

Annex H Citrus Heights Water District

H.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Citrus Heights Water District (CHWD or District), a previously participating jurisdiction to the 2021 Sacramento County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to the District, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

H.2 Planning Process

As described above, the CHWD followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Sacramento County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table H-1. Additional details on Plan participation and District representatives are included in Appendix A.

Table H-1 CHWD – Internal Planning Team

Name	Position/Title	How Participated
Todd Jordan	Director of Operations	Project Manager for CHWD. Attended meetings. Assisted with Plan development.
Brenna Howell	Emergency Manager (contracted)	Lead EM on project with PM. Attended meetings. Plan development.
Brian Hensley	Water Resources Supervisor	Assisted with Plan development
Kelly Drake	Field Services / Safety Officer	Assisted with Plan development
Kathy Abarca	Management Analyst	Assisted with Plan development.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously FEMA-approved 2021 LHMP into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2021 LHMP through other plans and programs shown in Table H-2.

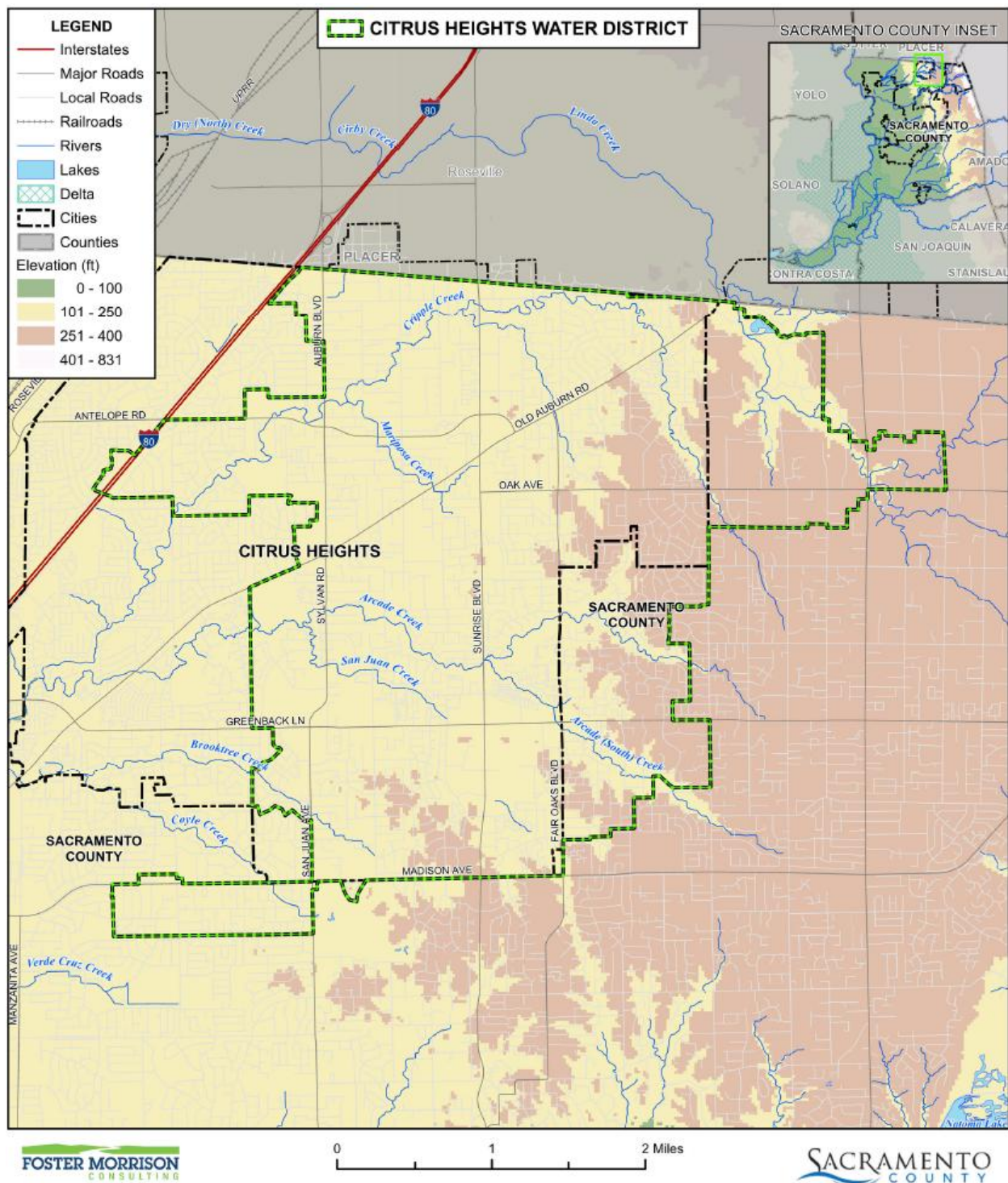
Table H-2 2021 LHMP Incorporation

Planning Mechanism 2021 LHMP Was Incorporated or Implemented Through	Details
Emergency Operations Plan	Used LHMP reference and integration
Water Emergency Response Plan and Assessment	Used LHMP to inform documents about threats and hazards affecting CHWD
Environmental Documents	Wells #7 & #8 are currently under construction. LHMP was used for permits for the wells.

H.3 Community Profile

The community profile for the CHWD is detailed in the following sections. Figure H-1 displays a District map and the location of CHWD within Sacramento County.

Figure H-1 CHWD



Data Source: Sacramento County, Cal-Atlas; Map Date: 6/16/2026.

H.3.1. Overview and Background

The Citrus Heights Water District is an Irrigation District, founded in 1920, operating under the State of California Water Code. CHWD provides drinking water to an estimated service area population of 67,000 customers via approximately 20,500 water service connections in Sacramento and Placer Counties, including about 60% of the area within the boundaries of the City of Citrus Heights. The District sits between 200 and 300 feet above mean sea level (as can be seen on Figure H-1). Like the rest of the County, the District has a Mediterranean climate. The District constructs and maintains water facilities and supplies domestic water in an area of approximately 12.8 square miles, including a system of approximately 250 miles of underground pipes, approximately 2,200 fire hydrants and valves, and nearly 20,500 water service connections. The District has 23 interconnections with neighboring water agencies to provide water in the event water from Folsom Lake, or its wells are unable to provide adequate water supply.

