Delta Annex Chapter 7 Reclamation District 551

7.1 Introduction

This Annex details the hazard mitigation planning elements specific to Reclamation District 551 (RD 551), a previously participating jurisdiction to the 2016 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 RD 551, with a focus on providing additional details on the risk assessment and mitigation strategy for this District.

7.2 Planning Process

As described above, the District 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 7-1. Additional details on plan participation and District representatives are included in Appendix A. FILL OUT TABLE WITH NAMES, TITLES, AND HOW EACH PERSON PARTICIPATED

Table 7-1 RD 551 – Planning Team

Name	Position/Title	How Participated

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 approved 2016 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2016 LHMP through other plans and programs shown in Table 7-2. FILL OUT TABLE – IF THERE WAS NO PLANNING DONE, SIMPLY PUT N/A IN THE FIRST COLUMN AND STATE THAT NO MITIGATION RELATED PLANNING MECHANISMS HAVE BEEN COMPLETED SINCE 2016

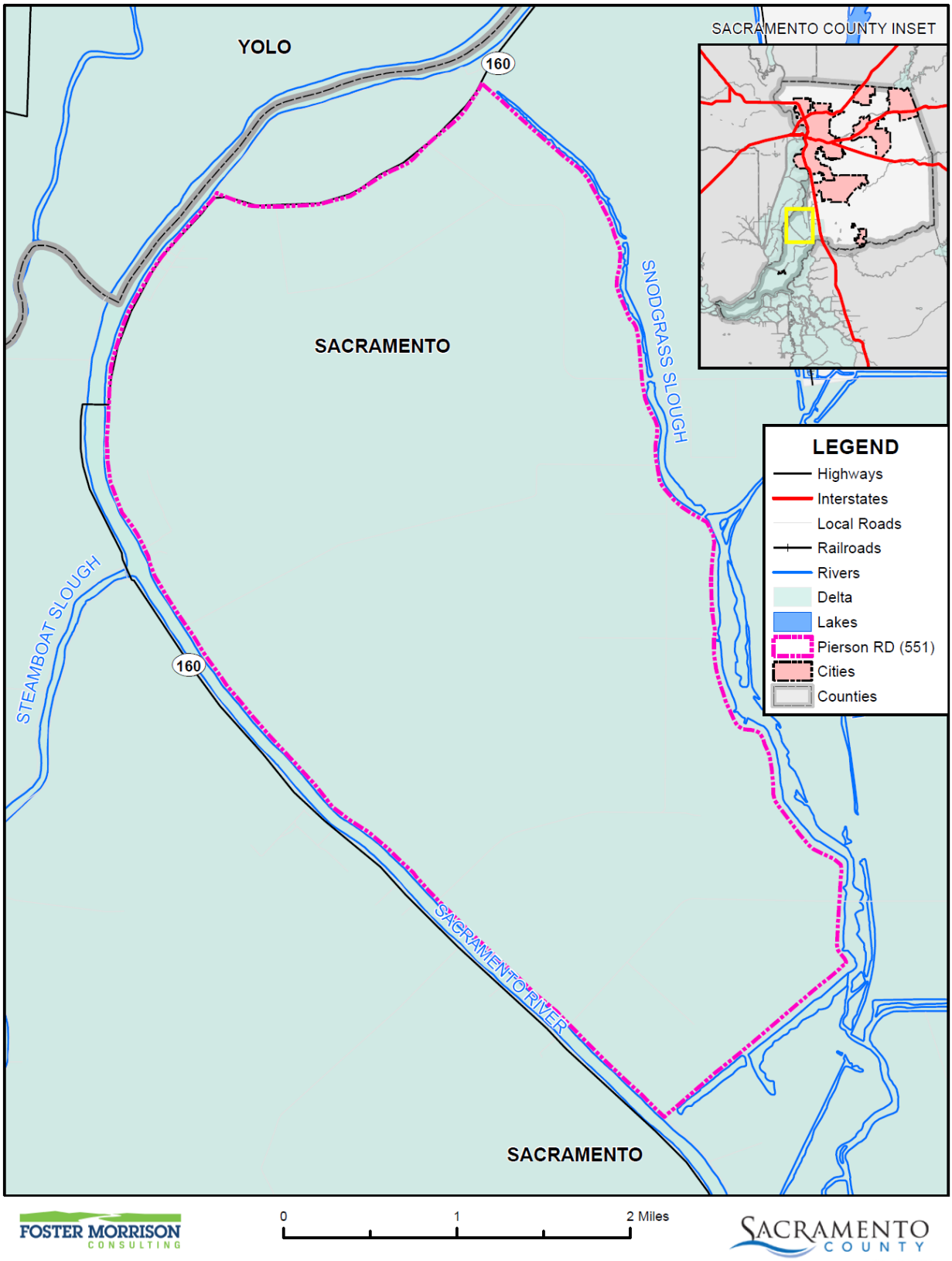
Table 7-2 2016 LHMP Incorporation

Planning Mechanism 2016 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?

7.3 District Profile

The District profile for the RD 551 is detailed in the following sections. Figure 7-1 displays a map and the location of the District within Sacramento County.

Figure 7-1 RD 551



Data Source: Pierson Reclamation District, Sacramento County GIS, Cal-Atlas; Map Date: 09/2020.

7.3.1. Overview and Background (Update)

Reclamation District No. 551, Pearson District (District), is the local public entity that provides flood protection in the form of levee maintenance and drainage to the landowners of Pearson District. The District operates and maintains all the levees that protect the landowners. As described in Division of Water Resources, (currently known as Department of Water Resources) Bulletin No. 37, published in 1930, the District is described as protecting 8,800 gross acres, with a net protected area of 8,537 acres, within Sacramento County.

The District originally built the project levee along the Sacramento River (6.85 miles); USACE, under authority of the SRFCP, rebuilt portions of the levee. This is the levee recognized by both the state and federal governments as the primary flood protection levee, as part of the SRFCP. The District built the non-project levee along Snodgrass Slough (5.91 miles) to its present design in the 1920s. There are also 1.37 miles of non-project cross levee, adjacent to the Delta Meadows State Park.

The District does not supply water, which is the responsibility of the individual landowners; however, the District maintains 37.97 miles of canals and ditches that provide drainage to the property owners. These ditches and canals are fed by farmer ditches, which are designed by the landowner to drain their property adequately. Once the drain water enters the District's ditches and canals, water is removed at pumping plants located at one location on Pearson District.

Land use is predominantly agricultural, aside from the small town of Courtland. Orchards (including pears, apples, and cherries), vineyards, alfalfa, grain, and miscellaneous row crops are the primary crops. The historic town of Courtland is the largest residential area on the District. There are an estimated 636 residents within the District. Courtland has a sewage treatment plant operated by Sacramento County. There are public roads running along the entire length of the Sacramento River levee.

The District has no major land use changes, although there are statewide planning efforts that if carried out could require major land use changes, affecting all aspects of the District operation and maintenance of the levee and drainage system.

