

## **INTRODUCTION**

The Weber Basin Water Conservancy District (WBWCD or District) is a local governmental entity. The District is the legal agency covering over 2,500 square miles and representing the people in a five-county area of Utah. These counties include Davis, Morgan, Summit, Weber, and part of Box Elder. The District supplies approximately 60% of the potable water to the residences of Davis and Weber counties, which have an approximate total population of 650,000. The District is also the major supplier of secondary (irrigation) water to these northern Utah counties.

The District is governed by a nine member Board of Trustees (Board): three from Davis County, three from Weber County, one from the upper Weber County, one from Morgan County, and one from Summit County. Members of the Board are nominated by the legislative bodies of the respective Counties which they represent and are appointed by the Governor of the State of Utah, subject to confirmation by the State Senate. The composition of the Board provides a balance between the urban and rural areas included within the District. The District also has approximately 120 employees.

The core mission of the District is to:

- Conserve and develop water resources to provide for the demands of its customer agencies and to use those resources responsibly for the greatest benefit of the public.
- Manage, construct, operate and maintain the federal Weber Basin Project and District facilities to deliver reliable, safe, and ample water supplies to its customer agencies.
- Maintain responsible financial stability including sufficient funds and reserves for large-scale regional facility operation and maintenance, system emergencies and the repayment of bond, federal, and state financing.
- Supply high quality drinking water that meets regulations and to protect the watersheds of its source rivers and groundwater supplies.
- Responsibly carry out the delivery of agricultural and urban irrigation water to sustain local food production and urban landscapes with the application of water conservation principles.
- Develop and manage water resources in a manner that recognizes and mitigates consequences of climate change.

### **The Water System**

The Weber Basin Project (Project) was planned by the United States Bureau of Reclamation to conserve and utilize practically all the flows of rivers and streams in the natural drainage basin of the Weber River, including the basin of the Ogden River, its principal tributary. Other areas encompassed are those lying between the west slope of the Wasatch Mountains and the east shore of the Great Salt Lake. The District administers the delivery of Project water, operates, and maintains the Project facilities, and has contracted with the U.S. Government for repayment of reimbursable costs of the Weber Basin Project.

Water is delivered from the Weber River through the Gateway Canal and subsequently through two aqueducts: the Davis and Weber Aqueducts. The Davis Aqueduct extends to the south from the Weber Canyon along the foot of the Wasatch Mountains to North Salt Lake. Part of this water is pumped for irrigation of lands above the aqueduct; the remainder of the water is sold by the District to irrigation companies, improvement districts, sub-conservancy districts, and individual landowners. These communities and sub-conservancy districts are dependent upon the Weber Basin Water District as the primary water utility. Water is processed for drinking water through the District's Davis North Water Treatment Plant (WTP) for distribution to communities in North Davis County, and through the Davis South WTP for communities in the south end of Davis County.

The District's other major aqueduct, the Weber Aqueduct, conveys irrigation water to lands on the Uintah Bench, and municipal and industrial water to Ogden and adjacent communities in Weber County. Part of the irrigation water is pumped to lands above the aqueduct and the remainder is delivered by a gravity pressure distribution system. At the terminal of the aqueduct, water is delivered to the District's Weber South Water Treatment Plant (WTP) from which it is distributed to Ogden City and surrounding communities.

Project laterals from these aqueducts include pipe systems that distribute irrigation water to farmland and suburban areas. The project includes the Willard Canal extending north, and the Layton Canal extending south from the Weber River in conjunction with other canals to serve the lower project lands adjacent to the Great Salt Lake. The project also includes drains for lower lands in the east shore area. Twenty-one deep wells supplement water supplies in dry periods and to meet peak water demands. The District's water system facilities assessed in this Plan are identified in Section 2.0, Table 2.3, shown in the system flow charts in Appendix A, and located on the hazard maps in Appendix C.

### **Past Development**

Since the District's original (2011) Multi-hazard Mitigation Plan, and subsequent (2018) Multi-hazard Mitigation Plan, WBWCD has seen significant growth and development within its own water system, as well as within the communities it serves. Since the latest 2018 Plan, the population served by WBWCD increased by approximately 5% from 2018 to the present. The majority of this increase can be attributed to the residential growth within Davis and Weber Counties, whose populations have also increased by approximately 5% since 2018. This population growth has made the District and its water system more vulnerable to natural hazards (due to increased system size) and also the consequences of potential hazard vulnerabilities have increased (due to a larger population served).

