

# Delta Annex Chapter 6 Reclamation District 551

## 6.1 Introduction

This new chapter to the Delta Annex details the hazard mitigation planning elements specific to the Reclamation District 551 (RD 551), a new 2016 participating jurisdiction to the Sacramento County Local Hazard Mitigation Plan (LHMP) Update. This chapter of the Delta 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 RD 551. This chapter of the Delta Annex provides additional information specific to RD 551, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this District.

## 6.2 Planning Process

As described above, the District followed the planning process detailed in Section 3 of the Base Plan. In addition to providing representation on the Sacramento County Hazard Mitigation Planning Committee (HMPC), RD 551 formulated its 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 6-1. Additional details on plan participation and RD 551 representatives are included in Appendix A.

*Table 6-1 RD 551 Planning Team*

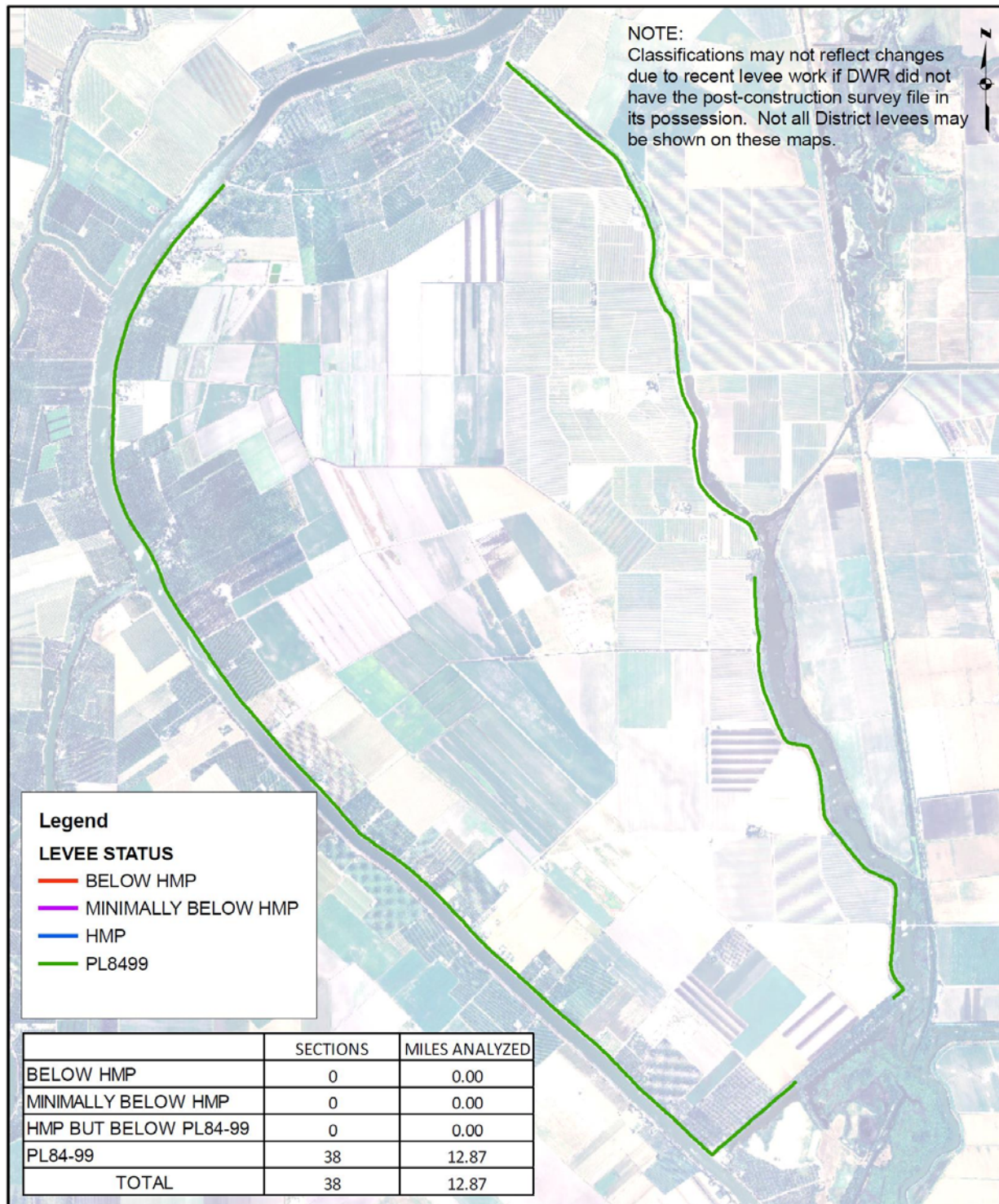
Name	Position/Title	How Participated
Gilbert Cosio	District Engineer	Attended meetings and workshops; reported to the District; compiled data for this annex; review draft documents
Topper van Loben Sels	District President	Briefed in Sacramento County LHMP