Interior ground elevations slope toward the center of the District. Interior ground elevations range from 12 feet (toe of Sacramento River levee) to -12 NGVD within the District interior. Top of levee elevations range from 19.0 to 27.5 feet national geodetic vertical datum (NGVD) along the non-project back levee, and 24.9 to 26.2 feet NGVD along the project levee (left bank of Sacramento River). The low elevation of 19.0 on the non-project levee is located at Lambert Road, still over 2.0 feet above the 100-year flood elevation. Except for this and two other road crossings, the non-project levee generally has over 6 feet of freeboard above the 100-year flood elevation.

Reclamation is one of the first forms of public improvement in California, with the early focus on reclaiming "swamp and overflowed" lands granted to the state under the Federal 1850 Arkansas Act. The term reclamation primarily encompasses flood control and drainage, but has also long included irrigation.[1] To

[1] Hershey v. Reclamation Dist. No. 108, 200 Cal. 550, 567-68 (1927).

help local landowners reclaim the swamp and overflowed lands, the state adopted a series of statutes authorizing them to form local reclamation and levee districts. The area of a proposed district was outlined in a formation petition presented to a state or county board, which would order a district to be formed after a majority vote of the affected landowners. Beginning in 1861, the Board of Swamp Land Commissioners issued the orders organizing reclamation and levee districts. Beginning in 1867, districts were organized under the Green Act by county boards of supervisors. (Stats. 1867-8, c. 415.) A few reclamation districts were also created by special act of the legislature. (See, e.g., Stats. 1911, c. 100 (RD 900).) Regardless of how they were formed, reclamation districts now operate under Water Code Division 15, § 50000 et seq., and levee districts under Division 19, § 70000 et seq. (See also Stats. 1911, c. 100, § 2.)

As reclamation districts were formed under the above noted laws, they were given numbers sequentially. Pearson District formed in 1893, and was given the number "551." The area protected by the District has remained the same for essentially the entire time of its existence.

Starting in the 1940s, USACE improved the Sacramento River levee is a flood control structure to meet the federal design standard. To satisfy the conditions of federal involvement in such projects, the Central Valley Flood Protection Board (CVFPB) agreed to operate and maintain the Sacramento River levee. USACE transferred the District levee, as part of Unit No. 111, completely over to CVFPB, formerly the State Reclamation Board, in September 1955. Under Section 8618 of the Water Code, reclamation districts are authorized to establish agreements with the CVFPB to perform these actions for the state. The District is required to maintain and operate the levees to meet the standards as listed in the Supplemental Operation and Maintenance Manual.

7.4 Hazard Identification

RD 551 identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to District (see Table 7-3).

Table 7-3 RD 551—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Climate Change					–
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage	Extensive	Occasional	Critical	Low	High
Earthquake	Extensive	Occasional	Limited	Medium	Low
Earthquake Liquefaction	Significant	Occasional	Limited	Medium	Low
Floods: 1%/0.2% annual chance	Extensive	Occasional	Catastrophic	High	Medium
Floods: Localized Stormwater	Extensive	Likely	Limited	High	Medium
Landslides, Mudslides, and Debris Flow					Medium
Levee Failure	Extensive	Occasional	Catastrophic	High	Medium
Pandemic					Medium
Severe Weather: Extreme Cold and Freeze					Medium
Severe Weather: Extreme Heat					High
Severe Weather: Heavy Rains and Storms	Significant	Likely	Critical	Medium	Medium
Severe Weather: Wind and Tornado					Low
Subsidence					Medium
Volcano					Low
Wildfire					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

7.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the District's hazards and assess the District's vulnerability separate from that of the Sacramento County Planning Area as a whole, which has already been assessed in Section 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Sacramento County Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

7.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section 7.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard (as shown in Table 7-3) affects the District and includes information on past hazard occurrences and the likelihood of future hazard occurrence. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Sacramento County Planning Area.

7.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the District's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the RD 551's assets at risk, with a focus on key District assets such as critical facilities, 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 LHMP. Critical facilities are defined for this Plan as:

> ***Any facility (a structure, infrastructure, equipment or service), that is adversely affected during a hazardous event may result in interruption of services and operations for the District 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.***

Table 7-4 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. RD 551's physical assets, valued at over $5 million, consist of the buildings and infrastructure to support the District's operations. VERIFY VALUES AND ADD TO TABLE WITH DISTRICT ASSETS. ADD ANY OTHER DISTRICT FACILITIES AND ASSETS. FILL OUT LAST COLUMN OF TABLE – WHAT ARE THEY AT RISK FROM?

Table 7-4 RD 551 Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Pumps – Snodgrass Slough	Drain Pumps	$2,000,000	
Pumps – Lake	Drain Pumps	$1,000,000	
District Owned Facilities	Home, Buildings & Equipment	$2,000,000	
Total		**$5,000,000**	

Source: RD 551

CAN THE DISTRICT ALSO PROVIDE A LIST OR TABLE THAT DETAILS BY LEVEE SEGMENT OR SYSTEM THE CURRENT STATUS OF THE LEVEE AND IF IT IS UNDERGOING ANY IMPROVEMENTS AND WHAT THAT LEVEL OF PROTECTION WILL INCREASE TO?

Natural Resources

RD 551 has a variety of natural resources of value to the District. These natural resources parallels that of Sacramento County as a whole. Information can be found in Section 4.3.1 of the Base Plan. In the past, RD 551 has protected a number of natural gas wells. Currently, there are no wells in operation on Pearson District. RD551's levees support vegetation that provide fish and wildlife habitat. Agricultural ground and ditches also support wildlife.

Historic and Cultural Resources

RD 551 has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallels that of Sacramento County as a whole. Information can be found in Section 4.3.1 of the Base Plan. Since the land has been settled for over 150 years, there are many historic structures on Pearson District.

Growth and Development Trends

IS THERE ANY ANTICIPATED GROWTH OF DISTRICT FACILTIES?

General growth in the District parallels that of the Sacramento County Planning Area as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Pearson District is within the Primary Zone of the Delta. Therefore, in addition to Sacramento County, development is controlled by a State agency, the Delta Protection Commission. Therefore, there is little, if any, potential for growth beyond that allowed by agricultural zoning.

Development since 2016

No District facilities have been constructed since 2016. TRUE? HAVE ANY BEEN IMPROVED? SEEN A DECLINE? IF ANY FACILITIES HAVE BEEN CONSTRUCTED SINCE 2016 - WERE THEY IN ANY IDENTIFIABLE HAZARD AREAS?

Future Development

DOES THE DISTRICT HAVE ANY PLANS FOR DEVELOPMENT OF NEW DISTRICT FACILITIES? INCLUDE ANY INFORMATION ON PLANNED OR ONGOING LEVEE IMPROVEMENTS.

Future development in these areas generally parallels that of the Sacramento County Planning Area. More general information on growth and development in Sacramento County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Sacramento County Vulnerability and Assets at Risk of the Base Plan.