H.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. “It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.”

The CHWD risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the District’s potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the District Profile above, a risk assessment was performed for the District utilizing the existing District boundaries. This includes the following sections:

- H.4.1 Assets Inventory and Growth and Development Trends
- H.4.2 Hazard Identification
- H.4.3 Hazard Profiles and Vulnerability to Specific Hazards

H.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the CHWD’s total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the CHWD’s total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the District, potentially at risk to identified hazards as discussed in Section H.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the District, both current and future, is presented.

Assets Inventory

The District's asset inventory is detailed in the following sections:

- People and Populations
- District Assets and Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section H.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. This section includes an inventory of past and current populations of the District and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the District and potentially at risk to hazards. Information from the District and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

The most important asset within any community are the people and populations that both work and reside in the District. For special districts, this generally includes District staff and contractors as well as those populations located within its boundaries and served by the District. The District has 43 staff that work for the District. The District provides services to 67,000 customers via approximately 20,500 service connections.

The District does not maintain a list of vulnerable customers but noted that they serve several senior homes and outpatient facilities in the District service area.

District Assets and Critical Facilities and Infrastructure

This section considers the CHWD's assets at risk, with a focus on key District assets such as structures, critical facilities and infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-risk Populations Facilities, (3) Hazardous Materials Facilities.

Most of the District assets are considered Category 1 critical facilities, specifically essential services facilities. Table H-3 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. CHWD's physical assets, valued at over \$10 million, consist of structures, critical facilities and infrastructure, and other District assets to support the District's operations.

Table H-3 CHWD Assets: Structures, Critical Facilities and Infrastructure, and Other Facilities

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Sylvan Rd Corporation Yard*	Land & Buildings	\$5,819,000	Earthquake, Dam Failure, Drought
Madison Property	Land & Buildings	\$2,667,000	Earthquake, Dam Failure, Drought
Well Sites**	Wells & Buildings	\$2,234,000	Earthquake, Dam Failure, Drought
Total		\$10,720,000	

Source: CHWD

*Includes Sylvan Well and associated equipment

**Well Sites Include: Mitchell Farms Well, Skycrest Well, Bonita Well, Sunrise Well, and Palm Well

Community Lifelines

Assessing the vulnerability of the CHWD to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical** – Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management

- **Energy** – Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material** – Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Sacramento County Planning Area serving as a partnership between the cities, local special districts and agencies, and Sacramento County. Most all of the District's community lifelines overlap with the Planning Area's and include many of the critical facilities and infrastructure assets inventoried for this LHMP. As such, specific information on these community lifelines in the District and how they may be affected by a hazard event or disaster are discussed collectively for all jurisdictions in the Base Plan.

Natural, Historic, and Cultural Resources

Natural Resources

CHWD has a variety of natural resources of value to the District. These natural resources parallel that of the City of Citrus Heights as a whole. Information can be found in the City of Citrus Heights Annex to this Plan Update.

Historic and Cultural Resources

CHWD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of the City of Citrus Heights as a whole and portions of Sacramento County. Information can be found in the City of Citrus Heights Annex and Chapter 4 to this Plan Update.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the CHWD to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the District.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

CHWD's physical assets, valued at over \$10 Million, consist of the buildings and infrastructure to support the District's operations. This includes the District's Corporation Yard, Madison Avenue Office, and various well sites throughout the area. Other economic assets in the District were listed in the City of Citrus Heights Annex and Chapter 4 to this Plan Update.

Community Activities of Value

Inventorying economic assets in the District and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring money into the communities such as sports tournaments and other recreational activities. Community Activities of Value for the City of Citrus Heights were discussed in Section A.4.1 of the City of Citrus Heights Annex and for the County, within Chapter 4 of the Base Plan, and are assumed to be the same or similar for the District.

Growth and Development Trends

As part of the planning process, the District looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This inventory section details both development since the 2021 LHMP and future development/redevelopment projects that are likely to occur over the next five years covered by this 2026 LHMP. For Districts, future development/redevelopment generally includes the following:

- Construction/development projects related to adding new District facilities, infrastructure, land acquisition, etc.
- Plans for expansion or build out of the District's service area, including new service hookups, and other District functions related to where the District will be expanding services.

Population Trends and Projections

The overall population of the District is slowly growing, as shown in the City of Citrus Heights Annex to this Plan Update.

Development since 2021 Plan

Though development is not controlled by CHWD, the District does plan for future water uses. New connections are added by the District as new development occurs. The number of existing water hookups has been flat since 2021. Wells are currently in design, but no development has occurred since 2021. No increase to natural hazards to the District has occurred since 2021.

Future Development Areas

It is important to review future development plans for the District. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards. The District has no control over future development in areas the District serves. Future development in these areas parallel that of the Citrus Heights and portions of Sacramento County. Though development of the District service area is not controlled by CHWD, the District does plan for future water uses. New connections are added by the District as new development occurs. The 2025 CHWD Urban Water Management Plan (UWMP) noted that some additional growth is expected. The UWMP noted that although in the early stages, redevelopment

of the Sunrise Mall is expected. The proposed project includes redevelopment and conversion of the existing parcels into residential and commercial properties. A total of 2,220 residential units could be added, including a mixture of townhouses, multi-family lifestyle units (apartments, flats, and mixed-use), and senior housing, while commercial operations could include a hotel, retail shops, offices, and community and institutional developments totaling 1,730,000 square feet.

H.4.2. Hazard Identification

The CHWD identified the hazards that affect the District and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the District (see Table H-4). Those hazards identified as a high or medium significance in Table H-4 are considered District priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the District were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the District to focus resources where they are most needed.

