



CITY OF ALGONA

Water System Plan

Keenan Ferar, P.E.
Project Engineer

November 2022

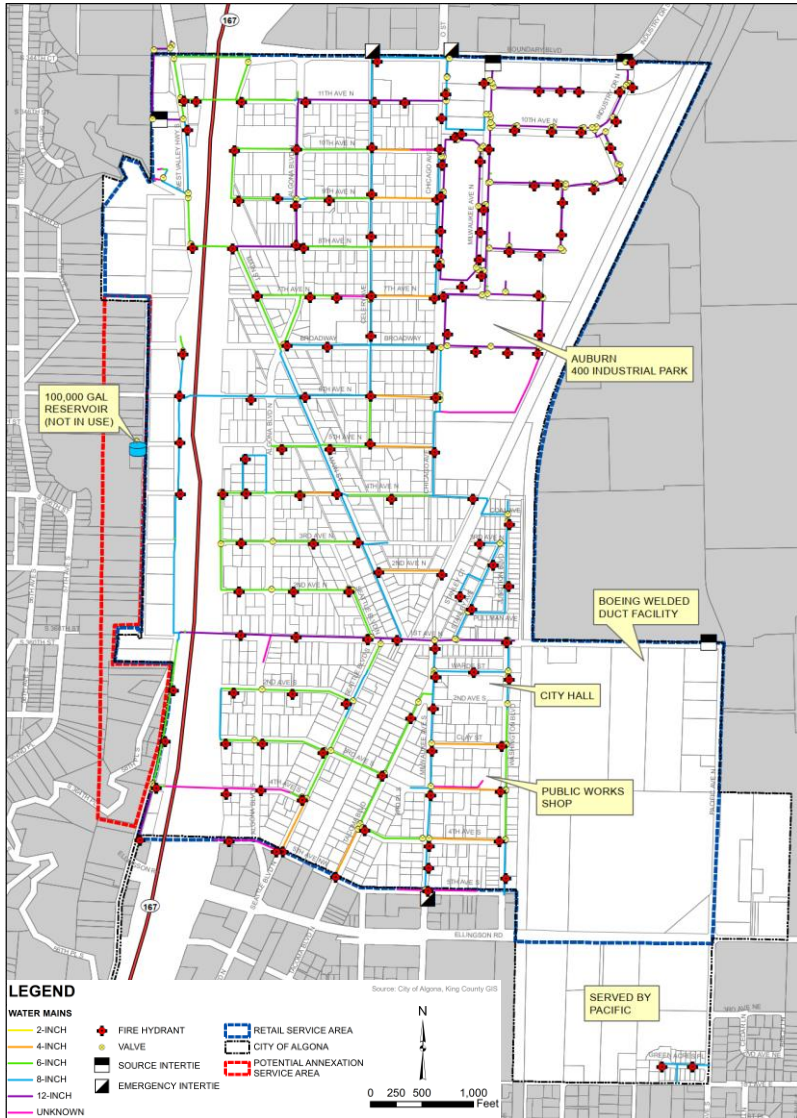


Water System Plan



- Updated Every 10 Years
- Goals:
 - Create Water Demand Projections based on Historic Data.
 - Update Water Use Efficiency Program.
 - Evaluate the Water System's Ability to Meet Current and Future Demands and Regulations.
 - Identify Current and Future System deficiencies.
 - Create Capital Improvement Plan do Address Deficiencies.
 - Outline Financial Plan that is Capable of Paying for Both O&M and Capital Improvements.

Existing Water System Facilities



Source Interties (w/ Auburn)

- 3 Servers the City of Algona (Milwaukee Ave North, Industry Drive North, & West Valley Highway)
- 1 Servers Boeing Duct Facility Directly (1st Avenue North)

Emergency Interties

- With Auburn (1)
- With Pacific (1)

Water Treatment

- Auburn is responsible for all treatment (Chlorination, Corrosion Control, Iron and Manganese Removal)

Storage

- 280,000 gallons of dedicated storage in Auburn's Lakeland Hill Reservoir 6.
- Algona's inactive 100,000 gallon reservoir

Distribution system

- 92,654 Feet of Pipe (~ 17.5 miles)
- 115 Fire Hydrants

Single Hydraulic Pressure Zone

- 242 Zone (60-75 psi)



Water Demand Projections



YEAR	RETAIL SERVICE AREA POPULATION	AVERAGE DAY DEMAND (gpd)
2022	3,271	361,000
2032	3,466	382,000
2042	3,672	404,000

Projections derived from:

- Characteristic parameters derived from historical data.
- Forecasted growth rate (0.84%) from from Algona's 2015 Comprehensive.