7.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table 7-3 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for 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 4.3 of the Base Plan.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. 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.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Power Outage/Power Failure

An impact of almost all hazards below relates to power outage 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 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. More information on types of power disruptions can be found in Section 4.3.2 of the Base Plan. HOW HAS THE DISTRICT BEEN AFFECTED BY POWER OUTAGES? DOES THE DISTRICT HAVE SUFFICIENT BACKUP POWER?

Public Safety Power Shutoff (PSPS)

A new intentional disruption type of power outage/failure event has recently occurred in California. In recent years, several wildfires have started 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 coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3.2 of the Base Plan. HAS THE DISTRICT EVER BEEN AFFECTED BY A PSPS EVENT?

Earthquake

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

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 can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, 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.

In Sacramento County, the Delta (including RD 551) is at risk to a damaging earthquake. The Delta sits atop a blind fault system on the western edge of the Central Valley. Moderate earthquakes in 1892 near Vacaville and in 1983 near Coalinga demonstrate the seismic potential of this structural belt. The increasing height of the levee system has prompted growing concern about the seismic stability of the levees. The concern is based on the proximity of faulting, the nature of the levee foundations, and the materials used to build the levees. Many levees consist of uncompacted weak local soils that may be unstable under seismic loading. The presence of sand and silt in the levees and their foundations indicates that liquefaction associated with a seismic event is also a possibility.

Location and Extent

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 4.3.9 of the Base Plan. Geological literature indicates that no major active faults transect the County; however, there are several subsurface faults in the Delta. The Midland fault, buried under alluvium, extends north of Bethel Island in the Delta to the east of Lake Berryessa and is considered inactive but possibly capable of generating a near 7.0 (Richter Scale) earthquake. This magnitude figure is speculative based on an 1895 earthquake measuring 6.9 on the Richter Scale with an epicenter possibly in the Midland Fault vicinity. However, oil and gas companies exploring the area's energy potential have identified several subsurface faults, none of which show any recent surface rupture. A second, presumably inactive, fault is in the vicinity of Citrus Heights near Antelope Road. This fault's only exposure is along a railroad cut where offsetting geologic beds can be seen. Neither the lateral extent of the trace, the magnitude of the offset, nor the age of faulting has been determined. To the east, the Bear Mountain fault zone trends northwest-southeast through Amador and El Dorado Counties. Geologists believe this series of faults has not been active in historic time. Potential earthquakes on the Hayward, Calaveras, and San Andreas fault could also affect the Delta area.

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 few earthquakes of significant magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low. Seismic shaking maps for the area show Sacramento County and the District fall within a low to moderate shake risk, with most of the moderate risk in the Delta area of the County.

Past Occurrences

There have be no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquakes or that affected the District in any meaningful way.

Vulnerability to and Impacts from Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquake as a result of the periodic release of tectonic stresses. Sacramento County lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result

of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured buildings can be very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry (URM) and soft story buildings. ARE THERE ANY URM OR STOFT STORY BUILDINGS OWNED BY 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 RD 551 is within the less hazardous Zone 3.

Impacts 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.

CAN THE DISTRICT PROVIDE SPECIFIC ISSUES/CONCERNS/IMPACTS TO THE DISTRICT RELATED TO EARTHQUAKES?

Assets at Risk

WHAT DISTRICT ASSETS (FROM Table 7-4) ARE AT RISK FROM THIS HAZARD? DO ANY NEED STRUCTURAL OR NON STRUCTURAL RETROFITTING? WHAT ABOUT THE LEVEES?

Earthquake: Liquefaction

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile and Problem Description

Liquefaction can be defined as the loss of soil strength or stiffness due to a buildup of pore-water pressure during a seismic event and is associated primarily with relatively loose, saturated fine- to medium-grained unconsolidated soils. Seismic ground shaking of relatively loose, granular soils that are saturated or submerged can cause the soils to liquefy and temporarily behave as a dense fluid. If this layer is at the surface, its effect is much like that of quicksand for any structure located on it. If the liquefied layer is in the subsurface, the material above it may slide laterally depending on the confinement of the unstable mass. Liquefaction is caused by a sudden temporary increase in pore-water pressure due to seismic densification or other displacement of submerged granular soils. Liquefiable soil conditions are not uncommon in alluvial deposits in moderate to large canyons and could also be present in other areas of alluvial soils where

the groundwater level is shallow (i.e., 50 feet below the surface). Bedrock units, due to their dense nature, are unlikely to present a liquefaction hazard.

Location and Extent

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, the Delta and areas of downtown Sacramento are at risk to liquefaction. The Delta sits atop a blind fault system on the western edge of the Central Valley. Moderate earthquakes in 1892 near Vacaville and in 1983 near Coalinga demonstrate the seismic potential of this structural belt. The increasing height of the levee system has prompted growing concern about the seismic stability of the levees. The concern is based on the proximity of faulting, the nature of the levee foundations, and the materials used to build the levees. Many levees consist of uncompacted weak local soils that may be unstable under seismic loading. The presence of sand and silt in the levees and their foundations indicates that liquefaction is also a possibility.

Past Occurrences

There have be no past federal or state disaster declarations from this hazard. The District noted no past occurrences of earthquake liquefaction or that affected the District in any meaningful way. TRUE?

Vulnerability to and Impacts from Liquefaction

Earthquake is discussed above, but is primarily focused on the vulnerability of buildings and people from earthquake shaking. This section deals with a secondary hazard associated with earthquake – the possible collapse of structural integrity of the ground underneath liquefaction prone areas. In Sacramento County, two of these areas have been identified: downtown Sacramento and the Delta area, which could lead to a possible collapse of delta levees and any above ground structures. While this levee failure differs from the levee failure discussion below which generally focuses on levee failure due to high water conditions or other types of structural failure, the resulting impacts would be similar and include those related to a large flood event.

WHAT SPECIFIC VULNERABILITY AND IMPACTS DOES THE DISTRICT SEE OCCURRING FROM LIQUEFACTION? WILL IT BE BASED ON SHAKING EFFECTS, LIQUEFACTION, OR THE SECONDARY EFFECTS TO LEVEES AND RESULTANT FLOODING?

Assets at Risk

WHAT DISTRICT ASSETS (FROM Table 7-4) ARE AT RISK FROM THIS HAZARD?

