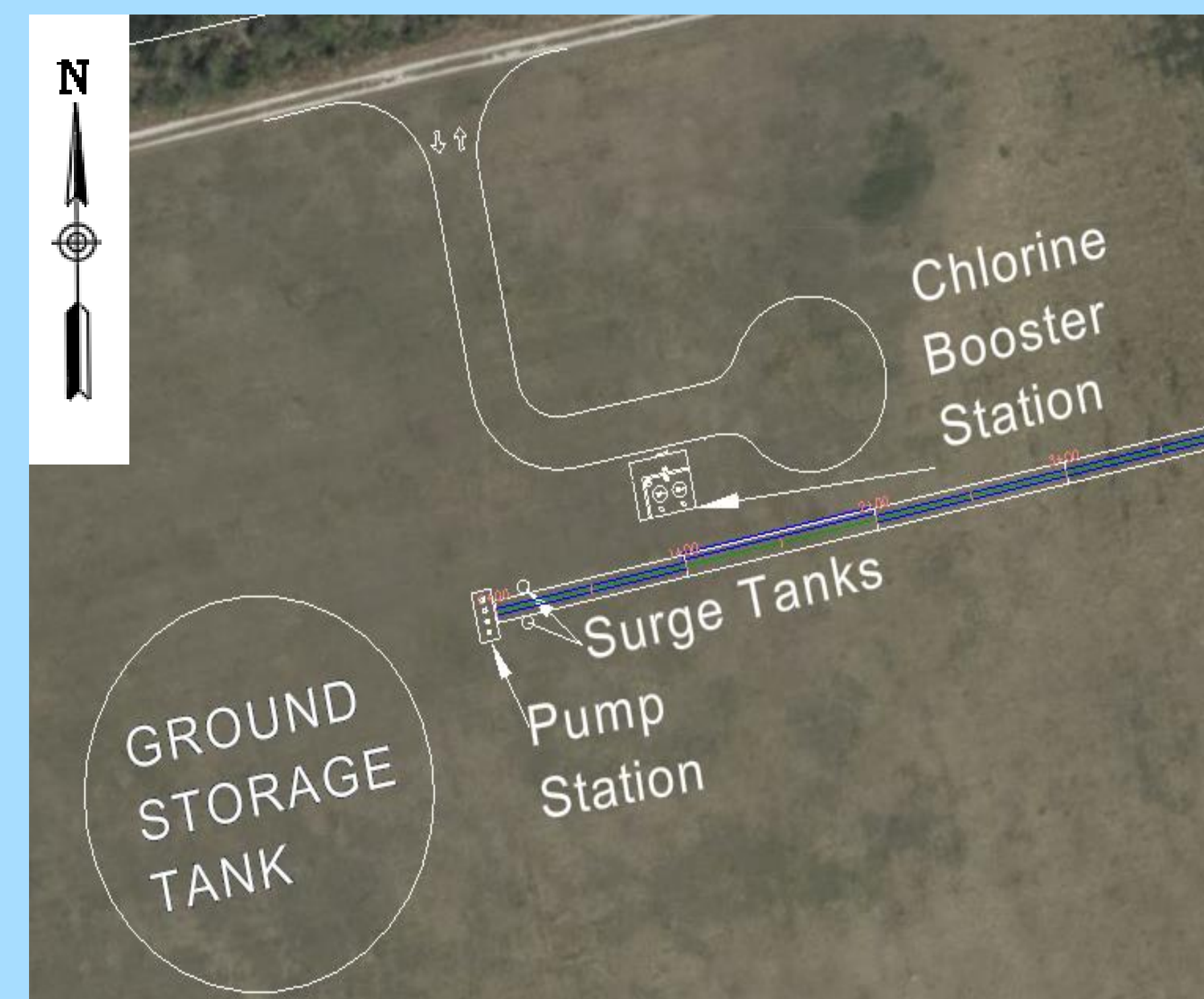
## Proposed Solution

- 61,537 linear feet
- 36" Ductile Iron Piping
- 3 parallel pump system, 1 back up
- Velocity: 5.68 ft/s
- Head Loss: 207.68 ft
- 2 surge tanks
- Two creek crossings
- Five road crossings
- 5 MG groundwater storage tank
- 1 MG composite elevated tank
- 24 air release valves
- 5,000-gal sodium hypochlorite