Development within WBWCD's water system over the last five years has included new construction, as well as upgrades to existing facilities. Since 2018, the District has added several new facilities, including: two new culinary wells, a new water reservoir in Kaysville, and a water conservation building in Layton. These facilities were built to current building code standards for earthquake, wind, and snow loads. This new construction has helped reduce the District's natural hazard vulnerabilities. The District has been very proactive with regard to natural hazard mitigation. The District has implemented many of the planned mitigation measures that were listed in the 2011 and 2018 FEMA approved mitigation hazard mitigation plans. The District has also replaced, or soon will replace several facilities, as described in Table 2.3.

### **Future Development**

Future issues for the District center around development of sufficient water supplies and facilities to meet the needs of the growing population within its boundaries. Water conservation plays an increasingly important role as new sources are likely to be difficult and expensive to develop. Water demands on the District are projected to double in the next 40 years even with the assumption that the existing per capita use will reduce significantly. These projections, along with the constant need to upgrade and rehabilitate existing infrastructure, push the financial needs projections to one half billion dollars over the next 30 years. Beyond conservation, new projects will include completion of groundwater drilling, change of use of local river supplies and possibly a large regional importation project. Therefore the future development of the WBWCD water system consists of both short term and long term additional water supply facilities with a strong emphasis on water conservation and incorporation of natural hazard mitigation as discussed below.

The District's short term development of additional water supply facilities includes the planned addition of wells in the Bountiful, Kaysville, and North Ogden areas of the District's service area. The new Green Road and Fruit Heights Wells are scheduled to be completed by 2023. The new North Ogden Well is

schedule to be completed in 2025. The District's long term additional water supply facilities include development of additional irrigation water supplies and conveyance systems.

In addition to development of future water supplies, WBWCD is very proactive in its water conservation efforts through the Weber Basin Water Conservation Garden and the District's water conservation programs. Weber Basin Water Conservancy District has committed, along with other members of the Utah Governor's Water Conservation Team, to reduce per capita water use 25 percent by the year 2025. This is a statewide goal that all agencies are working toward. This conservation goal will assist the District in meeting water demand needs, while future water development is planned and implemented. If future population projections occur, conservation coupled with future water development will be needed to meet all water demands.

Water conservation is part of the Weber Basin Water Conservancy District's mission to provide water to meet all the demands of its customers for various uses including: agriculture, irrigation, industrial uses, drinking water and even recreation. The District views water conservation as a future water supply and has therefore developed a water conservation plan that outlines how conservation fits into the larger water supply picture.

The greatest potential for water conservation exists with landscape irrigation. It is estimated that 60-65 percent of all municipal water use goes toward irrigation of landscapes. Much of that water is considered wasted because of the inefficiency of sprinkler systems, poorly designed sprinkler systems, or human behavior in not managing the water. There is also a direct correlation with water use and landscape health. Too often, homeowners are applying about twice as much water as they need to keep lawns and gardens healthy and maintain the landscapes they desire.

This is one of the main reasons WBWCD has created the Weber Basin Water Conservation Learning Garden to demonstrate and encourage the wise use of water in Utah landscapes. The Learning Garden was designed to be a beautiful, educational place, where anyone can come and learn the basic principles of proper landscaping to achieve water savings and have the aesthetic quality desired from a home landscape. There are several areas of the garden that have a specific purpose and principle to teach including landscape design, plant selection, irrigation and how the areas are maintained. The Garden is approximately two acres in size and provides the public an opportunity to see and learn a variety of proper landscape information. The District has recently constructed a Conservation Building at the Davis North WTP. This facility is used for regularly scheduled water conservation classes and other public meetings. Public meetings and public education sessions are held on an approximately monthly basis throughout the irrigation season (from June to October).

The water saving landscape principles that are demonstrated include: proper planning and design, proper use of beautiful plant material (right plants in the right places), proper use of turf, efficient irrigation, various irrigation system methods, soils, mulches, and maintenance. Visitors can see various turf varieties, mulches, native plants, hardscaping ideas, vegetable raised beds and example front and back yards meant to provide ideas and education to all visitors.