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Hazard Profile and Problem Description

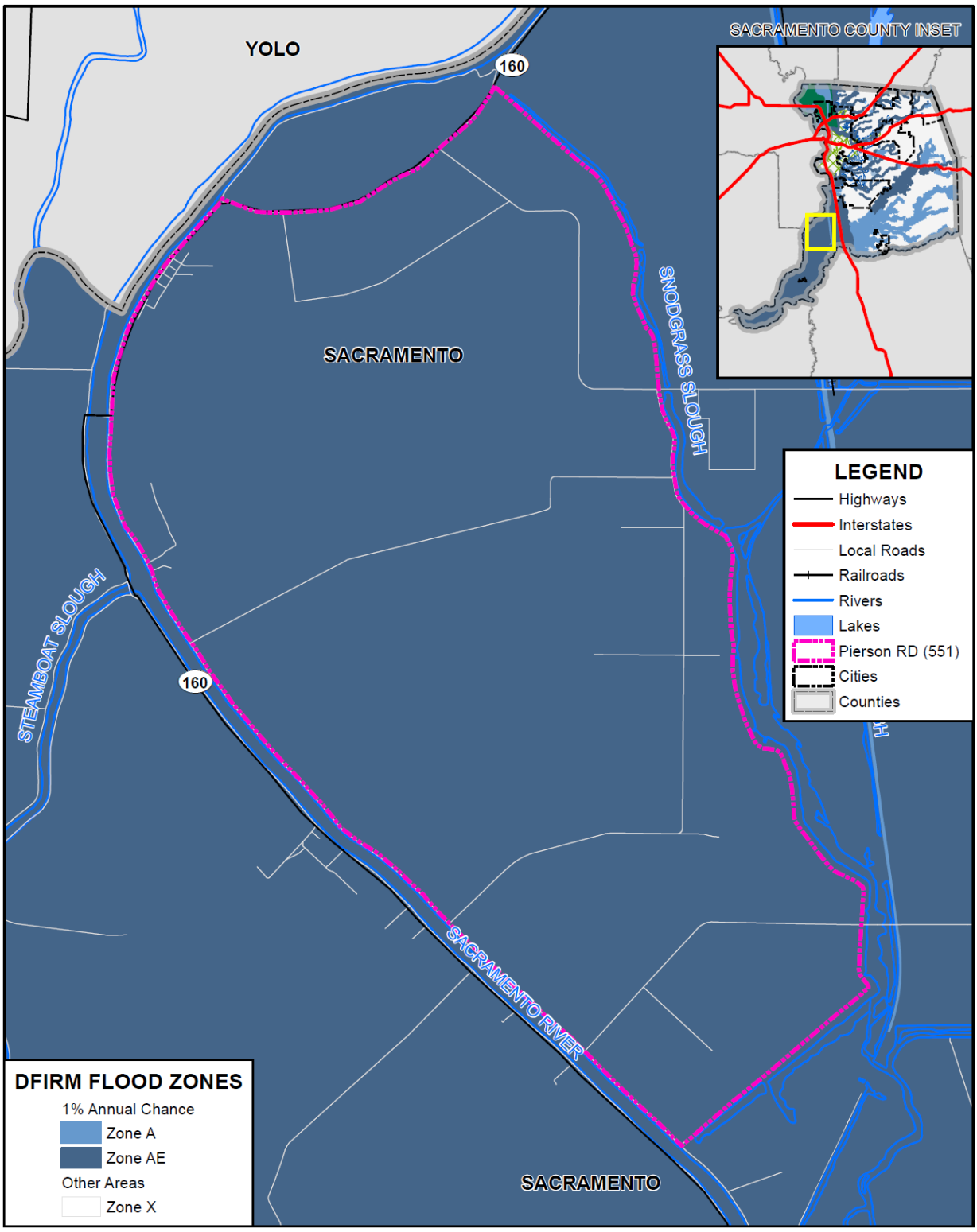
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the County or in the District, and have caused damages in the past. Flooding is a significant problem in Sacramento County and the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding on the Sacramento River has threatened the levees of RD 551 in the past. Flooding inside the leveed area would occur as a result of levee failure or overtopping. The flood elevations around Pearson District exceed the elevation of almost every acre of ground protected by RD 551 levees. Therefore, a levee breach under flood conditions would be catastrophic to the landowners. In addition, the Pearson District levees are not certified to protect against the 100-year flood.

As previously described in Section 4.3.11 of the Base Plan, the Sacramento County Planning Area and the RD 551 have been subject to historical flooding.

Location and Extent

The RD 551 has areas located in the 1% annual chance floodplain. This is seen in Figure 7-2.

Figure 7-2 RD 551 – FEMA DFIRM Flood Zones



Data Source: FEMA NFHL 07/19/2018, Pierson Reclamation District, Sacramento County GIS, Cal-Atlas; Map Date: 09/2020.

Table 7-5 details the DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the District.

Table 7-5 RD 551– DFIRM Flood Hazard Zones

Flood Zone	Description	Flood Zone Present in the District
A	100-year Flood: No base flood elevations provided	
AE	100-year Flood: Base flood elevations provided	X
AH	An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet	
AO	Areas subject to inundation by 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet	
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones	
Shaded X	500-year flood the areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X Protected by Levee	An area determined to be outside the 500-year flood and protected by levee from 100-year flood	
X (unshaded)	Areas outside of the flood zone	

Source: FEMA

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Past Occurrences

A list of state and federal disaster declarations for Sacramento County from flooding is shown on Table 7-6. These events also likely affected the District to some degree.

Table 7-6 Sacramento County – State and Federal Disaster Declarations from Flood 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	19	1950, 1955, 1958 (twice), 1963, 1969, 1982 (twice), 1983, 1986, 1995 (twice), 1996, 1997, 1998, 2008, 2017 (three times)	14	1955, 1958, 1964, 1969, 1983, 1986, 1995 (twice), 1997, 1998, 2006, 2017 (three times)

Source: Cal OES, FEMA

Past river floods have damaged the RD 551 levees in the form of erosion. Some of this erosion was repaired by RD 551 under flood fight conditions. Restoration erosion repair has typically been performed by the Corps of Engineers as authorized under PL 84-99. Repair work under PL 84-99 was performed by the Corps of Engineers on Pearson District levees following the recent floods of 1986, 1997, 1998, and 2006.

Past floods have also required flood fighting by RD 551. This flooding fighting has consisted of seepage control and emergency erosion repair. Seepage control is critical in levee breach prevention. The levees and levee foundations of Pearson District are very porous and subject to flood water seeping through, and under, the levee. If left uncontrolled, this seepage could accelerate to the point that it has the force to move levee material. This phenomenon is called piping, or internal erosion of the levee. Once enough material is moved out of the levee section, a levee breach occurs.

WHAT FLOOD EVENTS HAVE AFFECTED THE DISTRICT? CAN THE DISTRICT PROVIDE DAMAGE AND IMPACT INFORMATION FROM ANY PA WORKSHEETS ASSOCIATED WITH THE RECENT DISASTER DECLARATIONS SINCE THE 2016 LHMP OR OTHER SOURCES?

Vulnerability to and Impacts from Flood

Floods have been a part of the District's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Roads can be damaged and closed, causing safety and evacuation issues. People may be swept away in floodwaters, causing injuries or deaths.

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

OTHER DISTRICT SPECIFIC VULNERABILITIES/IMPACTS/CONCERNS?

Assets at Risk

Should a flood breach the levees, the entirety of the assets of RD 551 would be at risk. These assets include the small community of Courtland. All of the RD 551551 drain pumps would be flooded and therefore,

RD 551 could not drain the flooded areas with their existing pumps; auxiliary pumps would have to be brought in.