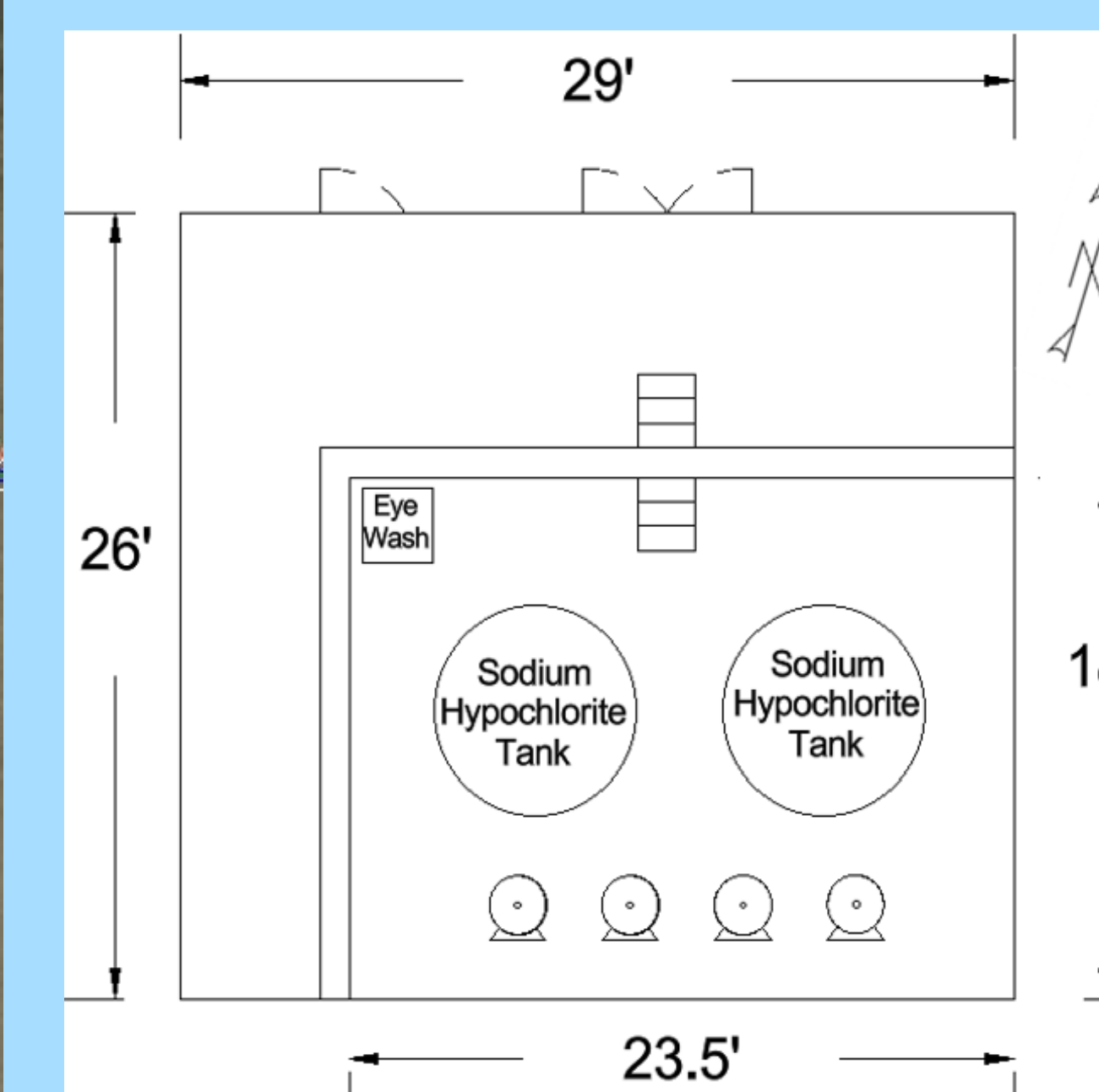
## Elements Design



Surge Tank



Site Layout Start of Line



Chlorine Booster Station

## Standards

- TCEQ -290.110, 290.42
- TxDOT - Roadway Design Manual
- AWWA - C512-15, M51
- COA -501-AW-01
- OSHA -1910.25