In addition to the Weber Basin Water Conservation Learning Garden, the District maintains other conservation programs and provides information on its website. The different conservation programs include: water checks, landscape ordinances, public education, conservation goals, "Slow the Flow" programs, secondary water metering, city websites, and rebates. Conservation information provided on the District's website includes classes and events, publications and resources, garden photo gallery, and conservation tips.

The design of future WBWCD facilities will meet current International Building Code (IBC) standards, which account for conditions associated with natural hazards (i.e., earthquake, severe winter weather,

severe winds, etc.). The District will continue in its current efforts to address and incorporate natural hazard mitigation (i.e., seismic upgrades/standards, backup power, and other measures listed in this plan) into future design and construction projects whether they are for new facilities or for capital replacement projects.

## **1.0 PLANNING PROCESS**

Preparation of this updated WBWCD Multi-hazard Mitigation Plan (MMP or Plan) was accomplished using a three-phase approach, which included:

- Phase I: 2023 Update to Planning Process
- Phase II: 2023 Update to Natural Hazard Risk Assessment and Mitigation Actions
- Phase III: Plan Adoption

Phase I was used to define the planning process for the Plan update and included meetings with District personnel to complete the major elements of this phase. The planning process was reviewed and the stakeholders list was prepared for the public involvement program. During this phase, the original 2011 Plan and subsequent 2018 Plan were reviewed. It was determined that the overall layout of the 2023 plan would follow the format of the 2018 Plan directly, and that the 2023 Plan update would incorporate any new facilities added since the 2018 plan was issued or any changes in the use of facilities since the development of the 2018 plan.

The first component of Phase II included revision to Natural Hazard Risk Assessment. The 2023 plan update included several revisions to the 2018 hazard identification and risk/vulnerability assessment. The prior assessments of the District's facilities (done during the development of the 2011 and 2018 plans) were reviewed for selected natural hazards based on current hazard data. Updated descriptions of the natural hazards affecting key water facilities were documented including an analysis of how hazards vary across facilities, location & extent (severity) of each natural hazard affecting the facilities, and updates on previous hazard occurrences. A screening process was used to limit the facilities assessed to those with High or Moderate risk of hazard. The vulnerability assessment task included research, document reviews, and interviews of WBWCD staff. The assessment also included review of existing hazard studies and reports provided by engineering consultants during development of the original WBWCD MMP. Current hazard studies incorporate updated aqueduct fault crossing analyses and updates to seismic analyses of structures and nonstructural components. Prior District-specific geotechnical landslide analysis, and a District-specific liquefaction analyses were also used in the current 2023 plan (see Appendices C and D). Each facility's vulnerability to each hazard was documented. This included rating of the impact of each hazard. The consequence assessment task included determining the system loss of service for each key facility for each hazard. Meetings were held with the District to review the results of Phase II. The second component of Phase II included revision of the Mitigation Strategy. The 2023 Plan update included several revisions to the 2018 Plan to include new facilities, delete facilities no longer owned, and reflect updated information of mitigation priorities. The mitigation strategy included development of mitigation actions based on risk assessment results to lower the natural hazard risk and consequence of failure of District facilities. This was accomplished by conducting the following tasks: analyze previous mitigation actions, identify and develop specific mitigation actions, prioritize action items, and review and update the current implementation plan. The mitigation actions were further developed with planning level order of magnitude cost estimates. For the highest priority mitigation projects, more detailed benefit cost analyses (BCAs) were developed. A mitigation implementation plan was developed for the various hazard mitigation projects and included project prioritization, potential funding source identification, and proposed implementation schedule. A Stakeholder meeting was held to present the results of Phases I- II to the Stakeholders, receive Stakeholder input, and provide a scope and schedule update for completion of the Plan update.

The draft Plan was reviewed by the District, presented to Stakeholders, then revised and submitted to the State of Utah for review. After addressing State comments, the updated Plan was submitted to FEMA for review and approval. After receiving conditional approval of the updated Plan from FEMA, the Plan was presented to the WBWCD Board for adoption. Finally, the signed adoption resolution was submitted to FEMA for final Plan approval (Phase III).

