ALPINE
RESOLUTION NO. 2025-33
A RESOLUTION APPROVING THE WATER USE AND PRESERVATION ELEMENT OF THE GENERAL PLAN FOR ALPINE CITY

WHEREAS, Utah Code §§ 10-20-401 through 10-20-408 (formerly §§ 10-9a-401 through 10-9a-408) requires municipalities to prepare and adopt a General Plan to guide long-range land use and development policies; and

WHEREAS, the Utah State Legislature enacted House Bill 121 (2022) and Senate Bill 110 (2022), which require municipalities served by a public water system to include a Water Use and Preservation Element in their General Plan; and

WHEREAS, Alpine City, in coordination with its water providers and planning consultants, has prepared a Water Use and Preservation Element to assess water demand, outline conservation goals, support watershed protection, and align water resources with land use policies; and

WHEREAS, the proposed Water Use and Preservation Element complies with all statutory requirements and has undergone review by the Alpine City Planning Commission and the City Council in duly noticed public meetings; and

WHEREAS, pursuant to law, a public hearing to receive public comment and consider adoption of the Water Use and Preservation Element of the General Plan was held by the Planning Commission on December 2, 2025, at 6:00 p.m. in the City Council Chambers located at 20 North Main, Alpine, Utah 84004; and

WHEREAS, pursuant to law, the date, time, and place of the public hearing, and the right of citizens to be heard, was published at least fourteen (14) days prior to the public hearing; and

WHEREAS, all interested persons in attendance at the public hearing were given an opportunity to be heard, for or against, the Water Use and Preservation Element of the General Plan; and

WHEREAS, the City Council finds that adopting this element is essential to ensuring sustainable development, safeguarding water resources, and responsibly planning for future growth;

NOW, THEREFORE, BE IT RESOLVED by the City Council of Alpine City as follows:

The Water Use and Preservation Element of the General Plan attached hereto as *Exhibit A* and made a part of this Resolution is hereby approved effective December 9, 2025, and will be fully incorporated into the City's General Plan which was adopted under Resolution R2024-17.

SIGNED, EXECUTED AND RECORDED in the office of the City Recorder, and accepted as required herein.

PASSED AND APPROVED this 9th day of December 2025.

ALPINE CITY COUNCIL

By: _____
Carla Merrill, Mayor

[SEAL]

VOTING:

Jason Thelin	Yea ✓	Nay ___	Absent __
Jessica Smuin	Yea ___	Nay ___	Absent ✓
Kelli Law	Yea ✓	Nay ___	Absent __
Chrissy Hannemann	Yea ✓	Nay ___	Absent __
Brent Rummler	Yea ✓	Nay ___	Absent __

ATTEST:

_____
DeAnn Parry
City Recorder

DEPOSITED in the office of the City Recorder this 9th day of December 2025.

RECORDED this 9th day of December 2025.

EXHIBIT A

Water Use and Preservation Element of the General Plan

Horrocks.

Mayor Carla Merrill and Members of the Alpine City Council
Alpine City
20 N Main Street
Alpine, Utah 84004

Subject: Transmittal of the Draft Water Use and Preservation Element for General Plan Adoption

Dear Mayor Merrill and City Council Members,

On behalf of Horrocks Engineers, we are pleased to transmit the draft Water Use and Preservation Element of Alpine City's General Plan for your review and consideration for adoption.

This element has been developed in close coordination with Alpine City staff and in accordance with Utah Code §10-9a-401 and §73-10-32. It aligns with the City's 2025 Water Conservation Plan and reflects the goals of recent state legislation, including SB 76 and HB 121, to integrate water supply considerations with land use planning.

Key components of the element include:
- Population growth projections and corresponding water demand trends
- Analysis of existing water resources and system capacity
- Goals, objectives, and policies to reduce per capita water use
- Implementation strategies to ensure compliance, stewardship, and sustainability

We appreciate the efforts of your staff and utility partners, who contributed valuable data and guidance throughout this process. Alpine City office staff have reviewed the document, and it is ready for formal consideration by the Planning Commission and City Council.

We look forward to your feedback and can assist with final revisions, public hearings, or presentation materials as needed.

