



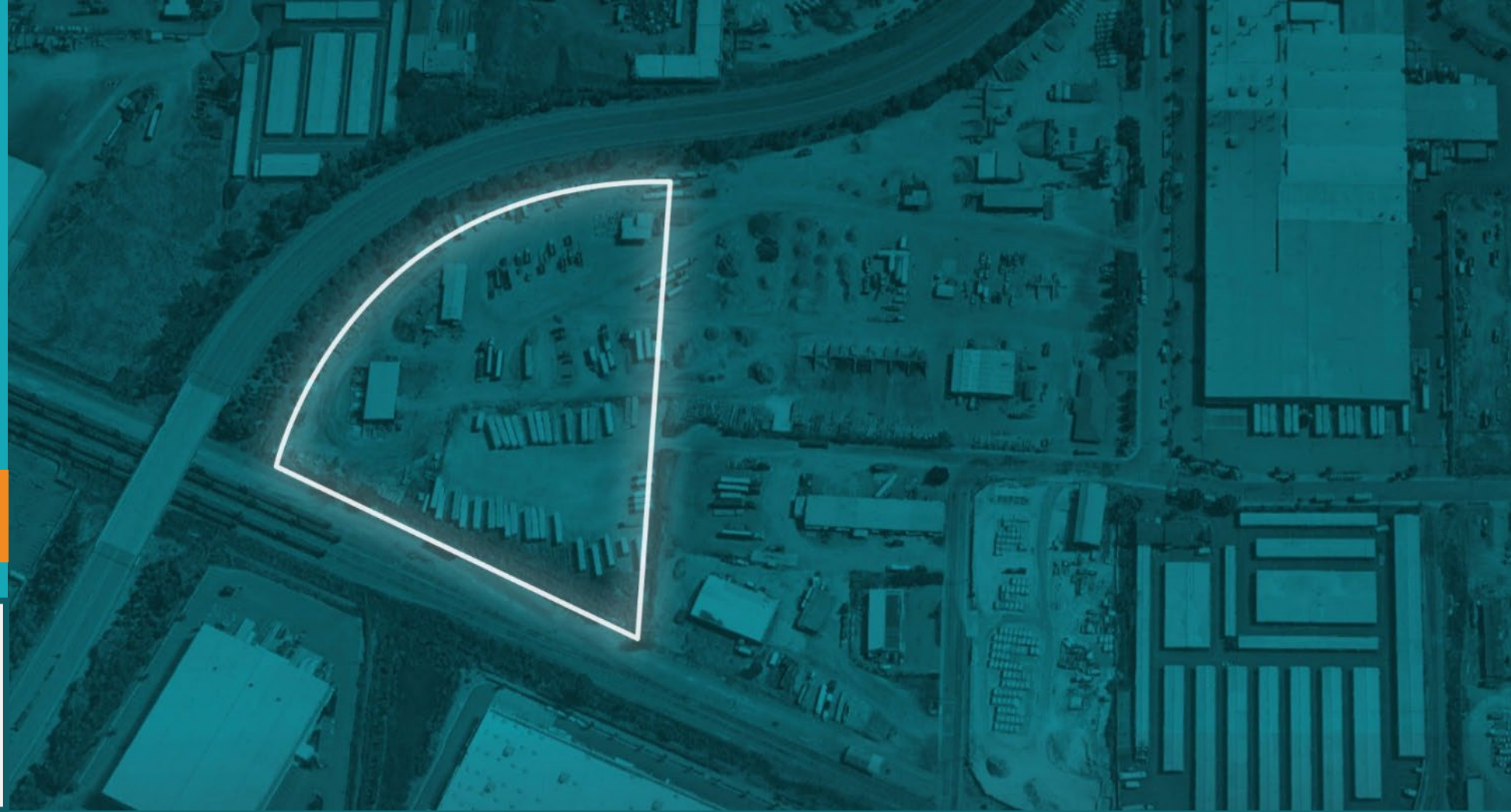
PNWS-AWWA
2022

 **Slayden**
part of MWH

 **carollo**

 **ZCS**
ENGINEERING
ARCHITECTURE

 **McMILLEN
JACOBS
ASSOCIATES**



Filtering the Options

💧 April 29, 2022



Background and Goals



Timeline to the RFP

- The City of Grants Pass' water treatment plant was originally constructed in 1931 and while regular updates were made in the 50's 60's and 80's the plant has remained largely unchanged in 91 years



Timeline to the RFP

- Following an update to the water treatment plant facility plan in 2014 the City Council made the hard decision to construct a new water treatment plant in a new location
- The plan identified significant structural deficiencies that while correctable – did not bring the treatment plant to current seismic code
- This began the process to determine how/when/where to deliver the replacement project

Timeline to the RFP

- In 2017 an Owners Agent was selected to assist the Council with many of complex decisions relating to the construction of the replacement facility
 - Three years after identifying and adopting the replacement of the water plant as the highest priority goal
- At this time Council also performed an performance audit of the water and wastewater programs and determined that contracting plant operations was also a key decision point for the project

Timeline to the RFP

- Items that Council needed to address
 - Funding – current rate structure would not support construction of a replacement water treatment plant
 - Design/Bid/Build – Design/Build – Design/Build/Operate – or other delivery model
 - Where to locate the new facility (this alone added years to the front end of the project)
 - What technology to implement at the replacement water treatment facility
- Finally, in 2021 an RFP was released to the Design Build Community

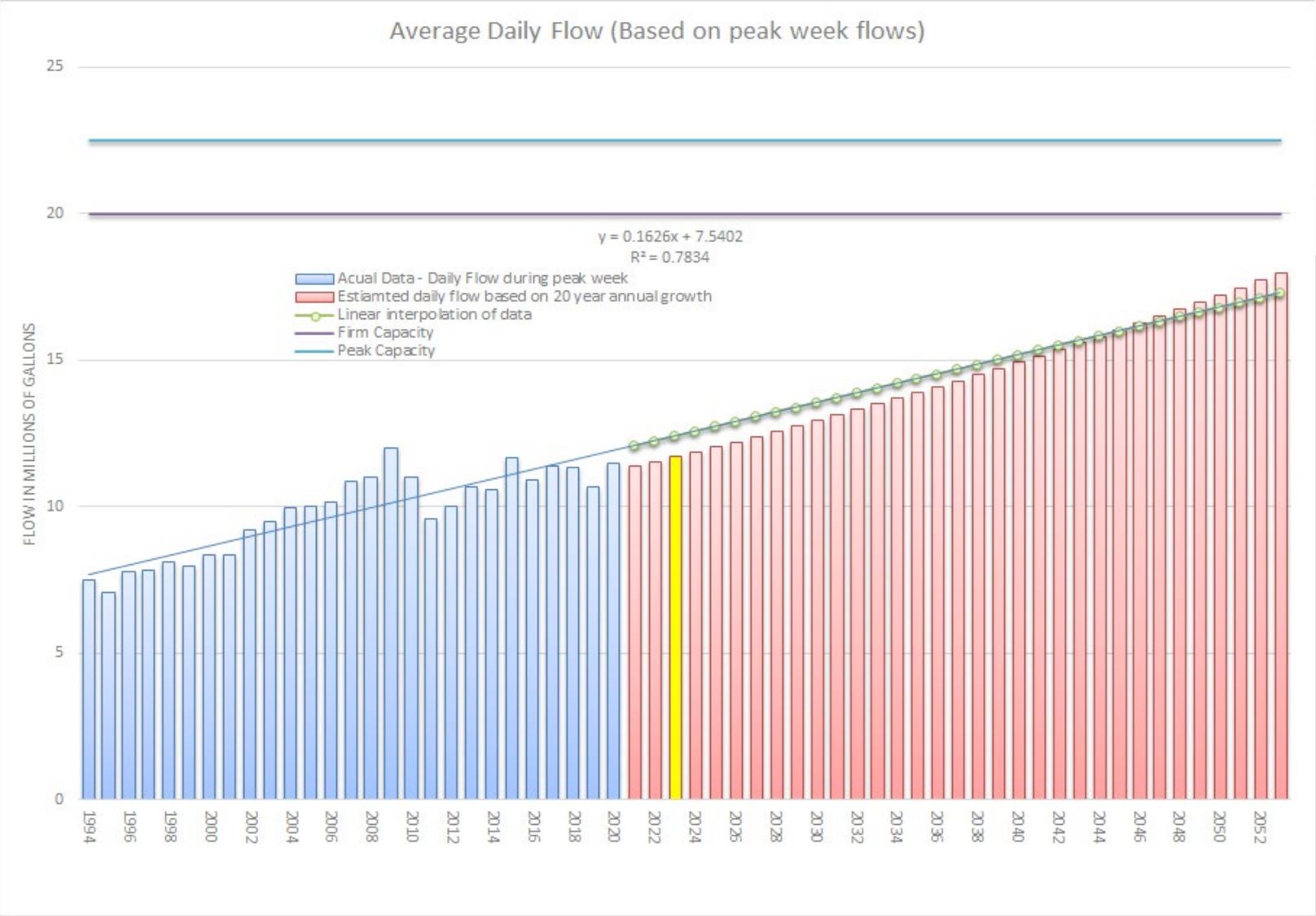
City Goals

- Maintain water affordability – Grants Pass has a large percentage of folks who meet federal poverty standards, increasing the cost of water disproportionately affects these groups
- The project has a primary goal of replacing the water treatment plant in a cost effective manner
- Construct a plant that will serve the community for the next 80-100 years
- Utilize our local workforce to the highest degree possible

Replacement Water Treatment Plant Goals

- The Replacement Water Treatment Plant will be capable of meeting or exceeding the city's needs into the foreseeable future.
 - Improved Resilience
 - Ease of expandability
 - Improved/enhanced Water Quality
 - Adaptability – future proof the plant from potential regulation changes
 - Ease of Operability

