City of Montrose

Water Treatment Plant Study

June 2022



Introduction





- Purpose of Study
- Water Demand Projections
- Water Capacity and Quality Evaluation
- Treatment Options
- Staffing Review
- Cost Estimate
- ➢ Next Steps





- Provide the City of Montrose with the necessary information to improve its water treatment process.
- Provide different options for the City to meet its water quality goals.
- Estimate costs for all improvements.
- Comply with all MDH and EPA drinking water regulations.





Water Demand Projection



Population used to determine future flows



Typically use a 20-year design life



Consider ultimate growth

Population Projections				
Year	Population	Population	Population	
	(Conservative)	(Moderate)	(Fast)	
2015	3,110			
2020	3,775			
2025	3,963*			
2030	4,148*			
2035	4,320*			
2040	4,479*	6,055**	7,500**	
2045	4,626*			

*Population projected as % of County

****City Comprehensive Plan estimates**

2045 population – 4,626 (20-year population)



REGIONALIZATION







Water Demand Projection

Historical Annual Peak Water Pumpage and Per Capita Usage				
Year	Average Day Pumpage (gpd)	Peak Day (gpd)	Peaking Ratio	Average Gallons per Person per Day
2016	188,016	375,000	1.99	60.0
2017	198,033	409,000	2.07	62.8
2018	198,047	440,000	2.22	61.0
2019	187,277	309,000	1.65	56.4
2020	217,405	455,000	2.09	57.6
Average	197,756	-	-	59.6
Maximum	-	455,000	2.22	

Water Demand Projection in 2045



*gallons per day (gpd)



Current Well Capacity



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Current Water Treatment Process





Storage Capacity

Table 3.3 - Summary	of Water Storage
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Structure	Type of	Year	Storage
Name	Storage	Constructed	Capacity
	Structure		(gallons)
1	Elevated	1930	50,000
	Storage		
2	Elevated	1967	250,000
	Storage		
Total			300,000

- Tower No. 1 needs structural improvements and is past its useful life.
- Tower No. 1 should be decommissioned and replaced with a higher capacity tower.
- Despite its age, Tower No. 2 is in good condition.









Current Locations of Towers and Well Houses



Water Quality Goals

- Provide sufficient well, treatment, and storage capacities
- Meet all drinking water standards

Summary of Water Manganese Concentration			
	Mn (mg/L)		
MDH HBV - Adults	0.300		
MDH HBV - Infants	0.100		
EPA SMCL	0.050		
Well 4	1.070		
Well 5	0.810		
Well 6	0.423		



Water Treatment Plant Options

Alternative 1Alternative 2Gravity FiltrationGravity Filtration

with Lime Softening

Alternative 3

Gravity Filtration with Reverse Osmosis



Gravity Filtration

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2

Gravity Filtration with Lime Softening



Gravity Filtration with Reverse Osmosis



Staffing Review and Conclusions

Total staff members needed at 20 hours/week for the following water treatment options:





Alternative Comparison

Table 7.1 - Decision Matrix				
	Primary Treatment (Removal)			
ltem	Gravity Filtration	Lime and Soda Ash Softening with Filtration	Gravity Filtration and Reverse Osmosis (RO)	
Ability to Meet	Cood	Evcollopt	Evcollopt	
Water Quality Goals	Good	Excellent	Excellent	
Expandability	Evcollopt	Evcollopt	Evcollopt	
Potential	Excellent	Excellent	Excellent	
Ability to Meet				
Future Average and	Excellent	Excellent	Excellent	
Peak Demand				
Ease of Operation	Excellent	Okay	Okay	

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Recommendations







Cost Estimate

Project Cost				
ltem	Option 1 Gravity Filtration	Option 2 Lime and Soda Ash and Filtration	Option 3 Filtration and RO	
WTF Cost	\$8,000,000	\$11,000,000	\$9,500,000	
New Water Tower	\$2,000,000	\$2,000,000	\$2,000,000	
Added Site Work, Land Costs, etc.	\$200,000	\$200,000	\$200,000	
Total Construction Cost	\$10,200,000	\$13,200,000	\$11,700,000	
Legal/Administration/ Engineering Costs (25%)	\$2,050,000	\$2,650,000	\$2,350,000	
Total Project Cost Project Range (+/-15%)	\$11.4M - \$17.2M	\$14.8M - \$22.2M	\$13.1M - \$19.7M	
Estimated Annual OM&R Cost	\$250,000.00	\$325,000.00	\$300,000.00	



Financing

Various options for financing the WTP improvements

Bonding

Drinking Water Revolving Fund (DWRF)

- Low interest loans
- Some grant possibilities

USDA Rural Development

- Loans
- Grants based on affordability

Limited grant options available for water treatment



Sample Implementation Schedule

Table 7.3 - Sample Implementation Schedule		
Task	Month #	
Initiate Preliminary Design	0	
Initiate Final Design	6	
Submit Plans/Specs to MDH	10	
Council Approval of Plans and Specs for Bidding	14	
Advertisement for Bids	15	
Bid Project	16	
Award Contract	17	
Start Construction	18	
Project Completion	36	

Note: Month which each activity is shown to occur is approximate

Note: This is the fastest this schedule can occur





Is the council interested in further pursuit of a WTP to improve water quality?

If so, does the council want to consider regionalization?

Consideration of site evaluations, survey, and preliminary engineering

Consideration of a preliminary rate impact study

Public open house



Questions?

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