Sincerely,

Craig Nebeker, PE
Project Engineer
435-790-1323 | craig.nebeker@horrocks.com

Alpine City, Utah

Water Use and Preservation Element

Prepared as part of the Alpine City General Plan

December 2025

Prepared by: Horrocks Engineers
Craig Nebeker, PE
Project Engineer

Drew Geiger, PE
Project Manager

Executive Summary

Water Use and Preservation Element – Alpine City General Plan (2025 Update)

Alpine City's Water Use and Preservation Element establishes a comprehensive framework for managing water resources considering projected population growth, climate variability, and evolving state requirements. As a semi-arid community reliant on groundwater and surface water, Alpine faces challenges and opportunities to ensure the sustainability of its long-term water supply. This element—prepared in accordance with Utah Code §10-9a-403, HB 121 (2022), and SB 110 (2022)—integrates water planning into land use policy, capital improvements, and conservation strategies.

In 2024, the City had a population of 10,679 persons, which as a group, utilized 999 acre-feet of culinary water, including losses (leaks, un-metered connections, etc.) This generated a per capita consumption rate of 83.58 gallons per day. This is slightly higher than the five year average (2020 through 2024) which is 78.56 gallons per capita per day and average use of 921 acre-feet per year.

In 2024 the City also utilized 5,227 acre-feet of secondary water (including losses.) The generated per capita irrigation use rate was 437 gallons per day. This is also slightly higher than the five year average (2020 through 2024) which is 436 gallons per capita per day and average use of 5,111 acre-feet per year.

By 2045, the population is projected to grow to 13,208 people, possibly increasing culinary water demand from an average of 921 acre-feet to 1,163 acre-feet based on current usage patterns. The secondary water demand is expected to increase from an average of 5,111 acre-feet to 6,448 acre feet based on current usage trends. However, with a targeted 15% reduction in per capita consumption through conservation efforts over the next ten years, Alpine can limit the average culinary demand to 986 acre-feet and secondary demand to 5,474 acre-feet — thereby preserving resources while avoiding costly infrastructure expansion.

This element identifies seven key components:

1. Background and Purpose – Outlining the necessity for integrated water-land use planning.
2. Existing Water Sources and Use – Summarizing current sources, infrastructure, and consumption patterns.
3. Projected Growth and Demand – Forecasting future water needs based on population trends.
4. Water Conservation Goals – Establishing a measurable, long-term reduction target.
5. Implementation Policies – Defining specific strategies for development review, zoning, and education.
6. Compliance with State Law – Consistent with HB 121 and SB 110.
7. Plan Integration and Conclusion – Positioning water planning as a critical priority for Alpine's future.

Additionally, the plan outlines goals related to watershed preservation, source water protection, and sustainable land use patterns. It includes a population-water demand chart, detailed data table, and comprehensive planning policies and objectives. Alpine's commitment to conservation and resource protection ensures that its water future remains resilient, equitable, and sustainable.

Introduction

Water is a critical and finite resource for Alpine City, especially given its location in the mountain deserts of Utah where precipitation is low and seasonal demand for water is high. As the city plans for future growth and development, proactive water management must ensure a reliable, high-quality supply for residents, businesses, and essential services. This Water Use and Preservation Element provides a strategic framework for managing current resources, projecting future demand, and implementing effective conservation measures. In alignment with Utah Code § 10-9a-403, HB 121 (2022), and SB 110 (2022), this element integrates water preservation planning into Alpine's General Plan to guide land use decisions, infrastructure investments, and regional coordination.

Understanding Water Conservation vs. Water Preservation

While often used interchangeably, water conservation and preservation reflect different but complementary approaches to managing water resources. Water conservation focuses on the efficient use and reduction of water waste, encouraging practices such as using low-flow fixtures and watering lawns during off-peak hours. On the other hand, water preservation emphasizes the protection and stewardship of water resources over the long term, including maintaining watershed health, safeguarding source water quality, and ensuring sustainable land use patterns. These approaches guide Alpine City's commitment to a reliable, resilient water future.