Water Use Efficiency



Water loss Control Action Plan

TABLE 4-3

Distribution System Leakage

Year	Total Production (gpd)	Authorized Consumption (gpd) ⁽¹⁾	Distribution System Leakage (gpd)	Distribution System Leakage %	3-year Rolling Average
2016	322,804	307,325	15,479	4.8%	4.7%
2017	338,252	306,678	31,574	9.3%	7.0%
2018 ⁽²⁾	374,580	306,227	68,353	18.2%	10.8%
2019	354,933	305,498	49,436	13.9%	13.8%
2020 ⁽³⁾	358,991	298,608	60,383	16.8%	16.3%
Average				12.6%	-

(1) Includes total consumption and credibly quantifiable flushing, fire flows, and large water main breaks.

(2) In 2018, a large leak lasting multiple weeks occurred resulted in higher DSL.

(3) In 2020, a prolonged leak at a fire hydrant resulted in higher DSL.

Action Plan calls for:

- Start water meter replacement program to replace aging meters
- Contract to do leak detection regularly
- Replace aging pipe
- Improve record keeping of major leaks

- The City’s 3-year average distribution system leakage was 16.3% in 2020 – Triggering a Water Loss Control Plan requirement.



Gray & Osborne, Inc.

Water Use Efficiency



Goals & Measures

- New Goals:

- 1) Maintain a maximum day peaking factor below 1.72
- 2) Reduce the average day consumption for a equivalent residential unit by one percent per year for the next 10 years.
- 3) Decrease DSL volume by 6.5 percent per year over the next 10 years & have DSL below 7 percent by 2032.

If goals are met approximately 128 MG would be saved over the next 10 years.

- Water Use Efficiency Measures (6 Required)

- Mandatory Measures

- Source and Service Metering Calibration
 - Provide Customer Education
 - Conservation Rate Structure
 - Evaluate Reclaimed Water Opportunities

- Supplementary Measures

- Bills showing consumption history
 - Customer leak detection

System Analysis – Water Quality

- Water quality monitoring responsibilities shared between City of Algona and Auburn.
 - Auburn Responsible for source monitoring
 - Algona responsible for distribution system monitoring
- The City is in compliance with all state and federal water quality requirements (as of Sept 2022).
- Changes to the Lead & Copper Rule (2024) and PFAS (2023) regulation are on the horizon.