## Sustainability

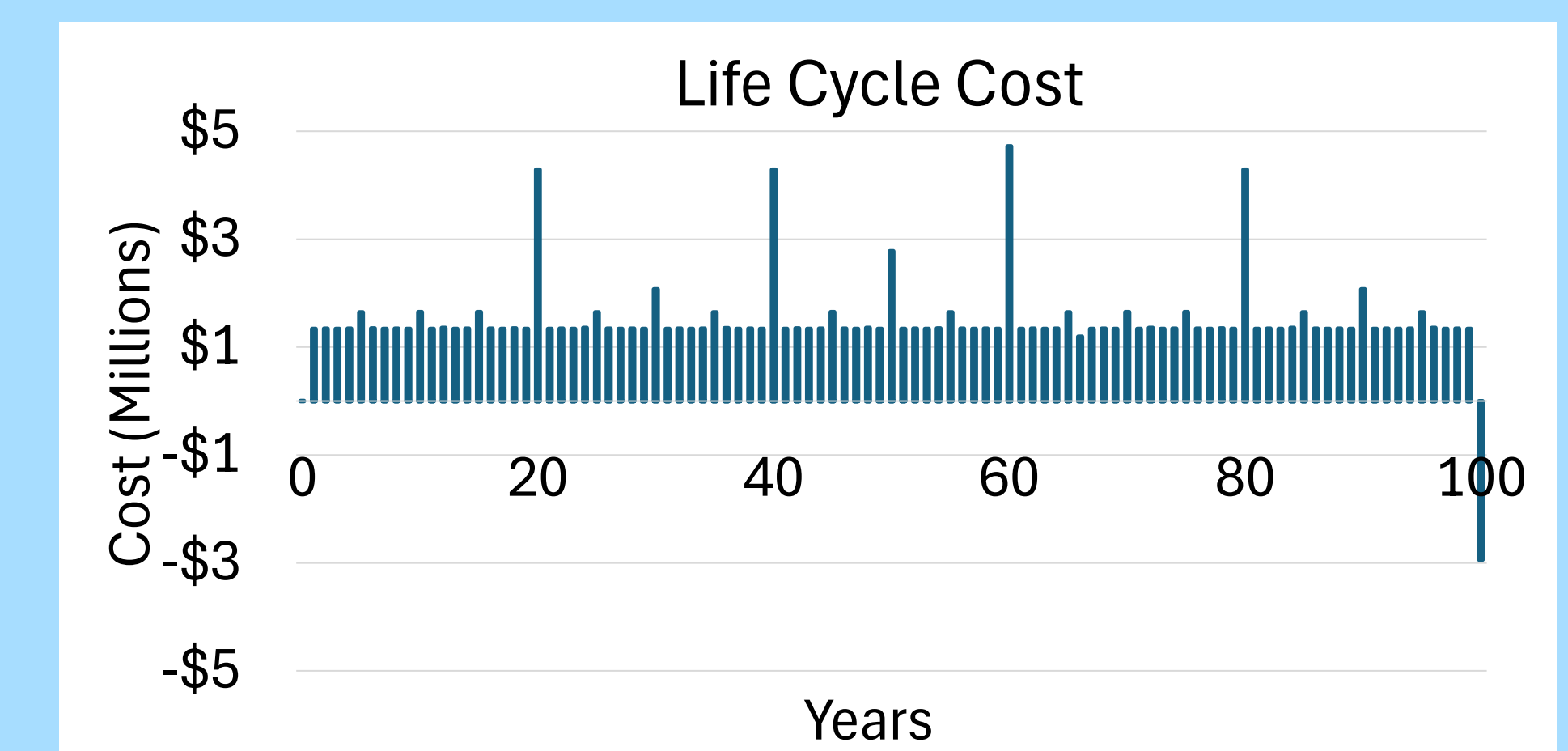
Credit Category	Applicable	Submitted	Percentage
Quality of Life	104	50	48%
Leadership	166	78	47%
Resource Allocation	166	61	37%
Natural World	208	124	60%
Climate and Resilience	172	59	34%
Total Points / %	816	372	46%



## Cost Analysis

### Capital Cost

Item	Unit	Amount	Cost	Total
Ductile Iron Pipe	lf	61,500	\$232	\$14,300,000
Trenching	lf	61,500	\$45	\$2,800,000
Land	SF	750,000	\$4	\$3,000,000
Pumps	Quantity	4	\$52,000	\$208,000
Air Release Valve	Quantity	24	\$1,000	\$24,000
Ground Water Storage Tank	Quantity	1	\$2,250,000	\$2,250,000
Surge Tank	Quantity	2	\$10,000	\$20,000
Water Tower	Quantity	1	\$6,500,000	\$6,500,000
Chlorine Booster Station	Quantity	1	\$50,000	\$50,000
Misc	-	0.2	30,000,000	\$6,000,000
				\$36,000,000



Total 100-year Life Cycle Cost is \$75 Million