Background: Water Use and Preservation in Alpine City

Summary of Present Conditions

Alpine City, located in Utah County, experiences a semi-arid climate characterized by hot summers, cold winters, and low annual precipitation. The city's water supply is sourced primarily from springs and is supplemented by deep well systems. The City has historically relied on its Water Conservation Plan to guide responsible water use practices.

Culinary Water System Description

Alpine City's water is primarily sourced from Grove Spring. The water is delivered via the city's pressure zone system to storage tanks strategically placed to provide the necessary capacity to each zone. Key infrastructure includes:

- Grove Tank
- 3MG Tank
- Hog Hollow Tank

- Box Elder Tanks
- Three Falls Tanks
- Willow Canyon Tank
- Major pipelines ranging from 6" to 20" diameter
- 8 Pressure Zones

In 2024, the system delivered approximately 1.4 Million gallons of culinary water during the peak day.

Water Consumption & Growth

- 2024 Water Use: 325.4 million gallons
- Population: ~10,679
- Per Capita Use: 83.58 gallons/day (in 2024) The 5 year per capita average is 78.56 gpcd.
- Growth Projection: 1.1% annual growth rate; population expected to reach 13,208 by 2045

Over the past three years, the city has achieved a 6.48% reduction in system water losses due to proactive leak detection, minimizing unmetered uses, and reducing water theft. These advancements are keeping culinary water use relatively low. When irrigation water is counted in the per capita use, the city is higher than the state conservation goals. This is mainly attributed to the larger lot sizes prevalent throughout the city and to pressurized irrigation water being provided to agricultural users. The city began installing individual pressurized irrigation meters in 2018. In 2023, customers began being billed based on actual usage on a tiered rate structure as a conservation measure. These actions have had a significant impact on water use reduction.

Projections of Change or Transformation

As Alpine City continues to grow, pressures on its water system are expected to increase. Population growth, land development, and climate variability will stress the current water infrastructure. Water-intensive landscaping and limited reuse systems may further contribute to peak-season shortages.

Statewide legislative changes—including HB 121 (2023), SB 76 (2023), and SB 110 (2022)—require municipalities to incorporate water use and preservation strategies directly into their general plans. In addition, the Utah Division of Water Resources has set regional water conservation goals that will necessitate new practices, technologies, and rate structures.

Current or Emerging Issues

Key challenges facing Alpine City's water future include:

- Undersized water storage tanks in some zones
- Aging infrastructure that may compromise leak detection and distribution efficiency;
- Limited public awareness of individual water use and conservation options;
- Adjust the existing modified tiered water rate structure to more strongly encourage efficiency;
- Compliance with new state mandates requiring measurable goals and policies in land use

planning documents.

Addressing these issues will require an integrated and forward-looking approach that links land use, fiscal policy, infrastructure investment, and community engagement.