System Analysis – System Capacity



Source & Treatment

- Adequate capacity through 2042 via existing interties and Auburn Agreement

Storage

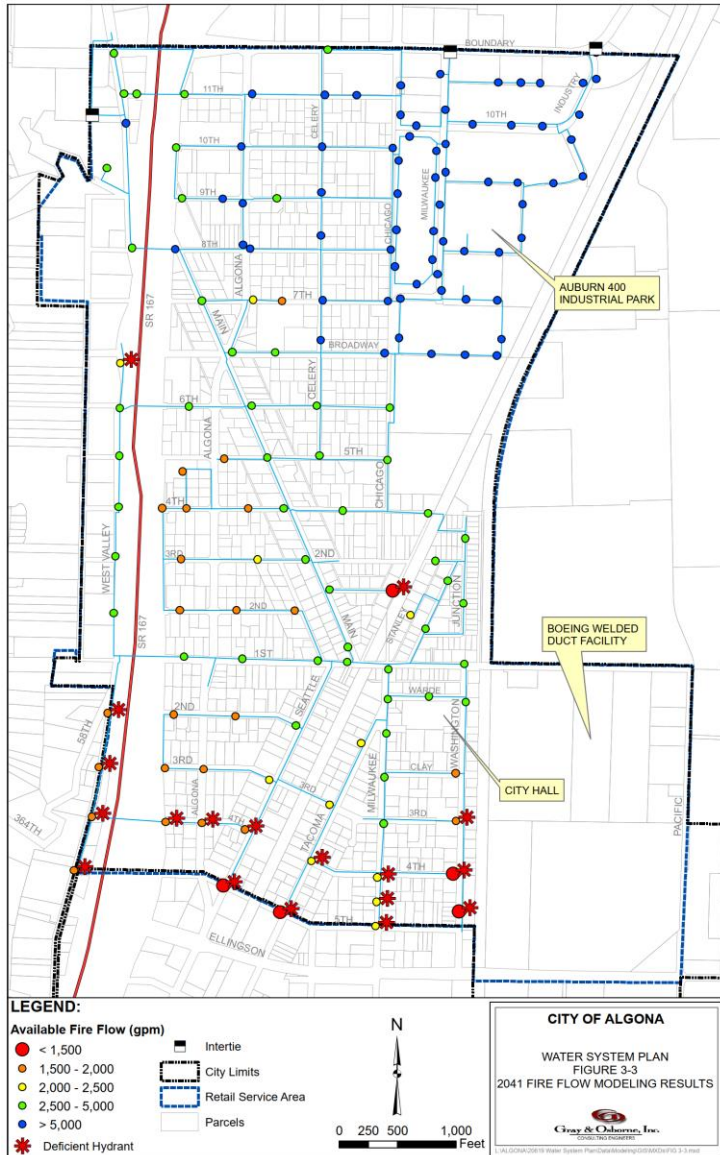
Storage Capacity Analysis

Year	Equalizing Storage (gal)	Standby Storage (gal) ⁽¹⁾	Fire Suppression Storage ⁽¹⁾ (gal)	Total Storage Required ⁽¹⁾ (gal)	Available Storage (gal)	Surplus/ (Deficit) (gal)
2022	0	342,998	450,000	450,000	280,000	(170,000)
2032	0	368,652		450,000	(170,000)	
2042	0	396,543		450,000	(170,000)	

(1) Fire Suppression Storage and Standby are nested, only the larger of the two storage requirements must be met.

- Increase in required fire suppressions storage (resulting from changes in zoning and International Fire Code)
- 170,000 gallon storage deficit

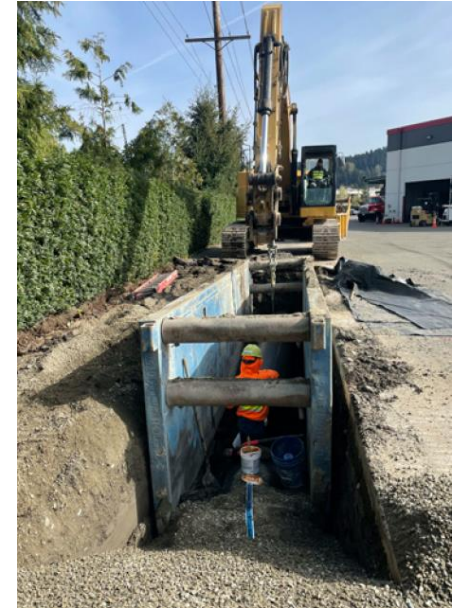
System Analysis – Distribution System



- 30 PSI can be provided at Peak Hour Demand throughout the entire system.
- The majority of City's distribution system can meet the required fire flows.
- Fire flow deficiencies are concentrated in the south and west of the system. Deficiencies are due to undersized mains and dead ends.
- Much of the City's pipe is Asbestos Cement (AC) which is nearing the end of it's useful life.
- Deficiencies are addressed in the City's capital improvement program.

