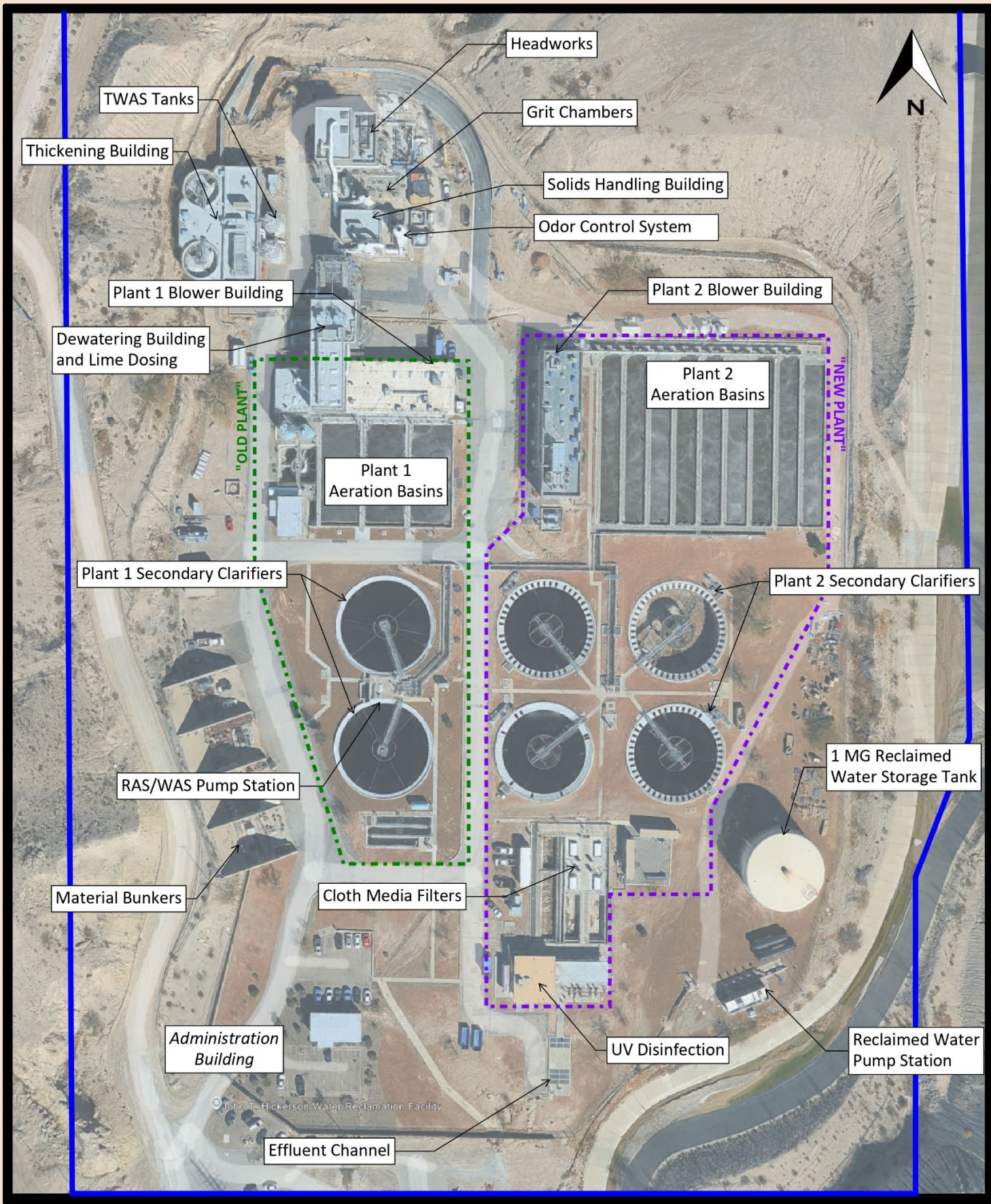


C1.04 – Hill Country Water Works

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Background



The John T. Hickerson Water Reclamation Facility (WRF) in El Paso, Texas, treats 17.5 MGD of municipal and industrial wastewater for the west and northwest regions of the city.