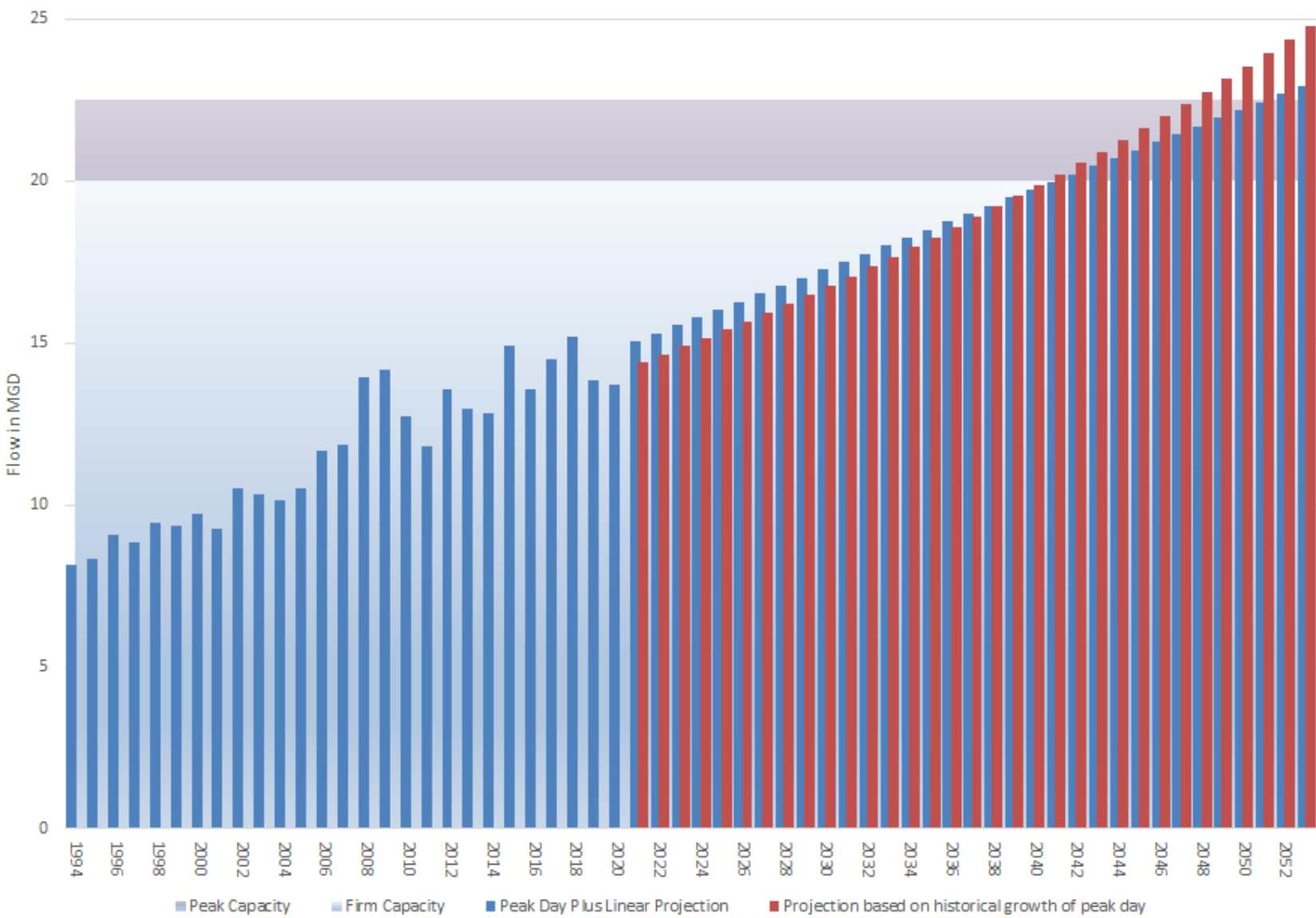
Expandability



Parameter	Value
Desired Phase 1 Capacity	22.5 MGD
Desired Phase 2 Capacity	33.75 MGD
Desired Phase 3 Capacity	45 MGD

Expandability

Peak Day vs Plant Capacity



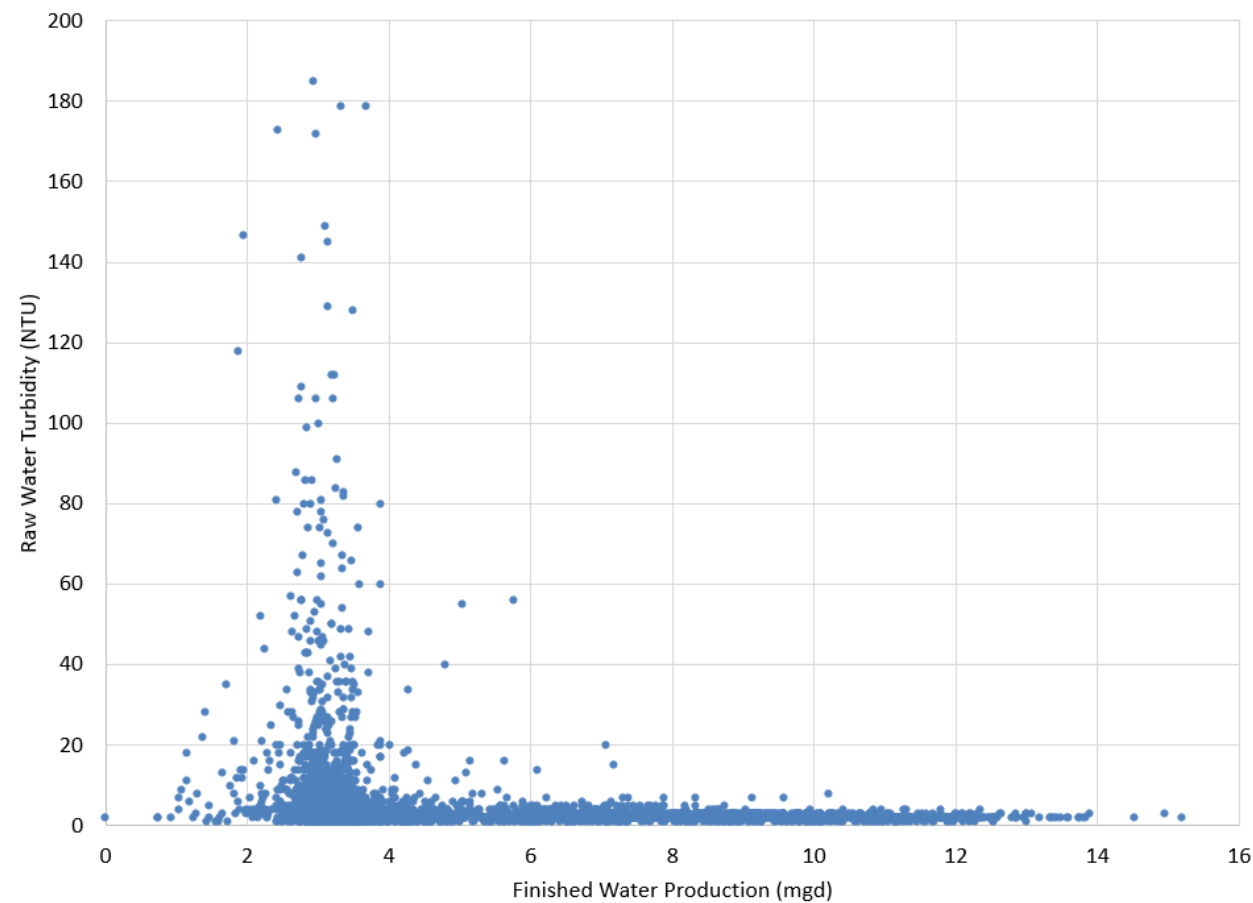
Parameter	Value
Desired Phase 1 Capacity	22.5 MGD
Desired Phase 2 Capacity	33.75 MGD
Desired Phase 3 Capacity	45 MGD



Treatment Options



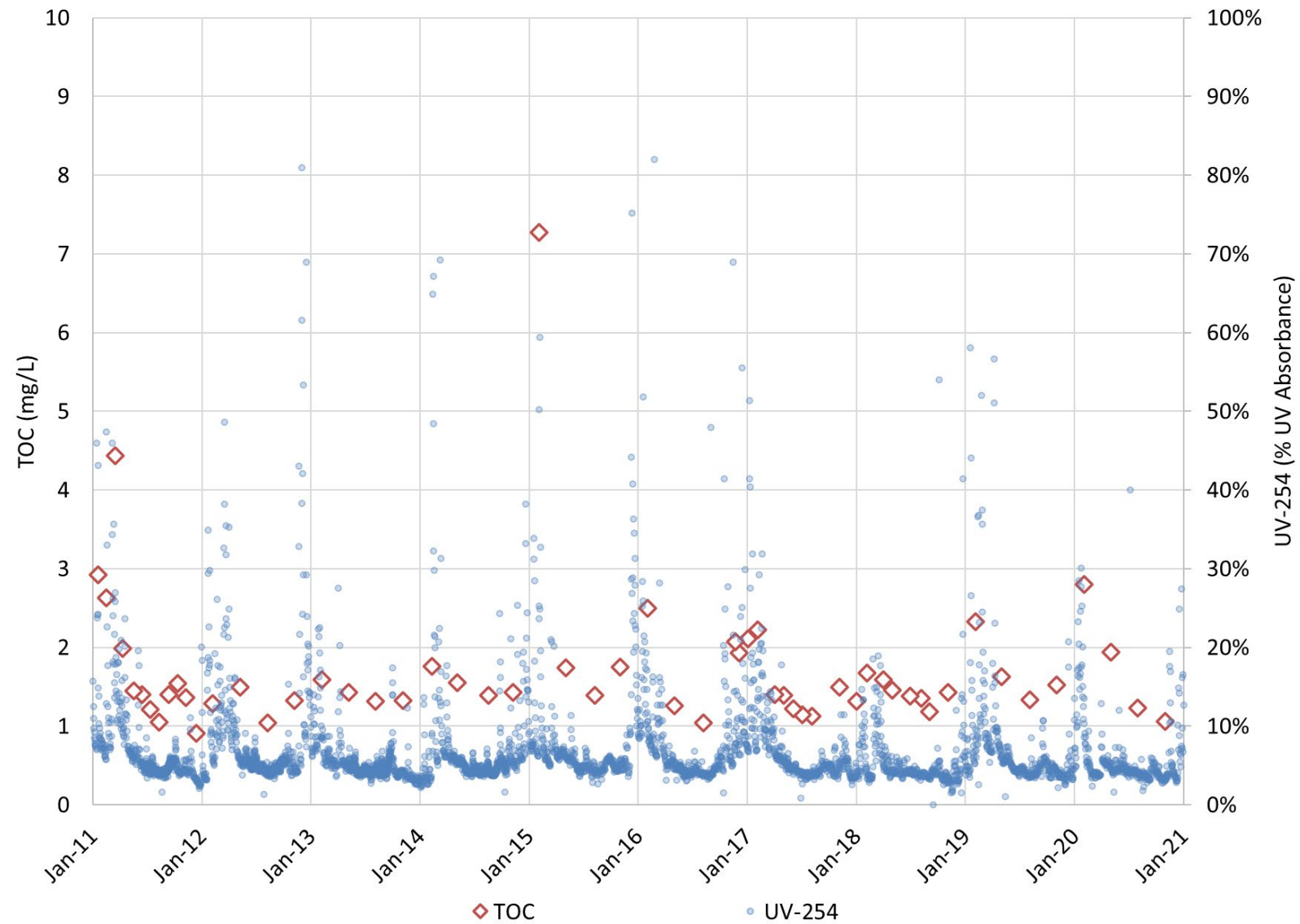
Turbidity and Flowrate



Turbidity events >200 NTU not shown (4 days since 2011)

Month	Average Turbidity (NTU)	Range (NTU)
January	13.3	1.0 – 51.3
February	11.2	1.0 – 51.8
March	10.4	2.0 – 34.0
April	8.6	2.0 – 27.1
May	3.7	2.0 – 6.0
June	3.0	2.0 – 4.5
July	2.1	1.0 – 3.0
August	2.1	1.0 – 3.0
September	2.1	1.0 – 3.0
October	2.8	1.0 – 5.0
November	3.3	1.0 – 8.9
December	13.8	1.0 – 58.4

