



PLUMMER

CHALLENGES AND REWARDS OF IMPLEMENTING A BNR PROCESS TO AN EXPANDING FACILITY

Brushy Creek East Plant

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PRESENTATION OUTLINE

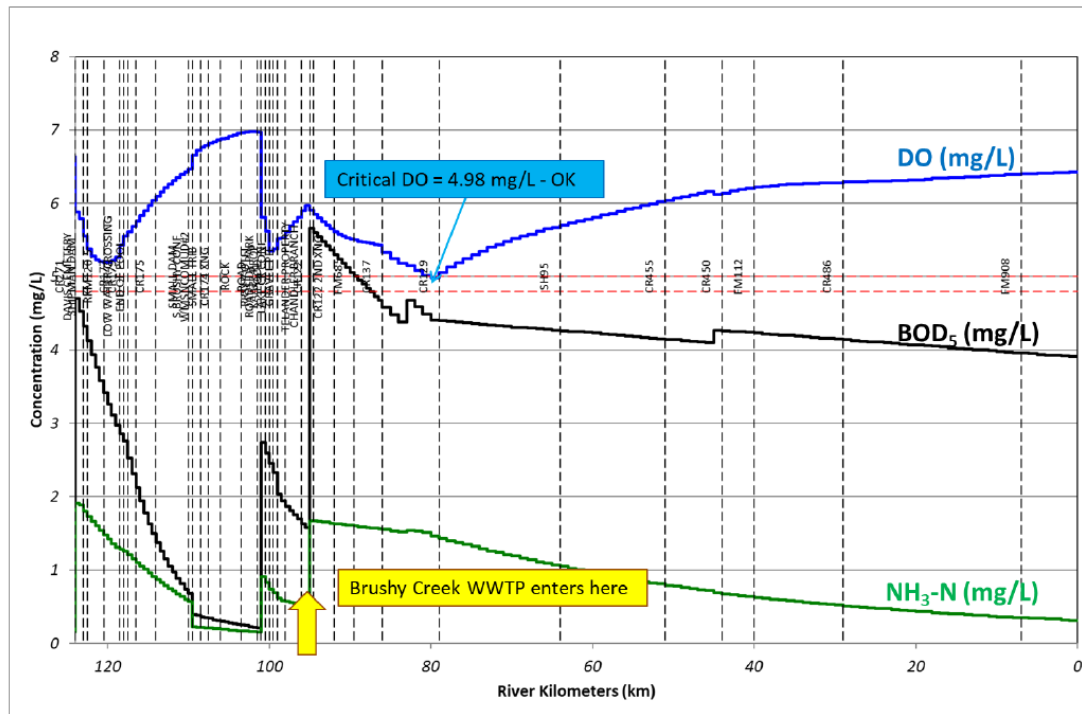


- Permitting & growth
- Treatment design
- Hydraulic solutions & construction sequencing
- Unusual challenges
- Modifications & time/cost savings
- Rewards!

PERMITTING & BACKGROUND



- Plant increase from 21.5 MGD to 30 MGD (through to 40 MGD Final) 3x peak factor
- Total Phosphorous and Total Nitrogen added to draft permit