Problem Summary

- Industrial influent has increased BOD concentrations (≈290 mg/L).
- Peak flows have reached ~40 MGD, exceeding the permitted 35 MGD 2-hour peak.
- These conditions overload the aeration and clarification systems, reduce process stability, and risk non-compliance with TCEQ standards.

This project evaluates improvements to stabilize hydraulics, strengthen biological treatment performance, and maintain continuous operation of the facility during construction.

Design Consideration

- Full operation during construction
- Accommodate peak flows up to 40 MGD
- Improve BOD handling
- Fit within existing hydraulic profiles
- Minimize impacts to existing facilities
- Support reliable long-term operations
- Remain cost-effective

Alternative Selection

- Alternative 1:** Offline Eq Basins - EQ basins store peaks up to 40 MGD to protect clarifiers and stabilize hydraulics.
- Alternative 2:** Expand Primary Treatment - New primary clarifiers and headworks reduce BOD ~35% before aeration.
- Alternative 3:** Expansion of existing process - Adds screens, grit, aeration, and clarifiers to increase full plant capacity.
- Alternative 4:** inDENSE Process Intensification - Hydro cyclones produce denser sludge to improve clarifier settling efficiency

Criteria	Weight	Offline Equalization Basin	Expanded Primary Treatment	Expansion of Existing Process	Process Intensification
Capital Cost	8	64	32	32	144
Hydraulic Capacity	10	190	130	140	110
BOD Removal Effective	9	36	171	135	180
Construction Impact	7	105	35	49	91
O&M Complexity	7	49	84	98	49
Feasibility/Site Fit	9	144	63	81	180
Totals		98	86	89	126

Two-Phased Approach

Alternative 1 for peak-flow control + Alternative 4 (inDENSE) for improved settling and biological performance.