Table H-4 CHWD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Aquatic Nuisance Species (plant/animal)	Limited	Occasional	Negligible	Low	Low
Climate Change	Extensive	Likely	Negligible	Low	–
Dam Failure	Significant	Unlikely	Catastrophic	Medium	Medium
Drought & Water Shortage (w/tree mortality)	Extensive	Likely	Limited	High	High
Earthquake (w/subhazards)	Extensive	Occasional	Limited	Medium	Low
Flood: 1%/0.5%/0.2% annual chance	Significant	Likely	Negligible	Low	Medium
Flood: Localized Stormwater	Extensive	Highly Likely	Negligible	Low	Medium
Landslides, Mudslides, and Debris Flow	Limited	Occasional	Negligible	Low	Medium
Levee Failure	Extensive	Occasional	Negligible	Low	Medium
Sea Level Rise	Limited	Likely	Negligible	Low	High
Severe Weather: Extreme Cold and Freeze	Extensive	Occasional	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Negligible	Low	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)	Extensive	Highly Likely	Negligible	Low	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Negligible	Low	Low
Subsidence	Significant	Unlikely	Negligible	Low	Medium
Wildfire (w/ smoke and air quality)	Significant	Unlikely	Negligible	Low	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years. Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact					

H.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for the CHWD's priority hazards (i.e., those ranked of medium or high significance specific to the District as identified in the Significance column of Table H-4). This section focuses on where and how the District is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Sacramento County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
 - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
 - ✓ **Location and Extent** – Location is the geographic area within the District that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
 - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCEM events are also discussed. Other past occurrences data specific to the District follow the disaster declarations and NCEM events for each hazard.
 - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Vulnerability Overview** – A general discussion of the hazard vulnerability and related issues is detailed here.
- **Local Concerns** – This includes District provided information on how the District is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section H.4.1 above, with a few exceptions. This includes sections on: People and Populations; District Assets: and Critical Facilities, and Other Facilities; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are common to all jurisdictions and are fully covered in Section H.4.1 above and in Chapter 4 of the Base Plan, and in the Citrus Heights Annex where the District is primarily located.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the District and its assets. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development may affect the hazard is also included. This considers both new District assets and improvements as well as any changes with the District’s service area.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. Most of the Sacramento County Planning Area is served by PG&E and SSMUD. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California’s three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan. PG&E noted no PSPS events in the Sacramento County Planning Area since the 2021 LHMP. SMUD noted that it has had no PSPS events for its service territories since 2021.

Local Concerns

There have been no intentional (including PSPS events) or unintentional power outage issues associated with hazard events affecting the District since 2021. However, with an increase in climate change related issues (e.g., extreme heat conditions, atmospheric river storms) occurring in the Sacramento County Planning Area, the potential for future hazard related power outages remain a concern. The District noted it has sufficient backup power to mitigate against any power outages in the future.

Hazard Profiles and Vulnerability Assessment by Hazards

The following sections provide the hazard profile and vulnerability assessments for each of the priority hazards identified in Section H.4.2 Hazard Identification.

Dam Failure

Likelihood of Future Occurrence–Unlikely

Vulnerability– Medium

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States. In addition, with storms increasing in volume and intensity, as seen with the atmospheric river events of recent years, controlled releases from dams can also impact downstream levees and flood control structures resulting in increased and widespread flooding.

Dam failures, for purposes of this Plan, can also result from any one or a combination of the following:

- Earthquake
- Overtopping and uncontrolled releases
- Controlled releases
- Inadequate spillway capacity resulting in excess overtopping flows
- Internal erosion caused by embankment or foundation leakage, or piping or rodent activity
- Improper design
- Improper maintenance
- Negligent operation
- Failure of upstream dams on the same waterway

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Location and Extent

Note: The Folsom Dam, a High Hazard Dam located within the Sacramento County Planning Area as shown on the Inventory Map (see Section 4.3.8 of the Base Plan) is owned and operated by the US Bureau of Reclamation (USBUR). In recent years, Folsom Dam has been undergoing a series of improvements, including the Folsom Dam Raise Project, intended to help further reduce flood risk in the Greater Sacramento Area. With respect to the High Hazard dams with an inundation in the Sacramento County Planning Area, it should be noted that a dam inundation layer was not available for use from the USBUR for the High Hazard Folsom Dam. Given its location in the Sacramento County Planning Area, and relying on inundation data from previous Sacramento County LHMPs, the Folsom Dam still poses a threat of flooding to downstream communities should a dam incident occur. This may include both uncontrolled and controlled releases resulting from extreme precipitation events as well as other hazard events contributing to a dam failure such as a significant regional earthquake event.

An inventory map of dams located within and around Sacramento County was shown in Section 4.3.8 in the Base Plan. Inundation mapping and analyses were conducted on Extremely High and High Hazard dams with inundation areas located in the Sacramento County Planning Area. The District sits outside of the dam inundation areas, analyzed for this Plan. As such, no mapping or tabular analysis is presented. However, based on the Folsom dam inundation analyses included in the 2021 and 2016 Sacramento County LHMPs, areas of the District fall within the previous dam inundation areas for Folsom. It is thus assumed that, while not quantified, the District remains at risk and vulnerable to a future Folsom dam incident.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property. These were discussed in more detail in Section 4.3.8 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event). The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations for dam failure in Sacramento County.

NCDC Events

The NCDC does not contain any dam failure events for Sacramento County.

CHWD Events

The District Planning Team noted no past occurrences of dam failure of any type to affect the District.

Climate Change and Dam Failure

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with dam failure. More information on future impacts to the District can be found below and in the Future Conditions/Future Development section of the Vulnerability Assessment below.

The 2023 California State Hazard Mitigation Plan noted that modeling described in California’s Fourth Climate Change Assessment projects less frequent but more extreme daily precipitation. Year-to-year precipitation will become more volatile, and the number of dry years will increase by mid-century. As the climate continues to warm, atmospheric rivers will carry more moisture, and extreme precipitation may increase. Climate model projections show a tendency for the northern part of the State to become wetter. Increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the potential for dam failure and uncontrolled (and controlled) releases in Sacramento County. The District could be affected by these changes, especially in those areas of the District located within dam inundation areas.

The 2024 Sacramento County CAP noted that climate change is likely to lead to changes in the frequency, intensity, and duration of extreme weather events. The County is projected to experience a steady increase in average annual precipitation through the end of the century, with much of that precipitation likely to occur during extreme precipitation events, which can lead to flood impacts. According to Cal-Adapt, the historic average annual precipitation in Sacramento County is 18.3 inches, and the historic average annual number of extreme precipitation events is four. The average annual precipitation across the County may rise upwards of 22 inches, with the number of extreme precipitation events potentially exceeding 7 per year by the end of the century, depending on the level of current and future GHG emissions.