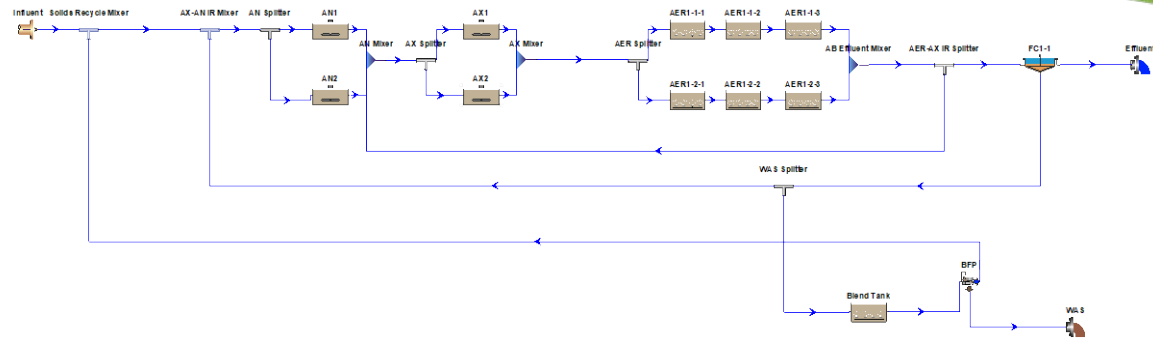


Model outputs from QUAL-TX (& Qual2K)

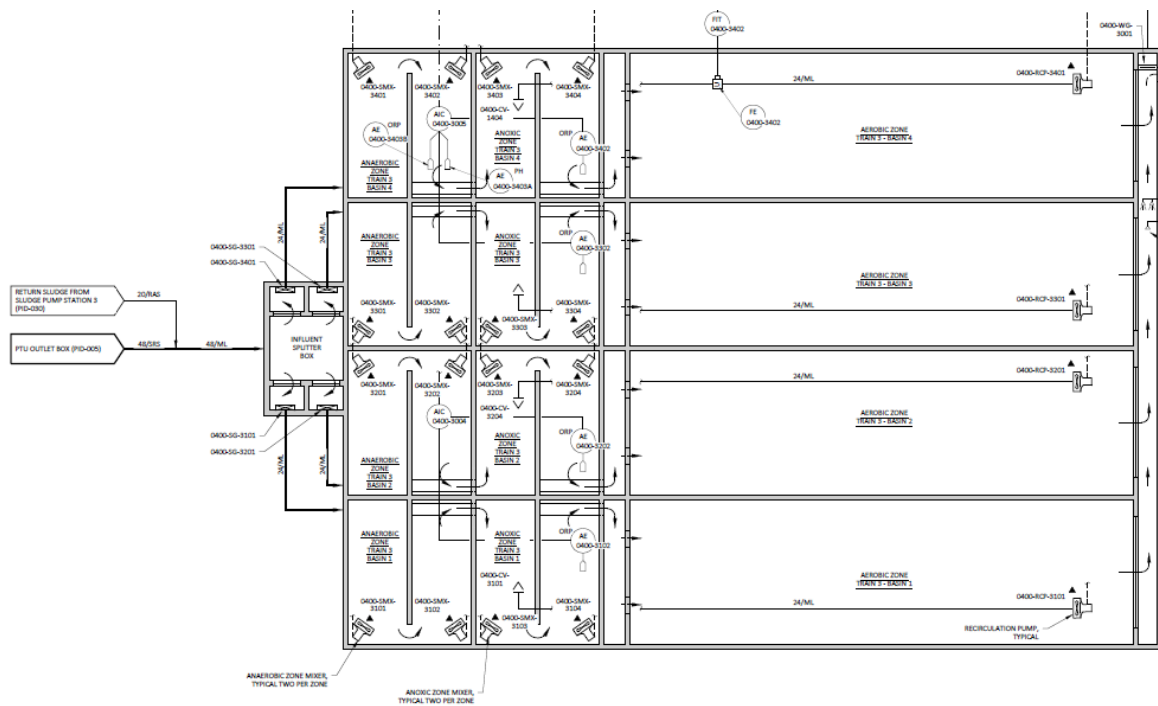


Outfall into Brushy Creek

TREATMENT DESIGN



- Increased influent strength / re-rating
- A2O Process was selected.
- Model work in BioWin to determine 2.5 hour detention time in Anaerobic as well as Anoxic.