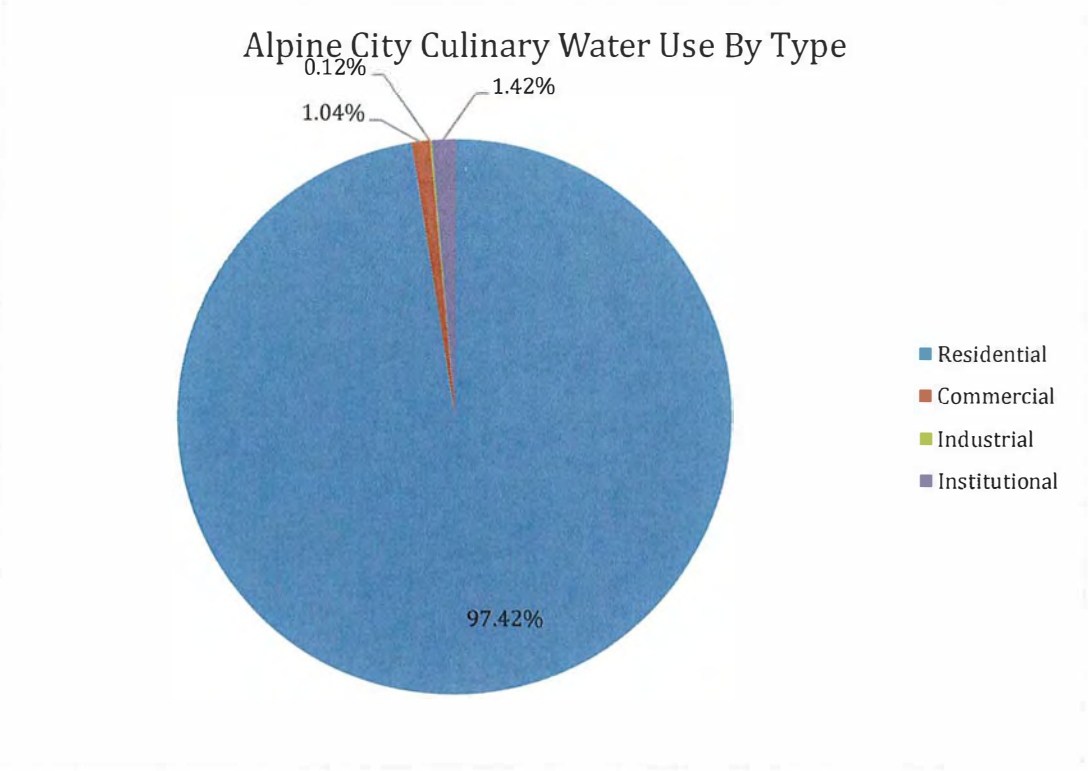
Water Use by Sector

The 2024 Public Water Supply Use Form shows the following breakdown of the culinary water use within Alpine City.

2024 Culinary Use by Type (Based on Usage at the Customer's Meter)

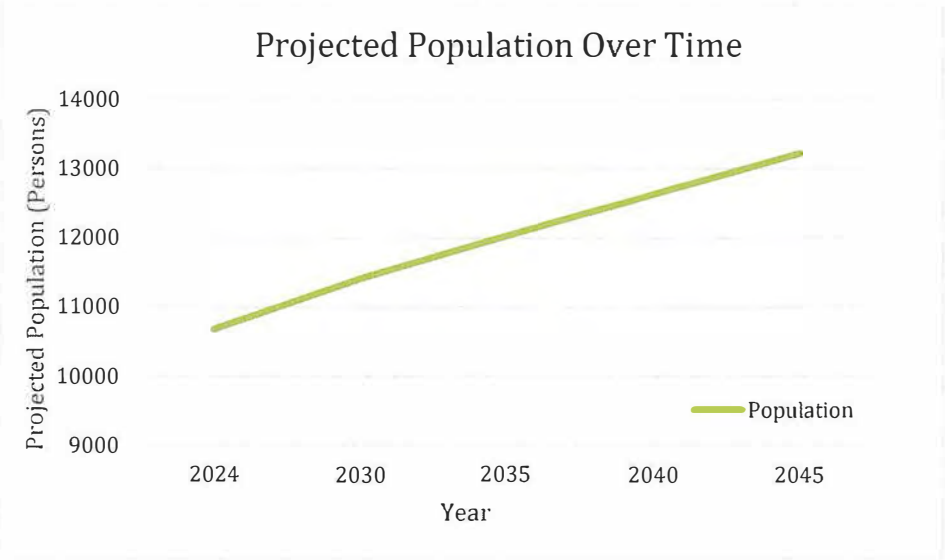
Type	Gallons	Ac-ft	% of Total
Residential	293,438,000	900.53	97.42%
Commercial	3,127,000	9.60	1.04%
Industrial	364,000	1.12	0.12%
Institutional	4,280,000	13.13	1.42%
Total	301,209,000	924.38	