WHAT DISTRICT ASSETS (FROM Table 7-4) ARE AT RISK FROM THIS HAZARD?

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration.

During high rainfall events, the drainage system is not capable to evacuate water from the interior of Pearson District without flooding some low lying properties. On properties that farm annual row crops, this is not a problem since crops are not normally planted until after the rainy season. However, winter wheat, perennial, or multi-year crops are susceptible to damage when water overflows the banks of the drain canals.

Location and Extent

The RD 551 is subject to localized flooding throughout the District. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture. PROBLEM AREAS?

Past Occurrences

There have been no federal or state disaster declarations in the County due to localized flooding. The District noted the following past occurrences of localized flooding:

- INSERT PAST OCCURRENCES SINCE THE 2016 LHMP

Stormwater flooding occurs every few years. In most years, it is not significant enough to be a problem. For the most part, past flooding has damaged alfalfa and winter wheat. However, past floods have damaged county roads. In addition, many acres of vineyards and orchards have been planted in the past few years, so it is anticipated that these recently planted permanent crops may be damaged by future canal bank flooding.

Vulnerability to and Impacts from Localized Flooding

Historically, much of the growth in the District and County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff.

As stated above, stormwater flooding has the potential to result in significant damage due to the increased acreage of permanent crops. In addition, residences in the lower elevations of Courtland are at risk.

Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

PROVIDE SPECIFIC VULNERABILITIES AND IMPACTS OF CONCERN TO THE DISTRICT

Assets at Risk

WHAT DISTRICT ASSETS (FROM Table 7-4) ARE AT RISK FROM THIS HAZARD?

Levee Failure

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Hazard Profile and Problem Description

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower steam channel, levees can also increase the speed of the water. Levees can be natural or man-made.

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. For example, levees can be certified to provide protection against the 1% annual chance flood. Levees reduce, not eliminate, the risk to individuals and structures located behind them. A levee system failure or overtopping can create severe flooding and high water velocities. Levee failure can occur through overtopping or from seepage issues resulting from burrowing rodents, general erosion, excessive vegetation and root systems and other factors that compromise the integrity of the levee. No levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

Location and Extent

There is not a scientific scale or measurement system in place for levee failure. Expected flood depths from a levee failure in the District vary by event and location. The speed of onset is slow as the river rises, but if a levee fails the warning times are generally short for those in the inundation area. The duration of levee failure risk times can be hours to weeks, depending on the river flows that the levee holds back. When northern California dams and reservoirs are nearing maximum capacity, they release water through the river systems, causing additional burdens on County levees.

IS THERE A MAP AND TABLE OF LEVEES AND THE LOP THEY PROVIDE FOR THE DISTRICT? CAN WE ALSO GET INFORMATION ON ANY ONGOING LEVEE IMPROVEMENT PROJECTS?

Past Occurrences

There have been no federal or state disaster declarations from levee failure. The District Planning Team noted no past occurrences of levee failures. The RD 551 levees have not failed in over 100 years. Two floods over the past few decades (1986 & 1997) required extensive flood fighting by RD 551 forces in order to prevent a levee breach.

TRUE? IF NOT PROVIDE DATES AND DAMAGES

Vulnerability to and Impacts from Levee Failure

A levee failure can range from a small, uncontrolled release to a catastrophic failure. Levee failure flooding can occur as the result of prolonged rainfall and flooding. The primary danger associated with levee failure is the high velocity flooding of those properties outside and downstream of the breach.

Should a levee fail, some or all of the area protected by the levees would be at risk to flooding. Impacts from a levee failure include property damage, critical facility damage, and life safety issues. Business and economic losses could be large as facilities could be flooded and services interrupted. School and road closures could occur. Road closures would impede both evacuation routes and ability of first responders to quickly respond to calls for aid. Other problems connected with levee failure flooding include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

A levee failure would impact almost all the assets and critical facilities on Pearson District; including the small community of Courtland. State Highways 160, as well as a number of county roads are at risk. Approximately 8,000 of agricultural land would be damaged and possibly rendered unfarmable for at least a year. There are many permanent crops on Pearson District, such as wine grapes, pears, apples and cherries that would be destroyed.

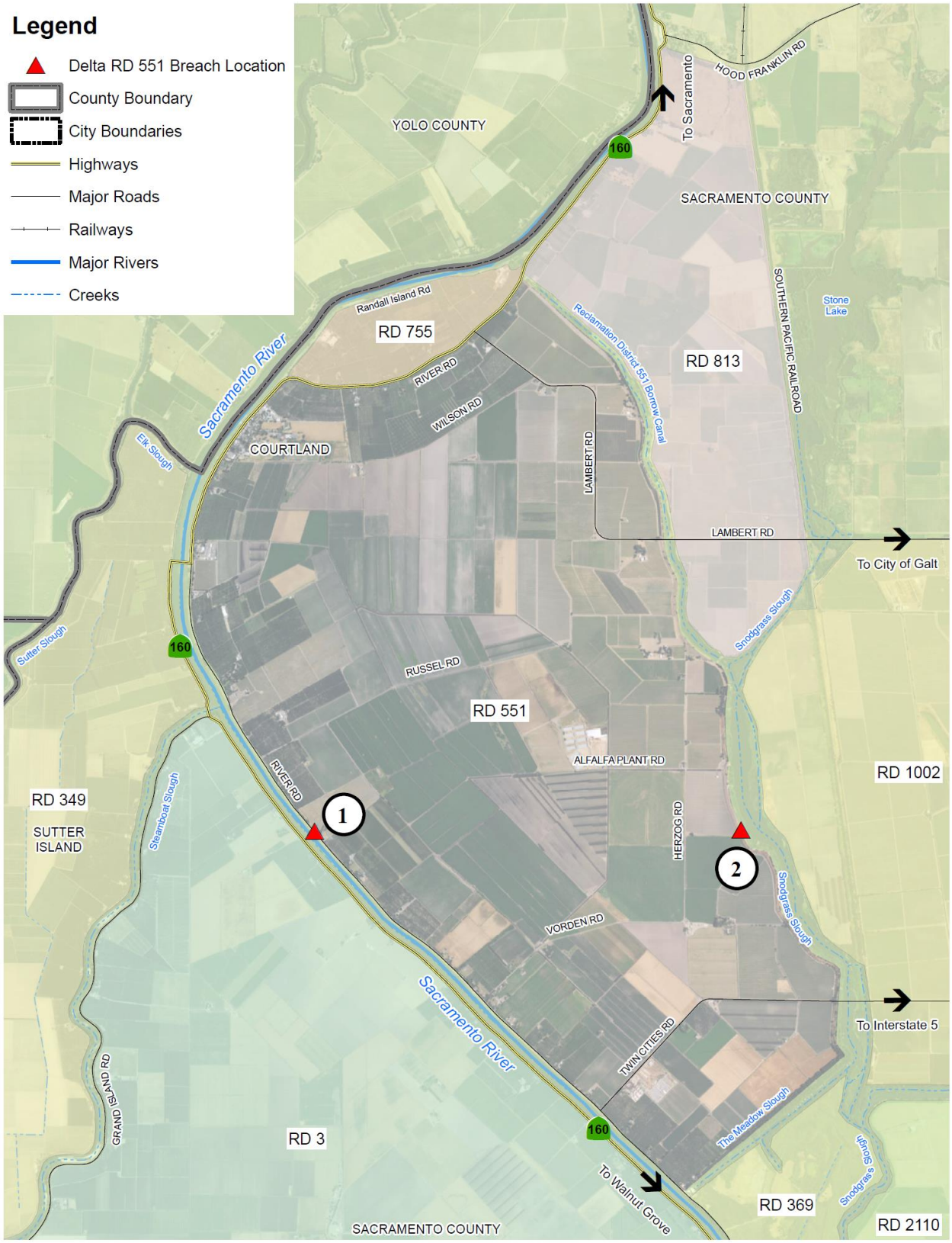
ANYTHING TO ADD AS TO HOW THE DISTRICT WOULD BE AFFECTED BY A LEVEE FAILURE? KEY AREAS ISSUES/CONCERNS/IMPACTS?