Source: RD 551

## 6.3 Community Profile

The community profile for RD 551 is detailed in the following sections. Figure 6-1 displays a map and the location of RD 551 boundaries within Sacramento County.

Figure 6-1 Reclamation District 551 Map



Levee Assessment - RD 551 - Pearson District



Source: RD 551

### 6.3.1. RD 551 Overview, History, and Background

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.<sup>1</sup> To

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<sup>1</sup> 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.

## 6.4 Hazard Identification

RD 551’s planning team identified the hazards that affect the District and summarized their geographic extent, probability of future occurrences, potential magnitude/severity, and significance specific to RD 551 (see Table 6-2).



*Table 6-2 RD 551—Hazard Identification*

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Agricultural Hazards	Extensive	Occasional	Limited	Low
Bird Strike				
Climate Change	Extensive	Occasional	Limited	Low
Dam Failure	Limited	Unlikely	Negligible	Low
Drought and Water Shortage	Extensive	Occasional	Critical	Low
Earthquake	Extensive	Occasional	Limited	Medium
Earthquake: Liquefaction	Significant	Occasional	Limited	Medium
Flood: 100/200/500-year	Extensive	Occasional	Catastrophic	High
Flood: Localized Stormwater Flooding	Extensive	Likely	Limited	High
Landslides				
Levee Failure	Extensive	Occasional	Catastrophic	High
River/Stream/Creek Bank Erosion	Significant	Highly Likely	Catastrophic	High
Severe Weather: Extreme Temperatures – Cold/Freeze				
Severe Weather: Extreme Temperatures – Heat				
Severe Weather: Fog				
Severe Weather: Heavy Rains and Storms (Thunderstorms, Hail, and Lightning)	Significant	Likely	Critical	Medium
Severe Weather: Wind and Tornadoes				
Subsidence				
Volcano				
Wildfire:(Burn Area/Smoke)				
<b>Geographic Extent</b> <b>Limited:</b> Less than 10% of planning area <b>Significant:</b> 10-50% of planning area <b>Extensive:</b> 50-100% of planning area <b>Probability of Future Occurrences</b> <b>Highly Likely:</b> Near 100% chance of occurrence in next year, or happens every year. <b>Likely:</b> Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. <b>Occasional:</b> Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. <b>Unlikely:</b> Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.		<b>Magnitude/Severity</b> <b>Catastrophic</b> —More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths <b>Critical</b> —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 <b>Limited</b> —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 <b>Negligible</b> —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 <b>Significance</b> <b>Low:</b> minimal potential impact <b>Medium:</b> moderate potential impact <b>High:</b> widespread potential impact		

## 6.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile RD 551’s hazards and assess the District’s vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 and 4.3 Vulnerability Assessment in the main plan. The hazard profiles in the main plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to RD 551 is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, 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 main plan.

### 6.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section 6.5.3, includes a description as to how the hazard affects RD 551 and information on past occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the Planning Area.