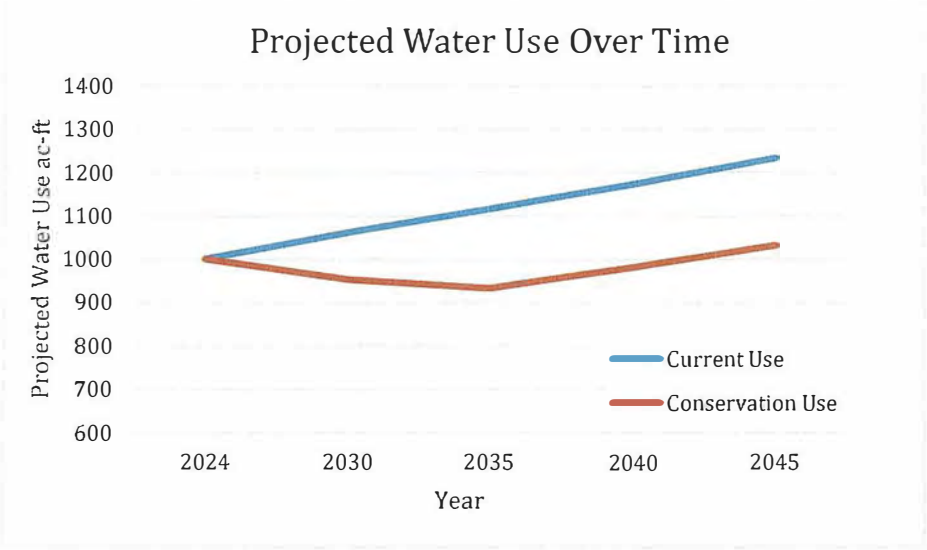
These figures demonstrate the predominance of residential water consumption in Alpine City. Understanding this distribution supports the City's focus on residential conservation programs and targeted policy interventions. The pie chart below provides a visual representation of sectoral water use.



Projected Water Use and Population Growth

Future projections show Alpine City's population continues to grow through 2045, while water usage trends reflect anticipated demand and potential conservation impacts. If no additional conservation measures are implemented, water demand may rise proportionally with growth. However, with sustained efficiency efforts, usage can remain more stable. The chart below illustrates projected trends for total population and water demand, with and without culinary conservation strategies.





In 2024, Alpine City population was 10,679 and culinary water use was approximately 999 acre-feet. The preceding charts illustrate how the culinary water use trend follows population growth projected through 2045. As the population increases from approximately 10,679 to 13,208 residents, total culinary water demand is expected to rise from 999 acre-feet to 1,234 acre-feet under current usage trends. The city has a goal to reduce water consumption by 15%

over the next 10 years. The following table shows expected trends at the 15% per capita reduction as the population grows.

Year	Projected Population	Projected Water Demand (acre-feet)
2025	10784	992
2030	11407	954
2035	12018	933
2040	12618	981
2045	13208	1032

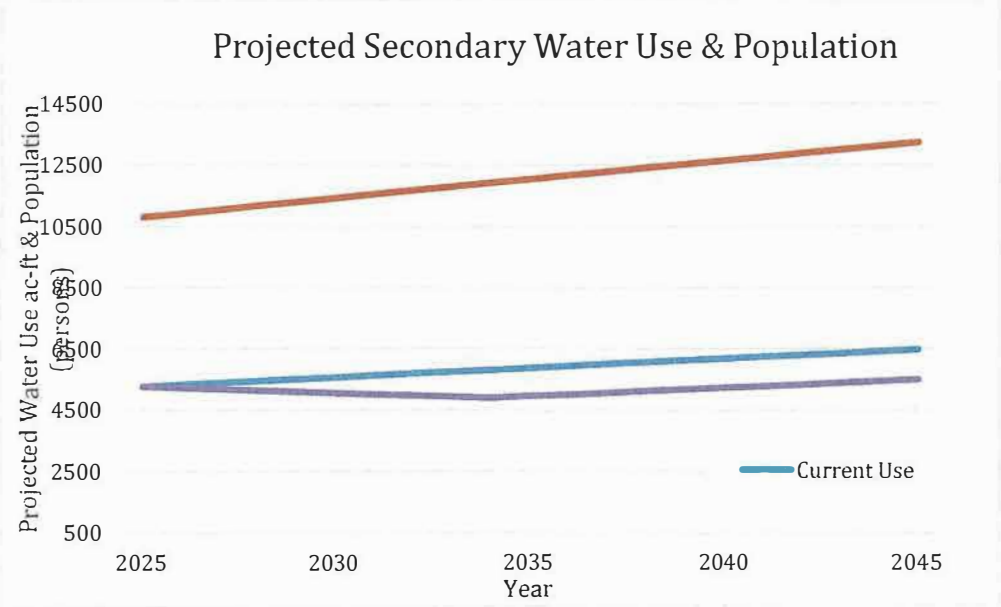
In 2035 when the 15% reduction goal is reached, the city will have a need for 933 ac-ft per year. Then, if no further conservation is done and the water use simply follows the population growth rate trend, the culinary demand will be 1032 acre-feet per year by 2045. An increase of only 40 acre-feet while increasing the population by over 2,529 people reflects good water preservation and conservation practices.

