

Decision Matrix of Top Two Potential Treatment Options (Final)				
Option 3B: Construct New Treatment Facility at Whitney Pond Wells				
Option 3C: Expand Baddacook WTP and Construct Water Main Improvements				
Factor	Weight	Rationale	Relative Scoring (1 = Poor/NA, 2 = Fair, 3 = Good)	
			Option 3B	Option 3C
Capital Costs^{1,2} (High Priority)				
Estimated Debt Service on Construction Cost	15%	Option 3B: Estimated Capital Cost: \$6.6M; Estimated Total Financing over 20 years: \$9M Average Annual Debt Payment of \$429k. Option 3C: Estimated Capital Cost: \$7.3M (Water Main: \$2.4M, Treatment: \$4.9M); Estimated Total Financing over 30 years: \$10.4M Average Annual Debt Payments for 20 years: \$435k, remaining 10 yrs: \$93k.	3	2
Estimated Cumulative Gain / Shortfall over Time	10%	Option 3B: Expected cumulative gain/shortfall relative to FY2020 debt load and \$20/yr capital charge: by 2032 = \$-264k; by 2043 = \$1.3M Option 3C: Expected cumulative gain/shortfall relative to FY2020 debt load and \$20/yr capital charge: by 2032 = \$-604k; by 2043 = \$836k; by 2052: \$4.9M	3	2
Resilience (High Priority)				
Treatment Redundancy	15%	Option 3B: Two independent facilities provides redundancy in the event of a prolonged outage or other issue. Option 3C: All Mn treatment would be at Baddacook facility; in an emergency, water could be routed from one facility to the other (and vice versa).	3	2
Filtration Operational Buffer	10%	Option 3B: Vertical vessels provide operational buffer. Less susceptible to losing media. Can backwash more aggressively. Option 3C: N/A - No operational buffer anticipated from horizontal vessels.	3	1
Operations and Maintenance (Moderate Priority)				
Annual O&M Cost Increase (2022) ³	10%	Option 3B: Estimated increase of \$150,000 / yr associated with new operator, electricity, and misc. costs to operate new facility. Option 3C: Estimated increase of \$100,000 / yr associated with new operator, electricity, and misc. costs to operate expanded facility.	2	3
Increase in Required Labor / Logistics	10%	Option 3B: New operator and may require additional 8-16 hrs of labor/week for logistics and coordination for O&M of two WTPs. Option 3C: New operator required.	2	3
Ease of Future Expansion & Misc. Factors (Lower Priority)				
Future Supply Expansion (Whitney Well #3) ^{4,5,6}	5%	Option 3B: Vertical vessels are sized to handle normal 5 gpm/sf loading rate and up to 7 gpm/sf temp. backwash loading rate with one filter offline. Proposed building includes capacity for future filter should future demands increase more than anticipated. Option 3C: Horizontal vessels are sized to handle normal 5 gpm/sf loading rate and up to 7 gpm/sf temp. backwash loading rate with one cell offline.	3	2
Future Treatment Implementation	5%	Option 3B: Adequate space for future PFAS or other treatment. Option 3C: Adequate space for future PFAS or other treatment. If PFAS shows up at both sources, treatment would only be required at Baddacook.	2	3
Distribution System Hydraulic Improvements	5%	Option 3B: 8-in water main will be upgraded to 12-in along Lowell Road between Allen's Trail and Hemlock Park Drive. Option 3C: N/A - no anticipated hydraulic improvements will be made.	1	3
Distribution System Performance During Backwash ^{7,8}	5%	Option 3B: Potential low pressure areas are slightly more pronounced, likely because Whitney is pulling water for a longer distance along Lowell Road. Option 3C: Potential low pressure areas are slightly less pronounced.	1	2
Accelerated Temporary Treatment	5%	Option 3B: N/A - Construction completion anticipated December 2024. Option 3C: Potential temporary treatment of all water demand for 9 months of the year by 2022 compared to 6 months currently (pending DEP approval)	1	3
Construction Disruptions Off-Site ⁹	5%	Option 3B: N/A - No anticipated disruptions. Option 3C: Water main installation will cause disruptions along Lowell Road. Estimated duration of 3-4 months.	3	1
Sum of Weights:	100%		Relative Score (Out of 3):	2.5
				2.2

Notes:

1. Cost estimates are for planning purposes only (i.e., order-of-magnitude) and have been adjusted for potential inflation from 2019 to 2022 assuming 3% annual inflation.
2. Financing cost estimates obtained from GWD via email on June 25, 2020. Assume equal payment scenario for comparison of each option. Assume water main pipes in ground by 2021. FY 2020 baseline debt load is 400.4k; estimated \$20 capital charge income is 140k/yr.
3. See supplemental Tables for increases to current O&M costs
4. Assume that potential Whitney Well #3 will have capacity of appx. 200 gpm. Order of magnitude cost estimates is < \$1M for development of new Whitney Well #3 from Manganese Mitigation Alternatives Analysis Report (CEI, August 2019).
5. Whitney Well #1, #2, and potential #3 design flow of 950 gpm. Option 3B proposed filters are two (2) horizontal filters with 7' dia. And 15' length split into two cells. Option 3C proposed filters are three (3) 10' dia. vertical filters.
6. Per July 2020 Blue Leaf Pilot Report (Table 3.07), pilot filters for Whitney Wells #1 and #2 were effective at loading rates of 5 gpm/sf to 7 gpm/sf (18" media depth). Estimated run time to 10 psi filter differential pressure ranged from 185 to 331 hours.
7. GWD's existing WaterCAD model was used to simulate potential capacity limitations from typical backwashing operations based on analysis of pressure contours.
8. Backwash (demand) of 975 gpm and 1,300 gpm was applied to new Whitney Facility (3B) and Baddacook Expansion, respectively. Analysis assumes that backwash will not be performed simultaneously (e.g., Whitney vs. Baddacook Filters will be backwashed at separate times)
7. Construction duration for appx. 10,900 linear feet of water main estimated based on installation of 100 to 200 linear feet per day.