### 6.5.2. Vulnerability Assessment

This section identifies RD 551’s assets at risk, including values at risk, critical facilities and infrastructure, economic assets, natural resources, historic and cultural resources, and growth and development trends.

#### *Assets at Risk and Critical Facilities*

This section considers the District’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 plan:

*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, and (3) Hazardous Materials Facilities.*

Table 6-3 lists particular critical facilities and other District assets identified by RD 551’s planning team as important to protect in the event of a disaster. RD 551’s physical assets, valued at over \$4 million, consist of the buildings and infrastructure to support RD 551 operations.

*Table 6-3 RD 551’s Critical Facilities, Infrastructure, and Other District Assets*

Name of Asset	Facility Type	Address	Replacement Value	Hazard Info
Pumps – Snodgrass Slough	Drain Pumps		\$2,000,000	
Pumps – Lake	Drain Pumps		\$1,000,000	

Name of Asset	Facility Type	Address	Replacement Value	Hazard Info
District Owned Facilities	Home, Buildings & Equipment		\$2,000,000	

Source: RD 551

### *Natural Resources*

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*

Since the land has been settled for over 150 years, there are many historic structures on Pearson District.

### *Growth and Development Trends*

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.

### **6.5.3. Vulnerability to Specific Hazards**

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table 6-2 as high or medium significance hazards. Impacts of past events and vulnerability of the RD 551 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 calculating loss estimates are the similar to those described in Section 4.3 of the Base Plan and are based on data provided by the District as described further below. In general, the most vulnerable District assets include the levees and supporting structures that the District owns. As stated, above, RD 551 levees and drainage provide protection to over \$89,000,000 in assets as estimated by the Delta Risk Management Strategy report.

An estimate of the vulnerability of RD 551 to each identified priority hazard, in addition to the estimate of probability 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.

### *Earthquake and Earthquake: Liquefaction*

**Likelihood of Future Occurrence**—Occasional

**Vulnerability**—Medium

### Hazard Profile and Problem Description

In Sacramento County, the Delta (including RD 551) is 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

The District Planning Team noted no past occurrences of earthquake that have affected the District.

### Vulnerability to Earthquake and Liquefaction

Although there have been no significant quakes in or closely adjacent to the Delta since high levees were originally constructed, there are at least five major faults within the vicinity of the Delta capable of generating peak ground acceleration values that would likely lead to levee failures. Should the levees that protect RD 551 fail, the dewatering costs would be in the millions of dollars.

### Future Development

The consequences of a major earthquake in RD 551 will also increase with time. Because of increasing water demand and the state's growing population and economy, the economic consequences of an interruption in Delta water supply operations due to an earthquake will increase. Consequences to the Delta Region will also increase due to additional development.

### *Flood: 100/200/500-year*

**Likelihood of Future Occurrence**—Occasional

**Vulnerability**—High

### Hazard Profile and Problem Description

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.

### Past Occurrences

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.

### Vulnerability to Flood

#### Assets/Critical Facilities at Risk

Fl Flooding of Delta islands has the potential to negatively impact water quality both locally and statewide. The largest of California's drinking water sources is the Sacramento-San Joaquin Delta and its tributaries. The Delta provides water throughout the state via the State and Federal water projects. During a flood, there is a higher potential for the waters in the Delta to be exposed to chemicals, fuel, oil, and multiple other constituents of concern that can quickly degrade water quality. Flooding can also disturb soil and soil-borne materials such as mercury and organic matter that can degrade water quality. If the flood water rushing into a Pearson District levee breach is large enough in volume, the surge of water into the island will call saltwater to be pull from San Francisco Bay and into the Delta, thus impacting the water quality of the Delta and water users who export water out of the Delta.

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 3551 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.

#### Natural Resources at Risk

The District Planning Team noted no specific natural resources at risk to flooding.

#### Historic and Cultural Resources at Risk

The District Planning Team noted no specific historic or cultural resources at risk to flooding.