Secondary Water Use

Alpine City has a secondary water system in place that provides outdoor watering for most of the residents. Secondary meters were installed in 2018 with billing starting in 2023. Data is being gathered to project future trends.

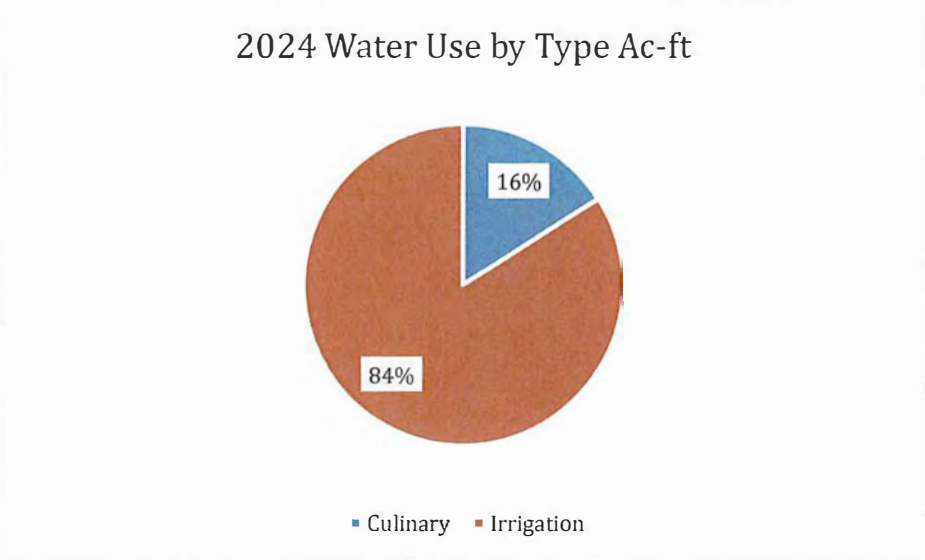
The city uses an average of 5,110 acre-feet of secondary water every year. The sources are deep wells, springs, and surface water. Some secondary water is also delivered to the city through the Central Utah Water Conservancy District (CUWCD).

The following chart shows the irrigation water trends in comparison to the population growth.



Following the current trend, by the year 2045, the city will need 6,448 acre-feet of secondary water. If the city were able to implement a 15% reduction in irrigation water use over the next ten years, and then maintain that quantity moving forward, by the year 2045 the irrigation need would be 5,475 acre-feet. The reduction is 973 acre-feet.

The following chart shows the irrigation water use compared with culinary water use for 2024.



As shown, most of the water used is secondary. Due to the largely residential population using the irrigation system, secondary water reduction is where the city will see its greatest water budget savings.

Vision Statement

> *Alpine City envisions a resilient, efficient, and sustainable water future where every drop is valued, infrastructure is modern and responsive, and the community works together to ensure that clean, reliable water remains available for future generations. Through proactive planning, technological innovation, and a shared conservation ethic, Alpine will lead by example in preserving its precious water resources amid growth and environmental change.*

Alpine City has identified strategic goals focused on measurable outcomes and long-term resilience to achieve this vision. These goals, supported by clear objectives and actionable policies, provide a framework for guiding decisions, allocating resources, and aligning future growth with sustainable water practices.

Water Use and Preservation Goals, Objectives, and Policies

Goal 1: Detect water leaks in the culinary system

Objective 1.1: Identify and repair at least 90% of leaks within 30 days of detection.