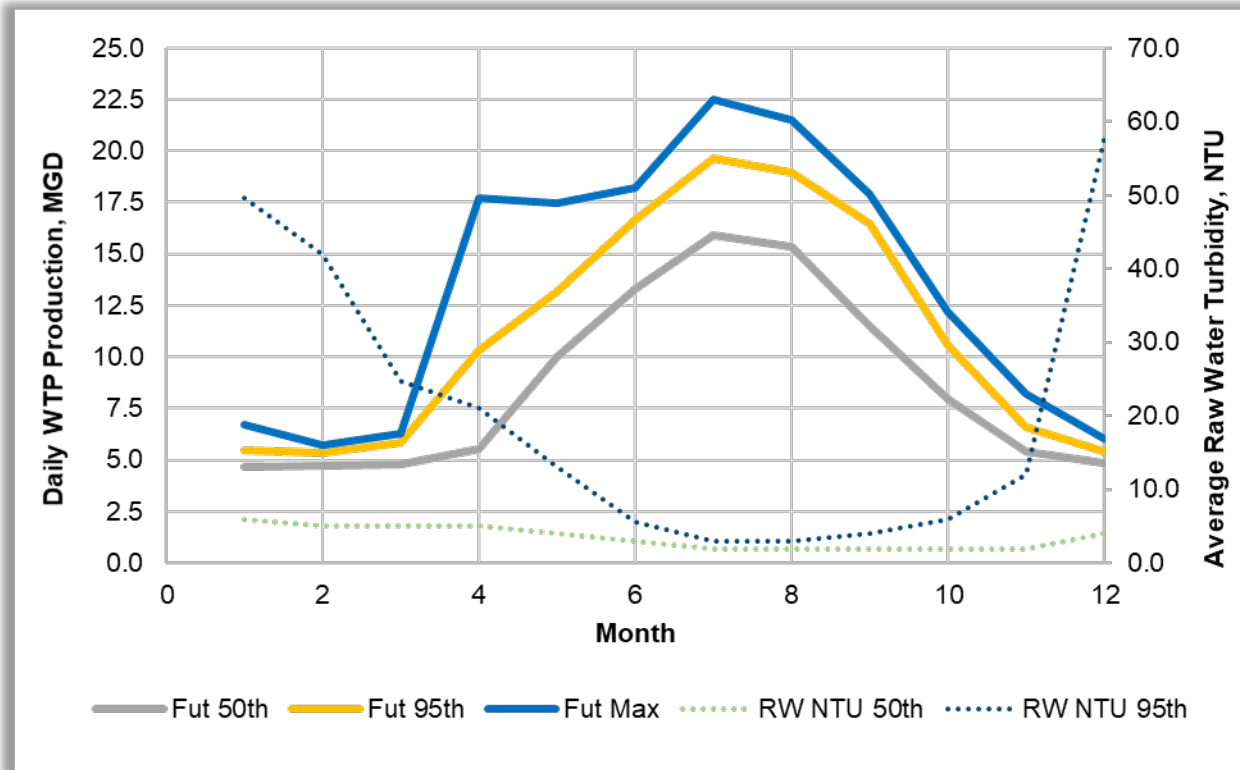
TOC



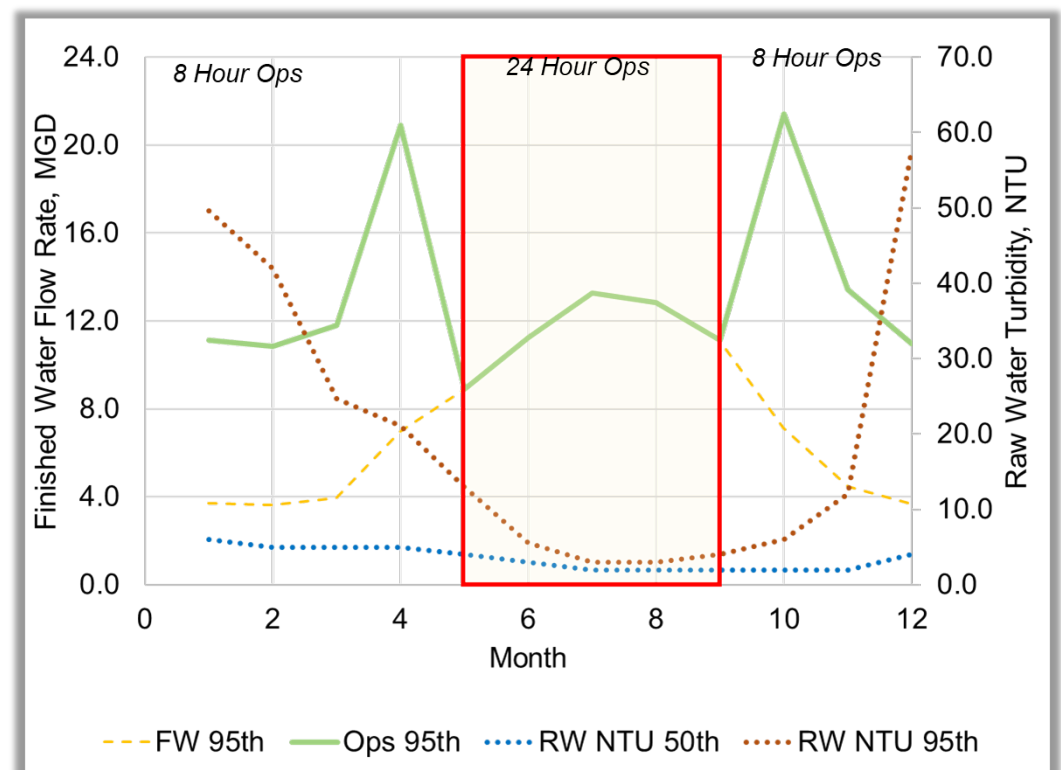
- TOC Average is 1.7 mg/L

Capacity Criteria

Membranes



Conventional

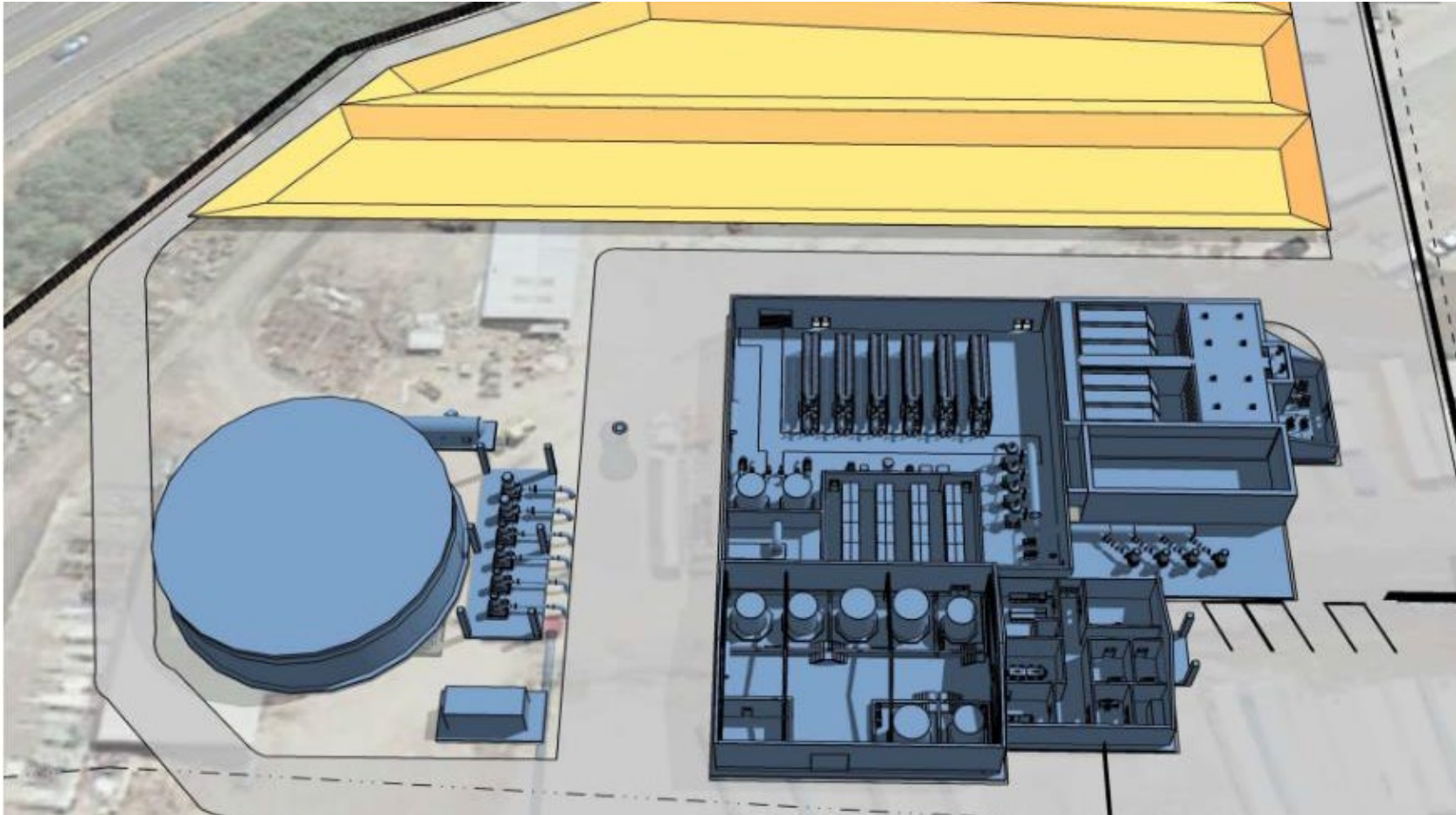
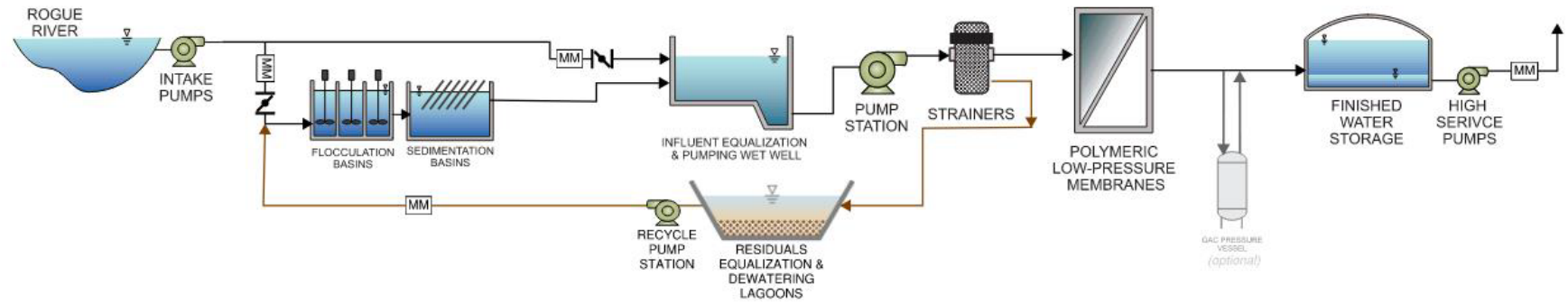