## Future Development

While future development may occur in the areas protected by levee, the District does not control this development. The District only can control whether the levees meet certification standards.

### *Flood: Stormwater/Localized Flooding*

**Likelihood of Future Occurrence**–Likely

**Vulnerability**–High

## Hazard Profile and Problem Description

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.

## Past Occurrences

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 Localized Flooding

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.

## Future Development

While future development may occur in the areas protected by levee, the District does not control this development. The District only can control whether the levees meet certification standards.

### *Levee Failure*

**Likelihood of Future Occurrence**–Occasional

**Vulnerability**–High

## Hazard Profile and Problem Description

Floods can threaten the District from several sources. Usually, the possibility of flooding can be anticipated from eight to twenty hours before the “Emergency Period” is reached. However, as demonstrated in Linda, California, in February 1986, it is possible for a levee to collapse with little or no warning when there are still four or more feet of freeboard available.

Generally, levees fail due to overtopping or collapse. A catastrophic levee failure resulting from collapse probably will occur very quickly with relatively little warning. Such a failure would occur where the levee is saturated and the high hydrostatic water pressure on the river side, coupled with erosion of the levee from high water flows or an inherent defect in the levee, causes an almost instant collapse of a portion of the levee. Under such circumstances, structures located relatively near the break will suffer immediate and extensive damage. Several hundred yards away from the break the energy of the flood waters will be dispersed sufficiently to reduce, but not eliminate, flooding damage to structures in its path. The flood water will flow in a relatively shallow path toward any low point in the affected area. Flood water will collect in these low areas and the levels will rise as the flow continues. When the rivers are high, it is not possible to close or repair a levee break until the water surface in the river and the flooded area equalize.

A major overtopping of a levee, if flow persists, will result in severe erosion of the levee crowns on the landward side and cause levee failure over a period of minutes to several hours. A severe levee overtopping can, therefore, be considered as a levee break for the purpose of determining the extent of flooding that any area will suffer. Generally, overtopping can be predicted based on river stages and the warning given depending on the source of the flood waters.

### Past Occurrences

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.

### Vulnerability to Levee Failure

#### Assets/Critical Facilities 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.

#### Natural Resources at Risk

Flooding of Delta islands destroys habitat, kills most species present, and can entrain and strand large populations of native and non-native fish species.

#### Historic and Cultural Resources at Risk

Should a levee failure occur, all historic and cultural resources in the District would be at risk.

### Future Development

While future development may occur in the areas protected by levee, the District does not control this development. The District only can control whether the levees meet certification standards.

## *River/Stream/Creek Bank Erosion*

**Likelihood of Future Occurrence**–Highly Likely

**Vulnerability**–High

### **Hazard Profile and Problem Description**

Stream bank erosion is a natural process, but acceleration of this natural process leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects. As farmers settled the valleys in the 1800s, the Gold Rush drew prospectors to the hills. As mining in the Sierra Nevada turned to the more “efficient” methods of hydraulic mining, the use of environmentally destructive high-pressure water jets washed entire mountainsides into local streams and rivers. As a result, the enormous amounts of silt deposited in the riverbeds of the Central Valley increased flood risk. As a remedy to these rising riverbeds, levees were built very close to the river channels to keep water velocity high and thereby scour away the sediment. However, the design of these narrow channels has been too successful. While the Gold Rush silt is long gone, the erosive force of the constrained river continues to eat away at the levee system and stream banks within the District.

### **Past Occurrences**

RD 551 experiences bank erosion essentially every year there is above normal precipitation. As part of the Corps of Engineers Sacramento River Flood Control Project, RD 551 erosion has been periodically repaired by the Corps of Engineers under PL84-99. In years when the Corps does not perform repair, RD 551 repairs the erosion with financial assistance from the state’s Delta Levees Subventions Program. Since RD 551 has been recently deemed ineligible for PL84-99 assistance, the likelihood is that the Corps will not perform erosion repairs in the future.