1. Policy 1.1.1: Create and execute a leak response protocol with specific response time targets.
2. Policy 1.1.2: Provide field crews with acoustic leak detection devices and training or obtain these services through a vendor.
3. Policy 1.1.3: Develop a tracking system to monitor leak incidents and repair status.

Objective 1.2: Reduce unaccounted-for water to below 10% of total system input

1. Policy 1.2.1: Conduct annual water audits following AWWA M36 methods.
2. Policy 1.2.2: Establish district metered areas (DMAs) to isolate and assess water losses.

Objective 1.3: Conduct an annual survey of the distribution system to identify hidden or underground leaks.

1. Policy 1.3.1: Obtain annual contracts for professional leak detection services.
2. Policy 1.3.2: Utilize GIS-integrated data to identify suspected leak areas.
3. Policy 1.3.3: Focus on older infrastructure for survey prioritization and replacement planning.

Goal 2: Establish a consistent and well-planned meter replacement program

Objective 2.1: Replace all malfunctioning meters identified during monthly readings.

1. Policy 2.1.1: Keep a performance log for each meter to identify recurring issues.
2. Policy 2.1.2: Procure replacement meters beforehand to minimize delays.
3. Policy 2.1.3: Establish meter replacement Key Performance Indicators (KPI) and report to the City Council annually.

Objective 2.2: Develop a 10-year meter lifecycle plan for systematic upgrades.

1. Policy 2.2.1: Catalog all meter types, ages, and conditions in a digital database.
2. Policy 2.2.2: Schedule replacements by neighborhood to enhance installation efficiency.
3. Policy 2.2.3: Forecast annual budget needs to support meter lifecycle upgrades.

Objective 2.3: Ensure that 100% of new meters are compatible with automated data collection.

1. Policy 2.3.1: Only adopt procurement standards for AMI-capable meters.
2. Policy 2.3.2: Test new meters for accuracy and data integration following installation.
3. Policy 2.3.3: Educate utility personnel on the latest meter technologies, software, and diagnostic tools.

Goal 3: Review the current water rate structure and implement necessary changes that encourage conservation

Objective 3.1: Implement a progressive water rate structure by the following fiscal year.

1. Policy 3.1.1: Conduct a rate study that evaluates tiered and seasonal pricing models.
2. Policy 3.1.2: Conduct public workshops to collect feedback on proposed rate changes.
3. Policy 3.1.3: Implement rate ordinance changes informed by usage data and equity analysis.

Objective 3.2: Reduce per capita water consumption by 10% within three years.

1. Policy 3.2.1: Design rate tiers to raise the cost per unit as consumption increases.
2. Policy 3.2.2: Combine pricing with rebate programs for more efficient fixtures.
3. Policy 3.2.3: Monitor usage trends monthly and engage high users with targeted outreach.

Objective 3.3: Improve billing transparency and customer education

1. Policy 3.3.1: Revise billing statements to display usage history and cost impacts.
2. Policy 3.3.2: Launch an online portal featuring real-time usage tracking tools.
3. Policy 3.3.3: Include seasonal conservation tips with each utility bill.

Goal 4: Protect and steward Alpine's water resources over the long term, including maintaining watershed health.

Objective 4.1: Preserve and restore the ecological functions of Alpine's watersheds.

1. Policy 4.1.1 Implement riparian buffer requirements along streams, creeks, and wetlands.
2. Policy 4.1.2 Prohibit development on steep slopes and high-erosion hazard zones within watersheds.
3. Policy 4.1.3 Collaborate with the U.S. Forest Service and state partners on watershed restoration projects.

Objective 4.2: Promote land use practices that support watershed sustainability

1. Policy 4.2.1 Integrate watershed protection priorities into the General Plan's land use map and zoning designations.
2. Policy 4.2.2 Require site designs in watershed areas to use low-impact development techniques (e.g., green infrastructure, pervious surfaces).
3. Policy 4.2.3 Limit impervious surface coverage in sensitive recharge zones and floodplains.

Objective 4.3: Educate and engage the public in watershed stewardship.

1. Policy 4.3.1 Create a city-sponsored watershed education program at schools and public events.
2. Policy 4.3.2 Post interpretive signage at trailheads and public access points near sensitive watershed areas.
3. Policy 4.3.3 Organize annual community watershed cleanup and monitoring days in coordination with local organizations.