StormReady Flood Scenarios and Evacuation Routes

The County of Sacramento and the City of Sacramento have prepared various detailed maps showing hypothetical levee breaks, inundation levels and the time it would take for waters to rise in affected neighborhoods, and rescue and evacuation zones. It is important to note that these maps deal with potential scenarios. These are to help Sacramento County citizens think of how to escape before an emergency occurs. It should be noted that it would be incorrect to assume that the evacuation routes shown on the maps will necessarily be citizens only way out in a flood. Escape routes could be affected by localized flooding, traffic accidents, and different flooding situations occurring at the time. Emergency officials will monitor roads and let the public know through radio stations and other media if alternate routes should be taken.

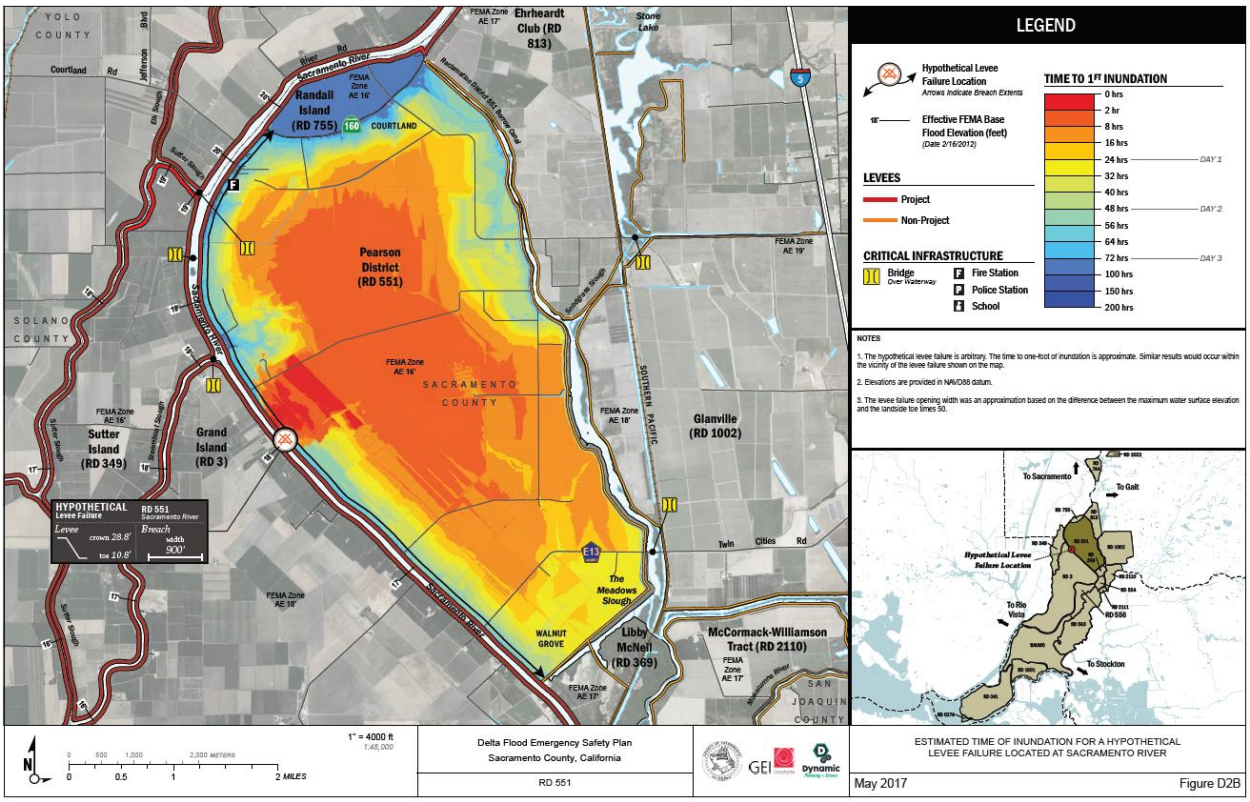
For RD 551, Figure 7-3 details the locations in the Delta within RD 551 where flooding could occur. The red triangles denote potential levee breach locations. RD 551 has two potential levee break scenarios. Maps for Scenario 1 regarding time to one foot inundation (Figure 7-4), estimated flood depths (Figure 7-5), and suggested evacuation routes (Figure 7-6) are displayed below. Maps for Scenario 2 can be found on the Sacramento County stormready.org website.