Design Criteria:

- Max 22.5 mgd (Summer)

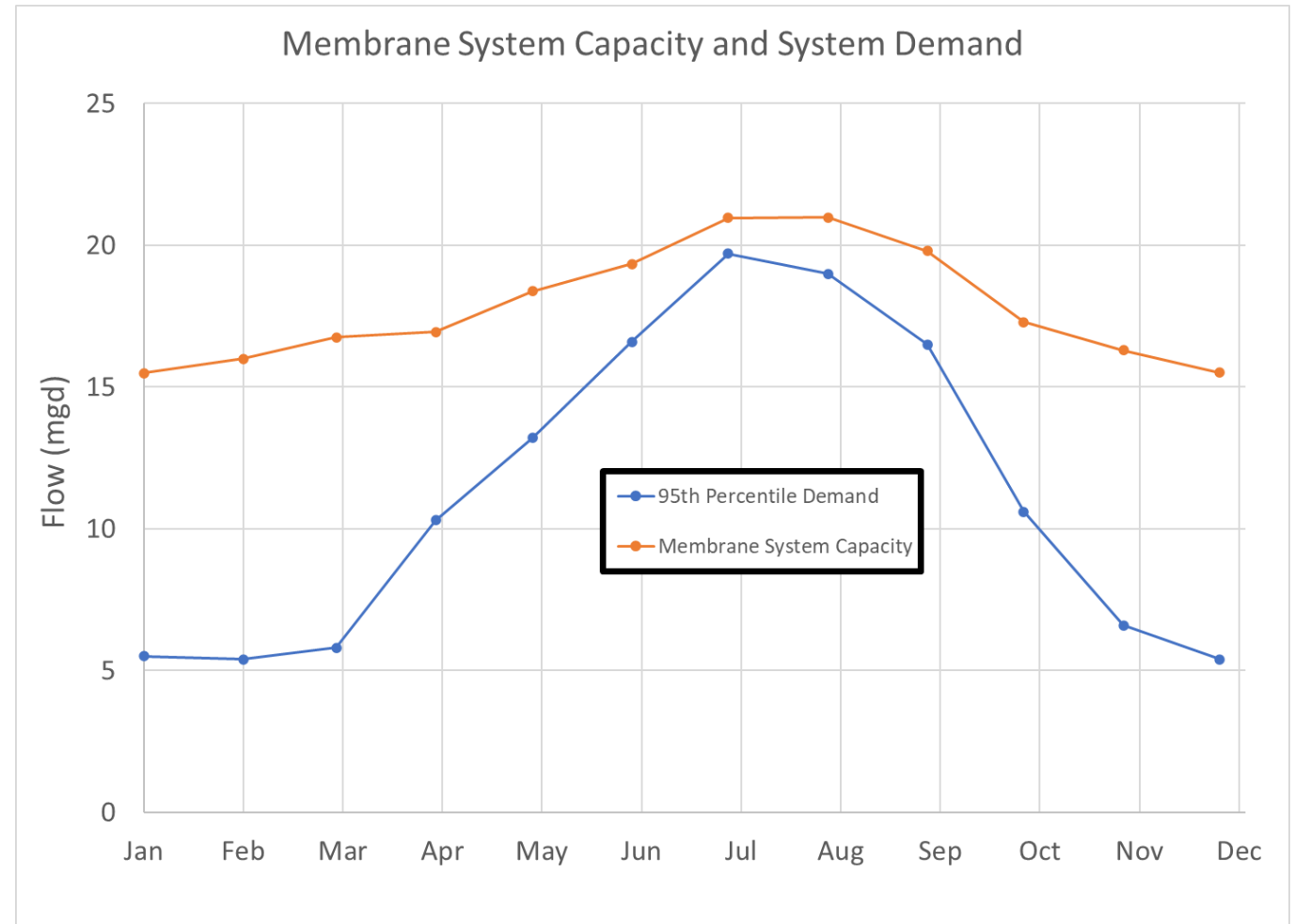
- Firm Winter Capacity Membranes: **6 mgd**
- Firm Winter Capacity Conventional: **16 mgd**

Membrane Option



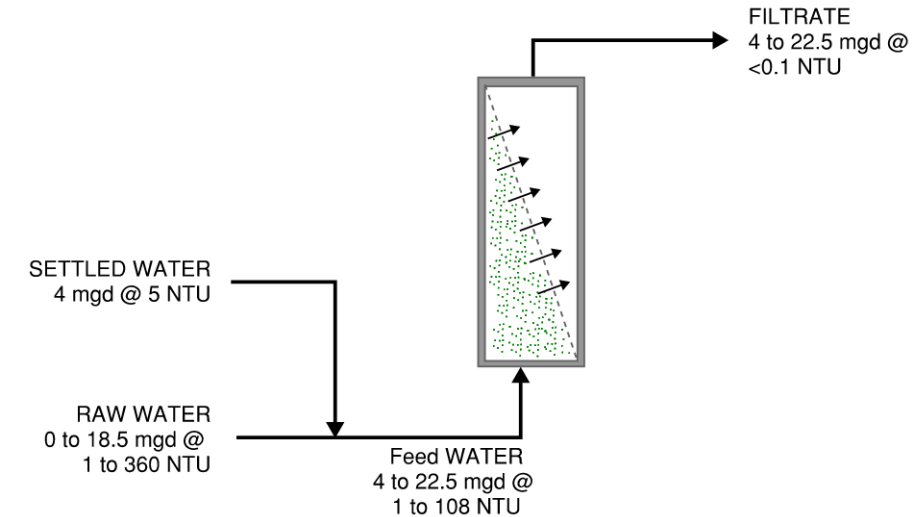
Membrane Design Criteria

- System Capacity
22.5 mgd @ 15 deg. C
- Winter Capacity
15.5 mgd @ 3 deg. C
- Summer Capacity
22.5 mgd @ 15 deg. C



Membrane Design Capacity

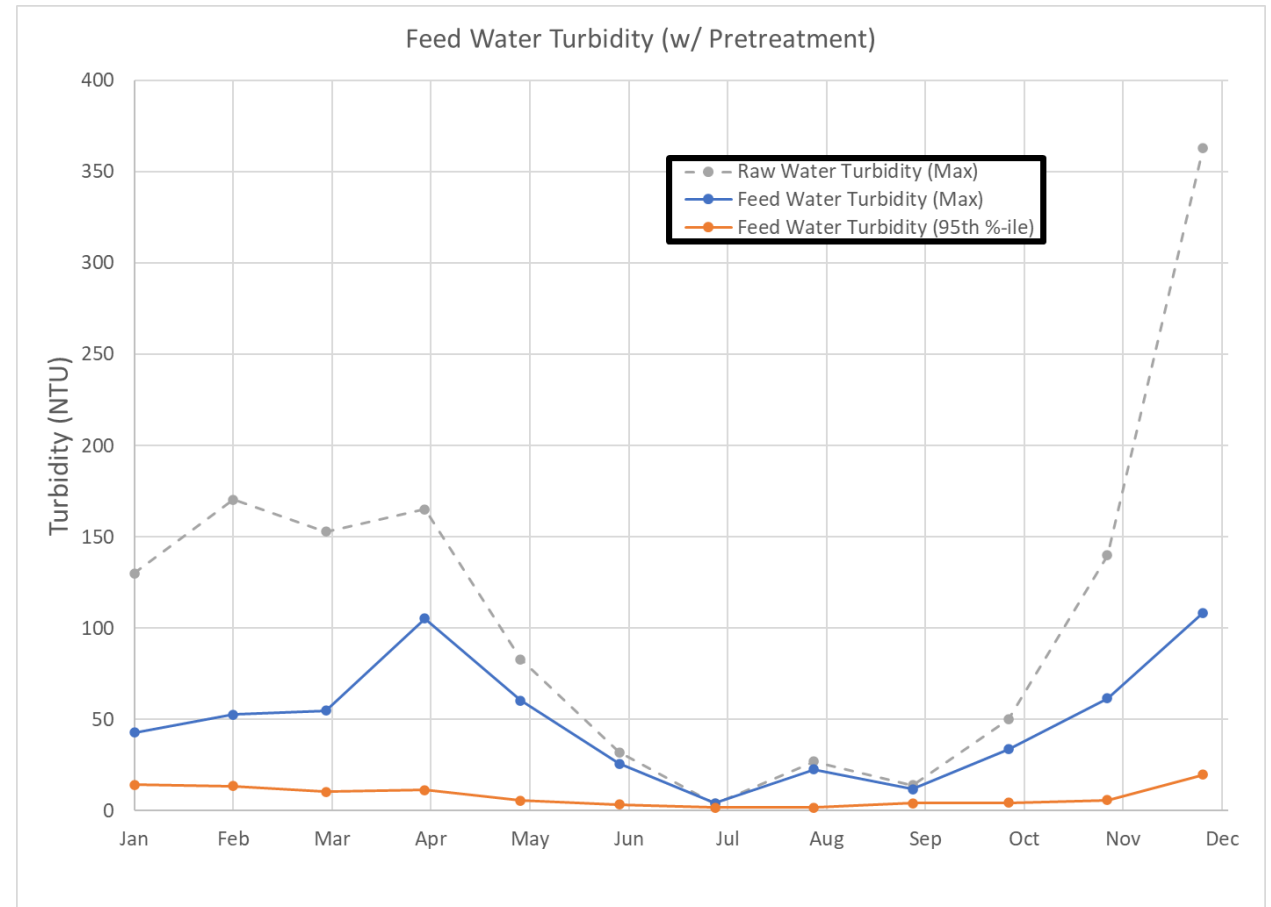
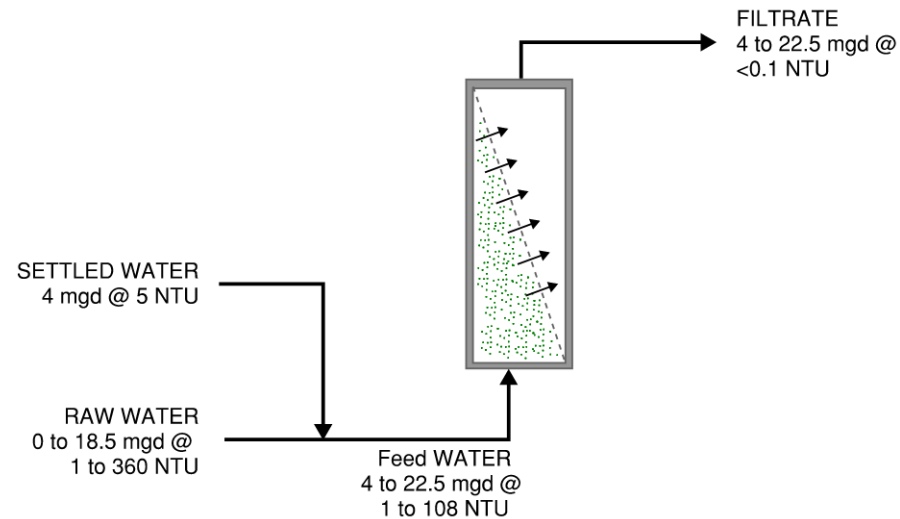
- Raw Water TC Flux = 70 gfd @ 20 deg. C
 - Piloted value at 96% recovery
- Settled Water TC Flux = 80 gfd @ 20 deg. C
- Operating TC Flux = 72-76 gfd @ 20 deg. C
- 6 racks (N+1)
- 96 modules/rack in quad module configuration*
 - 800 sf AMSA/module*
 - 76,800 sf AMSA/rack