Capital Improvement Program

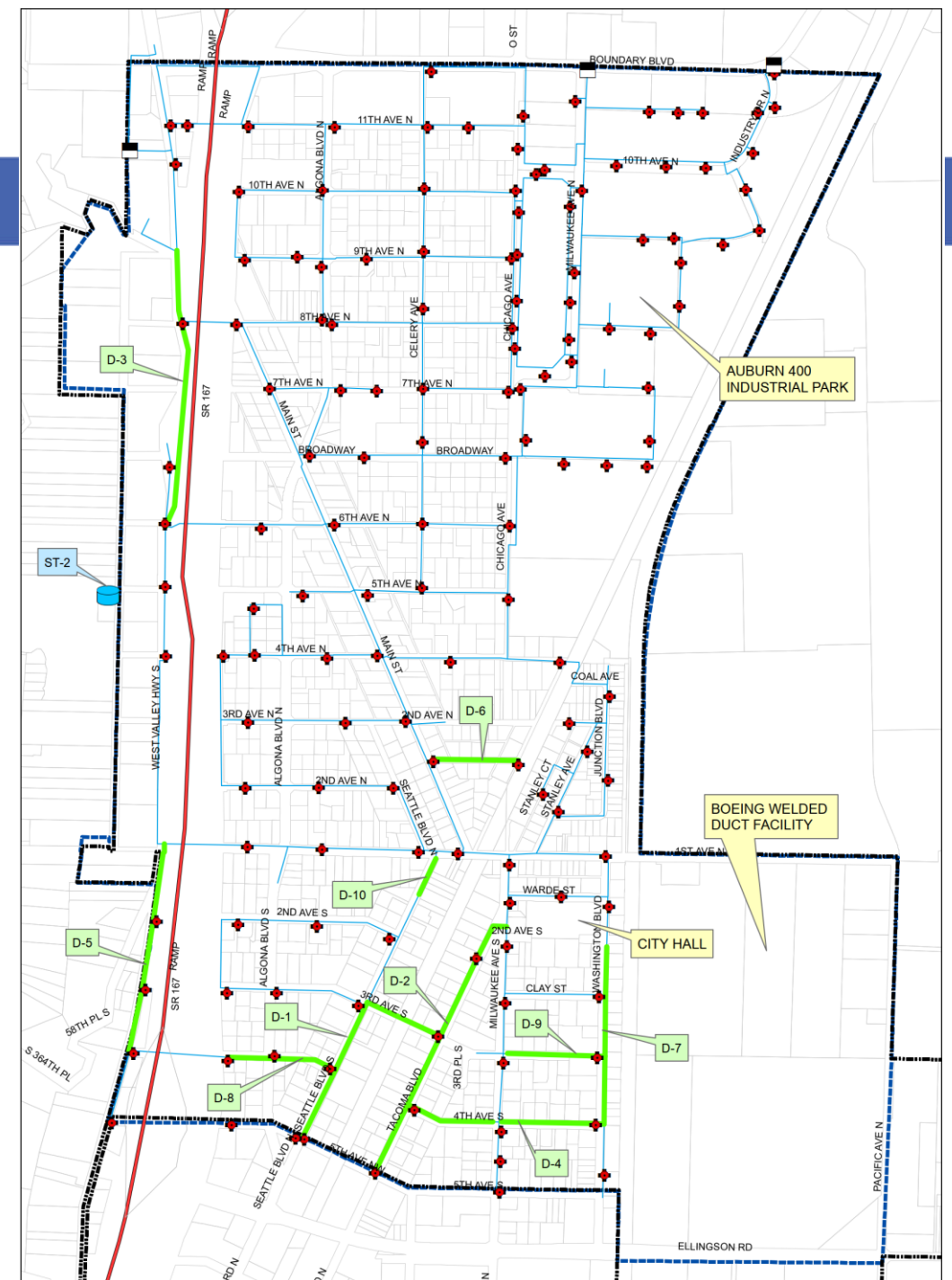
- Identified approximately \$7 million in projects over the next 10 years.
- Program Includes:
 - Water main replacement projects targeted at leaking and aging pipes and upsizing pipes to improve fireflow.
 - Increase dedicate storage from Auburn to address storage deficiency.
 - Begin meter replacement program (in 2029) to ensure accurate readings.



Gray & Osborne, Inc.

Capital Improvement Schedule & Map

Project	Project Name	Estimated Project Cost 2021 Dollars ⁽¹⁾	Projected Date
ST-1	Purchase Additional Storage	\$480,000	2023
ST-2	Demolish Abandoned Reservoir	\$46,000	2030
D-1	Water Main Along Seattle Boulevard South (Southern Portion)	\$564,000	2031
D-2	Water Main Along Tacoma Boulevard and 3 rd Avenue South	\$1,446,000	After 2032
D-3	Water Main Along West Valley Highway, 9 th Avenue North to Broadway Street	\$1,137,000	2025
D-4	Water Main Along 4 th Avenue South, Tacoma to Washington Boulevard	\$637,000	After 2032
D-5	Water Main Along West Valley Highway, 1 st Avenue North to 4 th Avenue South	\$876,000	2027
D-6	Water Main Along 2 nd Avenue North, East of Main Street	\$299,000	After 2032
D-7	Water Main Along Washington Boulevard, City Hall to 4 th Avenue South	\$899,000	After 2032
D-8	Water Main Along 4 th Avenue South, State Route 167 to Seattle Boulevard South	\$392,000	2029
D-9	Water Main Along 3 rd Avenue South, Milwaukee Boulevard South to Washington Boulevard	\$307,000	After 2032
D-10	Water Main Along Seattle Boulevard South, 1 st Avenue North To 2 nd Avenue South	\$174,000	2028
D-11	Replace AC Water Mains	\$337,000 per year	Every 2 Years, Starting in 2024
G-1	Service Meter Replacement Program	\$66,000 per year	2029-2035



Financial Program



- At Present:

- Water Funds can almost meet O&M expenses and but funding is inadequate for needed capital improvements.

- In the Future:

- Operating expenses are predicted to increase with inflation.
- \$7 million of improvements are recommended over the next 10 years.
- 4.5% rate increase per year is recommended to fund both capital and O&M expenses.



Gray & Osborne, Inc.

Next Steps...

- Awaiting commends from:
 - Washington State Department of Health
 - City of Auburn
 - Adjacent purveyors (City of Pacific & Lakehaven Utility District)
- Incorporate comments and draft responses
- City Council needs to
 - formally adopt the Plan
 - Hold a public Water Use Efficiency goals setting meeting & adopt goals



Questions?