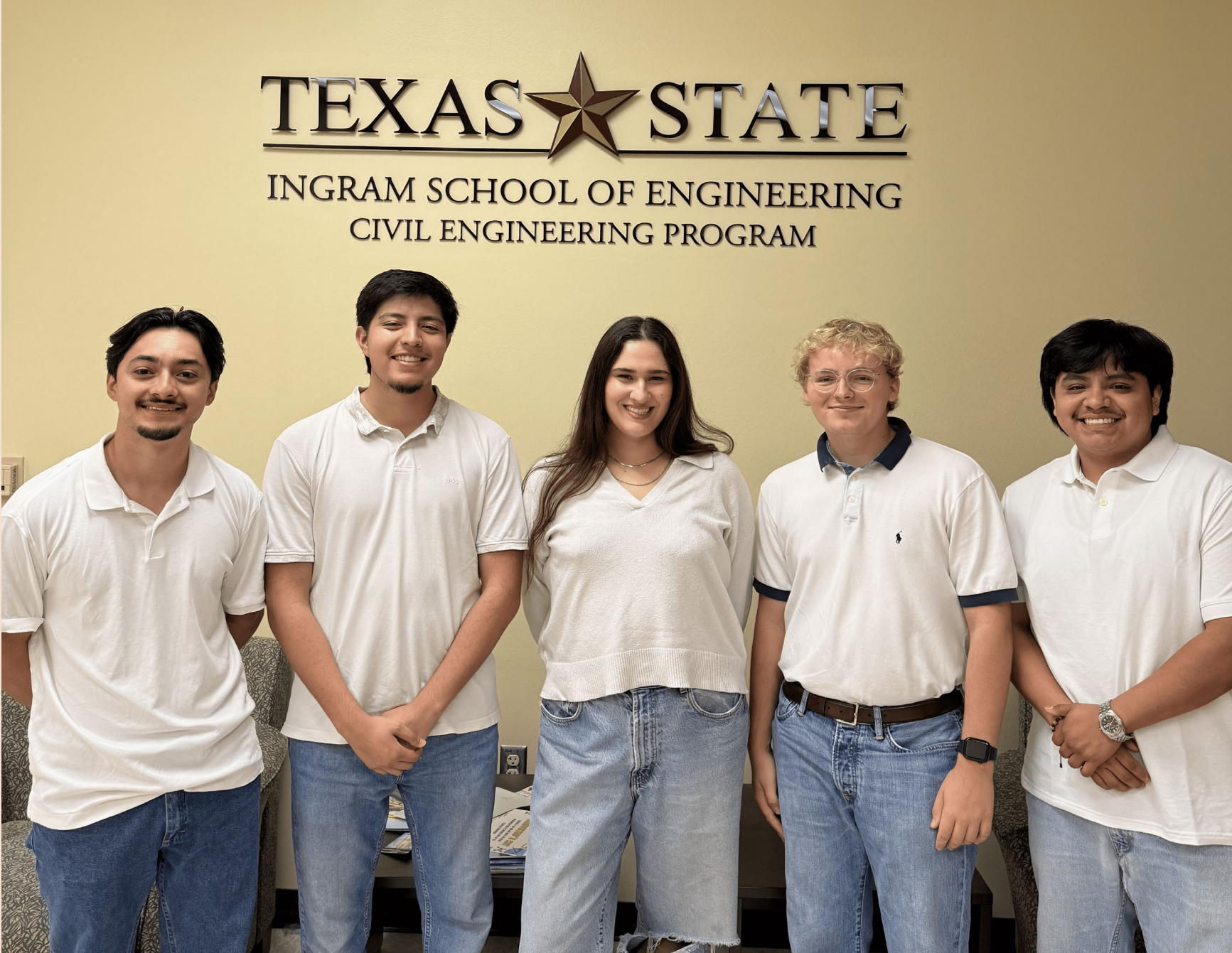
Constraints and Standards

- Limited onsite expansion footprint
- Hydraulic grade line must be preserved
- Peak flow routing must avoid plant bypass
- Industrial site = limited “Natural World” Envision scoring
- Continuous operation required during construction
- TCEQ Chapter 217** – Design criteria for domestic wastewater treatment facilities
- Texas Administrative Code §217.129** – Primary clarifier requirements
- EPA Wastewater Technology Fact Sheets** – Secondary treatment, clarifiers, package plant guidance
- EPA NPDES / TPDES Permit Requirements** – Peak flow compliance

Sustainability Framework

Credit Category	Applicable	Submitted	Percentage
Quality of Life	152	34	22%
Leadership	80	19	24%
Resource Allocation	88	20	23%
Natural World	82	13	16%
Climate and Resilence	130	50	38%
Total Points / %	532	136	26%

Team



Capital & Life-Cycle Cost

Capital Cost of EQ Basin		
Item	Assumption	Cost
EQ Basin (10 MG)	0.60M/MG	\$6,000,000.00
Piping & Diversion	10% of basin cost	\$750,000.00
Pumps, Valve Return Flow	6-7% of basin cost	\$380,000.00
Electrical & Controls	6-7% of basin cost	\$380,000.00
Engineering	Industry planning level	\$1,130,000.00
Contingency	Based on palmetto estimate	\$1,500,000.00
Total		\$10,140,000.00

Capital Cost of inDENSE System			
Item	Marshfield WWTP	Scaling Factor	Hickerson WWTP
Equipment / Structure	\$540,000	×2.71	\$1,463,400.00
Mechanical	\$270,000	×2.71	\$731,700.00
Electrical	\$140,000	×2.71	\$379,400.00
Sitework	\$60,000	×2.71	\$162,600.00
Contractor General Conditions	\$110,000	×2.71	\$298,100.00
Contingencies & Technical Svcs.	\$450,000	×2.71	\$1,219,500.00
Total	\$1,570,000.00		\$4,254,700.00

Life-Cycle Costs					
Alternative	Capital Cost	PV (O&M, 100 yr)	PV (Rehab)	PV (Salvage)	NPV Life-Cycle Cost (100 yr)
EQ Basins	\$10.14 M	\$2.48 M	\$0.14 M	-\$0.04 M	\$12.7 M
inDENSE	\$4.25 M	\$3.13 M	\$0.88 M	0	\$8.3 M
Total					\$21.0M