### **Vulnerability to Erosion**

Erosion by itself puts the levee and any structures on the levee at risk. These structures include irrigation and drainage systems, residential buildings, agricultural buildings, wildlife habitat, etc. If left unresolved, erosion would lead to a levee breach, imposing risk on all of the assets of Pearson District.

### **Future Development**

While future development may occur in the areas protected by levee, the District does not control this development. The District only can control whether the levees meet certification standards.

## *Severe Weather: Heavy Rain and Storms*

**Likelihood of Future Occurrence**–Likely

**Vulnerability**–Medium

### Hazard Profile and Problem Description

According to historical hazard data, severe weather is an annual occurrence in the District. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future.

### Past Occurrences

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.

### Vulnerability to Heavy Rain and Storms

#### Assets at Risk

Heavy rain and thunderstorms are the most frequent type of severe weather occurrence in the area. Wind and lightning often accompany these storms and have caused damage in the past. Problems associated with the primary effects of severe weather include erosion, flooding, pavement deterioration, washouts, landslide/mudslides, and downed trees. However, 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 stream bank erosion. Flooding, levee failure, and stream bank erosion can cost RD 551 millions in damages.

## 6.6 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.

### 6.6.1. Regulatory Mitigation Capabilities

Table 6-4 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.



**Table 6-4 RD 551's Regulatory Mitigation Capabilities**

<b>Plans</b>	<b>Y/N Year</b>	<b>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?</b>
Comprehensive/Master 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 3. 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 it 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
<b>Building Code, Permitting, and Inspections</b>	<b>Y/N</b>	<b>Are codes adequately enforced?</b>
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	
<b>Land Use Planning and Ordinances</b>	<b>Y/N</b>	<b>Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?</b>
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		

Source: RD 551

## 6.6.2. Administrative/Technical Mitigation Capabilities

Table 6-5 identifies the department(s) responsible for activities related to mitigation and loss prevention for RD 551.

*Table 6-5 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		

Source: RD 551

### 6.6.3. Fiscal Mitigation Capabilities

Table 6-6 identifies financial tools or resources that the RD 551 could potentially use to help fund mitigation activities.

*Table 6-6 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	
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		

Source: RD 551

### 6.6.4. Mitigation Education, Outreach, and Partnerships

Table 6-7 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 6-7 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	

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
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?		

### 6.6.5. Other Mitigation Efforts

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

## 6.7 Mitigation Strategy

### 6.7.1. Mitigation Goals and Objectives

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

### 6.7.2. Mitigation Actions

The planning team for 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.

#### *Action 1. Levee Improvements*

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**Hazards Addressed:** EQ, EQ Liquefaction, Flood: 100/200/500-year, Flood: Localized Stormwater Flooding, Levee Failure, River/Stream/Creek Bank Erosion, Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning), Severe Weather (Wind and Tornadoes)

**Goals Addressed:** 1, 3

**Issue/Background:** The goal of this Mitigation Action is to improve the Pearson District levees over the next five years to a level of protection that repairs current deficiencies as noted in the state's Flood System Repair Project, and correct issues noted in the 2013 Corps of Engineers Periodic Inspection Report.

**Other Alternatives:** None proposed at this time

**Existing Planning Mechanisms through which Action will be Implemented:**

**Responsible Office:** Reclamation District No. 551 as the local maintaining agency and the State of California Flood Protection Board as the local sponsor of the federal flood control project.

**Priority (H, M, L):** High

**Cost Estimate:** \$5 million

**Potential Funding:** Delta Levee Subventions Project currently funded by Propositions 1, 1E and 84. The state flood control deferred maintenance program (2016), the state Flood System Repair Program.

**Benefits (avoided Losses):** Preservation of the protection of 8,000 acres. Most of this property is farmed and thus a contributing factor to the local, state and national economy. The assets on Grand Island have been estimated to exceed \$89 million 10 years ago, and therefore are much larger today.

**Schedule:** 1 – 10 years depending on the availability of funds