New 120 MGD Preliminary Treatment Unit Constructed



Train 3 flow from anoxic zone to aerated basin

UNUSUAL CHALLENGES



June 2020

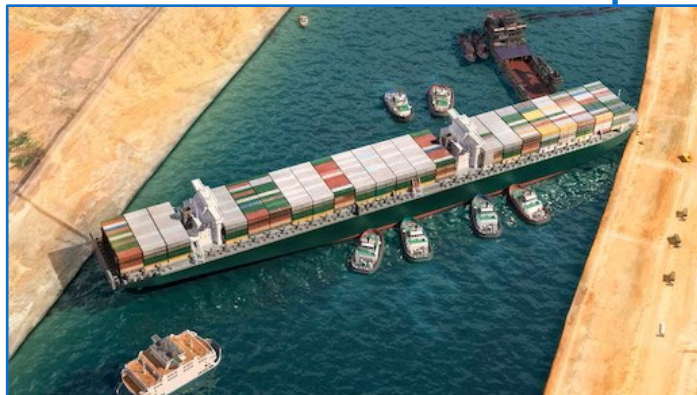
Feb 2021

March
2021

July 2021

May 2022

November
2022



CONSTRUCTION SEQUENCING



- Multiple active tie-ins required
- Phased demolition



Existing Trains 1 & 2 Prior to major demolition



PTU removal and A&A zone construction

SEQUENCE MODIFICATIONS



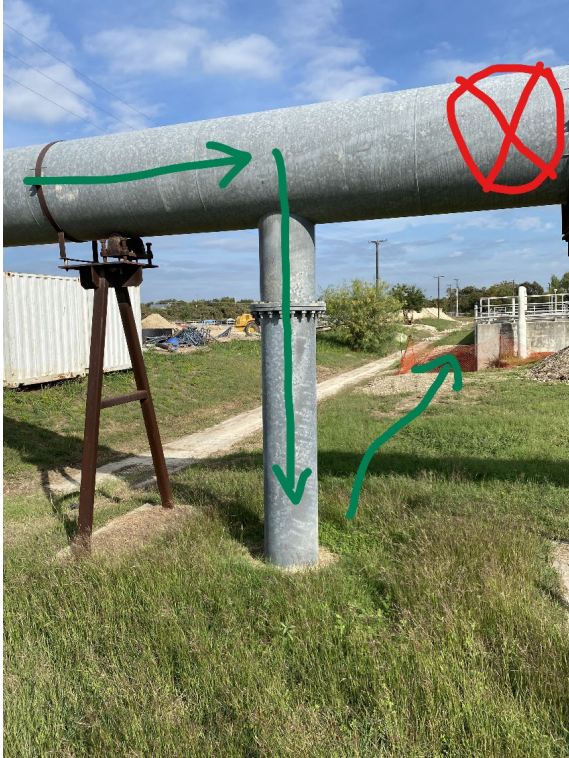
Tie-in new PTU (bypass pump)



Temporary channel construction



LPA Tie-in keeping 'new' and 'old'

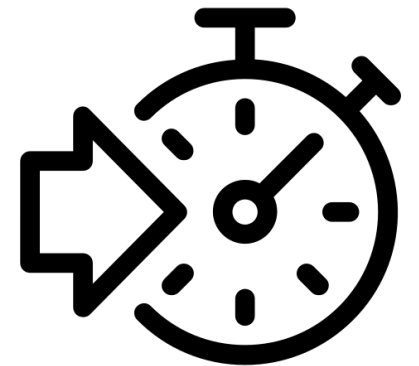


Modified LPA supply

TIME SAVINGS



- Pre-purchase of critical equipment (POs issued in 2020)
- Timing of project, other bulk purchases (pipe) and securing labor
- Construction Sequence modifications
 - Working ahead on other structures
 - Concrete batch plant
 - Major sequence changes (A&A zone demo & build, LPA mods)
- FRP Pipe, fast to field laminate and install
- Reduced start-up time required prior to discharge of new train



REWARDS



- Meeting next phase of permit limits (Train 3) without chemical addition
- Additional 5 MGD treatment during construction
- Provide early BNR Ops Training
- Improved screening and grit capture
- Expanding LS, Blower building, electrical and PTU for future capacity
- Higher quality stream effluent
- Shared risk with contractor – made up 3-6 months
- Cost of total project (within 4% C/O)





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