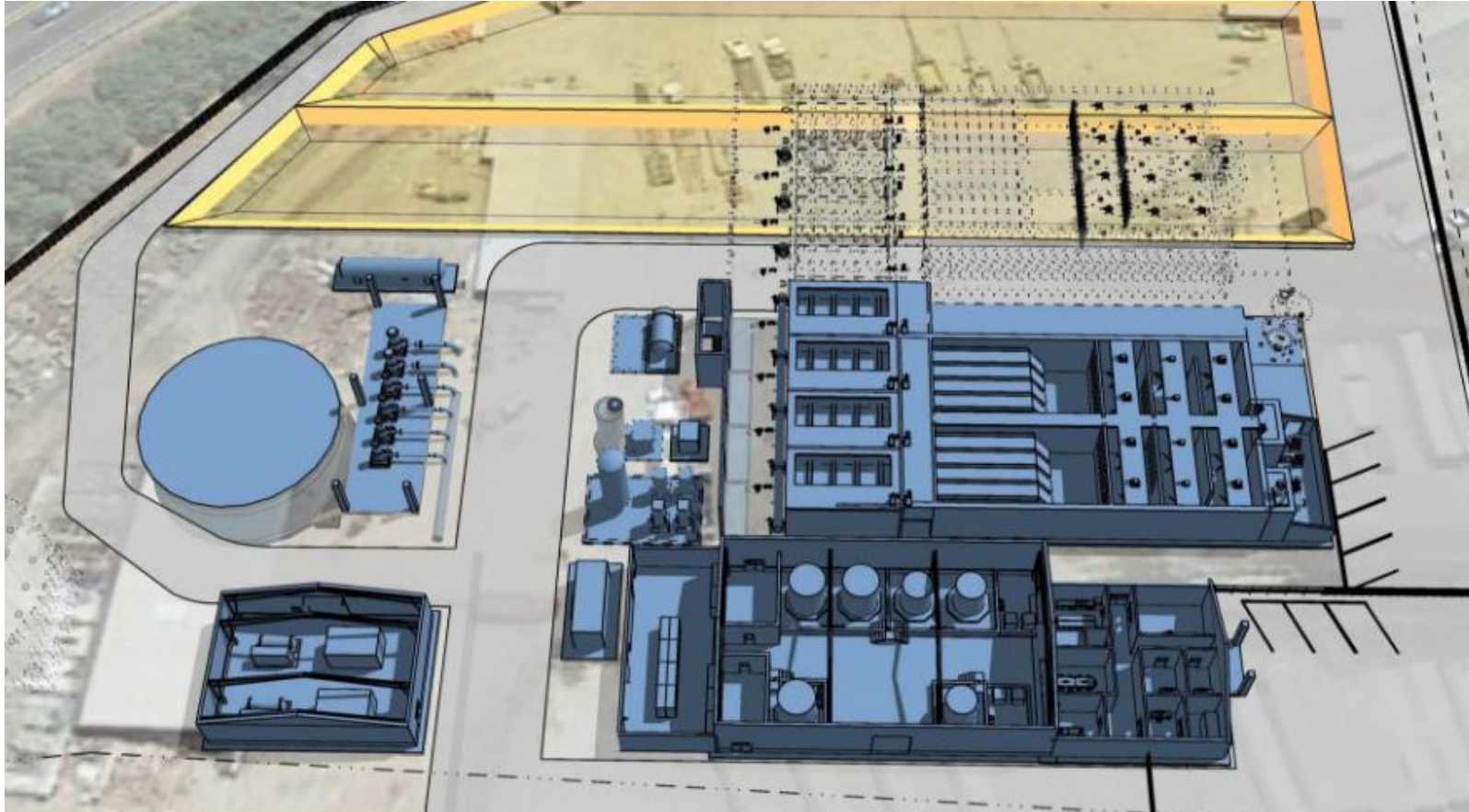
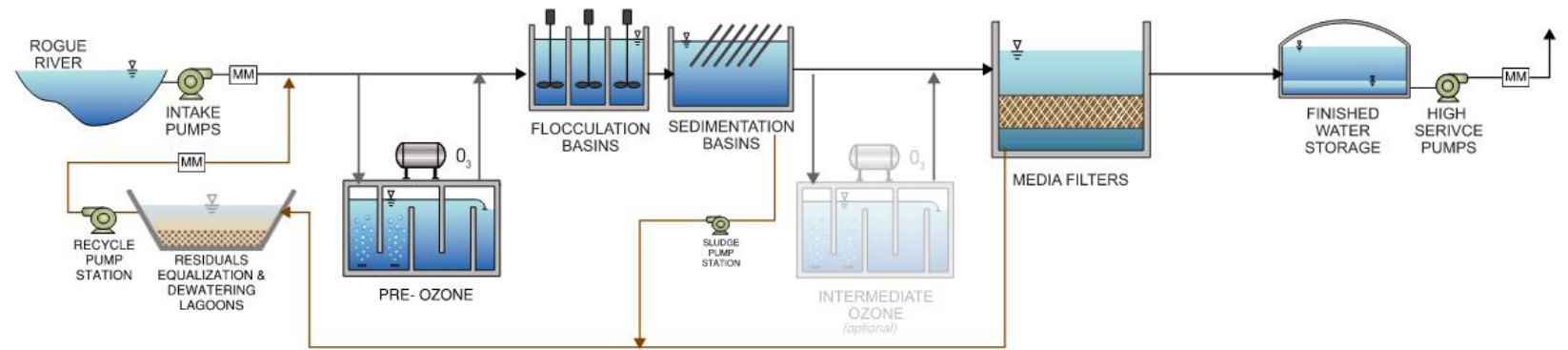
*Preliminary design value.
Final will be set by membrane
module manufacturer