**1.1 Planning Team**

The planning team was made up of WBWCD managers and engineers, as well as a risk management consulting firm (VIE Engineers, Inc.) and are listed in Table 1.1. This team relied on prior risk assessments on mitigation planning from the 2011 and 2018 District FEMA approved hazard mitigation plans, as well as additional risk analyses conducted subsequent to the 2018 Plan.

Table 1.1 Planning Team – Key Planners

<b>Team Member</b>	<b>Organization, Position Title</b>
Josh Hogge	Weber Basin Water Conservancy District, Manager, Municipal & Industrial Water
Derek Johnson	Weber Basin Water Conservancy District, Engineering Manager
John Masek	VIE Consultants, Inc., Structural Engineer and Risk Management Consultant
Ashley Nay	Weber Basin Water Conservancy District, Engineer
Brad Nelson	Weber Basin Water Conservancy District, Assistant General Manager
Riley Olson	Water Supply and Power Manager
Jon Parry	Weber Basin Water Conservancy District, Assistant General Manager

**1.2 Stakeholder Involvement**

This section documents the involvement of federal, state, regional, and local stakeholders in the development of this WBWCD Multi-hazard Mitigation Plan. The WBWCD Plan affects many jurisdictions, agencies, and organizations including water user/customer agencies, municipalities, regional and county organizations, and federal and state agencies. Stakeholder involvement was attained during meeting with WBWCD’s stakeholders was held on 09/08/2022. This meeting was held to inform the stakeholders about the planning process, present evaluation results, and solicit comments and feedback. Refer to Appendix M for further information regarding stakeholder involvement in development of the District’s current Plan. Recently, the District was awarded a FEMA BRIC grant for its highest priority mitigation project: seismic hazard mitigation for the Davis Aqueduct. A televised press conference was held in Provo on August 29, 2022, where an outline of this project was presented by District management as well as State and FEMA representatives. The District also holds public meetings on approximately a monthly basis at its Water Conservation Building in Layton Utah. These meetings are primarily focused on informing the public about the District’s drought mitigation strategies and providing training on installation of drought tolerant landscaping.

In addition to direct stakeholder input, the District has also reviewed other pertinent FEMA approved hazard mitigation plans (as well as plans that are in the final draft stage as of the writing of the District’s Multi-hazard Mitigation Plan). The plans reviewed have geographic or functional relevance to the District owned or District operated facilities. These plans included:

- 2022 Pre-Disaster Mitigation Plan for Summit, Utah, and Wasatch Counties
- December 2022 Bear River Association of Governments Pre-Disaster Mitigation Plan
- Davis County, Utah Pre-Disaster Mitigation Plan 2021 Update
- Weber County, Utah 2022-2023 Pre-Disaster Mitigation Plan Update (in draft stage)
- 2019 Salt Lake County Hazard Mitigation Plan
- 2019 Utah State Hazard Mitigation Plan
- 2018 WBWCD FEMA Approved Hazard Mitigation Plan
- 2011 WBWCD FEMA Approved Hazard Mitigation Plan (Includes Seismic Report in Appendix D)
- 2018 WBWCD Drought Contingency Plan (Appendix B)

Mitigation strategies proposed in the WBWCD Pre-disaster Mitigation Plan supported many of the goals of these plans. Specifically, where District owned and operated facilities exist in geographic areas under the jurisdiction of the plans, the District’s mitigation strategies supported these other plans where the

District had authority to do so. This is implicitly done any time the District improves that natural hazard resilience of water infrastructure within communities under its own jurisdiction and within the jurisdiction of related plans listed above. In addition, the District will monitor and evaluate its Multi-Hazard Mitigation Plan in conjunction with updates made to the State or regional (Weber/Morgan County and Davis County) plans that include the District's water system. The District will formally update its Multi-Hazard Mitigation Plan and submit a plan update to FEMA every five years.

### **1.3 Plan Adoption (PHASE III)**

FEMA provided conditional approval of the WBWCD Multi-hazard Mitigation Plan pending adoption of the Plan by the local governing body for WBWCD (the WBWCD Board). The WBWCD Board passed a resolution adopting the Plan during a board meeting held on March 3rd, 2023. A copy of the signed WBWCD Board resolution is provided in Addendum #1.