Goal 5: Protect the quality of Alpine's source water to ensure safe and clean drinking water for current and future generations.

Objective 5.1: Maintain regulatory compliance through proactive source water protection planning.

1. Policy 5.1.1 Update and enforce source protection plans for all municipal wells and surface water intakes.
2. Policy 5.1.2 Establish interagency agreements to monitor and manage pollution threats near source areas.
3. Policy 5.1.3: Require proof of source protection plan compliance for development applications near protected zones.

Objective 5.2: Minimize contamination risks from land use and industrial activity. planning.

1. Policy 5.2.1 Prohibit hazardous materials storage or disposal in source water protection zones.
2. Policy 5.2.2 Require stormwater pollution prevention plans (SWPPPs) for all construction sites within 1,000 feet of a source.
3. Policy 5.2.3 Restrict new septic systems in areas overlying groundwater recharge zones.

Objective 5.3: Improve infrastructure to support long-term source water protection.

1. Policy 5.3.1 Prioritize replacement of aging water distribution infrastructure near source water areas.
2. Policy 5.3.2 Develop and maintain spill response protocols for transportation routes near source waters.
3. Policy 5.3.3 Evaluate redundant water source development opportunities to reduce system vulnerability.

Goal 6: Ensure sustainable land use patterns that align with Alpine's long-term water availability and conservation objectives.

Objective 6.1: Direct growth to areas with existing water infrastructure capacity.

1. Policy 6.1.1 Use the General Plan's Future Land Use Map to guide growth toward served and serviceable areas.
2. Policy 6.1.2 Require water system capacity analyses for all major subdivisions and rezoning requests.
3. Policy 6.1.3 Encourage infill development and discourage leapfrog sprawl beyond water service boundaries.

Objective 6.2: Coordinate land use approvals with long-range water planning.

1. Policy 6.2.1 Mandate water availability assessments before final approval of large-scale developments.

2. Policy 6.2.2 Require consistency between zoning amendments and the City's water master plan.
3. Policy 6.2.3 Include water demand projections in all Capital Facilities Plans and Impact Fee Analyses.

Objective 6.3: Promote compact and efficient land development forms that reduce water consumption.

1. Policy 6.3.1 Establish water-efficient development design guidelines for site plan review.
2. Policy 6.3.2 Provide density bonuses for projects incorporating comprehensive water-saving features.
3. Policy 6.3.3 Limit turf installation in new commercial, institutional, and multifamily developments.

Conclusion

Alpine City proactively addresses water sustainability challenges through integrated planning, targeted conservation measures, and infrastructure modernization. This Water Use and Preservation Element reflects a coordinated response to local conditions, regional conservation goals, and state legislative mandates. By prioritizing leak detection, meter efficiency, and conservation-oriented rate structures, the city is laying the foundation for a resilient water system capable of supporting future growth while reducing waste and protecting valuable water resources.

The success of this plan depends not only on municipal action but also on community participation and regional collaboration. As the City continues to grow and climate pressures intensify, the strategies outlined in this document will help ensure long-term water availability and system efficiency. Alpine City remains committed to leading with innovation, transparency, and stewardship, ensuring that future generations inherit a healthy, reliable, well-managed water supply.

Compliance with Utah State Law

This element meets the requirements of Utah Code §10-9a-403, which mandates that general plans include a water use and preservation component. It also complies with HB 121 and SB 110, which require cities to plan for drought response, conservation, and long-term water needs.

Sources

- Alpine City Water Master Plan (2025)
- Alpine City Water Management and Conservation Plan (2025)
- Utah House Bill 121 (2023) – Water Conservation and General Plan Requirements
- Utah Senate Bill 76 (2023) – Water Efficiency Amendments
- Utah Senate Bill 110 (2022) – Secondary Water Metering Requirements

- Utah Division of Water Resources – Regional Conservation Goals
- American Water Works Association (AWWA) M36 and M52 Guidelines
- Alpine City Population Estimates – Utah Governor's Office of Planning and Budget