In general, California exhibits “booms and busts,” which refers to the existence of both very wet years and very dry years. The amount of precipitation that falls in any particular year is largely influenced by occurrences of large, discrete winter storms, also known as atmospheric rivers, which often provide a substantial fraction of the region’s annual precipitation, inclusive of the county. In California, atmospheric rivers vary in intensity; some are beneficial for water supply and replenish snowpack that naturally melts during the summer, serving as the water supply for people and agriculture, while others are responsible for widespread and adverse impacts (NOAA 2023). Extreme precipitation from these atmospheric rivers in the future may prove to be more variable, volatile, and potentially more severe. These extremes are most likely to occur during storm events, leading to more severe damage from waves and floods, thus possibly leading to more dam failure events, including the need for more controlled releases from dams.

The 2025 CHWD UWMP noted that annual precipitation projections show no significant trend in the median of change over the 21st century.

Vulnerability to Dam Failure

The vulnerability of the District to dam failure flooding would vary depending on which dam fails and the nature and extent of the dam failure and associated flooding. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam. A dam failure can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is generally confined to the areas subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the facility and associated revenues that accompany those functions. For the District, a dam failure also results in a loss of surface water. Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding.

An assessment of a community's vulnerability to dam failure begins with an understanding of local exposure to dam failure. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District's greatest concern is with Folsom Dam, as it serves as the water source for the District. A dam failure would result in a loss of surface water from the wholesaler, San Juan Water District, which is where the District gets a majority of its water supply. The complete loss in surface water supply long term while the dam is undergoing repairs would increase demand on alternative water supplies (similar to the drought and water shortage hazard).

The District may potentially be affected in the unlikely event of a dam or dike failure at Folsom Lake. The Folsom Dam and Reservoir is located on the American River, about 20 miles upstream of the City of Sacramento, four miles east of Citrus Heights. Completed in 1956 by the Corps of Engineers, Folsom Dam is owned and operated by the U.S. Bureau of Reclamation (USBR). The reservoir has a storage capacity of 1 million acre-ft at gross pool. The reservoir includes about 4.5 miles of man-made dike with a crest elevation of 480.5 ft above sea level. Folsom Lake Dam infrastructure includes Folsom Dam, Folsom Right Wing, Dikes 4-8, and Mormon Island (USBR 1999).

In 1997, the USBR analyzed the potential effects of the Folsom Dam/Other Dam Infrastructure failure on the Sacramento region. Based on the results of the analysis, the City of Citrus Heights may be at risk if portions of the Dam/Infrastructure were to fail. The analysis indicates that if Folsom Dam itself were to fail, no portion of Citrus Heights would be inundated by the resulting flood. However, if Dike 5 were to fail, the northeastern corner of the city as well as the portion of the city parallel to Interstate 80, southwest to the city limits may become inundated up to 8.2-feet within approximately five-hours of breaching. Furthermore, if the Folsom Right Wing were to fail, a portion of the floodwaters would follow the Cripple Creek channel resulting in inundation depths of up to 6.5- feet.

Assets at Risk

Assets at risk from dam failure include people and populations; District assets and critical facilities and infrastructure); and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (including both District staff and the population served by the District) located in dam inundation areas are vulnerable to dam failure. While not currently mapped, this includes those populations impacted by a future Folsom dam incident. Certain vulnerable populations may be at increased risk to dam failure, especially during a large event with minimal advance notice. These vulnerable populations may include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

District Assets and Critical Facilities and Infrastructure

District assets, including structures and critical facilities and infrastructure have some measure of risk to dam failure, as shown in Table H-3. The District noted that flooding resulting from a Folsom dam incident has a small chance of affecting the City of Citrus Heights, but not CHWD. Dam failure flooding can affect the built environment of the District. Structures in dam inundation areas are at risk and depending on flood depths, can range from slight damage to totally inundated.

Natural, Historic, and Cultural Resources,

A major dam failure event and associated flooding could have a devastating impact on the District. Large flood events can affect all natural, historic, and cultural resources that lie in the dam inundation areas, including Folsom Dam. There are a number of ways floodwaters associated with a dam failure event can impact natural resources and the environment: Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to these structures within the inundated areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme dam failure flood events.

Impacts from Dam Failure

Impacts to the District service area from dam failure flooding could be extensive and widespread and include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations may be necessary and compounded by impacts to transportation systems and infrastructure. Economic losses to the District and Sacramento County Planning Area can also be significant.

Other impacts associated with dam failure include landslides, bank erosion, and destruction of habitat. Dam failures can cause downstream flooding and can transport large volumes of sediment and debris and

contaminants from the floodwaters. Other environmental impacts can include contamination from septic system failures and releases of contaminants from hazardous materials facilities, contamination of potable water supplies; changes in configurations of streams; loss of wildlife habitats; and degradation of wetlands. A large dam failure event could have significant and catastrophic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Climate Change and Dam Failure discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- Climate change is likely to exacerbate future rain and storm conditions and associated impacts and vulnerability of the District to dam failure. This was discussed in greater detail in the Climate Change and Dam Failure section of the Hazard Profile above.
- Population projections within the jurisdictional boundaries of the District show general populations to be slowly increasing. With development of the proposed Sunrise Mall project, there may be additional population will be added requiring water from the District. It is unknown how population patterns and demographics will change in the near future. The District noted that it has no control over population changes within its jurisdictional boundaries. The District may add staff, but this number would be relatively small. As additional populations are added, the vulnerability of the District to this hazard is likely to increase.
- Changes in land use and development in the District are expected to occur in the near future. Locating new development, structures, and critical facilities and infrastructure within or near areas of dam failure risk may put additional development at risk. Thus, changes in land use and future development are likely to increase the vulnerability and associated impacts of the District to dam failure.

Future Development

CHWD does not have any identified plans to add new District facilities, without an expansion of its service area. Although development of the District service area is not controlled by CHWD, the District does plan for future water uses to accommodate future growth in the City of Citrus Heights and Sacramento County where the District is located. Although new growth and development may fall in the District service area flooded by a Folsom Dam incident, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area will continue to occur. Additionally, the

Folsom Dam has been undergoing several projects in recent years, thus reducing the likelihood of future dam failure flooding.