Figure 7-3 RD 551 – Potential Levee Breach Location



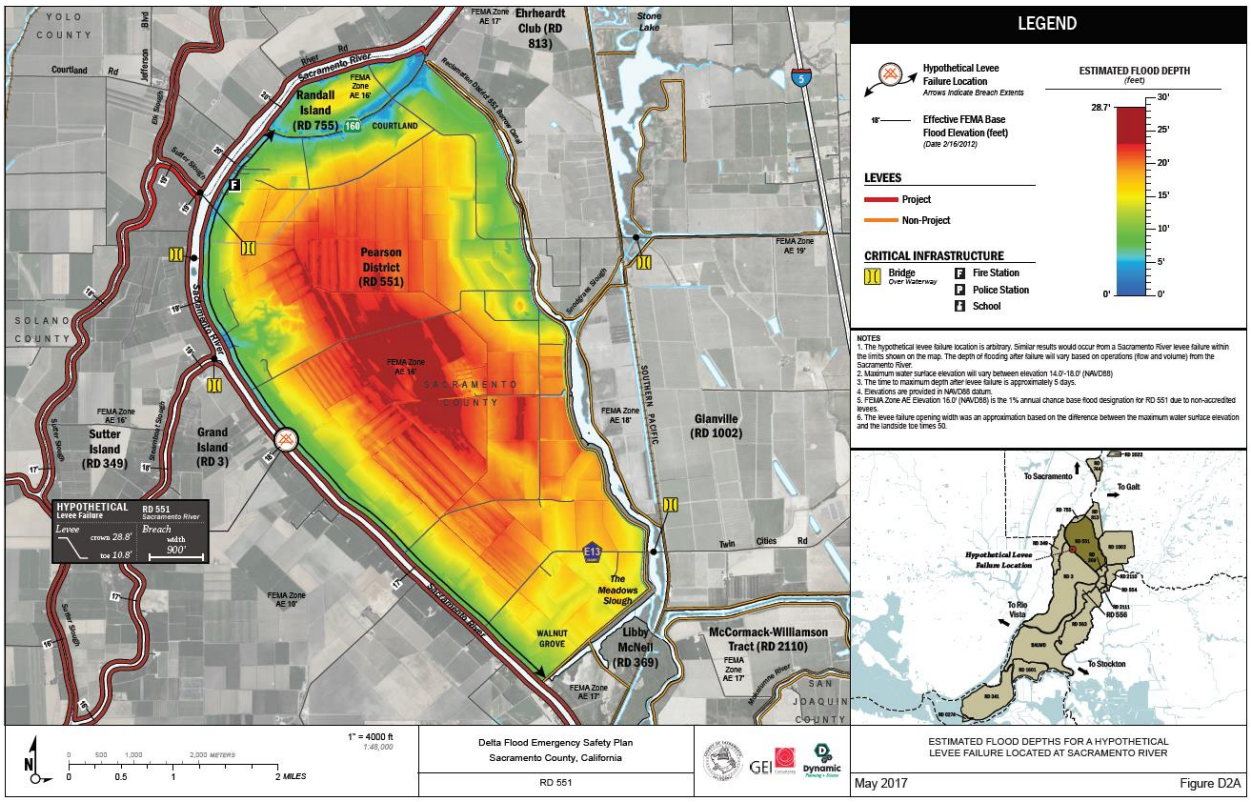
Source: Sacramento County Storm Ready – retrieved March 30, 2021

Figure 7-4 RD 551 – Time to One Foot Inundation after Levee Breach



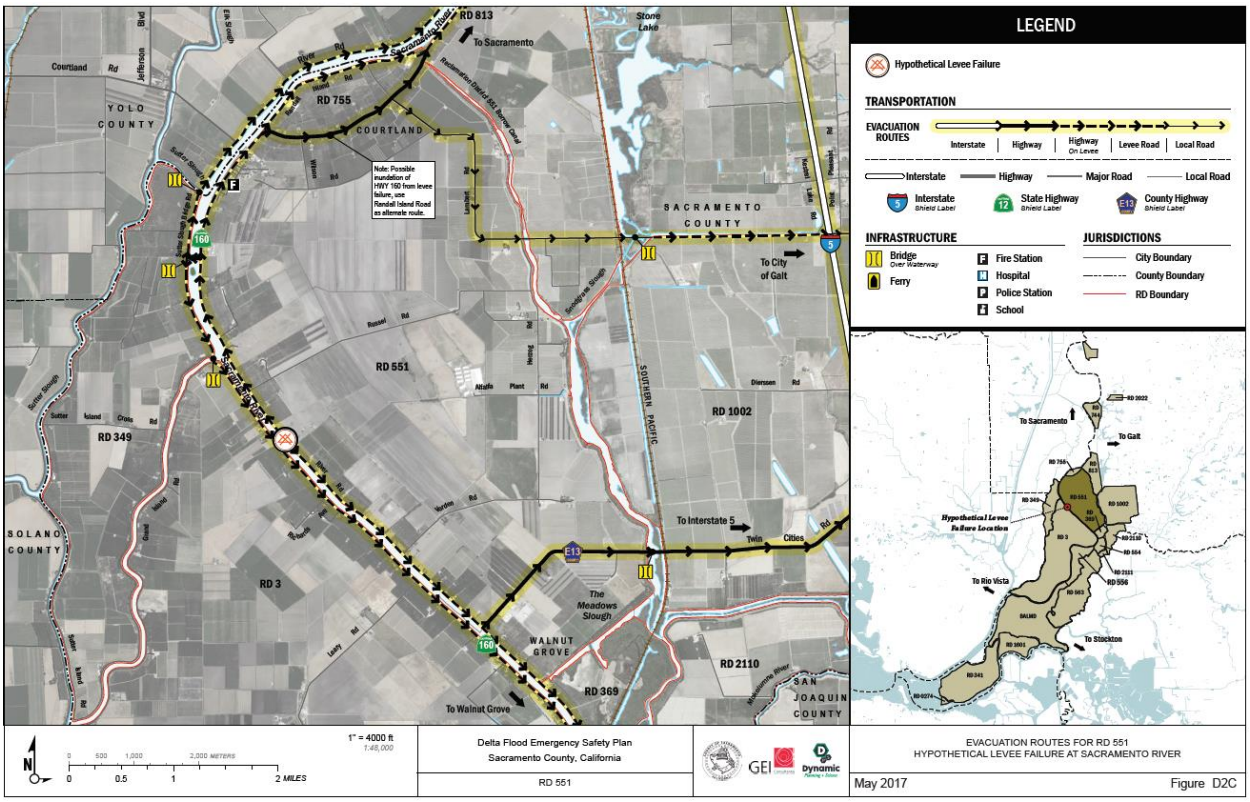
Source: Sacramento County Storm Ready – retrieved March 30, 2021

Figure 7-5 RD 551 – Estimated Flood Depth from Levee Breach Scenario



Source: Sacramento County Storm Ready – retrieved March 30, 2021

Figure 7-6 RD 551 – Levee Breach Scenario Evacuation Routes



Source: Sacramento County Storm Ready – retrieved March 30, 2021

Assets at Risk

WHAT DISTRICT ASSETS (FROM Table 7-4) ARE AT RISK FROM THIS HAZARD?

Severe Weather: Heavy Rains and Storms (Hail, Lightning)

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the fall, winter,

and spring months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Sacramento County, and the District can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

There have been past disaster declarations from heavy rains and storms, which were discussed in Past Occurrences of the flood section above. According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This is the cause of many of the federal disaster declarations related to flooding.

PROVIDE INFORMATION ON SPECIFIC EVENTS? PROVIDE DAMAGE AND IMPACTS FROM SIGNIFICANT EVENTS SINCE 2016

Vulnerability to and Impacts from Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause localized flooding. Elongated events, or events that occur during times where the ground is already saturated can cause 1% and 0.2% annual chance flooding. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District.

Actual damage associated with the effects of severe weather include impacts to property, critical facilities (such as utilities), and life safety. Heavy rains and storms often result in localized flooding creating significant issues. Roads can become impassable and ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Floodwaters and downed trees can break utilities and interrupt services. During periods of heavy rains and storms, power outages can occur. These power outages can affect pumping stations and lift stations that help alleviate flooding.

It is the secondary effects of heavy rain and storms that are of concern to RD 551. Heavy rains can cause flooding, levee failure, and erosion. Flooding, levee failure, and erosion can cost RD 551 millions in damages.