Pre-Treatment System Sizing

- Pretreatment sized to reduce feed water turbidity peaks to <100 NTU

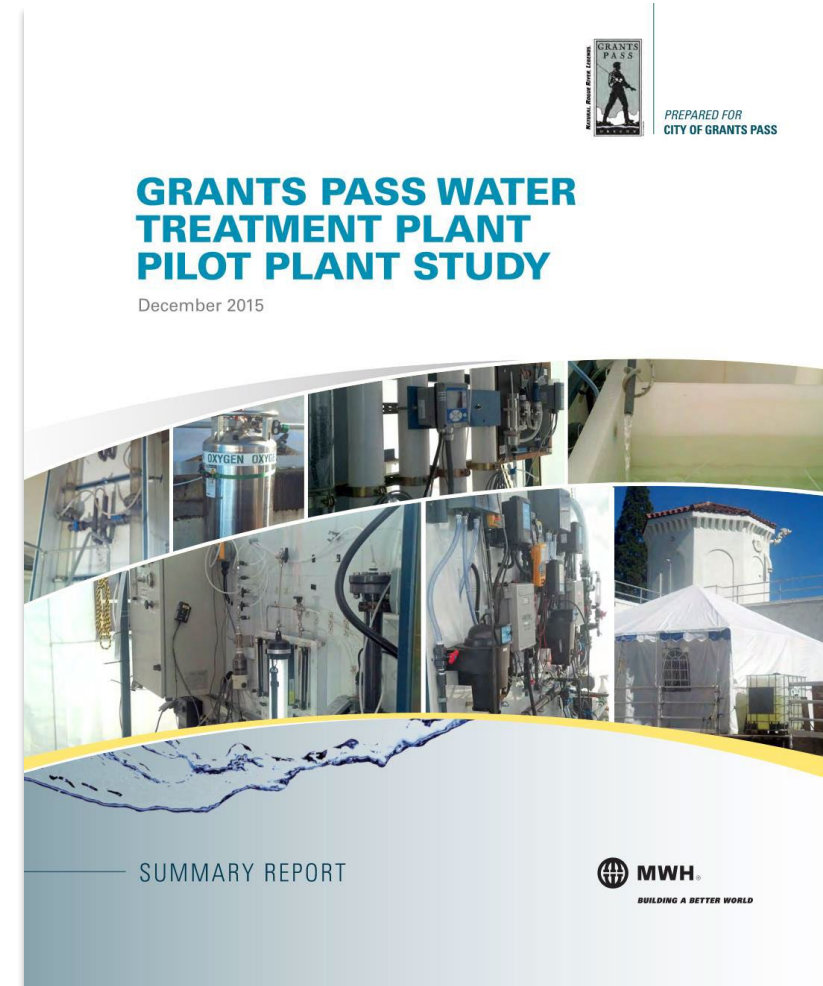


Conventional Option



Filter Design Criteria

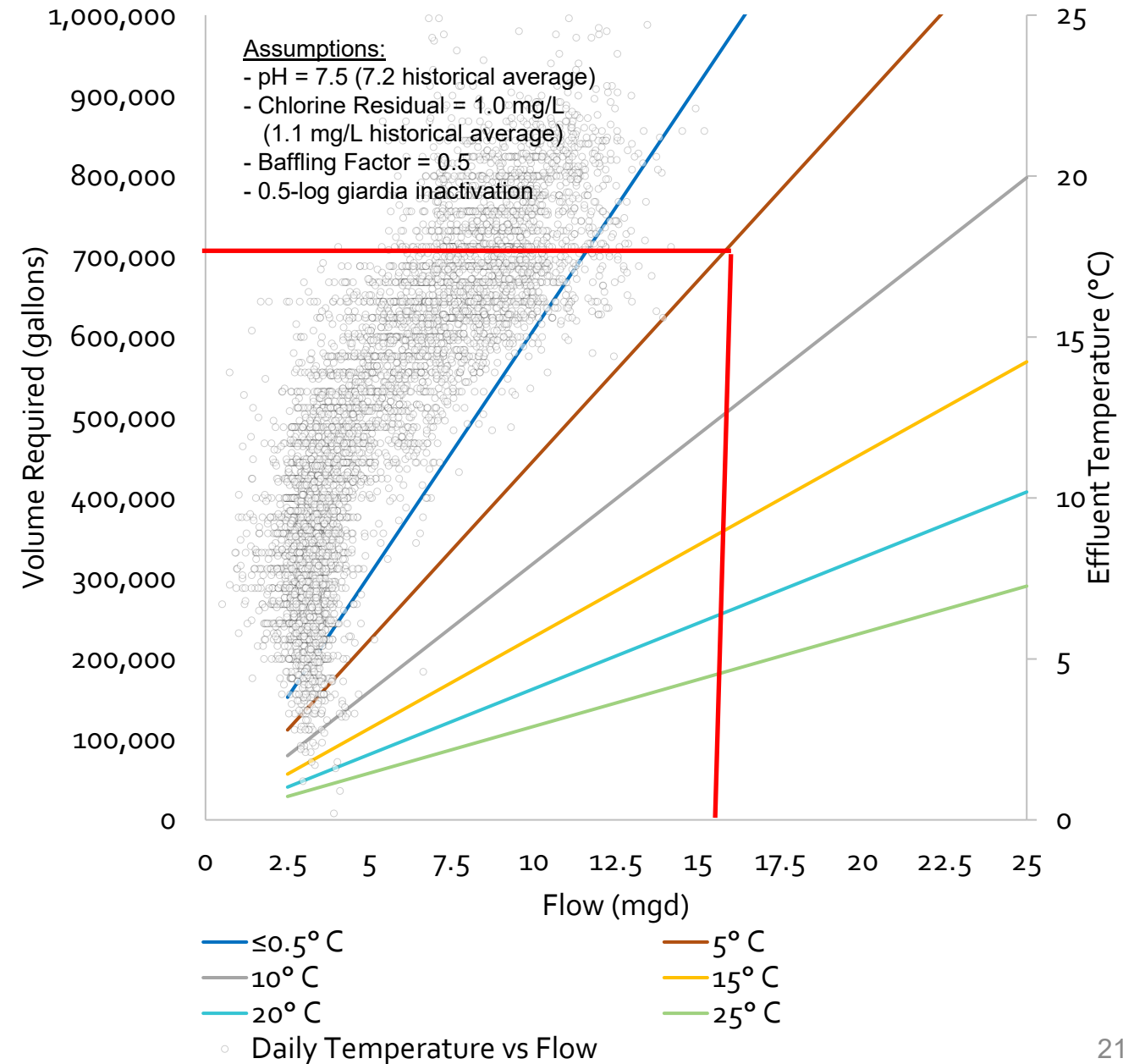
- Four dual media filters
 - 48" Anthracite
 - 12" Sand
- Plastic block Underdrain
- Filtration Rate
 - All Filters in Service = 8.2 gpm/sf
 - One Filter in BW = 10.9 gpm/sf



Approved to 12 gpm/sf

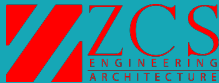
Disinfection Sizing

- Required CT Volume (0.5-log *Giardia*):
 - 0.4MG @ 0.5°C and 6 mgd
 - **0.7MG** @ 5°C and 16 mgd
- Operational Volume: **0.6 MG**
- Total Volume Required Proposed: **1.5MG**



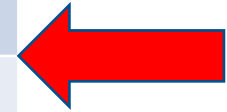


Cost



Cost Deliverables and where are we now?

Cost Deliverable	Date
Technology Selection OPCC	February 2022
Basis of Design OPCC	May
30% Design OPCC	September
60% Design OPCC	January
90% Design GMP	July 2023



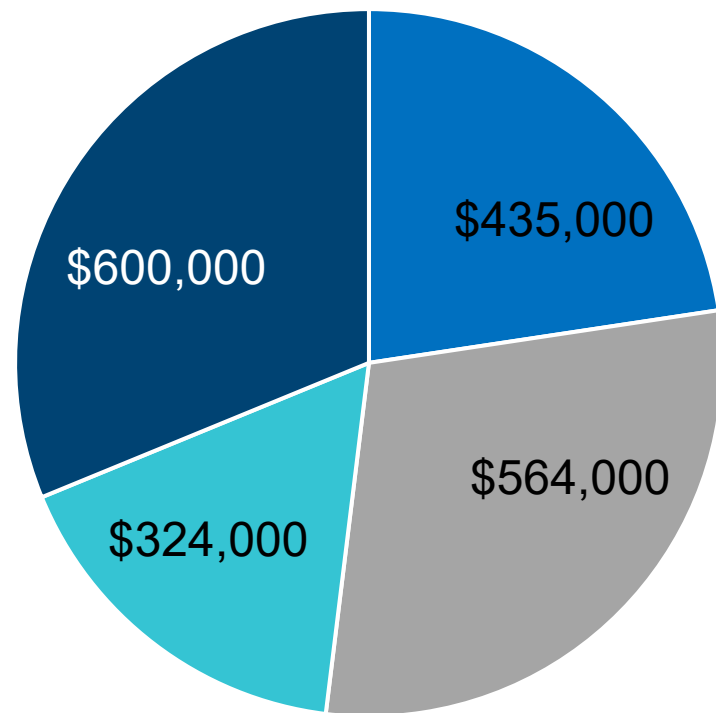
Technology Selection Cost Detail

Conventional		
Area Number	Description	Project Cost
01	RW Pipeline	\$ 4,481,000
05	RW Pump Station	\$ 5,009,000
10	RWTP Site	\$ 5,823,000
11	J Street Utilities and Site Work	\$ 2,934,000
20	Pretreatment	\$ 10,334,000
26	Ozone Contactor	\$ 2,480,000
30	Filters	\$ 8,274,000
35	Operations Area	\$ 2,724,000
40	Clearwell	\$ 6,203,000
41-43	Finished Water Pump Station	\$ 5,896,000
50	Residuals Lagoons	\$ 6,069,000
60	Chemical Storage	\$ 7,488,000
70	Ozone Generation	\$ 10,754,000
80	Electrical Distribution	\$ 4,210,000
	Site Unsuitable Material	\$ 1,627,000
	Site Finishes	\$ 1,391,000
	Subtotal	\$ 85,697,000
	Phase 1B Design	\$ 7,027,000
	Total	\$ 92,724,000

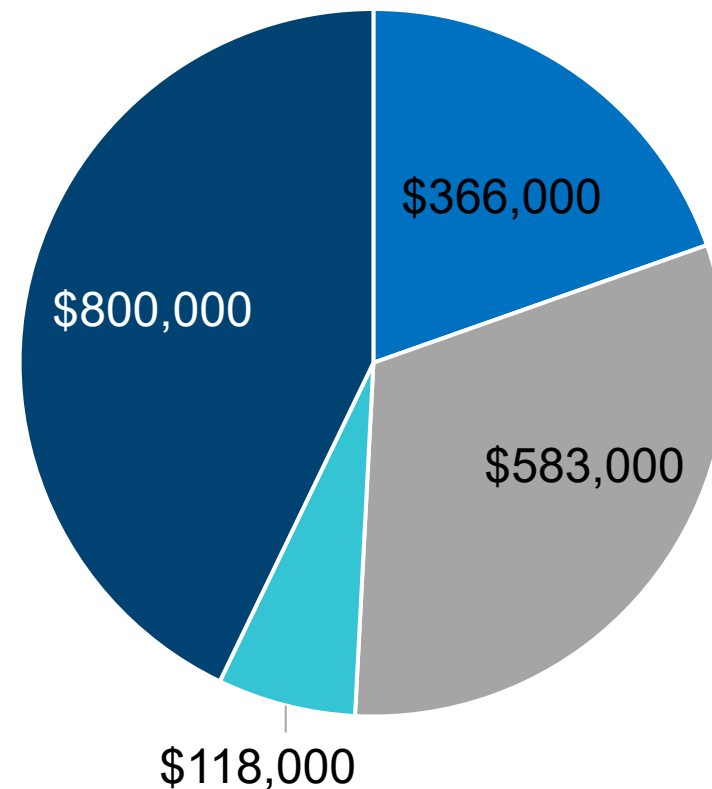
Membranes		
Area Number	Description	Project Cost
01	RW Pipeline	\$ 4,481,000
05	RW Pump Station	\$ 5,009,000
10	RWTP Site	\$ 5,873,000
11	J Street Utilities and Site Work	\$ 2,934,000
20	Pretreatment	\$ 5,004,000
25	PAC	\$ 552,000
26	EQ Tank	\$ 457,000
30	Treatment Building	\$ 29,039,000
35	Operations Area	\$ 2,724,000
40	Clearwell	\$ 4,169,000
41-43	Finished Water Pump Station	\$ 4,320,000
50	Residuals Lagoons	\$ 6,069,000
60	Chemical Building	\$ 7,203,000
80	Electrical Distribution	\$ 2,657,000
	Site Unsuitable Material	\$ 1,666,000
	Site Finishes	\$ 1,356,000
	Subtotal	\$ 83,513,000
	Phase 1B Design	\$ 6,848,000
	Total	\$ 90,361,000

Annual O&M Costs

Membranes



Conventional

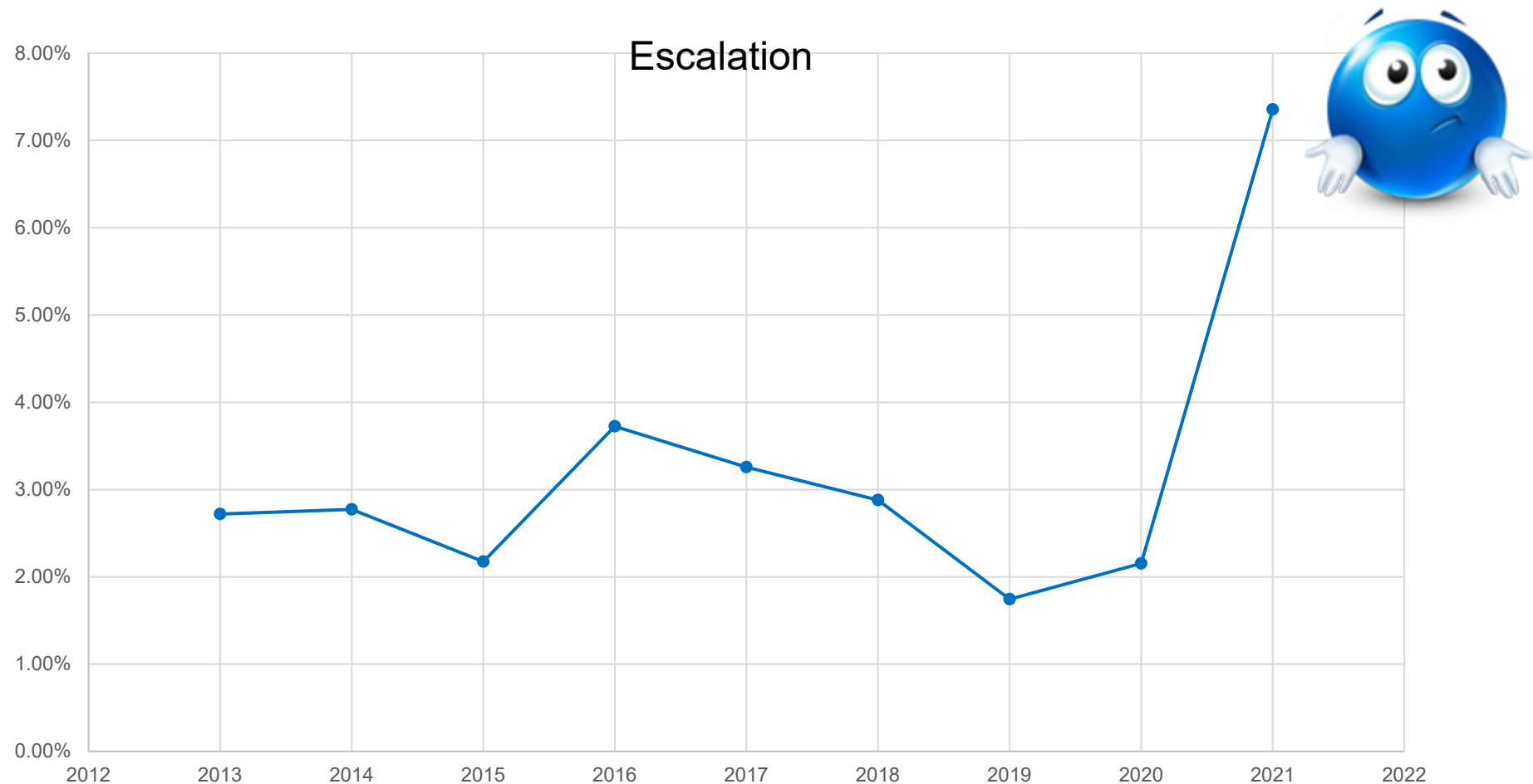


- Chemicals and Residuals
- Power
- Maintenance and Labor
- Labor

Technology Selection Cost Summary

	Conventional	Membranes
Project Cost	\$92.7M	\$90.4M
Annual O&M	\$1.8M	\$1.9M
30 Year NPV	\$137M	\$137M

Where is the market going?



