



TECHNICAL MEMORANDUM

PREPARED FOR: The Colorado Department of Public Health and Environment and the Town of Silt

PREPARED BY: Dewberry Engineers Inc.

DATE: May 5, 2023

SUBJECT: Silt Water Treatment Plant Upgrades – Cost Revision

1.0 Purpose

The purpose of this technical memorandum is to update the cost in the Project Needs Assessment submitted in November 2022 for the Town of Silt Water Treatment Plant (WTP) Improvements.

2.0 Rationale for Updated Opinions of Probable Cost

The project has progressed, and the alternatives have been better defined. With better definition, Dewberry revisited the opinions of probable construction costs (OPCC). This memo updates the PNA OPCCs submitted in November 2022. Specific changes are summarized below:

- The building size for Alternative 4 - ballasted flocculation with mixed media filters was 6,350 square feet while the building size for the plate settler was only 5,500 square feet, despite the fact that the plate settler will take more area.
- Increased piping costs to reflect recent observations in project costs.
- Incorporated a concrete cost to form the tanks for the plate settlers. The plate settlers are too large to utilize prefabricated steel/aluminum tanks.
- UV costs were reduced to reflect updated equipment budget quotes.
- Updated operations, maintenance, and replacement costs to include only mechanical components and not structural components.

3.0 Updated Opinions of Probable Cost

The following tables show the updated opinions of probable costs for the Silt WTP alternatives.

Table 1. Updated Construction Cost and Total Project Cost for WTP Alternatives

ITEM	CLARICONE	PLATE SETTLER W/ MEMBRANE FILTRATION	PLATE SETTLER W/ MIXED MEDIA FILTER	PULSAPAK	BALLASTED FLOCCULATION W/ MIXED MEDIA FILTER
	ALT 1	ALT 2A	ALT 2B	ALT 3	ALT 4
Site Civil	\$272,000	\$326,000	\$341,000	\$259,000	\$289,000
Structural	\$127,000	\$1,160,000	\$1,160,000	\$471,000	\$635,000
Architectural	\$5,141,000	\$4,288,000	\$4,172,000	\$3,763,000	\$3,472,000
Process/Mechanical	\$5,649,000	\$5,223,000	\$4,172,000	\$6,200,000	\$5,650,000
HVAC	\$1,679,000	\$1,650,000	\$1,511,000	\$1,604,000	\$1,507,000
Electrical	\$2,015,000	\$1,980,000	\$1,813,000	\$1,925,000	\$1,809,000
Capital Cost Subtotal	\$14,883,000	\$14,627,000	\$13,393,000	\$14,222,000	\$13,362,000
Contingency	\$4,465,000	\$4,389,000	\$4,018,000	\$4,267,000	\$4,009,000
Mobilization/Demobilization	\$745,000	\$732,000	\$670,000	\$712,000	\$669,000

Table 1. Updated Construction Cost and Total Project Cost for WTP Alternatives

ITEM	CLARICONE	PLATE SETTLER W/ MEMBRANE FILTRATION	PLATE SETTLER W/ MIXED MEDIA FILTER	PULSAPAK	BALLASTED FLOCCULATION W/ MIXED MEDIA FILTER
	ALT 1	ALT 2A	ALT 2B	ALT 3	ALT 4
Contractor OH&P	\$2,977,000	\$2,926,000	\$2,679,000	\$2,845,000	\$2,673,000
Bonding and Insurance	\$447,000	\$439,000	\$402,000	\$427,000	\$401,000
Total Opinion of Probable Construction Cost	\$23,517,000	\$23,113,000	\$21,162,000	\$22,473,000	\$21,114,000

Table 2. Updated Engineering and Administrative Costs for WTP Alternatives

ITEM	CLARICONE	PLATE SETTLER W/ MEMBRANE FILTRATION	PLATE SETTLER W/ MIXED MEDIA FILTER	PULSAPAK	BALLASTED FLOCCULATION W/ MIXED MEDIA FILTER
	ALT 1	ALT 2A	ALT 2B	ALT 3	ALT 4
Design (10%)	\$2,352,000	\$2,311,000	\$2,116,000	\$2,247,000	\$2,111,000
Construction Mgmt./Inspection (8%)	\$1,881,000	\$1,849,000	\$1,693,000	\$1,798,000	\$1,689,000
Administrative	\$470,000	\$462,000	\$423,000	\$449,000	\$422,000
Total - Engineering/Administrative	\$4,703,000	\$4,622,000	\$4,232,000	\$4,494,000	\$4,222,000
Total Project Cost	\$28,220,000	\$27,735,000	\$25,394,000	\$26,967,000	\$25,336,000

Table 3. Updated Buildout Operation, Maintenance, and Replacement Costs for WTP Alternatives

ITEM	CLARICONE	PLATE SETTLER W/ MEMBRANE FILTRATION	PLATE SETTLER W/ MIXED MEDIA FILTER	PULSAPAK	BALLASTED FLOCCULATION W/ MIXED MEDIA FILTER
	ALT 1	ALT 2A	ALT 2B	ALT 3	ALT 4
Annual Labor	\$267,000	\$267,000	\$267,000	\$267,000	\$267,000
Annual Chemical	\$288,000	\$288,000	\$288,000	\$288,000	\$288,000
Annual Power	\$82,000	\$98,000	\$82,000	\$82,000	\$82,000
Annualized Equipment Replacement and General Equipment Maintenance	\$67,000	\$29,000	\$28,000	\$84,000	\$28,000
Membrane Replacement	\$0	\$67,000	\$0	\$0	\$0
Filter Media Replacement	\$0	\$0	\$11,000	\$0	\$11,000
Total Annual Cost	\$704,000	\$749,000	\$676,000	\$721,000	\$676,000
Net Present Worth	\$40,726,000	\$41,235,000	\$37,281,000	\$39,848,000	\$37,223,000

4.0 Summary

The updated OPCC indicate Alternative 4 is the most cost-effective solution of the four alternatives evaluated for the Town of Silt. As shown in Tables 1, 2, and 3, the ballasted flocculation with mixed media filter alternative has the lowest construction cost and Net Present Worth costs. A Construction Manager at Risk has been added to the project team and will be providing construction cost estimates for the team moving forward.