Drought & Water Shortage (w/Tree Mortality)

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the specific impacts of drought in the CHWD and the Sacramento County Planning Area is the increased risk to trees from insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the District. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the District that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the District and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

The Sacramento County Planning Area, including the CHWD, has been in and out of drought since 2014. Over the last seven years since the 2021 LHMP, drought conditions have ranged from none to exceptional.

Drought conditions are expected to continue to be cyclical in nature depending on the year. Current drought conditions in the District are shown in Section 4.3.9 of the Base Plan.

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue. Surface water is a major source due to the number of rivers in the region, but ground water supplements agriculture, which consumes the majority of water in the surrounding County.

Past Occurrences

Disaster Declaration History

There have been 3 state and 1 federal disaster declarations for Sacramento County. This can be seen in Table H-5. Additionally, there have been 26 USDA Secretarial Disaster Declarations from drought in the County, as shown in Past Occurrences in Section 4.3.9 of the Base Plan.

Table H-5 Sacramento County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	4	2008, 2014, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 83 NCDC drought events in Sacramento County since 1993. These most likely had some impact on the District.

CHWD Events

Based on historical information, the occurrence of drought in California, including the CHWD, is cyclical, driven by weather patterns. Section 4.3.9 of the Base Plan notes that five droughts have occurred in the past 86 years, which impacted the District and Sacramento County Planning Area. The District Planning Team noted that the District has experienced multiple, consecutive years of drought.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state’s water storage, distribution, management, conservation, and use policies. The 2024 Climate Adaptation Study (CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that

climate change is likely to significantly diminish California’s future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.9 of the Base Plan.

The 2024 Sacramento County CAP noted that California, including Sacramento County, has a highly variable climate that is susceptible to prolonged periods of drought, and recent research suggests that extended drought occurrences (or “mega-droughts”) could become more pervasive in future decades, which may result in major impacts on local water supplies and other secondary impacts. The County is not located in an area where snow accumulates, however, major water districts and utilities in the County receive and depend on a substantial amount of water from watersheds that rely upon spring and early-summer snowmelt in the Sierra Nevada mountain range. The Sierra Nevada snowpack, which serves as a natural water supply reservoir for California during the dry months, is predicted to decline in area covered and water volume stored as temperatures rise and precipitation falls more frequently as rain instead of snow at mountain elevations. Further, increased temperatures will affect the timing of historical snowmelt such that the snowpack will typically melt earlier in the year, causing more rapid early spring flows in the Sacramento, American, Cosumnes, and Mokelumne Rivers and reduced late spring and summer flows. Approximately 50 percent of the County is served by groundwater supplies. Changes in surface water flow will have a direct impact on groundwater recharge, including decreased periods of recharge when late spring and summer stream flows diminish. Further, groundwater usage is higher in periods of drought, therefore, groundwater supplies may be reduced during and after periods of limited surface water flows.

The 2026 American, Bear, and Cosumnes Watersheds Resilience Plan noted that a key driver of climate vulnerability, adaptive capacity, and implementation readiness in the watershed group is drought. An equity analysis was performed as part of this Plan. An Equity Analysis Technical Appendix demonstrates how social vulnerability aligns with the physical hazard environment across the watershed. It noted that drought vulnerability intensifies in the upper watersheds, where cumulative annual flow deficits are projected to increase by up to 25%, contributing to downstream water-supply and affordability pressures that disproportionately affect low-income households.

The 2025 CHWD UWMP noted that changing climate conditions in the Sierra Nevada Mountains affect the volume of water stored in the snowpack and the timing of runoff entering Folsom Reservoir. Consequently, they can also affect the critical role of Folsom Reservoir in the CVP Operations. Reliance on Folsom Reservoir is expected to increase commensurate with the impact of sea level rise on salinity in the Sacramento-San Joaquin Bay Delta (Delta). Modeling of these factors has illustrated that, without operational adjustments, Folsom Reservoir is projected to have lower end of conservation season (end of September) storage levels and approach “dead pool” more often under most future climate scenarios. Similarly, increased early season runoff would increase flood risks along the Lower American River, leaving less water in the upper watershed available during water supply operations.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the

future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the CHWD to drought may vary and include reduction in water supply, turf and open space losses, impacts to natural resources, and an increase in dry fuels and tree dieback, potentially increasing the risk of wildfires.

The whole of the District is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District's greatest concern is with Folsom Dam, as it serves as the water source for the District. A dam failure would result in a loss of surface water from the wholesaler, San Juan Water District, which is where the District gets a majority of its water supply. The complete loss in surface water supply long term while the dam is undergoing repairs would increase demand on alternative water supplies.

If the groundwater levels decrease further, CHWD well capacities could be impacted or even eliminated. Another issue that could impact supply availability is groundwater contamination. Should this occur, CHWD will evaluate pump-and-treat alternatives versus drilling new wells. Climate change may create additional impacts to drought and water shortage in the County and the District. During periods of drought, vegetation can dry out which increases fire risk. Drought that occurs during periods of extreme heat and high winds can cause (though rare) Public Safety Power Shutoff (PSPS) events to be declared in the County.

Also as noted in the CHWD's local concerns to Dam Failure, Folsom Dam serves as a critical water source for the District. A Folsom dam incident would result in a loss of surface water from the wholesaler, San Juan Water District, which is where the District gets a majority of its water supply. The complete loss in surface water supply long term, while the dam is undergoing repairs, would increase demand on alternative water supplies (similar to the drought and water shortage hazard). Thus a Folsom dam incident could also have significant impacts to the ability of the District to meet its current water supply demands.

Assets at Risk

Assets at risk from drought and water shortage include people and populations; District assets and critical facilities and infrastructure); and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations of the District are not directly affected by drought; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however,

residents and other populations within the District may be vulnerable to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations. Drought and water shortage can lead to an increase in wildfires threatening District residents. Water shortages can have an effect on all of the population in the District, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access clean drinking water during shortages. During periods of drought, as the costs of water usage may increase, especially during mandated conservation times, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

District Assets and Critical Facilities and Infrastructure

Most District assets, including structures and critical facilities and infrastructure, have a limited vulnerability to drought and water shortage (as shown in Table H-3). Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems (like those of the District) may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to District facilities. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the District are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to District residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the District.

Impacts from Drought and Water Shortage

The vulnerability of the District to drought is District-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservation measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the District.