Footnotes:

- 1) Per Engineering News Record Construction Cost Index History
- 2) 2022 escalation thru mid-April is 3.34%

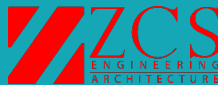
How do you meet budget in this market?



- Budget for Escalation
- Keep Tabs on the Market
- Material Selection
- Procurement Strategy and Timing
- Lock-in commodity pricing (bid some materials early, allow MOH payments)
- Use of Allowances and Contingency
- VE/ Scope Reduction Measures



Non Economic Criteria



Options were compared on non economic criteria

Technical:

- Technology is proven
- Flexibility for the future
- Resiliency/Redundancy
- Water Quality
- Upgradability

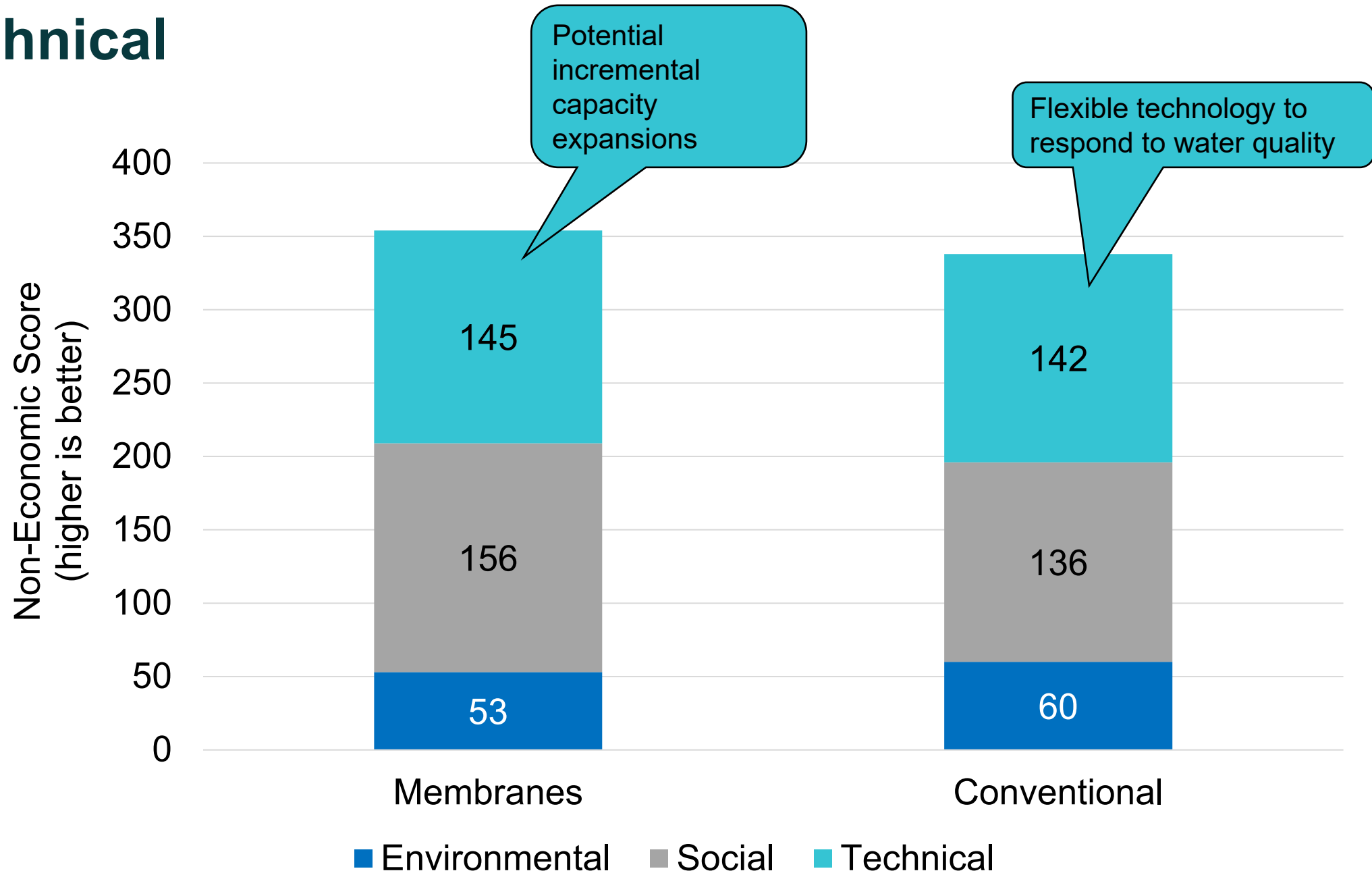
Social:

- Public Involvement Efforts
- Safety
- O&M Complexity
- Operability
- Higher Use of Local Workforce
- Ease of Staffing

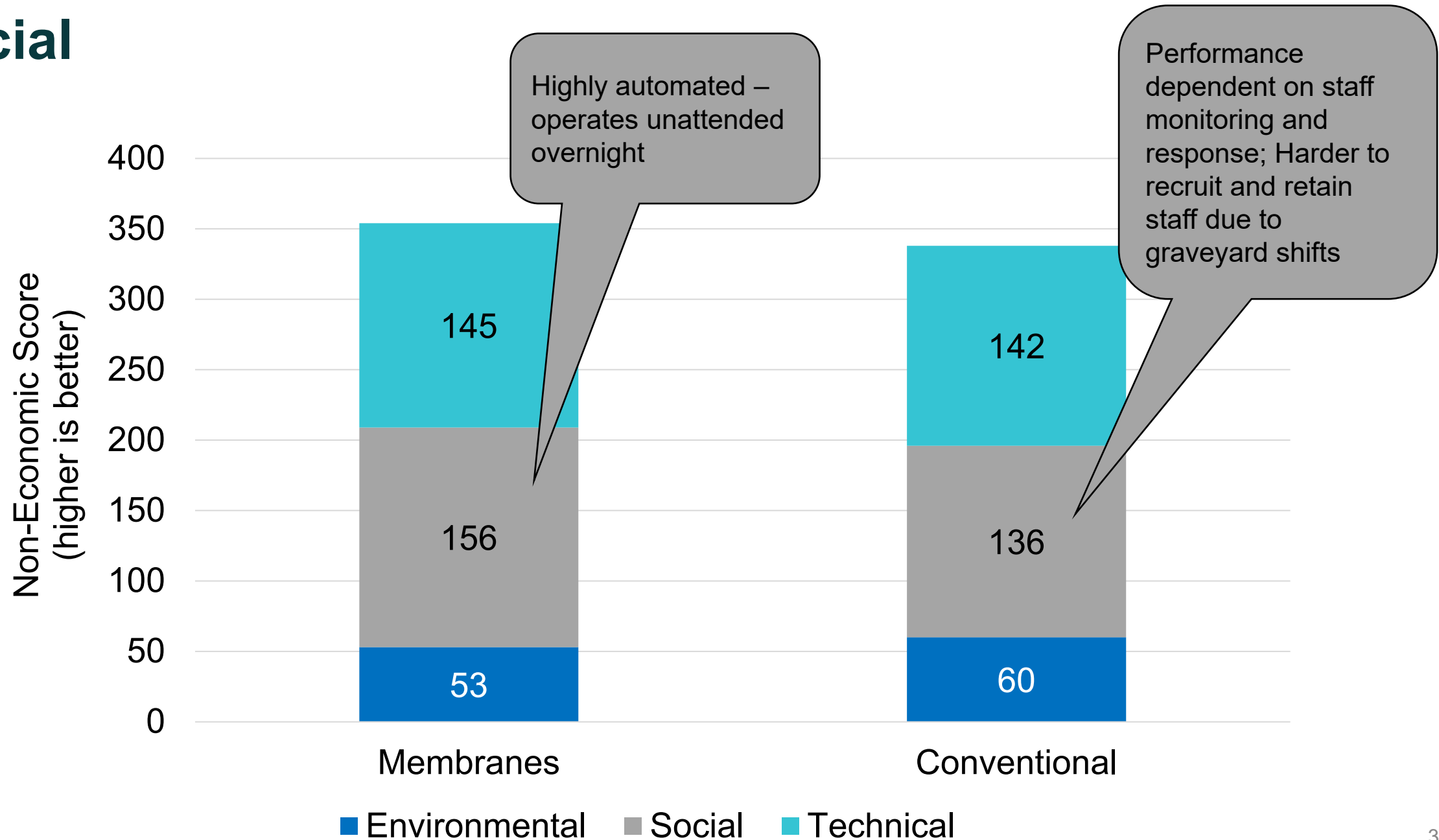
Environmental:

- Permitting Requirements
- Land Requirements
- Energy Intensity
- Chemical/Media Use

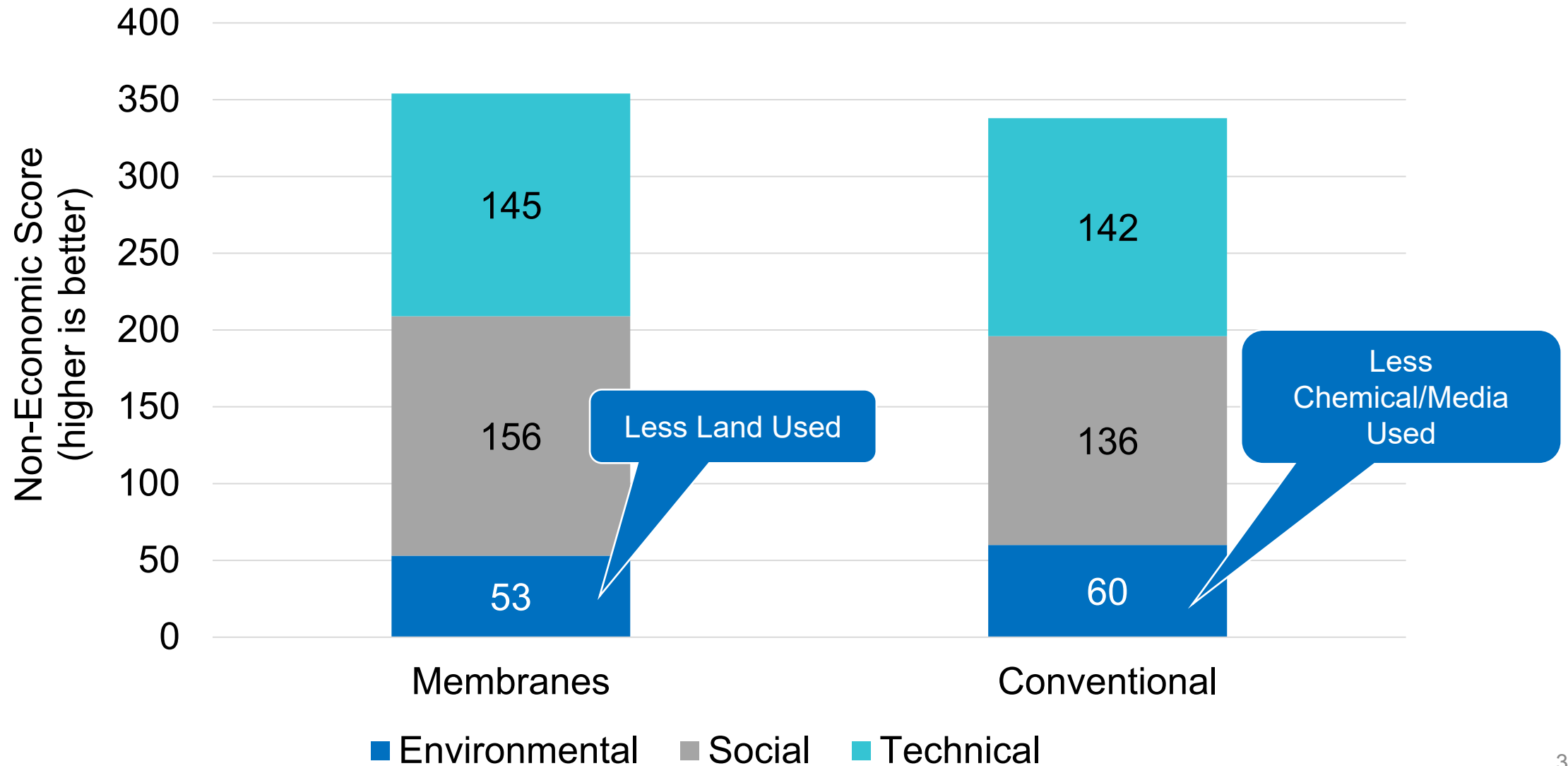
Technical



Social

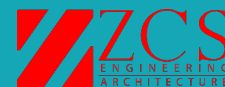


Environmental





Working with City Leadership



Council Challenges – Council Turnover

- Council has changed members 4-6 times since the project has begun with only 2 of the 8 members being present for the entire duration
 - This has led staff and consultant team to take numerous steps backwards to educate and re-educate Councilors about the project
 - Two steps forward three steps back... (or more)
- As Council has changed so has the perception of the importance of the project to the community
 - Hard work and open communication has kept the replacement water treatment plant as the most important goal for the Council

Council Decisions – Method of Delivery

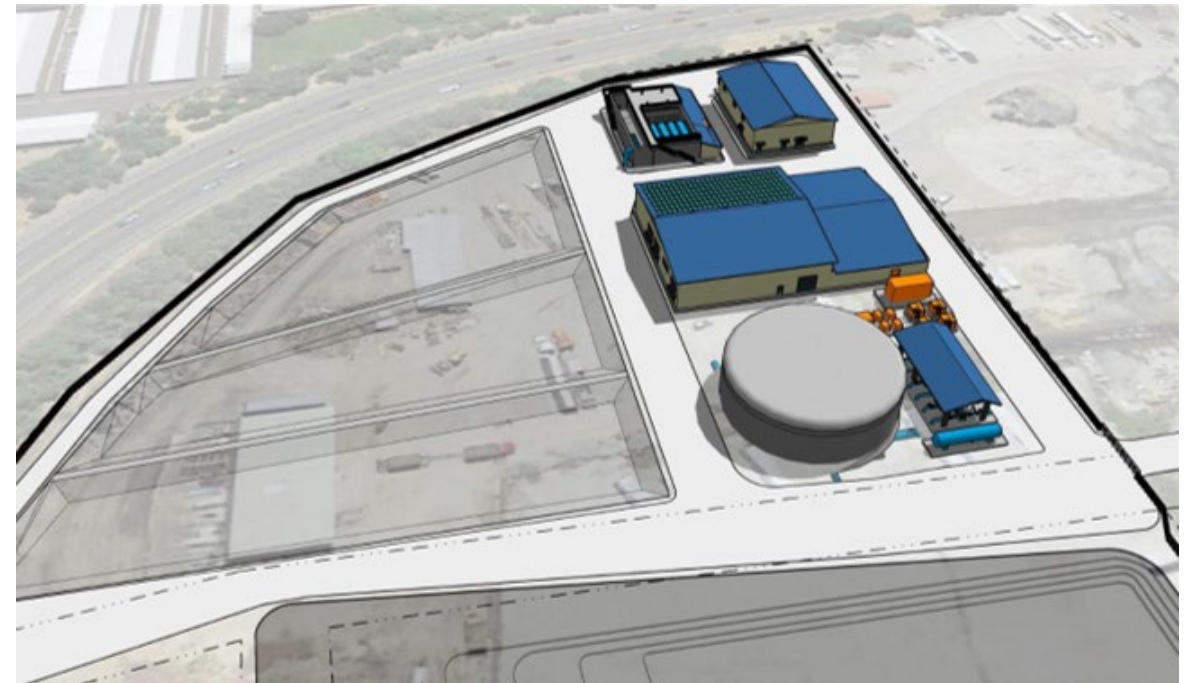
- DBB/DB/PDB/DBO
 - All of that to say that Council elected to choose a Progressive Design Build Option
 - Providing more control over project decisions
- Membrane technology – high levels of treatment with flexibility in operations

Council Decisions - Finance

- Water Rates
 - This was one of the biggest and most impactful decisions that was made
 - Rates were raised in excess of 58% over 5 years making the City's rates unaffordable for a large percentage of our population
- Project budget
 - Budget was created in 2016/2017 – project scope and costs have both increased since then
 - Staff and consultants have been working very hard to control project costs – but inflation is quickly outpacing the ability of the City to fund the project
 - Council has allowed staff to increase the budget in response project scope as well as changing costs

What's next on the horizon?

- Continue with preliminary and then final design and creation of Guaranteed Maximum Price
- Finalize funding sources to ensure project delivery
- Construct the project!





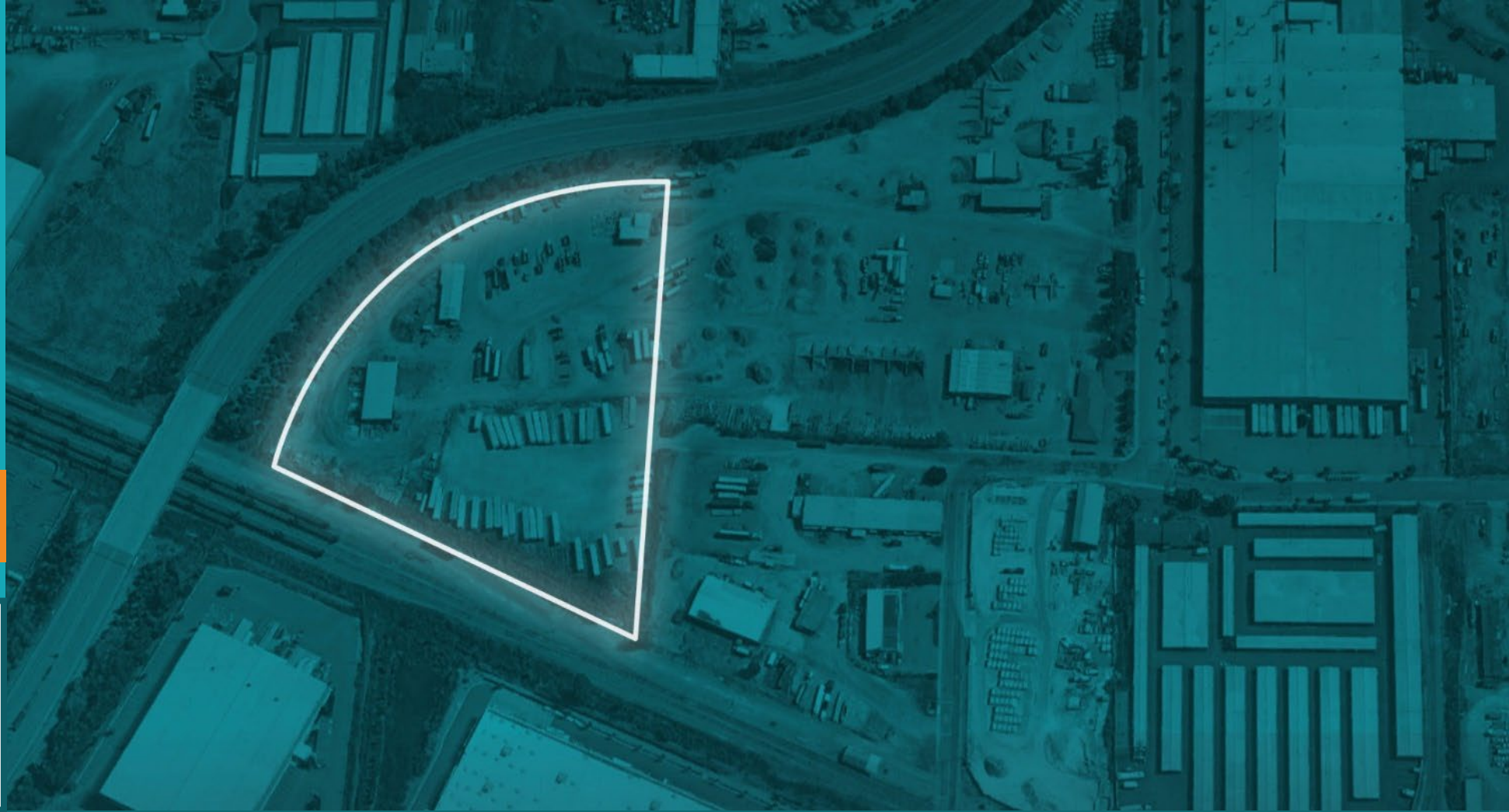
PNWS-AWWA
2022

 **Slayden**
part of MWH

 **carollo**

 **ZCS**
ENGINEERING
ARCHITECTURE

 **McMILLEN
JACOBS
ASSOCIATES**



THANK YOU