Severe storm events can lead to erosion, significant flooding and impacts to the levee system. Although water surface elevation is a major factor to levee seepage and overtopping, severe weather can cause significant damage, such as erosion, that puts the integrity of the Pearson District levee system at risk.

A levee failure would impact almost all the assets and critical facilities on Pearson District; including the small community of Courtland. State Highways 160, as well as a number of county roads are at risk. Approximately 8,000 of agricultural land would be damaged and possibly rendered unfarmable for at least a year. There are many permanent crops on Pearson District, such as wine grapes, pears, apples and cherries that would be destroyed.

OTHER DISTRICT SPECIFIC VULNERABILITIES AND IMPACTS?

Assets at Risk

WHAT DISTRICT ASSETS (FROM Table 7-4) ARE AT RISK FROM THIS HAZARD?

7.6 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.

7.6.1. Regulatory Mitigation Capabilities

Table 7-7 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 RD 551. UPDATE TABLE – THIS IS FROM THE OLD PLAN. TRY TO FILL OUT THE LAST COLUMN AS YOU ARE ABLE. MAKE SURE TO FILL OUT THE LAST CELL

Table 7-7 RD 551 Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y/2012	Five-year plan consisting of levee stability, seepage control and maintenance projects.
Capital Improvements Plan	N	
Economic Development Plan	N	
Local Emergency Operations Plan	Y/2017	Through a state grant, Sacramento County is funding development of an Emergency Action Plan for RD 551. The plan will be complete in early 2017
Continuity of Operations Plan	N	
Transportation Plan	N	
Stormwater Management Plan/Program	Y/Ongoing	RD 551 consistently evaluates flooding of low areas and the need for improvements in its drainage system
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	N	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		Y Annual routine maintenance plans and participation in the state Delta Levees Subventions Program which assists in funding levee maintenance. RD 551 is also drafting a Letter of Intent to draft a System-Wide Improvement Framework to respond to maintenance and rehabilitation issues brought up by the Corps of Engineers 2013 Periodic Inspection Report
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	N	Version/Year:

Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	N	Rating:
Site plan review requirements	N	
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	N	
Subdivision ordinance	N	
Floodplain ordinance	N	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	N	
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	Y	Erosion control measures on levee and canal slopes as necessary. Sediment removal from drainage system canals as necessary.
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
PROVIDE SPECIFIC DETAILS OF AREAS FOR IMPROVEMENT OF THESE TYPES OF CAPABILITIES AND HOW/WHY IT WILL HELP THE DISTRICT		

Source: RD 551

7.6.2. Administrative/Technical Mitigation Capabilities

Table 7-8 identifies the District department(s) responsible for activities related to mitigation and loss prevention in RD 551. UPDATE TABLE – THIS IS FROM THE OLD PLAN. TRY TO FILL OUT THE LAST COLUMN AS YOU ARE ABLE. MAKE SURE TO FILL OUT THE LAST CELL

Table 7-8 RD 551's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	RD 551 annually performs over $100,000 in maintenance. In addition, it periodically constructs projects to repair deficiencies in the levee.
Mutual aid agreements	N	
Other		

Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	
Floodplain Administrator	N	
Emergency Manager	Y	Topper van Loben Sels, President
Community Planner	N	
Civil Engineer	Y	Gilbert Cosio and the staff at MBK Engineers has served as District Engineer for over 30 years and has participated in many flood fight actions.
GIS Coordinator	N	
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	N	
Hazard data and information	N	
Grant writing	N	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
PROVIDE SPECIFIC DETAILS OF AREAS FOR IMPROVEMENT OF THESE TYPES OF CAPABILITIES AND HOW/WHY IT WILL HELP THE DISTRICT		

Source: RD 551

7.6.3. Fiscal Mitigation Capabilities

Table 7-9 identifies financial tools or resources that the District could potentially use to help fund mitigation activities. UPDATE TABLE – THIS IS FROM THE OLD PLAN. TRY TO FILL OUT THE LAST COLUMN AS YOU ARE ABLE. MAKE SURE TO FILL OUT THE LAST CELL

Table 7-9 RD 551's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (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	RD 551's annual assessment includes funding for future anticipated capital projects
Authority to levy taxes for specific purposes	Y	As dictated by law, RD 551 has the authority to levy taxes for specific purposes
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
Storm water utility fee	N	

Funding Resource	Access/ Eligibility (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?
Incur debt through general obligation bonds and/or special tax bonds	Y	RD 551 has the ability to levy special assessments
Incur debt through private activities	N	
Community Development Block Grant	Y	
Other federal funding programs		
State funding programs		
Other		
How can these capabilities be expanded and improved to reduce risk?		
PROVIDE SPECIFIC DETAILS OF AREAS FOR IMPROVEMENT OF THESE TYPES OF CAPABILITIES AND HOW/WHY IT WILL HELP THE DISTRICT		

Source: RD 551

7.6.4. Mitigation Education, Outreach, and Partnerships

Table 7-10 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. UPDATE TABLE – THIS IS FROM THE OLD PLAN. TRY TO FILL OUT THE LAST COLUMN AS YOU ARE ABLE. MAKE SURE TO FILL OUT THE LAST CELL

Table 7-10 RD 551's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	
Natural disaster or safety related school programs	N	
StormReady certification	Y	The RD 551 manager, trustees, and District Engineer have been, or soon will be, trained in SEMS and NIMS
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
PROVIDE SPECIFIC DETAILS OF AREAS FOR IMPROVEMENT OF THESE TYPES OF CAPABILITIES AND HOW/WHY IT WILL HELP THE DISTRICT		

Source: RD 551

7.6.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

RD 551 has been a very active participant in the state's Delta Levee Subventions Program for about 20 years. This program has proven useful and has enabled RD 551 to react financially if a non-routine cost arises.

WHAT MITIGATION EFFORTS ARE ONGOING OR HAVE BEEN CONDUCTED BY THE DISTRICT SINCE 2016?

7.7 Mitigation Strategy

7.7.1. Mitigation Goals and Objectives

The RD 551 adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

7.7.2. Mitigation Actions

The planning team for the RD 551 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, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Earthquake
- Earthquake Liquefaction
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Levee Failure
- Severe Weather: Heavy Rains and Storms

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 regardless of hazard priority. Collectively, this 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 although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

WILL NEED MITIGATION ACTIONS FOR EACH HAZARD IN THE BULLETED LIST ON THE PREVIOUS PAGE. ONE ACTION MAY ADDRESS MORE THAN ONE HAZARD. MITIGATION ACTION SWILL BE DISCUSSED AT THE 3/30/2021 LHMP MEETING

Multi-Hazard Actions

Action 1.

Hazards Addressed:

Goals Addressed:

Issue/Background:

Other Alternatives:

Existing Planning Mechanisms through which Action will be Implemented:

Responsible Office:

Priority (H, M, L):

Cost Estimate:

Potential Funding:

Benefits (avoided Losses):

Schedule: