



Nutrient Optimization Project – What We Did, What Went Right, and Lessons Learned

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November 16, 2023

Oro Loma Sanitary District



Oro Loma Sanitary District



- 12MGD ADWF Plant
- 273 miles of pipe
- 12 lift stations
- 13 square mile service area
- Recently completed plant upgrades from activated sludge to biological nutrient removal process

Why?

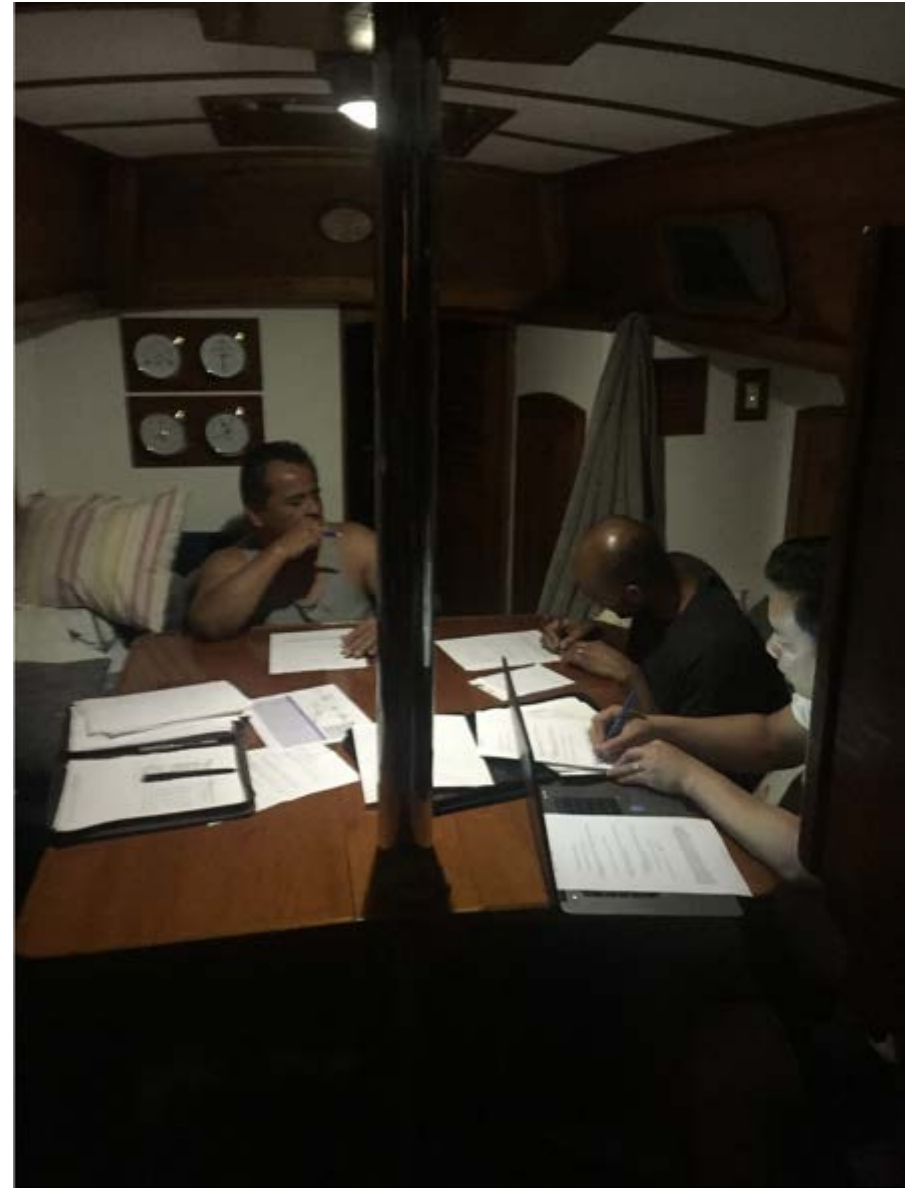
- Strategic goal to align our membership expenses with our use in EBDA.
- Nutrient regulations are coming anyway.(?)
- Reinstate our local outfall. Develop contingency for EBDA failure.



Lessons from the Future

- EPA's Genius Approach (What can you do? ..and keep score)
- Simple Operation – Baltimore's $<5\text{mg/L}$ TIN
- Instrumentation, Air, Blowers, Diffusers
- Knowledgeable Operators (Nutrient Consultants)

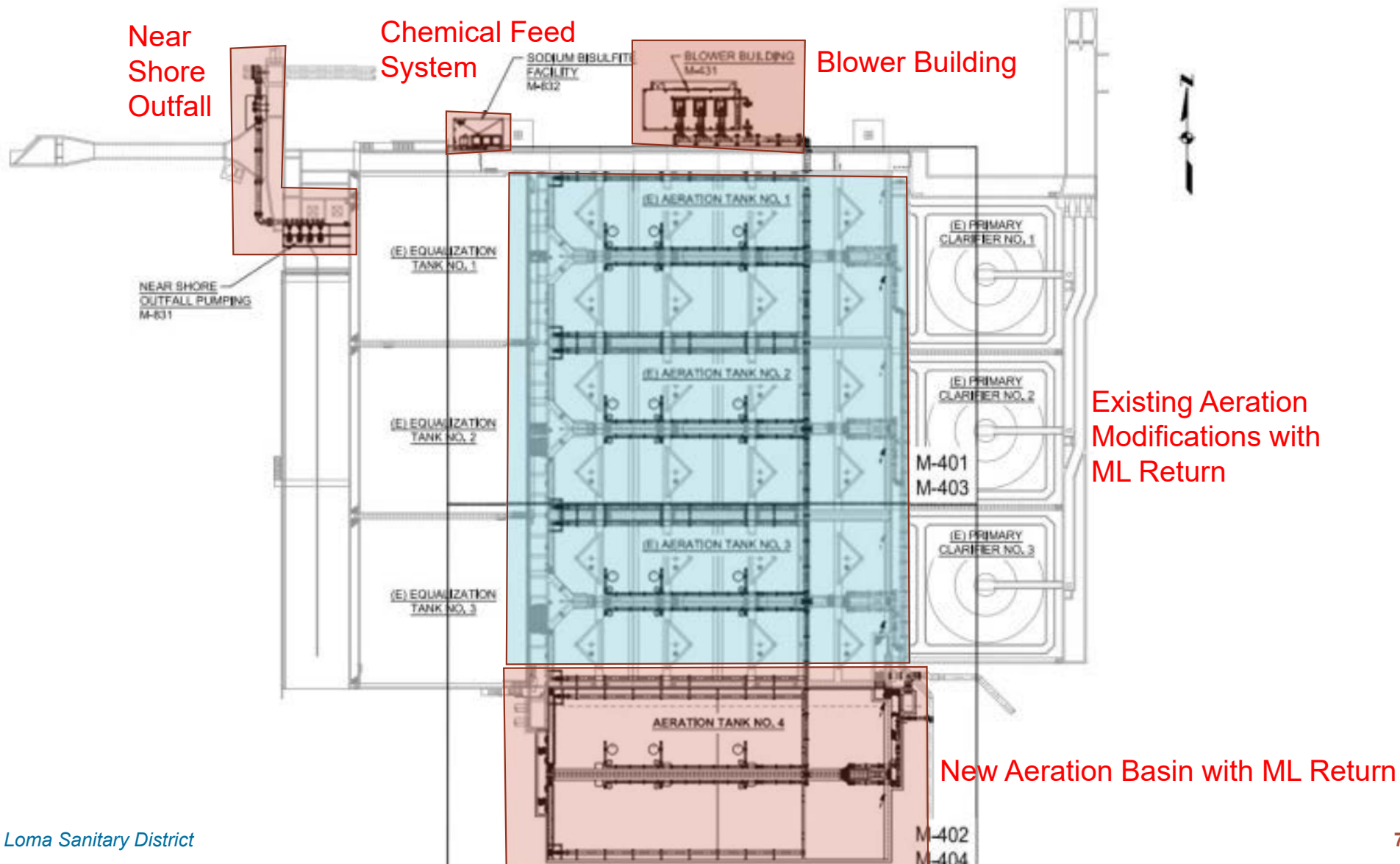
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Project Scope

- Treatment Plant upgrade project to remove 50% of the nitrogen from the influent flow
- Fourth Basin, Blower Building, Conversion to Diffused Air
- Total Project Budget: \$24.7M





Costs?

- Cost of acting early vs. total project costs
- \$24.7M Budget – Design, Project Management, and Construction
- ~\$300k Below Budget at Completion

	Costs
Project Management	\$0.5M
Design	\$1.2M
Construction	\$19.5M
Construction Management and Support	\$1.8M
Change Orders	\$1.4M



Bidder	Bid
GSE Construction Company, Inc.	\$ 19,430,900
Anderson Pacific	\$ 19,980,000
Gateway Pacific	\$ 19,989,000
C. Overaa & Co.	\$ 20,277,000
Meyers & Son Construction	\$ 20,625,000
Monterey Mechanical	\$ 22,200,000
Mountain Cascade	\$ 22,725,892
Anvil Builders	\$ 23,852,600
Western Water Construction	\$ 23,950,000
Engineer's Estimate	\$ 23,500,000

The Team

- Kennedy Jenks (Design)
- Beecher Engineering (Electrical Design)
- GSE Constructors
- Currie Engineers (CM)
- OLSD Operations and Maintenance
- Key Vendors (Neuros, Ovivo, Hach, Flygt)

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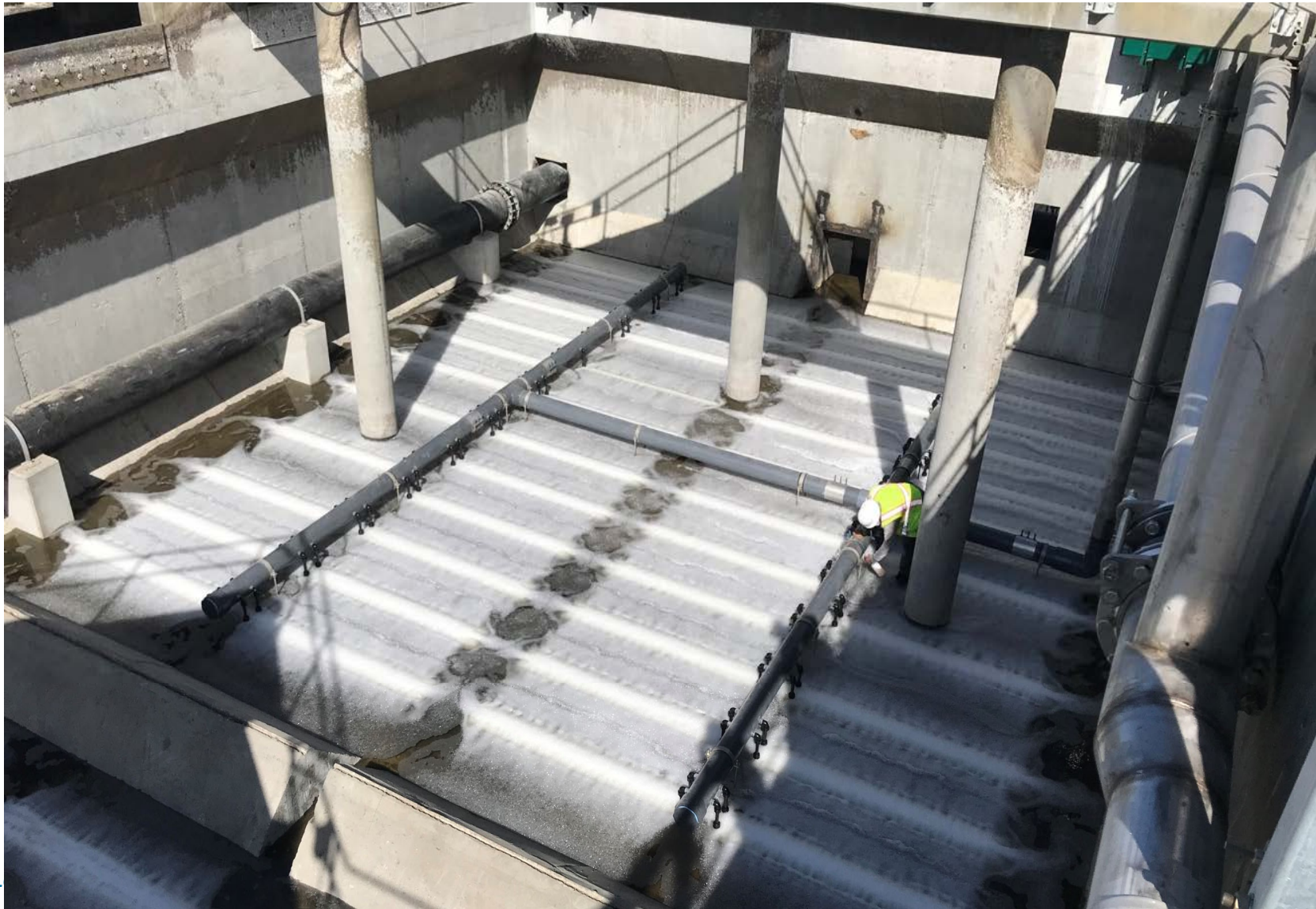


















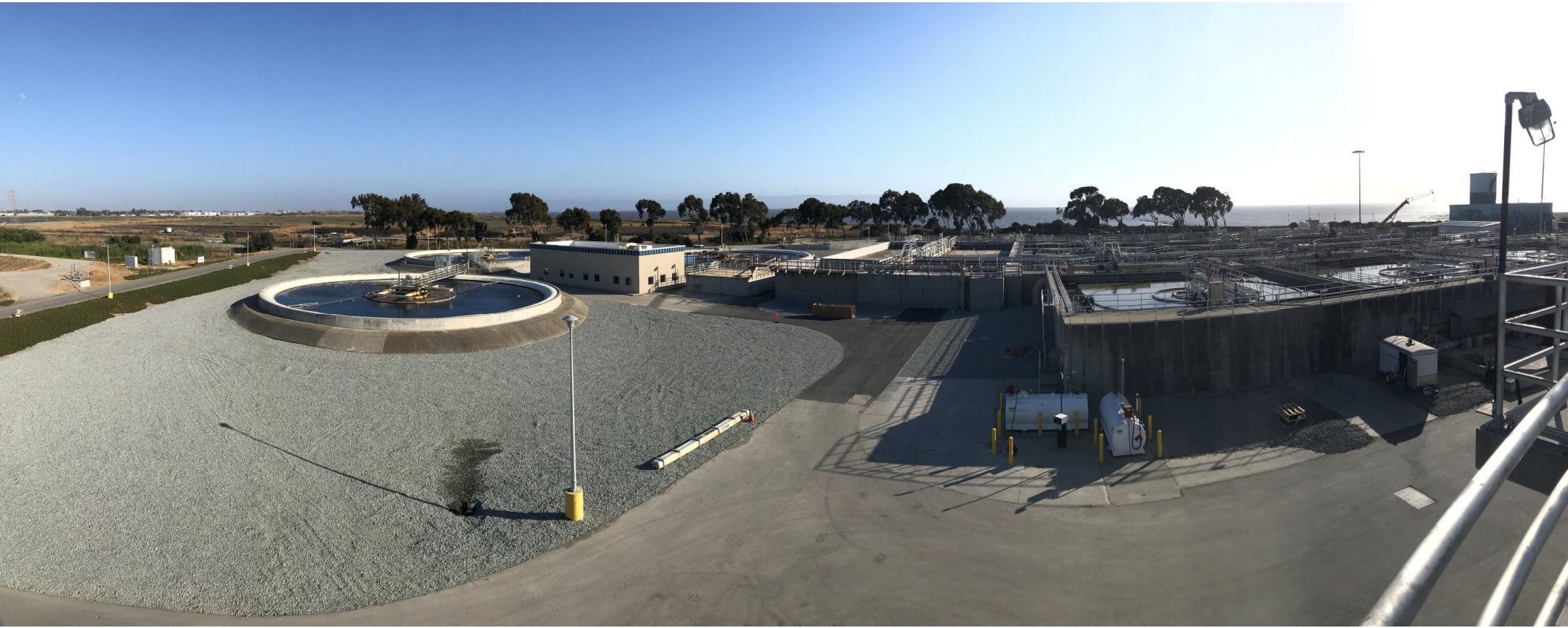


















What Went Right?

- Visited plants ahead of us
- Court your bidders - \$1M burritos
- Extensive Operator Training from Mike Barnes (KJ) and Brad Musick (WSI).
- Keep it simple (Air Header on Deck, Small Blower Building)



What Went Right?

- Single vendor for blowers, air valve control, and instrumentation integration
- Commitment to working safe – despite Covid
- Partnering for schedule acceleration
- Great teamwork

“What can you do with what you have? Make what you have do more, not just build a new whole treatment plant.”

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Lessons Learned

- CFD Modeling for Anoxic Zone
- Variability in loading across aeration trains requires more instruments
- Time for ethernet cable or wireless transmitters? (avoiding \$2M in conduit)



Lessons Learned?

- Lab data – gather more data on your influent characteristics – Now!
 - Alkalinity
 - Nutrients
- Power consumption up (23%) – get your Board ready for this or integrate energy savings into your project. (Electrical System Master Planning too)
- Dealing with Covid – Part-time shifts, Operator Training Program



This presentation represents the work of many.

Thank you!