Other qualitative impacts associated with drought in the District are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the CHWD include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the District to drought and water shortage. This was discussed in greater detail in the Climate Change and Drought and Water Shortage section of the Hazard Profile above.
- Population projections within the jurisdictional boundaries of the District show general populations to be slowly increasing. With development of the proposed Sunrise Mall project, there may be additional population will be added requiring water from the District. It is unknown how population patterns and demographics will change in the near future. The District noted that it has no control over population changes within its jurisdictional boundaries. The District may add staff, but this number would be relatively small. As additional populations are added, the vulnerability of the District to this hazard is likely to increase.
- Changes in land use and development within the District are expected to be limited in the near future (unless the Sunrise Mall project comes to fruition) and thus are not likely to affect the vulnerability of CHWD to drought and water shortage. Depending on the land use change, the District may or may not see an increased vulnerability to this hazard. The District conducts water supply planning to ensure a continued water supply to address future drought conditions.

Future Development

The District noted that it has no control over future development. That falls under the purview of the City of Citrus Heights and the County where the District is located. As the population in the District continues to grow, so will the demand for water. Ongoing planning will be needed by the District and local water companies to account for population growth and increased water demands.

Earthquake (w/Subhazards)

Likelihood of Future Occurrence—Occasional (minor)/Unlikely (major)

Vulnerability—High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes cause ground shaking, possible liquefaction, landslide, settlement, and can cause fires that follow the earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, wastewater, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the District is at risk to earthquake. The CHWD, Sacramento County, and surrounding areas have some level of risk from seismic and geologic hazards. Regional faults were shown in Section 4.3.10 of the Base Plan. Geological literature indicates that no major active faults transect the County; however, there are several subsurface, likely inactive, faults in the Delta, such as the Midland fault. A second, presumably inactive, fault is in the vicinity of Citrus Heights near Antelope Road. To the east, the Bear Mountain fault zone trends northwest-southeast through Sacramento and El Dorado Counties. As noted in the Base Plan, there have been historically active faults outside the County. These include: San Andreas, Vaca, Concord, Greenville, Hayward, Calaveras, Foothill Fault System, Las Positas, Midland, and West Napa. A significant seismic event on any of these major faults could cause damage in the CHWD.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where earthquakes of some magnitude could occur, so both magnitude and intensity of earthquakes are expected to remain low to moderate. Seismic shaking maps for the area in Section 4.3.10 of the Base Plan show Sacramento County and the District fall within a low to moderate shake risk.

There is no scientific scale for earthquake related liquefaction. The speed of onset is short, as is the duration. The effects from liquefaction can last for days, weeks, months or even years as areas of the County are

rebuilt or leveed areas are dewatered and the levees rebuilt. In Sacramento County, liquefaction zones were mapped by CGS for the first time in 2025. Mapping indicates that the District sits outside of these liquefaction zones.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations in Sacramento County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

CHWD Events

As shown in the Base Plan, no disaster declarations or other significant events causing significant damage have occurred in the County due to earthquake, including its subhazards such as liquefaction. The District Planning Team noted no past occurrences of earthquakes that affected the District in any meaningful way.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses. Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while more rural areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several active faults are near the Sacramento County Planning Area and the District, seismic hazard mapping indicates that the District has low to moderate seismic hazard potential. There is the potential for the District and Sacramento County Planning Area to be subject to some level of moderate seismic shaking during earthquake events occurring on these regional faults depending on the location and magnitude of the event. Some degree of structural damage due to strong seismic shaking could be expected in the District.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The CHWD is located within Zone 3.

Earthquake shaking can also cause liquefaction to occur. Areas with loose soil and high water tables are at risk from liquefaction. There are no known areas in and near the District prone to liquefaction.

The whole of the District is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Impacts to the District from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life.

The District is potentially affected by earthquake events from several active, regional faults as described above. As detailed in Section 4.3.10 of the Base Plan, Hazus deterministic analyses were performed on four different potential earthquake scenarios associated with four regional faults. Hazus is FEMA's loss estimation tool used to model earthquake damages for planning purposes. For deterministic Hazus scenarios, a single scenario event is selected based on a specific fault, the epicenter location, and the potential magnitude of the event. The faults and scenarios included the following: Calaveras (6.86M event), Concord (6.8M event), Hayward (7.58M event), and San Andreas (8.04M event). These scenarios likely affected the District in some way. A small portion of the damages from the Hazus analyses may also be attributed to the District.

Assets at Risk

Many assets in the District are at risk to ground shaking and other earthquake related impacts. Assets at risk from earthquake include people and populations; District assets and critical facilities and infrastructure); and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations are at risk from earthquake events (including both District staff and the population served by the District). Those at heightened risk include: the unsheltered, individuals dependent on medical equipment, and individuals with impaired mobility.

The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP. More information on the Hazus scenarios and how the District and County is affected is included in Section 4.3.10 of the Base Plan.

District Assets and Critical Facilities and Infrastructure

All District assets and critical facilities and infrastructure in the District are vulnerable to earthquakes and its subhazards, depending on the severity and location of the event. The Hazus scenarios conducted for the

entire Sacramento County Planning Area show how structures and critical facilities may be affected. Given the nature of earthquake events causing significant ground shaking among other issues, those critical facilities and infrastructure that include underground components such as water and wastewater facilities would be uniquely vulnerable to damaging earthquakes. This includes all District assets in Table H-3.

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials into the natural environment causing contamination that can be difficult to contain. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.10 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can result in loss of life and injuries, and have devastating impacts on the built environment. The greatest impact is to life safety of the CHWD staff, residents, and visitors. Other impacts to the District could include damages to infrastructure such as roads, bridges, and other transportation system infrastructure; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs or behind levees might be subject to flooding, if the dams, reservoirs, or levees fail as a result of an earthquake. The District has locations with flood risk that include facilities downslope from dams or reservoirs, levees, and other flood control structures that could be affected by a significant earthquake event.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the CHWD include the following:

- Climate change is likely to have no effect on future earthquake conditions and associated impacts and vulnerability of the District. This was discussed in greater detail in the Climate Change and Earthquake section of the Hazard Profile above.
- Population projections within the jurisdictional boundaries of the District show general populations to be flat or slightly declining. If the proposed Sunrise Mall project comes to fruition, there may be additional population that will need water from the District. The District may add staff, but this number would be relatively small. The District noted that it has no control over population changes within its jurisdictional boundaries. With no notable changes in populations numbers and makeup (save for those that may occur from the Sunrise Mall project), the vulnerability of the District to this hazard is unlikely to change.
- Changes in land use and development within the District are expected to be limited in the near future (unless the Sunrise Mall project comes to fruition) and thus are not likely to affect earthquake and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard.

Future Development

The District noted that it has no control over future development. That falls under the purview of the City of Citrus Heights. Although new growth and development corridors would fall in areas affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. The City enforces the state building code, which mandates construction techniques that minimize seismic hazards. Future development in the District is subject to these building codes and land use planning.

H.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

H.5.1. Regulatory Mitigation Capabilities

Table H-6 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the CHWD.

Note: The District does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the District’s jurisdictional boundaries will conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the District is located.

Table H-6 CHWD’s Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	Y: 2020	N/A
Climate Change Adaptation Plan		
Community Wildfire Protection Plan	N	
General Plan/Comprehensive Plan/Master Plan	N	
Continuity of Operations Plan	Y: 2021	
Economic Development Plan	N	
Land Use Plan		
Local Emergency Operations Plan	Y: 2019	Yes, addresses hazards
Stormwater Management Plan	N	
Transportation Plan	N	
Other	Y	2025 Urban Water Management Plan
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?
Acquisition of land for open space and public recreation use	N	
Building code	N	
Flood insurance rate maps	N	
Floodplain ordinance	N	
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N	
Subdivision ordinance	N	
Zoning ordinance	N	
Other		

How can these capabilities be expanded and improved to reduce risk?

CHWD staff will periodically review all plans for accuracy and make any necessary revisions. In addition, annual emergency trainings will be held to ensure that all staff are aware of the steps and procedures related to an emergency

Source: CHWD

H.5.2. Administrative/Technical Mitigation Capabilities

Table H-7 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the CHWD.

Table H-7 CHWD's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	
Civil Engineer, including dam and levee safety	Y	
Community Planner	N	
Emergency Manager	N	
Floodplain Administrator	N	
GIS Coordinator	Y	
Planning Commission	N	
Other		
Technical	Y/N	Has capability been used to assess/mitigate risk in the past?
Grant writing	Y	
Hazard data and information	Y	
GIS analysis		
Mutual aid agreements		
Other		
How can these capabilities be expanded and improved to reduce risk?		
CHWD will hire an additional engineer in the next several years to assist with assessing water mains. In addition, staff will look for opportunities to attend grant writing trainings.		

Source: CHWD

H.5.3. Fiscal Mitigation Capabilities

Table H-8 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table H-8 CHWD's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Y: new wells (water sources), yes, can be used for future mitigation actions
Community Development Block Grant	N	
Federal funding programs (non-FEMA)	Y	Grant funding: new well
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	N	
State funding programs	Y	Grant funding: new well
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
CHWD will continue to look for grant opportunities for new wells. In addition, CHWD will allocate funding for capital improvement projects in its annual budget.		

Source: CHWD

H.5.4. Mitigation Education, Outreach, and Partnerships

Table H-9 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table H-9 CHWD's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	Water Efficiency messaging, drought messaging
Local news	Y	
Organizations that interact with underserved and vulnerable communities	Y	
Social media	Y	

Program/Organization	In Place Y/N	How widespread are each of these in your community?
How can these capabilities be expanded and improved to reduce risk?		
CHWD is hiring a Communications Manager to assist with increased public information efforts. In addition, the District will continue to expand its Water Efficiency classes and programs for the local community.		

Source: CHWD

H.5.5. Other Mitigation Efforts

The District noted that the UWMP contains mitigation efforts for drought and water shortage and the climate change effects that exacerbate it.

H.6 Mitigation Strategy

H.6.1. Mitigation Goals and Objectives

The CHWD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

H.6.2. NFIP Mitigation Strategy

The District does not participate in the NFIP, as it is not an eligible participant. Some of the District's projects work to reduce impacts from flooding thus furthering the objectives of the NFIP.

H.6.3. Mitigation Actions

The Planning Team for the CHWD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)

Low priority hazards for mitigation planning include:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized Stormwater
- Levee Failure
- Sea Level Rise
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Cold and Freeze

- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/ smoke and air quality)

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards and jurisdictions regardless of hazard priority. Collectively, this LHMP's multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that each jurisdiction has focused on identifying those mitigation actions and projects to address their priority hazards, which are both realistic and reasonable for them to implement for this 5-year planning process, and would like to preserve their right to modify hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement. The participating jurisdictions are not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the jurisdictions to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the mitigation categories and criteria contained in Appendix C.

Mitigation Actions

The District has put forward the actions as shown in Table H-10. Details of the actions can be found below the table.

Table H-10 CHWD Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 1. Construct Additional Wells with Aquifer Storage and Recovery (ASR) Technology	Previous Action	X	X		Prevention
Action 2. Construction of a New Storage Tank	Previous Action	X	X		Structural Projects
Action 3. Construction of a New Operations Building	Previous Action	X	X		Prevention Property Protection Structural Projects
Action 4. Complete Mitigation Actions in 2025 Urban Water Master Plan	New Action	X	X		Prevention Property Protection Structural Projects

Action 1. Construct Additional Wells with Aquifer Storage and Recovery (ASR) Technology

Hazards Addressed: Drought & Water Shortage, Dam Failure

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background (Problem Statement): Climate change, prolonged drought, and increasing demands on California's water resources threaten the District's long-term water supply reliability. CHWD relies on Folsom Lake water for its supply. If the dam were to fail, that supply would be removed. Expanding groundwater storage capacity will improve operational flexibility and increase resilience during drought and emergency conditions.

Project Description: Implement Aquifer Storage and Recovery (ASR) technology at existing and future well sites to store treated water in underground aquifers during periods of surplus supply for use during droughts, peak demand, and emergency water shortages.

Other Alternatives: Storage tank (or both)

Existing Planning Mechanisms through which Action will be Implemented: CHWD Strategic Plan for item for 2026 and for 2027

Responsible Office/Partners: CHWD Operations Department, Sacramento County

Potential Funding (Local Budgets, Grant Funds, etc.):

- Citrus Heights Water District Capital Improvement Program (CIP)
- California Department of Water Resources (DWR) Integrated Regional Water Management (IRWM) Grant Program
- State Water Resources Control Board (SWRCB) Drinking Water State Revolving Fund (DWSRF)
- U.S. Bureau of Reclamation WaterSMART Program
- FEMA Hazard Mitigation Assistance (HMA) Programs, where eligible

Benefits (Losses Avoided): Improves drought resilience, increases emergency water storage capacity, enhances water supply reliability, and reduces vulnerability to prolonged water shortages

Timeline: Adding a new well with ASR technology will take approximately 3 years. The goal is to have this done within the 5-year cycle of this LHMP..

Project Priority (High, Medium, Low): High

Action 2. Construction of a New Storage Tank

Hazards Addressed: Drought & Water Shortage, Dam Failure, Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Increasing climate variability and recurring drought conditions require additional water storage capacity to maintain reliable service and support emergency operations during supply disruptions. This would be true if a dam incident occurred at Folsom Dam causing Folsom Lake levels to fall. This would also be true if earthquake were to affect the District.

Project Description: Construct a new potable water storage tank to increase system storage capacity, improve operational flexibility, and provide a reliable emergency water supply during droughts, infrastructure failures, and other emergencies.

Other Alternatives: Groundwater banking, ASR wells (or both)

Existing Planning Mechanisms through which Action will be Implemented CHWD 2027 Strategic plan item to evaluate location for future water facilities (well or storage)

Responsible Office/Partners: CWHD Operations Department

Potential Funding (Local Budgets, Grant Funds, etc.):

- Citrus Heights Water District Capital Improvement Program (CIP)
- California Department of Water Resources (DWR) Integrated Regional Water Management (IRWM) Grant Program
- State Water Resources Control Board (SWRCB) Drinking Water State Revolving Fund (DWSRF)
- U.S. Environmental Protection Agency Drinking Water State Revolving Fund
- U.S. Bureau of Reclamation WaterSMART Program
- FEMA Hazard Mitigation Assistance (HMA) Programs, where eligible

Benefits (avoided Losses): Provides additional emergency water storage, improves operational reliability, increases system redundancy, and reduces impacts from drought and water supply interruptions

Timeline: One year for construction. Desired within the 5-year life cycle of this LHMP Update.

Project Priority (High, Medium, Low): Low

Action 3. Construct a Resilient Administrative and Operations Facility

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The District's existing administrative and operations facilities are vulnerable to damage and operational disruptions caused by natural hazards. Earthquakes could damage facilities and critical infrastructure, while flooding associated with a downstream dam failure and extreme cold or freeze events could disrupt utility operations, damage equipment, and limit the District's ability to respond to emergencies. Modern, resilient facilities are needed to ensure continuity of operations and the uninterrupted delivery of essential water services.

Project Description: Construct a new administrative building and renovate the existing operations building and corporation yard to meet current seismic and building code standards while improving the District's ability to maintain essential operations during earthquakes, dam failure flooding, and extreme cold or freeze events. The project will enhance the resilience of critical facilities that support emergency response, system operations, and customer service.

Other Alternatives: Retrofitting the building.

Existing Planning Mechanisms through which Action will be Implemented: CHWD existing CIP project

Responsible Office/Partners: CHWD Operations & Engineering Departments

Potential Funding (Local Budgets, Grant Funds, etc.):

- Citrus Heights Water District Capital Improvement Program (CIP)
- FEMA Hazard Mitigation Grant Program (HMGP)
- FEMA Hazard Mitigation Assistance (HMA) programs
- California Office of Emergency Services (Cal OES) Hazard Mitigation Assistance
- California Infrastructure and Economic Development Bank (IBank) Infrastructure Financing Programs
- State and federal infrastructure resilience grant opportunities

Benefits (avoided Losses): Reduces potential damage to District facilities and critical equipment, minimizes service interruptions, protects employees and essential operational functions, and supports the continued delivery of potable water during and after earthquakes, flooding associated with dam failure, and extreme cold or freeze events

Timeline: Approximately 2 years following project approval and funding.

Project Priority (High, Medium, Low): High

Action 4. *Complete Mitigation Actions in 2025 Urban Water Master Plan & Urban Water Shortage Contingency Plan*

Hazards Addressed: Drought & Water Shortage, Dam Failure, Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The District has been, is, and will be at risk to certain natural hazards. These include drought and water shortage, dam failure (which affects water shortage in the District) and earthquake. In 2025, the CHWD updated its Urban Water Master Plan and Urban Water Shortage Contingency Plan.

Project Description: The UWMP evaluates the District's long-term water supplies, demands, conservation programs, and water system reliability, while the WSCP establishes response measures for water shortages and supply emergencies. These plans contain a number of mitigation type actions to help the District reduce risk from drought and water shortage, dam failure, and earthquakes.

Examples include:

- SASD Water Recycling Opportunities Study
- Water Shortage Contingency Plan
- Metering, Volumetric Pricing, and Water Budgets
- Multi-year Outreach Program for Water Use During Drought and Non-Drought Seasons

- Draft Bay-Delta Water Quality Control Plan Update
- Drought Risk Assessment

Other Alternatives: No action.

Existing Planning Mechanisms through which Action will be Implemented 2025 Urban Water Master Plan

Responsible Office/Partners: CWHHD Operations Department

Potential Funding (Local Budgets, Grant Funds, etc.):

- Citrus Heights Water District Capital Improvement Program (CIP)
- California Department of Water Resources (DWR) Integrated Regional Water Management (IRWM) Grant Program
- State Water Resources Control Board (SWRCB) Drinking Water State Revolving Fund (DWSRF)
- U.S. Environmental Protection Agency Drinking Water State Revolving Fund
- U.S. Bureau of Reclamation WaterSMART Program
- FEMA Hazard Mitigation Assistance (HMA) Programs, where eligible

Benefits (avoided Losses): Provides additional emergency water storage, improves operational reliability, increases system redundancy, and reduces impacts from drought and water supply interruptions

Timeline: Each mitigation project in the UWMP has a variable timeline. It is desired to start many of these within the 5-year life cycle of this LHMP Update.

Project Priority (High, Medium, Low): High